

USE CASES

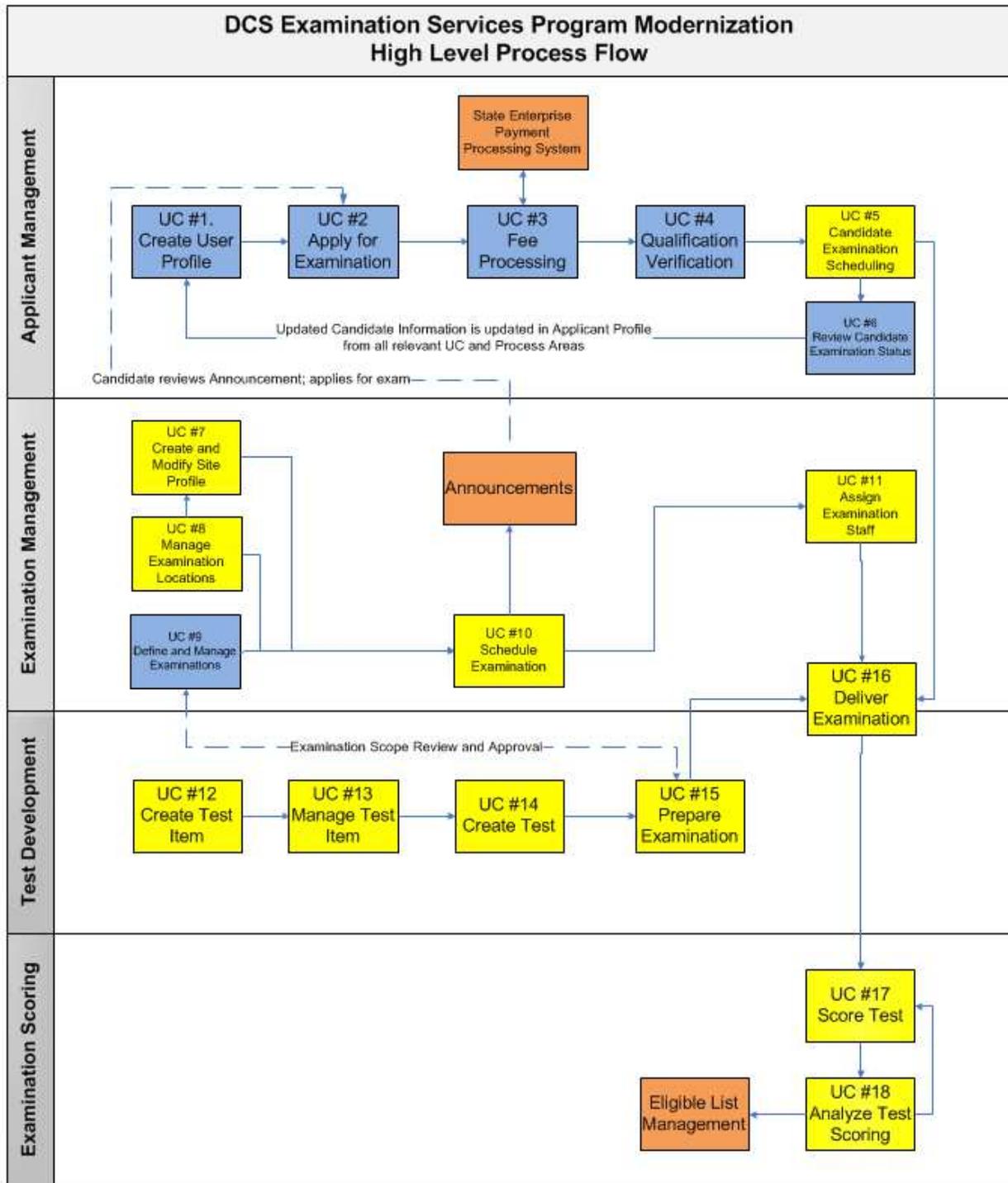
TABLE OF CONTENTS

Introduction to Use Cases.....	2
Examination System Volume Information / DCS Exam Forecast for next 5 years	4
Non-RFP Use Cases/Cross Referenced.....	5
Use Case 1: Create User Profile	5
Use Case 2: Apply for Examination	5
Use Case 3: Fee Processing.....	5
Use Case 4: Qualification Review.....	5
Use Case 6: Review User Examination Status.....	5
Use Case 9: Define and Manage Examination Program	6
RFP Use Cases.....	7
1. Test Development Functional Requirements	7
Introduction to Use Case 12: Create Test Item.....	8
Introduction to Use Case 13: Manage Test Item	16
Introduction to Use Case 14: Create Test.....	20
Introduction to Use Case 15: Prepare Examination.....	25
Introduction to Use Case 16: Deliver Examination	31
2. Examination Scoring Functional Requirements.....	36
Introduction to Use Case 17: Score Test.....	37
Introduction to Use Case 18: Analyze Test Scoring	43
3. Test and Candidate Scheduling Functional Requirements.....	48
Introduction to Use Case 5: Candidate Examination Scheduling	49
Introduction to Use Case 7: Create and Modify Site Profile	54
Introduction to Use Case 8: Manage Examination Locations.....	58
Introduction to Use Case 10: Schedule Examination.....	63
Introduction to Use Case 11: Assign Examination Staff.....	68

Introduction to Use Cases

The State is modernizing its entire examination services program processes and systems. After detailed analysis, the decision was made to seek a separate procurement for the functionality specific to test development and management. However, since that portion of work is part of a much larger work effort, information relative to the full examination services program processes is provided as context. Clearly integration between processes and systems will be needed to ensure an efficient and effective examination services program.

Following, you will find a complete workflow of the examination services process, short descriptions of Use Cases NOT included in this RFP and more detailed Use Cases for functions included in this RFP. It should be noted that not every detail and requirement is in each User Case. The Use Cases are provided as a way for vendors to understand the business and put context around the detailed functional and technical requirements.



DCS Exam Forecast on the new platform

Volume	Year 1	Year 2	Year 3	Year 4	Year 5
Total Test Items in Data Bank – State and Local	150,000	155,000	160,000	165,000	170,000
User Locations (for internal users – State and Local)	5	45	90	100	100
Online Testing Sites	5	50	100	150	200
Department of Civil Service Users	95	250	250	300	350
Total concurrent non-candidate users (see Section 1.01 Definitions)	90	405	690	870	1,020
Simultaneous Test Takers	750	5,000	20,000	30,000	30,000
Total Applicant	170,000	179,000	188,000	197,000	207,000
Total Candidate	140,000	147,000	154,000	162,000	170,000
Total Exams	5000	5000	5000	5000	5000
Total State Exams	800	800	800	800	800
Total Local Exams	4200	4200	4200	4200	4200
Delivery Method	Year 1	Year 2	Year 3	Year 4	Year 5
CBT Exams	10%	20%	40%	60%	80%
CBT Exams	500	1000	2000	3000	4000
Forms Delivered CBT	100	200	400	600	800
CBT Test Candidate	14,000	29,400	61,600	97,200	136,000
P&P Exams	75%	65%	40%	20%	0%
P&P Exams	3750	3250	2000	1000	0
Forms Delivered P&P	750	650	400	200	0
P&P Test Candidate	105,000	95,550	61,600	32,400	-
T&E Exams	15%	15%	20%	20%	20%
T&E Exams	750	750	1000	1000	1000
Forms Delivered T&E	375	375	500	500	500
T&E Test Candidate	21,000	22,050	30,800	32,400	34,000

Examination System Volume Information / DCS Exam Forecast for next 5 years

Term	Definition
Total Test Items in Data Bank	# of unique questions and instructions, that are used to create tests
Total Applicant	# of applications received in a given year. Assuming 10% growth. One person applying for 5 exams counts as 5 applications/
Total Candidate	# of candidates sitting for exams in a given year. Assuming 10% growth. One person sitting for 5 exams at one time counts as 5 candidates
Total Exams	# of exams held each year. No growth estimated as the goal is to test more candidates with fewer exams.
Test Forms	Many exams can be delivered with a single test form. This is currently about a 5/1 ratio of exams to test forms.
CBT Exams	Exams delivered on a computer in a proctored environment
P&P Exams	Exams delivered using paper and pencil in a proctored environment
T&E Exams	Exams delivered on a computer NOT in a proctored environment

Non-RFP Use Cases/Cross Referenced

The functionality identified in the Use Cases below is not part of this RFP. However, use cases that are cross referenced within the applicable RFP use cases, are defined here for your reference.

Use Case 1: Create User Profile Purpose and Objectives

This Use Case describes how individuals who are seeking employment with New York State or a local jurisdiction and who potentially wish to apply to compete in a DCS State or local examination, will create user profiles using the online DCS solution. The profile will allow users to record personal information which may be used in one or more examination applications. The user profile may also be used as a way for individuals to receive information about examinations by request or through targeted outreach by DCS based on user information.

Use Case 2: Apply for Examination Purpose and Objectives

This Use Case describes how users who wish to apply to compete in a DCS examination(s) will apply via the DCS online solution. Applications will utilize information from a user's profile and provide the option for additional questions or experience to be added. The solution will support users applying for multiple examinations by utilizing a common application that can be used for multiple examinations in a single interaction. Applicants will be provided with application progress updates and the ability to save an application as a draft.

Use Case 3: Fee Processing Purpose and Objectives

When an applicant submits an application to compete in a DCS examination, they may be required to pay an application processing fee to DCS. DCS may grant the applicant a fee waiver, or the examination may have no fee. The fee amount, which varies between exams, is stated in the examination announcement for the relevant exam. The application is not considered complete until the Fee payment process is completed.

Use Case 4: Qualification Review Purpose and Objectives

This Use Case describes how the review of examination application will be performed by DCS Reviewers will be able to review applications and the user's profile to determine if they meet the minimum qualifications to compete in an examination. Some applicants may be conditionally approved and DCS will conduct further reviews into their qualifications. Applicants will also be able to supply addition supporting information or documentation.

Use Case 6: Review User Examination Status Purpose and Objectives

This Use Case describes how a user can view their current examination status in their DCS profile. The profile will provide them with historical and upcoming examination information and enable messaging and information to be passed to the user, applicant or candidate (based on the phase of the process they are in).

[Clarification: An individual becomes a User when they create a profile; a User becomes an Applicant after submitting their application; an Applicant becomes a candidate when they are qualified to take an exam]

Use Case 9: Define and Manage Examination Program

Purpose and Objectives

This Use Case describes how State agencies and local municipalities will be able to create and submit examination requests using the solution. The examination request will utilize a comprehensive catalog of examination programs to allow DCS customers to request examinations for required job titles and groups as well as the development of a new examination if necessary. DCS will use the solution to complete a multi-level review of the request and, if approved, to define an associated Examination comprised of minimum qualifications, associated test(s) and their relative weights.

RFP Use Cases

1. Test Development Functional Requirements

The core Test Development business functions for the Examination Systems Modernization will support are described with the following numbered Use Cases:

- Use Case 12 *Create Test Item*
- Use Case 13 *Manage Test Item*
- Use Case 14 *Create Test*
- Use Case 15 *Prepare Examination*
- Use Case 16 *Delivery Examination*

The TMS should include, but not be limited to:

- Provide a highly flexible and robust engine for test content development.
- Provide flexible and robust security that allows access to tests and test content to be controlled and modified, as well as allowing multiple roles to be defined and configured.
- Include the ability to manage test items from creation and approval to utilization in tests and examinations.
- Support a wide array of test item formats from basic multiple-choice, to constructed response, to interactive simulation programs with branching paths and feedback to test takers.
- Provide, track, and export advanced utilization data and statistics (at the item, subtest, test, and examination level) that can be used for activities such as item analysis, test development, productivity evaluation, and examination planning.
- Permit Tests and examinations to be used in complex delivery patterns featuring many instances of repeated tests within related examinations (series), or multiple iterations of an examination. This includes the ability to present test content to a test taker once and use it in the scoring of multiple tests.
- Permit computer based testing and traditional paper-and-pencil delivery methods as needed.
- Facilitate the association of tests and exams by, among other things, providing the ability to associate a single test with numerous exams quickly and easily.
- Include a means to efficiently and accurately import and convert test content and related data and information that exists outside the system for use in the system.

Introduction to Use Case 12: Create Test Item

Among other things, the TMS will need to:

- Allow staff to create new test questions
- Allow staff to save newly created test questions to a repository
- Allow staff to add links and attachments to the stored test items
- Allow staff to classify/categorize test questions using a hierarchy of classification and sub-classification codes
- Allow staff to attach tags to created test questions

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 12: Create Test Item

Actors

- DCS Staffing Services
- DCS Testing Services
- Vendor/Subject Matter Expert (SME)

Role

- Test Content (item, subtest, or test) Creator
- Test Content Reviewer

Purpose and Objectives

This Use Case describes how Test Content Creators will use the system to create test items for use in subtests and tests.

