

FACULTY OF NATURAL SCIENCES
DEPARTMENT OF COMPUTER SCIENCE
CSE2101 - Software Engineering I



Submission 2

Software Requirements Specification (SRS)

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Distribution of Labour

Work was divided among the group members as follows:

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- ✓ Introduction

Nathan Budhu-

- ✓ Product Perspective
- ✓ Functions
- ✓ System Features
- ✓ Dependencies

Adam Singh-

- ✓ User Classes
- ✓ Design Constraints
- ✓ System Features

Monipha Sagon-

- ✓ Safety Requirements
- ✓ Security Requirements

Akeem Headley-

- ✓ Performance Requirements
- ✓ Software Quality Attributes
- ✓ Business Rules

Chris Wilson- Did not contribute.

We decided to split in pairs to work the chosen section and we collaborated with each other ensuring that all information was in. Exchanging information through the online mediums allowed for the completion of this submission. The challenge experienced was making sure that the requirements are met for the design of the system. This was handled by having a thorough discussion with fellow group members.

Signature of Final Submission

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1. Introduction

1.1. Purpose

The purpose of this SRS is to construct a document management system for a GBTI with the intent of diverging from conventional paper-based storage towards a more centralized digital system which will be more efficient in storing, retrieving, and securing documents.

1.2. Intended Audience and Reading Suggestions

As this project is in the startup phase, and may contain sensitive data, access is limited to the developers, testers and the project manager. This SRS is divided into four (4) main sections, Introduction, Overall Description, System features and Non-functional Requirements. It is suggested that users read each sub-section under the overall description to get an overview of the document while developers analyze the descriptions, system features and the non-functional requirements.

2. Overall Description

2.1. Product Perspective

The document management system is a new self-contained product produced to overcome the problems of the current manual document management system. The software solves the problem of organizing, indexing and securing large-scale physical files into a database. The management system will have access to the company's database as it can manage the documents within that database. The newly introduced system will provide a platform to store, manage, secure, integrate and track electronic documents and electronic images of paper-based information captured using a document scanner. The final outcome of this project will increase the efficiency of almost all the tasks done at the organisation in a much convenient and safer manner.

2.2. Product Functions

- Add users to the system
- Delete users from the system
- Log in/out of the system using unique identifier and password
- Import/attach multiple documents at once.
- Accept electronic documents from customers.
- Scan a document using the scanner and store the document in the database.
- Search for documents based on matching matches with single metadata elements, combinations of metadata elements or by free text search.
- Choose a specific document from the search results, and read the metadata of the document
- Delete document/s from the database.
- Modify contents of a chosen indexed document.
- Printing a chosen indexed document from the database.
- Integrate with the bank's repository so that users can work uninterrupted inside a single application.
- Prevent incomplete or improperly formatted documents from being entered into the repository.
- Associates all document revisions with users, timestamps, and other custom parameters to allow changes to be tracked and different versions to be restored when necessary.
- Protect sensitive content by limiting the distribution of master branches to hyperlinks or PDFs and digitally signing documents.
- Add necessary annotation to a selected document.

2.3. User Classes and Characteristics

The user classes are listed below (high-low importance)

- Front-Line staff (tellers, Customer Service Representatives, Document Controller, file clerks)- Main users of the system.
- IT staff – Maintenance and safekeeping of the system.
- Human Resources- Training staff to use the system.

Because the front-line staff are at the forefront of the business, it is critical that their demands are satisfied; they will be regular users of the system to record, manage, edit, and remove documents on the system. Because they will be frequent users, they will have access to this system.

Human resources will have to train staff to use the system, so they are the second most important. They will not be direct users of the system and will rarely use the system, but it is critical they understand how the system works so that staff can be taught and trained to use the system, which can lead to effective training with clear documentation and an understanding of the system.

IT staff are another important user class as they will be maintaining the system and making sure that the system is fully functional and dealing with any issues that occur with the system, they will be frequently maintaining aspects of the systems so their engagement with the system will be frequent but usage will be lower.

2.4. Design and Implementation Constraints

Document control standards, like the 9001 ISO certification, set limitations on how documents are to be transported in and out of the organisation.

