

Nurse Scheduling Application

Digi Health Solutions

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Introduction

Overview

Executive Summary

Digi Health Solution is in the process of designing and implementing a software that aims to streamline nurse scheduling for Island Health, to provide an easier, quicker, and simpler process for all stakeholders who use or work with the system. Island Health's current system is convoluted and requires a lot of unnecessary manpower and time consumption. There are several scheduling problems including difficulty for nurses to swap shifts, request time off, or have shifts covered without sufficient notice. The proposed solution is a secure website that automates the process of creating and maintaining a schedule in order to save time and be more efficient.

Automating the scheduling of nurses will increase workplace productivity and will allow organisations with hourly workforces to re-allocate resources to non-scheduling activities. Following are the key features that will be included in the website:

- Functionality to view nurses' annual schedule,
- The ability to request a change in shift,
- Alerts to the scheduler and administrator to oversee schedule changes,

and more.

Context

Island Health oversees all the public hospitals and medical clinics based on Vancouver Island. DigiHealth is being approached by the Gynaecology department of Victoria General Hospital (VGH) of Island Health to find a solution to their nurse scheduling problem. At the beginning of each year at VGH, a shift schedule is created by nurses, administrators and schedulers. This schedule consists of various aspects including accounting for requested time off from each nurse, each nurses' preferred hours, and matching the target number of nurses scheduled for each shift. This schedule abides by the laws and regulations set forth by the nurses union of British Columbia.

Need

Currently, creation, validation, and modifications of nurse schedules are handled manually, and there are no automated processes in place. Following is the current process of scheduling nurses in a singular department of a hospital:

1. At the beginning of each year, each nurse submits their requested time off, how many hours they would like to work each week, and which hours they would prefer to work to their scheduler and administrator in paper form.
2. The scheduler uses the information submitted to create a schedule for the upcoming year on a spreadsheet.
3. The schedule is then passed along to the administration for approval.
4. Once this master schedule has been approved, it is passed along to the scheduler to share this document amongst the nurses.
5. This same process is repeated anytime a nurse needs a shift covered, wants to swap shifts with someone else or needs to schedule time off.

This is a very tedious and time-consuming error-prone process, especially when a change in schedule is required as the master schedule document needs manual updating. Much of this process could be streamlined and automated to make this an efficient and error-free practice, allowing the stakeholders to utilize their time and resources on other tasks.

Scope

This project is scoped to only the Gynaecology department within Victoria General Hospital. We do not need to account for nurses from different departments or oversee schedules for more than one department. Additionally, this system is only limited to scheduling; there will not be functionality to oversee payroll based on hours worked by a nurse. This system's algorithm will incorporate the BC Nurses Union Scheduling Rules so that the administrators do not need to spend additional time to verify rules. The system will operate based on information inputted by nurses, to create, validate and modify each nurses' schedule; the administrator will then confirm all changes to the schedule before allowing the website to update with the newest schedule.

Stakeholders

Nurses - Nurses of the Gynaecology department at VGH will be significant users of the system. Each nurse will submit initial scheduling information and schedule preferences at the beginning of each year. Once the master schedule has been established, the nurses will be able to view their shift schedule within the system. Nurses will also be able to view other nurses' shift schedules and swap shifts. Additionally, they may request time off mid-year, or declare that they are unable to work an upcoming shift. If a nurse declares an unavailability for a shift, the system will notify all nurses in the system without scheduling incompatibilities for the shift (based on the BC Nurses Union Rules), and any nurse in the system may claim the unassigned shift.

Victoria General Hospital - This system will improve workflow at the Gynaecology department of VGH by allowing employees to utilize resources on other tasks rather than spending hours going back and forth on handling tedious scheduling conflicts. The department will also have fewer shifts which are short staffed as the system will have the ability to find and notify a nurse at the last minute to cover a shift, as compared to manually looking for another nurse to take up the shift.

Administrator - The administrator staff who are in charge of ensuring that the schedules are valid and meet the BC Nurses Union Rules. The system will make it easier for these people to inspect the current or proposed schedules and the system will also reduce the amount of work that administrators need to do by validating many of the BC Nurses Union Rules automatically.

Scheduler - The scheduler is in charge of reviewing any proposed schedules, prior to receiving the administrator's approval. The website will provide a list of proposed changes, making it extremely easy for the scheduler to view and make changes. Successful implementation of this system might even not require a scheduler for this department at VGH.

Objectives

Digi Health Solutions proposes an automatic system that gathers initial schedule request information, sets up the initial master schedule, and ensures the schedule abides by all BC Nurses Union Scheduling Rules. The system should also allow for all stakeholders to easily access and view the schedule. All nurses will be able to view other nurses' shifts to exchange shifts. If a nurse is unavailable to work a shift, the system will notify and find all valid nurses who can. This will result in fewer understaffed shifts.

Project Approach

Team Organization & Roles

NAME	ROLE	RESPONSIBILITIES
Alysha Chung	Primary Consultant	Representative of the clients and works closely with the business analyst to communicate client feedback and ideate optimal solutions.
Francis German	Quality Assurance Engineer	Tests for usability and system integrity of the system. Communicates closely with the primary consultant and clients.
Patrick Holland	Software Admin	Developing the software for the system.
William Lee	Project Analyst	Overseeing development of the system development project and task distribution among the implementation team.
Anisha Soni	Business Analyst	Researches solutions to optimize and improve the implementation of the nurse scheduler into IslandHealth.

Work Breakdown Structure

TASK	COMPLETION DATE	CONTRIBUTORS
Client Meeting 1	September 27th, 2021	- Francis German - Patrick Holland - Anisha Soni
Collection of Project Requirements	October 8th 2021	- Alysha Chung - Francis German - Patrick Holland - William Lee - Anisha Soni

Project Requirements Report	October 14th, 2021	<ul style="list-style-type: none"> - Alysha Chung - Francis German - Patrick Holland - William Lee - Anisha Soni
Use Cases	October 21st, 2021	<ul style="list-style-type: none"> - Francis German - Patrick Holland - William Lee
Client Meeting 2	October 25th 2021	<ul style="list-style-type: none"> - Alysha Chung - Patrick Holland - William Lee
Domain Models	November 1st, 2021	<ul style="list-style-type: none"> - Alysha Chung - Francis German - Patrick Holland - William Lee - Anisha Soni
Client Meeting 3	November 15th, 2021	<ul style="list-style-type: none"> - Francis German - William Lee - Anisha Soni
UI Models	November 18th, 2021	<ul style="list-style-type: none"> - Alysha Chung - William Lee - Anisha Soni
Prepare Final Report	November 24th 2021	<ul style="list-style-type: none"> - Alysha Chung - Francis German - Patrick Holland - William Lee - Anisha Soni
Project Presentation	December 10th 2021	<ul style="list-style-type: none"> - Alysha Chung - Francis German - Patrick Holland - William Lee - Anisha Soni

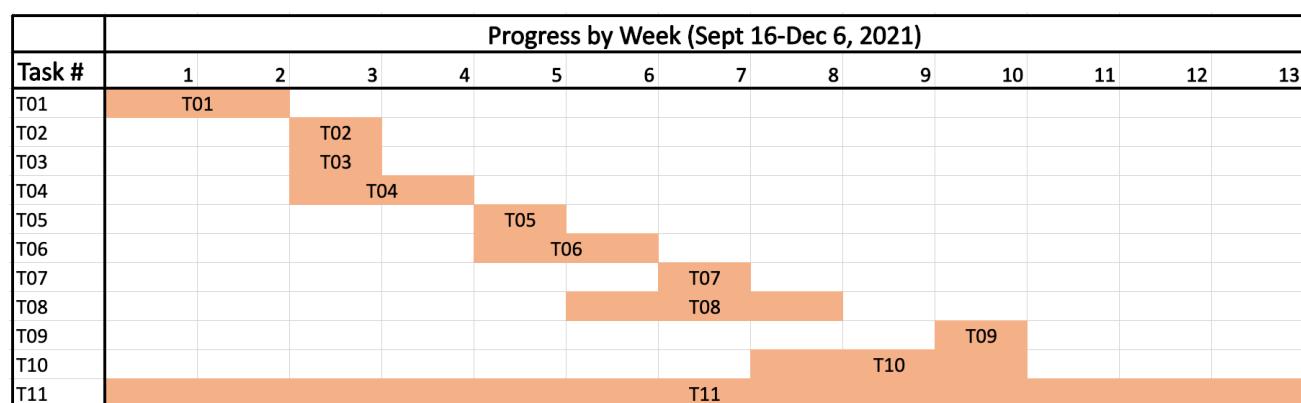
Milestones

Milestone:	Completion Date:
Client Meeting 1	September 27th, 2021
Collection of Project Requirements	October 8th 2021
Project Requirements Report	October 14th, 2021

Use Cases	October 21st, 2021
Client Meeting 2	October 25th 2021
Domain Models	November 1st, 2021
Client Meeting 3	November 15th, 2021
UI Models	November 18th, 2021
Prepare Final Report	November 24th 2021
Project Presentation	December 10th 2021

Gantt Chart

Task #	Task Name	Start Date	End Date	Duration (In Days)
T01	Review Client's RFP Document	9/16/2021	9/24/2021	8
T02	Client Meeting 1: Analysis of the Problem & Requirements Elicitations	9/26/2021	9/27/2021	1
T03	Analyze input from elicitations	10/1/2021	10/4/2021	3
T04	Project Charter	10/1/2021	10/7/2021	6
T05	Requirements Document	10/10/2021	10/14/2021	4
T06	Use Cases	10/14/2021	10/21/2021	7
T07	Client Meeting 2: Feedback on Requirements	10/28/2021	10/28/2021	1
T08	Domain Models	10/21/2021	11/1/2021	11
T09	Client Meeting 3: UI Prototypes	11/15/2021	11/15/2021	1
T10	UI Modelling	11/1/2021	11/18/2021	17
T11	Project Completion	9/16/2021	12/6/2021	81



Deliverables

1. Requirements
2. Use Case Modelling
3. Domain Models
4. UI Prototypes
5. UI Modelling
6. Project Report
7. Project Presentation

Risks

1. Technology Risk (low probability, med impact): to mitigate the risk of information breach, we will take precautions such as using secure computers and servers and using anti-virus and anti-spyware protection.
2. Communication Risk (high probability, high impact): to reduce misinformation, keep clarity, and preserve consistency, we have scheduled multiple client meetings. As well, our team will maintain regular contact with the clients to discuss any necessary issues .
3. Scope Creep Risk (med probability, high impact): to address unauthorized changes and addition of features and functionality of the project, we will create a written contract and outline the deliverables with timelines so all expectations are set before the project launch.
4. Cost Risk (low probability, med impact): to prevent miscalculation or mismanagement of funds and budget, we propose to begin the project with a lower budget. If an overspend were to occur, we would possess the emergency budget to accommodate all original project goals. Additionally, we plan to remove minor features and functionality to compensate for the lack of funds.
5. Operational Risk (med probability, med impact): to prevent operational risk such as breaking BC laws, we will take precautionary measures, such as abiding by the BC Nurses Union Scheduling Rules.

Approval Section

This section of the document contains the signatures of the relevant executives of IslandHealth. Through the signing of this section, the stakeholders of this project, IslandHealth will grant approval of this project charter and confirm their approval of the commencement of this project.

Island Health:

____ Kalsi, Asha _____
(Last Name, First Name)

____ A.K _____
(Signature)

____ Hannah, Patrick _____
(Last Name, First Name)

____ P.H _____
(Signature)

____ Eppler, Bryce _____
(Last Name, First Name)

____ B.E _____
(Signature)

____ Welsh, Alex _____
(Last Name, First Name)

____ A.W _____
(Signature)

____ Yoshido, Rikuto _____
(Last Name, First Name)

____ R.Y _____
(Signature)

____ Hussain, Rahma _____
(Last Name, First Name)

____ R.H _____
(Signature)

Digi Health Solutions:

____ Soni, Anisha _____
(Last Name, First Name)

____ A.S _____
(Signature)

____ Chung, Alysha _____
(Last Name, First Name)

____ A.C _____
(Signature)

____ Holland, Patrick _____
(Last Name, First Name)

____ P.H _____
(Signature)

____ Lee, William _____
(Last Name, First Name)

____ W.L _____
(Signature)

____ German, Francis _____
(Last Name, First Name)

____ F.G _____
(Signature)

____ 05/10/2021 _____
(DD/MM/YYYY)

Requirements

1.1 Functional Requirements

1. Each nurse must be able to request a two week period off.
2. Schedulers must approve or decline nurses' time off requests based on the nurse's eligibility.
3. At the beginning of each year, each nurse must be able to request the days of the week they can work.
4. At the beginning of each year, each nurse must be able to request shift times (ex. 6am - 6pm) that they can work.
5. Nurses must have access to a shift change form to update their shift availability throughout the year.
6. Nurses must be able to update and confirm their availability using the shift change form.
7. When a nurse requests to update their availability, the administrator and scheduler must receive an email notification informing them of the update.
8. The scheduler must confirm the request to update the nurse's availability.
9. At the beginning of each year, each nurse must be able to request a number of hours that they can work each week.
10. A nurse must be able to swap shifts with another nurse if both nurses agree, and the new schedule conforms to the BC Nurses Union Rules.
11. A nurse must be able to notify that he or she cannot work a shift.
 - a) A nurse must be able to notify that they cannot work due to a sickness.
 - b) A nurse must be able to notify that they cannot work due to non-sickness related factors (for ex. Family obligations, events, etc).
12. When a nurse notifies that he or she cannot work a shift, all eligible nurses must be alerted that there is a shift available.
 - a. A nurse must be eligible if they are not already scheduled to work during the shift and claiming the shift does not break any BC Nurses Union Rules.
 - b. Nurses must be notified when a shift is accepted.
13. Each nurse, scheduler, and administrator must be able to view the schedule for all nurses.
14. In the event that the scheduling algorithm cannot make a valid schedule, the scheduler must be notified to resolve any conflicts.
15. The scheduler must be informed of any shift change requests.
 - a. If the shift change request is approved by the scheduler, the administrator will be notified for final approval.
 - b. The nurse(s) involved with a schedule change must be informed if their request has been approved or denied.
 - c. Request denial should include a reason.
16. Each user must be able to send and receive messages to every other user.
17. The administrator must be able to remove all permissions from any user account in case of contract termination and/or resignation.

18. Different access privileges and permissions must be given to each user depending on their account type.
 - a. Account types must include administrators, schedulers, and nurses
19. A tutorial must be available to each user based on their account type.
20. A FAQ (frequently asked questions) tool must be available for users to access when they require additional help.
21. All users should receive email notifications when receiving a message.
22. Nurses must have access to a request history which lists all of their past requests and whether the requests were accepted or denied.
23. Nurses must be able to view all pending requests which list all of their requests that have not been accepted or denied yet.
24. Schedulers and Administrators must be able to view all pending requests which list all nurses' requests that have not been accepted or denied yet.
25. Each new user should receive an email confirmation once his or her account is created.
26. Data inputted by the administrator must only be in text or number format.
27. All users of the system must be able to access a name directory feature that allows users to find other users.
28. Previous years' schedules must be archived and available to view when needed.
29. Administrators and Schedulers must be able to remove active nurse accounts.
 - a. Nurses must be notified of shift availability immediately.
30. Administrators must be able to create new nurse accounts.
 - a. An email must be sent to the nurse once an account has been made using their email address.