[Test items are synonymous with test questions. Subtests refer to a group of test questions in a particular subject area on a test that the test taker is being assessed on (e.g. Project Management). A test is comprised of a combination of various subtests (e.g. Project Management, Preparing Written Material, and Supervision). A test item is a component of a subtest and a subtest is a component of a test.]

Trigger Events

- A new test item is designed and ready to be added to the system

[The completed test item needs to be saved and stored within the system.]

Precondition

- A Test Item Creator (DCS staff, a Subject Matter Expert, or a vendor), designed and developed a Test Item outside of the system in collaboration with sponsoring agencies and organizations to meet particular examination requirements for a position / title

[Test items may be created outside of the system and then data entered into the system; or test items may also be entered directly into the TMS as they are being created.]

Post Conditions

- Test item is created, classified, and able to be managed within the system

Use Case Flow

1. A test item is designed and developed by DCS, a Subject Matter Expert, or a vendor.
2. Test item design is generally completed outside of the system in collaboration with sponsoring agencies and organizations.
3. The Test Content Creator will use the system to create a new test item in the required format.

[Required format refers to the type of test item being created, such as multiple choice, short answer, etc.]

- a. The system will also permit test content created outside of the system (e.g., by Subject Matter Experts or vendors) to be imported, providing it is created in a specified format.

[Specified format refers to the layout of the item being created. In order to import it, certain information (fields) has to be in a particular place or order so that the system will be able to find and pull in the information appropriately.]

- i. When importing test content, the system will preserve formatting such as indents, bolding, bullets, tables, and numbering.
 - b. The system will permit the Test Content Creator to clone an item to initiate creation of a new item.

[To clone refers to the ability to create a copy of an existing test question, and save it as a new, unique test question which can then be modified.]
- 4. The system will support a number of common test item formats for test content creation:
 - a. Test item formats will include, but not be limited to:
 - i. True/False Questions
 - ii. Question with selection of drop-down responses
 - iii. Simple numerical / date / text response
 - iv. Fill-in-the-Blank
 - v. Matching
 - vi. Multiple Choice Questions
 - 1. Single correct response
 - 2. Multiple correct responses
 - 3. Scoring values associated with each choice

[Different score values associated with each choice. For example:
A=1, B=0, C=-1, D=2]
 - 4. Scalable in terms of number of choices

[Going beyond the basic A, B, C, D choices. The system would enable the Test content Creator to choose the number of choices.]
 - 5. Ability to restrict the number of choices that can be selected (e.g., Choose Only One, Choose up To Three, etc.)
 - 6. Ability to select all choices presented (e.g., Choose As Many as you feel are appropriate)
 - vii. Interactive Questions
 - 1. Drag and Drop
 - 2. Point and Click / Hot Spots
 - viii. Questions utilizing Stimulus/References/Exhibits
 - 1. Ability to link multiple test items with a set of reference information.

[For example, a map or a paragraph of information is presented to the test taker. Along with that stimulus, a bank of test questions can be created to be associated (linked) specifically to that stimulus. 10 Questions might pertain specifically to that stimulus. The Test Creator would only be able to select those 10 questions that are linked to that particular stimulus. The system will not allow the Test Creator to select any question from the Test Question Bank that is not linked to the stimulus being provided.]

- ix. Multimedia Content and Questions (e.g., charts, tables, graphs, maps, flow-charts, images, video, audio recordings)
 - 1. For some questions, the candidate will have the ability to manipulate and/or add content to the charts, graphs, etc.
- x. Task Simulation Content (e.g., MS Excel sheet to be completed by test-taker)
- xi. Branching questions that lead to different test questions depending upon the candidate's response
- xii. Essay Response Questions
- xiii. Short Answer Response Questions
- xiv. Oral Response Questions
 - 1. Responses are captured on audio or video recordings for later scoring.
 - 2. Questions for an in-person interview / Oral Test
 - a. Structured Response as well as individual questions
- xv. Training and Experience Questions
 - 1. Includes education/skills/experience inventory that candidates would respond to that could be matched to a departmental job profile.
 - 2. Responses will be automatically scored. However, sometimes the experience needs further analysis and cannot be automatically scored.
 - 3. Will include multiple education and experience factors in a questionnaire format that can have inter-related questions with variable values associated with those factors (e.g., Years and type of applicable work experience, advanced degrees and subject area)
 - 4. Points awarded based on a response to one question can vary based on responses to other questions.
 - 5. For a given question or set of associated questions, the system will permit a maximum to be set for the total number of points that can be earned for the question or set of questions.
 - 6. The system will permit a candidate-specific cutoff date to be defined which will be used as a reference for scoring certain responses, such as work experience that must be obtained after the acquisition of a degree or license.
- xvi. Performance based questions (e.g., typing proficiency)
- b. The system will permit blending of test item formats within a single test item (e.g., multi-media stimulus followed by a multi-choice, multi-answer question).
- c. The system will permit test items of different formats to be grouped together, and/or to follow from each other (e.g., branching or sequencing of related questions such as those used in a simulation).
 - i. The system will permit bundles to be saved and reused across multiple subtests or tests.

5. The system will provide options as to how an item will be presented to a candidate, which can be defined when creating the item and/or when compiling into a test. Options might include, but are not limited to:
 - a. Option to restrict test taker from changing answers once they moved on to another question/section.
 - b. Option to present feedback once an answer has been submitted
6. If necessary the Test Content Creator will use the system to add and/or link reusable objects such as background materials (electronic files or links) relative to the item creation or use (e.g., source documents, appeals discussions) to the test item.

[These attachments will be a part of the test item's repository.]
7. The Test Content Creator will be able to select item components from a library of reusable objects such as logos, graphics, charts, etc. The library should be structured for securing materials with access levels and be searchable.
 - a. Use of the library items will be tracked to ensure that the same items are not used in overlapping tests (or other inappropriate ways)
8. The system will allow the Test Content Creator to define test item criteria including but not limited to:
 - a. Time restrictions (e.g., length of time available to respond to a particular question or set of questions)
 - b. Specific feedback provided following candidate selection of a response
9. The system will also allow the Test Content Creator to create any instructions, test item help or additional content for test takers, and associate them with one or more test items.

[For example, Instructions preceding a set of test questions could read, For the following 15 questions, assume that you are the newly appointed supervisor of a unit consisting of several employees. You report to a section head.]

 - a. Test items will include the option of a candidate tutorial prior to starting the test.

[Tutorials could be demonstrations on how to navigate, manipulate and/or answer test questions of various formats (e.g. Hot Spots, Drag and Drop, etc.)]

 - i. Tutorials will be completed prior to the start of the examination.
 - ii. Tutorials can also be made available outside of examination delivery.
 - b. Test items that permit the use of calculators will be identified.
10. The Test Content Creator will add the required data and the system will create required metadata for the test item in order for it to be managed and discoverable in the system. Test item data and metadata will include but not be limited to:
 - a. Test Item Reference Number
 - b. Classification Information
 - c. Author
 - d. Subject Matter Expert(s) Consulted
 - e. Owner/Test Item Steward
 - f. Date Created

- g. User Created By (person performing data entry; automatically captured by TMS)
 - h. Dates of Use
 - i. Exams Used For
 - j. Performance Statistics
 - k. Updated By
 - l. Version number
 - m. Test Item Format Type
 - n. Level of Difficulty based on a standard scale
 - o. Optionally restrict use of test items to applicable exam/test
 - p. Refresh Date
 - q. Date of Appeals
 - r. Key Approval Status (e.g., ability to be scored with or without additional approval)
 - s. Assistive Technology Compatibility
 - t. Special technology requirements or configuration requirements (e.g., two screens, minimum screen resolution)
 - u. Linked item / stimuli
 - v. Administrative / Reference Documentation (file upload)
 - w. Correct answer / answers to test item, if applicable (e.g., multiple choice items, true / false items)
 - x. Links to items that would be excluded from being used with this item on the same test
11. The Test Content Creator will be able to use the system to categorize the test item using a hierarchy (taxonomy) of knowledge areas. The hierarchy will include:
- [For example: A Project Management Test Item is created. It could be categorized as Project Management (Main Knowledge Area) with subcategories of Origination, Execution and Control (Lifecycle Phases), Time Management, and Cost Management (Project Management Knowledge Areas).]
- a. Multiple nested levels of knowledge area categories and sub-categories.
 - i. The Test Content Creator will have the ability to create new and edit existing knowledge area categories and subcategories.
 - b. The ability to assign a test item to multiple knowledge areas.
- [A Test Item may be assigned to multiple Main Knowledge areas. For example, the same test question could have a main Knowledge Area categorization of Project Management as well as Business Systems Analysis.]
- c. The ability to assign owners to knowledge areas.
12. The Test Content Creator will be able to use the system to assign key words (tags) to the test items.
- [This function will make the item searchable by tags in addition to being searchable by category and sub-category.]

13. The Test Content Creator will be able to use the system to create a scoring scheme for each test item. The system will have the ability to automatically score test items based on the scoring schemes associated with each item.

[See also notes from Use Case 17 – Score Test]

- a. Scoring schemes for individual test items will include but not be limited to:
 - i. Dichotomous (Yes/No) (1 or 0)
 - ii. Scale Scoring (across positive and negative values, grouping of score values; e.g., Scores between 1 and 5 get converted to a score of 2)
 - iii. Range Scoring (values assigned to education or experience in a certain range are assigned a specific score value. e.g., 1-3 years of experience gets a score of 1)
 - iv. Manual scoring (e.g., DCS input of score for essay questions)
 - b. The Test Content Creator will use the system to specify the correct answer(s) to test item, if applicable (e.g., multiple choice items, true / false items)
 - c. The Test Content Creator will use the system to specify appropriate allocation of scoring and points for test item response(s).
 - d. The system will utilize test item attributes to determine if the test item can be scored in an automated fashion or whether manual scoring would be required.
 - e. Scoring schemes will have ability to have different score for each response (e.g., answer A might be 10 points, B is 5 points, C is 0 points, and D is -5 point).
 - f. For some test items, the system will be able to sequence the scoring of responses by generating a score based on the highest-value response first, then moving to the next highest-value response until a maximum is achieved (e.g., training and experience items combining most valuable part-time work first when computing equivalent full-time experience that is capped at 35 hours per week).
14. The system will enforce different data and content requirements (depending on the test item type) that must be completed for the test item and these will be clearly specified for the Test Content Creator.
15. The Test Content Creator will be able to view the test item as it would appear to a test taker.
16. The Test Content Creator will be able to save the test item as a draft (not approved for use) during development.
- a. The System will not allow the publication of a test that contains a draft test item.
17. The Test Content Creator will use the system to optionally assign the test item to another user or group of users for further refinement and editing.
- a. The system will keep a full audit record of edits and changes to the test item and allow for collaboration between Test Content Creators with clear version control management.
18. The Test Content Creator will use the system to optionally assign the test item to one or more Test Content Reviewers for final review.
- a. The system will manage the association of Test Content Creators and Test Content Reviewers.
 - b. Test items can be reviewed by multiple Test Content Reviewers.

- c. The system will provide Test Content Reviewers with notifications to review test items assigned to them.
 - d. The system will support re-assignment of a test item to a different approver.
 - e. On completion of reviews, DCS Test Content Reviewers will use the system to provide feedback, edits and recommendations for the reviewed test items.
 - i. Alternatively, the DCS Test Content Reviewer may provide feedback, edits, and recommendations outside the system; however they will have to use the system to record final approval.
 - ii. Test Content Reviewers will use the system to optionally approve multiple test items at once.
19. The system will indicate the review status of the test item. This status will include:
[Approved for Publication items will be open for candidate review and appeal after the test is held. Approved for scoring items can be scored immediately and are not subject to candidate review or appeal.]
- a. Approved for Publication (i.e., completed initial reviews such that the item can be used on a test)
 - b. Approved for Scoring (based on previous candidate reviews and assessment of test item correctness)
20. If any appeal is lodged on the test item, the date of appeal(s) and any supporting documentation will be saved with the item.
[This functionality ties into #6 above.]
21. When a test item review is fully completed with all test item data and content, the Test Content Creator will be able to publish the test item for use in the *Create Test Use Case*.

Associations with other Use Cases

- Use Case 13 *Manage Test Items*
- Use Case 14 *Create Test*

Alternative Flow

- Some test items will need to be published in a paper and pencil based version (test booklet) or alternative to support continued use of paper and pencil based and scanned response sheet testing. While some formatting may take place in another program (e.g., MS Word), test items need to be exported with their original formatting intact, including any associated charts, graphs, images, etc.
- Many test items will be used as-is for a paper and pencil based test, and if not, an appropriate alternative printable question will be available (it is anticipated that some test items will require a paper and pencil based version or alternative to support continued use of paper and pencil based and scanned response sheet testing 'bubble sheet' as necessary).

