Design Document
WebAgenda

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Part I

Preface

Chapter 1

Document Purpose

1.1 Introduction

This Requirements Documentation is a product of the need to produce a **System** or Entity that helps a business or company perform a job or series of tasks. The document itself contains information that relates to the objectives of this system, the problem that this system is designed to solve, and much of the finer details as well as environmental factors that are taken into consideration. This document will attempt to describe in full detail, the who, what, where, when and why of the System. Here is a brief description of the **Project** this document refers to:

WHO : We are targeting Businesses and Organizations that do not have functional, sophisticated and easily maintainable scheduling systems, but are looking to implement one without the frustrations of overly complex licensing, cost, and vendor lock-in. In this Project, the **Deerfoot Inn and Casino** are being directly involved to develop a scheduling system free of such inconveniences. This is partially achieved by licensing our product under the **General Public Licence (GPL)** and creating a product accessible by anyone with a **Web Browser**. The license agreement that the System is distributed with will clearly state any deviation from GPL, if applicable, upon installation. Source code will also be shipped with the product so any programmer or business can use and modify the program according to their needs. Code will be clearly documented for readability and to aid in its development. As our client, the Deerfoot Inn and Casino is going to be represented by their VP of Operations, Robin Featherstone. The Deerfoot Inn and Casino is going to be the main **testing** and **deployment** focus for the system and will be used to fulfill all their scheduling needs in most if not all their **department**s.

WHAT : This document describes the Scheduling System "**WebAgenda**" , designed to monitor the schedules of small-to-medium businesses and provide a cheap, easy-to-install-and-use system for scheduling employees. We will be designing it to easily and effectively manage approximately 500 employees for one company. This system does not monitor any other WebAgenda or scheduling systems that may exist on another network, or even on another **server** in the same business or company. Functionality, however, can be built in as users of this software are free to modify it so. This independence may be seen as a security benefit.

WHERE : As specified above, small-to-medium business are the target and so this system is meant to reside on those businesses‘ servers. In the event that a business does not have a server, any computer that runs a server and is connected to the Internet should theoretically be able to run this software. Any computer with a web browser installed should be able to use the system. In fact, most of the standard browsers will be involved in the testing of the final product that this document describes.

WHEN : This project should be completed in less than six months. Documentation will be released over that period of time along with revisions of this design document. Once complete, the final product will be supported as long as there are people interested or paid to support it. **Source code** will be freely available if a fix is needed, and as the project developers we may decide to support this product, depending on how this is implemented it may be for a fee.

WHY : The world is always in need of powerful, usable, and free software (both as libre and as gratis), especially in the business and IT sector. Many current scheduling solutions have a high cost or limited functionality unless until you purchase the full version. Most, if not all currently marketed scheduling solutions are proprietary and require monthly fees. If you want added functionality you must purchase additional software with possible monthly fees in order to get the job done. With WebAgenda, additional functionality can be built in-house, contracted out, or even mutually shared with other companies; there are no limitations and you always get the full version, for free.

It is not uncommon for businesses to use Excel spreadsheets, paper, or other resourceful but inefficient means to complete scheduling tasks. Security is always an issue. Mass distribution of schedules that are **encrypted** and on a need-to-know basis to hundreds of employees are not always feasable for the employer to put into practice, especially when solutions would cost time and money for little benefit when a simpler centralized system does the job. This project is a college requirement that is designed to have the biggest benefit-to-cost ratio for the widest distribution of potential users and partners.

This project aims to fulfill an often-overlooked aspect of business that time is wasted on needlessly without compromising productivity gains from the old system.

Chapter 2

Document Standards

Document Formatting All documents included in the project that are physically produced will be created using the following standards below. Web-based documentation does not follow all standards, as many do not apply to an electronic medium.

This document adheres to the following standards:

2.1 Document Standards List

- Single Sided
- Bound
- Header: [Chapter Title] - [Sub-Chapter Title] w/ a maximum of two sub-chapters per page, using the latter sub-chapter title if this event occurs. Example: Chapter 2 - Section 2.0 Document Standards. Once the header is located in an Appendix, it will only consist of the word "Appendix" and the letter that represents that specific appendix.
  Font should be a shade of grey.
- Footer: Page number will be:
  1. at the bottom center for single-sided pages or
  2. on the outside (bottom left for left-side page, bottom right for right-side page) if document is double-sided
- Images, Pictures, Charts must have figure text below the image, centered beneath it. If the figure is less than 40% of the page width, it can have text wrapped around the figure. The figure should always be on the left-hand side of the text if text wrapping exists. If figure is greater than 40%, it should be on its own lines with no text wrapping it.

- All paragraphs will start with a tab of 1 cm in length. The document is generated by **Latex** so that there is consistency in these measurements.
- Parts, Chapters and Sections are labelled in the Table of Contents due to the importance of their content. Smaller pieces of the document such as subsections and paragraphs, are not.
- Any bolded words in the document will have a definition in the glossary except for the beginning of paragraphs, numbers in lists, and titles. For glossary definitions, the bolding only applies to the first instance of the word(s) in the document although multiple instances of a word can still be found in the index.

Part II

User Requirements

Chapter 3

Business Overviews and Objectives

The Deerfoot Inn and Casino is a Canadian-owned casino, hotel and conference center located in Calgary, Alberta. The Deerfoot Inn and Casino is Calgary‘s premier hotel and convention center in the southeast quadrant. They provide a large number of entertainment, conference, and meeting areas to accommodate any group and size. With numerous events and conferences every month, the number of clients that the Deerfoot Inn and Casino need to accommodate is immense. They employ a lot of staff to deal with the large workload, but as the workload changes, so does the number of scheduled staff required. The business objective of the Deerfoot Inn and Casino is to become one of the top casinos in Alberta and to increase profits year after year. They achieve this by sponsoring events, advertising and other marketing means to increase sales, customers, and word-of-mouth.

3.1 Statement of the Problem

The Deerfoot Inn and Casino currently schedules their employees by using spreadsheets and paper postings. Creating based on a paper-based system has led to organizational issues and misunderstandings with those who do the scheduling. As the schedules are paper copies posted in common areas, they can get misplaced, damaged (ripped), or removed. In order to change a schedule in circulation, there would have to be a photocopy or an update to the original schedule which could then be printed and distributed. All old copies would have be removed and there would be a risk of employees misinterpreting shifts, employees not showing up, and discontent. When employees do not work consistently for a period of time (2 weeks straight, for example), checking a schedule that can only be read at the workplace can frustrate staff into making assumptions when they work. If a shift change is completed over a paper based scheduling system, the supervisor is told of the exchange and a note may be written down on the schedule. A note can be modified or forged by an employee, or the specifics of a shift negotiated after an agreement is made. Misunderstandings could lead to supervisor and management frustration, employees showing up for incorrect times or shifts, and having employees that have not worked being paid for another‘s time.

Communicating schedules between departments becomes a difficult task when using a paper-based system. If an employee works in multiple departments then having proper communication channels is a neccessity and requires extra work for both supervisors. To schedule shifts for employees that work in multiple departments, one supervisor may have to physically ask another for the current schedule of an employee or by ask via email which would take longer. Every change to the multi-department employee's shifts would have to be communciated to all corresponding supervisors. The frustration could result in affected employees getting less hours, miscommunications for shift details, working two shifts simultaneously, or high employee turnover rate in a worst-case scenario.

One of the problems that arise in the paper-based system that our client has addressed as a priority, is that supervisors do not know when and whether employees have seen the schedule. Even if a schedule has been posted where employees have had ample time to view it, they cannot be sure; likewise, employees may not always been a position to check it until the timeframe becomes short and urgent. With an electronic scheduling system, supervisors can send out priority notifications that pop up everytime a user logs in, or while they are using the system. Likewise, employees can check their schedules from virtually anywhere around the globe. One of the features being promoted to the client, is the ability to view when an employee has last logged into the system. This enables supervisors to view trends and follow up on employees that are not checking their schedules for reasons unknown. This function will reduce the number of problem areas for a company.

3.2 System Environment

Web Agenda will be hosted on the Deerfoot Inn and Casino‘s web servers. The scheduling system will run alongside their website and function independant of other systems residing on their server. It will run on a sub-domain of their current site, allowing the scheduler to be accessed from anywhere at any time provided the user has proper authority to use the service. The system will be able to be accessed through their internal computers as well as any external computer or mobile device with internet access. The system does not deal with monitoring equipment, daily employee clock-in and clock-out times, or employee payroll information. This is mostly handled by their current system Aloha that handles employee payroll information and shift monitoring. The human resources department relies on the current hourly data from Aloha to cover employee wages.

3.3 Current System

The current scheduling system is seen as workable, but lacking. The supervisors and administrators have different methods of scheduling staff under their authority. The schedules are mainly done in a spreadsheet **format** with templates printed and posted on a wall in employee common areas at the hotel or casino. Employees then write down their availability on the posted sheets for that time period. Supervisors and administration use spreadsheets to create official schedules which are then posted back to those areas. However, none of the schedules are identical and therefore become extremely difficult to track employee data. Also, only a limited number of schedules are printed for any given shift period and if they are lost or destroyed for some reason, the supervisor has to go and re-print the schedule to post. For shift change requests, the employees have to be physically present to complete the transaction. In addition to the validity of the changeover, having both parties present negates the risk of losing the shift change request form or not having it completed properly. There is also the issue of forgeries and miscommunications that the physical presence addresses.

Chapter 4

System Requirements

4.1 Functional Requirements

Users can export their schedule to a relevant viewer. This allows users to view schedules using different applications assuming the relevant viewer had already been installed.

Document Viewers Icons will represent the exporting options. Each icon will hyperlink to display the schedule in the relevant application. The icons displayed will include viewers for:

1. MS Word
2. MS Excel and generic spreadsheets
3. MS Outlook
4. Adobe PDF
5. iCal
6. iPhone calendar
7. Android calendar
8. Blackberry calendar

We will be designing an **Information System** to track and plan schedules for staff. The tracking module will include a way for employees to remotely access their schedules, request schedule changes and book days off.

As with any business, the system will require the ability to save and retrieve old schedules as well as templates and temporarily saved (partially completed) schedules. They will be stored in a database in this case (as opposed to an excel spreadsheet) which should provide more reliable speed and stability. It's requirements include having a very very low (non-existant) corruption rate of data. Data validation shall be in place to ensure that the inputs are proper and abide by any constraint it is given. Reliable **backup**s are a must and should be completed easily by any staff member who is authorized to do so.

Old schedules should be stored, but not editable, in the database. They should not be saved based on dates because dates on the computer can be changed or modified. While old schedules can be viewed based on their date, they are not defined by it. New schedules that are based on a future date (as opposed to being currently in use) should be editable by appropriate permission users. Only users who are given permissions to edit schedules should be able to edit them. If intervention is required for a current schedule, staff in higher positions of power can be given permissions to make those changes with notifications being sent out to staff that are affected by the change.

Staff with default permissions can only view current schedules and request changes. Higher privileged users can edit the current schedule, view older schedules, or make request of higher privileged users. All staff will be able to contact one another through built-in messaging functionality.

The structure of permissions is level-based, with each level having permissions that are equal or greater to the one below. There can be multiple variations of a lower permission level, which can have different levels based off those. Each level has a 'root' template: a set of permissions that are the lowest common denominator for that level. A variation of a root template has a suffix that shows that it is a variation.

Example: Permission Level 0 is the root and the lowest permission level. Permission Levels 0a, 0b, and 0c have slightly varying and higher permissions which apply to different types of employees. Level 0b can be higher than root level 1, but permission level 1b would have permissions higher than 0b.

It is possible to elevate permissions from one level to another, provided a higher authority approves of it. Even then, the hightened permissions are temporary.
Common permissions we expect to implement are the following: (see next page)

- Can Read Current Schedule
- Can Read Previous Schedules
- Can Read Future Schedules (Even though they may be blank)
- Can Edit Active Schedule (make changes in real-time)
- Can Write Next Schedule
- Can Write Future Schedules (This would essentially take employees out of the employee-labour-pool that others could use. Example: Admin wants one employee to serve a specific task that is not a regular task, therefore omitting the employee from a supervisor to schedule him or her to a regular task)
- Can View available resources (Employees/Time slots not filled/Report features)
- Can Search Previous, Current, or Future Schedules based on criteria specified by the user.
- Can change permissions of users [every level of tree is a potential possibility]
- Can Read Logs that are generated (What type of logs)
- Can create reports [depending on target: previous schedules, all prev schedules, future schedules, or current. Can **export** to other formats.]
- Can export schedule to format x (current, possibly future depending on restriction)
- Can request days off (to what length of time in the future, how many per time slice)
- Can request vacation (unlike days off, full-time employees may have extra scheduling benefits)
- Can request emergency notifications to supervisors / admin: if in accident, family member dies, act of God occurs and cannot come to work. Able to utilize 'not in advance', but immediately. Should create a notification of some sort to proper admin's that monitor emp.) This only applies to online requests, disabling this does not mean they cannot phone in.
- Can view Inactive Employees (only levels lower than you, not similar authority employees unless granted from higher levels)
- Can work shifts on short notice (# hours/days from shift start)
- Can exchange shifts with other employees working similar jobs
- Able to send notifications to [type of employee]

Permissions list is not comprehensive and subject to change.

Employees should be able to set their availability through the system so that the schedules can be auto-generated in addition to ease of use. Schedules can only be changed so often without admin consent. Auto-scheduling must be able to handle hundred upon hundreds of employees and staff. Should include **RSS** functionality, e-mail notifications, have a notifier when logging in to view schedule, a notification rss feed, schedule to device exporting such as palm and blackberry, and schedule to calendar programs such as mozilla suite, **Mac OS X iCal** and **Microsoft Outlook**.

The system is going to be able to be easily installed on any **Sub Domain**. This meaning that any employer or business that would like to use the system has the ability to easily install it, as long as they have a website capable of running the system. The application will be able to handle any management structure that could come up. As a user of the system with the highest permissions, such as a company owner, they will have the ability to create as many different permission levels as they deem fit. This allows any company, no matter how large or small to reap the benefits of web agenda.

Schedule-by-request feature, where employees can request work on a schedule that is optional (provided by higher-ups in the company, for non-essential work opportunities) The WebAgenda program will be licensed under the General Public Licence 2 so that the company is free to utilize the software to their purposes. Documentation as well as source code will be available to one and all who download/request it.

4.2 Non-Functional Requirements

The scheduling system does not monitor employee attendance or payroll functionality, although a stat holiday pay estimate feature will be implemented at the behest of the Deerfoot Inn and Casino Manager. WebAgenda is purely a scheduling, report generating, reference, and distribution system until functionality is extended at a later date. Scheduling is done by department or by a specific unit of the company.

The Deerfoot Inn and Casino needs to provide schedules for a minimum of 500 employees. In a worst-case scenario, the system must be able to provide 500 constant connections reliably. At full capacity, the system should be able to respond to a user within 2000 milliseconds of a request to view a schedule. For more intensive tasks such as searching for an employee or group of employees in addition to additional filtering, anywhere from 3000 to 5000 milliseconds maximum is reasonable under full load. While there may be potential for a company to include more than 500 employees, the system is designed for optimal performance at 500 or less. WebAgenda does not guarentee accuracy above that limit. Multiple WebAgenda scheduling systems can be run in parallel to manage certain departments independantly if one scheduler becomes difficult to manage and the hardware is available. System responsiveness will not be guarenteed if more than one system is running at a time. However, it is assumed the hardware will be powerful enough to reach those statistics in such a situation. If multiple scheduling systems are running, staff in one department will only be able to log into the system that holds their department; WebAgenda currently can not communicate with other WebAgenda systems unless data is explicitly exported and imported from database to database. In large corporations, having one scheduling system per department could be effective, provided higher management has access to information they need and maintenance support is available; either in the form of official, paid support or staff / IT department.

It is up to the supervisors, departments, and administrators to ensure that the schedule is indeed accurate and to their liking. They will have the ability to change things as they desire; a generated schedule will not automatically be uploaded and viewable to all. Rather, it will be saved until it is activated. An active schedule can be seen by anyone with schedule read permissions, and will be seen as official when the schedule‘s date coincides with the current date. The scheduling system will also feature a reporting function, which can list employee and schedule data in different ways. This will also be used to test the system for integrity and stability, although it may be restricted to administrators and maintenance staff. The system must have zero tolerance for data loss during operation. This does not account for human error.

Most, if not all, of the actions performed on the scheduling system are governed by permissions. An employee will have enough permissions to retrieve their schedule, request modifications, book days off within an certain time period from the current date, and change their availability. Depending on the type of employee, permissions may be restricted or granted. A contractor will not be able to book days off or change availability; They can be given an account to remain in contact with the required administration through the messaging system. Supervisors are basically employees with higher permissions including those that allow them to modify the schedule and to some degree, authorize it. **Department** leaders, Managers, and administration will have even higher permissions and ultimately be able to approve or modify a supervisor‘s decisions in order to suit their needs. Permissions will reflect duty, not overall authority. For maintenance and support of the system, a technician can have access to the system internals while an administrator will have access to creating employees of any type: a permission set that no other employee should have.

We will not be selling the software. The system also does not monitor anything outside of employees and date-related events; equipment, rooms, and other commonly monitored items are not within the scope of this software. Additional functionality can be built on this software for no cost provided it is licensed similarly. Employee shifts that are scheduled will be measured in time, currently to the nearest quarter of the hour. Setting up the server and performing administrative or server-related tasks is in the scope of this project, but exists in another document. As the system is running on a server, uptime is very important and a backup server may be of interest to the client. The general consensus for desired server uptime is 99.9%, which is approximately 364/365 days in the year that the system needs to be accessible. Backing up should not interrupt the function of the server, although restoring a previously backed up database may cause some time for the system to be inaccessible or partially functional.

4.3 System Interface Requirements

The employees at the Deerfoot Inn and Casino will have varying experience levels using computers. As such, the system should be built with a descriptive and intuitive **interface**. The system will be running as webpage for the front-end, allowing any computer with a web brower and **javascript** to interface with it. The employee‘s interface should have quick access to their schedule and job-related information with minimal effort. Supervisors and employees with higher permissions should have quick access to functions specific to their job, such as administration. The interface reads and writes information after validating it to the system backend. The backend consists of a database filled with employee and schedule information which can be interpreted by the interface when it is requested by the user. With the addition of a plug-in system, any user of the system can take relevant data from the backend and export it to an array of different formats.

Web Agenda is a full web based system and therefore in order to get communications out to the employees using the system, it needs to be able to interface with other applications. The following applications need to be able to be communicated with to ensure full functionality and ease of use of the system.

Microsoft Outlook: This mail application for Microsoft Windows operating system is the main mail client that the Deerfoot Inn and Casino uses for inter-departmental communication. Our system will need to be able to export schedules to a format that Microsoft Outlook will be able to import into its calendar function.

Mac OS X ICal: This application is an optional application that the application will need to interface with, and may be introduced at a later date as a plug-in as opposed to being added as a full feature upon release. The application needs to be able to export calendars and contact information to be added to Mac OS X ICal. Since Mac OS X ICal Is not used directly by the casino but may be used by employees using the system this will still need to be put into the system at some point.

GNU/Linux KCal: This application is an interface for KOrganizer, one of the more common calendar applications that WebAgenda will need to communicate with. Kcal is included in one of the two major Linux desktop environments and although its not used directly by the Deerfoot Inn and Casino, it could still be used by the end user of the system. Netbooks and specialized phones may have this software installed.

Mobile Web: The application will need to be able to work well with mobile devices. That being said the best way to have full functionality across multiple mobile platforms is to have a separate web interface to be able to work well with all mobile web enabled devices. Some business tasks are going to be handled by other applications at the Deerfoot Inn and Casino. Web Agenda will not need to interface with these applications as they handle aspects of the program that are outside of its scope.

Aloha: Aloha is an employee management system that handles tracking when employees clock in and clock out for a shift. This doesnt handle scheduling of the employees at all. We will not need to interface with Aloha as that would be outside the scope of the project.

Our system is designed to export to calendar formats, spreadsheets, text, and potentially any format the user wants via a plug-in. This generally applies to schedules, although employees with proper permissions can create and output reports. The system will also have to be usable on mobile devices such as phones, personal data assistants, and small laptops. The interface works closely with a permission set that each employee is given. It governs what tasks an employee is able to perform and will display the interface accordingly. The actual WebAgenda software is distributed with one employee active by default and having all permissions required to allow other users to utilize the system.

The hardware required to use the system are a pointing device, usually a mouse or touch screen depending on what computer is used to access it. A wireless or wired connection to a network that can contact the WebAgenda server is essential. Although not a necessity, having a keyboard or method of character input into the system will be needed to access some of the functionality such as sending messages, editing employee information, and search input. The possibility of using a computer or device without this hardware is almost non-existant as of this document's production.

4.4 Maintainability and Administration Requirements

WebAgenda will be hosted on web servers that are already in service and maintained by the Deerfoot Inn and Casino. IT Staff are already in place for maintaining the hardware for these servers so hardware maintenance will be outside the scope of this project.

All employee and scheduling information will be stored in a database. The WebAgenda system will provide the means for automatic backups of all data, though selective and manual backup functionality may be introduced at a later date.

A robust plug-in system will be included so that additional functionality can easily be added to the system, such as inclusion of data from Aloha or the ability to send notifications through **SMS**. Additional development time will be required to create plug-ins, though the plug-in system should significantly reduce the amount of time that it will take for these features to be created and added compared to more conventional methods.

Staff may require additional training to review and understand any error messages produced by the system, which can then be used to troubleshoot and fix errors. A knowledgebase will be provided that contains an in-depth explanation of all components of WebAgenda and its error messages with appropriate solutions.

At least one manager must be in the system with full privileges at all times to act as an administrator over other managers and supervisors. Without this, certain employees could not have their permissions upgraded; it would not be possible to add new supervisors or managers.

The previous scheduling system must be maintained for at least several months, and will be used in tandem with the WebAgenda system after it is first brought online. This will allow for a more comfortable transition between the two systems for all employees, and allow them to fall back on the old system in the event that there are any issues with WebAgenda during this transition. An emergency plan, in the unlikely event that WebAgenda should ever fail, will be implemented during the transition.

4.5 Usability Requirements

The system needs to be able to be used by a variety of clientelle. Users of the system will vary in experience so the system needs to take this into account. At one end of the spectrum, the system needs to be customizable and intuitive to allow for maximum usability. On the other end, the system needs to have a lot of functionality and features that advanced users of the system can access upon request without being buried under too many layers. With the amount of functionality that the system will bring, it's important that the system is usable by every user to do their jobs. This is a crucial aspect of the system and the interface design of the system that the project team will need to keep in mind at every level of the development process.

Part III

Requirements Models

Chapter 5

Use Case Diagram

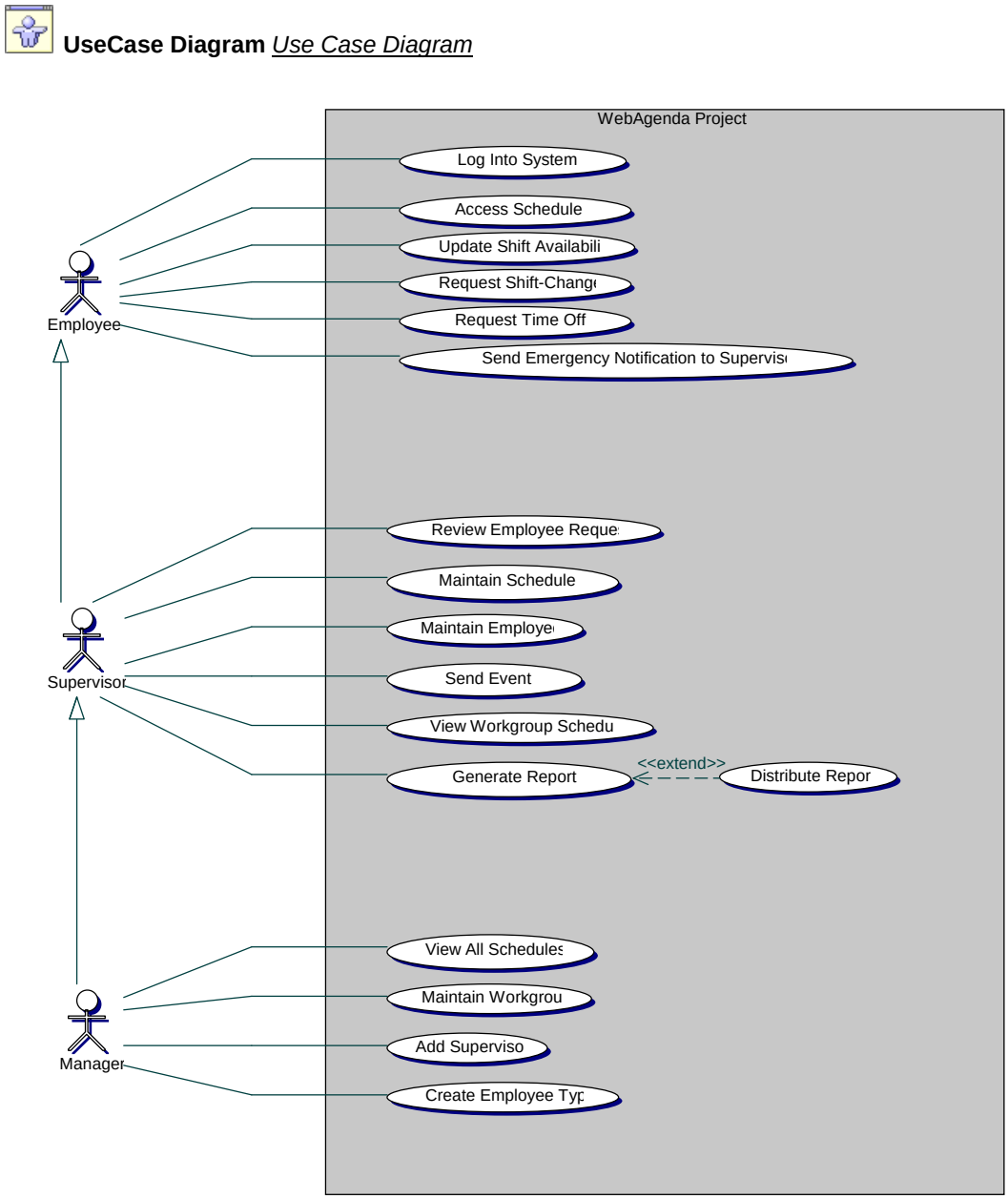

Figure 5.1: **WebAgenda Use Case Diagram**
A graphical overview of the interactions between users and the system.

Chapter 6

Extended Use Case Diagrams

6.1 Log-In System

Description:
The login use case goes through how a typical user would log into a system. If the user does not enter the correct information they are given an error and they can then re-enter their credentials.

Pre Condition:
User must access the online system and have the login page open.

Post Condition:
Dashboard is displayed to a newly logged in user

Actor:
Employee of a company using WebAgenda

Normal Flow

Actor	System
1. User enters a string into the username field of the login screen.	
2. User enters a password into the password field of the login screen.	
3. User presses the "Log In" button to log into the system.	

Actor	System
	4. System takes the value that was entered from the username field and the password field when the log in button was pressed, queries the database and compares the values.
	5. When the values match the values that were queried from the database, proceed to allow access and display the dashboard screen. (A 5.1)
	6. Presents the dashboard screen and populates it with user-specific data.

Alternate Path 5.1

User enters data into the fields that do not match the database records.

Actor	System
	5.1.1 System queries the data entered by the user and they do not match the data found in the database.
	5.1.2 System displays error message above the username field advising the user that the username/password combination was invalid.
5.1.3 User enters data in username field again	
5.1.4 User enters data in the password field again	
	5.1.5 Return to Normal Flow Step 5.

6.2 Access Schedule

Description:
This use case will be used for the actors accessing their schedule through the schedule screen.

Pre Condition:
A user needs to successfully be logged into the system and the dashboard screen being displayed.

Post Condition:
A schedule widget is displayed to the user with user specific information

Actor:
Employee of a company using WebAgenda

Normal Flow

Actor	System
1. User clicks on the Users tab	
2. User clicks on Current Schedule link *Note to Mark: changed from schedule button*	
	3. System accesses schedule data based on what user is logged in and accessing the schedule screen. (A 3.1)
	4. System displays the schedule screen.
	5. System retrieves the schedule widget and displays it on the schedule screen with information specific to the user that is currently logged in.

Alternate Path 3.1
User is not added to any current schedule

Actor	System
	3.1.1 System does not pull any schedule data for the current user meaning they are not currently added to any schedule.
	3.1.2 System displays a message to the user saying they are not currently scheduled in the system.

6.3 Review Employee Request

Description:
This use case is used for the process of a supervisor reviewing an employee request and either accepting it, deleting it, or updating it.

Pre Condition:
The user must be successfully logged into the system and on the dashboard screen

Post Condition:
A schedule widget is displayed to the user with user specific information

Actor:
An Employee logged into the system with a permission level above other employees in the same job category

Normal Flow

Actor	System
1. Clicks on the Employee Requests Widget.	
	2. System displays the new Employee Requests screen and loads a new copy of the Employee Requests widget.
	3. System loads all the of the requests for that the supervisor that are in the database.
4. Loop: For Each Request - User chooses to approve the request (A 4.1, A 4.2)	
	5. System accepts the change and modifies data in the system based on what type of request was approved. (Example: shift change modifies the shift, etc.)
	6. Notification is sent using the notification in the API to however many users are involved in the request.
	7. Removes the request that was approved
8. End Loop	

Alternate Path 4.1
User chooses to modify the request

Actor	System
4.1.1 User clicks the Modify button on the Employee Request widget	
	4.1.2 System displays text boxes in place of all fields to allow the supervisor to modify values.
4.1.3 User Clicks the Submit button to submit the new values (A 4.1.3.1)	
	4.1.4 System will accept the new values and change the values in the database according to the new values entered. (E1)
	4.1.5 Return to Normal Flow Step 6

Alternate Path 4.1.3
User Clicks the Cancel button to cancel any values entered

Actor	System
4.1.3.1 Actor Clicks the Cancel button	
	4.1.3.2 System reverts back to the original request that was sent by the employee
	4.1.3.3 Return to Normal Flow Step 4

Alternate Path 4.2
User Chooses to delete the request

Actor	System
4.2.1 Actor Presses the Delete button	
	4.2.2 System erases the request from the screen, however it will still be stored as a disabled user request in the database to be accessed if need be.

Error Flow 1
User Enters invalid data after being request is modified

Actor	System
1.1 Actor Enters invalid data for the Modify Employee Request.	
	1.2 System queries database to check data.
	1.3 System displays error message pertaining to what fields were entered incorrectly.
1.4 User Clicks OK button and enters correct data for missing fields.	

6.4 Add Supervisor

Description:
This use case is used when promoting an employee to a supervisor position. accepting it, deleting it, or updating it.

Pre Condition:
A manager must be logged into the system and on the maintain employees screen

Post-Condition:
Success message telling the logged in user that the employees permissions were successfully changed

Actor:
User with Permission Level higher than an employee considered to have supervisor authority

Normal Flow

Actor	System
1. Actor presses the promote button	
	2. System produces a message that asks the user if they are sure they want to promote the user to supervisor.
3. Actor Clicks the Confirm button (A 3.1)	
	4. System raises the permission level of the user that is promoted by 1. (A 4.1)
	5. System displays a confirmation box displaying the employee‘s current permission level and an overview of their now current permissions.

Alternate Path 3.1
Actor Clicks the Cancel button

Actor	System
3.1.1 Actor Clicks the Cancel Button	
	3.1.2 Return to Normal Flow Step 1.

Alternate Path 4.1
Employee does not have a workgroup

Actor	System
	4.1.1 Actor is Redirected to the Maintain Employee screen (See Maintain Employee extended use case)

6.5 Booking Emergency Days Off

Description:

This use case describes how a user would go about using the WebAgenda web interface to send an emergency notification for not coming into work. This case assumes that an emergency has happened and the user is not using the system for another reason.

Pre Condition:

The user must be successfully logged into the system, presented the dashboard screen and the permission for sending emergency notifications is enabled

Post Condition:

A schedule widget is displayed to the user with user specific information

Actor:

An employee for the company that can book off days (which may exclude contracting positions)

Normal Flow

Actor	System
1. Click the "Users" tab on the dashboard	
2. Click the "Days Off" item on the sidebar	
3. Click on the "Emergency" sub-item on the sidebar	
4. Click the "Next Shift" radio button option to affect the employee's next working shift. If the shift has already started, that shift will be the one that is booked off. (A 4.1, A 4.2)	
	5. Present user with an overview of the date(s) booked off and a textbox for them to fill in an optional reason for their absence.
6. User clicks the "Confirm" button.	
	7. Send a notification to the user's supervisor, including the reason for the absence if user entered any text into the textbox.