1.2 Non-Functional Requirements

1. All schedules must abide by all BC Nurses Union Rules.
2. Only nurses, schedulers and administrators must receive access to the system.
3. The system must only be accessed through verified user accounts, with a unique username and password assigned to each user.
4. Schedulers and administrators must receive access to all nurses' schedules and contact data.
5. Administrators must confirm that the schedule follows BC Nurses Union Scheduling Rules.
6. The schedule must be accessible from any version of Google Chrome after version 90.0, Safari after version 15, and Firefox after version 93.0.
7. The scheduler must be able to add or remove nurses from a shift to resolve conflicts.
8. The schedule and scheduling features must be available, maintainable, and reliable for proper functionality
 - a. Must have 99.99% availability / day as nurses will frequently be sending tickets for shift change requests
 - b. Must have 99% reliability to prevent errors in new schedule changes once shift changes are approved by the administrator
 - c. In the rare case the system faces an error, the mean time between failures (MTBF) should be 1 hour to accommodate the constantly heavy oncoming ticket traffic.
9. The schedule should be backed up daily (every 24 hours at 00:00)
10. The system must be developed to comply with the British Columbia Nurses' Union's standards
 - a. The nurse scheduler should be a digitalized and streamlined version of incumbent nurse shift scheduling practices.
 - b. Same rules of the BC Nurses' Union's scheduling regulations must apply to the practices being done on this nurse scheduling application
 - c. Comply with BC Nurses' Union PCA – Contract Interpretation Manual (Nurses' Bargaining Association) Article 25 – Work Schedules
 - i. Includes: Master Work Schedules, Determination of Work Schedules, Posting of Work Schedules, Insufficient Notice, Voluntary Shift Exchange, Leave of Absence Refused
11. The nurse shift scheduler must be developed under IslandHealth's proposed financial budget as per IslandHealth's Request for Proposal.
12. Each user should be able to use the scheduler proficiently and demonstrate computer literacy.
13. All schedule and user data must be stored within British Columbia.
14. All users must be able to change their own passwords.
15. The system must have the capacity to add over 200 users.
16. Whenever an administrator approves a new schedule, all users should be able to see this new schedule within 5 seconds.
 - a. Nurses must be notified with the updated schedule.
17. New users should receive an email confirmation message that states an email has been sent to the new user within 5 seconds of creating an account.
18. All users must be able to access the system from any operating system.
19. The schedule must be attached to the Island Health internal website.

Use Cases

<p>Use Case: CreateNewAccount</p> <p>ID: UC-1</p> <p>Brief Description: The system creates a new account for a given job title.</p> <p>Actor(s): Administrators</p> <p>Preconditions:</p> <ol style="list-style-type: none"> 1. The account does not already exist in the system. <p>Main Flow:</p> <ol style="list-style-type: none"> 1. The Administrator wants to create a new account 2. The Administrator selects to create a new account. 3. The Administrator enters a key. 4. The Administrator selects between three account types: Administrator, Nurse, Scheduler. 5. The Administrator fills a form with the new account's information. 6. The system creates a new account and gives account permissions based on account type. 7. The system returns to the Administrator's home page. <p>Postconditions:</p> <ol style="list-style-type: none"> 8. A new account is created by the Administrator. 9. The account is given appropriate user permissions based on the specified account type. <p>Alternate Flow(s): None.</p>	<p>Use Case: LogIn</p> <p>ID: UC-2</p> <p>Brief Description: The system logs in the User.</p> <p>Actor(s): Nurses, Schedulers, Administrators</p> <p>Preconditions:</p> <ol style="list-style-type: none"> 1. No User is logged in to the system from the device used. <p>Main Flow:</p> <ol style="list-style-type: none"> 1. The User wants to log in to their account. 2. The User selects to login. 3. While the User details are valid <ol style="list-style-type: none"> 3.1. The User is prompted to enter their details again for confirmation. 3.2. The User's details are validated. 4. The system logs in the User and validates the session. 5. The system redirects to the User home page. <p>Postconditions:</p> <ol style="list-style-type: none"> 1. The User is logged into the system. <p>Alternate Flow(s): None.</p>
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Use Case: ViewSchedule	Use Case: SubmitSchedulingInformation
ID: UC-3	ID: UC-4
Brief Description: Users must be able to view the current schedule assigned to nurses.	Brief Description: Nurse wants to submit information including hours of work availability per day, days of work per week, and vacation days for a schedule to be created by the Scheduler.
Actor(s): Nurses, Schedulers, Administrators	Actor(s): Nurse
Preconditions: 1. User is logged into the system.	Preconditions: 1. Nurse is logged into the system.
Main Flow: <ol style="list-style-type: none"> 1. If user wants to see a specific week's schedule, <ol style="list-style-type: none"> 1.1. User selects "Date" and types in the date in mm-dd-yyyy format of the schedule they would like to view. 2. Else, the user views the current week's schedule displayed upon logging into the system. 	Main Flow: <ol style="list-style-type: none"> 1. Nurse clicks the 'Request New Schedule' button. 2. Nurse enters their availability for hours per day, days of work per week, and the dates for their vacation days into the 'New Schedule' form. 3. Nurse clicks submit once all fields are completed. 4. A request for a new schedule with all of the relevant information has been sent to the Scheduler to be created.
Postconditions: <ol style="list-style-type: none"> 1. Users are able to view any week's schedule of that year. 	Postconditions: <ol style="list-style-type: none"> 1. Schedule information has been submitted and a request for schedule creation has been sent to the Scheduler.
Alternate Flow(s): None.	Alternate Flow(s): None.

Use Case: ApproveNewSchedule	Use Case: RequestShiftSwap
ID: UC-5	ID: UC-6
<p>Brief Description: The Administrator receives a created schedule after it is processed by the Scheduler and approves or disapproves the schedule based on their interpretation of the BC Nurses' Union shift schedule standards.</p>	<p>Brief Description: A nurse would like to swap a specific shift of theirs with someone else.</p>
<p>Actor(s): Administrator</p>	<p>Actor(s): Nurse (who would like to swap one of their shifts)</p>
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. Scheduling information has been submitted and schedule has been created 	<p>Preconditions:</p> <ol style="list-style-type: none"> 1. The nurse has at least one shift on the master scheduler.
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The Scheduler submits their proposal for a new schedule. 2. This proposal request is sent to and received by the Administrator. 3. The Administrator will cross-reference up-to-date BC Nurses' Union rules with the schedule structure to determine whether it is compliant or not. 4. If the schedule is compliant, the Administrator will approve the schedule. 5. The schedule is approved and an official schedule change has been made. 	<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The nurse navigates to the master schedule page. 2. The nurse clicks on the shift they would like to swap. 3. They are presented with a menu which includes a "Request Swap" button. 4. They click this button. 5. They are presented with feedback confirming their swap request.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. Schedule has been approved by the Administrator and the relevant nurses are notified for the official schedule change. 	<p>Postconditions:</p> <ol style="list-style-type: none"> 1. All other nurses who would be eligible (based on BC Nurses Union Rules) to take this shift are notified (through the system and also by email) that the shift is available for swap.
<p>Alternate Flow(s): None.</p>	<p>Alternate Flow(s): None.</p>

Use Case: CancelRequestShiftSwap	Use Case: OfferShiftSwap
ID: UC-7	ID: UC-8
<p>Brief Description: A nurse who has an active shift swap request would like to cancel that request.</p>	<p>Brief Description: A nurse (N0) has already requested a shift swap. Another nurse (N1) received a notification for that request and would like to offer one of their shifts to swap.</p>
<p>Actor(s): Nurse (who would like to cancel their shift swap request)</p>	<p>Actor(s): Nurse N1 (who would like to offer a shift swap to a nurse who has requested one)</p>
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. The nurse has an active shift swap request. 	<p>Preconditions:</p> <ol style="list-style-type: none"> 1. Nurse N0 has already requested a shift swap for one of their shifts. 2. Nurse N1 is eligible to take this shift and so they received a notification from the system about this swap request by N0.
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The nurse navigates to the master schedule page. 2. The nurse clicks on the shift with an active shift swap request. 3. The nurse is presented with a menu which includes a “Cancel Swap Request” button. 4. The nurse clicks this button. 5. The nurse receives feedback confirming that their shift swap request has been cancelled. 	<p>Main Flow:</p> <ol style="list-style-type: none"> 1. Nurse N1 navigates to the Shift Swap Request page within the system. 2. Nurse N1 clicks the Offer Swap button beside Nurse N0’s swap request. 3. Nurse N1 is presented with all of their shifts that would be eligible for Nurse N0 to take. 4. Nurse N1 chooses one of the shifts and clicks the Offer Swap button. 5. Nurse N1 is given feedback from the system confirming their swap offer.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The swap request has been cancelled and no other nurses can view or interact with that swap request anymore. 	<p>Postconditions:</p> <ol style="list-style-type: none"> 1. Nurse N0 receives a notification within the system and also email that a shift swap offer has been received for one of their swap requests.
<p>Alternate Flow(s): None.</p>	<p>Alternate Flow(s): None.</p>

<p>Use Case: AcceptShiftSwapOffer</p>	<p>Use Case: SchedulerShiftSwapApproval</p>
<p>ID: UC-9</p>	<p>ID: UC-10</p>
<p>Brief Description: A nurse N0 received a shift swap offer from nurse N1 for one of N0's active shift swap requests. N0 would like to accept this offer so that the shifts are swapped.</p>	<p>Brief Description: Nurse N0 and nurse N1 have accepted a shift swap. This shift swap now needs to be approved by the scheduler (and then the administrator) before it is accepted into the master schedule.</p>
<p>Actor(s): Nurse N0 (who initiated the original shift swap request)</p>	<p>Actor(s): Scheduler</p>
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. Nurse N0 has an active shift swap request. 2. Nurse N1 has sent a shift swap offer for this swap request. 	<p>Preconditions:</p> <ol style="list-style-type: none"> 1. Nurse N0 and nurse N1 have accepted a shift swap.
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. Nurse N0 navigates to the notifications page within the system. 2. Nurse N0 clicks on the Shift Swap Offer notification from Nurse N1. 3. Nurse N0 is presented with the swap offer details and determines that they would like to accept this offer. 4. Nurse N0 clicks the Accept Swap Offer button. 5. Nurse N0 is presented with feedback from the system confirming the offer acceptance and telling N0 that the scheduler (and then administrator) will be notified for approval. 	<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The scheduler navigates to the notification page within the system. 2. The scheduler clicks on the swap request between N0 and N1 that is awaiting approval. 3. The scheduler reviews the shift swap details. 4. The scheduler clicks the Approve Shift Swap button. 5. The scheduler receives feedback from the system confirming their approval and detailing that the shift swap has been sent to the administrator for final approval.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The scheduler receives a notification (within the system and by email) about a pending Shift Swap Request that needs their approval. 	<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The administrator receives a notification (within the system and by email) of a pending Shift Swap that requires their approval. 2. Nurses N0 and N1 receive a notification (within the system and by email) that their shift swap request has been approved by the scheduler and must now be approved by the administrator.
<p>Alternate Flow(s): None.</p>	<p>Alternate Flow(s): None.</p>

Use Case: SchedulerShiftSwapDenial
ID: UC-11
<p>Brief Description: Nurse N0 and nurse N1 have accepted a shift swap, but will now be denied by the scheduler.</p>
<p>Actor(s): Scheduler</p>
<p>Preconditions: 1. Nurse N0 and nurse N1 have accepted a shift swap.</p>
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The scheduler navigates to the notification page within the system. 2. The scheduler clicks on the swap request between N0 and N1 that is awaiting approval. 3. The scheduler reviews the shift swap details. 4. The scheduler clicks the Deny Shift Swap button. 5. The scheduler fills out the Reason for Denial textbox with their reason for denying it. 6. The scheduler receives feedback from the system confirming their denial.
<p>Postconditions: 1. Nurses N0 and N1 receive a notification (within the system and by email) that their shift swap request has been denied by the scheduler and also the reason why.</p>
<p>Alternate Flow(s): None.</p>

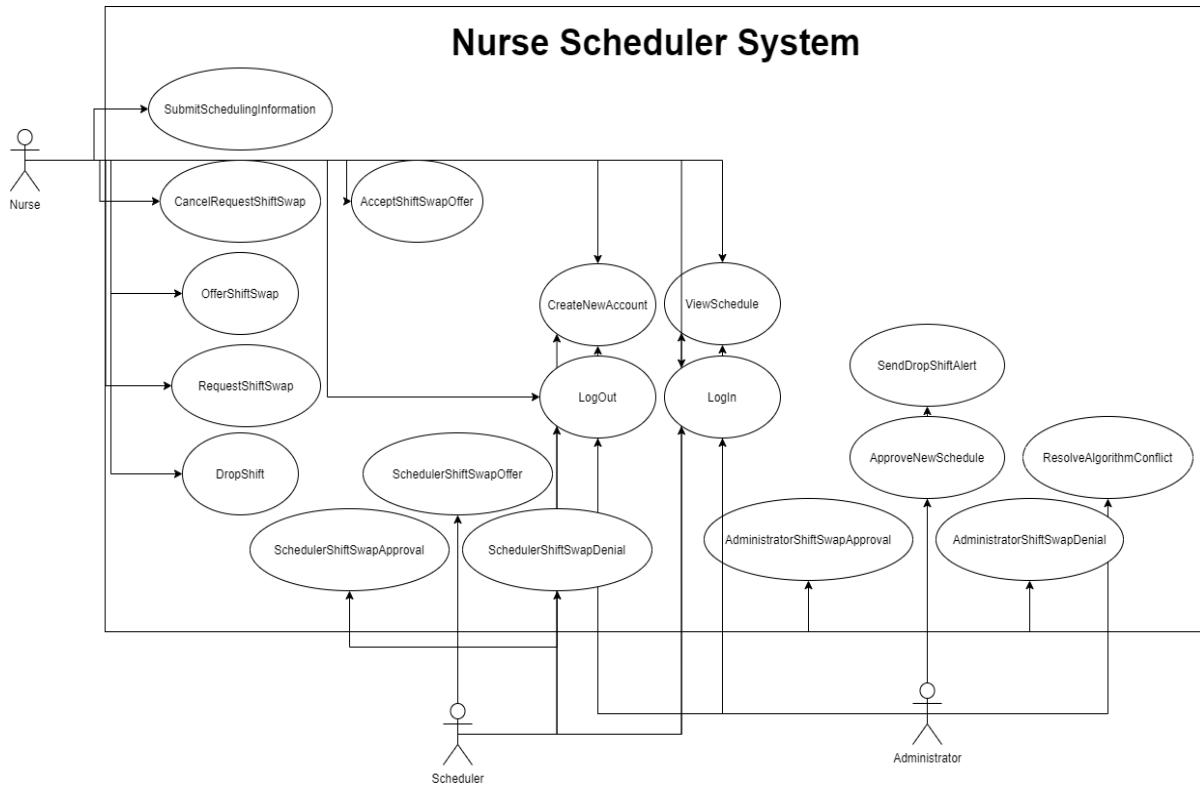
Use Case: AdministratorShiftSwapApproval
ID: UC-12
<p>Brief Description: A shift swap between nurses N0 and N1 has been approved by the scheduler and must now be approved by the administrator before it is accepted into the master schedule.</p>
<p>Actor(s): Administrator</p>
<p>Preconditions: 1. A shift swap between nurses N0 and N1 has been approved by the scheduler.</p>
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The administrator navigates to the notifications page within the system. 2. The administrator clicks on the swap request between N0 and N1 that is pending administrator approval. 3. The administrator reviews the shift swap details and confirms that this swap would not violate any BC Nurses Union Rules. 4. The administrator clicks the Approve Shift Swap button. 5. The administrator receives feedback from the system that the shift swap has been approved and has been accepted into the master schedule.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The master schedule has been updated with this shift swap between N0 and N1. 2. Nurses N0 and N1 receive a notification (within the system and by email) that their shift swap has been approved by the administrator and is now active in the master schedule. 3. The scheduler receives a notification (within the system and by email) that the shift swap between N0 and N1 has been approved by the administrator.
<p>Alternate Flow(s): None.</p>