Introduction to Use Case 13: Manage Test Item

Among other things, the System will need to:

- Allow staff to modify existing test questions
- Allow staff to search existing test questions by classification code, sub-classification code, key words or by tags
- Allow staff to create reports based on selected test item data
- Record, track, search and archive, records of test item usage data

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 13: Manage Test Item

Actors

- DCS Staffing Services Division
- DCS Testing Services Division
- Test Content Development Vendor/SME

Role

- Test Content Manager
- Test Content Creator

Purpose and Objectives

This Use Case describes how the DCS Test Content Manager will use the system to manage test items for use in tests and examinations. This includes the ability to monitor the usage of the item and track and store item statistics.

[The system should be able to track the Examination Series name and date that the test item was used for, as well as the subtest that it was used in. It should also be able to record all item statistics for that test item by individual subtest usage for each Examination Series.]

Trigger Events

- Need to review test item utilization
- Need to edit, update, or suspend a test item
- Need to copy/clone test item
- Need to associate test item with a subtest

[Test item utilization refers to the statistical results of the item's usage and also the data about the name and date of the examination series in which the test item was used, etc. Associating a test item with a subtest refers to selecting that test item as one of the questions to be asked in a particular subject area on a test.]

Precondition

- Test item creation has been completed

Post Conditions

- Test item management is complete

Use Case Flow

1. The Test Content Manager will use the system to locate any test item at any time by searching on test item data and metadata (e.g., test performance statistics, dates of use, classification).

[For example, searching for items with the main knowledge area of Project Management that have an item difficulty level of between 58% - 85%.]

2. The Test Content Manager will use the system to make edits and the system will maintain the audit log and update any relevant metadata as detailed in the *Create Test Item Use Case*.
 - a. The Test Content Manager will have the option of submitting edits for review, as detailed in the *Create Test Item Use Case*.
3. If the Test Content Manager makes an edit for a test item that is in a current examination the system will ensure that the approved, updated version of the test item is the one that will be available for use in any future test.

- a. As finalized edits are saved, the system will track and store previous versions.
 - b. The Test Content Manager will use the system to view previous versions.
 - c. The Test Content Manager can use the system to restore a previous version.
4. The system will allow the Test Content Manager to restrict test items from being used together with other specific test items (e.g., test items with similar concepts, test items that may give away an answer in another test item).

[If the Test Content Creator sets a restriction where a classified test question is not to be used with another classified test question, then the system will not allow those questions to be used together in a test.]
5. The system will complete comprehensive logging as test items are used in examinations, including but not limited to:
 - a. Test item utilization (e.g., the tests the item is associated with, the exams the item is associated with—to prevent overuse).
 - b. Candidate response and item completion (e.g., percentage with correct answer, percentage of each incorrect answer, time spent per test item - to provide insight on test item difficulty).
 - c. Item reliability statistics (e.g., correlation of item score to the test group score to understand how well an item interacts with other items in that subject area).
 - d. Statistics for equivalent forms of tests (e.g., LOFT (Linear-On-The-Fly) based on IRT (Item Response Theory) to enable system based test item management within examinations).
 - e. The number of higher scoring candidates selecting each choice and the number of lower scoring candidates selecting each choice (i.e., High/Low Split to understand the effectiveness of test items).
 - i. The system will allow the Test Content Manager or Creator to set the split points for the High/Low split (e.g., 50/50, 25/50/25).
 - ii. The system will allow the High/Low Split to be based on select criteria (e.g., Breakdown by ethnic group).
 - f. Historical item statistics will be saved and stored, and will be searchable and reviewable based on these statistics.
6. The Test Content Manager will be able to quickly create reports on test item data in order to assist in test issue diagnosis, test validity reviews, and security investigations.
7. The system will alert the Test Content Manager if test items exceed thresholds to identify issues with (for example):
 - a. Excessive incorrect candidate responses (e.g., any positively valued simulation item that is selected by less than 25% of respondents will automatically be flagged)
 - b. Excess utilization in examinations
 - c. The system will allow the Test Content Manager or Creator to set and adjust issue thresholds.
8. If an issue is identified with a particular test item, the system will allow the Test Content Manager to suspend the test item from further use.

- a. The system will be able to recognize if suspension of a test item will impact planned examinations and will require an alternative test item be selected as a substitute.
- b. The Test Content Manager will be able to be unsuspending, archive or delete (subject to permissions) suspended test items as necessary.

Associations with other Use Cases

- Use Case 12 *Create Test Item*
- Use Case 14 *Create Test*

Alternative Flow

- None

Introduction to Use Case 14: Create Test

Among other things, the system will need to:

- Allow staff to create and manage a wide variety of subtests and tests
- Allow staff to combine multiple subtests into a single test
- Allow staff to request test content (subtests) from one another, keeping track of requests that have been made and associating each request with the test(s) it was made for
- Allow staff to associate a single subtest with multiple tests
- Allow staff to associate a single subtest with multiple tests owned by multiple test creators
- Provide robust support for paper and pencil testing, as well as for computer-administered testing
- Allow staff to search for existing tests by classification code, sub-classification code, or by tags
- Record, track, archive, and report on item, subtest, and test usage data
- Allow staff to create reports based on selected item, subtest, and test data and metadata

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 14: Create Test

Actors

- DCS Staffing Services
- DCS Testing Services
- Test Content Development Vendor/SME

Roles

- Test Creator
- Test Content Manager
- Test Reviewer

Purpose and Objectives

This Use Case describes how the Test Creator will use the system to create tests by associating available test items to subtests or subject areas. This process will involve a collaborative team working together to create the full test. Test Creators will also be able to request the use of test items which they do not have ownership over. Once a test is created it will be reviewed, potentially in a multiple reviewer, peer review method.

[Not all tests are the result of collaborative efforts. At times, a single test creator will develop and assemble an entire test.]

Trigger Events

- An exam is planned and tests need to be administered
- A test is created, independent of an exam, to be used in the future

[Test creators need to be able to create tests as standalone entities. They also need to be able to associate any test with any examination.]

Preconditions

- Test scope has been determined and approved
- Subject areas are created and defined in the solution

[The term subject areas refers to the knowledge area or ability that is tested with a specific set of test content. A test typically covers multiple subject areas.]

Post Conditions

- Test is created
- Test may be published
- Preliminary subtest scoring weights are defined

Use Case Flow

1. The Test Creator will use the system to create a new test.
 - a. The system will support creating a new test by cloning an existing test.

[The term cloning refers to the ability to create a copy of an existing object, in this case a test, and save it as a new, unique test which can then be modified.]
2. The system will manage test data and metadata. Where necessary, the Test Creator will use the system to add required metadata to the test. Test data and metadata will include but not be limited to:

[Metadata is very important to DCS work, as it is used to run a variety of reports that enable analysis of various aspects of operations, such as the types of tests that are held, the job titles tests are held for, and the age of the tests.]

- a. Test Reference Number
 - b. Author
 - c. Primary Test Owner
 - d. Date Created
 - e. Test Created By
 - f. Test Classification
 - g. Assistive Technology Needs
 - h. Key words
 - i. Refresh date
 - j. Review Status
 - k. Publication Approval
 - l. Delivery type (e.g., computer-based, paper and pencil)
 - m. Software needed by candidates to take test, such as MS Excel
 - n. Standard references and tools required for items/subtests in test
3. The Test Creator will use the system to define a collaboration team of test item owners and to assign authorization to view and/or modify test items and subtests within that test.
- [Collaboration is typically done through the subcontracting of test content, in which one test creator (the subcontractor) provides specialized content for use in another test creator's test. Most subcontracted test content is used in for the assessment of general competencies, for example, reading comprehension, logical reasoning, and clerical accuracy. Most test creators develop the job-specific, technical test content they use in their tests.]
4. The system will maintain a full audit record of edits and changes made to the test. The audit record will include but not be limited to:
- a. User
 - b. Action taken by user
 - c. Date / time of action
5. The system will allow the Test Creator to store, track and view previous versions of a test.
- a. The Test Creator will use the system to view previous versions of the Test.
6. The Test Creator will use the system to create a new subtest or select an existing subtest and be able to associate it with a test.
- [A subtest is a subpart of a test. A subtest contains test items that address a specific knowledge area or ability. The knowledge area or ability addressed by a subtest is typically identified by the subject area designation given to the subtest.]
- a. Each subtest within an examination is defined by a content domain definition (subject area) that is developed by DCS as part of the job analysis.
 - b. The system will include an inventory of subtests that is searchable and supports re-use of subtests.

[It is important to be able to use a subtest in multiple tests held at different times. Additionally, DCS needs to be able to store, search for, and retrieve subtests at any time.]

7. The Test Creator will use the system to identify and select test items for inclusion in subtests, both by bundle and by individual item.

[Subject areas can change over time, and some subject areas contain multiple knowledge areas that are subject areas in their own right. Given these circumstances, it is important to be able to use any item in any subtest, regardless of item classification or subject area designation.]

- a. Searching for test items can be by keyword, subject area hierarchy, level of difficulty, or other test item metadata.
 - b. The Test Creator can add test items to a subtest regardless of the subject area hierarchy classification of those items.
 - c. The Test Creator will provide preliminary subtest score weighting, if required.
 - d. The system will also have the capability of automatically selecting items for subtests based on Test Creator criteria, item statistics, and other item characteristics.
8. The system will enable the Test Creator to request test content from other Test Content Managers.
 - a. The Test Content Manager would, upon request, provide the test items that they own, to the Test Creator for inclusion in the Test Creator's test or subtest.
 - b. Some coordination among the group providing subtests may occur outside of the solution.
 - c. The system will record requests for test content and allow the Test Creator and authorized test item owners to manage and track them and their status.

[As mentioned above (item 3), Test Creators often obtain general competency test content from subcontractors. Therefore, Test Creators need a mechanism for requesting subcontracted test content, and subcontractors need a mechanism for receiving, tracking, and filling requests for subcontracted test content.]

- d. Test Content Manager will have the ability to associate their set of test items to multiple tests or subtests (i.e., requests from various Test Creators).

[Subcontractors need to be able to associate a single subtest with multiple tests. Often, subcontractors need to associate the same subtest with the tests of several test creators. In this case, the subcontractor creates one subtest with one set of test items, and then associates the subtest with the test(s) of each test creator. The tests typically are administered on the same day but independently of one another.]
9. The Test Creator will use the system to optionally assign the test to another user or group of users for further refinement and editing.
 - a. The system will keep a full audit record of edits and changes to the test and allow for collaboration between Test Creators with clear version control management.

10. The Test Creator will be able to view the test as it would appear to a test taker.

11. The Test Creator will be able to save the test as a draft (not approved for use) during development.

12. The Test Creator will use the system to optionally assign the test to one or more Test Reviewers for review.
 - a. The system will manage the association of Test Creators and Test Reviewers.
 - i. Optionally can send to multiple reviewers (e.g., peer review).
 - b. The system will provide Test Reviewers with notifications to review test items assigned to them.
 - c. On completion of reviews, Test Reviewers will use the system to provide feedback, edits and recommendations for the reviewed test.
 - i. Alternatively, the Test Reviewer may provide feedback, edits, and recommendations outside the system and use the system to record final approval.
 - ii. Test Reviewers will use the system to optionally approve multiple tests at once.
 - iii. The Test cannot be published until all approvals have been recorded in the solution.
13. When test creation and review is fully completed with all test data and content, the Test Creator will use the system to publish the Test for use in the *Prepare Examination Use Case*.

Associations with other Use Cases

- UC #12 *Create Test Item*
- UC #13 *Manage Test Item*
- UC #15 *Prepare Examination*

Alternative Flow

- None

Introduction to Use Case 15: Prepare Examination

Among other things, the system will need to:

- Allow staff to quickly and easily associate a single test with numerous exams
- Allow staff to create multiple tests that share some test content (subtests) in common and that can be presented to a single candidate in one session
- Be able to present multiple tests to a single candidate in one session, presenting any common test content only once while scoring it as many times as needed
- Allow staff to assign weights to subtests and tests

Additional Background:

The term scope of an exam refers to the tests and subject areas that are used in the exam to assess the candidates who are taking the exam. Typically, an exam has a single test, which is often a multiple choice test. The scope of such an exam would be the subject areas that are covered in the test. An example of such a scope is the following:

- Preparing written material
- Understanding and interpreting tabular material
- General Accounting
- General Auditing

DCS needs to analyze the examinations held from multiple perspectives, some of which include analyzing the tests that have been administered, the subject areas covered, the test items used, and the candidates tested. It is very important that test data and metadata be accessible and reportable both in the testing system and in the system used to define and manage examinations.