Alternate Path 4.1
Book off an extended period of time

Actor	System
4.1.1. Click on the extended period radio button	
4.1.2. User types a number that represents a period that they will be unscheduleable for work. Maximum will be determined by the system permissions set. (E 1)	
4.1.3. Clicks Confirm button	
	4.1.4. System changes notification message to supervisor including the number of days the employee expects to be away.

Alternate Path 4.2
Book off an unknown period of time

Actor	System
4.2.1. Click on the unknown period radio button	
4.2.2. Clicks Confirm button	
	4.1.3. System changes notification message to supervisor requesting that they contact the employee to understand the situation as the employee may be gone for an unspecified length of time.

Error Path 4.1.2.
A non-number is entered into the extended period of days to book off field

Actor	System
	4.1.2.1 Characters that are not numbers will just not appear in the field.

6.6 Update User Availability

Description:

An employee that wants to change the days they work has the option to configure a template schedule populated with shifts they can work, called an availability. As long as the template schedule meets minimum shift and hour requirements, within a period of time, they will be able to work that new schedule at their job. Note that the shifts placed in the template are not guarenteed, but schedule creators will have the option of using those employees at those times.

Pre Condition:

The user must be successfully logged into the system, presented the dashboard screen and the permission for changing availability is enabled

Post Condition:

Supervisor does not reject the new availability user creates, duration for availability to take effect passes and new schedule after that date will contain the new availability. Old availability will be archived, current employee availability will be overwritten by new one.

Actor:

An employee for the company that is in a position to fill out their availability (contractors may not be able to)

Normal Flow

Actor	System
1. User clicks on the "Users" tab on the dashboard.	
2. User clicks on the Availability link in the sidebar.	
	3. A blank week-long schedule template is produced and presented to the user. A Finish or Complete button will be shown but disabled until a time that the schedule meets requirements.
	4. Weekly Schedule option is selected by default (A 4.1)

Actor	System
LOOP	
5. User clicks on one of the 7 columns for each day of the week. Columns are divided up into rows that represent time. Clicking on a row will create a shift object starting at the time representation of the row.	
6. [Optional] User can expand or shrink the shift anywhere in the day by grabbing the start or end row of the shift object and dragging it to another row. User can move an entire shift without resizing it by clicking the middle and dragging it, even between different days.	
7. User creates shifts until the minimum number of shifts (as defined in the system permission set) is met and/or until the required number of hours is met.	
END LOOP	
8. User clicks on "Complete" button. (A8.1)	
	9. Availability is saved alongside their current availability, which can be blank if they are new.
10. [Optional] User clicks on "Activate Availability" button to request that the current user's availibility be changed to the saved one.	
	11. Supervisor of the employee is notified that a new availability was filled out.

Alternate Path 4.1
Monthly Schedule is selected

Actor	System
LOOP	
4.1.1. Continue Normal Flow steps 5 through 7. Once step 7 is finished, user clicks on a button with an arrow icon at the top right of the schedule, another blank template will appear for the user to fill out.	
	4.1.2. Once all the shifts that can be added for the schedule to be valid are added (minimum for all 4 weeks in a month), Activate Schedule button becomes enabled.
	4.1.3. Continue from Normal Flow, Step 8

Alternate Path 8.1
User clicks on Clear button

Actor	System
LOOP	
	8.1.1. System removes all shifts from any applicable weeks that have been edited.
	8.1.2. Presents user with notifications saying that the available template has been cleared.
	8.1.3. Continue from Normal Flow, Step 3.

6.7 Manager Viewing All Schedules

Description:

The managers may want a snapshot of all the schedules that are being created / produced within a certain month, as well as quickly accessable links to any period of schedules from the current time forward. A manager being anyone with a specific level of permissions.

Pre Condition:

The user must be successfully logged into the system, presented the dashboard screen and is at a permission level where User can read current and future schedules and has employees that can create schedules under their level. User must have a permission level greater than 0 at a minimum.

Actor:

An employee for the company that may need confirmation, access to, or a general overview of the business‘ scheduling specifics

Normal Flow

Actor	System
1. User clicks on the Administration tab.	
2. Click the View Schedules button	
	3. System checks the User‘s permission level and fetches all of the employees with a lower level than User.
	4. A clickable miniature representation image of the schedule is shown on the page in a grid for each employee found in Step 3 for the current date in a widget.
5. User views the schedule representations they want to examine. (A 5.1, A 5.2)	

Actor	System
	6. If the User wants to view a schedule in greater detail, they will click on the representation schedule to display it in the widget in full detail, as the creator would view it.
	7. The other schedule representations are moved to a short horizontal widget below the detailed view of the currently viewed schedule. They appear as boxes that have tooltips when the mouse is hovered over them or they are given focus by usually pressing the Tab key.
	8. [Optional] Clicking on a schedule representation in the smaller widget below the schedule displaying widget will swap the currently viewed schedule with the clicked-on schedule, so the selected schedule will be viewed in full detail.

Alternate Path 5.1
Different Date is selected to view

Actor	System
5.1.1. User clicks the Next arrow located above and to the right of the main schedule display widget to view the next month of schedules.	
	5.1.2. New schedule representation images are displayed and the old ones are removed from the widget.

Alternate Path 5.2
Different Date is selected to view

Actor	System
5.2.1. User clicks the Month Drop Down Menu and selects a month.	
5.2.2. User types in a year to display. (E1, E2)	
	5.2.3. New schedule representation images are displayed and the old ones are removed from the widget.

Error Path 1
Number is not entered into the year text field

Actor	System
	1.1 Any non-number detected input will be ignored.

Error Path 2
No schedules are found for the year entered

Actor	System
	2.1 No schedule representation images are displayed. Text is displayed stating that no schedules exist for that year while displaying the current year.

6.8 Book Days Off

Description:

How an employee should go about booking days off in advance. Unlike emergency requests which is to accomidate rare and difficult circumstances, this requires a supervisor‘s permission level or greater to be granted or denied. There are a pre-defined number of days, weeks, or time periods that can be booked off.

Pre Condition:

The user must be successfully logged into the system, presented the dashboard screen and have permissions to book days off. The user must also have a supervisor for this to have any effect. Schedules cannot be accessed previous to the current date plus the buffer period for requesting days off as specified by the system permission set.

Post Condition:

Schedules are modified, supervisor is notified.

Actor:

Employee who logs into the system can have any permission set as long as they have a supervisor to approve of the request.

Normal Flow

Actor	System
1. Click the “Users” tab on the dashboard.	
2. Click the “Days Off” item on the sidebar.	
	3. Displays the number of days off that the user can take (There is a limit imposed every year-month- or week) and a schedule starting at the next available day to book off (as specified by system, defaulted to 2 week wait if not set).

Actor	System
4. Selects a period of time by clicking on a day object in the schedule for the number of times the day off counter is above 0. Clicking on a day that is already selected will deselect it and add back to the day off counter. No partial days can be booked off. If the user wants to work a partial day, they will have to ask a supervisor to edit their current schedule to accompany the request.	
	5. For every booked off day, a day off counter is removed (-1) (A 5.1)
6. User clicks the Confirm button. (A 6.1)	
	7. Is shown details of selection (in a list) of days booked off and asked to confirm again. (A 6.1)
	8. System notifies supervisor of the book off requests (A 8.1) and supervisor accepts the request.
	9. Schedule is modified.

Alternate Path 5.1
No counters, no more days off to book

Actor	System
5.1.1. Clicks on a day off when counter is at 0	
	5.1.2. Nothing happens.

Alternate Path 6.1
Clear off booked days

Actor	System
6.1.1. Clicks Clear button	
	6.1.2. Any days off are deselected and counters restored for every day.

Alternate Path 8.1
Supervisor rejects the request

Actor	System
	8.1.1. Counters are returned to the user, schedule is not modified.
	8.1.2. Notification is sent to user with an optional explination as to why their request was refused.

6.9 Request Shift Change

Description:

An employee wants to get rid of a shift, or trade a shift because the shift is at an inconvenient time. Instead of booking the day off, leaving the business short-staffed, or if employee is unable to book it off as the due date is past, they can ask their fellow employees to take the shift instead. A supervisor has permissions to revert the changes if they do not want the changes to take place. The supervisors supervisor has the ability to overrule that decision, to keep a reign on lower authority supervisors in case decisions are found to be biased.

Pre Condition:

The user must be successfully logged into the system, presented the dashboard screen and have permissions to request the shift be taken. Only an employee with the same permission set or higher can accept a request.

Post Condition:

Schedule is updated with the involved employees according to the shift(s) being modified.

Actor:

Employee who logs into the system has a job they are working. Higher permission set employees may have trouble finding replacements as generally there are less high-position workers in a company than lower-position workers.

Normal Flow

Actor	System
1. User clicks on the Users tab	
2. User clicks on the Request Shift Change link in the sidebar.	
3. User selects one shift from their schedule (shown in a widget) that they want to trade.	
4. User clicks Confirm. (A 4.1)	
	5. The request for the shift change is placed in the Shift Exchange Pool, a list of all the shifts that employees want to get rid of.
	6. System waits for another employee to accept the proposed shift. (A 6.1)
	7. Shift is accepted from another employee, notifications are sent to Users supervisor (A 7.1)
	8. Schedules of both employees are changed. (A 8.1)

Alternate Path 4.1
User requested specific employee to change shifts with.

Actor	System
	4.1.1. List is populated of people that have the same job type that User works.
4.1.2. User clicks on an employee name (which is a link) .	
	4.1.3. Displays information on the request and asks for confirmation. (A 4.1.3.1., A 4.1.4.1.)
4.1.4 Clicks Confirm to send request.	
	4.1.5. Looks up employee and sends request to them.
	4.1.6. Notification is sent to supervisor with option to revert the request.
	4.1.7. Resume at Normal Flow Step 8.

Alternate Path 4.1.3.1.
Cancel pending shift request to employee

Actor	System
4.1.3.1.1. Clicks on “Users” tab.	
4.1.3.1.2. Clicks on Request Shift Change link in sidebar.	
	4.1.3.1.3. Pending Request in progress will be shown in sidebar below Request Shift Change link.
4.1.3.1.4. Click on Pending Request link.	
	4.1.3.1.5. Displays information on the pending request and a button to drop request.
4.1.3.1.6. Clicks “Drop Request“ button.	
	4.1.3.1.7. Notification is sent to the employee mentioning that a shift request was cancelled by User.

Alternate Path 4.1.4.1.
Employee can work as requested by user

Actor	System
	4.1.4.1.1. Requested employee is notified that a shift change request is pending.
4.1.4.1.2. Employee denies request (A 4.1.4.1.2.1.).	
	4.1.4.1.3. Notification is sent back to user explaining request was denied. (A 4.1.4.1.3.1.).
	4.1.4.1.4. System removes Pending Request.

Alternate Path 4.1.4.1.2.1.
Employee accepts request that is sent by User

Actor	System
	4.1.4.1.2.1.1. Employee accepts request to take Users shift.
	4.1.4.1.2.1.2. Notification of acceptance is sent to user.
	4.1.4.1.2.1.3. Schedule of both users are modified accordingly.

Alternate Path 4.1.4.1.3.1.
Employee silently ignores the request

Actor	System
	4.1.4.1.3.1.1. Employee requests to have request ignored.
	4.1.4.1.3.1.2. Shift is seen as pending until time for shift approaches. Unless User cancels the request and gets someone else to work it, they will be expected to work that shift.

Alternate Path 6.1.
No user accepts the shift in time (either request pool or specific request)

Actor	System
	6.1.1. Notification is sent to User saying that the shift could not be traded.
	6.1.2. Remove the pending request.

Alternate Path 7.1.
Employee and User have different supervisors

Actor	System
	7.1.1. Notifications are sent to both supervisors. (A 8.1.)

Alternate Path 8.1.
Supervisor reverts decision to have shift change

Actor	System
	8.1.1. Supervisor is notified of the exchange and clicks on the Reverse Decision button.
	8.1.2. Employees that had their schedules modified have changes reverted.
	8.1.3. Notifications are sent to both employees informing them that the schedules are reversed.
	8.1.4. Supervisor has information displayed that encourages them to contact the employees to explain why decision was reversed.
	8.1.5. Notification is sent to supervisors supervisor notifying them that a decision was overruled. (A 8.1.5.1.)

Alternate Path 8.1.4.1.
Supervisor‘s Supervisor reverts the previous decision

Actor	System
	8.1.4.1.1. Involved employees are sent a notification that mentions their shifts have been changed yet again.
	8.1.4.1.2. Schedules are changed.
	8.1.4.1.3. Notification is sent back to supervisor explaining that their decision was overturned.

6.10 Distribute Reports

Description:
Once a report has been generated, it can be sent to others as an electronic copy through email, or it can be printed and distributed by paper.

Pre Condition:
A report has been generated and is displayed on the screen.

Post Condition:
A report has been printed or emailed, and the user has returned to the report view.

Actor:
An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. User clicks distribute report button.	
	2. System displays distribution option list.
3. User clicks the print report link. (A 3.1)	
	4. Generate print-friendly version of the report.
	5. Display report on screen.
	6. Initiate web browser‘s print action.
7. Prints report (Browser functions outside project scope)	
8. User clicks return to report view link.	
	9. Reload report view.

Alternate Path 3.1
E-Mail report link selected

Actor	System
	3.1.1. Display email entry field.
3.1.2. User enters e-mail address.	
	3.1.3. System verifies that email is in proper format. (E 1)
	3.1.4. Enable Send Emails button.
3.1.5. Press send Emails button.	
	3.1.6. Send report to listed emails.
	3.1.7. Display emails sent successfully.
3.1.8. Clicks OK Button.	
	3.1.9. Use case resumes at step 9.

Error Path 1.1
Entered email(s) detected as invalid

Actor	System
	1.1. Highlight invalid emails
	1.2. Request that user corrects or removes invalid emails.
1.3. Correct email addresses.	
	1.4. Use Case resumes at Step 3.1.3.

6.11 Generate Reports

Description:

Supervisors can generate reports give information on schedules, employees and their usage of the system.

Schedule Reports list information on previously implemented schedules, or future schedules that have yet to take effect.

Employee Resource Reports list information such as employees that are free during a given time, or future timeslots that have yet to be filled.

Employee Usage Reports will allow supervisors to see statistics on how employees are using the system. This will include information such as when they last viewed their schedule, which will allow supervisors to see who might not yet know about changes that have been made.

Pre Condition:

The supervisor has successfully logged in; Dashboard is displayed.

Post Condition:

A specific report is displayed, and can be printed or emailed if desired.

Actor:

An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. User clicks button to enter report view.	
	2. Display front page of report view, listing report types.
3. User selects Schedule Report, enters date range for report. (A 3.1, A 3.2)	
	4. Collect schedule data.
	5. Generate schedule data.
	6. Display report.

Alternate Path 3.1
Employee Resource Report selected

Actor	System
	3.1.1. Collect employee and employee‘s shift data.
	3.1.2. Generate resource report.
	3.1.3. Use case continues at Step 6.

Alternate Path 3.2
E-Mail Employee Usage Report selected

Actor	System
	3.2.1. Collect employee and employee‘s schedule data.
	3.2.2. Generate usage report.
	3.2.3. Use case continues at Step 6.

6.12 Maintain Workgroups

Description:

Managers are able to create, edit and delete employee workgroups. When a new workgroup is created, the manager may choose to assign employees to the workgroup, or leave it empty for employees to be added at a later date.

Pre Condition:

The manager has successfully logged in; Dashboard is displayed.

Post Condition:

The manager has finished creating/editing/deleting a workgroup, and has returned to the available workgroups list.

Actor:

An Employee who has Manager permissions.

Normal Flow

Actor	System
1. User clicks the Administration tab.	
2. User clicks maintain workgroups link in sidebar.	
	3. Load maintain workgroups widget.
	4. Populate available workgroups list.
5. Presses create new workgroup button. (A 4.1, A 4.2)	
	6. Creates new workgroup.
	7. Populate available employees list.
	8. Display edit workgroup view.
9. Enters new workgroup name.	
10. Selects employees to add to workgroup.	
11. Clicks add employees to workgroup button.	
	12. Show dialog requesting confirmation and displaying employee info.
13. Clicks accept changes button (A 13.1.)	
	14. Save workgroup.
	15. Return to available workgroups list.

Alternate Path 4.1
Manager edits workgroup

Actor	System
4.1.1. Selects workgroup from available workgroup list.	
4.1.2. Clicks edit workgroup button.	
	4.1.3. Load selected workgroup.
	4.1.4. Populate available employees list.
4.1.5. Selects employees to add to workgroup. (A 4.1.4.1.)	
4.1.6. Clicks add employees to workgroup button.	
	4.1.7. Use case resumes at Step 11.

Alternate Path 4.1.4.1.
Manager edits workgroup

Actor	System
4.1.4.1.1. Clicks remove employees button.	
	4.1.4.1.2. Use case resumes from Step 11.

Alternate Path 4.2.
Manager deletes workgroup

Actor	System
4.2.1. Selects workgroup from available workgroup list.	
4.2.2. Clicks delete workgroup button.	
	4.2.3. Use case resumes from Step 11.

Alternate Path 12.1.
Manager clicks cancel changes button.

Actor	System
	12.1.1. Undo changes, deselect employees.
	12.1.2. Use case resumes from Step 9.

6.13 Send Announcement

Description:
Custom announcements can be created that will be sent to specific employees, employee types, or all employees working under the supervisor.

Pre Condition:
The supervisor has successfully logged in; Dashboard is displayed.

Post Condition:
The supervisor has finished sending an announcement, and is able to send another or return to the dashboard.

Actor:
An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. Clicks send announcement button.	
	2. Load announcement widget.
	3. Display announcement type selection view.
4. Presses workgroup announcement button. (A 4.1)	
	5. Populate and display list of workgroups for supervisor.
6. Selects target workgroup from list.	
7. Enters announcement message.	
8. Presses send button.	
	9. Send announcement to all employees within selected workgroup.
	10. Display messages sent alert window.
11. Clicks ok button on alert window.	
	12. Return to announcement type selection view.

Alternate Path 4.1.
Presses employee type announcement button

Actor	System
	4.1.1. Populate and display list of employee types for supervisor.
4.1.2. Selects target employee type.	
4.1.3. Enters announcement message.	
4.1.4. Presses send button.	
	4.1.5. Send announcement message to all employees within selected employee type.
	4.1.6. Use case resumes from Step 9.

6.14 View Workgroup Schedule

Description:
After entering the schedule view, supervisors can select to view a schedule for a specific workgroup of employees. Weekly schedules are displayed by default, which can be switched to a daily schedule if desired.

Pre Condition:
The supervisor has successfully logged in; Dashboard is displayed.

Post Condition:
The schedule for a specific workgroup is displayed.

Actor:
An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. Clicks schedules button to enter schedule view. (A 1.1)	
	2. Get schedule data on super workgroup (all employees) for supervisor.
	3. Populate workgroup dropdown list. (E 1)
	4. Display weekly schedule view of super workgroup for current date, listing workgroups in dropdown box.
5. Selects workgroup from dropdown box.	
	6. Reload schedule view, showing employees only from selected workgroup.
	7. Get schedule data for employees in the selected workgroup for the given time period.
	8. Display workgroup schedule.

Alternate Path 1.1.
Daily schedule selected

Actor	System
	1.1.1. Get daily schedule data for employees in seelected workgroup only.
	1.1.2. Use case resumes from Step 1.

Error Path 1.1.
No additional workgroups exist

Actor	System
	1.1.1. Disable workgroup dropdown list.
	1.1.2. Use case resumes at Step 4.

6.15 Maintain Locations

Description:
Supervisors are able to create, edit and delete locations. Once created, employees can choose or be assigned a preferred location, used for automated scheduling.

Pre Condition:
The manager has successfully logged in; Dashboard is displayed.

Post Condition:
The manager has finished creating/editing/deleting a location, and has returned to the dashboard.

Actor:
An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. Clicks maintain locations button.	
	2. Load maintain locations widget.
	3. Display location list view, populating location list.
4. Clicks add location button. (A4.1)	
	5. Display empty edit location view.
6. Enters location name and description.	
7. Clicks save button.	
	8. Confirm location does not already exist. (E1)
	9. Save location in database
	10. Display location saved alert.
11. Clicks OK button on alert	
	12. Display location list view, populating location list.
13. Clicks return to dashboard link.	

Alternate Path 4.1.
Selects existing location

Actor	System
4.1.1. Clicks edit location button. (4.1.1.1)	
	4.1.2. Display edit location view.
	4.1.3. Populate fields with data from selected location.
4.1.4. Changes location name or description.	
4.1.5. Clicks save button.	
	4.1.6. Use case resumes from step 9.

Alternate Path 4.1.1.1.
No additional workgroups exist

Actor	System
	4.1.1.1.1. Display confirm delete dialog.
4.1.1.1.2. Clicks ok button on dialog.	
	4.1.1.1.3. Remove location from database.
	4.1.1.1.4. Display location removed alert.
	4.1.1.1.5. Use case resumes from step 11.

Error Path 1
Location already exists

Actor	System
	1.1 Display location already exists alert.
1.2. Clicks ok button on dialog.	
	1.3. Use case resumes from step 6.

6.16 Maintain Positions

Description:
Supervisors are able to create, edit and delete positions. Once created, employees can choose or be assigned a preferred position, used for automated scheduling.

Pre Condition:
The manager has successfully logged in; Dashboard is displayed.

Post Condition:
The manager has finished creating/editing/deleting a position, and has returned to the dashboard.

Actor:
An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. Clicks maintain positions button.	
	2. Load maintain positions widget.
	3. Display position list view, populating position list.
4. Clicks add position button. (A4.1)	
	5. Display empty edit position view. Populate skill list.
6. Enters position name and description. Chooses required skills.	
7. Clicks save button.	
	8. Confirm position does not already exist. (E1)
	9. Save position in database
	10. Display position saved alert.
11. Clicks OK button on alert	
	12. Display position list view, populating position list.
13. Clicks return to dashboard link.	

Alternate Path 4.1.
Selects existing position

Actor	System
4.1.1. Clicks edit position button. (4.1.1.1)	
	4.1.2. Display edit position view.
	4.1.3. Populate fields with data from selected position. Populate Skill List
4.1.4. Changes position name, description or required skills.	
4.1.5. Clicks save button.	
	4.1.6. Use case resumes from step 9.

Alternate Path 4.1.1.1.
Clicks delete position button.

Actor	System
	4.1.1.1.1. Display confirm delete dialog.
4.1.1.1.2. Clicks ok button on dialog.	
	4.1.1.1.3. Remove position from database.
	4.1.1.1.4. Display position removed alert.
	4.1.1.1.5. Use case resumes from step 11.

Error Path 1
Position already exists

Actor	System
	1.1 Display position already exists alert.
1.2. Clicks ok button on dialog.	
	1.3. Use case resumes from step 6.

6.17 Maintain Skills

Description:

Supervisors are able to create, edit and delete skills. Once created, skills may be assigned to employees and positions. Skills will be used in the automatic generation of schedules, limiting what positions an employee can be assigned to, and for keeping track of extra skills an employee has outside of their position.

Pre Condition:

The manager has successfully logged in; Dashboard is displayed.

Post Condition:

The manager has finished creating/editing/deleting a skill, and has returned to the dashboard.

Actor:

An Employee who has Supervisor permissions.

Normal Flow

Actor	System
1. Clicks maintain skills button.	
	2. Load maintain skills widget.
	3. Display skill list view, populating skill list.
4. Clicks add skill button. (A4.1)	
	5. Display empty edit skill view. Populate skill list.
6. Enters skill name and description. Chooses required skills.	
7. Clicks save button.	
	8. Confirm skill does not already exist. (E1)
	9. Save skill in database
	10. Display position saved alert.
11. Clicks OK button on alert	
	12. Display skill list view, populating skill list.
13. Clicks return to dashboard link.	

Alternate Path 4.1.
Selects existing skill

Actor	System
4.1.1. Clicks edit skill button. (4.1.1.1)	
	4.1.2. Display edit skill view.
	4.1.3. Populate fields with data from selected skill.
4.1.4. Changes skill name, description.	
4.1.5. Clicks save button.	
	4.1.6. Use case resumes from step 9.

Alternate Path 4.1.1.1.
Clicks delete skill button.

Actor	System
	4.1.1.1.1. Display confirm delete dialog.
4.1.1.1.2. Clicks ok button on dialog.	
	4.1.1.1.3. Remove skill from database.
	4.1.1.1.4. Display skill removed alert.
	4.1.1.1.5. Use case resumes from step 11.

Error Path 1
Skill already exists

Actor	System
	1.1 Display skill already exists alert.
1.2. Clicks ok button on dialog.	
	1.3. Use case resumes from step 6.

Chapter 7

Problem Domain Class Diagram

7.1 Problem Domain

Class Diagrams

Problem Domain

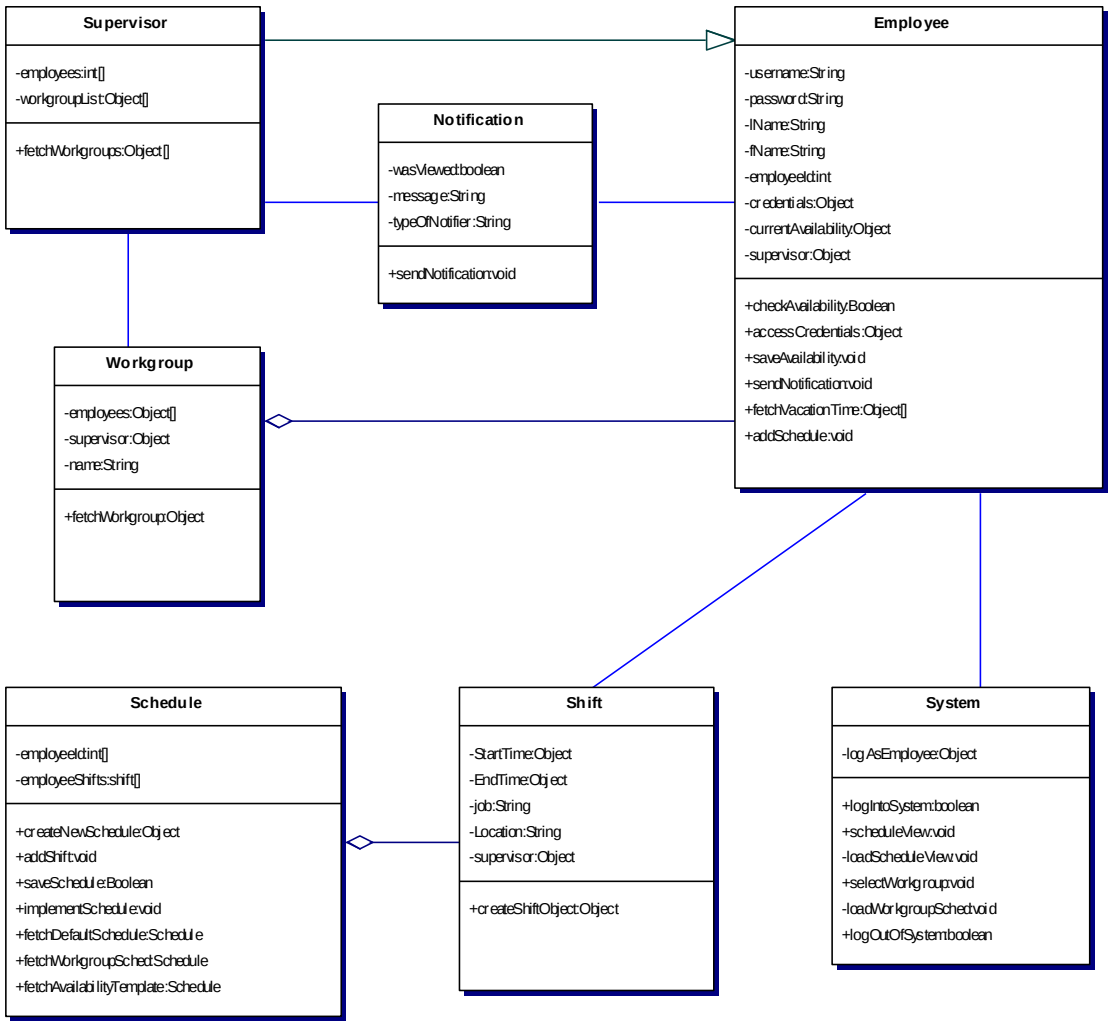

Figure 7.1: **Class Diagram** The classes that are utilized by the system with their respecive attributes

Chapter 8

State Machine Diagrams

8.1 State Machines

State Diagram *CreateNewScheduleState*

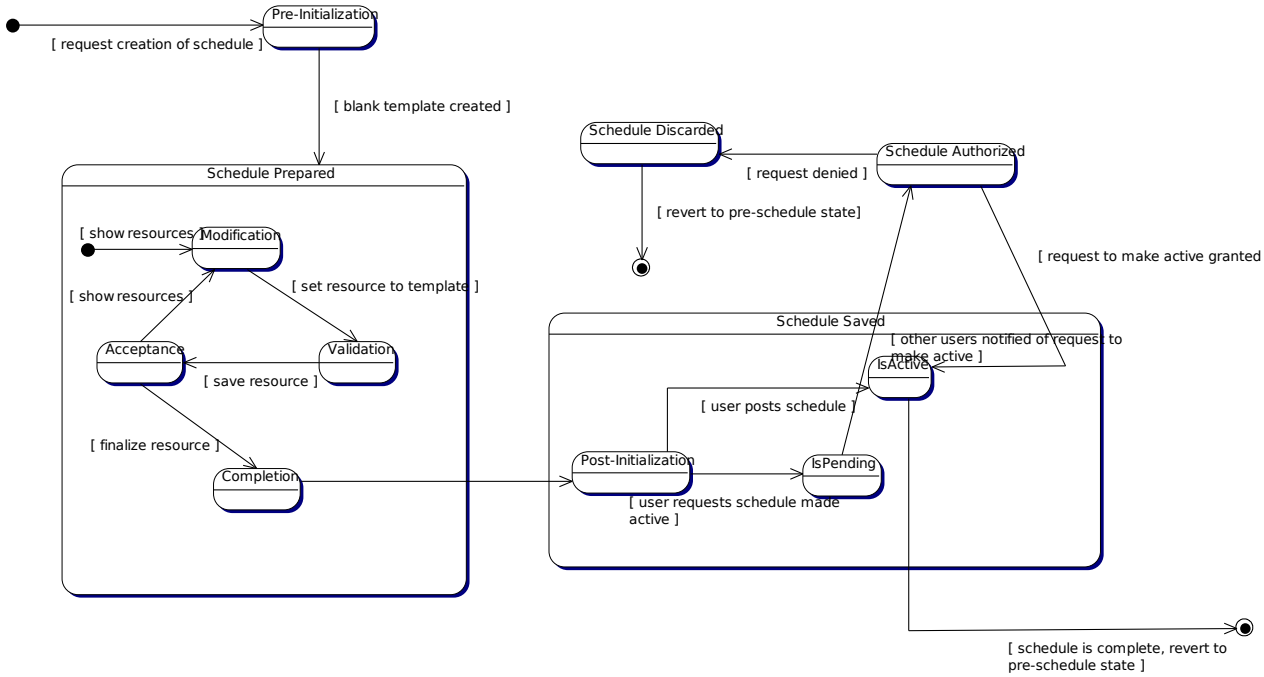

Figure 8.1: **Create New Schedule State Diagram**
A representation of different states the system goes through in creating a new schedule

Diagram Contents Summary

- **State** Pre-Initialization
- **State** Schedule Authorized
- **State** Schedule Discarded
- **State** Schedule Prepared
- **State** Acceptance
- **StartState** ActionsEnabled
- **State** Completion
- **State** Modification
- **State** Validation
- **State** Schedule Saved
- **State** IsActive
- **State** IsPending
- **State** Post-Initialization
  - **EndState** scheduleAvailable
  - **EndState** scheduleRefuse
- **StartState** StartScheduleCreation

State Detail

State *Pre-Initialization*

This state is when user permissions are checked to ensure they have the right to create a schedule, as well as checking for temporary data that might exist from previous schedule creations that have not been saved. The user is assumed to have schedule creation privillages.

Transition links

to **State** Schedule Prepared

Event:
[blank template created]

State *Schedule Authorized*

A pending schedule is given approval from users not in the scope of the creator and is made active.

Transition links

to **State** IsActive

Event:
[request to make active granted]

to **State** Schedule Discarded

Event:
[request denied]

State *Schedule Discarded*

The saved object of the schedule may have been deleted

Transition links

to **EndState** scheduleRefuse

Event:
[revert to pre-schedule state]

State *Schedule Prepared*

The schedule has been initialized so that the user starts off with a blank schedule. If temporary values are found, they can be restored or deleted; that is out of scope for this diagram.

Substates

State *Acceptance*

When a resource is accepted as it is placed in a valid position, it is written to a temporary value in memory which is routinely saved to the backend.