System memory is limited and costly, storage issues will arise if the number of documents being stored outweighs the rate of system memory upgrades. The hardware's performance is only limited and will not be able to take on workloads that outweighs their capabilities without influencing operation time. Operational time is also influenced by human limitations since human interference is needed for inputting documents (using the OCR and Scanner) and accessing and outputting documents (Logging in and Printing documents).

One of the biggest risks to the system is data security, hackers can gain access through wireless connection or by taking advantage of a basic mishap in the system's online security. However, simply by logging into a computer attached to the system they can gain access to every data recorded on the system. System engineers would need to consider these factors and implement various measures to reinsure the system if such a situation occurs.

Regular S.W.O.T analysis is needed to ensure every strength and weakness as well as threats and opportunities of the system are constantly updated and maintained, as no system is never faultless.

2.5. Assumptions and Dependencies

The proposed plan of the system is meant to be integrated into the already established paper based DMS of the organization without interfering with any of its functions that are not related to the purpose of the project. Also, for those functions excluded to be most considered in the development of the project.

The document management system compatibility with other systems in the organization needs to be taken into consideration as some software from the DMS may not be noticeable by others of a sub-system or any other system that utilizes the DMS. Systems being immigrated from the previous paper based DMS will have outdated code, in which the developers will have to ensure to implement in the software created some amount of backward compatibility.

System maintenance must be executed when out of peak hours and must be done briskly and in intervals. A full maintenance should never occur unless a major failure occurred, each maintenance will be for a single sector of the DMS and will be executed frequently taking on a different sector of the DMS every time, prioritizing the most affected sector of the system. In this way the system would never be full down during any maintenance operations. Also, the availability of a back-up system on hand for the sector of the system being maintained will be necessary if an emergency use of that sector is needed. The maintenance of physical and inhouse systems should be done once the closing hours have passed, however, online systems with 24hr access should be managed at late nights and at even briefer intervals.

3. System Features

3.1. User Registration

1.1. Description and Priority

This feature describes how the users will registered and be managed.

Priority: Very High

1.2. Stimulus/Response Sequences

Stimulus: The user clicks the “create profile” button.

Response: The system presents a form to the user.

Stimulus: The user enters their new info and clicks “Save” then “Close” or clicks “Save and Close.”

Response: The system creates a profile using the supplied info.

Response: The system authenticates the user.

1.3. Functional Requirements

- The system must allow a user must be able to register with the system.
- The system must allow a user to be classified as a regular user or an administrator, or any combination of the two user types.
- The system must allow a user, once registered, to log into the system.
- The system must allow a user to have privileges to access system content, based on their user status.
- The system must allow user to reset their password.

3.2. User Login

1.1. Description and Priority

This requirement is primarily for the system module. Users will need to create a profile and login to access the system. Users will be asked to enter their unique ID and password to be authenticated into the system dashboard.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user clicks on the login page.

Response: The system displays the login page.

Stimulus: The user supplies a unique ID and password and clicks the “login” button.

Response: The system authenticates the user.

Response: The system displays the dashboard upon successful authentication.

1.3. Functional Requirements

- The system should be capable of using the ID and password as login authentication.
- The system must allow tracking of user’s login and log out time as well as other common tasks to help determine productivity. (The system should automatically create an audit trail to track transactions by user and timestamp.)
- The system should notify the administrator through email for each login.
- The system should lock the user out after three failed attempts.

3.3. User Logout

1.1. Description and Priority

This feature allows users to logout of the system.

Priority: Medium

1.2. Stimulus/Response Sequences

Stimulus: While logged in and on any page, the user clicks the “Logout” link in the top right-hand corner.

Response: The system logs the user out and displays the login page.

1.3. Functional Requirements

- The system must provide a mechanism for logged users to log out of the system.
- When logging a user out, the system should invalidate the cookie storing the session data.
- When logging a user out, the system should remove all session data.

3.4. **Change Password**

1.1. **Description and Priority**

The user can optionally ask the system to help in resetting the password. As part of the on-boarding process, employees and administrators will be required to set-up ‘security questions’ along with standard email verification. Password reset procedure will include providing correct answers to these questions and verification of the email.

Priority: Medium

1.2. **Stimulus/Response Sequences**

Stimulus: To change their password the user rolls over the “Site” dropdown menu and selects “My profile.”