Often, DCS administers hundreds of tests at the same time which are constructed from one set of subtests. Usually, a number of candidates take several of these tests, all in one sitting. Typically these tests are in a single occupational area, such as engineering, accounting, or clerical support. The tests may not be exactly the same, even though they share some test content in common. The Table (below) illustrates a simple example of this. The letter x indicates that a subtest is part of a test.

	Subtest 1	Subtest 2	Subtest 3	Subtest 4
Test 1	x		x	x
Test 2	x	x		x
Test 3	x	x	x	
Test 4		x	x	x

A candidate who is taking all four tests shown in Table 1 is presented with the test items in the four subtests only once. The candidate’s scores on each of the subtests are used repeatedly to compute the candidate’s scores on the four tests as applicable. This is critical DCS’s ability to use test content efficiently and effectively, and administer thousands of tests every year.

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 15: Prepare Examination

Actor

- DCS Staffing Services Division
- DCS Testing Services Division
- DCS Office of Commission Operations and Municipal Assistance (OCOMA)
- State Agencies
- Local Jurisdictions

Roles

- Examination Creator
- Examination Requestor
- Examination Reviewer

[An Examination Creator is responsible for defining exams them in the TMS. The exam definition is based on work conducted outside the system, such as analysis of the job title and the needs of the requesting agency. An Examination Creator is not always a test creator. An Examination Requestor is typically someone outside of DCS, such as a staff member of another State agency or a local civil service agency. An Examination Reviewer is a supervisor or manager who reviews and approves the work of Examination Creators.]

Purpose and Objectives

This Use Case describes the process for associating test, subtests and test content with an examination and defining test weights and sequencing. This will include the ability for examination requesters to provide feedback on the test components. This Use Case will also describe how examinations will be associated into examination series that candidates will navigate when completing multiple similar examinations with shared content. Finally, the examination and its content will be reviewed to ensure it is ready for delivery.

[Some examinations have multiple tests that are given in a specific sequence. For example, the first test may be a multiple choice test that is administered on one date, and the second may be an oral test that is administered over several weeks at a later time. When an examination consists of more than one test, the tests may have different weights in the computation of the examination score. In the above example, the multiple choice test might have a weight of 1 and the oral test might have a weight of 2. In this case, the multiple choice test would make up 1/3 of the examination score and the oral test would make up 2/3 of the examination score.]

Trigger Events

- An examination is defined and the appropriate test content prepared

Preconditions

- If an examination has been previously held for the job title requested, information on that examination should be available

Post Conditions

- One or more tests is associated with the examination
- Any test weights have been defined
- The examination is ready for delivery

Use Case Flow

1. An Examination Creator will use the system to identify the test(s) that will be used for an exam, using as input the examination request as described in the *Define and Manage Examination Program Use Case 9*, the description of the job title the examination will be held for, the examination history for the job title, tentative exam schedules, and existing series information.
2. The Examination Creator will use the system to associate appropriate test(s) to examinations.
 - a. The Examination Creator can select one or more existing tests and associate them with the examination.
 - b. All creation of new test items, subtests and tests will be completed in the *Create Test Item, Manage Test Item, and Create Test Use Cases*.
3. The Examination Creator will use the system to set weights for the tests within the examination.
 - a. The test weights could be optionally locked, but an administrative override would be needed. (Once the announcement is published, an amended announcement must be issued to change the relative test weights, however item weights could still be changed as long as they are correctly identified on the test administration materials.)
4. Examination Requesters (local Civil Service agencies, State agencies, DCS) will use the system to review the scope of examination and provide feedback before publication of the announcement.
 - a. Examination Requesters can request scope of the examination changes at this time that will require the Examination Manager to make updates to the examination as in the *Define and Manage Examination Program Use Case 9*.
5. The Examination Creator will use the system to define if there is a specific order / sequencing of the tests in an examination.
 - a. Tests may be administered in a specific order during one testing session.
 - b. Tests may be administered over multiple testing sessions, with all candidates taking the first test before candidates are able to take the second test.
 - c. The Examination Creator will may also define if failing one test results in failing the entire exam (e.g., a qualifying test or pass/fail).
 - d. In some instances, failing a test in an examination would prevent the candidate from advancing to the next test
6. The system will manage examination data and metadata by aggregating associated Test data and metadata. Where necessary, the Examination Creator will use the system to add required data to the Examination as described in the *Define and Manage Examination Program Use Case*.
7. The Examination Creator can use the system to group multiple exams and associate them with into an examination series.
 - a. This is done in order to work on the examinations together and to streamline certain tasks, such as associating tests with examinations.
 - b. This will also simplify test administration for candidates who are taking multiple tests, or a single test for multiple examinations, during a single test session.
 - c. The examinations in a series are typically associated with tests that share one or more subtests in common.

- d. Examinations that have been bundled together in an examination series can be viewed and managed by the Examination Creator together.
 - e. An examination series may contain a few, or several hundred examinations.
 - f. When working on an examination series, the Examination Creator can select multiple exams and easily associate them with a single test.
 - i. This is to avoid having to associate the test with each exam using multiple, independent operations.
 - g. When a candidate is being tested for multiple exams during the same testing session and the exams use the same test or subtest, the candidate will be presented with the questions in that test or subtest only once, but the test or subtest score will be appropriately applied to all exams.
8. The Examination Creator will be able to save the changes to the Examination (not approved for use) during these development steps.
 9. The Examination Creator will use the system to initiate an optional review of the examination.
 - a. The Examination Creator will use the system to optionally assign the examination to one or more Examination Reviewers for final review.
 - i. The system will manage the association of Examination Creators and Examination Reviewers.
 - ii. The system will provide Examination Reviewers with notifications to review examinations assigned to them.
 - iii. On completion of reviews, Examination Reviewers will use the system to provide feedback, edits and recommendations for the reviewed examination.
 1. Alternatively, the Examination Reviewer may provide feedback, edits, and recommendations outside the solution, however they will have to use the system to record final approval.
 2. Examination Reviewers will use the system to optionally approve multiple examinations at once.
 10. The system will indicate the review status of the examination (e.g., approved, pending review, in-progress).
 11. The system will provide the option to update the Examination Catalog with a new examination as described in the *Define and Manage Examination Program* Use Case.
 12. The system will make the examination available for delivery during the appropriate timeframe as dictated by the examination schedule, test(s) characteristics and the examination type

Associations with other Use Cases

- UC #9 *Define and Manage Examination Program*
- UC #10 *Schedule Examination*
- UC #12 *Create Test Item*

- UC #13 *Manage Test Item*
- UC #14 *Create Test*
- UC #16 *Deliver Examination*

Alternative Flow

- Paper and pencil tests will need to provide similar efficiencies in terms of administration and scoring by use of an examination series.
- The system should be capable of exporting test content in a standard word-processing format suitable for DCS formatting and publishing for paper and pencil testing.
- A paper-and-pencil candidate being tested for multiple exams during the same testing session will be presented with and answer the test questions in the common subtests only once.
- The responses collected on the Candidate's test paper or bubble sheet will need to be scored in the system where possible and then applied to multiple examinations as necessary.

Introduction to Use Case 16: Deliver Examination

Examination and test delivery supports the completion of examinations and tests by candidates. This is the culmination of examination planning and scheduling, user application and scheduling, and test content management. Examinations are the critical events which all other business processes support and from which they flow. The number of candidates for which DCS must provide testing is substantial. In 2015, DCS tested approximately 140,000 state and local candidates for. DCS is committed to delivering examinations to these candidates using state of the art technologies and providing an enhanced user experience that allows for the most accurate and reliable testing for State and local recruitment.

Our Current Process:

Under our current business model, most of the examinations held are paper and pencil tests. State tests are administered by State employees using locations that, generally, are not owned by the State. Use of the facilities is arranged based on agreements made between the State and the entities that own the locations. Examinations for local government positions are administered by each of the 95 local civil service agencies operating throughout the State. The local civil service agencies each have their own examination administration staff and use facilities not under their immediate control to hold most of the examinations, although some examinations with small candidate pools may be held in facilities operated by the local civil service agencies.

The examination materials are shipped to examination locations immediately prior to the examinations and are secured until the examination date.

State and local examinations are grouped together into series in order to allow the use of test material common to the examinations included in the series. Each examination series, whether State or local, is held on a specific date at a specific time to reduce the possibility that the examination material will be compromised by candidates who take the examination and then disclose the examination material to other candidates.

Future Process:

Computer based examinations may be administered using a commercial testing facility; others may be administered using a State- or local-operated testing facility; or a public facility made available pursuant to an agreement between the facility and DCS or a local civil service agency (such as a municipal building, local school or community center); others using the candidate's own equipment; while others may be administered in a paper and pencil format. Regardless of the method of delivery, the enhanced examination experience for candidates must meet the highest testing industry standards. Maintaining the security of the examination material must be at least as stringent as the standards currently in place.

Among other things, the Examination Delivery system should:

- Allow for flexible test delivery methods, with the option for computer based testing and/or traditional paper-and-pencil delivery methods, as needed.
- Permit tests and examinations to be used in complex delivery patterns featuring many instances of repeated tests within related examinations (series), or multiple iterations of an examination. This includes the ability to present test content to a test taker once, yet use it in the scoring of multiple tests.
- Facilitate the association of tests and exams by, among other things, providing the ability to associate a single test with numerous exams quickly and easily.

- Allow for/enable job simulation testing.
- Allow for delivery: over a period of time; multiple times in a single day; and multiple times over multiple days
- Offer multimedia capacity (use of headphones, graphic displays, audio, and video)
- Allow for standard computer functionality during the test (i.e. Excel for spreadsheet manipulation during administration)
- Allow for multiple examinations/tests to be administered in one seating
- Allow for candidates to get a preliminary score (based on the candidate's correct answers and available scoring information)
- Allow for capture and transmittal of the candidate responses
- Enable Test Delivery Services (at DCS, locality or vendor site) while providing functionality for:
 - Candidate Check-in and Identity Verification
 - Test Monitoring and Proctor Management
 - Examination Security
 - Administration of multiple examinations/tests simultaneously
 - Administration of examinations/tests developed using software other than your own.

Use Case 16: Deliver Examination

Actors

- Candidates
- Test Site Supervisor
- Test Monitors

Role

- Candidate
- Test Monitor

Purpose and Objectives

This Use Case describes how qualified candidates will use the DCS testing system to compete in computer-based DCS tests on a pre-determined date, time, and location under the supervision of test center staff. This will include validation of candidate identity and the management of scoring data for completed examinations. The system will also support delivery of examinations in paper and pencil based test formats. (See Alternative Flow below for non computer based examination delivery.)

Trigger Events

- The candidate has a scheduled time, date, and location to take a DCS test for an exam (or multiple tests for multiple exams) they have been approved to compete in.

Preconditions

- None

Post Conditions

- The candidate has completed the DCS computerized test(s) for which they were scheduled and their responses have been recorded in the solution.

Use Case Flow

1. Prior to the examination, equipment and supplies are shipped to the test site in advance based on the information included in the system and also as described in the *Manage Examination Locations* Use Case.
2. The Test Monitor will use the system to access examination materials including:
 - a. Candidate Roster based on the use of the *Candidate Examination Scheduling* Use Case.
 - b. Special Monitor Instructions created for specific examinations by DCS.
3. At the test site, the Test Monitor will confirm the candidate's identity and eligibility by checking a photo ID against the solution-generated roster.
 - a. Future capabilities may include use of fingerprinting or other biometric capabilities.
 - b. If the applicant has not completed an exam application and does not have an admission notice, the applicant may be granted admission by the Test Monitor as determined by DCS policy.
 - i. The Candidate would have to complete the processes included in the *Create User Profile, Apply for Examination, Fee Processing and Candidate Examination Scheduling* Use Cases.