Transition links

to **State** Modification

Event:
[show resources]

to **State** Completion

Event:
[finalize resource]

StartState *ActionsEnabled*

At this start point, the user is allowed to perform some actions on the blank schedule.

Transition links

to **State** Modification

Event:
[show resources]

State *Completion*

The user requests the schedule as complete. The temporary object is saved to the backend, temporary value is deleted, and user begins the implementation process if they have permissions to.

Transition links

to **State** Post-Initialization

State *Modification*

A resource that is available to place on the schedule can be added, edited, or removed.

Transition links

to **State** Validation

Event:
[set resource to template]

State *Validation*

Has a resource been applied when it is not available or sufficient for a task? Any modification that goes against the set of rules that apply to a schedule are undone and not saved.

Transition links

to **State** Acceptance

Event:
[save resource]

State *Schedule Saved*

The template has been saved officially so that it is recognized as a schedule that can have actions applied to it (as opposed to modifications and view requests).

Substates

State *IsActive*

Schedule has been made active, so it can be seen by everyone who requests viewing a schedule.

Transition links

to **EndState** scheduleAvailable

Event:
[schedule is complete, revert to pre-schedule state]

State *IsPending*

If user permissions require authorization to activate a schedule template, it will be placed in a pending state and users with higher permissions will be notified. Only users that are directly above the user will be automatically notified, although notifications to other higher authorities can be requested, but outside the scope of this diagram.

Transition links

to **State** Schedule Authorized

Event:
[other users notified of request to make active]

State *Post-Initialization*

Checks are done for permissions: user may not be able to make the schedule 'active' or may require other users to accept the changes.

Transition links

to **State** IsPending

Event:
[user requests schedule made active]

to **State** IsActive

Event:
[user posts schedule]

EndState *scheduleAvailable*

backgroundColor:
0,0,0

EndState *scheduleRefuse*

The schedule was refused by higher authority to be made active. User who created the schedule will be notified of it's denied

status. A denied schedule may also be deleted by those denying it.

backgroundColor:
0,0,0

StartState *StartScheduleCreation*

This is the point where the system will start preparing for new schedule creation.

backgroundColor:
0,0,0

Transition links

to **State** Pre-Initialization

Event:
[request creation of schedule]

Request Shift-Change

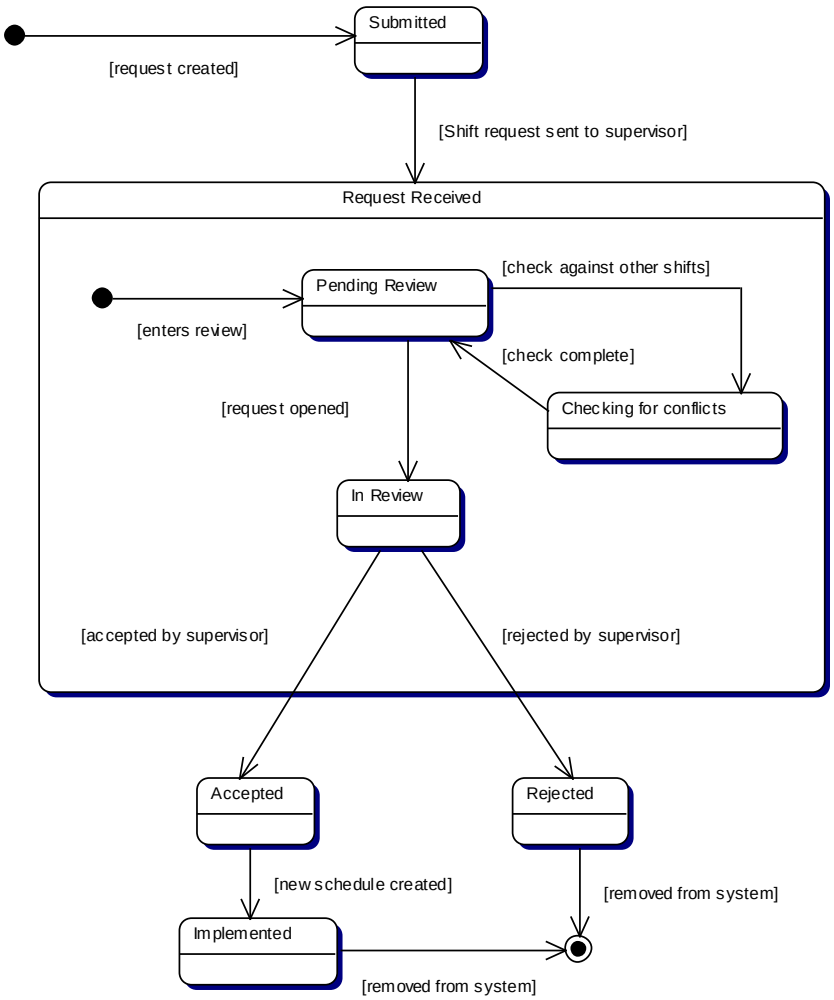

Figure 8.2: **Request Shift Change State Diagram**
A representation of different states the system goes through in allowing a user to request a shfit change

State Detail

State *Accepted*

The shift change has been accepted by the supervisor. Notifications will be sent informing the employee of the decision, and the the new shift for this employee will await inclusion in a future schedule. The request will persist in the system until it has been included in a schedule.

State *Implemented*

The shift change is now included within a future schedule for the employee. Additional notifications will be sent to the employee to remind them that their work hours will be changing at this time.

State *Rejected*

The shift change has been rejected by the supervisor. Notifications will be sent informing the employee of the decision, and the shift change will be removed from the system.

State *Request Received*

The request has been recieved by the supervisors account, and is in the review process.

Substates

State *Checking for conflicts*

The shift request is in the process of being checked for any conflicts with any current shifts from other employees. Conflicts include conditions such as the shift being requested not having room for an additional employee.

State *In Review*

The shift change is in the process of being reviewed by the supervisor, including the review of any conflicts that the system has detected with the new shift times the employee has requested. It is awaiting a decision on whether or not the shift change will be accepted or rejected.

State *Pending Review*

A pending shift change is one that has been sent to the supervisor including any notifications that their is a new employee request for them to view. The supervisor has yet to view the request at this time.

State *Submitted*

The shift change request has been submitted by the employee and has been created in the system.

Request Time Off

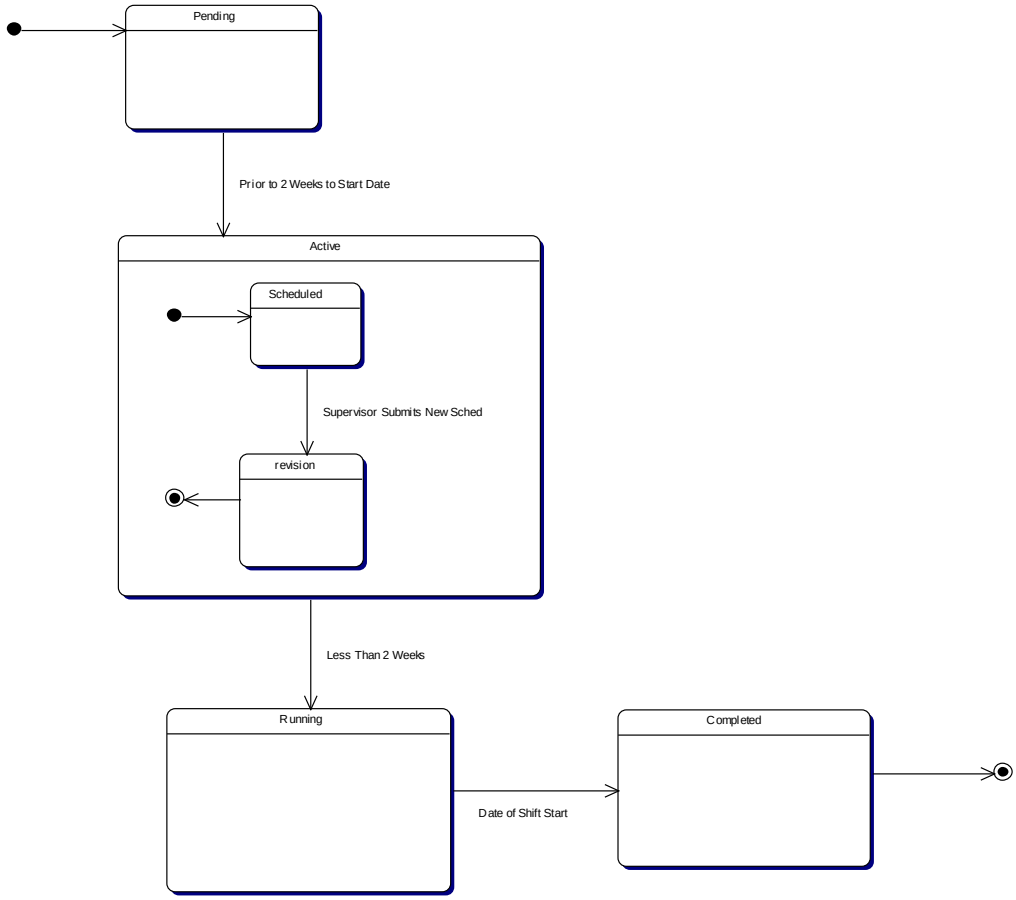

Figure 8.3: **Request Time Off State Diagram**
A representation of different states the system goes through when an employee requests time off

State Detail

State *Active*

This state can be achieved by a supervisor taking the shift change request out of the pending state.

Substates

State *revision*

This state can be accessed if a supervisor is viewing an schedule and decides that it should be changed. The state can then proceed to the end of a revision stage by the supervisor sending the modified schedule back.

State *Scheduled*

This is an internal state inside of active. This state can be achieved if the schedule is currently being viewed by a supervisor after an employee has submitted the shift change request.

State *Completed*

The state of the shift change request goes to completed after the date of the shift change request has passed.

State *Pending*

This state is when the shift change request is sent to the supervisor and it is pending approval. This can no longer be changed once the 2 weeks to start date has occurred.

State *Running*

A shift change request can be put into a running state after all the changes have been made and a supervisor accepts the shift change request.

Chapter 9

Activity Diagrams

9.1 Activity Diagrams

Add NewEmployee

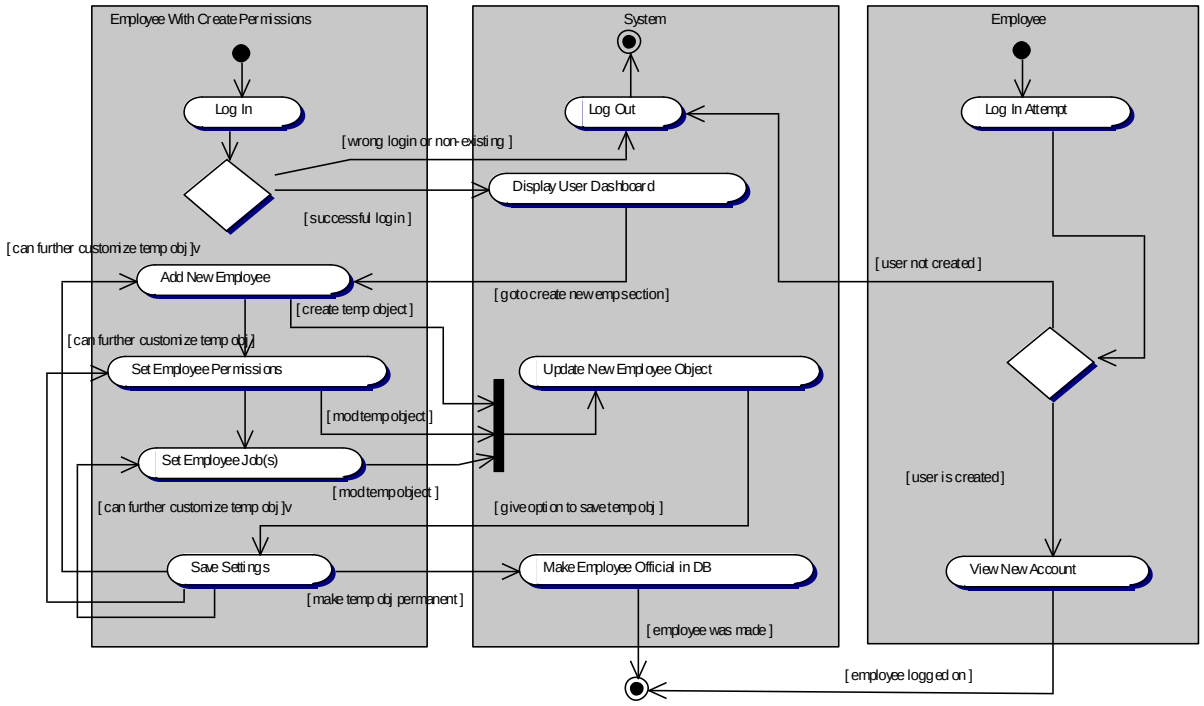

Figure 9.1: **Add New Employee Activity Diagram**
The actions required in order to add a new employee to the system

Generate Report

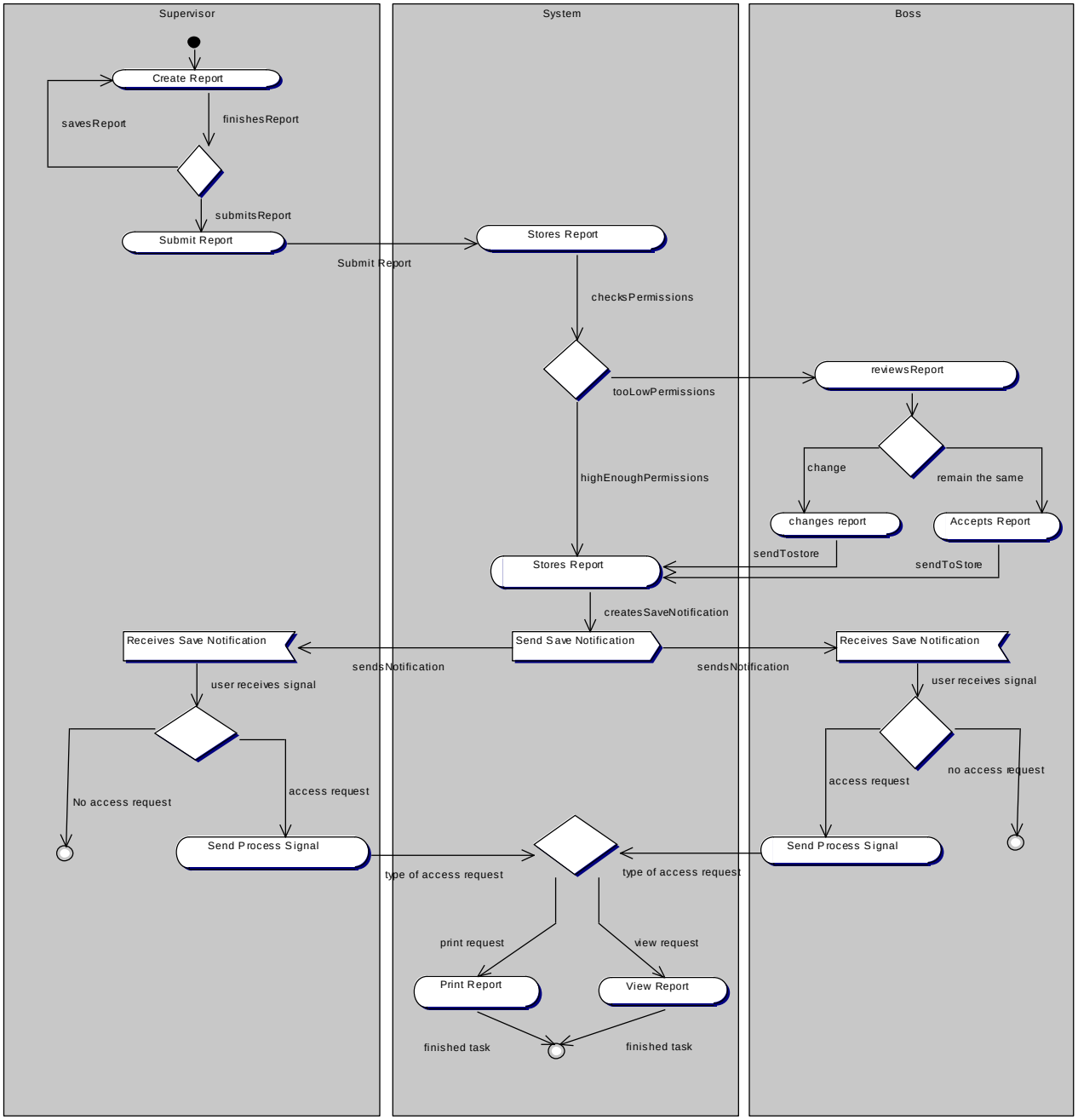

Figure 9.2: **Generate Report Activity Diagram**
The actions required to generate detailed and relevant reports

Request Shift-Change

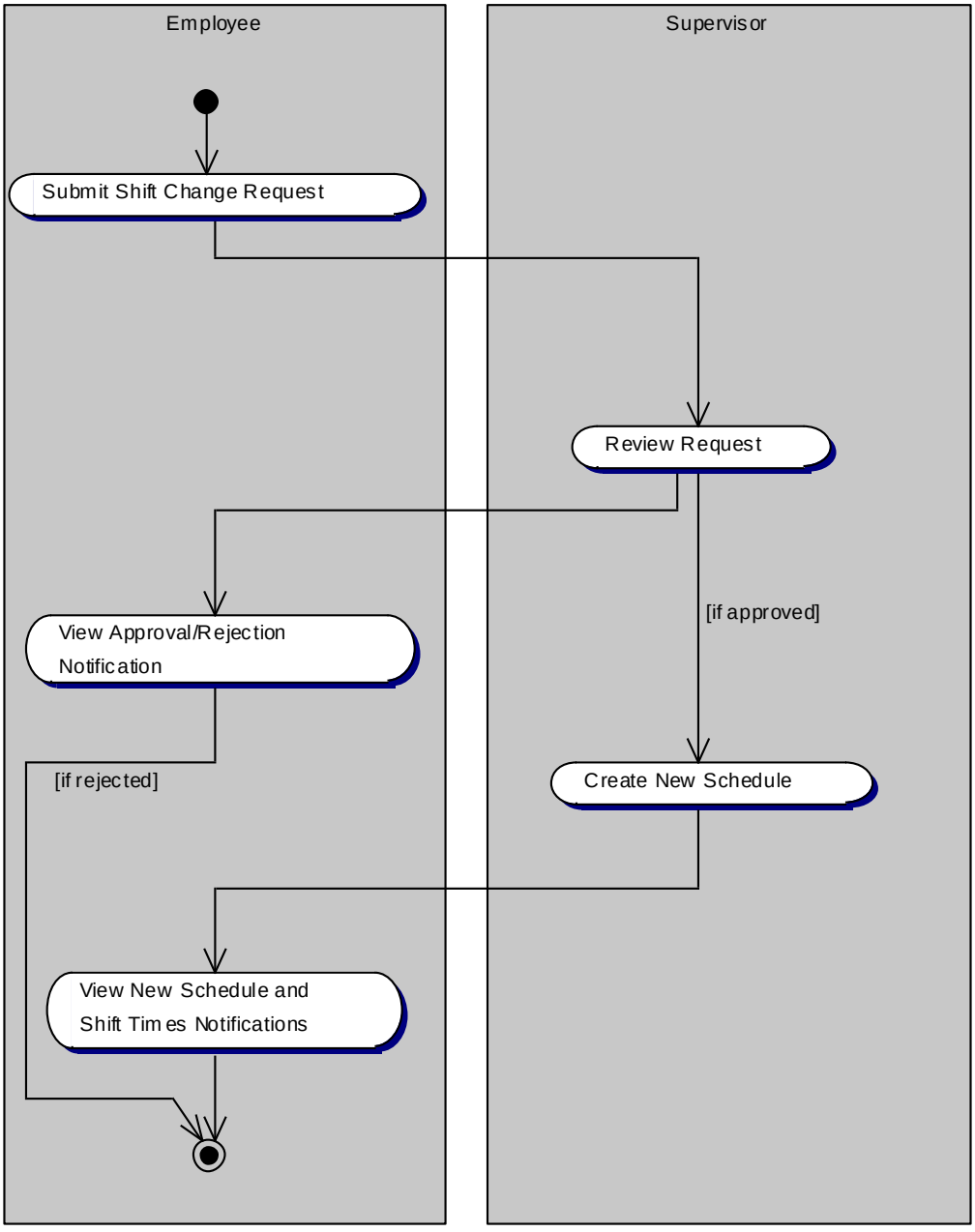

Figure 9.3: **Request Shift Change Activity Diagram**
This diagram shows the status of a shift change request, from being created by an employee, reviewed by a supervisor, and being implemented in future schedules or removed from the system.

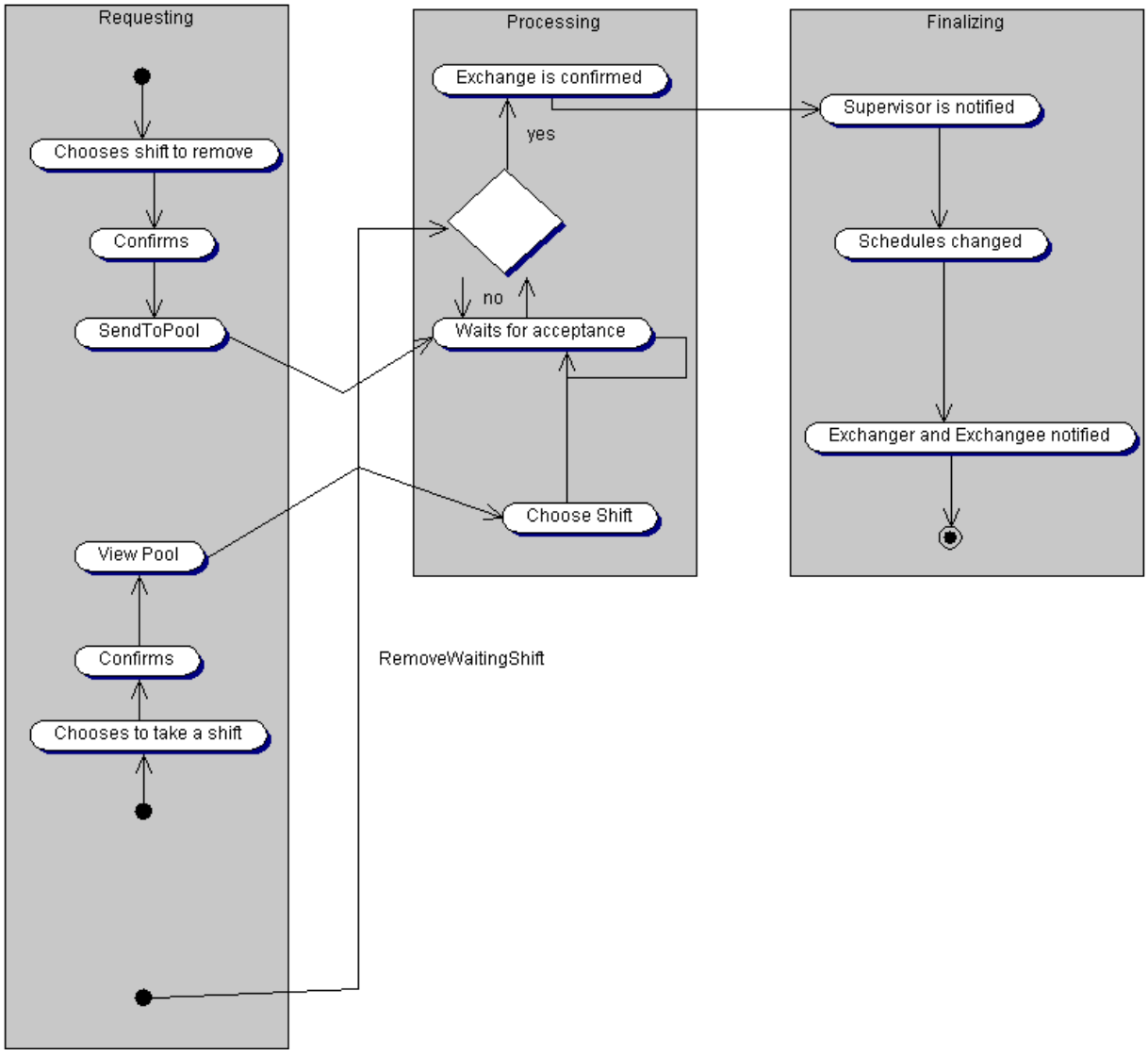

Figure 9.4: **Shift Exchange Activity Diagram**
This diagram shows the status of a shift being exchanged or given to another employee.

Part IV

System Design

Chapter 10

Layered Architecture

10.1 Package Diagram

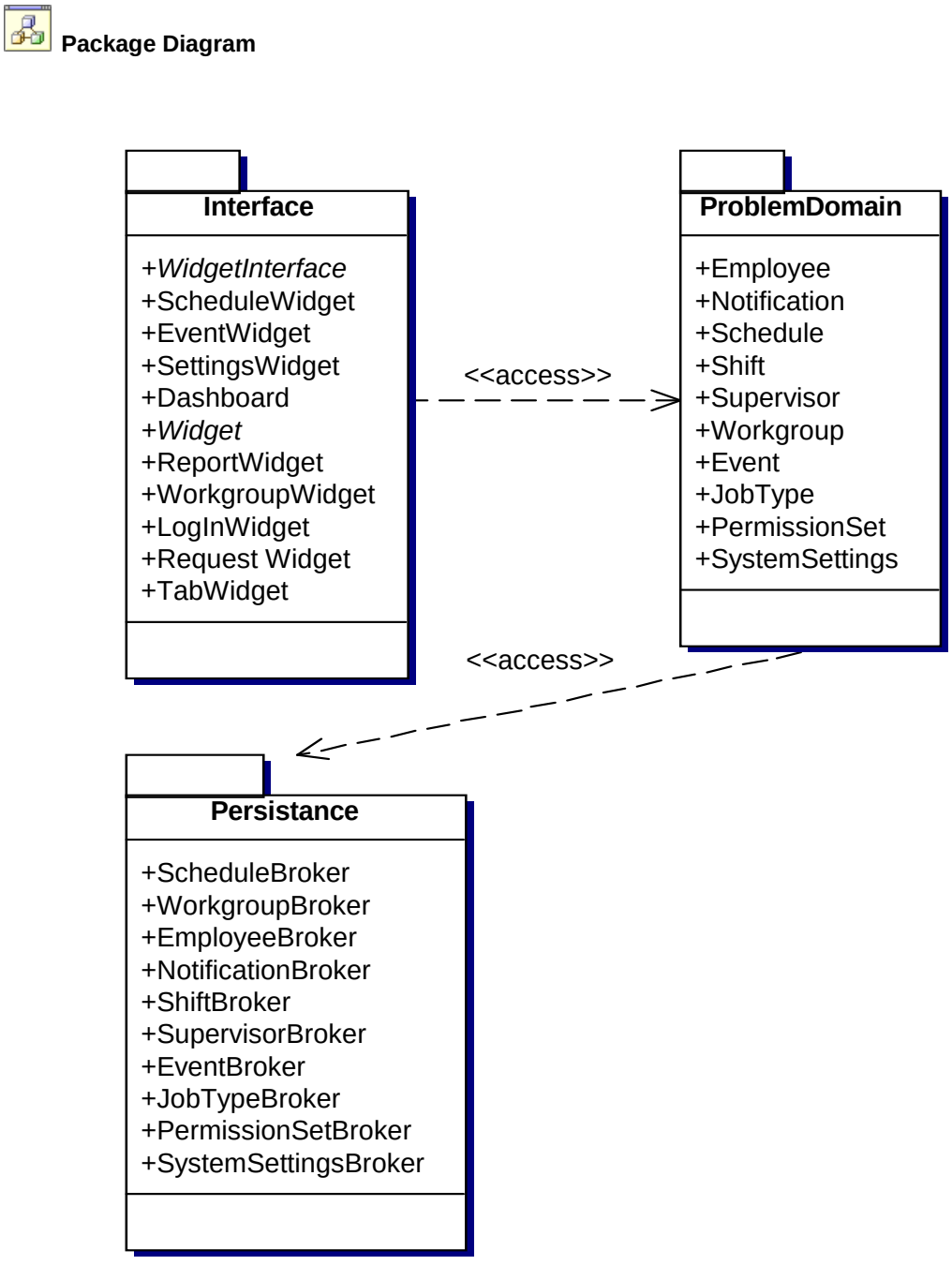

Figure 10.1: **Package Diagram**
This diagram shows all the packages and objects included in the system

Chapter 11

Persistence Model

11.1 Textual Description Document

Control Classes

Our system will have control classes, or brokers, that will be in charge of directly interacting with the database. Any insertion, deletion or updating of data occurs with the assistance of these classes. The control classes are also used to perform any interaction with the interface and problem domain layers. Basically they are the link between the physical data in the database and what the user sees in the end. The broker classes are in place to put forth an application programming interface to allow developers to get data from the database without directly interacting with the data. This is in place to ensure that the data integrity of the database stays consistent throughout system use. Ensuring data integrity is a key aspect of a system with a tri-architecture. Allowing the developers to access direct data and information from the database without physically letting them grab the data is the key point of having the control classes.

The interface classes will be used to communicate with the users in an easy to use fashion. The interface classes will then interpret the user interaction and send that parsed information to the broker classes to get the information that the user requested. From there the interface class will parse the information received from the broker classes back into a format that the user can understand and interact with.

The persistence classes will be used as direct data from the database. Mostly consists of objects that are persisted into the database as actual data. The persistence classes will be hidden

from the developers due to the broker classes. So in fact, the developers will not be able to directly interact with these classes without first going through the broker classes. This again, is to ensure data integrity in the persistence layer and at the physical data layer.