Response: The system then displays a form with fields for name, login (user) name, password with confirmation, and email.

Stimulus: The user enters the new information.

Response: The system will request the user to validate the registered mail and (for administrators) answer the security questions.

1.3. **Functional Requirements**

- The system should have a password reset tool to be managed by the end user requester via email.
- The system should notify the administrator through email for new request for change password.
- The system must securely store passwords for validation.

3.5. **Add user**

1.1. **Description and Priority**

This feature shall allow an authorised user to add a new system user.

Priority Level: High

1.2. **Stimulus/Response Sequences**

Stimulus: The user logs into the admin dashboard.

Response: The system checks if the logged user is authorised for user management.

Stimulus: The user clicks on the user management menu item.

Response: The system displays the user management dashboard.

Stimulus: The user clicks on the Add User button.

Response: The system displays a form.

Stimulus: The user enters user details, assigns user roles, and saves the changes.

Response: The system displays a success message.

1.3. **Functional Requirements**

- The system must check if authenticated users are authorised to access the user management module.
- The system should allow authorised users to add new users.
- The system should allow authorised users to view existing users and their roles.

3.6. Manage user roles

1.1. Description and Priority

This feature shall allow system administrators to manage user access to system resources through user role management.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user logs into the admin dashboard.

Response: The system checks if the logged user is authorised for user management.

Stimulus: The user clicks on the user management menu item.

Response: The system displays the user management dashboard

Stimulus: The user selects an appropriate action (i.e., Create User Role, Edit User Role, Assign User Role).

Response: The system authenticates and updates the information.

1.3. Functional Requirements

- The system should allow an authorised user to create a new user role.
- The system should allow an authorised user to edit a user role.
- The system should allow an authorised user to assign permissions to a user role.
- The system should allow an authorised user to assign a role to a user.
- The system should allow an authorised user to remove a role from a user

RECORDS MANAGEMENT

3.7. Add document

1.1. Description and Priority

This feature allows for a user to add a document to the system. This is essential for managing documents, a key aspect of the system.

Priority Level: High

1.2. Stimulus/Response Sequence

Stimulus: On the main dashboard page the user clicks import documents.

Response: The system displays an import wizard and allows the user to add their files.

Stimulus: The user submits the file/s.

Response: The system stores the file/s and indexes it.

1.3. Functional Requirements

- The system should have a Record Management - It can archive and purge documents based on the retention period that was set. It has an advanced record retention and disposition that manage and organize the active and inactive files.
- The system must have the ability to import/attach multiple documents at once.
- The system must have the ability to accept electronic documents from customers.
- The system must have the ability to integrate the system directly with document digitising equipment such as scanners/copiers/printers, check readers and cameras.
- The system must allow additional pages to be inserted into a scanned document.
- The system must allow the scanner to sense the quality characteristics of a document and automatically adjust the scanner settings to optimize the image.
- The system should have Document Tracking/History - efficiently track the movements and activities of electronic documents.
- The system should be capable of reading Optical Character Recognition (OCR) - It converts images into searchable machine encoded text.
- The system should be capable of "date stamping" images with date scanned.
- The system should have Document Linking - It can link documents to certain documents that can build child or parent relationships. It also allows users to link and organise documents into a logical form.
- The system should have a Document Version Control - It provides a check-in/check-out facility that prevents the documents from being overwritten or deleted. The documents can be updated by any user who has permission to update.
- The document management system must provide functionality for import of both metadata as csv-files and corresponding files to the system. It shall be possible to specify whether data represents new documents or addition to existing documents. Conflicts with existing data shall be flagged for resolution.

3.8. Delete Documents

1.1. Description and Priority

This system feature shall allow authorized users to delete a document.

Priority Level: Medium

1.2. Stimulus/Response Sequences

Stimulus: The user logs into the admin dashboard.

Response: The system checks if the user is authorized to initiate “document delete” requests.

Stimulus: The user clicks on the Delete document button.

Response: The system displays a delete request form with a summary of the facility’s details.

Stimulus: The user types in the reason for deleting the selected facility and clicks on the Submit button.

Response: The system displays a success or error message, as appropriate.

Response: The system transfers the facility delete request to the next approval level.