- ii. If Qualification Review is required, it will be completed after the examination as required based as in the *Qualification Review Use Case*.
4. The candidate will use a DCS approved computer device to take the DCS test.
5. The system will securely authenticate the candidate's identity using the credentials they were provided in the *Create User Profile Use Case*.
6. The system will match candidate ID to approved tests; retrieve and present to the candidate the test items and sub-items that make up the examination which the candidate is scheduled to take at that time.
 - a. Tests, subtests and test items will be developed as described in Test Content and Development process area.
 - b. The system will be able to present tests, subtests and test items to candidates based on previous responses or simulation steps as described in the *Create Test Item Use Case*.
 - c. When multiple tests are used for an associated examination series, the system will present the candidate with an appropriate test form that the candidate has not taken previously.
 - d. All computerized test construction and delivery will conform with computerized testing standards of the Association of Test Publishers and the International Test Commission's *International Guidelines on Computer-Based and Internet-Delivered Testing*.
 - i. This will include a confidentiality statement prior to examinations.
 - ii. This will include amenities such as navigational support for candidate usability.
7. The candidate will complete the DCS test(s) under the conditions stipulated by the test definition and any applicable candidate reasonable accommodations.
 - a. Test Monitors will have the ability to stop/start the test for individual candidates and the entire group.
 - b. Test Monitors will have the ability to hide test screens for individual candidates and the entire group.
 - c. Timed tests will provide feedback to the candidate such as time remaining, number of questions answered/unanswered, etc.
 - d. The system will indicate time remaining and time expired to the candidate.
 - i. If necessary the Test Monitor will be able to adjust time allowances for candidates.
 - e. The Candidate's name will remain on screen at all times to support the Test Monitor's role.
8. The system will be able to process and store candidates' responses on a continuous basis (avoiding loss of data if outage occurs) in order to support scoring as described in the *Score Test Use Case*.
9. Per the test definition, the candidate can complete on-line review information form(s) and/or other supplemental materials.
10. The system will generate and store testing metrics including, but not limited to, time spent on each specific question and time spent on each test to support test review in the *Analyze Test Scoring Use Case*.

11. Test Monitors will use the system to monitor test completion across all candidates and identify if there are any issues with test completion.
12. Test Monitors will be able to use the system to report any system or candidate issues during the course of the examination.
13. Candidate will use the system to complete the examination at which point the Test Monitor will again verify the candidate's identity.
14. Candidates will follow standard offline check-out procedures and exit the building.
15. Candidates will be able to review the tests and answers they have taken if a pre-rating review is required following the completion of the examination.

Associations with other Use Cases

- Use Case 1 *Create User Profile*
- Use Case 5 *Candidate Examination Scheduling*
- Use Case 8 *Manage Examination Locations*
- Use Case 17 *Score Test*
- Use Case 18 *Analyze Test Scoring*

Alternative Flow

Paper and Pencil Testing

- It will also be necessary for the system to support paper and pencil testing for examinations with very high candidate numbers or for candidates with special accommodations.
 - The system will generate reports that facilitate tracking candidates who need special accommodations, including their test location and the accommodation granted.
 - The system will generate reports that identify the test materials (booklets, candidate directions, etc.) needed at each test center and the number of each type needed.
- The system will be able to provide printing for these forms of testing at either the test site or a centralized location.
- Paper and pencil tests will include answer booklets and optical answer sheets (bubble sheets) that will be machine readable at either the test site or a centralized location.
- Candidates may also be able to complete paper and pencil based testing remotely after picking up the test materials and then either returning the materials or mailing them to a central location.
- For paper and pencil tests the Test Monitor will use the TMS to check-in, validate and record test completion as well as any issues with testing and the system will be used to gather data and record scores for all tests (see also the *Score Test Use Case*).

Online Examinations

- Some examinations will be delivered to Candidates remotely for online completion (e.g., Training and Experience examinations.)
- Candidates will receive instructions to access an online examination question set and be required to complete the examination by a particular deadline.

2. Examination Scoring Functional Requirements

The core Examination Scoring business functions that the DCS Examination Systems Modernization system will support are described with the following numbered Use Cases:

- Use Case17 *Score Test*
- Use Case18 *Analyze Test Scoring*

Among other things, the system will need to:

- Be able to draw upon exam applicant information (***Integration point***) generated within the Applicant Management and Examination Planning system in order to link applicant(s) to examinations(s) and to test(s).
- Be able to draw upon the scoring scheme identified for each test item (Section 13 of Use Case 12 – Create Test Item) as well as the test scoring definitions identified for each examination (Section 7 f. and g. of Use Case 15 – Prepare Examination).
- Provide maximum accuracy and flexibility for DCS's use to analyze test/candidate test performance.
- Include tools necessary to support a variety of examination weightings and adjustments for candidate veteran or seniority status.
- Permit item, subtest, test, and examination scoring adjustments as may be deemed necessary during post-test analysis, as well as the generation of formatted score distributions and other reports needed for the analysis of test results based on industry standards and using advanced analytical techniques.
- Permit DCS users to assess and identify test score passing standard(s) and the methodology/formula to be used in the generation of Test Scores and Examination Scores.

Introduction to Use Case 17: Score Test

Among other things, the system will need to:

- Automatically score items, subtests, tests, and exams
- Allow staff to manually score items, subtests, tests, and exams, and upload the scores individually and en masse to the Solution
- Score items, subtests, tests, and exams regardless of when they have been administered
 - Candidates may need to be scored on tests that take more than one day to complete (e.g., two-part test with part one being held on one date; part two being held on a later date).
 - Candidates may need to be scored for tests administered months after the registered (announced) test date, e.g., candidates who are in the armed services at time of original test date will need to be tested after returning from deployment.
 - Test creators may need to review and analyze the results that would be obtained with different scoring schemes before or after the test is administered to candidates, sometimes years after the test is administered
- Permit score adjustments to be made both automatically and manually
- Provide an electronic record and a printable record of the answer key and scoring scheme (as applicable) used for items, subtests, tests, and examinations

Notes:

Notes have been added to some of the items in the following Use Cases. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 17: Score Test

Purpose and Objectives

This Use Case describes how DCS users will use the system to conduct and manage test scoring. The system will enable manual scoring of candidate responses and automated scoring of candidate responses, where appropriate.

[The system must support the scoring of examinations administered by computer as well as hard-copy (paper and pencil) answer sheet formats and must allow for override entry of scores resulting from manual review, e.g., incorrect use of answer sheet - answers placed in wrong spaces.]

Actors

- DCS Testing Services Division
- DCS Staffing Services Division
- Vendor / SMEs
- Candidates

Role

- Test Scorer
- Candidate

Trigger Events

- A test has been administered by DCS
- Responses to test items have been provided by candidates (computerized, bubble sheet or other test format)

[Scoring data may come from multiple sources (captured by computer at time of test or scanned answer sheet response record file)]

Preconditions

- Examination has been scheduled
- Tests (content/type) have been defined
- Scoring weights have been determined at the subtest and test levels
- The tests and the relative weights of tests have been published in the exam announcement
- A tentative/initial item scoring key for all test items in the subtest(s) exists

[Item/test scoring information must be imported/captured prior to administration. It is important to note scoring is typically a two-step process: 1) test item scoring; and 2) exam score conversion. Not all examination scoring information (pass-points/cut-scores) will be known in advance of test administration and the system must permit post-test analysis and pass-point entry during the scoring process.]

Post Conditions

- Initial review and scoring of candidate responses to test items is complete
- Candidates' test and exam scores are calculated and stored for analysis.

Use Case Flow

1. The system will be used to configure how raw scores, adjusted scores and weighted scores are computed for each exam:
 - a. For test items, subtests, and tests that do not have pre-constructed choices that candidates can select, a maximum possible raw score may be assigned in the *Create Test Use Case*.
 - b. The weight of each subtest within a test will be assigned in the *Create Test Use Case*
 - c. The weight of each test within an examination will be assigned in the *Prepare Examination Use Case*.

[Items are typically collected into a subtest collection of items which defines a subject matter area. Subtests may have the same or differing weights, e.g., all subtests equally weighted; one subtest is weighted 2 and all other subtests are weighted 1.]

2. For applicable test items (e.g., multiple choice items, true / false items) in a subtest, the system will automatically record the raw scores for the responses provided by the candidate, as determined by scoring key or the value assigned to each choice.
 - a. The system will have the ability to capture, store and utilize responses as soon as they are provided by the candidate.
 - i. For example, for use with an adaptive testing approach as configured in the *Create Test Use Case*.
 - ii. This will permit scoring analysis to begin before all candidates have completed the test.
 - b. Scores may be assigned within the system for each candidate at the item subtest or test level.
3. Where applicable, the Test Scorer will use the system to score test items that require manual review (e.g., essays responses, short answer responses, oral responses).
 - a. Depending on the type of test item the review will be able to occur within the system or via creation of hard copy from system records followed by upload of scores by reviewers.
 - b. The Test Scorer will use the system to capture and store raw scoring results provided by DCS for manually-reviewed test items.
 - i. Scores may be uploaded en masse for all candidates or entered individually for each candidate.

[The system will need to allow for the post-test entry of ratings for short-answer / essay format tests.]

4. The system will include the capability to assess and review some fill-in-blank, short answer and essay questions using automated review tools.
 - a. The Test Scorer would be able to review and revise initial scores assigned by the solution.

[The system will need to allow for the post-test entry of ratings for short-answer / essay format tests.]

5. The system will calculate the score for each test item based on the assigned scoring scheme in the *Create Test Use Case*.

6. After all the test items are scored, the system will compute the subtest score (sum of all test item scores) and the weighted subtest score based on the application of the defined weight as assigned in the *Create Test Use Case*.
 - a. Some subtest scores may be scaled, such as when the subtest is a job simulation and a large raw score range needs to be reduced to a smaller range (e.g., negative raw scores may result in a scaled score of zero and a range of raw scores may be translated into the same scaled score)

[The system must permit variable weighting of answer choices, e.g., A = 1; B = 0, C = -1; D = 0; as well as scaled scoring of item/subtest results, e.g., subtest scores of 1 – 5 = 3; 6 - 10 = 7; 11- 15 = 13.]

7. The system will compute the test score based upon the weighted subtest scores.
8. The system will compute each candidate's examination score using the test or tests that made up the examination and utilizing the specified final scoring methodology.
 - a. When an examination consists of multiple tests, the system will combine the scores for each of the tests in the manner defined for the examination.
 - b. Examples of final scoring methodologies include but are not limited to
 - i. Discrete Scoring
 - ii. Band scoring, which combines overall weighted test scores into score bands such as 70, 80, 90, and 100.
 - iii. Customized final scoring scheme

[The system must permit addition of scoring instruction once cut-score has been established and recorded in the system. The scoring instruction may include individual item summation or banding/scaling of total test scores.]

9. The system will have the capability to provide an immediate initial scoring of a candidate's examination based on automated scoring, subject to any further candidate or scoring scheme adjustments.
10. The system will allow scoring of candidates at any time (e.g., testing of military personnel who were deployed during the original examination).
 - a. This will also be needed for certain types of analysis that may be conducted after the test is administered as described in the *Analyze Test Scoring Use Case*.

[Not all tests / examinations are held at the same time; in some instances, some tests to be scored may be administered years apart, e.g., to military service personnel returning from active duty deployment.]

11. Where applicable, the Test Scorer will use the system to adjust candidate subtest, test, or examination scores by adding, deleting, converting, or otherwise adjusting scores according to policy based on the candidate's status; special qualifications; item, subtest, or test performance; or other factors. Examples of these adjustments include, but are not limited to:
 - a. Credits for omitted answers
 - b. Correction for guessing
 - c. Use of standard or percentile scores
 - d. Certifications / Licenses (adjusted for a passing test level score)

- e. Waiving of subtest for a candidate with a special requirements, with prorated scoring of other test components.
- f. Correction of scoring following a review of the Candidate's offline responses.
- g. The system will be used to apply any credit and record the reason for the candidate level scoring adjustment.

[The system must permit scoring adjustments / modifications.]

12. The system will automatically adjust candidate subtest, test, or examination scores based on other candidate characteristics maintained within the solution:
- a. Veteran's credits (absolute addition to an overall examination score) – if requested by a Candidate for the examination.
 - i. Based on data gathered and managed in the *Create User Profile Use Case*.
 - ii. The system will enforce the one-time use of this credit by Candidates.
 - iii. Eligibility for veteran's credits must be verified by DCS when claimed by the Candidate.
 - b. Seniority credits for State promotional examinations
 - i. These are applied only to passing test scores.
 - ii. These are based on years of service.
 - iii. Based on data gathered from the State NYSTEP system as described in the *Verify Qualifications Use Case*.

[The system must allow additional points/credits to be added to test scores during final scoring (after pass-points/cut-scores have been determined) following specific rules e.g., addition of seniority credits to only passed candidate raw scores; the addition of veteran credits to test scores (Raw scores + Seniority credits).]

13. Some tests may require the Candidate to take one part of a test on one date and another part of the test on another date, and the system will combine the scores from the different dates and manage the scoring of the examination.

[Examinations may be held over multiple days & require the collation & tabulation of responses that have been gathered at different points in time for the same individual.]

14. In some multi-test examinations Candidates who fail one test will fail the entire exam.
- a. The system will be able to prevent a candidate from progressing to a subsequent test based on a failing score in a previous test (i.e., multiple hurdles).
 - b. The system will be able to compute an examination score based on just one of the tests in a multi-test examination.
15. The raw test scores and exam score will be available for analysis by DCS in the *Analyze Test Scoring Use Case*.
16. After analysis is completed, the system will provide capabilities to make scoring adjustments to any scoring scheme or weighting as described above for an examination and all associated candidates, and then re-compute scores.
- a. The system will provide a simple and integrated means of making scoring adjustments based on the outcome of the test scoring analyses.