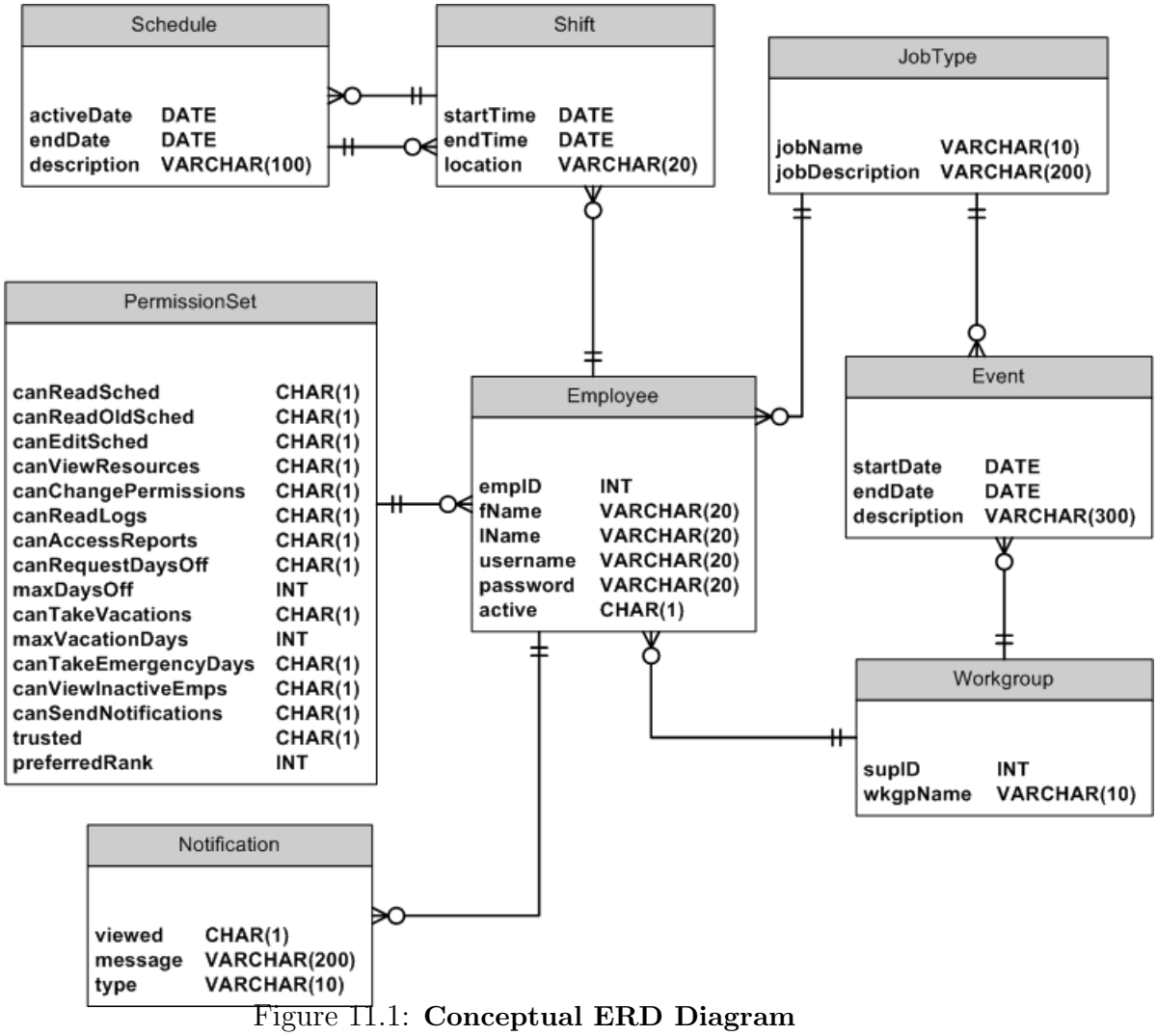

Figure 11.1: **Conceptual ERD Diagram**

11.2 Entity Relationship Diagrams

11.3 Expected Persistent Class Sizes

Class Name	Size Per Instance (Bytes)	Expected Instances	Total Data Size (Bytes)
Employee	101	800	80,800
Event	320	50	16,000
JobType	216	40	8,640
Notification	221	2,000	442,000
PermissionSet	29	10	290
Schedule	111	62,400	6,926,400
Shift	35	3,500	122,500
Workgroup	20	30	600
		Total Database Size:	**7,597,230 (7.60MB)**

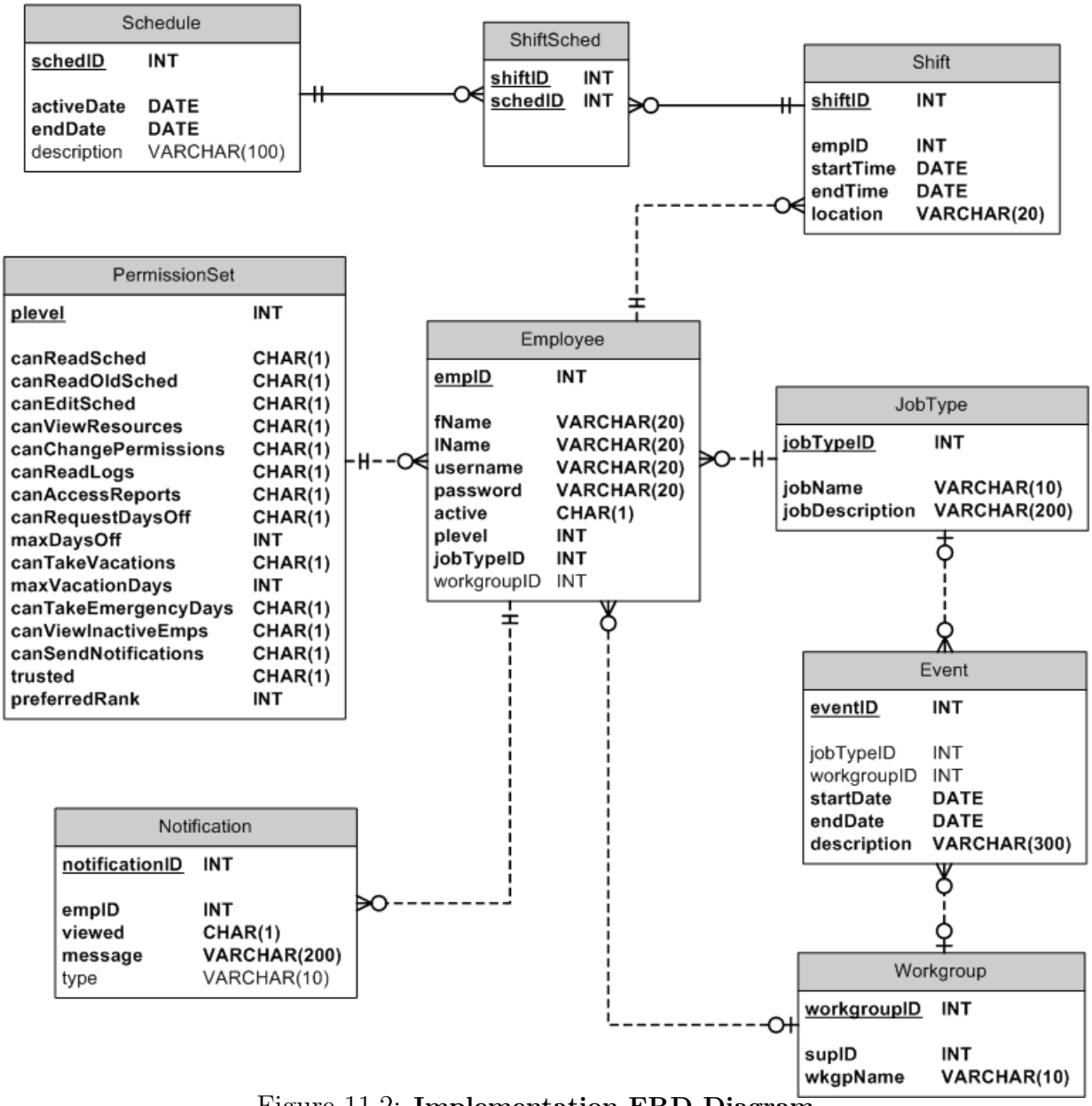

Figure 11.2: **Implementation ERD Diagram**

Chapter 12

Class Diagram

12.1 Interface, Persistence, and Problem Domain

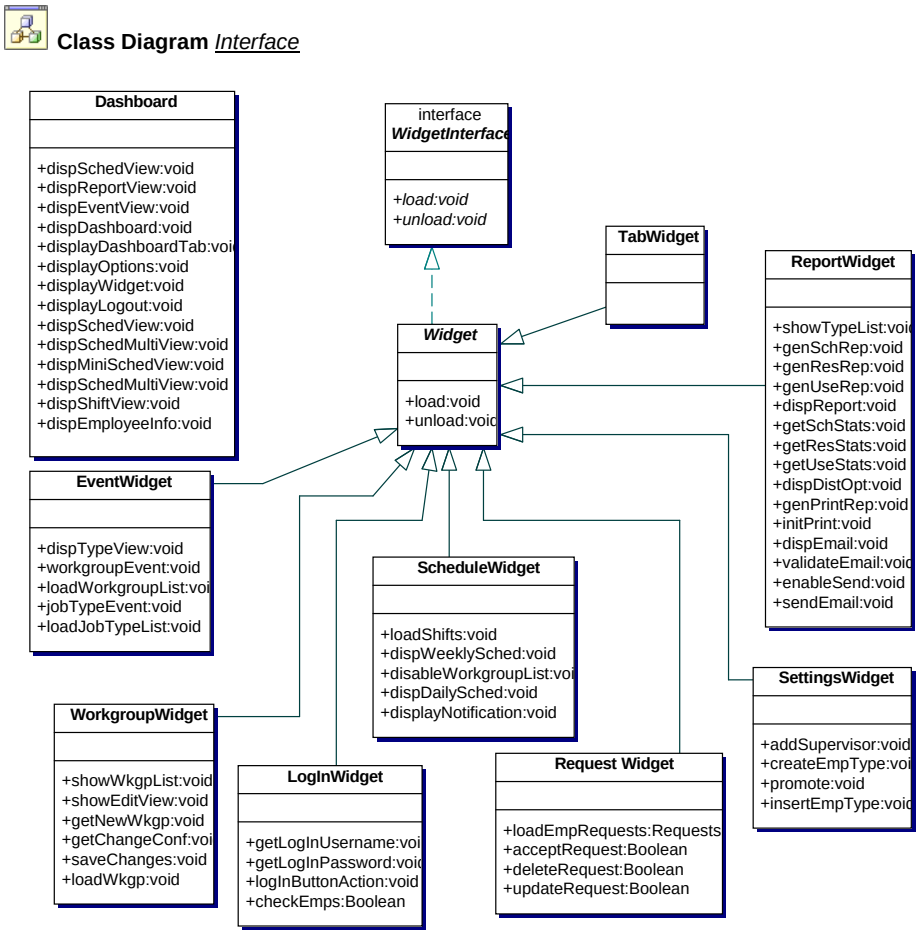

Figure 12.1: **Interface Class Diagram**
This diagram shows the objects that make up the interface for WebAgenda and methods associated with them.

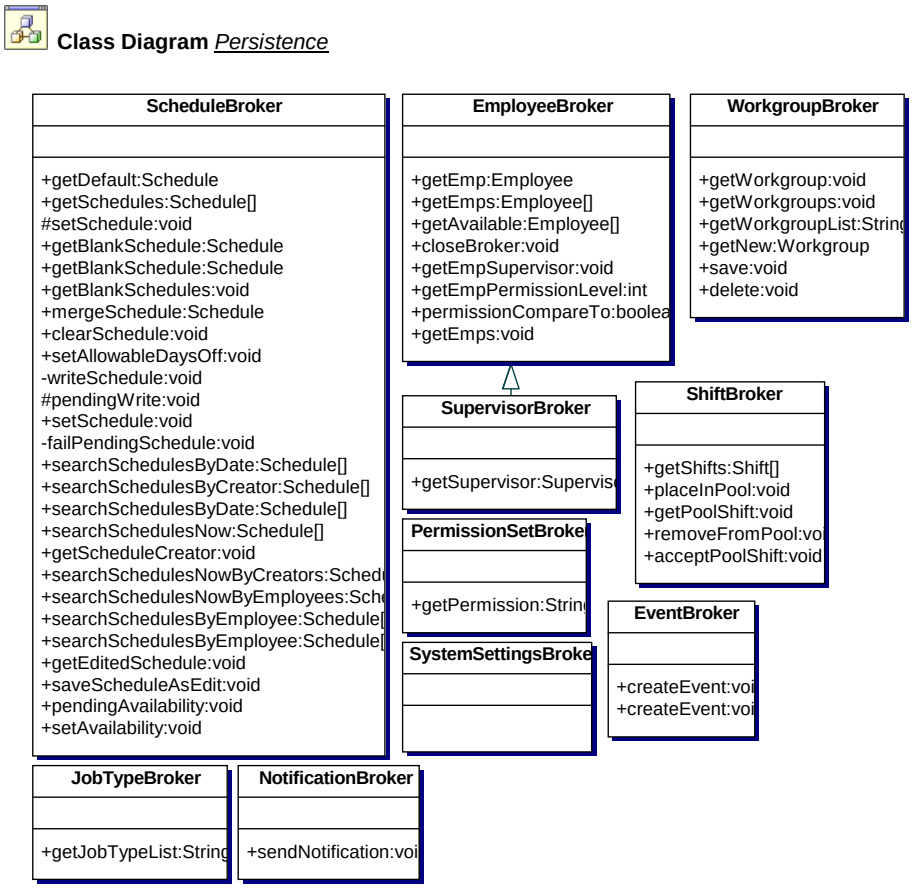

Figure 12.2: **Persistence Class Diagram**
This diagram shows the objects that make up the persistence layer, the classes and objects that utilize backend or data objects

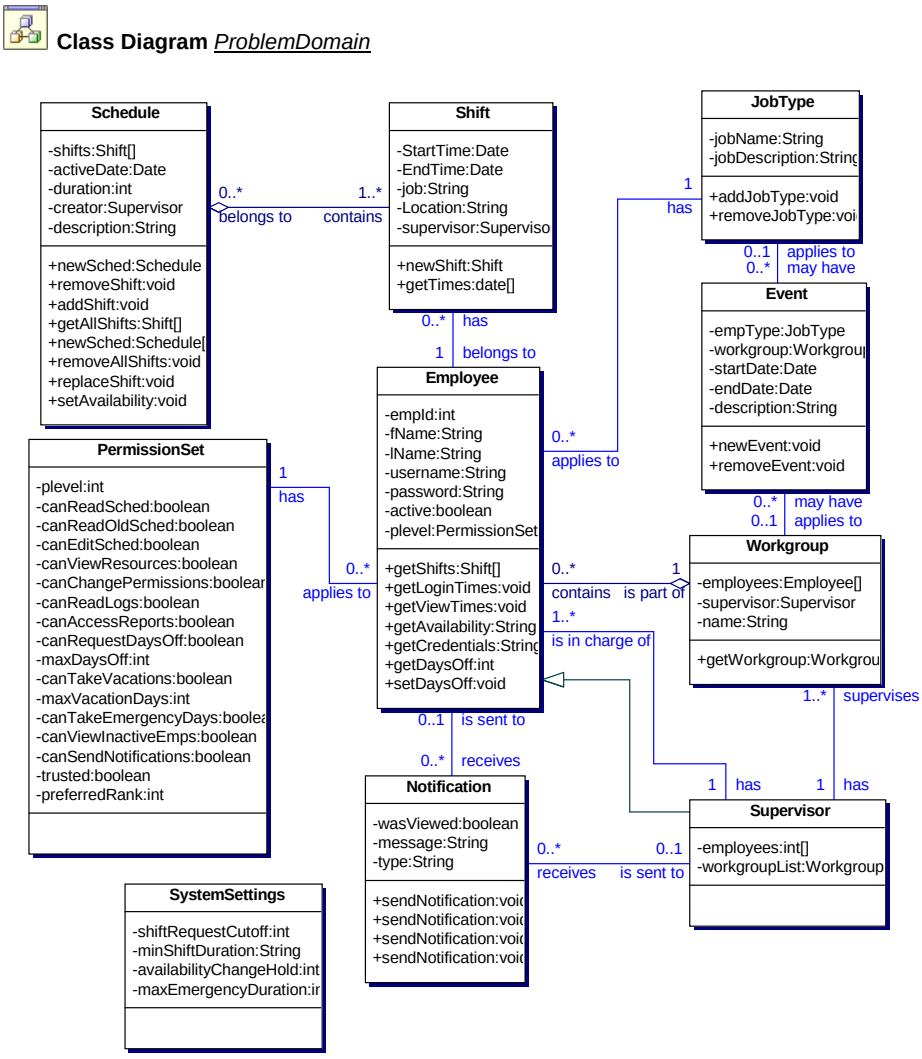

Figure 12.3: **Problem Domain Class Diagram**
This diagram shows the objects that make up the problem domain, or all the representation objects of data the system used.

Chapter 13

Interaction Sequence Diagrams

13.1 New Schedule Sequence Diagram

Interaction Diagrams

Create New Schedule

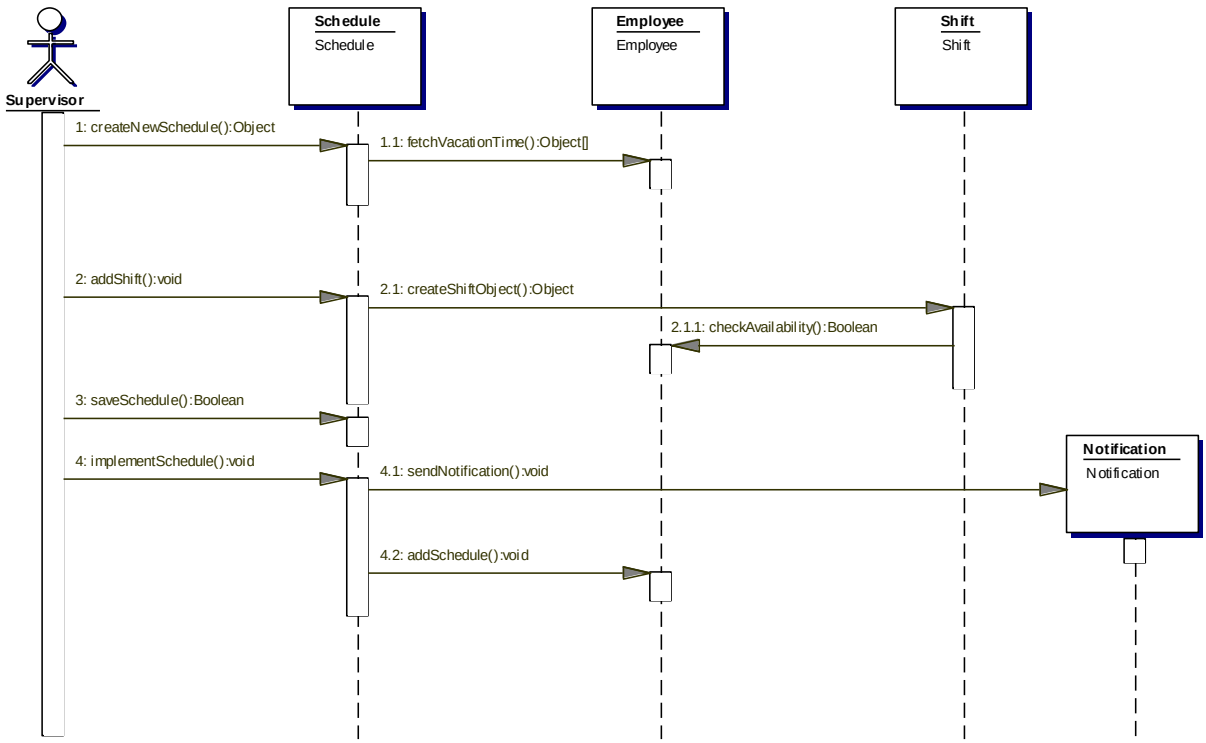

Figure 13.1: **New Schedule Creation Sequence Diagram**
A representation of the proper sequence in creating a new schedule

13.2 Request Shift Change Sequence Diagram

Request Shift-Change

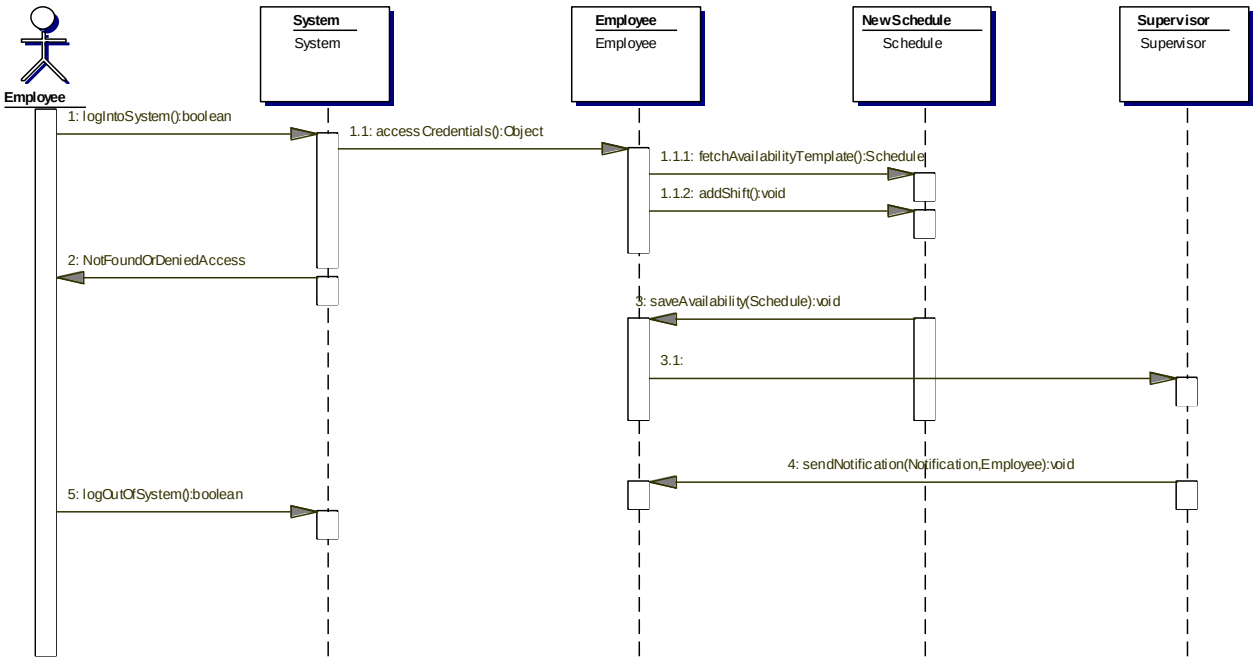

Figure 13.2: **Request Shift Change Sequence Diagram**
A representation of the proper sequence in requesting a shift change

13.3 Viewing Schedule Sequence Diagram

ViewWorkgroup Schedule

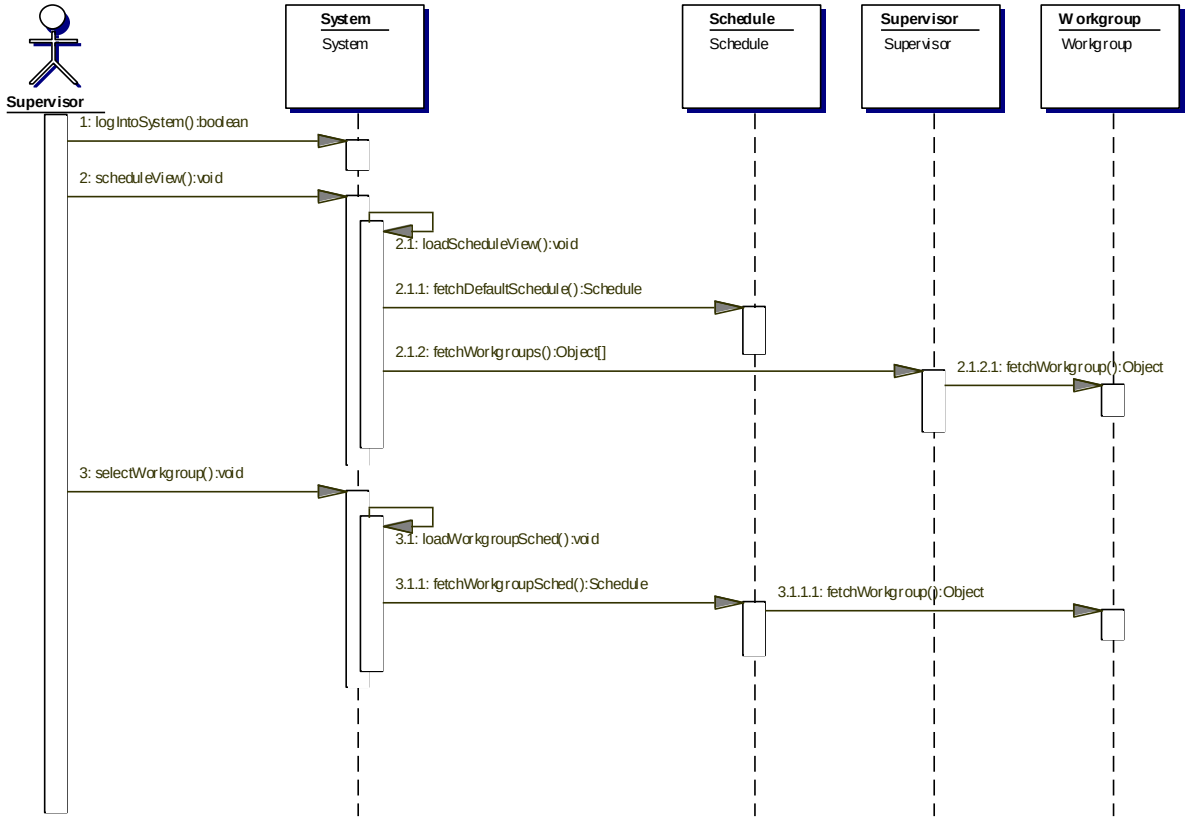

Figure 13.3: **Viewing Schedule Sequence Diagram**
A representation of the proper sequence for viewing a schedule

13.4 Book Days Off Sequence Diagram

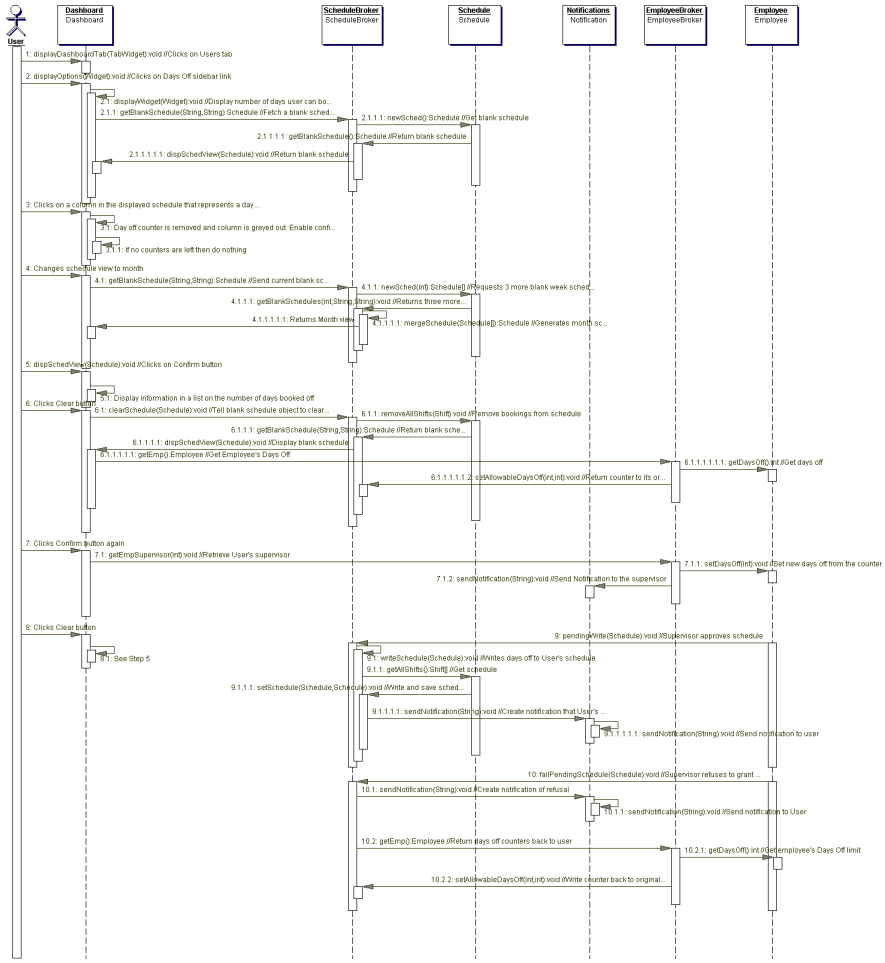

Figure 13.4: **Book Days Off Sequence Diagram**
A representation of the proper sequence for booking days off

13.5 Administrative Schedule Viewing Sequence Diagram

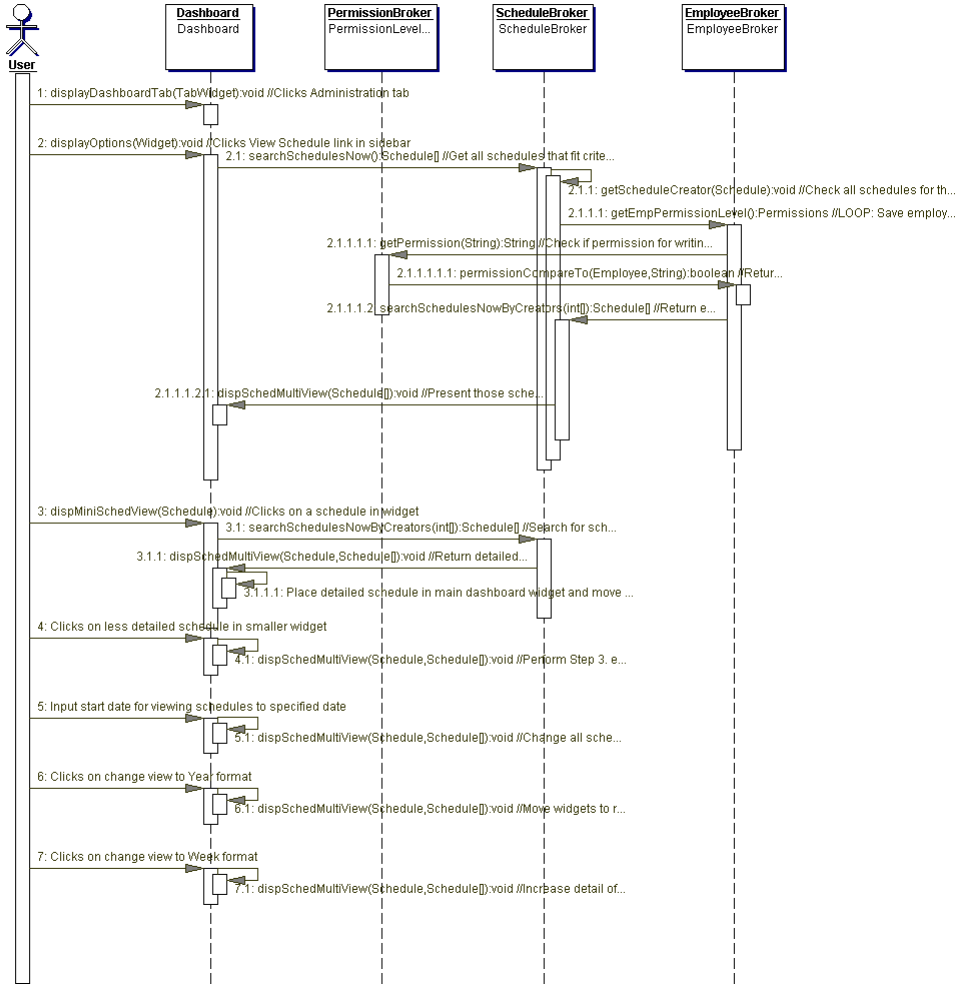

Figure 13.5: **Administrative Schedule Viewing Sequence Diagram**
A representation of the proper sequence for a manager or authoritative employee to view multiple schedules

13.6 Request Shift Change Sequence Diagram

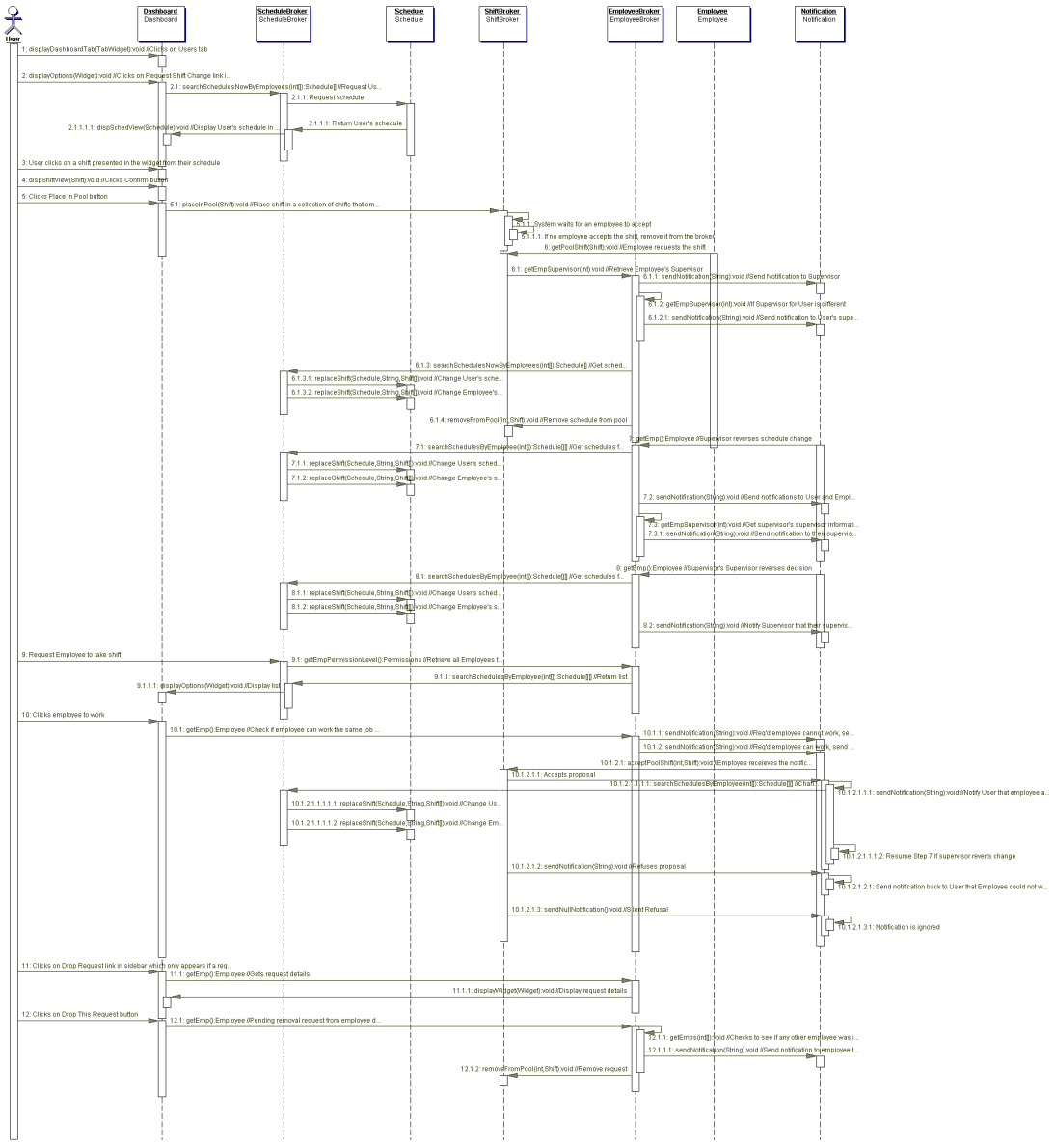

Figure 13.6: **Request Shift Change Sequence Diagram**
A representation of the proper sequence for changing a shift with another employee

