

Danfoss Enterprise Layered Process Auditing

Design Document

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Project Statement

In this project, our group will design and implement a web application to simplify and centralize Danfoss' auditing process. The current process lends itself to time-consuming or incomplete audits with too many possible points of failure. Simplifying this process will allow audits to be completed quicker with more flexibility, creating a safer workplace and higher-quality work output.

Deliverables

First Semester

- Documentation of auditing process flow
- UI prototype

Second Semester

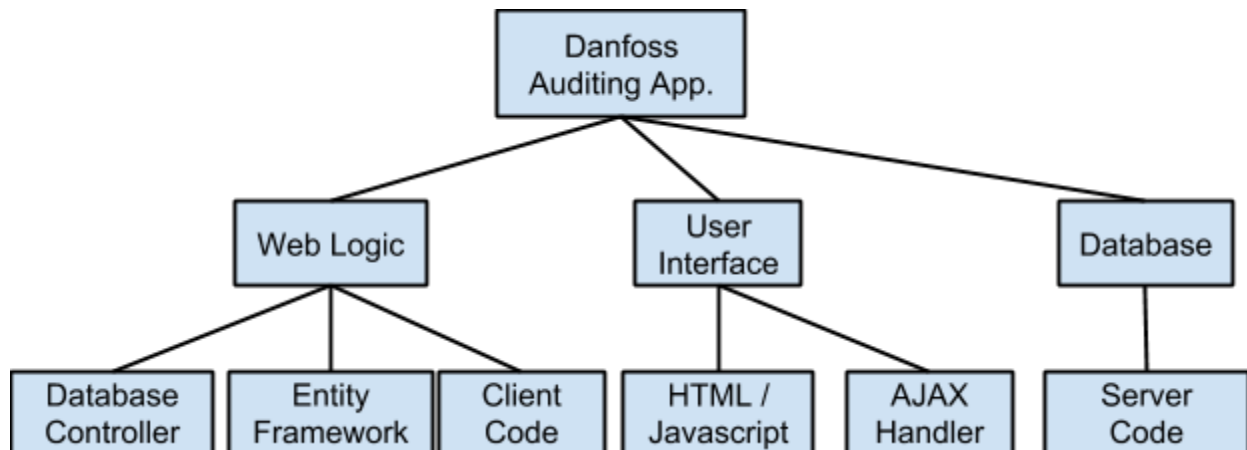
- A working web app
- A database backend to support the web app.

Specifications

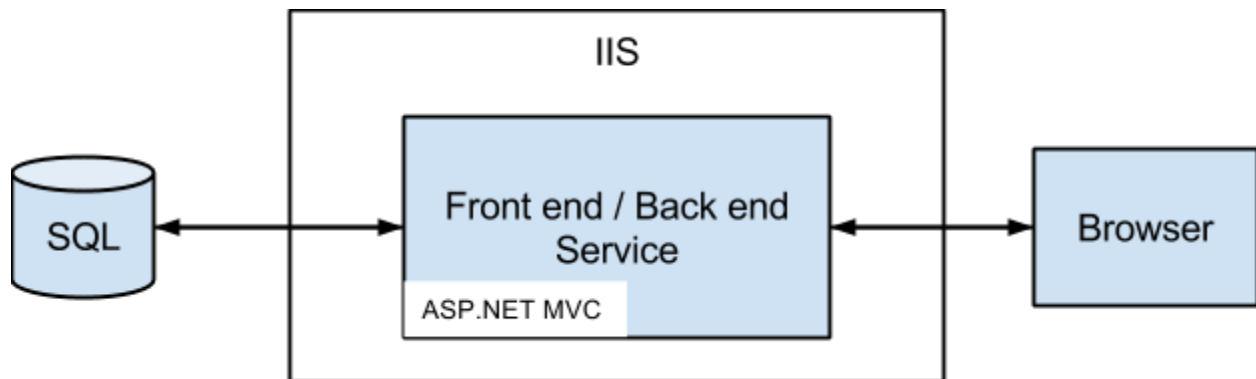
Auditing system must work for both PC and iPad platforms. This allows for mobile completion on the shop floor as well as in the office. The code should be developed using Stylecop standards.