17. Following the test scoring analysis, DCS will finalize the pass point and formula for converting raw/adjusted scores to final scores for each test in accordance with regulations and business rules.
 - a. The system will generate the final score for each examination a candidate has taken.
 - b. Final scores will be locked and in most cases no further changes will be permitted, pending a few exceptions (e.g., appeal)
The system will be able to generate a final score notification for each candidate.
 - c. Test Scorer will control the distribution of these notifications given policy restrictions on distribution (e.g., DCS cannot report scores to candidates before the eligible list is established).
 - d. Candidates will be able to see their scores and score profile (e.g., number of questions answered correctly and percentile for each subject area) in the system and (when allowed) how they were calculated.
 - e. Candidates that have not paid required fees will not be able to receive score notifications.
18. The system will support the generation of a list of candidates and scores that will be exportable by the system to be added to appropriate eligibility lists outside of the solution.
 - a. Lists for State examinations will be integrated with the State Eligibility List Management System (ELMS)
 - b. Lists for local examinations will be provided by secure file transfer and include all score data to allow local jurisdictions to complete their own scoring analysis.
 - c. Sometimes tests are administered on an ongoing basis (i.e., continuous recruitment examinations) and names and scores are continually interfiled on a single eligible list.
 - d. Lists will also need to be filtered and adjusted for different combinations of questions and scoring to meet different job title needs. This selective certification especially applies to Training and Experience examinations and scoring, allowing for greater leverage by DCS of individual examination processes for additional eligibility list needs.

Associations with other Use Cases

- UC #01 *Create Profile*
- UC #12 *Create Test*
- UC #15 *Prepare Examination*
- UC #21 *Analyze Test Scoring*

Alternative Flow

- For paper and pencil based tests with scanned sheets, the system will support scanning of those sheets and recording of those responses for subsequent scoring analysis.
- When candidates request a computational review the system will be able to print out all required candidate responses and scoring information (e.g., keys, weights) for that candidate's review.

Introduction to Use Case 18: Analyze Test Scoring

Among other things, the system will need to:

- Automatically generate a variety of standard statistical reports for items, subtests, tests, and exams
- Generate both electronic and printable statistical reports
- Allow the definition of standard reports and ad hoc, user-defined reports
- Allow users to select the candidates and exams that statistics will be generated for
- Save the standard statistical reports generated for items, subtests, tests, and exams, allowing them to be accessed at any time
- Associate statistical reports with the items, subtests, tests, and exams they were generated for
- Allow statistical reports to be accessed through the items, subtests, tests, and exams they have been associated with

Notes:

Notes have been added to some of the items in the following Use Cases. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 18: Analyze Test Scoring

Actors

- DCS Testing Services Division
- DCS Staffing Services Division
- Vendor / Consultant / SMEs

Role

- Test Analyst

Purpose and Objectives

This Use Case describes how DCS users will use the system to analyze test scores, including making decisions on changing the answer key for individual test items or eliminating test items from final scoring.

[Post-test analysis is conducted to determine if answer key adjustments are needed; system must permit the recording and processing of answer key/scoring key changes.]

Trigger Events

- Candidate responses have been received and preliminary scores have been generated, and final scoring recommendations are needed
- Further study is needed to explore issues such as a potential cheating incident or the impact of changing the subject areas included in a test (this could take place at any time after the test is held, sometimes years afterwards)

[The system must enable the generation of reports/score records needed for cheating analysis or other post-test research purposes as deemed necessary & appropriate.]

Preconditions

- Preliminary (first run) item, subtest, and test score exist in the solution
- Vacancy / number of anticipated appointments needed for each examination have been captured by the system for use during cut score analysis and pass-point recommendations

Post Conditions

- Scoring recommendations have been made and are ready for implementation; analysis is completed and can be used to inform decisions

[The system will permit the import of data upon which analysis and reports are to be generated, e.g., number of appointments to be made as a result of the examination, the geographic location of candidates across the state at each test score point, etc.]

Use Case Flow

1. The Test Analyst will use the system to conduct analysis on all components of an examination (test item responses, subtests, tests, weights, and scoring schemes) order to assess the effectiveness of the items, subtests, tests, and examinations.
 - a. Analysis is conducted on full candidate field and any subgroups (e.g., based on ethnicity, gender, minimum qualifications, promotional vs. non-promotional, geographic area, agency/jurisdiction).
 - b. Analysis will include but not be limited to:
 - i. Score distributions
 - ii. Mean and standard deviation
 - iii. Internal consistency reliability (e.g., KR-20 or Cronbach's alpha)
 - iv. 80% rule analysis
 - v. Mantel-Haenszel stratified analysis of subgroup performance on items
 - vi. Differences in subgroups means computed in overall Standard Deviation units (D statistic)
 - vii. Z-scores
 - viii. Correlation of variables
 - ix. 3 parameter model of IRT
 - x. Analysis of candidate responses to detect cheating
 - xi. Analysis of the test scores of candidates taking multiple exams (cross-filers)
 - c. The system will support exporting of data for analysis outside of the solution.
 - d. The system will support en masse analysis for examinations using the same combination of subtests by aggregating candidate data from multiple exams (some tests are used for multiple exams).
 - e. The system will support en masse analysis of subtests regardless of examination by aggregating candidate data from multiple exams (some subtests are used for multiple exams, although each exam does not use the same test).

[The system must support the generation of a range of statistical reports needed for post-test analysis.]
2. The system will support storing multiple versions of scoring analysis.

[The system must enable analysts to evaluate/store multiple score results for comparison to help inform pass-point/cut-score decisions.]
3. The system will support generation of reports to aid in analysis, in both printed and electronic format.
4. The system will support analysis of the following test content data, as defined in the *Manage Test Item Use Case*:
 - a. Test item utilization (e.g., the tests that the item is used in, the exams that the item is used for, and dates of use).

- b. Candidate response and item completion (e.g., percentage of candidates selecting correct answer, percentage of candidates selecting each incorrect answer, average time spent per test item by candidates).
- c. Item reliability statistics (e.g., correlation of item score to the test bundle score).
- d. Statistics for equivalent forms of tests (e.g., Linear on the Fly testing (LOFT) based on IRT).
- e. Statistics for test item response distribution (e.g., response selection distribution by high/low scoring candidates (i.e., High/Low Split)).

[The system must be flexible/robust enough to support differing test administration formats (Static vs. LOFT) and permit the generation of statistical analysis assessments when needed, i.e., during test /after test administrations.]

5. The Test Analyst will use as an input to analysis the pre-list and post-list review processes (e.g., candidate objections to items and candidate appeals of exam scores), which occur outside of the solution.
6. The Test Analyst will use the system to review the impact of potential scoring decisions on scores and overall results (e.g., what-if analysis, removal of a subtest, exclusion of test items from scoring, key changes, and multiple keys in place of single key).

[The system must enable analysts to evaluate/store multiple score results for comparison to help inform pass-point/cut-score decisions.]

7. The Test Analyst will use the system to run simulations or 'What-If?' analysis to assess the impact of decisions prior to finalizing them.
 - i. Simulations may be run at any time, potentially even years after the examination was held.
 - ii. This activity will not impact final scoring; it is for analytical purposes only.
 - iii. The system will support storing multiple versions of the results of 'What-if?' analysis to permit easy comparison of different outcomes.

[The system must enable analysts to evaluate/store multiple score results for comparison to help inform pass-point/cut-score decisions.]

8. Any changes to scoring based on the above analyses will be managed in the Score Test Use Case and there will be a high level of integration between analytical and score adjustments within the solution.
9. The Test Analyst completes these analyses to assess various scoring options and develop a recommendation for final scoring.
 - a. All scoring data will be maintained and available for analysis from individual test item scores to combined un-weighted and weighted scores for subtests, tests and examinations.
 - b. The system will allow DCS to generate a variety of reports. Examples include but are not limited to the following:
 - i. The number of candidates at each adjusted and weighted score (as in *Score Test Use Case*) based on certain characteristics (e.g., gender, geographic, test center).
 - ii. A report that ranks candidates in descending test score order and shows for each candidate their total test score and their subtest scores.

1. The system will provide the option of showing candidates' subtest scores as z-scores.
- iii. For each exam and for groups of exams using the same test, a report that provides statistics related to final scoring such as:
 1. Total number of candidates competing in the exam or group of exams.
 2. Number and percent of candidates passing the exam or group of exams at a raw or adjusted score equivalent to 70% of the maximum number of points (for a typical multiple choice test, this would be 70% of the questions included in the test).
 3. Number and percent of candidates passing the exam or group of exams at the recommended pass point (cut score).
- c. DCS will use the system to conduct analysis to help identify and recommend a preliminary pass point and a formula for converting raw scores to final scores for each test (includes banding and conversion of scores/weights).

[The system must enable analysts to evaluate/store multiple score results for comparison to help inform pass-point/cut-score decisions.]

10. Based on these analyses DCS will work with exam stakeholders to establish a pass-point (cut score) and scoring bands based on anticipated hiring needs as collected in the *Define and Manage Examination Use Case*.

[Based upon analysis, the system must support the addition of scoring instructions to be used in the generation of final test & examination scores.]

Associations with other Use Cases

- Use Case 9 *Define and Manage Examination*
- UC #20 *Score Test*

Alternative Flow

- None

3. Test and Candidate Scheduling Functional Requirements

Test and candidate scheduling business functions that the DCS Examination Systems Modernization system will support are described with the following numbered Use Cases:

- Use Case 5 – *Candidate Examination Scheduling*
- Use Case 7 – *Create and Modify Site Profile*
- Use Case 8 – *Manage Examination Locations*
- Use Case 10 – *Schedule Examinations*
- Use Case 11 – *Assign Examination Staff*

Among other things, the system will need to:

- Provide a highly flexible and robust scheduling tool to allow candidates and DCS staff to manage multiple schedules.
- Enable bulk scheduling by DCS Staff permitting the automated scheduling and rescheduling of candidates and groups of candidates to appear at specific locations on specific dates/times. Enable self-scheduling by candidates, permitting candidates to self-schedule and reschedule for specific locations on specific dates/times.
- Provide capability to manage test sites for computerized testing and sites for paper and pencil testing.
- Collect critical information for each test center (region) and the test sites within. The solution will also supporting managing individual rooms within sites and maintaining a record of availability of test rooms and sites.
- Determine the quantity of the various test booklets required at a given test site based on an estimated number of candidates at that site. The system will also track the deployment, usage and collection of test booklets and other supplemental materials as required.
- Determine the number of devices required at a given test site based on an estimated number of candidates at that site. The system will also track the availability, deployment, usage and collection of devices, peripherals, and other supplemental materials as required.
- Support scheduling many different exams at the same time at the same locations.
- Provide flexible and robust security that manages access to schedules by individuals, localities, agencies and DCS staff.
- Support all aspects of location management including: seating availability, location capabilities, staffing availability.
- Allow staff to plan scheduling of tests for testing seasons and for individual dates. The system shall support changing and/or canceling scheduled tests and appropriate notifications.
- Support the management of the schedule by DCS staff and/or another agency.
- Support the assignment and management of test site staff.
- Support DCS in bulk scheduling while also managing candidate requests for reasonable or religious accommodations and alternate test dates.

Note: Site and Location are used interchangeably

Introduction to Use Case 5: Candidate Examination Scheduling

Among other things, the system will need to:

- Allow staff to schedule one or more candidates for tests and locations
- Allow candidates to self-schedule for tests and locations
- Allow candidates to identify locations (in their vicinity) available for taking tests
- Allow candidates to request and/or schedule alternate dates or reasonable accommodations.
- Allow schedule changes to be made based on defined rules

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 5: Candidate Examination Scheduling

Actor

- State Candidate
- Local Candidate
- DCS Test Administration Staff
- Test Administration Vendor

Roles

- Candidate
- Test Scheduler

Purpose and Objectives

This Use Case describes how candidates who compete in a DCS examination will use the system to schedule or reschedule the time, date, and location for taking the tests associated with that examination. The system will be able to support DCS in bulk scheduling candidates while also managing candidate requests for reasonable or religious accommodations and alternate test dates.

[Scheduling, siting, or placement, might be done by DCS for all candidates for a test (pre-scheduling) or candidates may be allowed to self-schedule. Local governments will be able to schedule their candidates as well.]