13.7 Update Availability Sequence Diagram

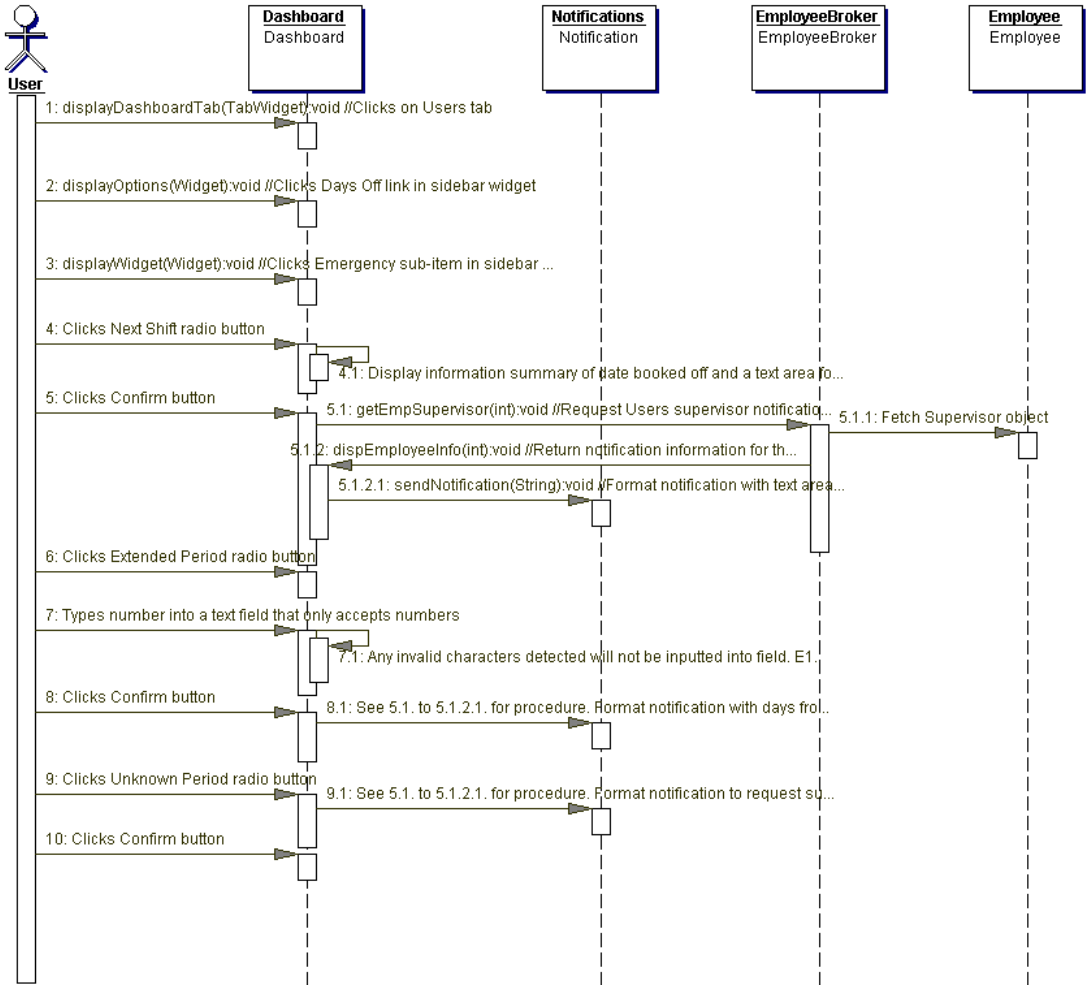

Figure 13.7: **Update Availability Sequence Diagram**
A representation of the proper sequence for updating an Employee‘s availability

13.8 Access Schedule Sequence Diagram

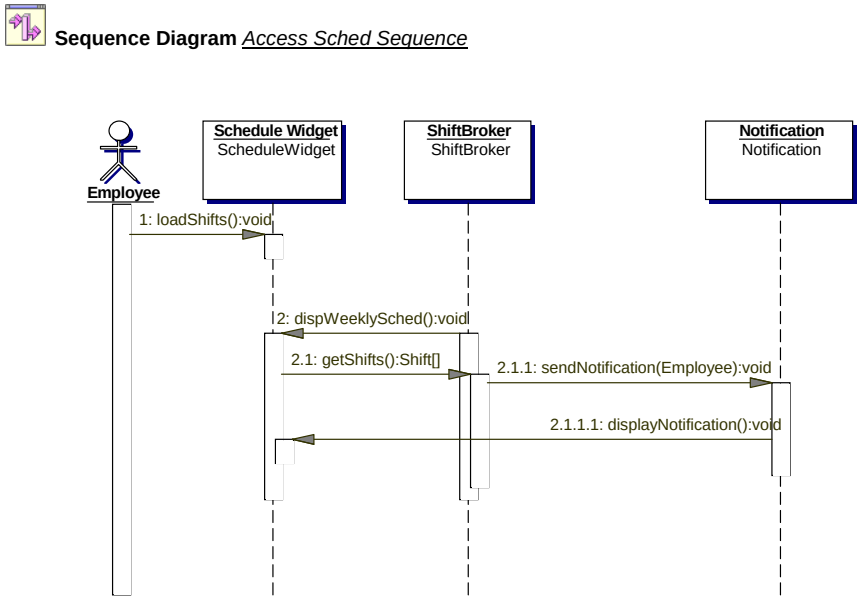

Figure 13.8: **Access Schedule Sequence Diagram**
A representation of the proper sequence for accessing an Employee's Schedule

13.9 Add Supervisor Sequence Diagram

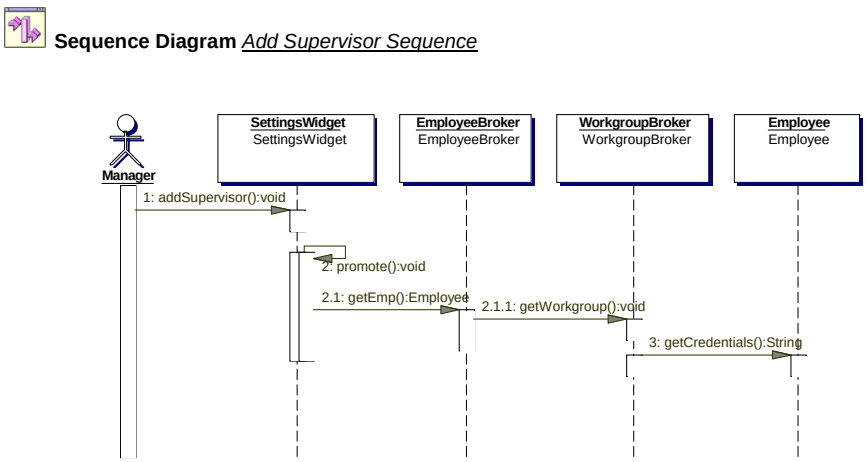

Figure 13.9: **Add Supervisor Sequence Diagram**
A representation of the proper sequence for creating an employee with supervisor permissions

13.10 Create Employee Type Sequence Diagram

Sequence Diagram *Create Emp Type Sequence*

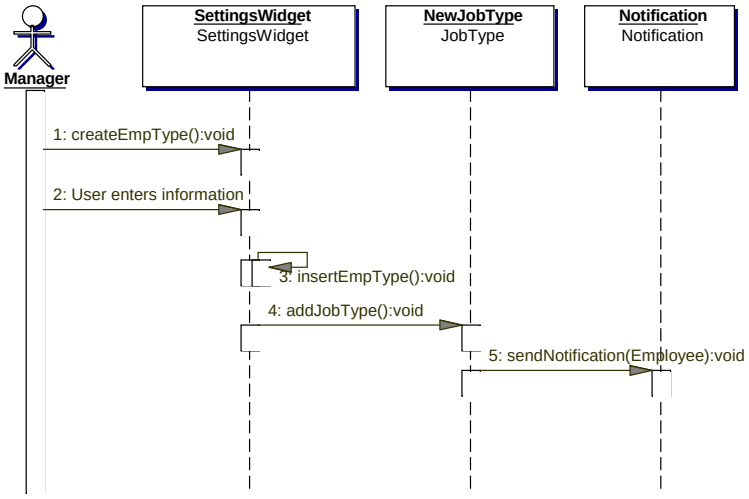

Figure 13.10: **Create Employee Type Sequence Diagram**
A representation of the proper sequence for creating an employee to work a specific job

13.11 Create New Employee Sequence Diagram

Sequence Diagram *Create New Schedule*

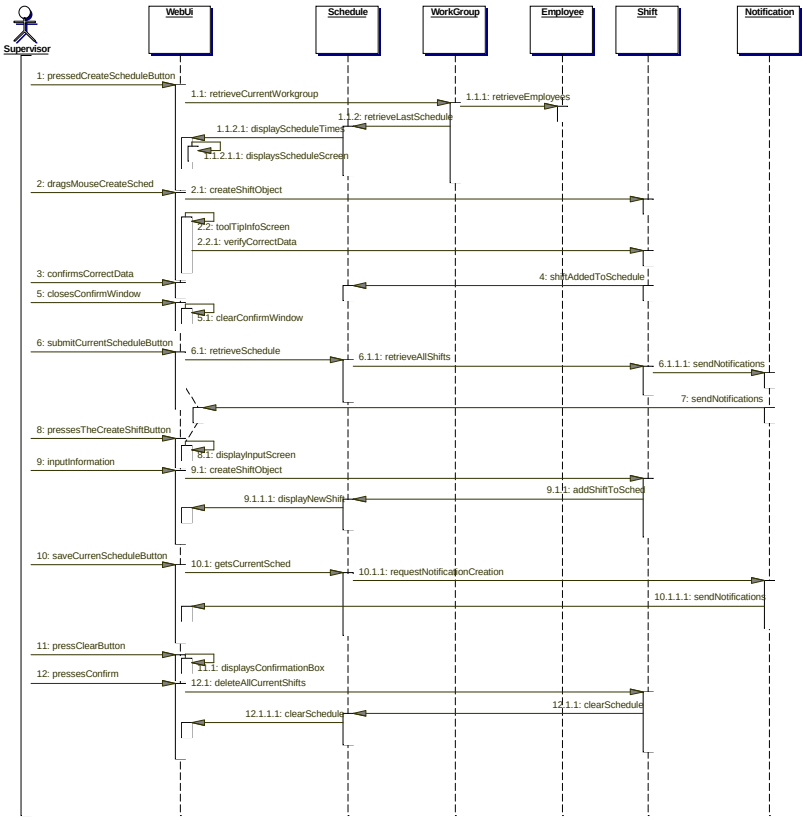

Figure 13.11: **Create New Employee Sequence Diagram**
A representation of the proper sequence for creating a new employee

13.12 Distribute Report Schedule Sequence Diagram

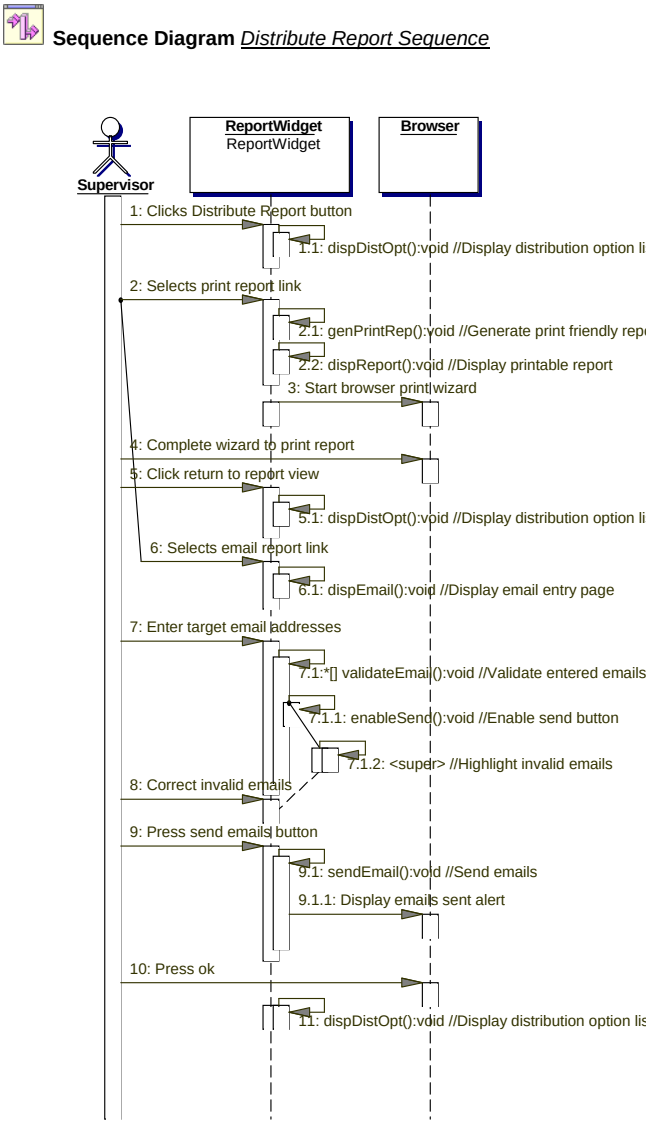

Figure 13.12: **Distribute Report Sequence Diagram**
A representation of the proper sequence for distributing reports that are created

13.13 Generate Report Schedule Sequence Diagram

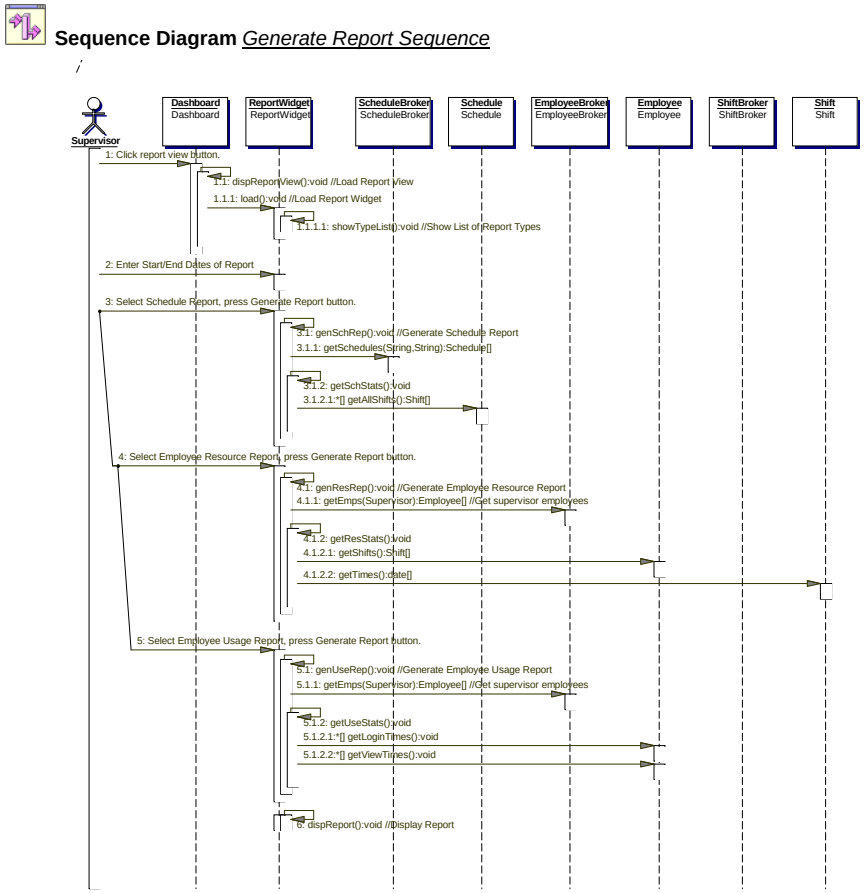

Figure 13.13: **Generate Report Schedule Sequence Diagram**
A representation of the proper sequence for generating reports

13.14 System Log In Sequence Diagram

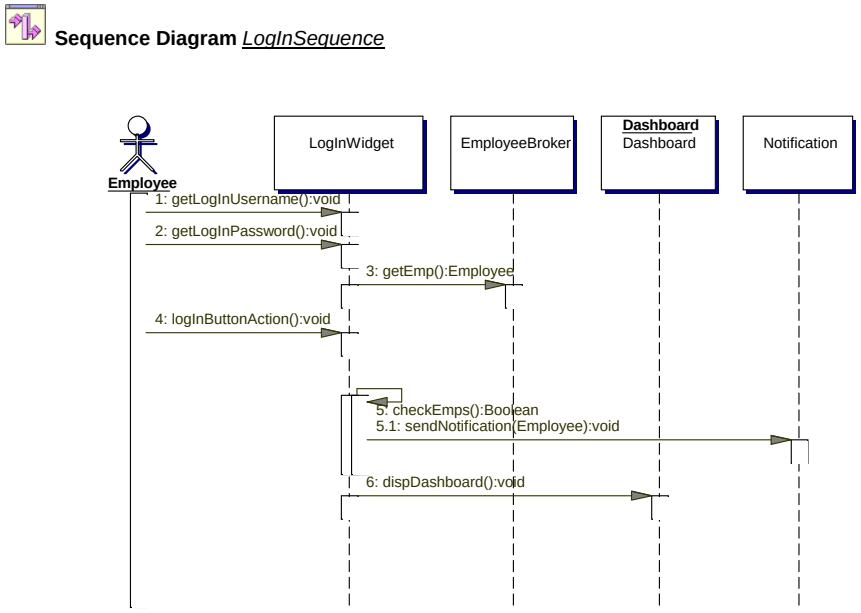

Figure 13.14: **System Log In Sequence Diagram**
A representation of the proper sequence for logging into the system

13.15 Maintain Workgroup Sequence Diagram

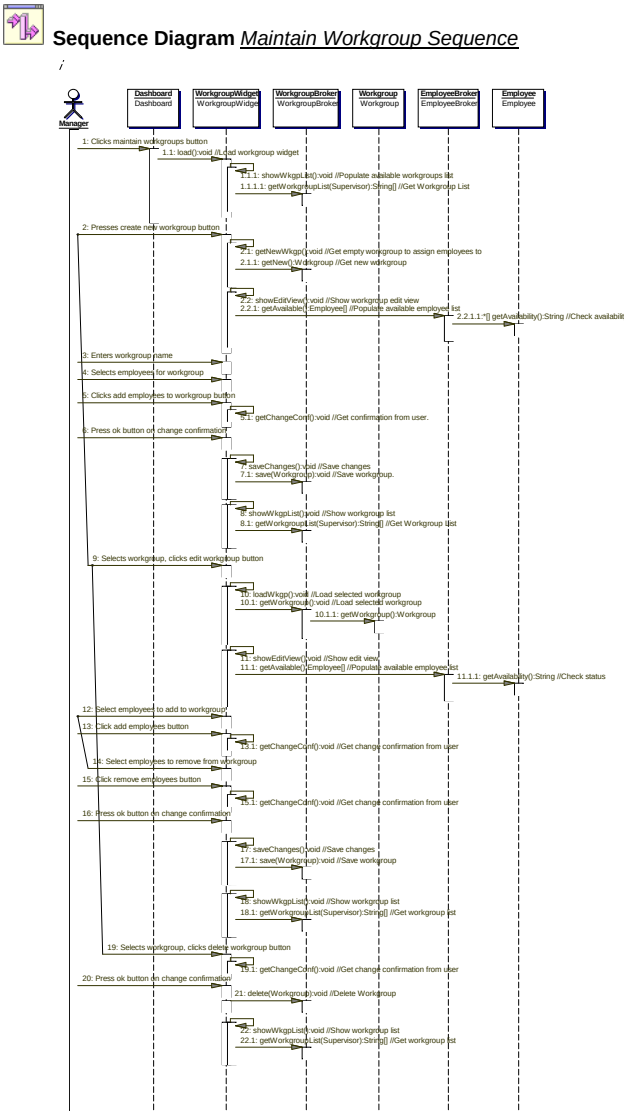

Figure 13.15: **Maintain Workgroup Sequence Diagram**
A representation of the proper sequence for editing workgroups to the desired situation

13.16 Maintain Employee Sequence Diagram

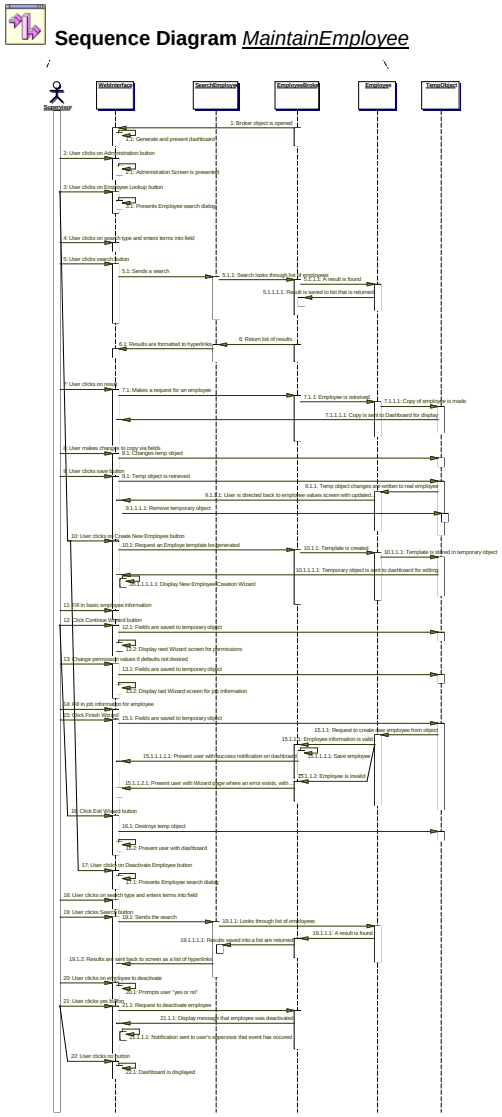

Figure 13.16: **Maintain Employee Sequence Diagram**
A representation of the proper sequence for editing an employee to the desired situation

13.17 Review Request Sequence Diagram

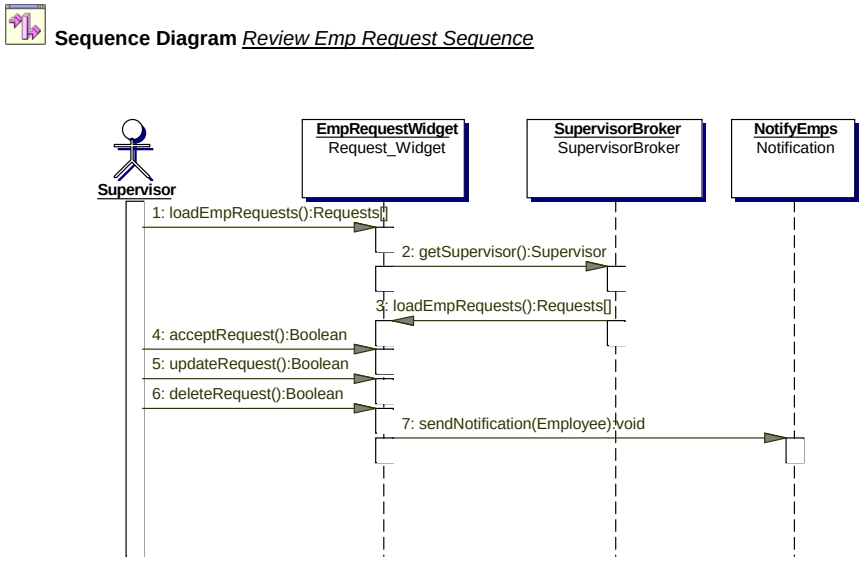

Figure 13.17: **Review Request Sequence Diagram**
A representation of the proper sequence for reviewing an employee request by an authoritative employee

13.18 Send Event Sequence Diagram

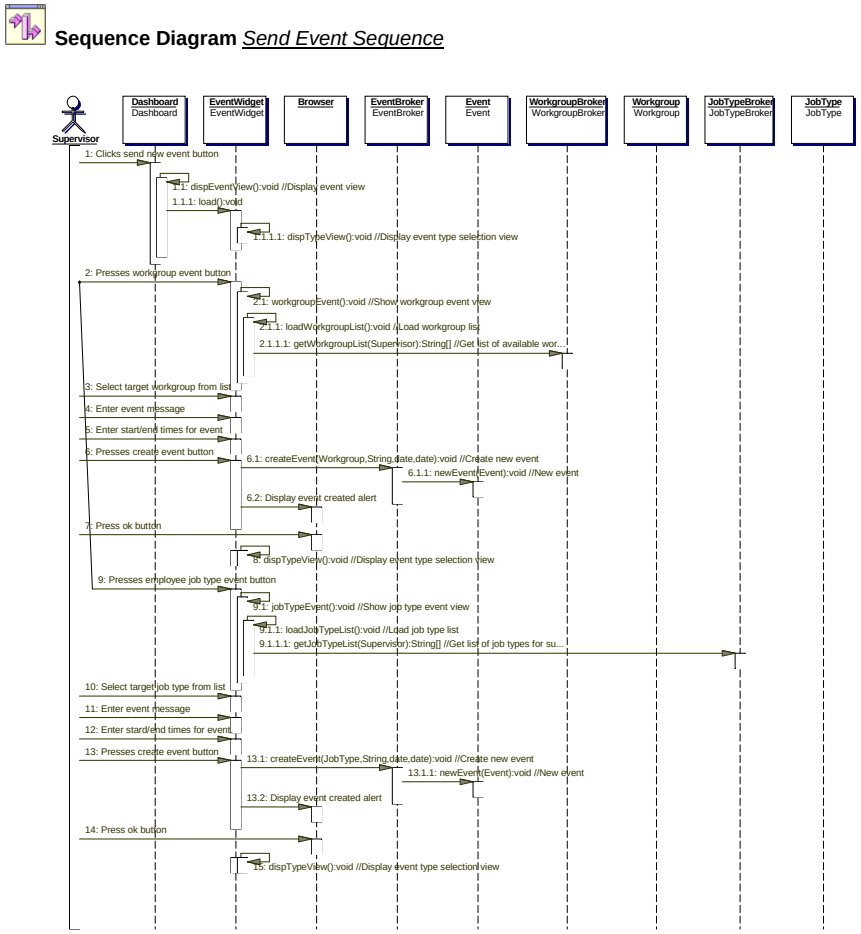

Figure 13.18: **Send Event Sequence Diagram**
A representation of the proper sequence for posting an event that certain groups of employees will see

13.19 Book Days Off Sequence Diagram

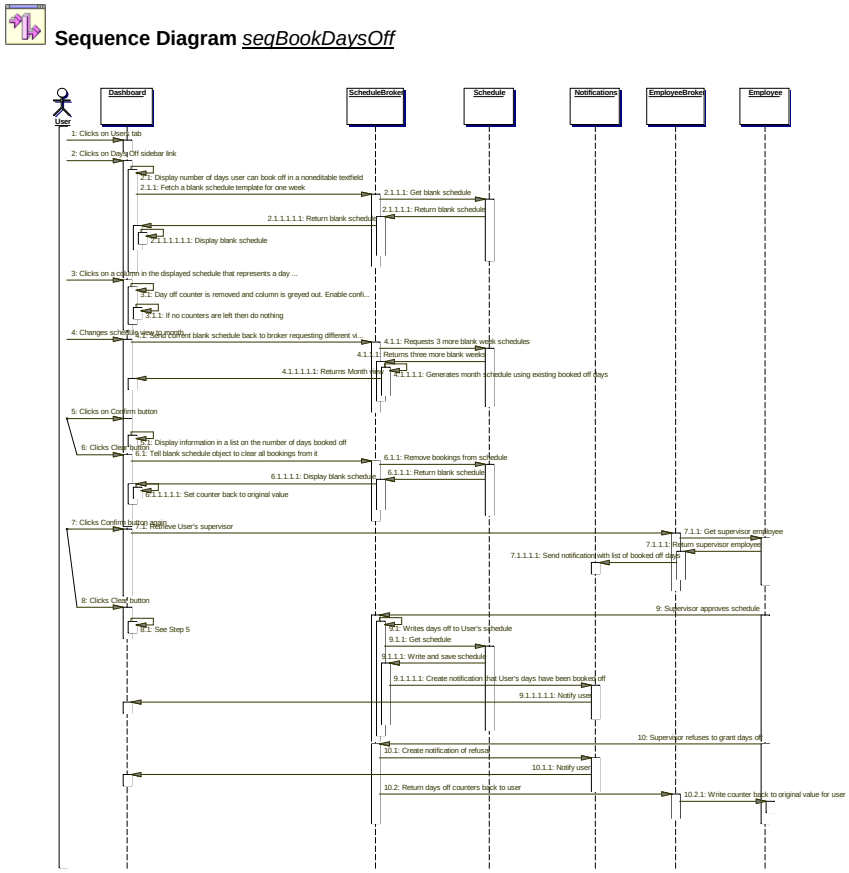

Figure 13.19: **Book Days Off Sequence Diagram**
A representation of the proper sequence for an employee to reduce working days in their schedule

13.20 Manager View Schedules Sequence Diagram

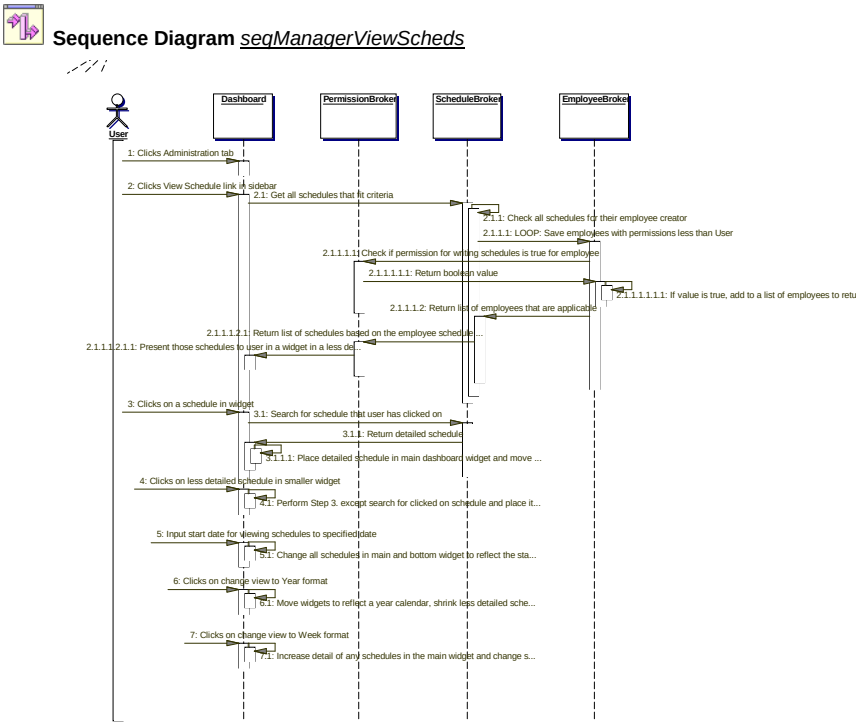

Figure 13.20: **Manager View Schedules Sequence Diagram**
A representation of the proper sequence for a Manager to view multiple schedules at one time