Use Case: AdministratorShiftSwapDenial
ID: UC-13
<p>Brief Description: A shift swap between nurses N0 and N1 has been approved by the scheduler, but will now be denied by the administrator.</p>
<p>Actor(s): Administrator</p>
<p>Preconditions: 1. A shift swap between nurses N0 and N1 has been approved by the scheduler.</p>
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The administrator navigates to the notifications page within the system. 2. The administrator clicks on the swap request between N0 and N1 that is pending administrator approval. 3. The administrator reviews the shift swap details and confirms that this swap would not violate any BC Nurses Union Rules. 4. The administrator clicks the Deny Shift Swap button. 5. The administrator fills in the Reason for Denial textbox with their reason for denying the request. 6. The administrator receives feedback from the system that the shift swap has been denied.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. Nurses N0 and N1 receive a notification (within the system and by email) that their shift swap has been denied by the administrator and also the reason why. 2. The scheduler receives a notification (within the system and by email) that the shift swap between N0 and N1 has been denied by the administrator and also the reason why.
<p>Alternate Flow(s): None.</p>

Use Case: DropShift	Use Case: SendDropShiftAlert
ID: UC-14	ID: UC-15
Brief Description: Nurse wants to drop a shift from their schedule.	Brief Description: The system notifies other nurses and the scheduler about a dropped shift.
Actor(s): Nurse	Actor(s): Nurses, Scheduler.
Preconditions: 1. Nurse must be scheduled for the selected shift to be dropped.	Preconditions: 1. Nurse must have successfully dropped the selected shift.
Main Flow: 1. Nurse logs into the system. 2. Nurse navigates to the schedule section. 3. Nurse selects the shift they want to drop. 4. Nurse clicks “drop shift” and confirms their selection. 5. The system alerts the nurse that the shift has been dropped. 6. Nurse gets an email notification.	Main Flow: 1. Nurse drops a shift. 2. The system sends an email notification to the scheduler and other nurses on the system informing them of the dropped shift.
Postconditions: 1. The shift gets removed from the nurse's schedule.	Postconditions: 1. The scheduler and the nurses receive an email notification informing them about a dropped shift from the system.
Alternate Flow(s): None.	Alternate Flow(s): None.

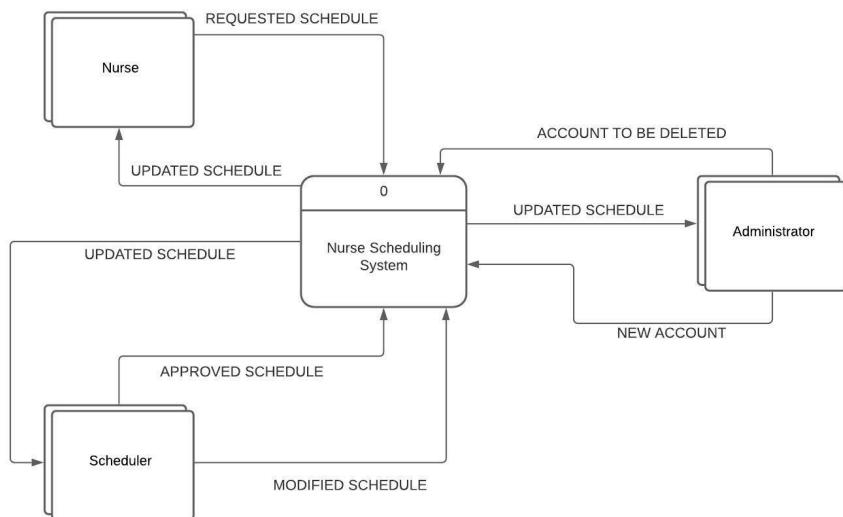
Use Case: AcceptDroppedShift	Use Case: LogOut
ID: UC-16	ID: UC-17
<p>Brief Description: The system schedule offers the dropped shift to other nurses available to work on that day.</p>	<p>Brief Description: The user wants to log out of the system.</p>
<p>Actor(s): Nurses</p>	<p>Actor(s): Nurses, Schedulers, Administrators</p>
<p>Preconditions:</p> <ol style="list-style-type: none"> 1. A shift is dropped by a nurse. 2. The selected nurse to accept a dropped shift must be available to work. 	<p>Preconditions:</p> <ol style="list-style-type: none"> 1. The User must be logged into the system.
<p>Main Flow:</p> <ol style="list-style-type: none"> 1. Selected nurses receive an email notification of the offer for a dropped shift. 2. A selected nurse accepts the offer. 3. The system schedules the nurse for the dropped shift. 4. All nurses are notified that the shift has been taken. 	<p>Main Flow:</p> <ol style="list-style-type: none"> 1. The User wants to log out of their account. 2. The User clicks “log out” on the top right of the screen. 3. The system logs out the User and invalidates the session. 4. The system redirects to the login page.
<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The system schedules a nurse for the dropped shift. 2. The system sends a notification to all users that the dropped shift has been assigned to another nurse and is no longer available. 	<p>Postconditions:</p> <ol style="list-style-type: none"> 1. The User is logged out.
<p>Alternate Flow(s): None.</p>	<p>Alternate Flow(s): None.</p>

Use Cases Diagram



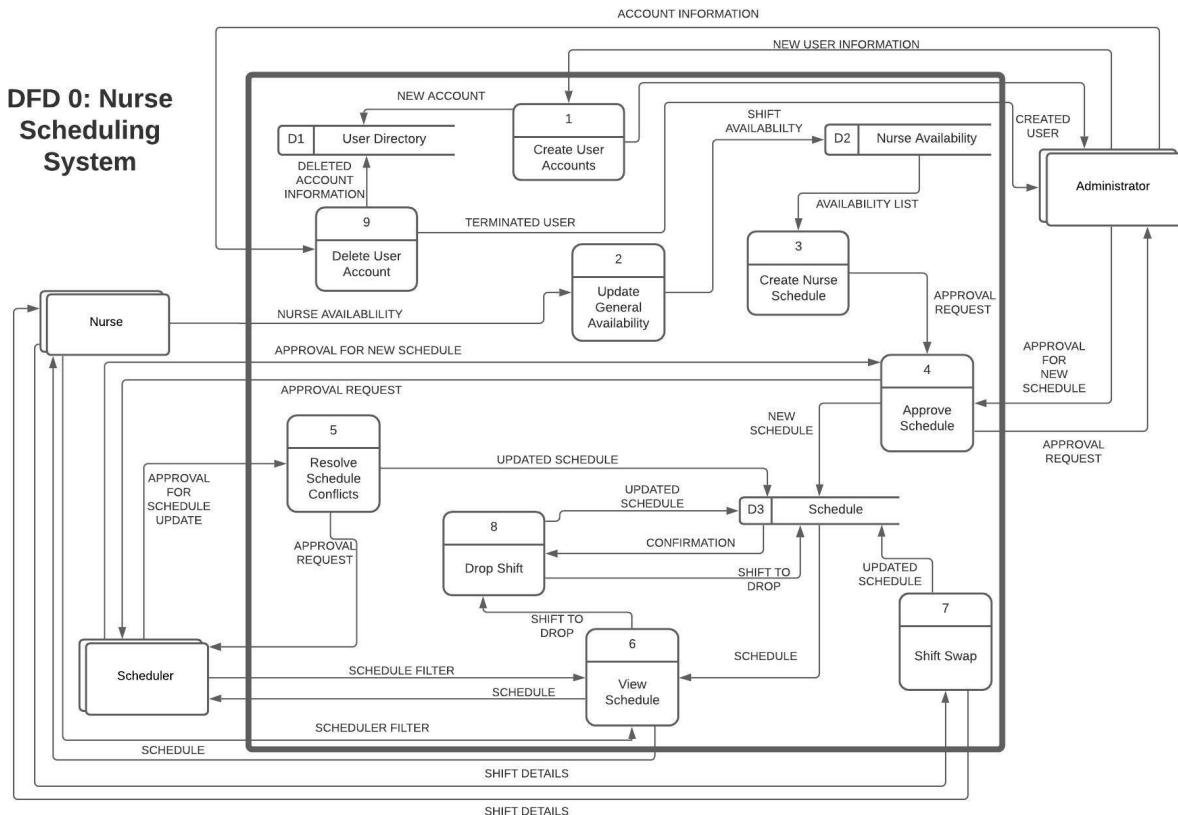
Domain Models

System Context Diagram (SCD)

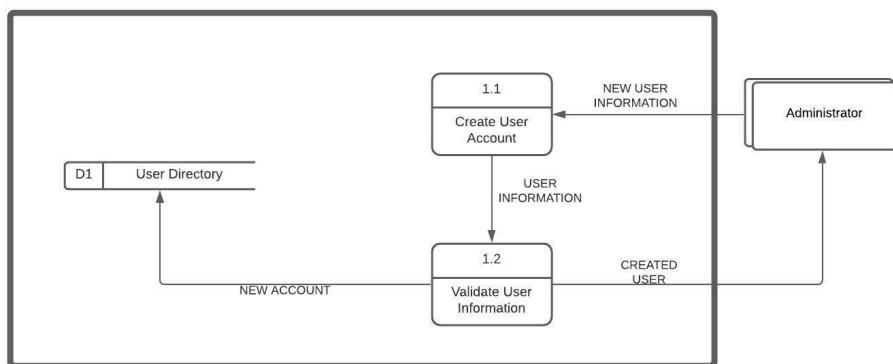


Data Flow Diagrams (DFD)

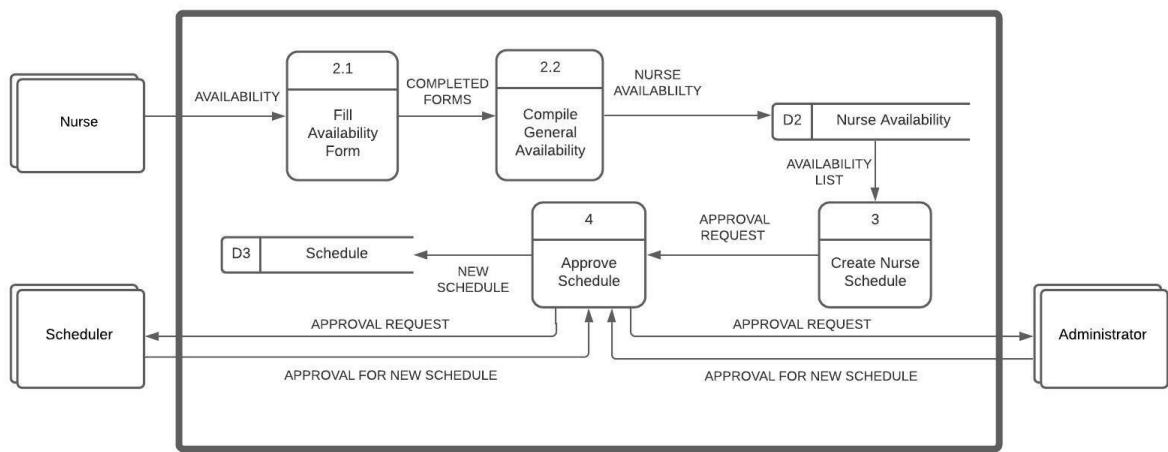
DFD-0:



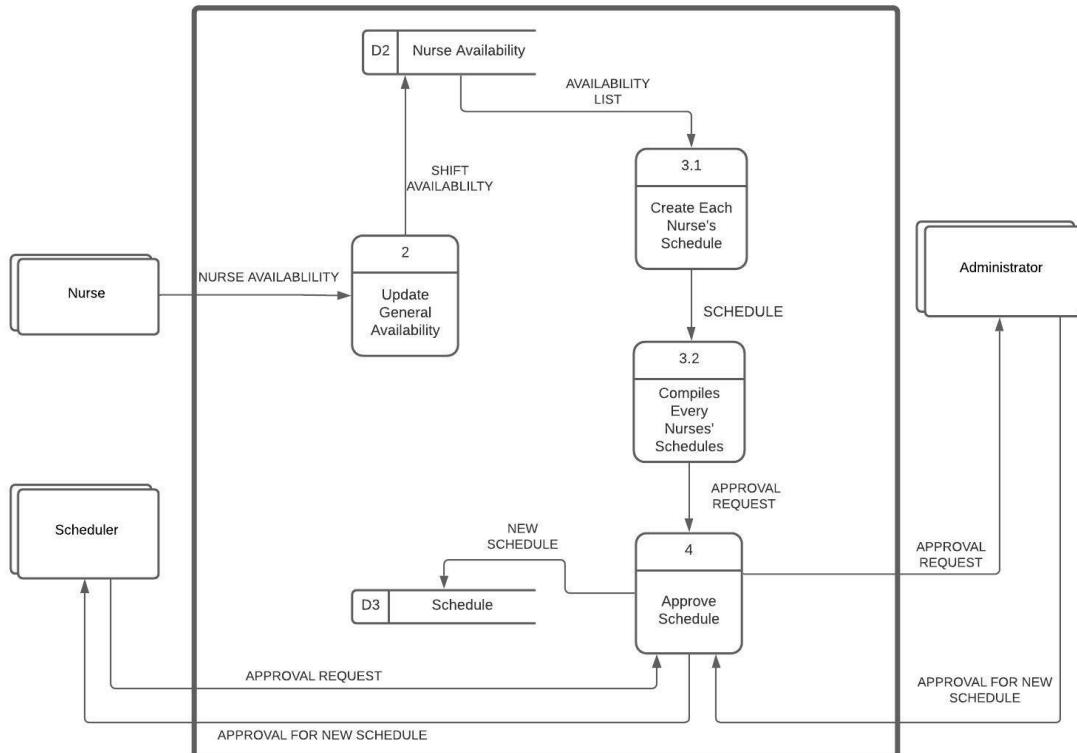
DFD-1: Create Account



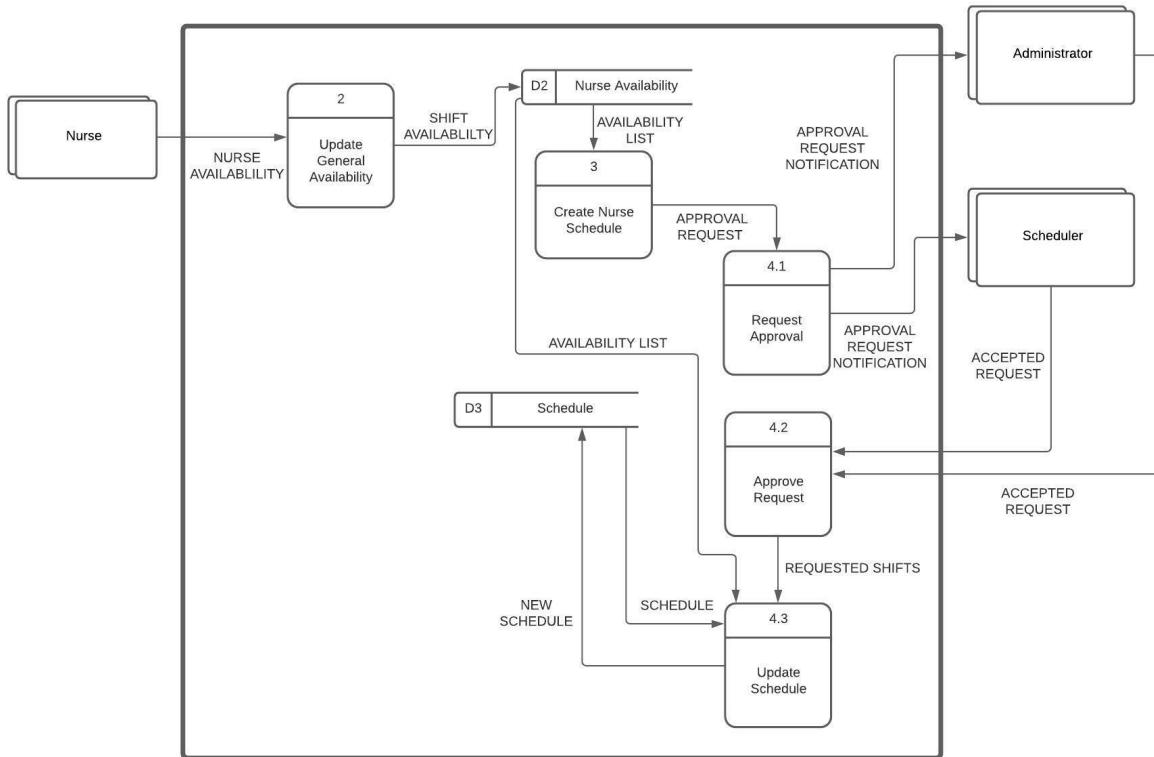
DFD-2: Update General Availability



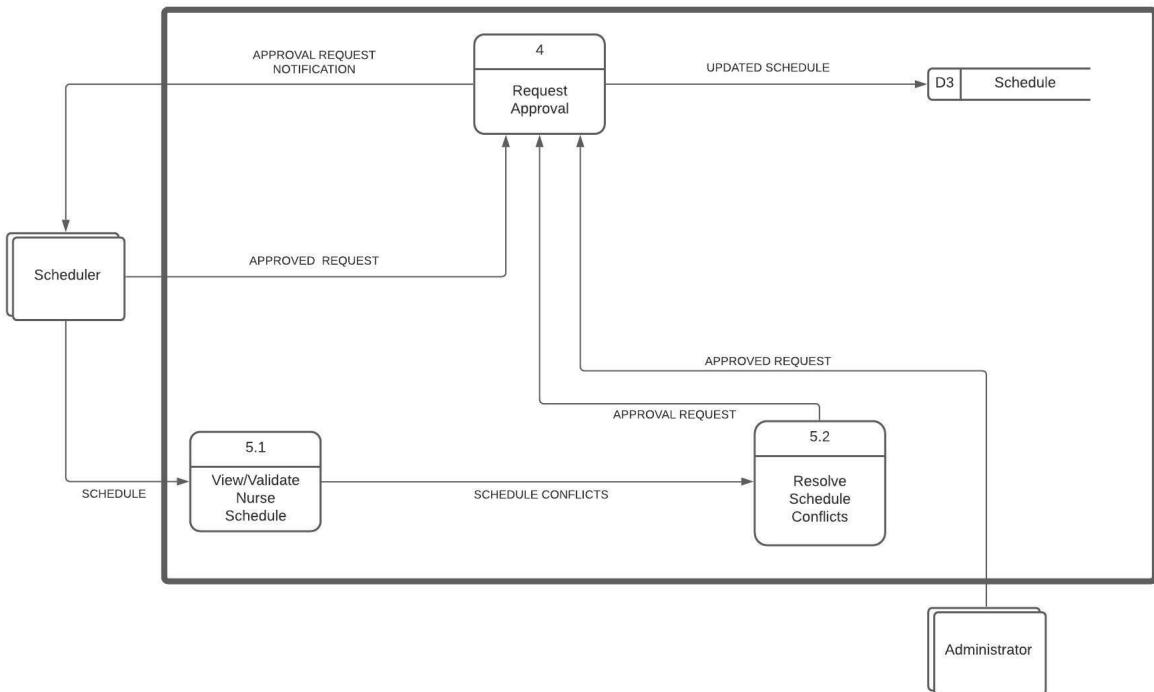
DFD-3: Create Nurse Schedule



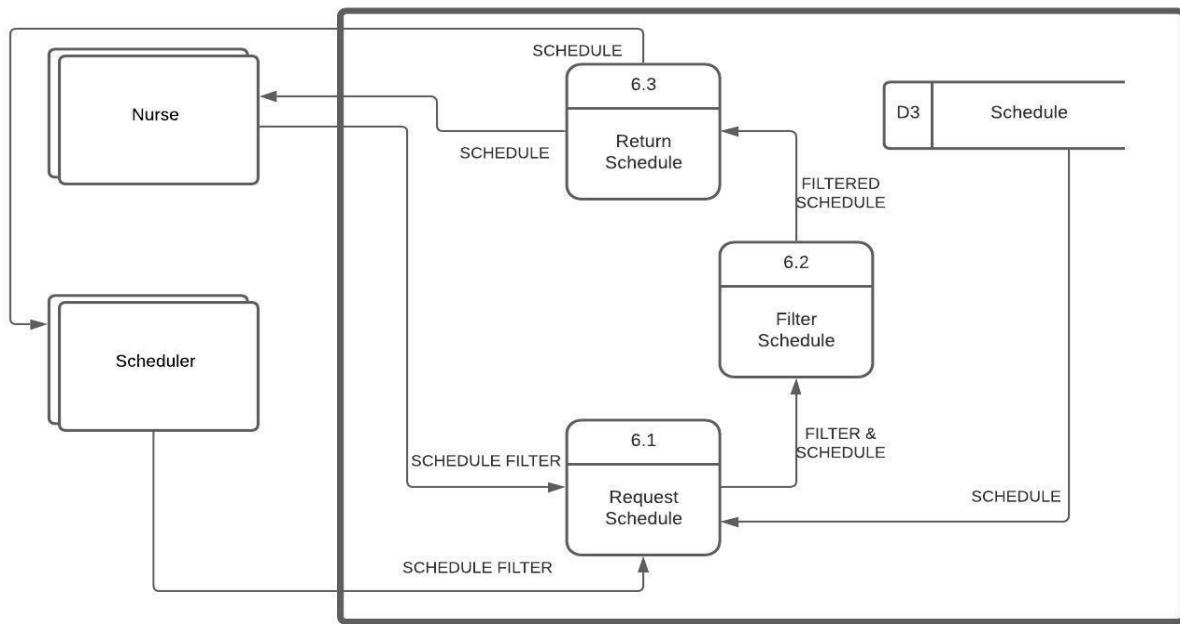
DFD-4: Approve Schedule



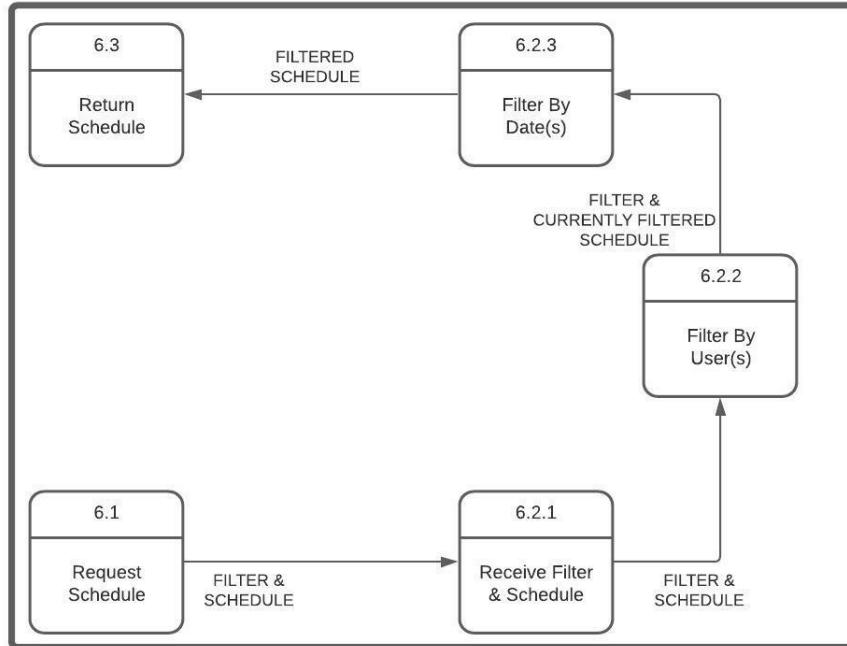
DFD-5: Resolve Schedule Conflicts



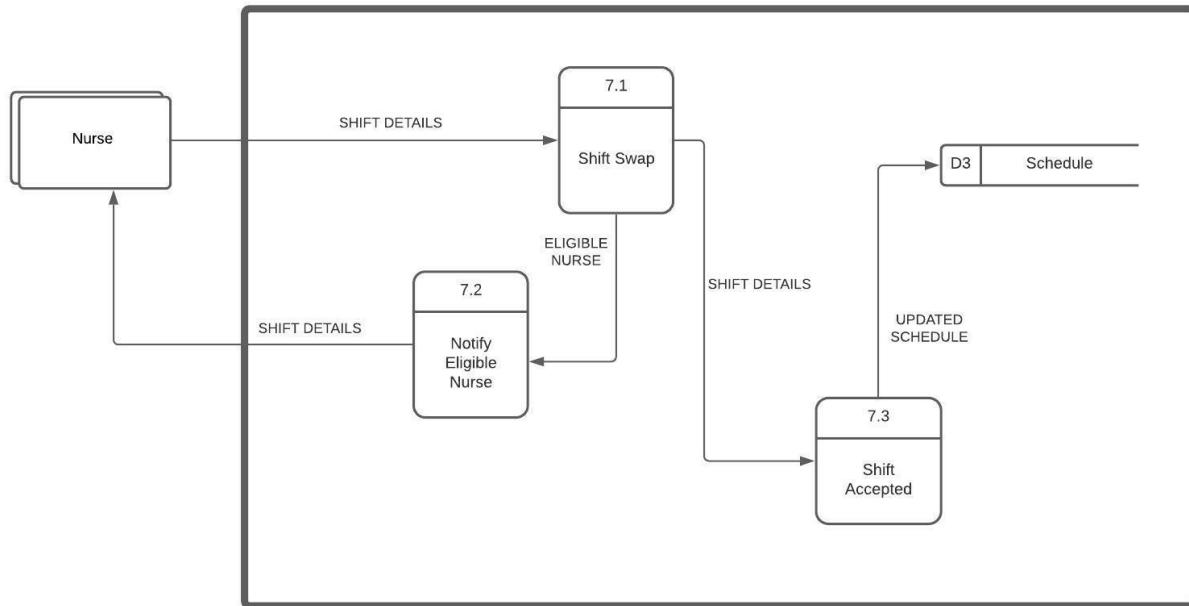
DFD-6: View Schedule



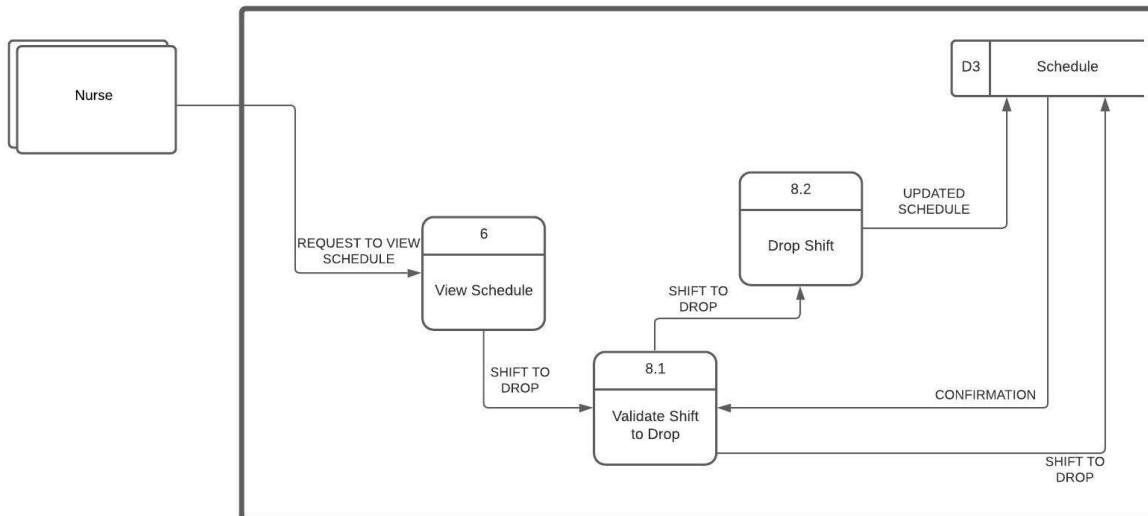
DFD-6.1:



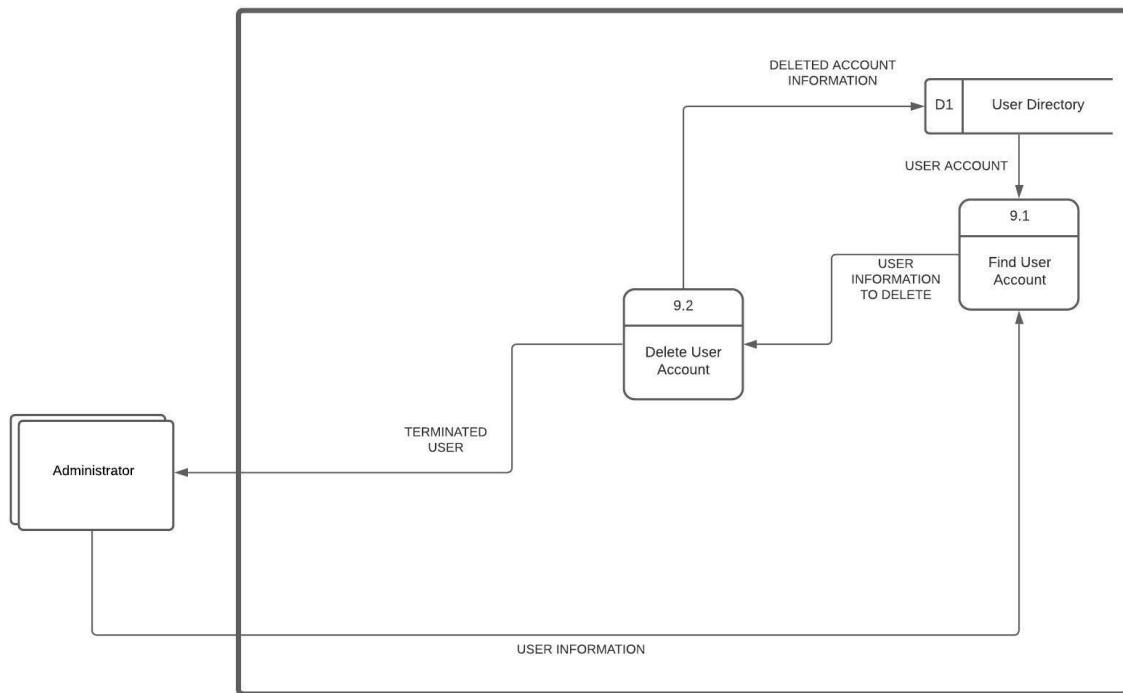
DFD-7: Swap Shifts



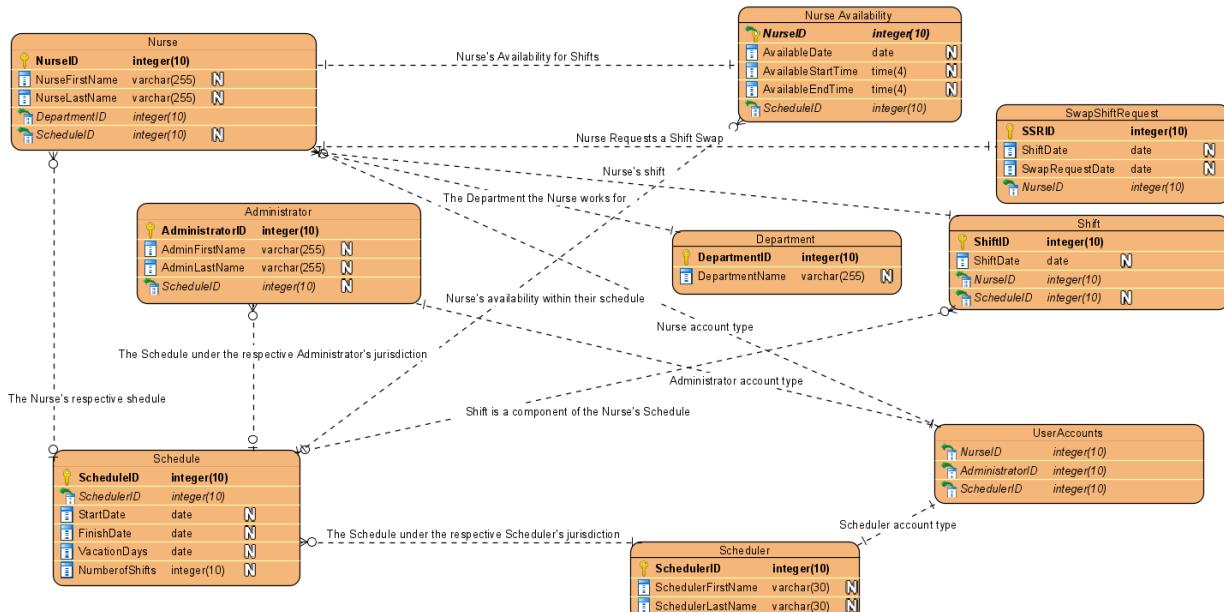
DFD-8: View Schedule



DFD-9: Delete User Account



Entity Relationship Diagram (ERD)



Data Dictionary

UserAccounts Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
FK	NurseID	Nurse's identifier (foreign key)	integer	10	
FK	AdministratorID	Administrator's identifier (foreign key)	integer	10	
FK	SchedulerID	Scheduler's identifier (foreign key)	integer	10	

Nurses Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	NurseID	Nurse's identifier	integer	10	
	NurseFirstName	Nurse's first name	varchar	255	
	NurseLastName	Nurse's last name	varchar	255	
FK	DepartmentID	Nurse's department	integer	10	
FK	ScheduleID	Nurse's schedule ID	integer	10	

Administrators Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	AdministratorID	Administrator's identifier	integer	10	
	AdminFirstName	Administrator's first name	varchar	255	
	AdminLastName	Administrator's last name	varchar	255	
FK	ScheduleID	Nurse's schedule ID	integer	10	

Schedulers Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	SchedulerID	Scheduler's identifier	integer	10	
	SchedulerFirstName	Scheduler's first name	varchar	30	
	SchedulerLastName	Scheduler's last name	varchar	30	

Schedules Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	ScheduleID	Schedule's unique identifier	integer	10	
FK	SchedulerID	Scheduler's identifier	integer	10	
	StartDate	Administrator's last name	date		
	FinishDate		date		
	VacationDays		date		
	NumberOfShifts	Number of shifts within the schedule	integer	10	

Department Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	DepartmentID	Department identifier	integer	10	
	DepartmentName	Department name	varchar	255	

SwapShiftRequest Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	SSRID	Identifier for shift swap request ticket	integer	10	
	ShiftDate	Scheduler's identifier	date		
	SwapRequestDate	Administrator's last name	date		
FK	NurseID		integer	10	

Shifts Table:

PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK	ShiftID	Shift identifier	integer	10	
	ShiftDate	Date of the shift	date		
FK	ScheduleID	Foreign key from Schedule table of Schedule identifier	integer	10	
FK	NurseID	Associated Nurse's identifier (foreign key from Nurse table)	integer	10	

NurseAvailability Table:

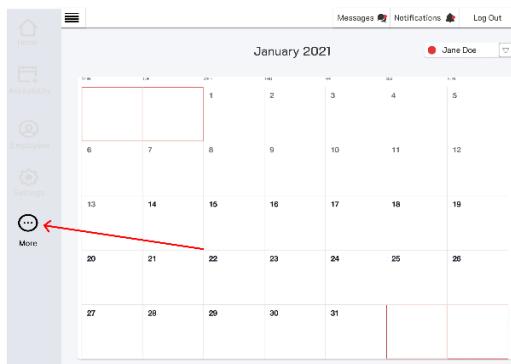
PK/FK	Field Name	Caption	Data Type	Field Size	Notes
PK/FK	NurseID	Shift Identifier	integer	10	
	AvailableDate	Date of the nurse's availability	date		
	AvailableStartTime	Time of the nurse's availability (start of time slot)	time	4	
	AvailableEndTime	Time of the nurse's availability (end of time slot)	time	4	
FK	ScheduleID	Nurse's schedule ID	integer	10	

Solution and Design

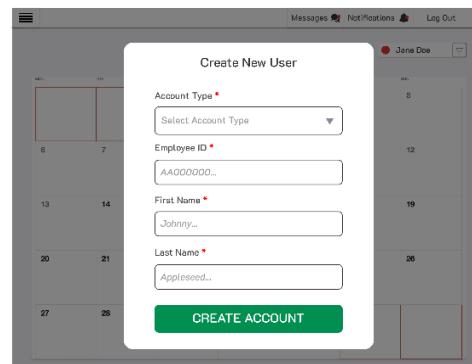
User Interface (UI Models) & Storyboards

To view high definition images of the storyboards, click [here](#)

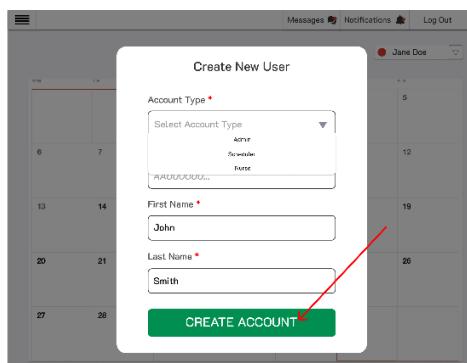
Storyboard 1: Create a New Account (UC 1)



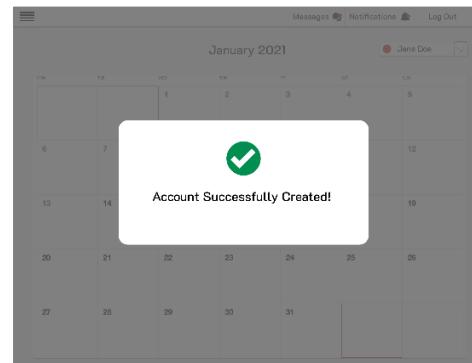
1. Admin wants to create a new user account. Navigates to 'Create New Account' option within the 'More' button.
(Only the admin has the privileges to make a new user account.)



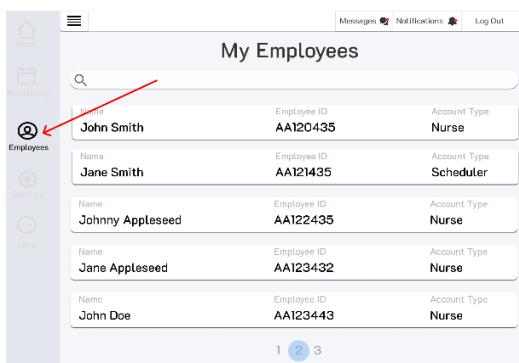
2. Clicking the 'Create New Account' button will direct the user to a pop-up modal for creating a new user account.



3. The admin will then enter the new users account type, their employee ID, and their first name/last name, among other user information.



4. After the admin creates a new account, a success modal will display on the screen and shortly disappear after 3 seconds. This will signify that a new account has been made.



5. After the admin has created a new account, they will be able to find the employee in the 'My Employees' page.

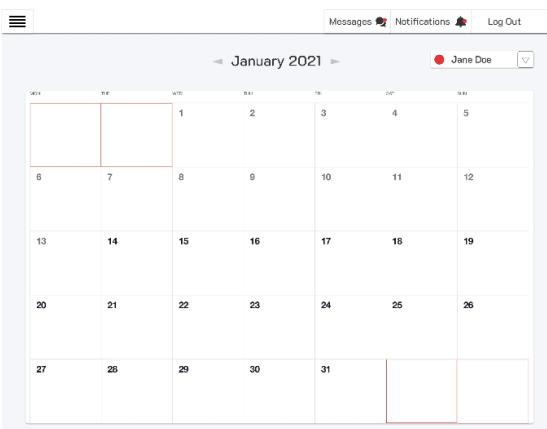
Storyboard 2: LogIn (UC 2)

The screenshot shows the 'Nurse Scheduler' landing page. It features a central input field for 'Employee ID *' and a password field for 'Password *'. Below these fields is a green 'LOG IN' button.

1. User wants to log into their new user account. The Nurse Scheduler landing page prompts account details.

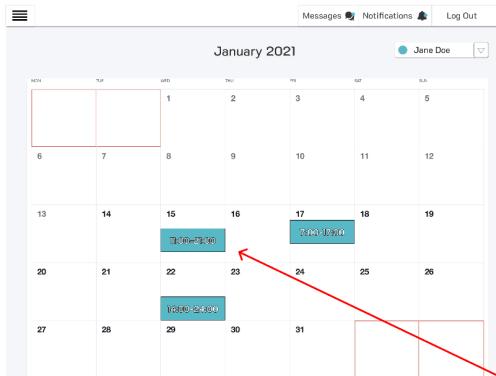
The screenshot shows the 'Nurse Scheduler' landing page after the user has entered account details. The 'Employee ID *' field contains 'AA123456' and the 'Password *' field contains '*****'. A red arrow points to the green 'LOG IN' button.

2. User enters account details and selects "LOG IN".

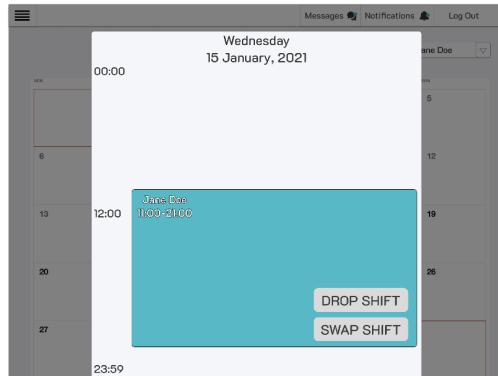


3. User accounts are directed to the Home Page.

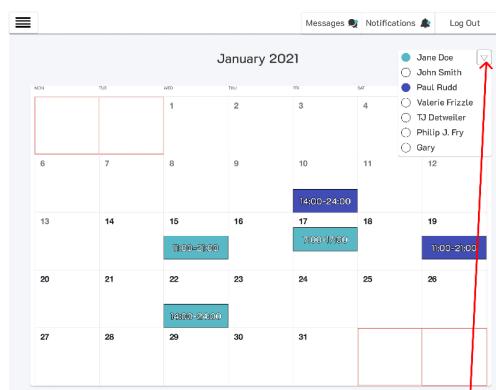
Storyboard 3: View Schedule (UC 3)



1. User Jane Doe can view her monthly schedule from the Home page.

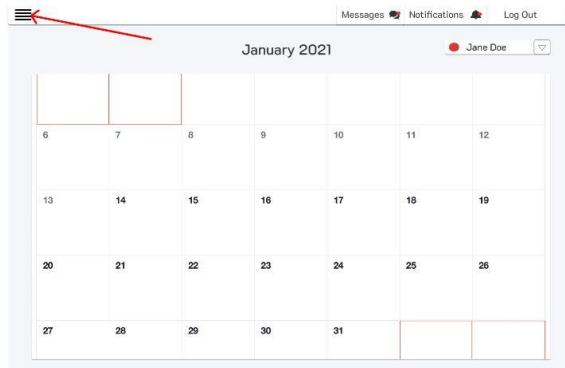


2. Clicking one of the shifts will “zoom” in on that day. If the shift belongs to the logged-in user, the Drop Shift and Swap Shift buttons will be present.

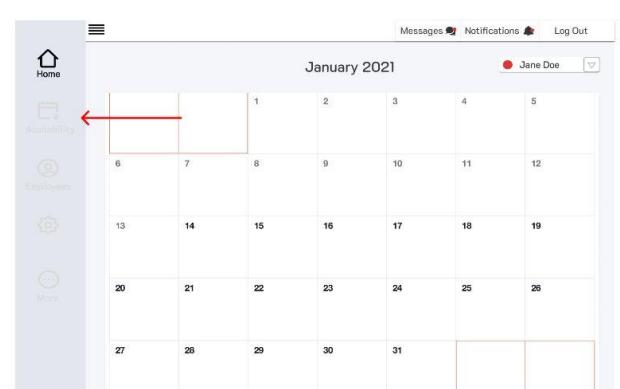


3. Using the dropdown menu from the Home page, the user can choose zero or more users to include in the calendar. Each user will get a unique colour.

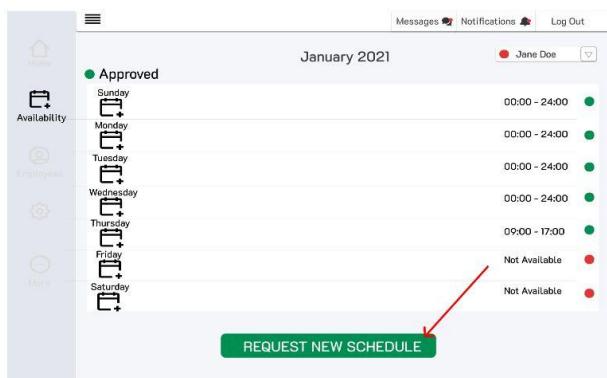
Storyboard 4: SubmitScheduleInformation (UC 4)



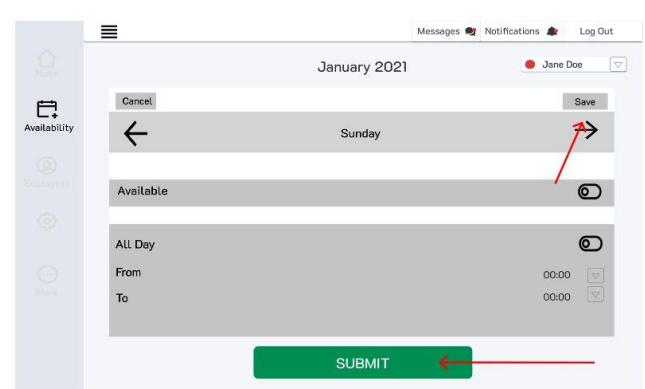
1. User Jane Doe wants to request a schedule change, user has already been logged into her account and is currently at the homepage of the system. User clicks on the hamburger menu.