Trigger Events

- A candidate wants to schedule a time, date, and place to take a test that is part of an examination for which they have applied OR,
- A candidate wants to change the time, date, or place of their scheduled test(s)
- DCS Test Administration Staff wants to change the time, date, or place of their scheduled test(s)
- Candidate needs Religious or Reasonable Accommodation
- Candidate is not able to be tested on regularly scheduled test date

Preconditions

- Data on State and local tests has been loaded into the solution
- Where applicable, the candidate has paid the DCS application processing fee for the examination for which they have applied
- The candidate has been approved to compete in the DCS examinations for which they are scheduling the test (if approval is required)
- DCS has defined the times, dates, and locations available for the test the candidate wishes to take
- DCS has received details and documentation for reasonable accommodations and/or select alternate test dates (if needed)

[It is anticipated that examination definition (and setup) will be done in another system. Only when the exam has been set up will scheduling be able to be done. Candidate information will be in another system. That data will be needed by the Test Management System in order for scheduling to be done.]

[Candidate profiles will be in another system that will need to be integrated into the Test Management system.]

Post Conditions

- The date, time, and location of the DCS test(s) the candidate will take are defined in the solution.

Use Case Flow

1. The candidate will access the DCS online system to complete scheduling of their test.
2. The system will provide candidates with basic policies/procedures on scheduling/rescheduling tests, and instructions on how to schedule or reschedule their test(s).
3. In the solution, the candidate will see the DCS examinations in which they have been approved to compete and the associated tests they can schedule or re-schedule.
[This will require integration with the system used to define the examinations.]
 - a. For some tests, the candidate may have been pre-scheduled and pre-sited, or placed, and they will see that date/time/location.
 - b. Pre-scheduling will include reference to the Candidate's profile and any reasonable accommodations requested for one or more specific tests.
 - i. As candidates with requests for reasonable accommodations are scheduled, the system will record or track that the appropriate preparations are made at test centers as described in the *Deliver Examination Use Case*.
 - ii. The system will provide the ability to generate reports that, for a given test date, will list the candidates needing reasonable accommodations, the accommodations that have been approved for them, the test(s) they are scheduled to take, and other solution-based data that is needed to arrange for the accommodation.
 - c. For pre-scheduled tests, candidates may accept the pre-scheduled date/time/location, or may be able to re-schedule the date/time/location where applicable.
 - i. To prevent candidates from repeating previously taken tests, the system will limit the available test forms to those not previously seen.
4. The Test Scheduler can set a date beyond which candidates cannot make changes to a specific test date/time/location.
5. To schedule or reschedule a test, the candidate will enter a ZIP code or city/state into the DCS system that will be used as the candidate's location.
 - a. A default ZIP code will be pulled from the candidate's user profile which the candidate can edit.
6. Based on the candidate's location and other parameters (e.g., test locations, available tests, candidate special needs), the system will identify relevant dates, times, and test sites where the relevant tests will be offered.
 - a. Where applicable, the system will identify multiple sites at which the relevant test is being offered.
 - b. When the test is being offered at more than one time on a given day at a test site, the system will retrieve and display all available times on a given date at which the test is being administered.
 - c. Religious observers who are not available on specific days, as defined in their profile, would not be offered those test days by the solution.

7. The candidate will have the opportunity to select one available date, time and location at which the test is offered.
 - a. Candidates will not be permitted to select multiple dates, times, and/or locations for the same test.
 - b. Candidate will not be permitted to select multiple tests for the same time unless they contain shared test content or are associated with one another in the system in order to enable concurrent test administration.
 - c. For examinations that include multiple parts across multiple times/days the system will require Candidates to schedule all required tests.
8. The candidate will be prompted to affirm the test appointment they have selected.
 - a. The candidate will be given the opportunity, within set parameters, to make changes to the test appointment they have made.
9. The candidate will receive an Admission Notice from DCS (via email, USPS, text) regarding their selected test appointment.
 - a. Candidates who reschedule their appointment will receive a new Admission Notice.
10. The candidate will be able to view selected information regarding the test site(s) at which they are scheduled to take a test(s). This information also described in the *Create and Modify Site Profile* Use Case will include but will not be limited to:
 - a. Test site address
 - b. Mass transit information
 - c. Driving direction
 - d. Hours of operations
11. The system will provide reminders to the candidate regarding upcoming tests that they have scheduled, and/or upcoming tests for which they have been approved.
 - a. If a candidate has not self-scheduled for an upcoming test for which they have been approved, the system will notify the candidate.
 - i. Information included in this notification will include but not be limited to:
 1. Reminder to the candidate to self-schedule
 2. Advisement to the candidate of the consequences of failing to self-schedule by deadline established.
 - b. At a pre-defined time before a candidate's self-scheduled test appointment, the system will send the candidate a reminder of the date, time, and location of their scheduled test.
 - i. Any change will results in a new Admission Notice.
 - ii. Any DCS change may optionally result in another application / rescheduling / missed special accommodations fee.
12. The system will allow the Test Scheduler to administratively change a candidate's scheduled date/time/location.
 - a. The Test Scheduler can flag a candidate as a no show for a test at a particular time, date, and location, if that candidate has missed their test appointment.

13. Where applicable, the system will enable exception processing (e.g., candidate incapacitated day before their test is held). This is a combination of system and manual processing.
 - a. The Test Scheduler can note why a candidate needs to be re-scheduled due to a DCS approved exception.
 - b. The Test Scheduler can note any reasonable accommodation requests.
 - c. The Test Scheduler can note any fees changes required as described in the *Fee Processing Use Case*.

Associations with other Use Cases

- Use Case 1 *Create User Profile*
- Use Case 3 *Fee Processing*
- Use Case 4 *Qualification Review*
- Use Case 6 *Review Candidate Examination Status*
- Use Case 7 *Create and Modify Site Profile*
- Use Case 10 *Schedule Examination*

Alternative Flow

- The applicant schedules a DCS test appointment over the phone and DCS creates or revises applicant's scheduled test in the Solution.
- The applicant schedules a DCS test in person at test site (walk-in).
- A test site vendor performs scheduling.
- DCS will bulk schedule candidates for a test in which case the solution will [permit the automated scheduling and rescheduling of candidates and groups of candidates to appear at specific test centers/sites/sessions/rooms on specific dates/times.](#)

Introduction to Use Case 7: Create and Modify Site Profile

Among other things, the system will need to:

- Allow staff to add, define and modify test site profiles
- Allow staff to define characteristics of sites

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 7: Create and Modify Site Profile

Actor

- DCS Test Administration Unit
- Local Jurisdiction
- Test Vendor

Role

- Test Site Administrator (DCS Test Administration Unit or local jurisdiction)

Purpose and Objectives

This use case describes how test sites for assembled, proctored tests (written, oral, performance, etc.) are managed in the solution. This will include collecting critical information for each test center (region) and the test sites within. The solution will also support managing individual rooms within sites and maintaining a record of availability of test rooms and sites.

Trigger Events

- A new test site needs to be defined in the solution
- Test site information updates required

Preconditions

- DCS Test Administration Staff negotiates terms of potential use of site with facility/building owner/manager, obtains relevant site details, and evaluates sites for potential use

Post Conditions

- A new test site is successfully defined in the solution and made available for scheduling
- The profile for an existing test site is modified

Use Case Flow

1. The Test Site Administrator will use the solution to define or update the test centers (or regional groupings of test sites).
 - a. DCS Test Centers include multiple test sites/locations within a regional grouping.
2. The Test Site Administrator will use the solution to define or update the attributes of new test sites in the solution. The attributes of test sites may include but will not be limited to:
 - a. Test Center Name
 - b. Overall capacity
 - c. Number of rooms / seats per room
 - d. General Availability / typical hours
 - e. Site Address(es)
 - f. Parking Capacity
 - g. Mass transit locations and distance
 - h. Directions to site
 - i. Test site Room ADA Compliance
 - j. Name of Test site Supervisor

- k. Main Contact(s) / role(s) : Administrative / Custodial
 - l. Secondary Contact(s) / role(s) : Administrative / Custodial
 - m. Emergency Contacts and Security Personnel Names/Phone/Email
 - n. Fees to use the site
 - o. Restrictions (e.g., no water or food)
 - p. Reasonable Accommodation capability (e.g., separate rooms)
 - q. Notes (e.g., issues with site, special concerns)
 - r. Site Layout / Blueprint documents
 - s. Owner of Site (State / Local / Vendor)
 - t. Verification of Valid Permit / Contract
 - u. Active End Date
 - v. Mailing Address / Delivery Address if different
3. The solution will maintain information about the available test rooms at each test site. This will include but not be limited to:
- a. Number of test rooms
 - b. Test capacity (seating) for each room
 - c. Computer Equipment and Peripherals / Quantity
 - d. Technical Capabilities (Networking, Cabling, Wi-Fi, etc.)
 - e. Audio and Video Equipment / Quantity
 - f. Room Dimensions (L x W x H)
 - g. Acoustics
 - h. Tables vs. Desks
 - i. Room ADA Compliance
 - j. Reasonable Accommodation capability (e.g., tables/desks, left-handed desks, left-handed mouse)
 - k. Notes (e.g., issues with room such as lighting, number and placement of outlets)
4. The Test Site Administrator will use the solution to maintain and continually update site and room availability for each test date.
- a. The information managed in this use case will inform the solution validations and data presented in the *Schedule Examination* use case.
 - b. This information will also be used in the *Manage Examination Location* use case when deploying required test equipment.
 - c. This information will also be used in the *Assign Examination Staff* use case when assigning test staff to proctored tests.
 - d. This information will be used to inform the solution validations needed to permit and regulate candidate self-scheduling in the *Candidate Examination Scheduling* use case.
5. Candidates will be able to view the selected elements of this information when completing the *Candidate Examination Scheduling* use case.

Associations with other Use Cases

- UC#5 *Candidate Examination Scheduling*
- UC#8 *Manage Examination Locations*
- UC#10 *Schedule Examination*
- UC#11 *Assign Examination Staff*

Alternative Flow

- None

Introduction to Use Case 8: Manage Examination Locations

Among other things, the system will need to:

- Allow staff (or vendor) to manage and track test sites
- Allow staff to define features and functionality for each site and group sites into regions
- Allow staff to track the deployment, usage and collection of devices, peripherals, and other supplemental materials as required
- Allow staff to manage both computer testing sites and sites used for paper and pencil testing

Notes:

1. Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.
2. Examination Locations is comparable to Test Sites.

Use Case 8: Manage Examination Locations

Actors

- DCS Test Administration Unit
- Test Site Supervisor
- Test Site Monitor (Note: Supervisors / Staff at the Test Site may be DCS, Vendors, or a combination)

Roles

- Test Site Manager
- Test Site Supervisor
- Test Site Staff

Purpose and Objectives

The system will be capable of managing test sites for computerized testing and sites for paper and pencil testing. This Use Case contains separate sections below for computerized test administration and for paper and pencil based test administration. Administration is the same regardless if the site is a DCS, State, or local site.

[DCS understands that some vendors provide this functionality as a service. Vendors should indicate in their response what services they provide in this area and which functions are performed by the customer or are available to the customer.

Additionally some vendors might partner with others for this service. Please indicate that as well. Who do you partner with and how is the relationship managed.]

FOR COMPUTERIZED TEST ADMINISTRATION

Purpose and Objectives

This Use Case describes how DCS Test Administration Unit staff will use the system to define the types of devices, specifications and software required to administer a computer-based test or set of tests. The system will be used to manage the number of devices required and available at a given test site on an estimated number of candidates at that site. The system will also track the deployment, usage and collection of devices, peripherals, and other supplemental materials as required.

Trigger Events

- Requirement for specific test site devices in planned examination
- Updates/changes required for test site devices

Preconditions

- An estimated candidate count has been determined by DCS Test Administration Unit or qualified candidates for a given test have been approved by DCS Test Administration Unit

Post Conditions

- Sufficient test sites/centers have been reserved for a test date or range of dates for testing
- Appropriate hardware and necessary applications and configurations are either available or have been deployed to DCS test sites for use in the administration of computer-based tests

Use Case Flow

1. The system will include the capability to track the characteristics of available hardware suitable for use as candidate workstations during DCS tests at DCS test sites. Characteristics will include but not be limited to:
 - a. Hardware type (e.g., monitor, tower, mouse)
 - b. Hardware manufacturer
 - c. Hardware serial number
 - d. Installed software functionality (e.g., calculator, word processing application, Microsoft Excel, multimedia capability)
2. The system will identify software functionality necessary to administer that test (e.g., word processing, calculator, spreadsheet) based on the characteristics of the tests scheduled in the *Schedule Examination* Use Case at a given test site.
3. The Site manager will assign an appropriate number of suitably configured devices required for sites at which that test is being administered given the estimated number of approved candidates, as determined in the *Define and Manage Examination Program* Use Case.
4. The system will track the number of candidates assigned to specific testing site to ensure that the number of candidates assigned to the site on any given date & time does not exceed the number of suitably configured devices based on overall completion of the *Candidate Examination Scheduling* and *Create and Modify Site Profile* Use Cases.
 - a. Candidates with special accommodations for the particular test will be identified for the Site manager and Test Site Supervisor.
 - b. The Site manager and the Test Site Supervisor will use the system to acknowledge these accommodations and identify any scheduling issues as necessary.
5. The Site manager will manage the physical deployment of devices to test sites and retrieval of devices from test sites on completion of tests as necessary.
6. The Test Site Supervisor will use the system to record the distribution of devices at a test site, set-up of devices, and configuration of devices by Test Site Staff.
 - a. Workstations that require additional / specialized configuration after deployment to test sites will be serviced by Test Site Staff.
 - b. The system will identify the number and type of test accommodations needed at each Workstation based upon the characteristics of the tests scheduled in the *Schedule Examination*, *Create User Profile*, and *Apply for Examination* Use Cases.
7. The Test Site Supervisor and Test Site Staff will validate that devices are operational and properly configured to administer assigned tests.