13.21 Request Shift Change Sequence Diagram

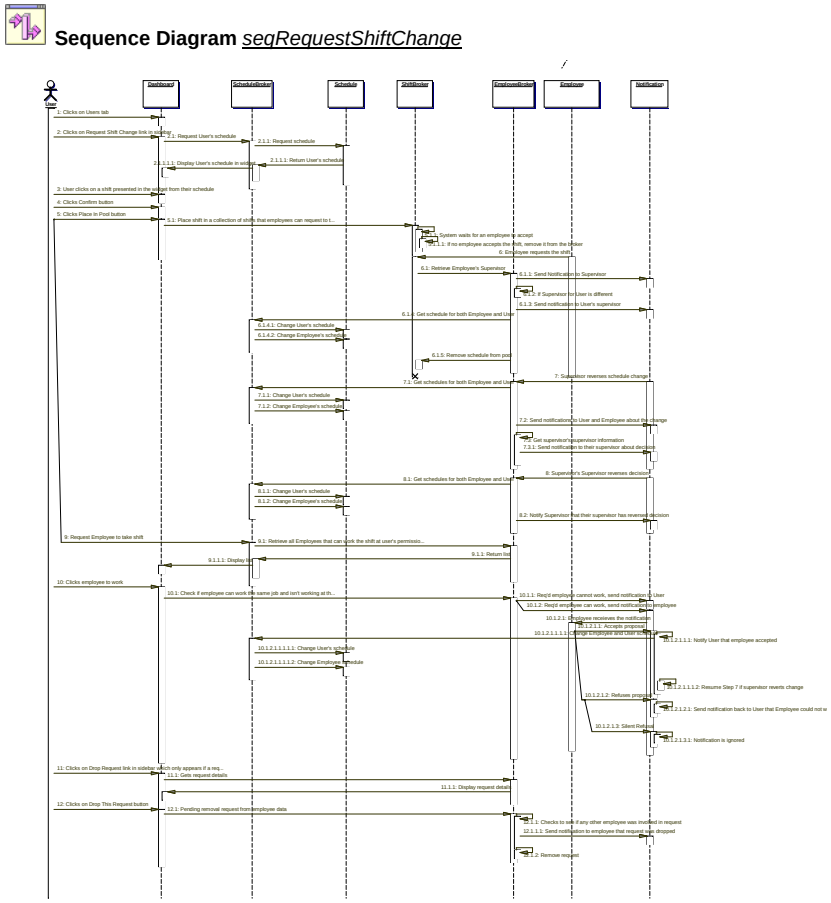

Figure 13.21: **Request Shift Change Sequence Diagram**
A representation of the proper sequence for requesting another user to take or exchange shifts with

13.22 Update Availability Sequence Diagram

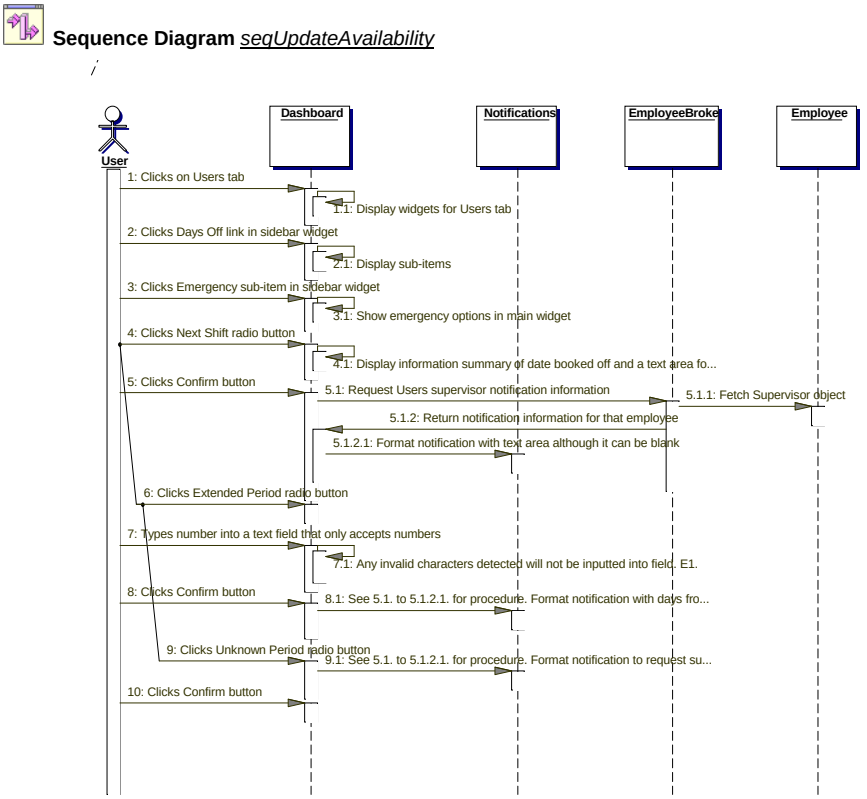

Figure 13.22: **Update Availability Sequence Diagram**
A representation of the proper sequence for changing an employee‘s available work times

13.23 Send Emergency Notification Sequence Diagram

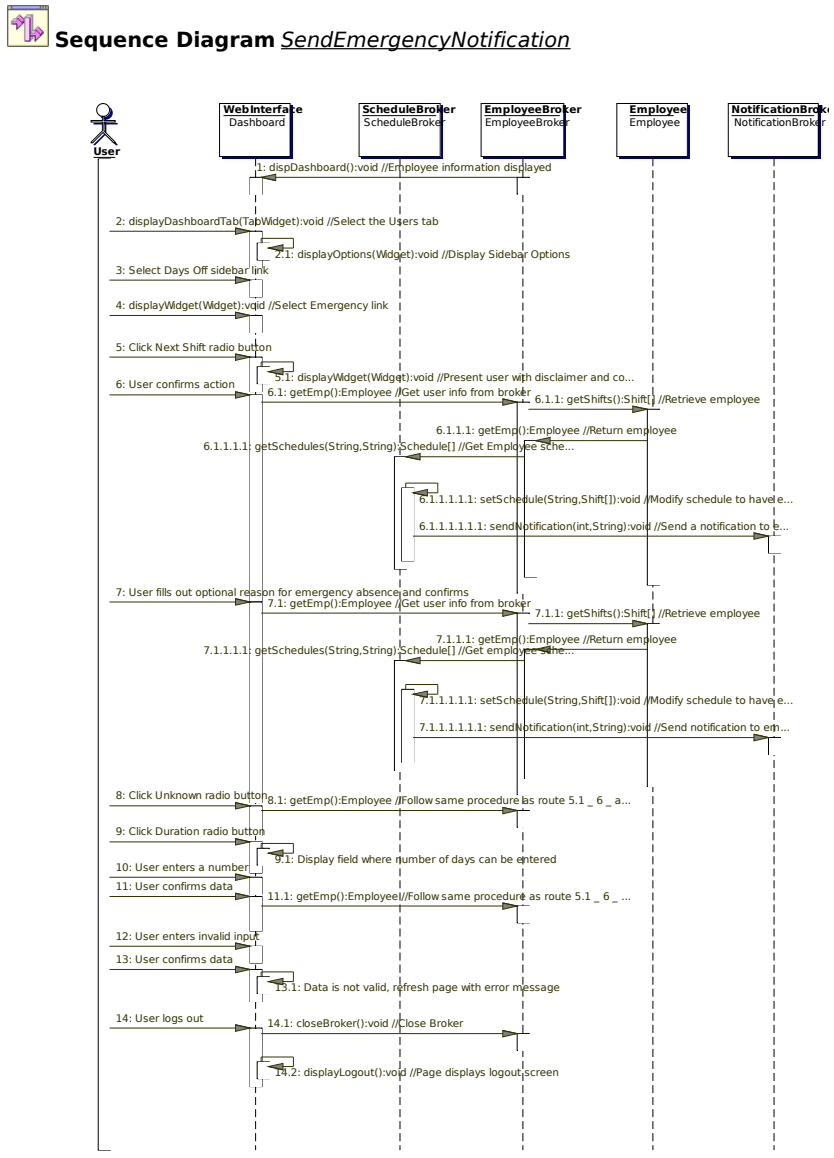

Figure 13.23: **Send Emergency Notification Sequence Diagram**
A representation of the proper sequence for handling emergencies that prevent employee‘s presence at work

13.24 View Workgroup Schedule Sequence Diagram

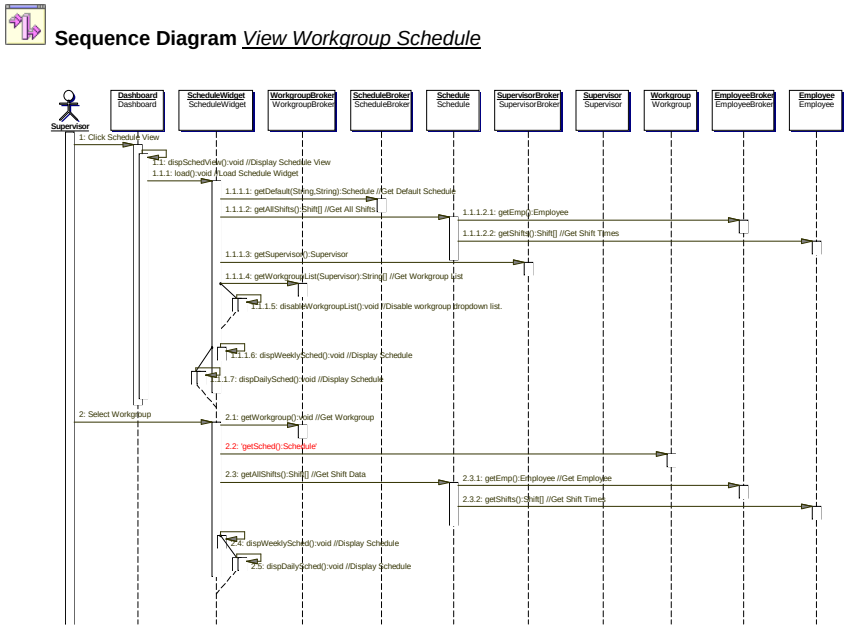

Figure 13.24: **View Workgroup Schedule Sequence Diagram**
A representation of the proper sequence for viewing schedules of employees working for one job type

Chapter 14

Data Dictionary

14.1 Interface Dictionary

Class Detail

Class *Dashboard*

package: **Interface**

```
public class Dashboard
```

The main interface object of the system that provides access to all other main sections, such as schedule or report views. Available sections will be determined by the permissions of the employee that is currently logged in.

Method Summary	
public void	**dispDashboard**() Displays the dashboard itself.
public void	**dispEmployeeInfo**(int p0)
public void	**dispEventView**() Displays the report view, loading and displaying the Event Widget that allows new events to be created and sent to workgroups and job types.
public void	**displayDashboardTab**(TabWidget p0) Displays a Tab widget, a larger widget that contains a main widget area that does not interfere with other widget's main areas
public void	**displayLogout**() Logs user out along with displaying the page they are directed to after logging out from their dashboard.
public void	**displayOptions**(Widget p0) Displays relevant options in the sidebar widget, related tasks based on the main widget.
public void	**displayWidget**(Widget p0) Displays a widget set by the method in the main widget area
public void	**dispMiniSchedView**(Schedule p0) Displays a schedule in a view that based on colours in a week/month/year form so that an understanding of shift intensity and employee density can be understood.
public void	**dispReportView**() Displays the report view, loading and displaying the Report Widget that provides all report functionality.
public void	**dispSchedMultiView**(Schedule p0, Schedule[] p1) Displays the standalone schedule parameter in a detailed form in a larger widget with the rest seen as smaller simple view widgets.
public void	**dispSchedMultiView**(Schedule[] p0) Displays an array of schedules in a multi-view.
public void	**dispSchedView**() Displays the report view, loading and displaying the expanded version of the Schedule Widget that provides all functionality for managing schedules.
public void	**dispSchedView**(Schedule p0) Displays a specific schedule in the main widget
public void	**dispShiftView**(Shift p0) Displays a detailed view of a shift's properties

Method Detail

dispDashboard

```
public void dispDashboard()
```

Displays the dashboard itself.

dispEmployeeInfo

```
public void dispEmployeeInfo(int p0)
```

---

dispEventView

```
public void dispEventView()
```

Displays the report view, loading and displaying the Event Widget that allows new events to be created and sent to workgroups and job types.

---

displayDashboardTab

```
public void displayDashboardTab(TabWidget p0)
```

Displays a Tab widget, a larger widget that contains a main widget area that does not interfere with other widget's main areas

---

displayLogout

```
public void displayLogout()
```

Logs user out along with displaying the page they are directed to after logging out from their dashboard.

---

displayOptions

```
public void displayOptions(Widget p0)
```

Displays relevant options in the sidebar widget, related tasks based on the main widget.

---

displayWidget

```
public void displayWidget(Widget p0)
```

Displays a widget set by the method in the main widget area

---

dispMiniSchedView

```
public void dispMiniSchedView(Schedule p0)
```

Displays a schedule in a view that based on colours in a week/month/year form so that an understanding of shift intensity and employee density can be understood.

---

dispReportView

```
public void dispReportView()
```

Displays the report view, loading and displaying the Report Widget that provides all report functionality.

---

dispSchedMultiView

```
public void dispSchedMultiView(Schedule p0, Schedule[] p1)
```

Displays the standalone schedule parameter in a detailed form in a larger widget with the rest seen as smaller simple view widgets.

---

dispSchedMultiView

```
public void dispSchedMultiView(Schedule[] p0)
```

Displays an array of schedules in a multi-view. All schedules are in a mini-view, a small widget that displays a simple overview of what the schedule contains.

---

dispSchedView

public void dispSchedView()

Displays the report view, loading and displaying the expanded version of the Schedule Widget that provides all functionality for managing schedules.

---

dispSchedView

public void dispSchedView(Schedule p0)

Displays a specific schedule in the main widget

---

dispShiftView

public void dispShiftView(Shift p0)

Displays a detailed view of a shift's properties

Class *EventWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.EventWidget
```

public class EventWidget

Extends:

Interface.Widget

Provides the user interface for creating and managing events that exist within the system.

Method Summary	
public void	**dispTypeView**() Displays a list of available event types, allowing the user to choose what type of event they wish to create.
public void	**jobTypeEvent**() Creates a new event that will be sent to all employees within a specific job type.
public void	**loadJobTypeList**() Loads a list of all available job types that the supervisor has access to, allowing them to choose what job type they want the event to be sent to.
public void	**loadWorkgroupList**() Loads a list of all available workgroups that the supervisor has access to, allowing them to choose what workgroup they want the event to be sent to.
public void	**workgroupEvent**() Creates a new event that will be sent to all employees within a specific workgroup.

Method Detail

dispTypeView

public void dispTypeView()

Displays a list of available event types, allowing the user to choose what type of event they wish to create.

---

jobTypeEvent

public void jobTypeEvent()

Creates a new event that will be sent to all employees within a specific job type.

loadJobTypeList

public void loadJobTypeList()

Loads a list of all available job types that the supervisor has access to, allowing them to choose what job type they want the event to be sent to.

loadWorkgroupList

public void loadWorkgroupList()

Loads a list of all available workgroups that the supervisor has access to, allowing them to choose what workgroup they want the event to be sent to.

workgroupEvent

public void workgroupEvent()

Creates a new event that will be sent to all employees within a specific workgroup.

Class *LogInWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.LogInWidget
```

public class LogInWidget

Extends:

Interface.Widget

Provides the user interface that will verify employee credentials and provides access to the system.

Method Summary	
public Boolean	**checkEmps**() Verifies the given username and password by checking it against employees that currently exist within the system.
public void	**getLogInPassword**() Retrieves the password that was entered by the user.
public void	**getLogInUsername**() Retrieves the username that was entered by the user.
public void	**logInButtonAction**() Activates when the the log in button is clicked by the user, initiating validation procedures.

Method Detail

checkEmps

public Boolean checkEmps()

Verifies the given username and password by checking it against employees that currently exist within the system.

getLogInPassword

public void getLogInPassword()

Retrieves the password that was entered by the user.

getLogInUsername

public void getLogInUsername()

Retrieves the username that was entered by the user.

---

logInButtonAction

public void logInButtonAction()

Activates when the the log in button is clicked by the user, initiating validation procedures.

Class *ReportWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.ReportWidget
```

```
public class ReportWidget
```

Extends:

Interface.Widget

Provides the user interface for distributing and managing events that exist within the system.

Method Summary	
public void	**dispDistOpt**() Display options for distributing a report after it has been generated.
public void	**dispEmail**() Displays the email entry page where the user may enter whih emails the report should be sent to.
public void	**dispReport**() Displays a report after it has been generated.
public void	**enableSend**() Enables the send button so that reports can be sent to the entered email address.
public void	**genPrintRep**() Generates the print-friendly version of a currently displayed report.
public void	**genResRep**() Generates a resource report.
public void	**genSchRep**() Generates a schedule report.
public void	**genUseRep**() Generates an employee usage report.
public void	**getResStats**() Collects resource statistics as part of generating a resource report.
public void	**getSchStats**() Collects schedule statistics as part of generating a schedule report.
public void	**getUseStats**() Collects usage statistics as part of generating an employee usage report.
public void	**initPrint**() Initializes the print wizard of the browser that is currently being used to report.
public void	**sendEmail**() Sends the report to the target emails.
public void	**showTypeList**() Shows a list allowing the user to choose what type of report they wish to generate.

Method Summary	
public void	**validateEmail**() Validates entered emails ensuring they are properly formated before trying to send emails to them.

Method Detail

dispDistOpt

public void dispDistOpt()

Display options for distributing a report after it has been generated.

---

dispEmail

public void dispEmail()

Displays the email entry page where the user may enter whih emails the report should be sent to.

---

dispReport

public void dispReport()

Displays a report after it has been generated.

---

enableSend

public void enableSend()

Enables the send button so that reports can be sent to the entered email address. This will only be possible after the entered emails have been validated

---

genPrintRep

public void genPrintRep()

Generates the print-friendly version of a currently displayed report.

---

genResRep

public void genResRep()

Generates a resource report.

---

genSchRep

public void genSchRep()

Generates a schedule report.

---

genUseRep

public void genUseRep()

Generates an employee usage report.

---

getResStats

public void getResStats()

Collects resource statistics as part of generating a resource report.

---

getSchStats

public `void` `getSchStats()`

Collects schedule statistics as part of generating a schedule report.

---

getUseStats

public `void` `getUseStats()`

Collects usage statistics as part of generating an employee usage report.

---

initPrint

public `void` `initPrint()`

Initializes the print wizard of the browser that is currently being used to report.

---

sendEmail

public `void` `sendEmail()`

Sends the report to the target emails.

---

showTypeList

public `void` `showTypeList()`

Shows a list allowing the user to choose what type of report they wish to generate.

---

validateEmail

public `void` `validateEmail()`

Validates entered emails ensuring they are properly formated before trying to send emails to them.

Class *Request_Widget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.Request_Widget
```

```
public class Request_Widget
```

Extends:

Interface.Widget

Provides the user interface that employees will use to send requests to their supervisor, and will also be used by supervisors to manage any requests they have received.

Method Summary	
public `Boolean`	**`acceptRequest`**`()` Accepts a selected request, notifying the employee of the decision.
public `Boolean`	**`deleteRequest`**`()` Deletes a selected request.
public `Requests[]`	**`loadEmpRequests`**`()` Gets the list of all current requests that have been sent by employees.

Method Summary	
public Boolean	**updateRequest**() Updates a request, allowing notifications to be sent to the requestee that

Method Detail

acceptRequest

public Boolean acceptRequest()

Accepts a selected request, notifying the employee of the decision.

---

deleteRequest

public Boolean deleteRequest()

Deletes a selected request. This is equivalent to rejecting a request, and the employee that sent it will be notified accordingly.

---

loadEmpRequests

public Requests[] loadEmpRequests()

Gets the list of all current requests that have been sent by employees.

---

updateRequest

public Boolean updateRequest()

Updates a request, allowing notifications to be sent to the requestee that

Class *ScheduleWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.ScheduleWidget
```

```
public class ScheduleWidget
```

Extends:

Interface.Widget

Provides the user interface for creating and managing schedules that exist within the system.

Method Summary	
public void	**disableWorkgroupList**() Disables the workgroup list, used when there are no custom workgroups that can be accessed.
public void	**dispDailySched**() Displays the schedule in a daily format.
public void	**displayNotification**()
public void	**dispWeeklySched**() Displays the schedule in a weekly format.
public void	**loadShifts**() Loads all shifts that are contained within a given schedule.

Method Detail

disableWorkgroupList

public void disableWorkgroupList()

Disables the workgroup list, used when there are no custom workgroups that can be accessed.

---

dispDailySched

public void dispDailySched()

Displays the schedule in a daily format.

---

displayNotification

public void displayNotification()

---

dispWeeklySched

public void dispWeeklySched()

Displays the schedule in a weekly format.

---

loadShifts

public void loadShifts()

Loads all shifts that are contained within a given schedule.

Class *SettingsWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.SettingsWidget
```

public class SettingsWidget

Extends:

Interface.Widget

Provides the user interface that will be used to change employee specific permission settings.

Method Summary	
public void	**addSupervisor**() Adds an employee as a supervisor within the system, and sets their permissions accordingly.
public void	**createEmpType**() Creates a new employee type, which can then be applied to any employees within the system.
public void	**insertEmpType**() Inserts a new employee type, based off of data from outside the system.
public void	**promote**() Increases an employees permission level.

Method Detail

addSupervisor

public `void` `addSupervisor()`

Adds an employee as a supervisor within the system, and sets their permissions accordingly.

---

createEmpType

public `void` `createEmpType()`

Creates a new employee type, which can then be applied to any employees within the system.

---

insertEmpType

public `void` `insertEmpType()`

Inserts a new employee type, based off of data from outside the system.

---

promote

public `void` `promote()`

Increases an employees permission level.

Class *TabWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.TabWidget
```

`public class TabWidget`

Extends:

Interface.Widget

A widget that can be used in the dashboard as a tab, that when clicked, will switch the currently displayed widget to the selected one.

Class *Widget*

package: **Interface**

`public abstract class Widget`

Implements:

Interface.WidgetInterface

Default widget that can not itself be loaded, but must be extended by all other widgets so that they all contain the same base functionality.

Method Summary	
public `void`	**`load`**`()` Creates a new widget instance and allows it to be referenced and displayed.
public `void`	**`unload`**`()` Removes a widget from the system, releasing all resources it is using and saving any related data.

Method Detail

load

public void load()

Creates a new widget instance and allows it to be referenced and displayed.

---

unload

public void unload()

Removes a widget from the system, releasing all resources it is using and saving any related data.

Class *WorkgroupWidget*

package: **Interface**

```
Interface.Widget
  |
  +--Interface.WorkgroupWidget
```

```
public class WorkgroupWidget
```

Extends:

Interface.Widget

Provides the user interface for creating and managing workgroups that exist within the system.

Method Summary	
public void	**getChangeConf**() Gets confirmation from the user before applying a specific change, such as deleting a workgroup, or saving changes after a workgroup has been edited.
public void	**getNewWkgp**() Fetches a new workgroup through the broker, and makes it available in the edit view for available employees to be added to it.
public void	**loadWkgp**() Loads a selected workgroup so that it can be edited.
public void	**saveChanges**() Saves all changes to the currently viewed workgroup to the database.
public void	**showEditView**() Shows the edit workgroup view, used to add or remove employees from a workgroup.
public void	**showWkgpList**() Shows a list of all available workgroups that can be edited or deleted by the supervisor.

Method Detail

getChangeConf

public void getChangeConf()

Gets confirmation from the user before applying a specific change, such as deleting a workgroup, or saving changes after a workgroup has been edited.

---

getNewWkgp

public void getNewWkgp()

Fetches a new workgroup through the broker, and makes it available in the edit view for available employees to be added to it.

---

loadWkgp

public void loadWkgp()

Loads a selected workgroup so that it can be edited.

---

saveChanges

public void saveChanges()

Saves all changes to the currently viewed workgroup to the database.

---

showEditView

public void showEditView()

Shows the edit workgroup view, used to add or remove employees from a workgroup.

---

showWkgpList

public void showWkgpList()

Shows a list of all available workgroups that can be edited or deleted by the supervisor.

Interface Detail

Interface *WidgetInterface*

package: **Interface**

All Known Implementing Classes:

Widget

```
public interface WidgetInterface
```

Interface object that determines what methods all widgets must have in the system.

Method Summary	
public void	**load**() Creates a new widget instance and allows it to be referenced and displayed.
public void	**unload**() Removes a widget from the system, releasing all resources it is using and saving any related data.

Method Detail

load

public void load()

Creates a new widget instance and allows it to be referenced and displayed.

---

unload

public void unload()

Removes a widget from the system, releasing all resources it is using and saving any related data.

Class Detail

Class *Dashboard*

package: **Interface**

```
public class Dashboard
```

The main interface object of the system that provides access to all other main sections, such as schedule or report views. Available sections will be determined by the permissions of the employee that is currently logged in.

Method Summary	
public void	**dispDashboard**() Displays the dashboard itself.
public void	**dispEmployeeInfo**(int p0)
public void	**dispEventView**() Displays the report view, loading and displaying the Event Widget that allows new events to be created and sent to workgroups and job types.
public void	**displayDashboardTab**(TabWidget p0) Displays a Tab widget, a larger widget that contains a main widget area that does not interfere with other widget's main areas
public void	**displayLogout**() Logs user out along with displaying the page they are directed to after logging out from their dashboard.
public void	**displayOptions**(Widget p0) Displays relevant options in the sidebar widget, related tasks based on the main widget.
public void	**displayWidget**(Widget p0) Displays a widget set by the method in the main widget area
public void	**dispMiniSchedView**(Schedule p0) Displays a schedule in a view that based on colours in a week/month/year form so that an understanding of shift intensity and employee density can be understood.
public void	**dispReportView**() Displays the report view, loading and displaying the Report Widget that provides all report functionality.
public void	**dispSchedMultiView**(Schedule p0, Schedule[] p1) Displays the standalone schedule parameter in a detailed form in a larger widget with the rest seen as smaller simple view widgets.
public void	**dispSchedMultiView**(Schedule[] p0) Displays an array of schedules in a multi-view.
public void	**dispSchedView**() Displays the report view, loading and displaying the expanded version of the Schedule Widget that provides all functionality for managing schedules.
public void	**dispSchedView**(Schedule p0) Displays a specific schedule in the main widget
public void	**dispShiftView**(Shift p0) Displays a detailed view of a shift's properties

Method Detail

dispDashboard

```
public void dispDashboard()
```

Displays the dashboard itself.

14.2 Persistence

Class Detail

Class *EmployeeBroker*

package: **Persistance**

```
public class EmployeeBroker
```

Provides functionality for accessing employee data from the database.

Method Summary	
public `void`	**`closeBroker`**`()` Writes or discards any pending or temporary data, refuses any method calls to acess the object's methods.
public `Employee[]`	**`getAvailable`**`()` Gets a collection of all employees that work under a given supervisor, limited only to those who are currently available to be assigned to new shifts.
public `Employee`	**`getEmp`**`()` Gets an employee object from the database.
public `int`	**`getEmpPermissionLevel`**`()`
public `void`	**`getEmps`**`(int[] p0)` Get an array of employees using their id numbers in an array as parameters.
public `Employee[]`	**`getEmps`**`(Supervisor supervisor)` Gets a collection of all employees that are currently working under a given supervisor.
public `void`	**`getEmpSupervisor`**`(int p0)` Get the supervisor of the employee with id as the parameter.
public `boolean`	**`permissionCompareTo`**`(Employee p0, String p1)` Compares the current employee's permissions with another employee's permissions, returning the number of levels that user is above (+) or below (-), 0 if the same.

Method Detail

closeBroker

```
public void closeBroker()
```

Writes or discards any pending or temporary data, refuses any method calls to acess the object's methods.

---

getAvailable

```
public Employee[] getAvailable()
```

Gets a collection of all employees that work under a given supervisor, limited only to those who are currently available to be assigned to new shifts.

---

getEmp

```
public Employee getEmp()
```

Gets an employee object from the database.

---

getEmpPermissionLevel

```
public int getEmpPermissionLevel()
```

---

getEmps

public void getEmps(int[] p0)

Get an array of employees using their id numbers in an array as parameters.

---

getEmps

public Employee[] getEmps(Supervisor supervisor)

Gets a collection of all employees that are currently working under a given supervisor.

---

getEmpSupervisor

public void getEmpSupervisor(int p0)

Get the supervisor of the employee with id as the parameter.

---

permissionCompareTo

public boolean permissionCompareTo(Employee p0, String p1)

Compares the current employee's permissions with another employee's permissions, returning the number of levels that user is above (+) or below (-), 0 if the same. Note that permission levels can have variations on what is assigned.

Class *EventBroker*

package: **Persistance**

public class EventBroker

Provides functionality for accessing event data from the database.

Method Summary	
public void	**createEvent**(JobType type, String message, date start, date end) Creates an event that will apply to all employees within a specified job type.
public void	**createEvent**(Workgroup wrkgp, String message, date start, date end) Creates an event that will apply to all employees within a specified workgroup.

Method Detail

createEvent

public void createEvent(JobType type, String message, date start, date end)

Creates an event that will apply to all employees within a specified job type.

---

createEvent

public void createEvent(Workgroup wrkgp, String message, date start, date end)

Creates an event that will apply to all employees within a specified workgroup.

Class *JobTypeBroker*

package: **Persistance**

public class JobTypeBroker

Provides functionality for accessing job type data from the database.

Method Summary	
public String	**getJobTypeList**(Supervisor supervisor) Returns a list of all job types that currently exist within the system.

Method Detail

getJobTypeList

public String getJobTypeList(Supervisor supervisor)

Returns a list of all job types that currently exist within the system.

Class *NotificationBroker*

package: **Persistance**

```
public class NotificationBroker
```

Provides functionality for accessing notification data from the database.

Method Summary	
public void	**sendNotification**(int p0, String p1) Sends a basic notification with a message.

Method Detail

sendNotification

public void sendNotification(int p0, String p1)

Sends a basic notification with a message. This method will send a notification message to the recipients mailbox (determined by int employee id parameter) as well as a popup on their dashboard in the MessageWidget.

Class *PermissionSetBroker*

package: **Persistance**

```
public class PermissionSetBroker
```

Provides functionality for accessing permission set data from the database.

Method Summary	
public String	**getPermission**(String p0) Fetches a string detaling an employees permission set.

Method Detail

getPermission

public String getPermission(String p0)

Fetches a string detaling an employees permission set.

Class *ScheduleBroker*

package: **Persistance**

```
public class ScheduleBroker
```

Provides functionality for accessing schedule data from the database.

Method Summary	
public void	**clearSchedule**(Schedule p0) Clears a schedule by removing all shifts
private void	**failPendingSchedule**(Schedule p0) Schedule that is pending being written can be failed, so it will not be written.
public Schedule	**getBlankSchedule**()
public Schedule	**getBlankSchedule**(String p0, String p1) Returns a blank schedule using a start date and end date for length.
public void	**getBlankSchedules**(int p0, String p1, String p2) Returns an array of same-length blank schedules.
public Schedule	**getDefault**(String p0, String p1) Gets the default schedule for a specified date range for all employees that work under the supervisor.
public void	**getEditedSchedule**(int p0) Returns a schedule that is saved but not active.
public void	**getScheduleCreator**(Schedule p0) Get a schedule's creator from the schedule itself.
public Schedule	**getSchedules**(String startDate, String endDate) Gets a collection of all schedules that currently exist for the supervisor, limited to a given date range.
public Schedule	**mergeSchedule**(Schedule p0) Takes an array of schedules and adds the shifts of all into one, which is returned.
public void	**pendingAvailability**(Schedule p0) Send a schedule into pending state for a change in availability.
protected void	**pendingWrite**(Schedule p0) Send a schedule into pending mode so it will be written and can be retrieved.
public void	**saveScheduleAsEdit**(Schedule p0) Saves a schedule as an edited schedule.
public Schedule	**searchSchedulesByCreator**(int p0) Get all schedules created by employee from their id
public Schedule	**searchSchedulesByDate**(String p0) Returns all schedules that have a duration on the date specified.
public Schedule	**searchSchedulesByDate**(String p0, String p1) Returns all schedules that have a duration in between the dates specified.
public Schedule	**searchSchedulesByEmployee**(int p0) Returns all schedules from one employee
public Schedule	**searchSchedulesByEmployee**(int[] p0) Returns all schedules from all employees via their id
public Schedule	**searchSchedulesNow**() Returns all schedules that are active at the current date
public Schedule	**searchSchedulesNowByCreators**(int[] p0) Returns all the schedules that have been created by employees specified by their id that are active
public Schedule	**searchSchedulesNowByEmployees**(int[] p0) Returns all the schedules that are active that the following employee ids are involved in
public void	**setAllowableDaysOff**(int p0, int p1) Set the number of days off an employee can take
public void	**setAvailability**(Schedule p0)

Method Summary	
protected void	**setSchedule**(String p0, Shift[] p1) Sets the schedule for a certain day (the string param is a date) with the shift[] 's specified.
public void	**setSchedule**(Schedule p0, Schedule p1) Sets a schedules duration over the specified dates.
private void	**writeSchedule**(Schedule p0)

Method Detail

clearSchedule

public void clearSchedule(Schedule p0)

Clears a schedule by removing all shifts

---

failPendingSchedule

private void failPendingSchedule(Schedule p0)

Schedule that is pending being written can be failed, so it will not be written.

---

getBlankSchedule

public Schedule getBlankSchedule()

---

getBlankSchedule

public Schedule getBlankSchedule(String p0, String p1)

Returns a blank schedule using a start date and end date for length.

---

getBlankSchedules

public void getBlankSchedules(int p0, String p1, String p2)

Returns an array of same-length blank schedules.

---

getDefault

public Schedule getDefault(String p0, String p1)

Gets the default schedule for a specified date range for all employees that work under the supervisor.

---

getEditedSchedule

public void getEditedSchedule(int p0)

Returns a schedule that is saved but not active. Returns null if no edited schedule exists.

---

getScheduleCreator

public void getScheduleCreator(Schedule p0)

Get a schedule's creator from the schedule itself.

---

getSchedules

public Schedule getSchedules(String startDate, String endDate)

Gets a collection of all schedules that currently exist for the supervisor, limited to a given date range.

---

mergeSchedule