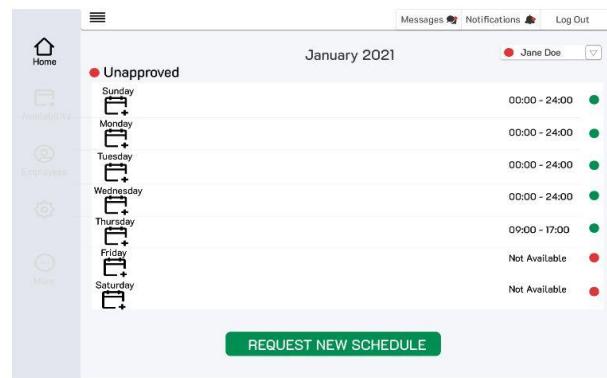
2. User then clicks the availability icon to view her schedule



3. User gets redirected to the systems availability page, user clicks the Request New Schedule button to request a new schedule.

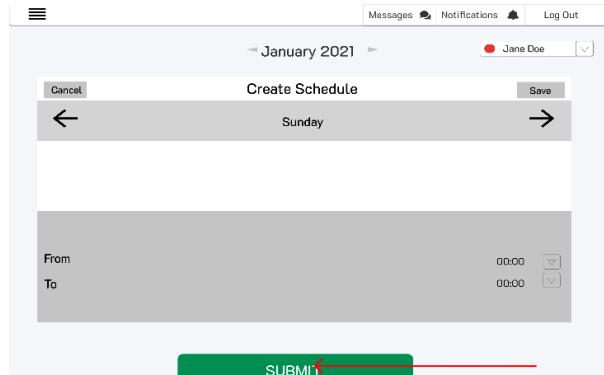


4. User updates their availability, saves the update, and selects submit.

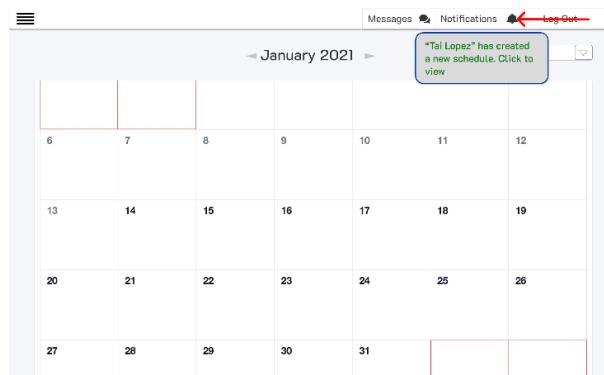


5. User availability is updated but has not been approved by the admin or scheduler.

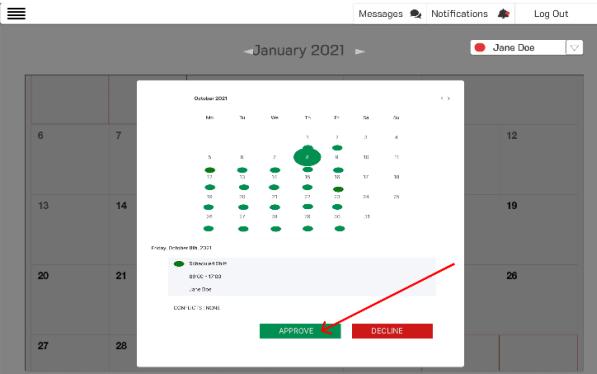
Storyboard 5: Approve New Schedule (UC 5)



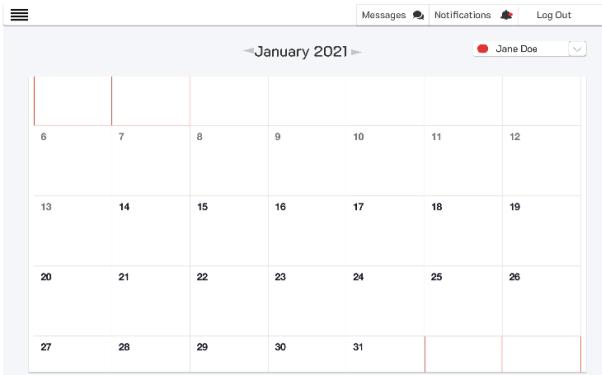
1. The scheduler has created a new schedule for a nurse based on her new availability. The scheduler clicks "Submit" when he's done creating the new schedule to send a request to the administrator for approval of the new schedule.



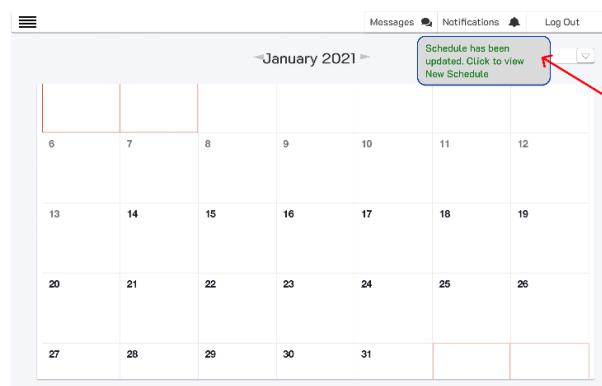
3. The Administrator then clicks the notification button and sees a request from the scheduler that informs him that a new schedule has been created.



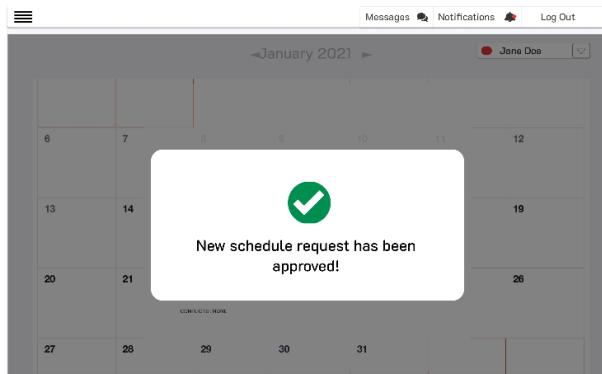
5. The Administrator examines the new schedule to see if it's compliant with B.C health union rules, and then clicks the approve button to approve the new schedule.



2. The Administrator is logged into his account and is at the systems homepage. The Administrator views a new notification alert.

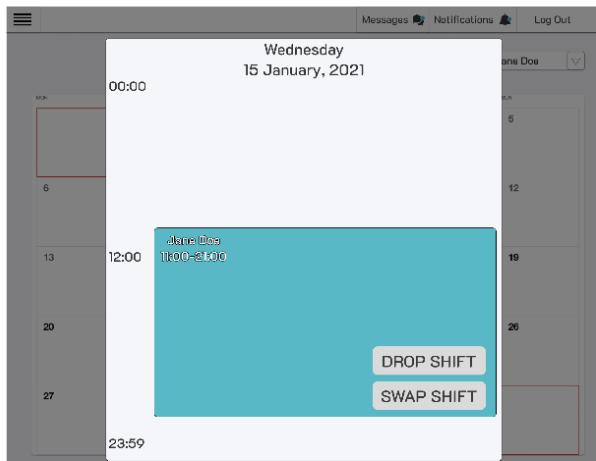


4. The Administrator then clicks on the notification to view it.

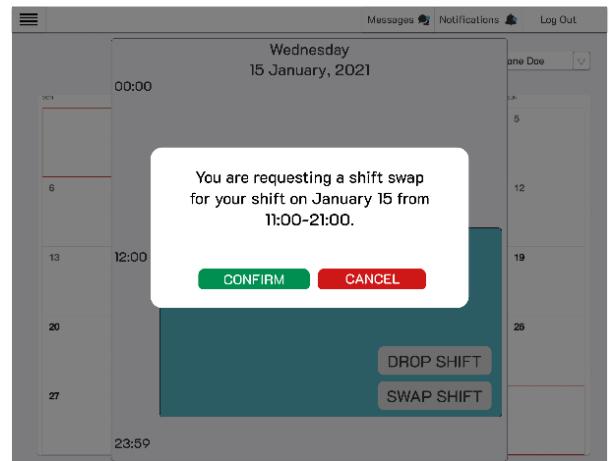


6. The Administrator has approved the new schedule and a notification message as been sent to both the nurses and the scheduler.

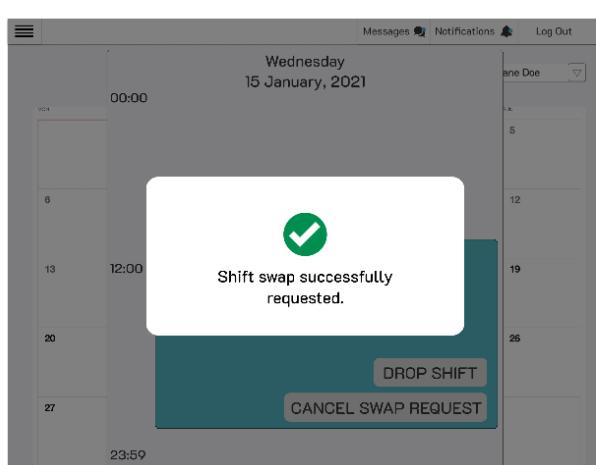
Storyboard 6: Request & Cancel Shift Swap (UC 6-7)



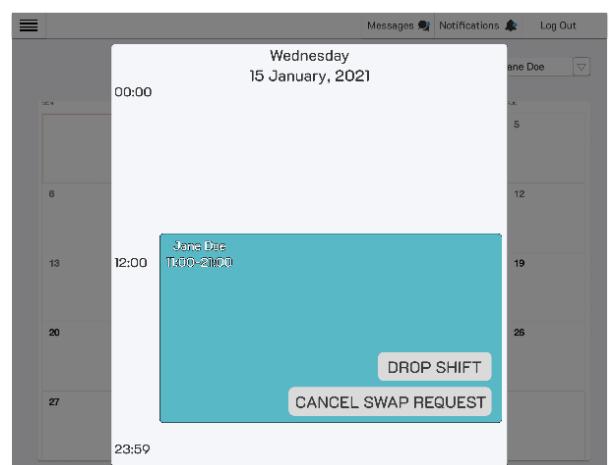
1. If a user wishes to request a shift swap for one of their upcoming shifts. They can click the Swap Shift button after zooming in on the day that the shift is scheduled on.



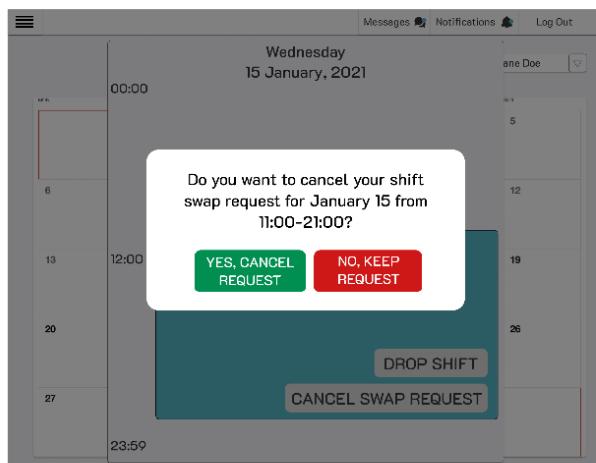
2. After clicking on the Swap Shift button, the user will be prompted to confirm the shift swap request.



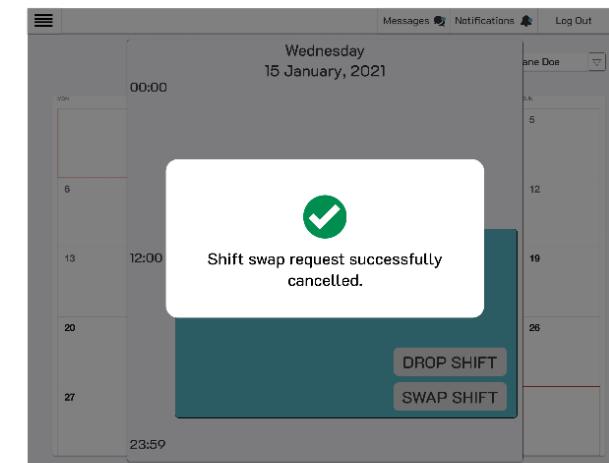
3. If the user clicks the Confirm button, they will receive confirmation feedback.



4. If a user has a pending shift swap request, the SWAP SHIFT button will become a CANCEL SWAP REQUEST button.

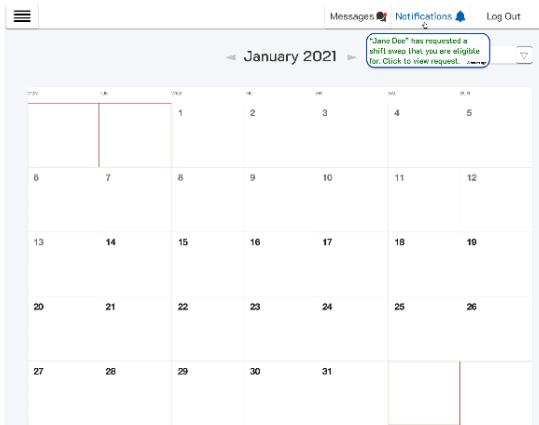


5. Clicking on the Cancel Swap Request button will cause a confirmation prompt to appear.

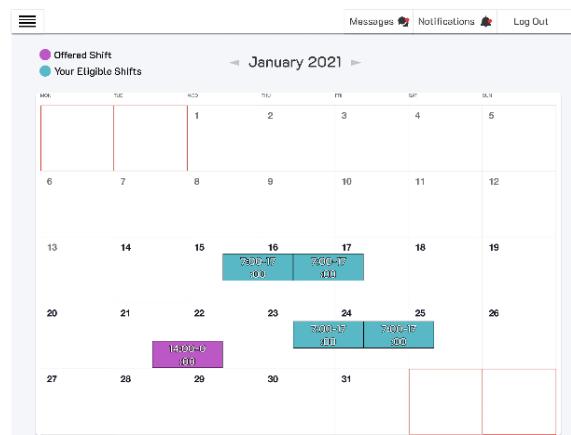


6. If the user clicks the Yes, Cancel Request button, they will receive confirmation feedback.

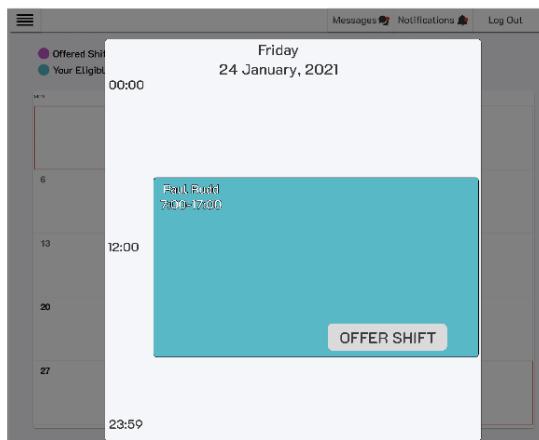
Storyboard 7: OfferShiftSwap (UC-8)



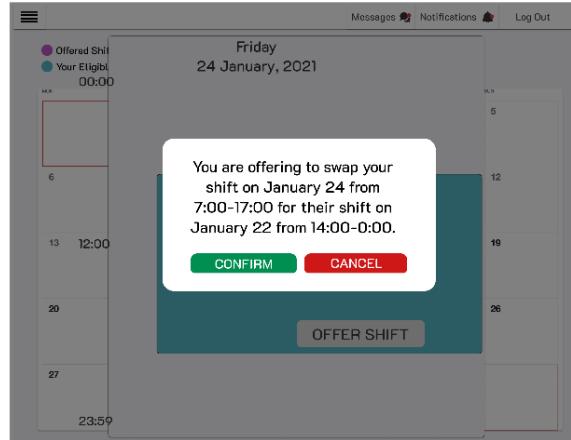
- When a nurse requests a shift swap, all eligible nurses will receive a notification that there is a shift swap available to them.