8. The Site manager will use the system to distribute test content to test devices as needed for planned tests.
 - a. All test content will be encrypted / securely stored, transmitted, and delivered (at rest and in transit).
9. The system will record and log all individuals who use a device during the deployment period.

FOR PAPER AND PENCIL BASED TEST ADMINISTRATION

Purpose and Objectives

This Use Case describes how DCS Test Administration Unit staff will use the system to define the test booklets and related test administration instructions required to administer a paper and pencil based test or set of tests. The system will be used to manage the number of test booklets required at a given test site based on an estimated number of candidates at that site. The system will also track the deployment, usage and collection of test booklets and other supplemental materials as required.

Trigger Events

- A test has been planned that will require the use of hard copy Test Booklet / Answer Sheet and Candidate Directions for test administrations

Preconditions

- An estimated candidate count has been determined by DCS or qualified candidates for a given test have been approved by DCS

Post Conditions

- Appropriate test booklets and instructions are deployed to DCS test sites for use in the administration of paper and pencil based tests

Use Case Flow

1. The system will include the capability to identify and track the specific test booklets needed for each Examination Program for use at DCS test sites. Tracking variables will include but not be limited to:
 - a. Test Booklet Numbers (e.g., 456-G; 457-H)
 - b. Number of Test Booklets (e.g., 456-G 300 copies; 457-H 57 copies)
2. The system will identify materials needed to administer tests at each test site location on the characteristics of the tests scheduled in the *Schedule Examination* Use Case at a given test site.
 - a. The system will identify the number and type of test accommodations needed at each test location on the characteristics of the tests scheduled in the *Schedule Examination, Create User Profile, and Apply for Examination* Use Cases.
3. The Site manager will assign an appropriate number of test booklets and related materials required for sites at which that test is being administered given the estimated number of approved candidates, as determined in the *Define and Manage Examination Program* Use Case.
4. The system will track the number of candidates assigned to specific testing site to ensure that the number of candidates assigned to the site on any given date / time does

not exceed the test center capacity based on overall completion of the *Candidate Examination Scheduling* and *Create and Modify Site Profile* Use Cases.

- a. Candidates with special accommodations for the particular test will be identified for the Site manager and Test Site Supervisor.
 - b. The Site manager and the Test Site Supervisor will use the system to acknowledge these accommodations and identify any scheduling issues as necessary.
5. The Site manager will manage the physical deployment of hard copy test materials to test sites and retrieval of test materials and answer records from test sites on completion of tests.
 6. The Test Site Supervisor will use the system to record the distribution of test materials to a test site, set-up of test rooms by Test Site Staff.
 7. The Test Site Supervisor and Test Site Staff will use reports to verify that all test materials needed to administer tests are received and present at the test location for use on day of test.
 8. The system will record the number of test material sent and received to and from each test center.

Associations with other Use Cases

- UC #1 *Create User Profile*
- UC #2 *Apply for Examination*
- UC #5 *Candidate Examination Scheduling*
- UC #7 *Create and Modify Site Profile*
- UC #9 *Define and Manage Examination Program*
- UC #10 *Schedule Examination*

Alternative Flow

- Local jurisdictions will be able to use the system to manage their test sites used for system managed examinations. Local sites will be managed using the same functionality and features as State managed sites.

Introduction to Use Case 10: Schedule Examination

Among other things, the system will need to:

- Allow staff to plan schedule for testing seasons and for individual dates
- Allow staff to ensure that locations and proper setups are available for scheduled tests
- Allow staff to send notifications relative to the test schedule
- Allow staff to modify the test schedule

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 10: Schedule Examination

Actors

- State Agencies
- Local Jurisdictions
- DCS TSD Examination Control and Composition Unit
- Test Administration Vendor

Role

- Test Scheduler

Purpose and Objectives

This Use Case describes how DCS staff will use the system to manage the scheduling of tests that are part of an examination. As examinations are defined, key dates and timeframes for activities are developed (operational schedule). The system will include tools to assist in tracking the operational schedule for exams. Tests will be able to be amended and/or canceled.

Trigger Events

- An examination is needed and the examination request has been approved

Preconditions

- Examination program has been created.
- Examination has been defined and an examination number has been assigned.
- Tentative annual schedule of test dates established

[It is anticipated that examination definition (and setup) will be done in another system. Only when the exam has been set up will scheduling be able to be done. The examination definition data will be needed by the Test Management System in order to actually schedule the test for a specific date.]

Post Conditions

- The test(s) created to fill examination requests from Agencies or Local Jurisdictions are scheduled in the appropriate time, format and location(s)

Use Case Flow

1. After an examination request is approved and an examination has been defined by the Examination Manager, the Test Scheduler will use the system to schedule the test. The Test Scheduler will update specific test information:
 - a. Projected candidate counts
[For exams held previously, this may be pre-populated with actual number of candidates in previous exams.]
 - b. Priority
 - c. Required Locations
 - d. Associated Tests / Grouping
 - e. Test Number (solution generated)
2. The Test Scheduler will use the system to bundle and schedule as a group test that share common test material, are covered by a common examination program, or share other common factors.

3. Test Content for the test will be managed in the Test Content Development process area and tests will be associated with examinations in the *Prepare Examination* Use Case.
4. DCS Staff will use the system to review the master calendar of all upcoming tests by available locations to assist in operational planning.
5. The system will be used to track dates and progress against examination milestones using standard project management methods (e.g., start/end data or Gantt Charts). For each examination the following timeframes will be defined:
 - a. Application Period
 - b. Qualification Review Period
 - c. Test Content Preparation Period
 - d. Date and Duration of Test
 - i. Can include multiple tests across multiple dates.
6. The system will provide the Test Scheduler with detailed information and validation checks when scheduling the Test timeframes.
 - a. Data elements for test and site scheduling shall include but will not be limited to:
 - i. Availability of locations
 - ii. Available number of seats
 - iii. Duration of tests
 - iv. Number of available test sessions (e.g., AM/PM, Saturday/Sunday)
 - v. Locations with required facilities and attributes
 - vi. Location staffing
 - vii. Accommodated testing resources and anticipated needs
 - viii. Holidays / Religious Observances / other Events
 - ix. Shift Coverage (e.g., Health Care facility, 24 hour IT coverage, Correctional Services, Food Service)
 - x. Other Scheduled DCS tests (State & local)
 - xi. Other Testing Entities Scheduled tests (OCA, SAT, DCAS)
 - xii. Previous data on number and location of candidates likely to apply (anchor series)
7. If necessary, DCS Staff will be able to cancel and/or reschedule a test as well as add an additional date as required using the same steps as described above.
 - a. If a scheduled test is changed or cancelled the system will create notifications to any assigned Test Monitors or Test Site Supervisors.
 - b. Notifications will also be sent to Candidates for the changed or cancelled test and will:
 - i. Allow Candidates to select an alternative test using the *Candidate Examination Scheduling* Use Case; or
 - ii. Indicate that alternative test(s) will be arranged with further notification when available for scheduling; or
 - iii. Indicate that the test was cancelled indefinitely.

Associations with other Use Cases

- Use Case 1 *Create User Profile*
- Use Case 2 *Apply for Examination*
- Use Case 8 *Manage Examination Locations*
- Use Case 9 *Define and Manage Examination Program*
- Use Case 11 *Assign Examination Staff*

Alternative Flow

- The system will also be used to create an annual master schedule of examinations. These placeholders may not have an examination request as yet submitted but will need to occupy timeframes on the master calendar for planning purposes.

Introduction to Use Case 11: Assign Examination Staff

Among other things, the system will need to:

- Allow staff (or vendor) to manage assignment of staff to test locations
- Allow staff to verify that appropriate staffing levels set based on test requirements at a location
- Allow staff to request, view, or change their staffing assignments

Notes:

Notes have been added to some of the items in this Use Case. They are set off in square brackets. The purpose of these notes is to provide additional context and information that may make the Use Case easier to understand. The notes are also intended to highlight areas of particularly high importance.

Use Case 11: Assign Examination Staff

Actor

- DCS Test Administration staff
- Test Administration Vendor staff

Role

- Test Site Supervisor

Purpose and Objectives

This use case describes how DCS Test Administration staff will use the solution to manage the allocation of approved staff to tests which require formal in-person oversight of onsite completion by Candidates. DCS will be able to assign staff and the solution will ensure that all tests have assigned coverage and that staff are informed of their schedules. The solution will use updated staff availability, experience and certifications to assign staff and allow supervisors to adjust schedules. Staff will be able to confirm their assignments or reschedule and the solution will allow supervisors to proactively manage staffing requirements. The solution will also be used by staff to report and attest as their hours worked in order to support payroll management.

Trigger Events

- Test that requires in-person monitoring is scheduled

Preconditions

- None

Post Conditions

- Test site staff are assigned to tests at specific test sites and/or test centers

Use Case Flow

1. The solutions will maintain a list of available staff, roles and work attestations of completed staff training, and associated test centers (regions) and sites (specific locations within a test center).
 - a. Roles shall consist of but not be limited to:
 - i. Test Site Supervisor
 - ii. Assistant Test Site Supervisor
 - iii. Monitor as a Reader
 - iv. Sign Language Interpreter
 - v. Monitor
 - vi. Technician
 - b. Attributes of a staff member shall consist of but not be limited to:
 - i. Skills (e.g., interpreter, reader, hall monitor, room monitor, amanuensis (scribe))
 - ii. Certifications
 - iii. Active/Inactive
 - iv. Assessment/Incident

- v. Prior test administration experience
 - c. Attributes of a Role shall consist of but not be limited to:
 - i. Skills required
 - ii. Pay rate
 - iii. Certifications required
2. The Test Site Supervisor will use the solution to maintain and continually update Test Staff availability.
 - a. Test Center and Site information is managed in the *Create and Modify Test Site Profile* use case.
3. The solution will provide the ability for the Test Site Supervisor to assign the number of role slots required per scheduled test.
4. The solution will automatically schedule staff for tests for both full-time and part-time test sites.
 - a. Staff are assigned at least 30 days prior to the test.
 - b. The solution will be able to select staff from the Test Center that are available for the specified location and assign them to a specified date and time.
5. Solution assignments will be based on test administration policy/procedure and can be adjusted by the Test Center Supervisor as needed.
6. Once assigned, the solution will generate notifications to staff that they have been assigned for a location date and time. Staff may be notified by email and via a listing of assignments available in the solution.
7. The solution will permit staff to confirm their assignment, re-schedule or cancel their appointment as appropriate.
 - a. The solution will automatically fill with another staff member any slots that a staff member cancels as described above.
8. The solution will inform Test Site Supervisor of unfilled roles for specific location date and time.
 - a. If no staff are available, DCS will be able to change or cancel location date and time as described in the *Schedule Examination* use case.
9. The solution will provide multiple viewpoints on the current state of test staff assignment:
 - a. Overall staff assignments by location date and time.
 - b. DCS will be able to review location, date and time staff assignment schedules by location.
10. The staff will use the solution to attest to the hours worked by day.
11. The Test Site Supervisor will use the solution to confirm and attest the number of hours per staff by day.
 - a. Test Site Supervisor will indicate who was scheduled but did not appear and the solution will track the number of no-shows by staff.
 - b. Test Administration Supervisor reviews hours and approves (or changes if needed).
 - c. DCS will use the data within the solution to manage payroll for test center/site staff.

- i. Data can be exported or integrated into a separate State system for payroll purposes.

Associations with other Use Cases

- UC #1 *Create User Profile*
- UC #2 *Apply for Examination*
- UC #5 *Candidate Examination Scheduling*
- UC #10 *Schedule Examination*
- UC #16 *Deliver Examination*

Alternative Flow

- Test Administration Vendor manages staff