```
public Schedule mergeSchedule(Schedule p0)
```

Takes an array of schedules and adds the shifts of all into one, which is returned.

---

pendingAvailability

```
public void pendingAvailability(Schedule p0)
```

Send a schedule into pending state for a change in availability.

---

pendingWrite

```
protected void pendingWrite(Schedule p0)
```

Send a schedule into pending mode so it will be written and can be retrieved. Is not active yet even if written.

---

saveScheduleAsEdit

```
public void saveScheduleAsEdit(Schedule p0)
```

Saves a schedule as an edited schedule. Used in building blank schedules.

---

searchSchedulesByCreator

```
public Schedule searchSchedulesByCreator(int p0)
```

Get all schedules created by employee from their id

---

searchSchedulesByDate

```
public Schedule searchSchedulesByDate(String p0)
```

Returns all schedules that have a duration on the date specified.

---

searchSchedulesByDate

```
public Schedule searchSchedulesByDate(String p0, String p1)
```

Returns all schedules that have a duration in between the dates specified.

---

searchSchedulesByEmployee

```
public Schedule searchSchedulesByEmployee(int p0)
```

Returns all schedules from one employee

---

searchSchedulesByEmployee

```
public Schedule searchSchedulesByEmployee(int[] p0)
```

Returns all schedules from all employees via their id

---

searchSchedulesNow

```
public Schedule searchSchedulesNow()
```

Returns all schedules that are active at the current date

---

searchSchedulesNowByCreators

public `Schedule` `searchSchedulesNowByCreators(int[] p0)`

Returns all the schedules that have been created by employees specified by their id that are active

---

searchSchedulesNowByEmployees

public `Schedule` `searchSchedulesNowByEmployees(int[] p0)`

Returns all the schedules that are active that the following employee ids are involved in

---

setAllowableDaysOff

public `void` `setAllowableDaysOff(int p0, int p1)`

Set the number of days off an employee can take

---

setAvailability

public `void` `setAvailability(Schedule p0)`

---

setSchedule

protected `void` `setSchedule(String p0, Shift[] p1)`

Sets the schedule for a certain day (the string param is a date) with the shift[] 's specified.

---

setSchedule

public `void` `setSchedule(Schedule p0, Schedule p1)`

Sets a schedules duration over the specified dates. It is possible thatroom is left or cut off

---

writeSchedule

private `void` `writeSchedule(Schedule p0)`

Class *ShiftBroker*

package: **Persistance**

`public class ShiftBroker`

Provides functionality for accessing shift data from the database.

Method Summary	
public `void`	**`acceptPoolShift`**`(int p0, Shift p1)`
public `void`	**`getPoolShift`**`(Shift p0)` Gets a shift that is from the pool.
public `Shift[]`	**`getShifts`**`()` Gets a collection of all shifts that the logged in supervisor is responsible for.
public `void`	**`placeInPool`**`(Shift p0)` Places a shift into the pool.
public `void`	**`removeFromPool`**`(int p0, Shift p1)` Removes a shift that was placed in the pool into the pool.

Method Detail

acceptPoolShift

public `void acceptPoolShift(int p0, Shift p1)`

---

getPoolShift

public `void getPoolShift(Shift p0)`

Gets a shift that is from the pool.

---

getShifts

public `Shift[] getShifts()`

Gets a collection of all shifts that the logged in supervisor is responsible for.

---

placeInPool

public `void placeInPool(Shift p0)`

Places a shift into the pool.

---

removeFromPool

public `void removeFromPool(int p0, Shift p1)`

Removes a shift that was placed in the pool into the pool. Current logged in user must have the id of the shift in order to remove, or user must have a higher permission level.

Class *SupervisorBroker*

package: **Persistance**

```
Persistance.EmployeeBroker
  |
  +--Persistance.SupervisorBroker
```

`public class SupervisorBroker`

Extends:

Persistance.EmployeeBroker

Provides functionality for accessing supervisor data from the database.

Method Summary	
public `Supervisor`	**`getSupervisor`**`()` Gets the supervisor object for the employee that is currently logged in, assuming they have the required permissions to be classed as a supervisor.

Method Detail

getSupervisor

public `Supervisor getSupervisor()`

Gets the supervisor object for the employee that is currently logged in, assuming they have the required permissions to be classed as a supervisor.

Class *SystemSettingsBroker*

package: **Persistance**

```
public class SystemSettingsBroker
```

Provides functionality for accessing system settings data from the database.

Class *WorkgroupBroker*

package: **Persistance**

```
public class WorkgroupBroker
```

Provides functionality for accessing workgroup data from the database.

Method Summary	
public `void`	**`delete`**`(Workgroup p0)` Deletes the given workgroup object from the database.
public `Workgroup`	**`getNew`**`()` Gets a new, empty workgroup that can then have employees assigned to it.
public `void`	**`getWorkgroup`**`()` Returns a specific workgroup.
public `String`	**`getWorkgroupList`**`(Supervisor supervisor)` Returns a collection of the names of all workgroups, rather than the workgroups themselves.
public `void`	**`getWorkgroups`**`()` Returns a collection of all workgroups that a supervisor is responsible for.
public `void`	**`save`**`(Workgroup p0)` Saves the given workgroup object to the database.

Method Detail

delete

public `void delete(Workgroup p0)`

Deletes the given workgroup object from the database.

---

getNew

public `Workgroup getNew()`

Gets a new, empty workgroup that can then have employees assigned to it.

---

getWorkgroup

public `void getWorkgroup()`

Returns a specific workgroup.

---

getWorkgroupList

public `String getWorkgroupList(Supervisor supervisor)`

Returns a collection of the names of all workgroups, rather than the workgroups themselves. This is primarily used for lists which are then used to choose a specific workgroup to access.

---

getWorkgroups

```
public void getWorkgroups()
```

Returns a collection of all workgroups that a supervisor is responsible for.

---

save

```
public void save(Workgroup p0)
```

Saves the given workgroup object to the database.

14.3 Problem Domain

Class Detail

Class *Employee*

package: **ProblemDomain**

```
public class Employee
```

Contains information on an employee within the system including username and passwords to log in, and basic employee information such as first and last name.

Field Summary	
private boolean	**`active`** The active state of the employee.
private int	**`empId`** The ID number of the employee within the system.
private String	**`fName`** The first name of the employee.
private String	**`lName`** The last name of the employee.
private JobType	**`lnkEmployeeType`**
private Notification	**`lnkNotification`** Employees will receive and view notifications that are sent automatically, or manually sent by their supervisor.
private PermissionSet	**`lnkPermissionLevel`** All employees have an assigned permission set that determines employee-specific permissions within the system regarding what they can and can't access, as well as numerical values relating to time off.
private Shift	**`lnkShift`** Multiple employees can work the same shift, and an employee can work multiple shifts.
private String	**`password`** The password that the employee uses to log into the system.
private PermissionSet	**`plevel`** The current permission level of the employee, tied to a permission set.
private String	**`username`** The username that the employee uses to log into the system.

Method Summary	
public `String`	**`getAvailability`**`()` Returns the current availability status of the employee.
public `String`	**`getCredentials`**`()` Returns the permissions of an employee, used to determine what they have access to within the system.
public `int`	**`getDaysOff`**`()`
public `void`	**`getLoginTimes`**`()` Returns the last several times at which the employee logged into the system.
public `Shift`	**`getShifts`**`()` Gets a collection of shifts that the employee is currently assigned to.
public `void`	**`getViewTimes`**`()` Returns the last several times at which the employee viewed their schedules, which can be used to verify that an employee is aware of and has seen any chances that may have occurred.
public `void`	**`setDaysOff`**`(int p0)`

Field Detail

active

private boolean active

The active state of the employee. When active, an employee can be included in shifts and schedules.

An inactive employee is equivalent to one that has been deleted, and is kept in the system so they may still be included in reports and auditing procedures.

---

empId

private int empId

The ID number of the employee within the system.

---

fName

private String fName

The first name of the employee.

---

lName

private String lName

The last name of the employee.

---

lnkEmployeeType

private JobType lnkEmployeeType

---

lnkNotification

private Notification lnkNotification

Employees will receive and view notifications that are sent automatically, or manually sent by their supervisor.

---

lnkPermissionLevel

private PermissionSet lnkPermissionLevel

All employees have an assigned permission set that determines employee-specific permissions within the system regarding what they can and can't access, as well as numerical values relating to time off.

---

lnkShift

private Shift lnkShift

Multiple employees can work the same shift, and an employee can work multiple shifts.

---

password

private String password

The password that the employee uses to log into the system.

---

plevel

private PermissionSet plevel

The current permission level of the employee, tied to a permission set.

---

username

private String username

The username that the employee uses to log into the system.

Method Detail

getAvailability

public `String getAvailability()`

Returns the current availability status of the employee.

---

getCredentials

public `String getCredentials()`

Returns the permissions of an employee, used to determine what they have access to within the system.

---

getDaysOff

public `int getDaysOff()`

---

getLoginTimes

public `void getLoginTimes()`

Returns the last several times at which the employee logged into the system. Primarily used when generating usage reports.

---

getShifts

public `Shift getShifts()`

Gets a collection of shifts that the employee is currently assigned to.

---

getViewTimes

public `void getViewTimes()`

Returns the last several times at which the employee viewed their schedules, which can be used to verify that an employee is aware of and has seen any chances that may have occurred. Primarily used for usage reports.

---

setDaysOff

public `void setDaysOff(int p0)`

Class *Event*

package: **ProblemDomain**

`public class Event`

An Event is used to mark real-world occurrences of importance that will happen at a specific time, such as an employee meeting or a business provided lunch event. Events may be sent to all employees within a workgroup, or a within a job type.

Field Summary	
private String	**`description`** A short description of what the event is.

Field Summary	
private JobType	**empType** The job type for which all employees will see the event.
private Date	**endDate** The time at which the event is scheduled to end.
private JobType	**lnkJobType**
private Workgroup	**lnkWorkgroup**
private Date	**startDate** The date and time at which the event is scheduled to begin.
private Workgroup	**workgroup** The workgroup for which all employees will see the event.

Method Summary	
public void	**newEvent**(Event event) Used to save a newly created event, which should include either a target job type or target workgroup, the start and end dates/times, and description of the event.
public void	**removeEvent**() Removes an event from the system.

Field Detail

description

private String description

A short description of what the event is.

---

empType

private JobType empType

The job type for which all employees will see the event.

---

endDate

private Date endDate

The time at which the event is scheduled to end.

---

lnkJobType

private JobType lnkJobType

---

lnkWorkgroup

private Workgroup lnkWorkgroup

---

startDate

private Date startDate

The date and time at which the event is scheduled to begin.

---

workgroup

private Workgroup workgroup

The workgroup for which all employees will see the event.

Method Detail

newEvent

public void newEvent(Event event)

Used to save a newly created event, which should include either a target job type or target workgroup, the start and end dates/times, and description of the event.

---

removeEvent

public void removeEvent()

Removes an event from the system.

Class *JobType*

package: **ProblemDomain**

public class JobType

A position that an employee can hold within the business, including the name of the position and a short description of it.

Field Summary	
private String	**jobDescription** A short description of the job type.
private String	**jobName** The name of the job type.

Method Summary	
public void	**addJobType**() Saves a new job type so that it can be assigned to employees.
public void	**removeJobType**() Removes a job type from the system

Field Detail

jobDescription

private String jobDescription

A short description of the job type.

---

jobName

private String jobName

The name of the job type.

Method Detail

addJobType

public void addJobType()

Saves a new job type so that it can be assigned to employees.

---

removeJobType

public void removeJobType()

Removes a job type from the system

Class *Notification*

package: **ProblemDomain**

public class Notification

A notification is a type of message object that is sent to employees. These can be sent out automatically to inform an employee of the status of requests they have made, and can also be sent manually if a supervisor wishes to send a message to his/her employees.

Field Summary	
private String	**message** Contains the message text of the notification.
private String	**type** Contains the type of notification that this object represents, such as an accept/reject notification for an employee request, or a general notification sent by the supervisor.
private boolean	**wasViewed** Shows whether or not the intended recipient of this notification has opened and viewed it.

Method Summary	
public void	**sendNotification**(Employee p0) Creates a new notification and sends it to a specific employee.
public void	**sendNotification**(JobType p0) Creates a new notification and sends it to every employee within a specific job type.
public void	**sendNotification**(Schedule p0) Creates a new notification and sends it to every employee within a specific schedule.
public void	**sendNotification**(Workgroup p0) Creates a new notification and sends it to every employee within a specific workgroup.

Field Detail

message

private String message

Contains the message text of the notification.

---

type

private String type

Contains the type of notification that this object represents, such as an accept/reject notification for an employee request, or a general notification sent by the supervisor.

---

wasViewed

private boolean wasViewed

Shows whether or not the intended recipient of this notification has opened and viewed it.

Method Detail

sendNotification

public void sendNotification(JobType p0)

Creates a new notification and sends it to every employee within a specific job type.

---

sendNotification

public void sendNotification(Schedule p0)

Creates a new notification and sends it to every employee within a specific schedule.

---

sendNotification

public void sendNotification(Employee p0)

Creates a new notification and sends it to a specific employee.

---

sendNotification

public void sendNotification(Workgroup p0)

Creates a new notification and sends it to every employee within a specific workgroup.

Class *PermissionSet*

package: **ProblemDomain**

public class PermissionSet

All employees have a set of permission settings that determine what levels of access they have within the system.

Field Summary	
private boolean	**canAccessReports** Sets whether or not the employee can access the reporting system, allowing them to both generate and distribute reports.
private boolean	**canChangePermissions** Sets whether or not the employee is able to change the permission settings of other employees that are below their permission level.
private boolean	**canEditSched** Sets whether or not the employee is able to edit schedules, either by creating new ones or by editing future schedules that have not yet come into effect.
private boolean	**canReadLogs** Sets whether or not the employee is able to view system logs.
private boolean	**canReadOldSched** Employee is able to access archived schedules that have ened before the current date.
private boolean	**canReadSched** Employee can access times on a schedule under their name and lower plevels for the current date or period.
private boolean	**canRequestDaysOff** Sets whether or not the employee is able to request days off.
private boolean	**canSendNotifications** Sets whether or not the employee can send notifications which are messages internal to the system that can be sent to specific employees, workgroups, or job types.
private boolean	**canTakeEmergencyDays** Sets whether or not the employee is able to take emergency days off.

Field Summary	
private boolean	**canTakeVacations** Sets whether or not the employee is able to take vacation days.
private boolean	**canViewInactiveEmps** Sets whether or not the employee can view details on inactive employees who are not currently working, such as ones that have left the company.
private boolean	**canViewResources** Sets whether or not the employee is able to view employee resources, such as employees that are available, booked off, or are already working at a given time.
private int	**maxDaysOff** Sets the maximum number of days off that an employee can request for a given schedule period.
private int	**maxVacationDays** Determines the maximum number of vacation days that an employee can take off over a schedule period, assuming they have the required permission for vacation days.
private int	**plevel** Each collection of unique permission settings are tied to a specific permission level number.
private int	**preferredRank** Starting with 0 as the highest priority employee and then incrementing, this differentiates seniority within the same plevel.
private boolean	**trusted** Similar to a permission promotion (which canot be given by self), trusted is a permission that allows any employee to perform actions that affect the next highest level without requiring authorization from a superior.

Field Detail

canAccessReports

private boolean canAccessReports

Sets whether or not the employee can access the reporting system, allowing them to both generate and distribute reports.

---

canChangePermissions

private boolean canChangePermissions

Sets whether or not the employee is able to change the permission settings of other employees that are below their permission level.

---

canEditSched

private boolean canEditSched

Sets whether or not the employee is able to edit schedules, either by creating new ones or by editing future schedules that have not yet come into effect.

---

canReadLogs

private boolean canReadLogs

Sets whether or not the employee is able to view system logs.

---

canReadOldSched

private boolean canReadOldSched

Employee is able to access archived schedules that have ened before the current date.

---

canReadSched

private boolean canReadSched

Employee can access times on a schedule under their
name and lower plevels for the current date or period.

---

canRequestDaysOff

private boolean canRequestDaysOff

Sets whether or not the employee is able to request days off.

---

canSendNotifications

private boolean canSendNotifications

Sets whether or not the employee can send notifications which are messages internal to the system that can be sent to specific employees, workgroups, or job types.

---

canTakeEmergencyDays

private boolean canTakeEmergencyDays

Sets whether or not the employee is able to take emergency days off. This will be on by default, but can be turned off if desired.

---

canTakeVacations

private boolean canTakeVacations

Sets whether or not the employee is able to take vacation days.

---

canViewInactiveEmps

private boolean canViewInactiveEmps

Sets whether or not the employee can view details on inactive employees who are not currently working, such as ones that have left the company. This is primarily used for reports and auditing.

---

canViewResources

private boolean canViewResources

Sets whether or not the employee is able to view employee resources, such as employees that are available, booked off, or are already working at a given time.

---

maxDaysOff

private int maxDaysOff

Sets the maximum number of days off that an employee can request for a given schedule period. This value will only be accessed if the employee already has permission to request days off.

---

maxVacationDays

private int maxVacationDays

Determines the maximum number of vacation days that an employee can take off over a schedule period, assuming they have the required permission for vacation days.

---

plevel

private int plevel

Each collection of unique permission settings are tied to a specific permission level number. Employee permissions are determines by setting them to a permission level, rather than having to set all permission settings individually for each employee.

---

preferredRank

private int preferredRank

Starting with 0 as the highest priority employee and then incrementing, this differentiates seniority within the same plevel.

---

trusted

private boolean trusted

Similar to a permission promotion (which canot be given by self), trusted is a permission that allows any employee to perform actions that affect the next highest level without requiring authorization from a superior. However, a notification will be sent notifying the supervisor (n/a if highest plevel) explaining actions. This only applies to permissions that are currently enabled. Ex: If an employee cannot book days off, a trusted employee canot book days off either.

Class *Schedule*

package: **ProblemDomain**

```
public class Schedule
```

A collection of shifts of multiple employees, grouped together by the workgroup or supervisor that those employees share.

Field Summary	
private Date	**activeDate** The date and time at which the schedule is set to become active, and all affected employees will be expected to follow the shifts it contains.
private Supervisor	**creator** The supervisor who created the schedule.
private String	**description** A description of the schedule, if one is desired.
private int	**duration** The duration in days that the schedule will be active for.
private Shift	**lnkShift** A schedule is composed of one or more shifts.
private Shift	**shifts** Holds references to all shifts that are active for this schedule.

Method Summary	
public void	**addShift**() This method is used to actually assign a shift to a schedule for a specific employee.
public Shift	**getAllShifts**() Gets a collection including all shifts that the schedule contains.
public Schedule	**newSched**() The createNewSchedule() method is used to create a blank schedule and by default will include any time booked off by any of the employees he is scheduling.
public Schedule	**newSched**(int p0)
public void	**removeAllShifts**(Shift p0) Removes all shifts from the schedule
public void	**removeShift**() Removes a specified shift from the schedule.
public void	**replaceShift**(Schedule p0, String p1, Shift p2) Takes a day's worth of shifts and replaces it with another day's worth of shifts.
public void	**setAvailability**(Schedule p0)

Field Detail

activeDate

private Date activeDate

The date and time at which the schedule is set to become active, and all affected employees will be expected to follow the shifts it contains.

---

creator

private Supervisor creator

The supervisor who created the schedule.

---

description

private String description

A description of the schedule, if one is desired. This is not required to create a schedule.

---

duration

private int duration

The duration in days that the schedule will be active for.

---

lnkShift

private Shift lnkShift

A schedule is composed of one or more shifts.

---

shifts

private Shift shifts

Holds references to all shifts that are active for this schedule.

Method Detail

addShift

public `void addShift()`

This method is used to actually assign a shift to a schedule for a specific employee. This method can be used for as many shifts as the supervisor wants to have to as many employees as he/she wants. Error checking will take place every time a supervisor tries to create a schedule that goes outside normal bounds of employment.

---

getAllShifts

public `Shift getAllShifts()`

Gets a collection including all shifts that the schedule contains.

---

newSched

public `Schedule newSched(int p0)`

---

newSched

public `Schedule newSched()`

The createNewSchedule() method is used to create a blank schedule and by default will include any time booked off by any of the employees he is scheduling. This can be turned off if the supervisor does not want to include the dates that the employees are on vacation/sick/absent.

---

removeAllShifts

public `void removeAllShifts(Shift p0)`

Removes all shifts from the schedule

---

removeShift

public void removeShift()

Removes a specified shift from the schedule.

---

replaceShift

public void replaceShift(Schedule p0, String p1, Shift p2)

Takes a day's worth of shifts and replaces it with another day's worth of shifts.

---

setAvailability

public void setAvailability(Schedule p0)

Class *Shift*

package: **ProblemDomain**

public class Shift

A shift contains information on the specific time and place that one or more employees will be working.

Field Summary	
private Date	**EndTime** The time at which work ends for the employees assigned to the shift.
private String	**job** The duties associated with this specific shift.
private String	**Location** The building or room where the shift work is taking place.
private Date	**StartTime** The time at which work begins for the employees assigned to the shift.
private Supervisor	**supervisor** The supervisor who is in charge of the employees working that shift.

Method Summary	
public date[]	**getTimes**() Get the start and end times for which this shift takes place.
public Shift	**newShift**() This method is used to create a shift object that is attached to a specific employee's schedule.

Field Detail

EndTime

private Date EndTime

The time at which work ends for the employees assigned to the shift.

---

job

private String job

The duties associated with this specific shift.

Location

private String Location

The building or room where the shift work is taking place. Primarily for organizaional purposes.

StartTime

private Date StartTime

The time at which work begins for the employees assigned to the shift.

supervisor

private Supervisor supervisor

The supervisor who is in charge of the employees working that shift.

Method Detail

getTimes

public `date[] getTimes()`

Get the start and end times for which this shift takes place.

newShift

public `Shift newShift()`

This method is used to create a shift object that is attached to a specific employee's schedule. However this is a temporary shift object and is not actually added to an employee schedule until a supervisor confirms the entire schedule.

Class *Supervisor*

package: **ProblemDomain**

```
ProblemDomain.Employee
  |
  +--ProblemDomain.Supervisor
```

```
public class Supervisor
```

Extends:

ProblemDomain.Employee

Supervisors by default have full employee credentials, and are able to access all features that are available to employees. In addition, supervisors may access special features, allowing them to add new employees in the system and create new workgroups, shifts and schedules.

Field Summary	
private int[]	**`employees`** A collection of all employees that the supervisor is in charge of, stored as a list of the ID's of those employees.
private Employee	**`lnkEmployee`**
private Notification	**`lnkNotification`** Supervisors may view notifications created by the system, as well as manually create notifications to send to their employees.
private Workgroup	**`lnkWorkgroup`** A supervisor may be in charge of multiple workgroups, which they have created for their employees.

Field Summary	
private Workgroup	**workgroupList** A list of employee workgroups that the supervisor is in charge of.

Field Detail

employees

private int[] employees

A collection of all employees that the supervisor is in charge of, stored as a list of the ID's of those employees.

lnkEmployee

private Employee lnkEmployee

lnkNotification

private Notification lnkNotification

Supervisors may view notifications created by the system, as well as manually create notifications to send to their employees.

lnkWorkgroup

private Workgroup lnkWorkgroup

A supervisor may be in charge of multiple workgroups, which they have created for their employees.

workgroupList

private Workgroup workgroupList

A list of employee workgroups that the supervisor is in charge of. This will include the super workgroup that all of the employees for that supervisor are a part of, and all workgroups that those employees have been divided into.

Class *SystemSettings*

package: **ProblemDomain**

```
public class SystemSettings
```

Holds global settings that will apply to all employees in the system.

Field Summary	
private int	**availabilityChangeHold** Minimum amount of days that must pass between changes in availability by an employee.
private int	**maxEmergencyDuration** Maximum amount of consecutive days that can be taken off on emergency leave.
private String	**minShiftDuration** The minimum shift length that employees will be paid for, in the format HH:MM.
private int	**shiftRequestCutoff** The time in days before a shift starts that shift requests for it will be cancelled and the requestee notified.

Field Detail

availabilityChangeHold

private int availabilityChangeHold

Minimum amount of days that must pass between changes in availability by an employee.

---

maxEmergencyDuration

private int maxEmergencyDuration

Maximum amount of consecutive days that can be taken off on emergency leave. Days beyond this amount will require additional discussion between the employee and their supervisor.

---

minShiftDuration

private String minShiftDuration

The minimum shift length that employees will be paid for, in the format HH:MM. With a limit of 03:00, an employee who is works for two hours will still be recorded as being paid for three. 00:00 by default.

---

shiftRequestCutoff

private int shiftRequestCutoff

The time in days before a shift starts that shift requests for it will be cancelled and the requestee notified.

Class *Workgroup*

package: **ProblemDomain**