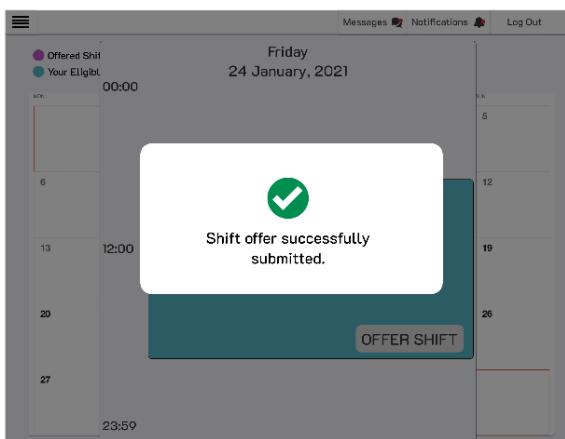
- Interacting with that notification will show the user the offered shift as well as all of the user's shifts which are eligible to be swapped.



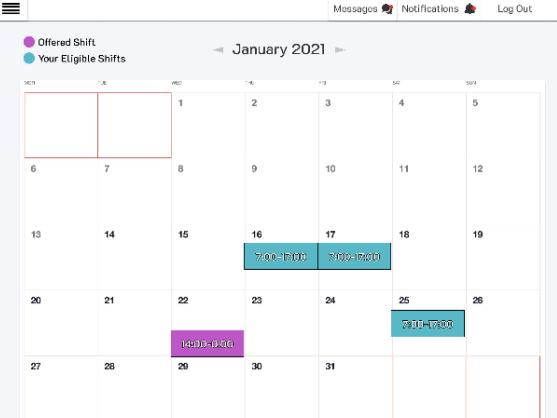
- If the user clicks on one of their eligible shifts, the day will be expanded and they will be presented with the Offer Shift button.



- Clicking on the Offer Shift button will prompt the user to confirm their shift swap offer.

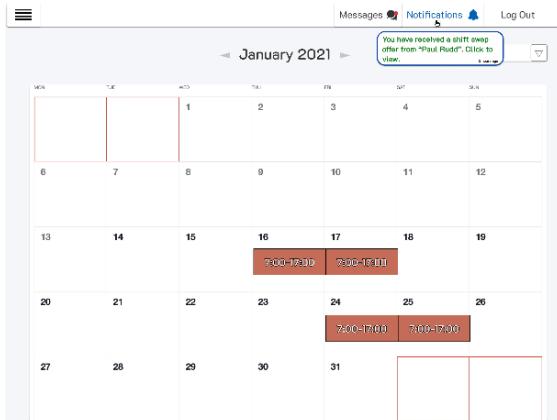


- Confirming the shift swap offer will present the user with a confirmation.

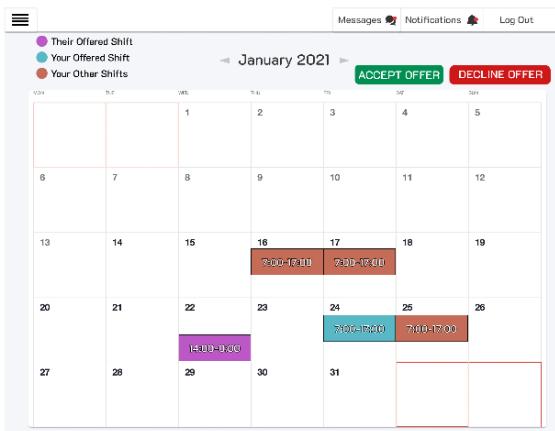


- Clicking anywhere on the window will return the user back to the offer schedule. The shift that was offered is no longer present. The user can continue to offer more than 1 of their shifts.

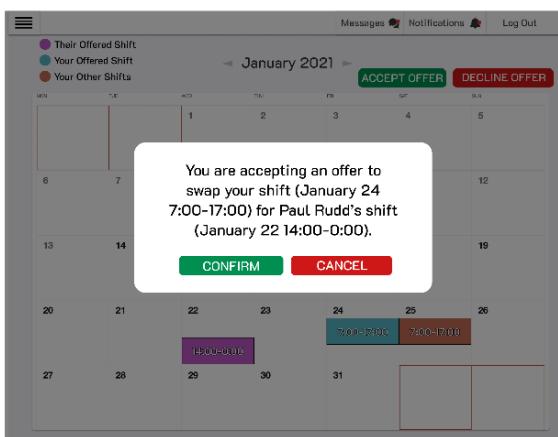
Storyboard 8: AcceptShiftSwapOffer (UC-9)



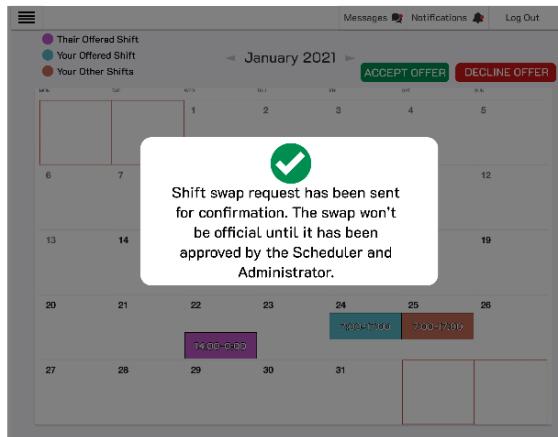
- When a nurse receives an offer for one of their pending shift swap requests, they will receive a notification.



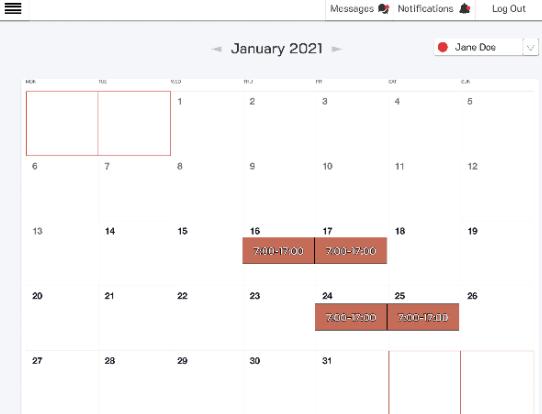
- Clicking on that notification will show the shift swap offer details on the calendar.



- Clicking the Accept Offer button will ask for confirmation in a prompt.

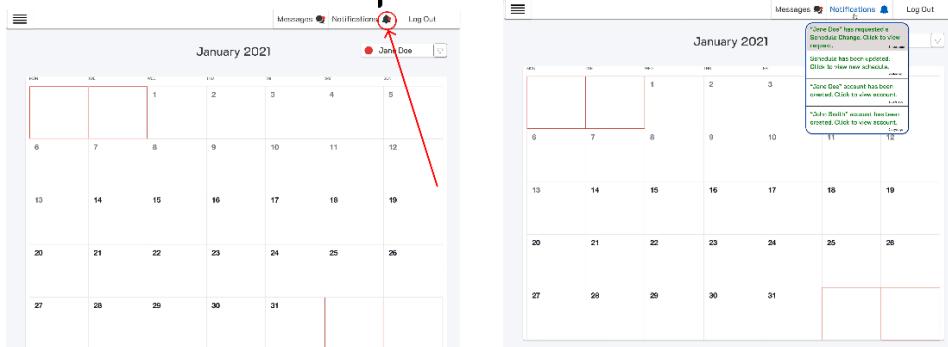


- After confirmation, the shift swap will need to be approved by both the Scheduler and the Administrator before it becomes official and the schedule is updated.

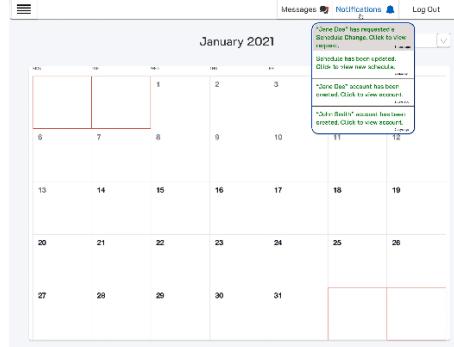


- Returning to the master schedule, you can see that the shift swap has not been approved yet and the nurse still has their original schedule.

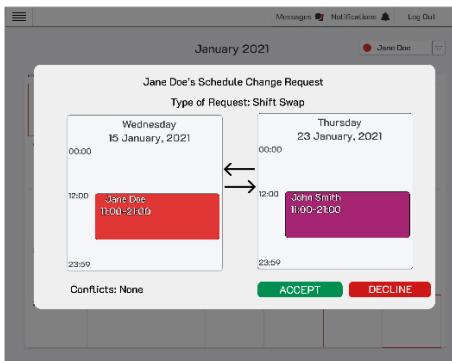
Storyboard 9: ShiftSwapApproval, ShiftSwapDenial (UC 10-13)



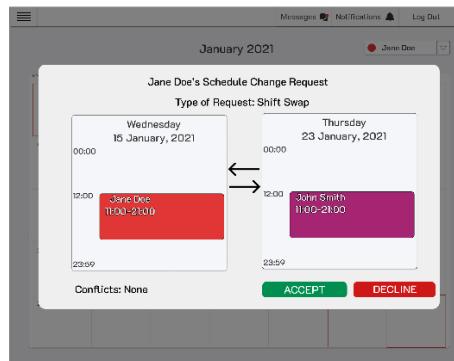
1. User (Scheduler and Administrator) receives a notification indicated by the red alert on the notifications tab.



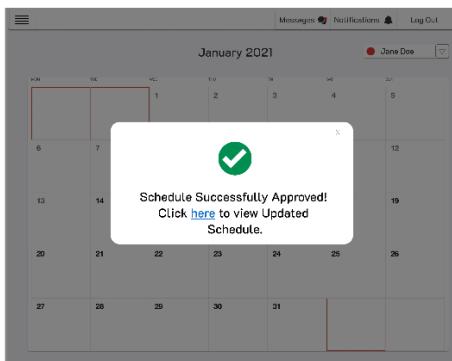
2. User clicks on the "Notifications" tab to view the Schedule Change Request notification.



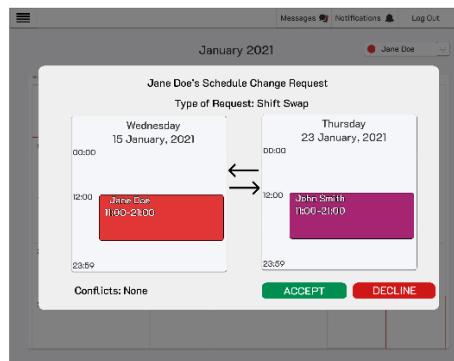
3. Jane Doe's Schedule Change Request pop up appears on the screen.



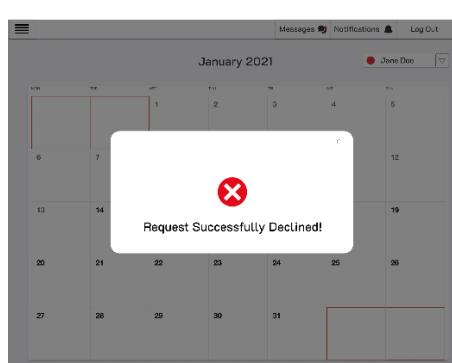
4. User clicks on the "Approve Request" button.



4.2 User receives feedback showing the request was successfully approved.
User may click to view the updated schedule or close the pop up.

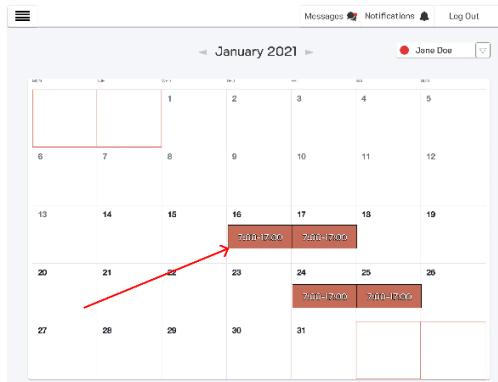


5.1 Alternate Scenario: User clicks on the "Decline Request" button.

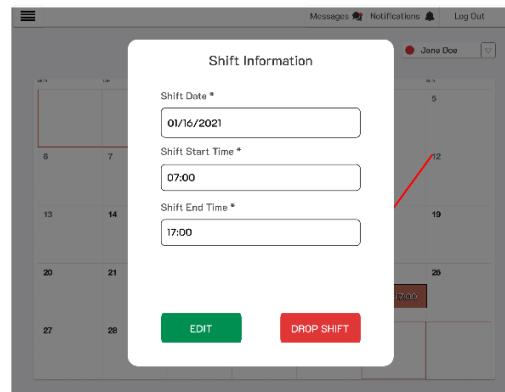


5.2. User receives feedback showing the request was declined.

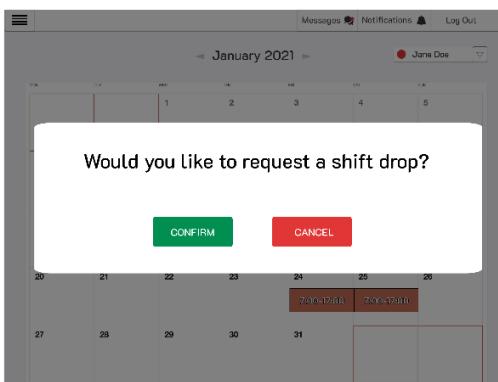
Storyboard 10: Drop Shift, Send Drop Shift Alert (UC 14-15)



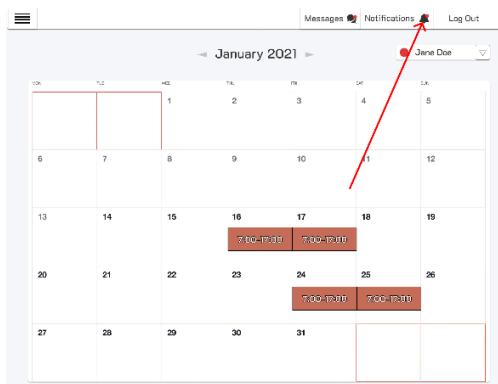
1. Nurse navigates to their schedule and clicks on desired shift to drop.



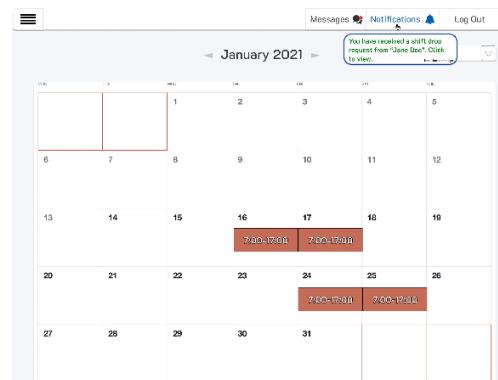
2. On the 'Shift Information' pop-up modal, Nurse clicks the 'Drop Shift' button to request a drop shift.