1.3. Functional Requirements

- The system should allow an authorized user to initiate a document delete request and submit it for approval.
- The system should allow a user to view the status of his/her facility delete request.
- The system should have a Document Version Control - It provides a check-in/check-out facility that prevents the documents from being overwritten or deleted. The documents can be updated by any user who has permission to update.

3.9. Store Documents

1.1. Description and Priority

This system feature shall allow authorized users to store a document.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user scans a document using the scanner.

Response: The system uploads the document to the database and indexes it.

1.3. Functional Requirements

- The system should allow an authorized user to store a document.
- The system should allow a user to view the document.
- The system should have a Document Version Control - It provides a check-in/check-out facility that prevents the documents from being overwritten or deleted. The documents can be updated by any user who has permission to update.

3.10. Modify Document

1.1. Description and Priority

This system feature shall allow authorized users to modify the metadata of a document.

Priority Level: Medium

1.2. Stimulus/Response Sequences

Stimulus: On the main dashboard page the user clicks the modify document button.

Response: The system displays the viewer, and the user is able to modify it within the window.

Stimulus: User submits the modified document.

Response: System authenticates and verifies changes.

1.3. Functional Requirements

- The system should have the ability to modify/add text on generated reports prior to printing and saving.
- The system should allow the ability to modify the content of a document with appropriate document security.
- The system should allow the viewing of the document within the application.
- The system must have the ability to lock down documents submitted as final or record copies, preventing editing, deletion or replacement until their retention period is met.
- The system must have the ability to track revisions on attached edited documents.

3.11. Save Document

1.1. Description and Priority

This system feature shall allow authorized users to save a document and store it in a respective format.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user clicks on the “save” button in the viewer.

Response: The system saves the selected document.

1.3. Functional Requirements

- The system should allow the following document formats must be supported for storing and viewing documents:
 - TIFF
 - PDF (Including OCR Text Layer)
 - DjVu (Including OCR Text Layer)
 - PDF/A
 - All Microsoft Office document formats
 - All Open Office document formats
 - JPG
 - GIF
 - GML
 - XML
 - MVI
 - HTML
 - Email
 - RTF
- When viewing a document, the system must allow a user to print the document.
- When viewing a document, the system must allow a user to download the document.
- The system must allow a user to export a document.

3.12. Annotations

1.1. Description and priority

Annotations are comments, notes, explanations, or other types of external remarks that can be attached to a Web document or to a selected part of a document. This system feature solves the problem of tampering and impersonation in digital documents. Digital signatures can provide evidence of origin, identity and status of electronic documents, transactions or digital messages. Signers can also use them to acknowledge informed consent.

Priority Level: Medium

1.2. Stimulus/Response Sequences

Stimulus: The user clicks the “add digital signature” button in the viewer.

Response: The system displays the \times and y axis for insertion of digital signature by the assigned user.

Stimulus: The user clicks the “highlight” button in the viewer.

Response: The system shows the document.

Stimulus: The user selects text to highlight.

Response: The system shows the highlighted text.

Stimulus: The user clicks the “add notes” button in the viewer.

Response: The system shows the document.

Stimulus: The user inputs text.

Response: The system adds the note to the document.

Stimulus: The user clicks the “redact” button in the viewer.

Response: The system shows the document.

Stimulus: The user selects text to redact.

Response: The system redacts the selected text.

Stimulus: The user clicks the “digital watermark” button in the viewer.

Response: The system digitally watermarks the selected document.

1.3.Functional Requirements

- The system should be capable of signing a document using digital signature.
- The system should be capable of plotting the exact \times and y axis for insertion of digital signature by the assigned user.
- The system should be capable of adding two or more signatures in a single document.
- The system should support annotations.
- The system annotation functionality must not alter the original image or document.
- The system should support searchable annotations.
- The system should support the following markup capabilities:
 - Highlighting
 - Digital Signatures
 - Notes
 - Redact (blackout)
 - Digital watermarking

3.13. Managing Folders- Creating, renaming, locking, deleting

1.1. Description and Priority

Folder management ensures the document management system is easy to use, secure and devoid of unnecessary files.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user clicks on the button “create folder”

Response: The system creates a folder and displays it.