System Level Design

Module Design Diagram



Structural Diagram



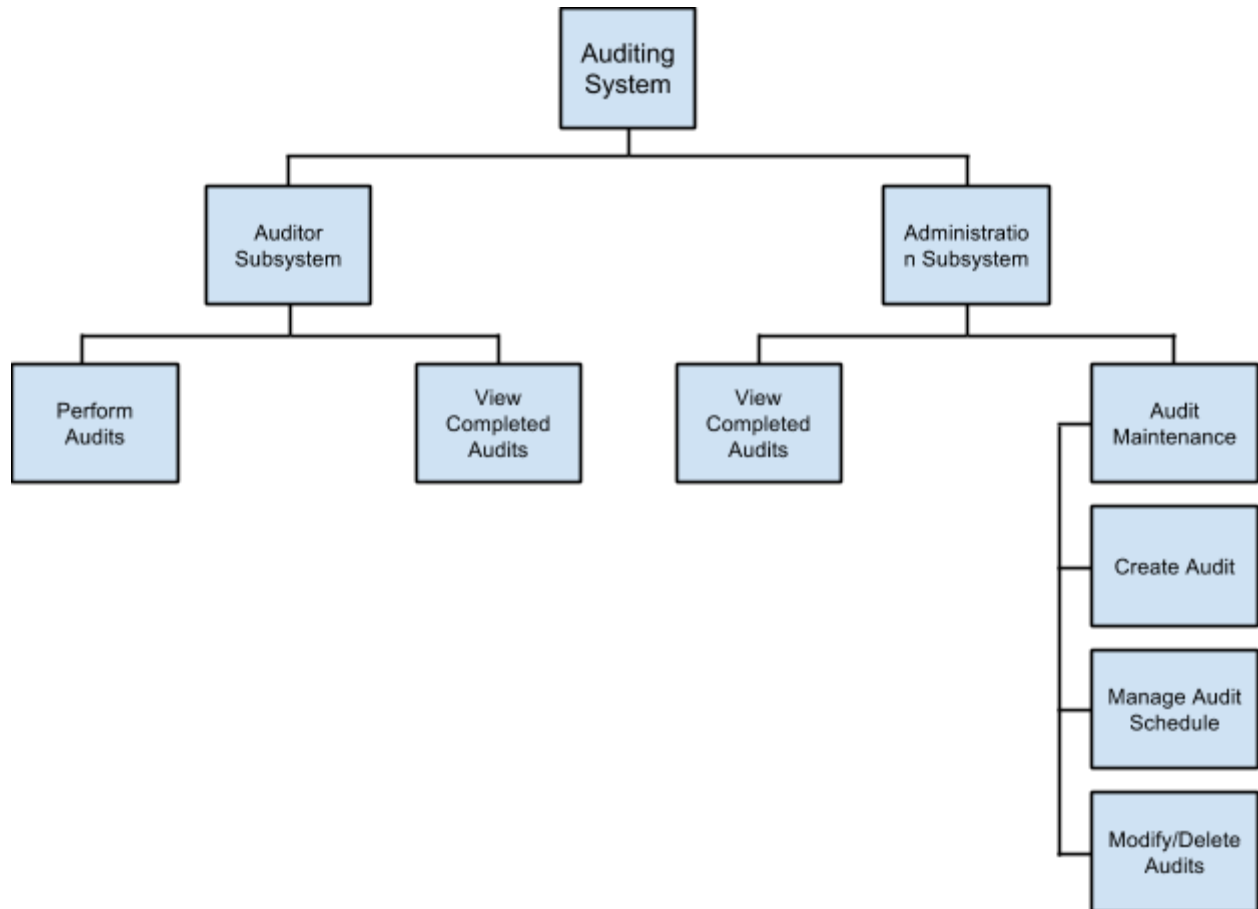
Database Schema

Database schema will be included once it has been finalized.