3. Confirmation modal pops up and Nurse clicks the 'Confirm' button.

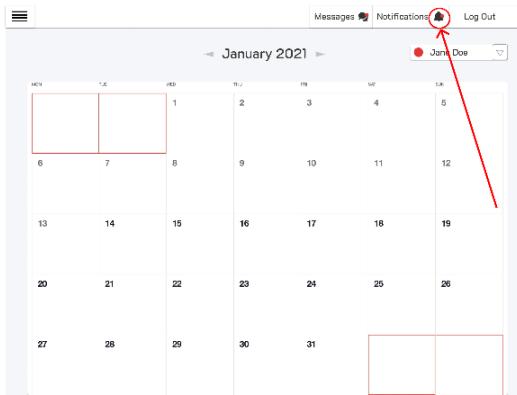


4. Scheduler will receive a notification that will display in the Notifications tab in the top menu.

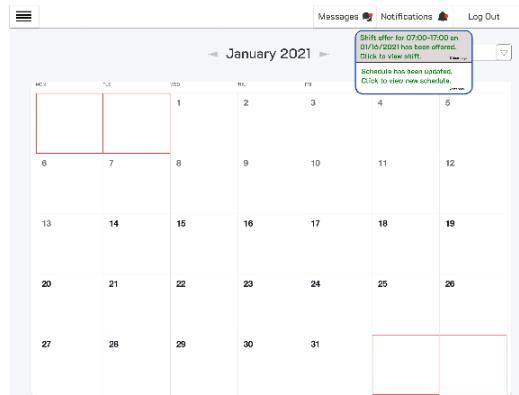


5. The scheduler will then click the 'Notifications' tab and be able to view the drop shift alert notification.

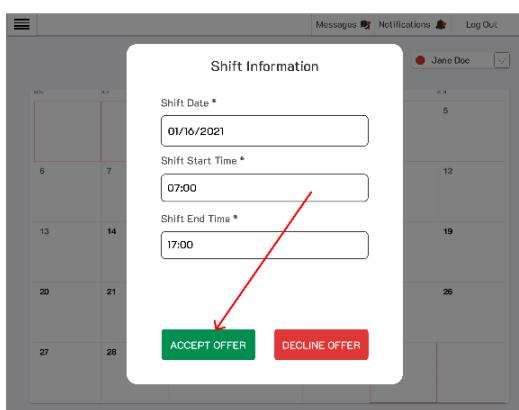
Storyboard 11: Accept Dropped Shift (UC 16)



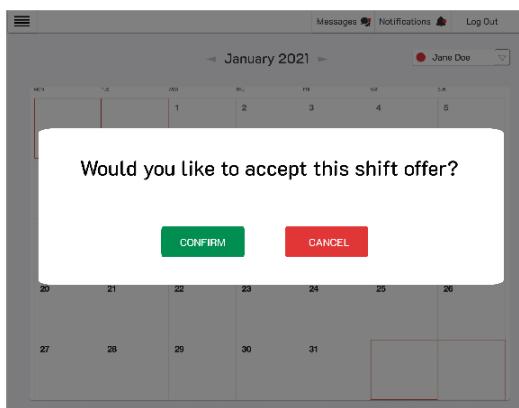
1. A selected nurse is available to work a dropped shift. The nurse receives a notification indicated by the red alert on the notifications tab, once the Scheduler allocates dropped shift to the respective nurse.



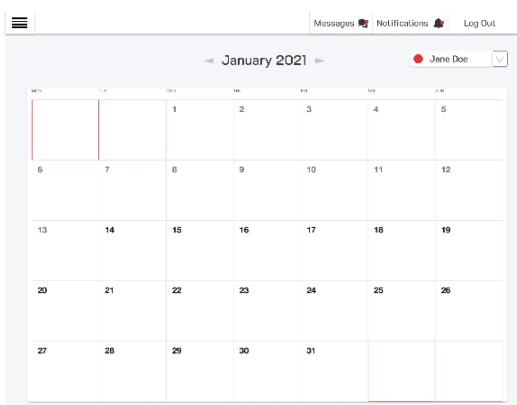
2. The nurse will click this notification.



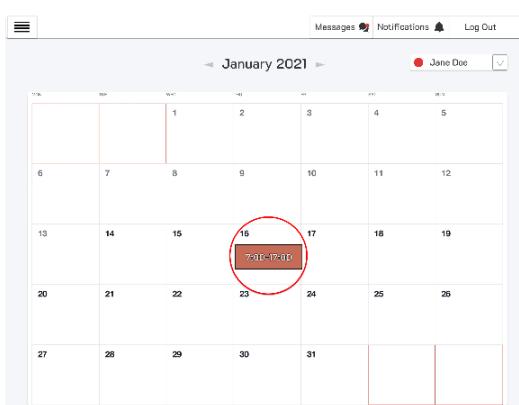
3. The Nurse will then click 'Accept Offer' to accept the vacant shift.



4. Confirmation modal will pop up where the Nurse will click 'Confirm' to finalize accepting their new shift.

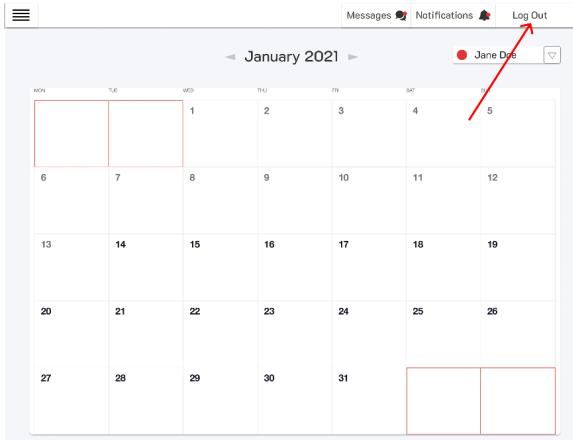


5. Final success modal will pop-up after accepting new shift is finalized.

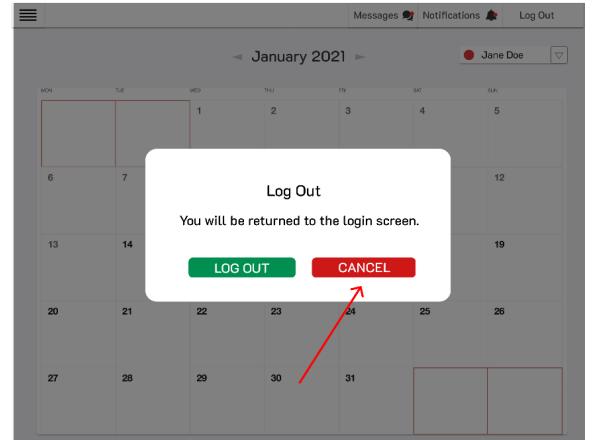


6. New shift will be visible on the Nurse's schedule.

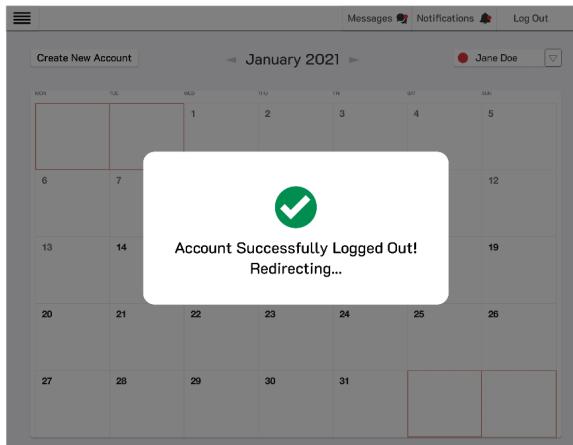
Storyboard 12: LogOut (UC 17)



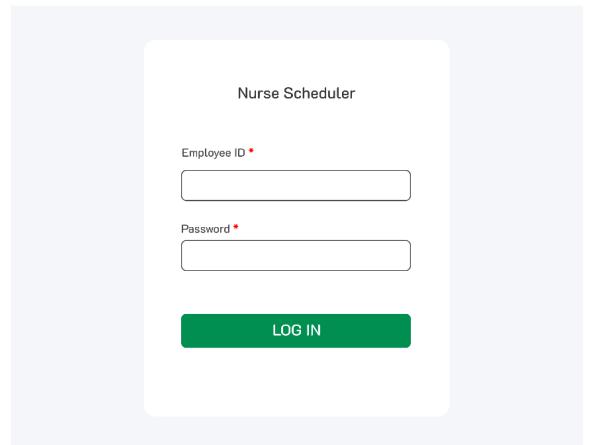
1. User wants to log out. User selects the “Log Out” button.



2. Selecting the ‘Log Out’ button will direct the user to a pop-up modal for confirming the log out.



2. After the user logs out, a success modal will display on the screen for 3 seconds. This will signify that the account has been logged out.



4. After the success modal is displayed, the user will be redirected to the login page.

Conclusions and Recommendations

Most people regularly interact with software throughout their day. Due to the frequency of use and many poorly designed programs, it is common to encounter an application that elicits feelings of frustration, anger, or confusion.

The most significant reason for the difficulty of use is that the designers of the applications may not fully understand the client's intended use and purposes of the application. As a future software developer, exclusively pursuing projects in one's field of expertise would resolve this problem. However, this would severely limit job opportunities and may not be realistic.

CSC 375 at the University of Victoria instructs and demonstrates that, despite a lack of familiarity with a project, there are procedures and steps that can be followed to ensure successful designing and implementation of software. The material taught in the course, and the experiences gained through working on the course project, brings confidence and valuable practice for future jobs, careers, and projects.

A recommendation for future students attending CSC 375 is to ensure participation in discussions and active communication within groups. There is much to learn from clearly understanding the work of others, as well as to benefit from others' ideas and observations.

Contribution

Team Member	Contribution
Alysha Chung	<ol style="list-style-type: none"> 1. RFP - Wrote the Intended users, interactions, and constraints of the system. 2. Website - Added a personal profile, edited, and submitted the document. 3. Project Charter - Helped develop the overall document, edit, and document the risks section. 4. Client Meeting 1 - Attended as a client with William Lee to answer questions on the development of the medical check in application, 'CliniCheck'. 5. System Requirements - Contributed individual requirements to the final list and edited/finalized each requirement for cohesion. 6. Use Cases - Created several use cases and organized them on the final report. 7. Client Meeting 2 - Participated as the only client to give feedback on questions on the requirements of the medical check in application, 'CliniCheck'. 8. Domain Models - Helped create DFD-0, created DFD-2,9, and helped edit all other DFDs. 9. Client Meeting 3 - Attended the meeting alongside Patrick Holland as a client to review prototypes and general UI designs for 'CliniCheck'. 10. UI Models - Made some master components for all storyboards. Created storyboards 2 and 3. Helped edit and redesign all others for consistency. 11. Final Report - Helped organize and edit for overall consistency, and made necessary changes after reviewing feedback from previous submissions.
Francis German	<ol style="list-style-type: none"> 1. Website - Created the team's website and added my personal information to it. 2. Use Cases - participated in creating use cases and use case diagrams. 3. UI Models - Participated in creating storyboards for use case 4 and 5. 4. Domain Models - Participated in creating domain models for the system. 5. System Requirement - Participated in creating functional and non-functional requirements for the system. 6. Client Meetings - Participated as an analyst during the client meetings.
Patrick Holland	<ol style="list-style-type: none"> 1. Involved in most discussions related to the design and plan for every deliverable throughout the course. 2. Fair share of requirements, use cases, use case diagrams,

	domain models, and UI models.
William Lee	<ol style="list-style-type: none"> 1. RFP - Contributed to the overall development of the RFP and particularly took charge of the Intended Users of the System, Project Schedule, and the Project Team sections. 2. Website - Added my personal profile on the team page of the website. 3. Project Charter - Wrote the Team Organization & Roles, Work Breakdown Structure (WBS), Milestones, and Approval Sections. 4. Client Meeting 1 - Led meeting as a client for the check-in application alongside Alysha where we answered questions on system features regarding the check-in application and its development. 5. System Requirements - Contributed detailed requirements for security of system alongside various functional and non-functional system requirements including a tutorial/user training process workflow. 6. Use Cases - Created Use Case 4 and 5 and created the Use Case Diagram. 7. Client Meeting 2 - Participated in the meeting as an analyst alongside Anisha, asked questions and received feedback for the requirements. 8. Domain Models - Created DFD-5, the ERD for the system, and the associated data dictionary. 9. Client Meeting 3 - Participated in the meeting alongside Anisha, showed our client the system's prototype, received feedback and took meeting minutes. 10. UI Models - Created master components for all storyboards on Figma and storyboards with UI wireframe screens for Use Cases 1, 14, 15, and 16. 11. Final Report - Helped compile information from various sections, edited the final report.
Anisha Soni	<ol style="list-style-type: none"> 1. Website - Edited the website, added new tabs and components 2. Project Charter - Wrote the Executive Summary, Edited "Project Needs & Scope" 3. Client Meeting 1 - Led the meeting with Patrick, asked client questions and took meeting minutes 4. System Requirements - Contributed 10 requirements, edited and updated requirements based on client feedback 5. Use Cases - Wrote a couple use cases, edited use cases to ensure consistency 6. Client Meeting 2 - Led the meeting, asked questions and received feedback for the requirements. 7. Domain Models - Helped create DFD-0; Created DFD-4, 5 8. Client Meeting 3 - Led the meeting, showed client our prototype, received feedback and took meeting minutes 9. UI Models - Created UI models for Use Cases 10-13 10. Final Report - Helped compile information from various sections, edited the final report

Appendices

Glossary

Administrator - The person(s) that ensures the schedule does not break any BC Nurses Union Scheduling Rules.

Scheduler - The person(s) who is responsible for uploading and maintaining the master schedule.

Nurse - The person(s) who works at the Gynecology department at the Victoria General Hospital as a nurse.

User - The person(s) that uses the system, including the administrators, the schedulers, and the nurses.

BC Nurses Union Scheduling Rules - A set of labour laws that all BC Nurse schedules must abide by. Click [here](#) to access the rules.

VGH - The abbreviation for Victoria General Hospital, a medical facility in Victoria, B.C

Interview Notes

Client/Analyst Meeting 1, 27th September, 2021:

Q&A Meeting Minutes:

1. Can you further describe each of the stakeholders? Can you describe how you envision the usage of the system from the perspective of each stakeholder?
 - Nurses within the program: within a hospital there's different departments, we want the scheduling system for just one department (icu/palliative/gynaecology)
 - Administrator, schedulers and nurses are main stakeholders
 - Schedulers are not admin. Admin has more access - contact info etc
 - Nurses give their preference once a year, goes to admin to check, scheduler enters it into the system
2. When someone requests time off (from an already scheduled shift), should other people be notified with an option to take that shift? (First come first serve basis?) Are there restrictions for who can accept that new shift? (Maybe based on the area of the hospital it's in, or how many hours that week they already have scheduled?)
3. Do nurses request to swap with other nurses or do they send a shift change request and then the admin decides which nurse takes up the shift?
 - Shift Trading - System should be able to switch shifts with another nurse (send request in the system, admin approves it)
 - Shift Coverage - if nurse calls in sick, system should alert eligible nurses
4. Should there be a mobile app or just a browser with email notifications?
 - Just a browser with email notifications

5. As mentioned in your RFP, it states that annual schedules for nurses within the specified jurisdiction should be accessible to all users of the system. Should all nurses be given a default yearly schedule? How would an annual schedule usually be generated? From what I know nurses are not assigned shifts by the year.
 - Nurse shifts depends on contract: part time/full time/how many hours they've worked that week, etc
 - There's no default schedule, the schedule is formed based on the nurse's preference. The schedule is made once a year and then modified accordingly
 - Nurse should send in availability/preference on the website (by like Nov-early Dec 21 for January 2022)

Client/Analyst Meeting 2, 28th October, 2021:

- Discussions regarding system requirements
- Clients reviewed requirements prepared by Analysts
- Updated few requirements

Client/Analyst Meeting 3, 18th November 2021:

- Discussed Prototypes: Clients liked the first prototype shown to them
- Clients want a simple system, no complex designs
- Needs to be user-friendly