Stimulus: To change the folder’s name the user left clicks on the folder and selects “Rename”.

Response: To system prompts the user to enter the new name of the folder.

Stimulus: The user clicks on the “breadcrumb” of the folder.

Response: The system indicates the current page's location within a navigational hierarchy.

Stimulus: The user clicks on the “lock” icon.

Response: The system locks the selected folder.

Stimulus: To delete the folder the user left clicks on the folder and selects “Delete”.

Response: To system moves the folder into the “Trash” folder.

1.3. Functional Requirements

- The system should have a dashboard for private and public folders, uploaded documents and notifications.
- The system should have no limit in creation of folders and sub folders.
- The system should have a breadcrumb in the folder path.
- The system should have a public repository where users can only view the uploaded/created record in the assigned public folder.
- The system should have a private repository where only permitted users and groups are allowed to view and edit a record.
- The system shall have a lock feature for folders.
- The system shall be capable of assigning users and groups to specific folders.
- The system shall have a workflow management for automating a process per folder.

3.14. Search and Retrieval Management

1.1. Description and priority

This feature will allow a user to search for any document stored in the DMS by entering various parameters. The data can then be displayed onto a screen or requested to be printed out as hardcopy depending on the user's choice.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user clicks on the search icon.

Response: The system displays a search tab along with a filter tab.

Stimulus: The user either chooses a filter from the filter tab or enters keywords into the search tab or both.

Response: The system displays document/documents indexed by the parameters entered.

1.1. Functional Requirements

- The system should be capable of searching data such as Index, file name, date, author name, uploader name, document type and content of the scanned document.
- The system should have an advanced content search that can search OCR scanned documents.
- The system should have a filtering in search result to easily track the Documents
- The system should have indexing - It can provided unique classification through the document metadata or indexes extracted from the documents' contents
- The system should have Document Tagging functions/features - It captures a metadata (tagging) of electronic documents that creates database mining when information is needed.
- The system should have no limits in index field
- The system should have a field for upload date and expiry date for archiving purposes.
- The system should have an automatic archive feature.
- The system supports full text searching.
- The system has a single search screen to search using common elements.
- The search screens can change search fields based on document type or category.
- The system will allow for searching by index fields.
- The system provides support for searching on multiple index fields.
- The system supports a shared repository. For example, an invoice would be scanned, and indexed using the EDMS imaging. A user could search and retrieve this invoice from within the FIS using the same indexes. Or an invoice could be attached in FIS and searched in the EDMS.
- The system provides the ability to execute a single search query to retrieve images, text and/or other document formats.
- The system has the ability to limit searches to a specific document stores/location.

- For textual and numeric fields, the retrieval software permits index searches based on exact or partial matches of specified field values.
- For numeric fields, the system permits index searches based on ranges of field values specified by the following relational expressions: between, greater than, less than, greater than or equal to, and less than or equal to.
- The system has the ability to retrieve documents based upon scan date range.
- The system has the ability to display text or image samples on screen when reviewing a search "hit list" to assist in determining which files to retrieve.
- The system displays search results in rank order
- The system highlights the search words in the results window
- The system supports thumbnails for search results and ability to click on thumbnail and view document
- The system allows multiple users to view a single stored image simultaneously.
- The system allows the users to go back to the search screen from the results screen without losing their selection criteria.
- The system allows for printing the search results list.

3.15. Reports Management

1.1. Description and priority

This is essential for creating reports on every document stored in the system. The details of each document entered into the system are constantly recorded so as to always keep reports updated.

Priority Level: High

1.2. Stimulus/Response Sequences

Stimulus: The user rolls over the dropdown menu and selects “Document Reports”

Response: The system creates a new window that displays a sort list of every document in the DMS with every document displaying their ID, page number, word count, date added/modified, the folder they are stored in and the account who uploaded them in a dropdown tab linked to their names.

Stimulus: To search the reports the user clicks on the search tab and enters a keyword.

Stimulus: The user may also click on the filter tab and select a parameter they would like to filter by.

Response: The system displays a document or sorted list of documents linked to the keywords entered and/or filter selected.

Stimulus: The user rolls over the dropdown menu and selects “Storage”.

Response: The system displays an analysis of the storage used compared to what is left in the system, along with a list of the documents occupying the most storage in the system.