System Requirements

- Ability to answer audit questions
- Automatic selection of auditors with defined rotation
 - Select from list with managers, directors, and guests in defined rotation
 - Guest can be inserted at random and does not change the rotation
- Automatic notification by e-mail to auditor of upcoming audit
- Automatic notification by e-mail if audit is not complete when due
- 'Base' audit for to use when starting audits in a cell/area
- List of questions for audit by category to select when changes to the audit are desired by a cell/area
- How and where defined for questions
 - How to determine answer to question
 - Where to look for information to answer question
- Dropdown list of responses to audit questions
 - Automatic tracking of individual audit questions
 - Automatic notification when audit question competency is reached
 - Automatic tracking of total audit score (chart)
- Number of 'no' responses is limited on each question
- Standard work to be audited displays the current standard work from Navigator

Functional Decomposition



System Analysis

Use Case 1

Auditor is required to do their scheduled audit.

Preconditions

User is logged in

Postconditions

A new audit entry is added into the application

Main Success Scenario

1. Auditor opens the application
2. Application displays the audits that the auditor needs to do
3. Auditor selects the audit they need to do
4. Application displays audit questions one at a time
5. Auditor fills out entire audit

Exceptions

1. Server is unable to be reached

Use Case 2

Alternate auditor has to do an audit.

Preconditions

User is logged in

Postconditions

Auditor is added into audit schedule

Main Success Scenario

1. Administrator clicks option to view audit schedule
2. Administrator selects audit location
3. Application displays audit schedule and allows for addition and removal of auditors into schedule
4. Administrator adds auditor to schedule
5. Application updates schedule with new auditor in schedule

Exceptions

1. Server is unable to be reached

Use Case 3

A user wishes to see audit results.

Preconditions

User is logged in

Postconditions

Audit results are portrayed to the user

Main Success Scenario

1. User selects location of audit results
2. Application retrieves results of audits for specified location
3. Application view displays historical chart of audits and their results

Exceptions

1. Server is unable to be reached
2. No audits have been made at the location

Use Case 4

A user wishes to change the audit form

Preconditions

User is logged in

Postconditions

Audit form is changed

Main Success Scenario

1. Administrator clicks the option to edit audit forms
2. Administrator selects audit location to be edited
3. Application displays the audit questions for the selected location
4. Administrator alters/adds/deletes questions as desired

Exceptions

1. Server is unable to be reached

Detail Description

I/O Specification

Input	Output
Keyboard input Touch input Mouse input	Images .NET chart data Unicode Text

Screenshots

Danfoss Auditing

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Password:

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Audit Administration

[Auditing Schedule](#)
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Shop Floor Audit

Safety

1. Are Near Miss / Safety Alerts posted on the Safety Board?

?

Where to look: Check the Safety Board for Near Miss or Safety Alerts

Additional Comments

Hardware/Software Specifications

The application and web service will use ASP .NET 4.0+ framework, and will run on Windows Server. The database will run on Microsoft SQL Server. This application will be able to work on PC and iPad.

Simulations and Modeling

We are in the process of creating a UI Prototype using HTML / CSS and the .NET frameworks provided. It will provide simulated calls to the database and backend services.

Implementation Issues and Challenges

Danfoss has a system design specification for internal web applications. This could result in potential implementation difficulties for our team with no prior experience.

Our team hasn't had any experience with ASP.NET MVC development. This challenges team members to quickly learn new technology to create a dynamic web application.

Testing Procedures and Specifications

For testing, we will be using NUnit for unit testing. The unit tests will ensure functionality of requirements, such as the auditing schedules and ability to alter the audit schedule. Developing these test cases will also allow for regression testing if new features are introduced into the system.

Conclusion

This web application will simplify and centralize Danfoss' auditing process. It will provide an easy to use question system and result analytics. Notifying users to complete an audit will result in higher completion rate than before. Editing current questions will be easier than the current system in place.