Stimulus: The user rolls over the dropdown menu and selects “Deleted Docs”

Response: The system displays a sorted list of documents deleted along with their date deleted and every other detail included in the “Document Reports” section in a dropdown tab next to their names.

Stimulus: The user rolls over the dropdown menu and selects “Account Details”

Response: The system displays every activity with its data stamp of the account that is being used.

Stimulus: The user rolls over the dropdown menu and selects “Switch Account”.

Response: The system prompts the user to enter the new account details and switches to that account.

1.3.Functional Requirements

- The system should be capable to count all the uploaded records by folder or user
- The system should be capable to count all the pages in every record uploaded.
- The system should be capable to display the accumulated storage and total storage capacity.
- The system should be capable to display the uploaded record of each user account.
- The system should be capable to display the total deleted record of each user account.
- The system should be capable to display the activity of each user account with date stamp.

4. Other Nonfunctional Requirements

4.1. Performance Requirements

- **Response Time**

The system needs to respond quickly to user inputs and requests, with minimal response time between them.

- **System Efficiency**

Efficiency describes the manner in which a system utilizes input from users to produce an output. To be truly effective, the system must be able to function at peak capacity even under extreme conditions of usage.

- **Load Speed**

The system's loading times must be fast. Files within the system shouldn't require users to wait for a prolonged period of time.

- **Audit and track**

Documents must be tracked in order to be effectively managed. Only authorized changes should be made to the files.

4.2. Software Quality Attributes

- **Availability:** The system must be accessible to all authorized members of staff at all times. The system must be able to handle times when there are a lot of users, which means that its performance shouldn't get worse as the number of users increases. There is an expectation of a small drop in performance if the system is under stress.
- **Maintenance:** In order to be in optimal condition, maintenance is a major priority. After implementation, all system users and staff members will be instructed on how to operate and maintain the system. If any problems or errors are discovered within the system while it is in operation, staff members should note them and communicate them to the development team so that they can be corrected when updates or patches are made.
- **Reliability:** There is a high level of reliance on the system being available at all times. There is also a high level of reliance on it being able to operate efficiently during all periods of operation. Further, the extent to which users can trust the system will be established by its present state. If, for example, the system frequently crashes or is loaded with malfunctions, then the workers cannot rely on it to carry out the responsibilities for which it was created.

4.3. Safety Requirements

- **Defragmentation:** The system's hard drive should be defragmented frequently; this process is designed to reorganize and retrieve all file fragments and preserve them in a central location within the drive. This helps with adequately managing the files and also frees up your storage space.
- **Backups:** Schedule both full and incremental automatic backups so you can have multiple backups of the documents in a separate storage location if possible; this helps reduce some of the dangers, such as loss.

4.4. Security Requirements

- **User Login:** Some form of user login procedure will be implemented within the system to prevent unauthorised personnel from accessing the system. Any member with access to the system will be expected to have a user name and pass word that enables them access to the systems facilities.
- **Access Levels:** Depending on which staff member is accessing the system, i.e. manager or teller, the system is expected to have multiple access levels to help prevent unauthorised parties from accessing, viewing or changing certain elements and information within the system. This means that some aspects of the system will be limited to only specific users contingent on their authority within the company.
- **Data Confidentiality:** This requirement goes in line with the regulations of the Data Protection Act 1998, and therefore it's extremely important for the system to be implemented with the goal of maintaining data confidentiality of the customers they hold information on. It's expected that the system should be able to securely store data and retrieve it upon request. The documents within the document management system must be encrypted, and this is a necessary procedure. This is to prevent employees from viewing, altering, or downloading them openly, especially when they have access to the documents. When transferring documents, it is wise to use end-to-end encryption so that in case the document happens to get into the hands of the wrong person, they won't be able to view the context of the document.

4.5. Business Rules

The decision about how to use the system for each of these will be entirely up to the business. The system will be created to run as intended, but the customers themselves will need to decide who will be able to operate which parts of the system. The employer, in its sole discretion, will determine which employees are qualified to receive training after the system has been deployed and made available to them. Additionally, if they choose to restrict some operations to only a subset of the company's employees, then different forms of training will be required for each set of employees based on the responsibilities given to them by the system.