```
public class Workgroup
```

A workgroup is a collection of employees, grouped together by a supervisor. It can be used to view workgroup specific schedules, or to print reports on a specific set of employees rather than all that the supervisor is in charge of.

Field Summary	
private Employee	**employees** A list of the employees that are in the workgroup.
private Employee	**lnkEmployee** An employee may be part of multiple workgroups, which must be assigned by that employee's supervisor.
private String	**name** The name of the workgroup, assigned by the supervisor who created it.
private Supervisor	**supervisor** The supervisor that is in charge of this employee workgroup.

Method Summary	
public Workgroup	**getWorkgroup**() Retrieves a specific workgroup.

Field Detail

employees

private Employee employees

A list of the employees that are in the workgroup.

---

lnkEmployee

private Employee lnkEmployee

An employee may be part of multiple workgroups, which must be assigned by that employee's supervisor.

---

name

private String name

The name of the workgroup, assigned by the supervisor who created it.

---

supervisor

private Supervisor supervisor

The supervisor that is in charge of this employee workgroup.

Method Detail

getWorkgroup

public `Workgroup` `getWorkgroup()`

Retrieves a specific workgroup.

Part V

Project Management

Chapter 15

Schedule

15.1 Gantt Chart

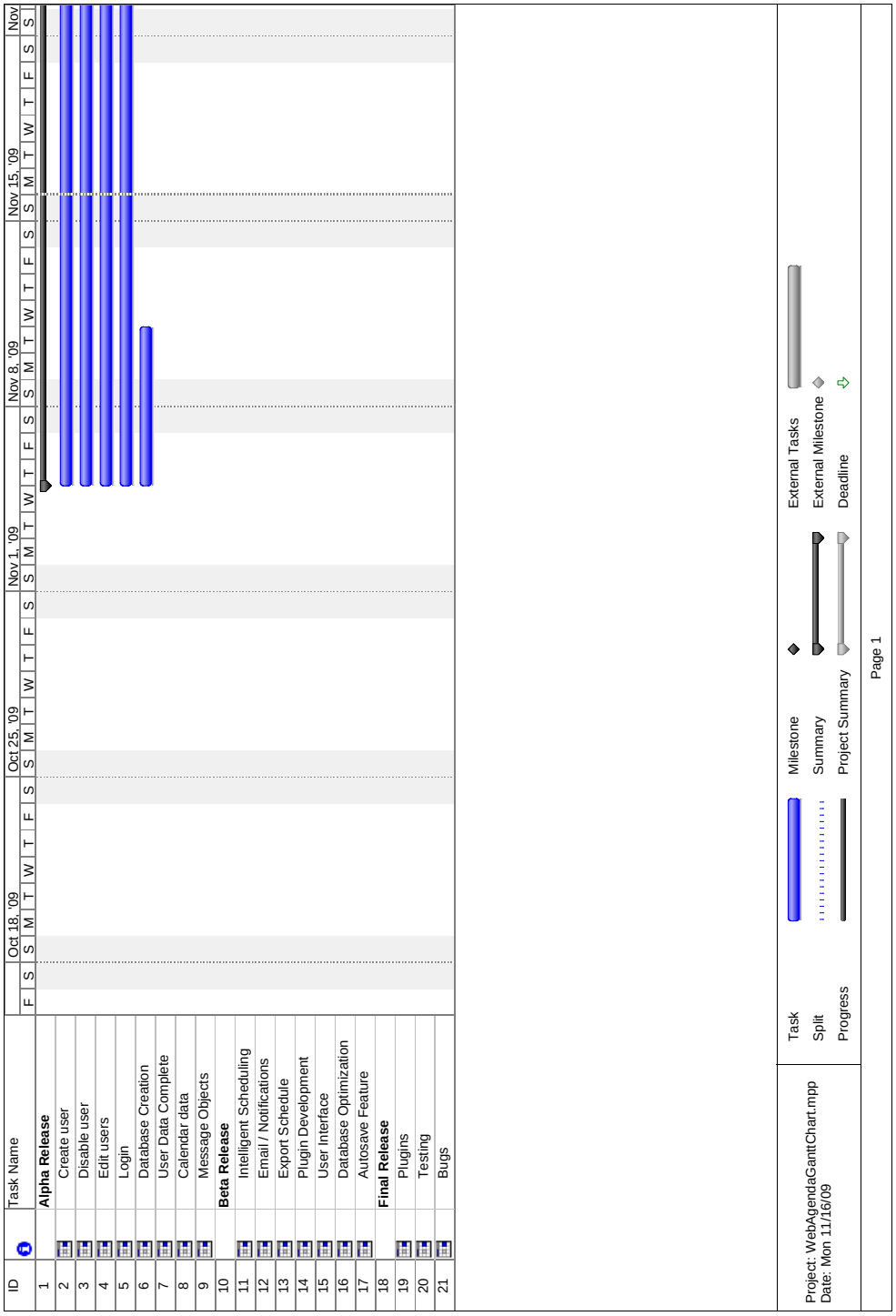

Figure 15.1: **WebAgenda Milestones** A quick look at the major foreseeable events in the project's timeline, page 1

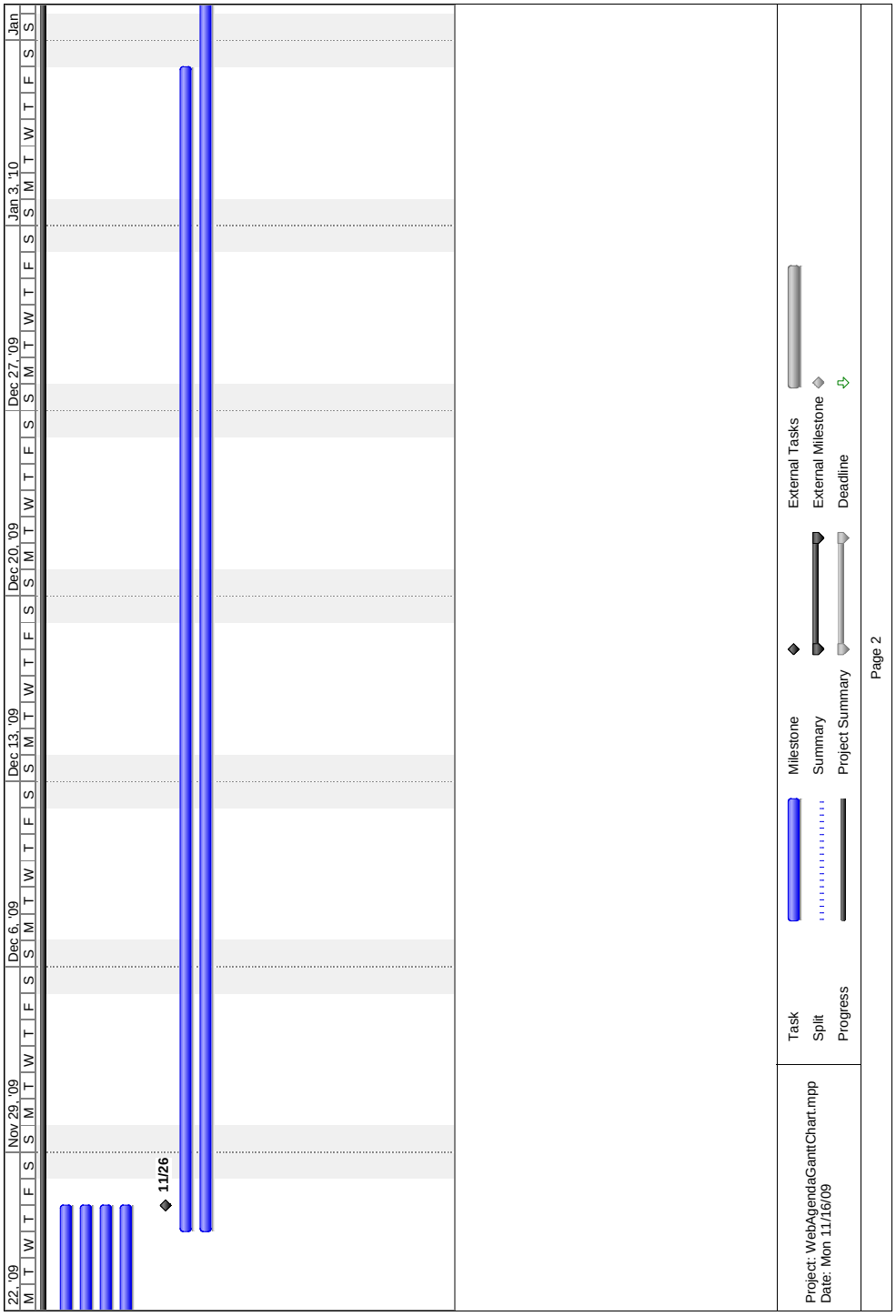

Figure 15.2: **WebAgenda Milestones** A quick look at the major foreseeable events in the project's timeline, page 2

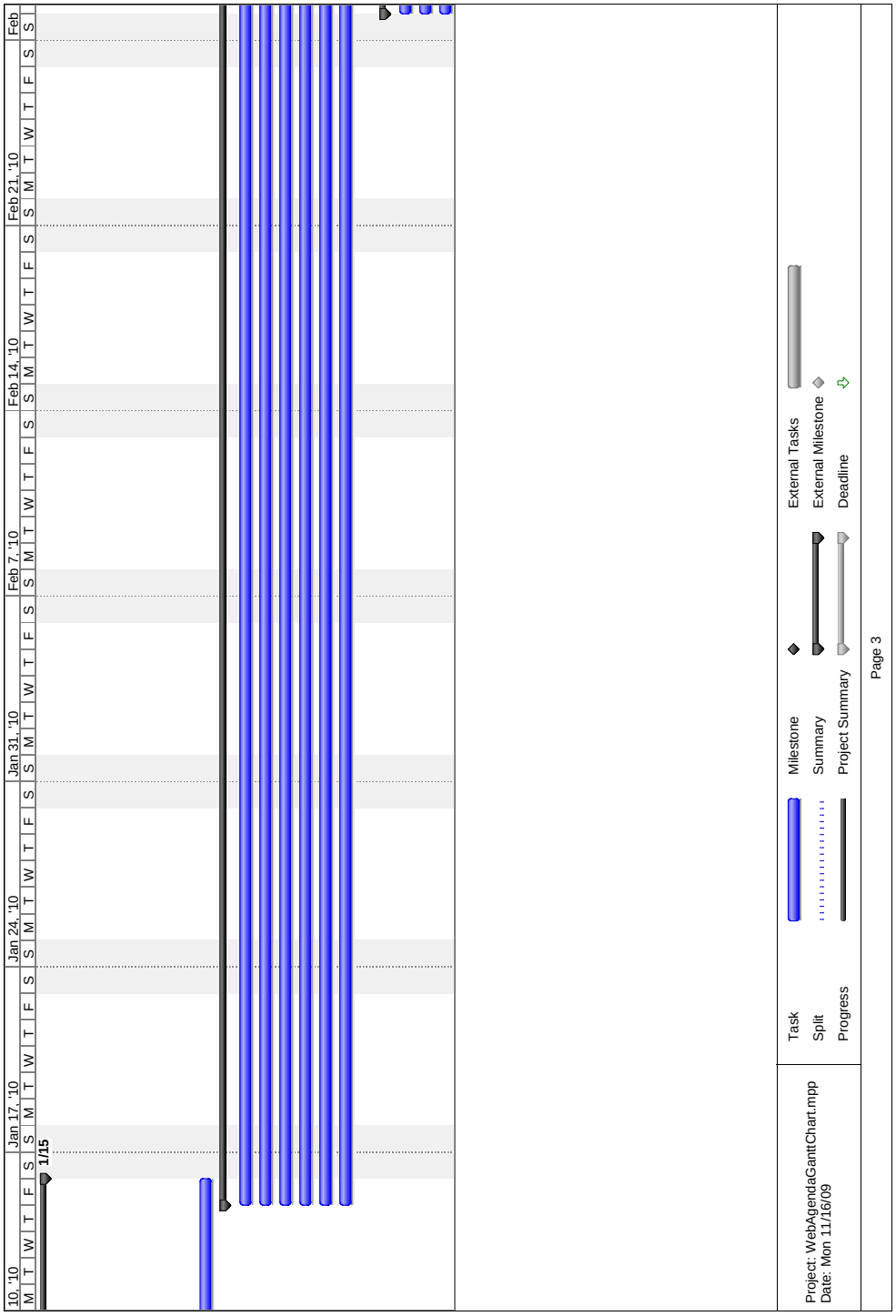

Figure 15.3: **WebAgenda Milestones** A quick look at the major foreseeable events in the project's timeline, page 3

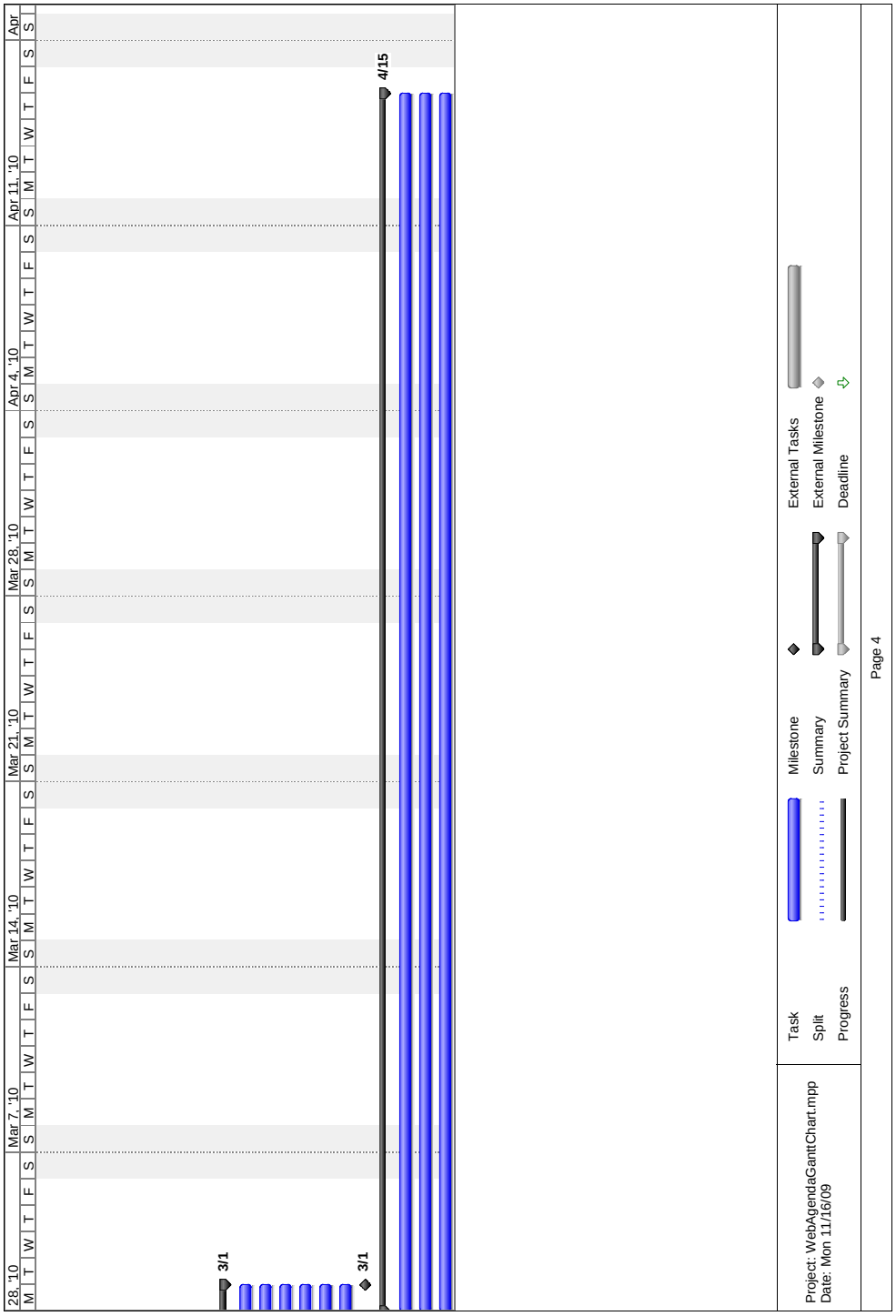

Figure 15.4: **WebAgenda Milestones** A quick look at the major foreseeable events in the project's timeline, page 4

15.2 2009 -10-08 Requirements Documentation

The requirements documentation is a compilation of details on the WebAgenda project. This document is used to outline the specific user requirements of the project, the **system requirements** of the project, the **system interface requirements** of the project, and the project management details of the project.

Inside the user requirements portion of the document, the business overview and objectives need to be defined. This includes the nature of the clients business, the mission of the business and all other relative information in regards to the clients business model. A project overview should also be included in the documentation. It should include things like a statement of the current problem or issue the client has with their current system. The **project scope** should also be included with the project overview. This should include things like what the system needs to be able to do and include a summary of the major functional requirements of the system. The system environment will also be included in the project overview. The scope of the project details what the system will be able to do and what it will not be able to do. In other words, the scope just outlines the project boundaries. The system environment is also included in the project overview and details where the project will be deployed upon **beta release** and **final releases**. The project overview will include a description of the current system and what the type of functionality it has in addition to its downfalls and the desired improvements.

The next section of the requirements document is the project system requirements. The first point of the system requirements is the fact-finding methodology. This will include a description of the approach project team members took to find facts regarding the system. Any questions that were asked in the interview process will also be included in the fact-finding methodology section of the system requirements. A use case diagram that was derived from the fact-finding process should also be included in the system requirements section. A description of the use case elements should also be included in this section, things like actor definition, and roles should be defined in this section. A non-functional requirement should also be derived here from the use case and the fact-finding section of the system requirements. A system interface requirements section should also be included and derived from the use case and fact-finding sections. **Maintainability** and Administration requirements should also be included in this section. This means things like maintenance and backup schedules, and all administration aspects that the system needs to include to have the full functionality that the current system has. Usability requirements should also be included in this section. The usability requirements includes things like how advanced the users are at using software/computers in general. This should also include how many people will be using the software and how familiar they are with software/computers in general.

15.3 2009-11-05 Requirements Analysis

The requirements analysis is incorporated into the project planning stages of the project by identifying how close the requirements are to the actual project features. Once the project team meets with the client and determines exactly what the client wants, the updated features list then is located in the requirements analysis. Changes to the original requirements documentation will go into the requirements Analysis report. The client should receive both a copy of the requirements documentation and the requirements analysis to ensure that it is up to date and accurate.

15.4 2009-12-17 Design Documentation

The design documentation is the final piece of documentation in the planning stages of the project. It is an all inclusive summary of all the clients technical and informational requirements for the project. This includes budget, time constraints, and any final technical specifications for the project. The design documentation should be used by the developers as a reference when building the project. If any questions arise as to features of the project the developers should consult the design documentation for conclusion. It is the most up to date compilation from the client and the developers about the project.

Included in the design document is design related functionality. How the system needs to be implemented needs to be considered at this stage. Information regarding the human computer interface needs to be seriously considered here. All interface related documentation needs to be reflected in both the sequence diagrams and the problem domain class diagram.

Hardware architecture needs to be described in this document. Minimum hardware specifications for properly running the software need to be outlined in this document. Software architecture also needs to be implemented. Minimum software requirements need to be outlined in this document as well. Any software dependencies need to be outlined and documented in this document so the user can see what software they need in order to run the system.

15.5 2009-01-30 Alpha Release

The pre-beta release, known as an **alpha release**, is a basic functional release of the software. The software may have next to no features of the full release and the ones that do exist are partially tested and potentially have **bug**s. The alpha release is used to start working out bugs and get any input from the client as to features that need to be modified or changed to meet the clients needs. The interface may need some changes at this stage to incorporate other features.

15.6 2009-02-28 Beta Release

The beta release will have full functionality of the final software, with the exception of plug-ins. However, there will probably be bugs in the program. This release of the software is meant to work out any bugs and ensure that the software is acceptably tested. The software at this stage will also get stress tested, meaning that testers and possibly the client need to use the program and purposely try to break it. This way we can find bugs that may not have surfaced at the alpha stage and fix them before the final release. This stage should include any minor adjustments that the client requests.

15.7 2009-04-15 Final Release

The final release will be a full featured, and fully tested release. The software will have all the features that the client requested as well as all the other features that the system implements within the scope of the project. Having tested the software at both the alpha release and the beta release, most of the major bugs should be worked out by the final release period. Some minor bugs may still be in the system but they should not influence productivity or stability at all. The software needs to be in a safe usable state. All **encryption** and **SSL** features need to be implemented so that the users can fully use the software without worrying about any security flaws. The software should also be deployment ready, so that it can be installed and go live on the users system.

Chapter 16

Team Configuration

The following section provides detail on the team members involved in the project, as well as their current roles. Contact information is included for team members as well as other key stakeholders.

16.1 Members And Roles

The following people are the members of the project team. Current role assignments are included and described.

Mark Hazlett

- Team Leader Ensures all team members understand their roles and what work is required from them each week.
- Meeting Organizer Schedules future meetings and ensures all team members are aware and able to attend.

Daniel Kettle

- Standards Checker Ensures all documentation meets the guidelines listed in the Documentation Standards section of the Preface.
- Archivist Handles storage of documentation and other project related files, ensuring they are freely accessible to the team.

Daniel Wehr

- Scribe Distributes audio recordings of all meetings to group members on the same day they were recorded. Meeting minutes will be typed up and submitted to the team for review before they are finalized and included in the project documentation.
- Quality Assurance Ensures non-documentation project files such as source code meet the standards of the team and have been reviewed for efficiency.

16.2 Reporting Relationships and Procedures

All group members will be responsible for reporting the status of the project to the client. The reporting position will be filled by individual members, and be rotated through on a regular basis as per agreement with the client. Current reporting periods are once a month, and since they will be in person the reports can be printed and sent electronically. Reports will be written, and will be sent to the client by email or fax. The client will be given time to review the report, after which they will be contacted for their input on the progress that has been made to ensure the project is following their requirements. All reports will be included in the project documentation for later reference.

16.3 Contact Information

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Calgary, AB T2Z 3W4

Chapter 17

Project Standards And Procedures

LaTeX2E , also known as LaTeX, is a document preparation system for high-quality typesetting. It has been used in various academic institutions and produces standardized and consistant pages based on tags specified in the LaTeX files. It is not a word processor; appearance is generated from the source file the user creates. Final documents will be generated as a pdf file. LaTeX is also free and available for Windows, Mac, and Linux-Unix systems. The current version is 2E; it will be used for generating all digital-based final documentation. Since WebAgenda is licensed under the GPL 2, source code for the documentation in LaTeX will be available. LaTeX will be used for developing the documentation required by the system in forms of both manuals (instructions, support, and overviews) as well as documents we will upload on the server, which should include troubleshooting, tutorials and Frequently Asked Questions for a variety of basic tasks, downloadable copies of the perviously mentioned document manuals, and the scheduling system documents (WebAgenda‘s plugin and compatibility documents).

Date Formats Dates, when inputted or displayed to the user, should be in a DD-MM-YYYY format. Regardless of whether the code beneath the user translates this to another format, it is irrelevant. (This is subject to change, but allows for a common understanding of dates to this point.)

Interface: This layer of the architecture will handle all user related events, interface requirements, displaying functional data, etc. User events are handled through the use of text boxes, buttons, links, radio buttons and other event handlers to accept user input into the system. The user interface handles everything that the user sees and interacts with. The user interface provides a method to send items to the problem domain so that they can be persisted and manipulated. Error messages are also displayed using this layer.

Problem Domain: This layer handles all the **API** calls for the system. The API calls allow the interface to grab specific pieces of data to be displayed by the interface. Through the use of API calls, the interface will be able to grab data from the persistence layer and display it using the interface layer. (Refer to Appendix B for full API documentation).

API: The application programming interface is the main method to access the persistence layer. The API is a set of pre-defined methods that have specific functions to the program. Only developers can add API methods as to keep the integrity of the system.

Persistence: The persistence layer is the layer that handles all database access and storage. The database access, inserting, deleting, copying, etc will all be handled by this layer. This layer will be the only layer of the architecture that will handle directly touching and accessing the database.

17.1 Hardware Architecture

17.1.1 Hardware Platform for Production System

The hardware to run the system will be different than that needed to utilize the system. For the server side of the system that will actually be hosting the application and displaying it, the hardware qualifications are much larger. It will require a web server to host the system along with appropriate storage space for a database. The database can be located directly on the server if needed. In this case, where the database is located on the same hard drive running the web server, then the hardware architecture diagram will change to include only a central unit for both the server and the database. In order for the system to be capable of running, the server must meet the following general requirements:

- Capable of running all software on the server
- Capable of running an estimated minimum of 500 simultaneous **HTTP** and **HTTPS** connections
- Capable of staying online for extended periods of time without shutting down (99.9% uptime is the industry standard)

The more hardware that is installed on the server (memory, hard drive, processors), the faster the server should respond. The server‘s performance should be scalable as the use of the system increases. As per the ”Document Purpose“ chapter of this document, our scope aims to satisfy approximately 500 employees. The system may suffer no ill performance if this estimate is exceeded and due to possible additional programs that run on a server, exact hardware requirements will vary. As such, there are no specific specifications for running the system as it depends on many external factors aside from the size and labour force of the company or business.

If the database is not installed alongside the webserver, it should be installed on another server. Doing so will require that server to be connected through a network so that the web server can access the database. If the database is located nexted to the web server, then the server needs to have enough storage space and processing power to hold the number of employees in the system and run any web services required. When the number of employees increase, the server will require extra disk space to accomidate them. As usage goes up, the server will access the database more frequently. If the database cannot handle the demand or runs out of space, then the server will need to be reconfigured or extended. The **MySQL** database is licensed under the same license as our product, the GNU Public License, and is efficient and lightweight. It should be more than capable of satisfying the needs of a 500 employee business. If another database is preferred or required, moving data from a MySQL database is a straightfoward process.

17.2 Hardware Platform for Development System

The hardware platform requirements for the development system are significantly less than those needed for the production system. However, if the developers are testing with large amounts of data and users then the development system requirements would increase proportionally. The development system could be as little as a generic laptop running an HTTP server to a rack mount server with an exponential increase of processors and memory to run the system. The test data that the developers decide to use will help determine the minimum specifications needed to run a development version of the system. The database needed for the development system should reflect the database used in the development server. Depending on the data used in testing, accurate estimates of disk usage and certain performance tweaking can then be used to enhance the production server.

17.3 Software Platform

17.3.1 Server Software

- **J2EE** 1.5+
- **JSP**
- **Apache** 2.0+
- MySql 5.0+
- Storage Space dependent on usage
- Bandwidth determined by usage

17.3.2 Client Software

Browsers

- Safari 3.0+ (Windows or Mac), Safari Mobile
- Chrome 1.0+ (Windows, Mac or Linux)
- IE 7.0+ (Windows)
- Firefox 2.0+
- Opera 8+, Opera Mini
- Konqueror 3.5+
- Javascript Enabled Browser

Operating Systems

1. Windows XP+
2. Mac OS X 10.4.8+
3. Linux 2.6.x -based
4. RIM (Blackberry OS)
5. Unix & BSD

The minimum system requirements are a set of guidelines will allow the system to function as smoothly as possible. If the minimum software requirements are not followed, then the system cannot be guaranteed to work properly, although it may still work. The system will be optimized to function on the above specifications to ensure that there are no environment variables that could cause some issues with the system. Again, the system requirements are not completely required, however to get a smoothly running system the minimum specifications are encouraged.

17.4 Interaction Model

17.4.1 Style

The system will have the same look and feel throughout the entire system. Each screen will be using the same style standards for fonts, text boxes, and general human to system interaction. Using CSS for our style standards, we can define user modifiable values and standard values to keep a consistent look and feel throughout the entire main system as well as third party plug-ins for the system.

17.4.2 General Style Guidelines

Dialog Boxes
The dialog boxes that appear in the system will all be clearly outlined using a darkening technique for the rest of the system around the dialog box. This allows the user a clear understanding of what window they need to work with at what time.

Text Fields
Text fields will be highlighted when the user selects them so that the user can easily understand what field they need to enter data into. If the user enters incorrect data or an error occurs, then a clearly defined error message will occur.

Error Mesages
If an error message is needed to be displayed, the priority of the error message is taken into account when determining how the error will be displayed. If the error message is a system error and is not recoverable, then the same principles will apply to displaying the error message as a dialog box. If the error is minor, for example if the user enters a piece of data incorrectly, then an error message will be displayed to alert the user what was entered incorrectly.

Widgets
A widget will have some areas that are available for user customization; however the overall look and feel will be unavailable to change. This is to ensure that all widgets, both internal and external, have the same look and feel throughout the system.

Page
A page is a generic site layout without any widgets installed. A page will have a default header and footer that are customizable by the user. The header will have a logo and a company name that will be able to be customizable by the user. A page is generally just a blank template with the basic areas such as a footer, header, and content area.

17.4.3 System Feedback Style

Dialog Boxes

Dialog boxes are going to be used for system feedback when the system encounters and irreversible error. The dialog boxes will be used for this type of error because they draw the most attention from the user to address the issue at hand. Included in the dialog box will not only be a description of the error that occurred but also help articles and links to help resources to allow the user to try and fix the problem him/herself.

Error Messages

Error messages, like dialog boxes will be used if a minor error occurs to provide feedback to the user. The error messages will be positioned over the area that the error occurred to provide optimal feedback to the user. The error message will display information about what the error is and how to fix the error. The error message will also provide a link to help articles and areas of the system that can help the user solve the issue at hand.

Any piece of information that needs to be immediately communicated to the user with the up most importance will need to be communicated using a dialog box. Otherwise, the error message method should be sufficient for most types of errors.

17.4.4 Standards

Font
As a general rule of thumb, the Helvetica font will be used throughout the system. Helvetica is a professional font that is standard across all browsers and operating systems.

Colours
Web 2.0 colors are all valid colors to be using the system. As a general theory, the colors used by the system or third party plug-ins need to be compatible with all large browsers and operating systems.

Widget Outline
The outline of the widgets, or the placeholders, need to be consistent with the standards set during the initial release. However because the users will be able to modify the look and feel of the widgets, the widgets do not have a specific look and feel that they must adhere to.

Page
A page will determine the look and feel of the widgets and everything that is displayed on the page. The CSS to change the look and feel of the internal widgets will all be handled by how the page looks. If you want to change the look and feel of the widgets, then that must be changed on the page.

NOTE The following information is from Desired User Support. Unsure if this should be in its own user-related section or under a ‘project‘ heading. Dan suggests that we have a basic help section for new users, and anothe for developer-related issues.

17.5 Desired User Support

Throughout the process of using the system, Users may require help or assistance with certain aspects of the program. The development team would like to have as many help options available to the users as possible to increase ease of use of the system. Available to all users using the system will be the in system help, the wiki, and developer contact.

System Help

Throughout the system there will be a help menu option to allow users at any time during the system to access the in system help resources. The in system help resources is an internal help resource that comes complete with recent issues, popular issues, frequently asked questions, plug-in, and help articles to help out with aspects of using the system.

Recent Issues List

The recent issues list will include bugs and problems that users have recently submitted to the system. Users will be able to look through the recent issues list to view if the issue that they are having and see if that is the same issue they are having. If the help article listed is what the users are looking for they can click on the article and it will pull up the article.

Popular Issues List

The popular issues list will pull a list of the most popular issues, or the issues that are currently getting the most attention. These issues are listed on the main help screen because they are the issues that the users are most likely to come across. The users can then click on any of the articles to view the article on how to solve their issue or perform the action that they are looking to accomplish.

Frequently Asked Questions

A frequently asked questions section will be available in the help section to allow users to view answers to commonly asked questions about the system. These may change over time with updates and dependent on features.

Plug-in Specific Help

Plug-in developers have a section in the help section for plug-in specific help articles. Developers can include how to articles specific to their plug-ins here. They can also include frequent issues, and other issues that users of the system may take advantage of.

Wiki

The wiki is a resource that includes all help articles written by the Web Agenda development team. How to articles, recent issues, HCI guidelines, and all other relevant information can be found on the wiki. Currently the wiki is located at http://webagenda.googlecode.com/wiki/ but could change at a later point. The wiki will also include developer resources such as design info, API information and plug-in development information.

17.6 Screen Descriptions

17.6.1 Widgets

Widgets - Mini programs that can be run on a webpage. Each widget has different functionality that uses the system‘s API to get and receive information from the system. Widgets will be openly available to any developer wanting to develop a widget to increase functionality of the system.

Schedule Summary Widget - The schedule summary widget is a basic view widget that will allow users to view the current schedule for the date and time by default. If the user that is logged in is a supervisor that has created schedules, this widget will show the user all the schedules for the current date and time for the users inside his/her workgroup.

Admin Widget - The admin widget is used to provide an easy access to other screens in the system. By default, this widget will be available only on the main screen but can be embedded on any screen at the users request. The widget provides a number of customizable links that allow the users to navigate through the system to the different pages. The users can choose from a pre-defined group of links to add to the admin widget.

Sidebar Widget - The sidebar widget is an embeddable widget that will contain a number of customizable widgets that the user can add to the sidebar. The sidebar is by default visible on every page, however if more screen real-estate is needed then the sidebar can be hidden or even disabled by the user in the user preferences.

Events Widget - The events widget is used to send notifications to employees on just about anything that is going on. The widget displays event notifications in real-time to the users. If users do not want real-time updates they have the ability to turn them off at any time.

Scheduling Widget - The scheduling widget handles one of two tasks depending on who is logged into the system. If the user logged in has adequate permissions to create a schedule then the user has access to the ability to create schedules using the schedule widget. If the user that is logged in does not have adequate permissions to create schedules then they will be able to view the scheduling widget as a read-only widget that will allow them to check their schedules on a daily, weekly, or monthly basis.

Browse Users Widget - The browse users widget is used to browse the users of the system. Employees can only see information that is specified by administrative users. Users will have the ability to filter information based on items such as workgroup, job title, etc to find the information they need. The main function for the browse users widget is to allow employees to retrieve contact and shift information from other employees.

Search Users Widget - The search users widget is used to search for a specific employee or shift based on parameters set by the user. Again, information that can be retrieved is determined by the administrative users of the system.

Settings Widget - The settings widget is used to display settings information for the users profile and settings for the system. Based on the users permission level, certain settings may be available to change and certain settings may not be. The administrators of the system will be able to change what information if available to be changed at which permission level.

User Admin Widget - The user admin widget is used to add, remove and modify users if the user logged in has adequate permissions to do so. The widget will contain user information and allow administrators to add users to the system, update users, and delete or disable users from the system.

Internal Mail Widget - The mail widget is the main method of communication for internal communications within the system. If at any point the users would like to send/receive email to any other user in the system, they can do so by using the built in mail widget. It will have the ability to send, receive and update messages from users in the system.

17.6.2 Screens

Dashboard - The dashboard screen is the main screen after a user successfully logs into the system. The dashboard is the window that displays a summary of information for the user as well as other links to navigate to different areas of the system. Tabs along the top of the dashboard will allow the user to navigate to the main subsection of the site. The main section of the screen will include different widgets to increase functionality of the system. The Dashboard by default will contain multiple widgets: a schedule summary widget, an admin widget, and a sidebar widget which will contain any number of widgets.

Schedule - The Schedule section of the system is where the main scheduling widget is located. Here, supervisors will have the ability to create schedules, modify schedules, delete schedules, and perform any other action when it comes to dealing with the scheduling aspect of the system. If a user logs into the system to check his/her schedule then they can view schedules by day, week and month. This screen can contain up to 2 widgets: the schedule widget as well as the sidebar widget which I enabled by default.

Users - The users screen is a section of the program that will allow users to browse, search, and communication of the users of the system. The users screen contains a browse users widget, a search users widget and a communication widget that is embedded within the other widgets on the users screen.

User Administration - The user admin screen contains a user admin widget that allows users with adequate permissions to add users, delete users, and modify users in the system. The user admin screen is a sub screen of the users screen and is only available if the user logged in has adequate permissions to add, modify and delete users.

Settings - The settings screen contains a settings widget that allows the user to modify settings in their profile. The sidebar widget on the settings screen is disabled by default to allow for maximum screen real estate being dedicated to the settings widget. Any changes made to the users settings will be stored for the next time that they login to the system.

Mail - The mail screen is the main communication method between users of the system. Although the system has the ability to send emails to external emails, private internal emails are also available to be sent and received using the internal mail widget of the system. The sidebar widget on the mail screen is by default enabled for this screen.

17.7 Manual Procedures

17.7.1 Security

The system stores confidential and sensitive data about employees, administrators and the business. Therefore, below are the safety procedures that will be implemented to prevent Web application attacks. This will ensure that none of the data is threatened at any point.

- All employees require a password to login into the system. They are assigned usernames and generated passwords at first. Once the administrator creates an account, an email is sent to the employee with the generated password. In case the employees email was missing, the person creating the account will be notified with the generated password. Users are then prompted to change their passwords as soon as they login. Passwords must be 6 -8 alphanumeric characters and are going to be encrypted in the database.
- Application auto-logout if the system was left idle for 15 minutes. Reliable mechanisms will logout the users by popping up Time Out or Session Expired messages. This will prevent loss of data in case of a power outage, and will prevent unauthorized individuals from accessing the system through an idle computer.
- Setting specific permission sets for different workgroups. This will allow the administrator to configure the credentials for all employees and workgroups. Thus allowing flexibility as it provides the option of granting temporary credentials for particular employees at given times.

17.7.2 Operation

The system mainly operates over an online application that allows Direct Manipulation through multiple interface screens. Those screens are to be accessed using different devices like mobiles and pcs taking in consideration the systems requirements. The entire system is based on widgets and allowing the flexibility of adding plug-ins for future scalability.

17.7.3 Backup and Restore

Application data (from the database) must be backed up on regular basis. Our system will provide automatic ongoing data backup for time consuming input procedures i.e. schedules. Due to the systems nature, providing ongoing data backup for all procedures will cost a lot more than the cost of an error for example, recreating a single account. Instead full and incremental backups are to be scheduled automatically by the systems administrator. Users with the right permission set can perform manual full data backup. They can create restore points using the system's wizard.

The wizard will walk them through the steps required to back up all their data. All backed up files could then be removed for off site storage using external storage devices. This will protect users against hardware failures or any other unforeseen problems. Ultimately users could simply refer to a restore point from an existing backup file. They are then walked through in a wizard to complete the procedure.

17.7.4 Data Archival

Most of the old data is to be archived annually. This will include schedules, shifts, and employment records. Other records like Notifications and e-mail messages are not to be archived due to their irrelevance to the system and thus they are to be deleted every 3 months. Similarly to backup and restore, an administrator or an employee with the appropriate set of permissions must manually schedule to archive the data using the systems wizard.

17.8 Developer Contact

This feature of the help section can only be accessed by higher authorities and employees with adequate permissions by default, but can be changed to accommodate other employees if desired. This feature can be used to contact the developers via bug tracking, issue tracking and feature requests.

Part VI

Appendix

Appendix A

Interview Questions

1. **What are your current scheduling procedures?**
   We currently run a paper based scheduling system. We have some checkout of employee data tied into blackberrys, but that is mostly on the supervisors end. The amount of time that a schedule is generated differs per group. Some groups may generate schedules 2 weeks in advance and some may be a month. Our current scheduling procedures, although are done on paper, differ from department to department.

2. **What are some of the down sides to you current system?**
   Since the system is completely based on paper, it can be time consuming for supervisors or department heads to make up schedules. It can be especially time consuming for certain departments that have employees working in multiple departments. This results in the supervisors and department heads to wait until the other department has scheduled their hours and schedule around it. Also, a paper based system takes a long time to complete, and because there is no specific template for each department, the supervisors are in charge of creating one.

3. **What are some of the benefits to your current system?(What do you want to keep)?**
   Once supervisors and department heads have completed the template for creating schedules, it isnt very difficult to create schedules, just time consuming. I would like the system to still be easy to use.

4. **What would you like the system to accomplish?**
   The system needs to be able to take time off the current scheduling system. It needs to be more efficient and easier to use. The system needs to be able to communicate between departments in the event that an employee works in multiple departments.

5. **Are there any specific features that you would like the system to have?**
   Nothing specific at my request. But I havent done actual scheduling in a while. The better person to talk to about this would be Michael the chef. He schedules the largest group of employees covering all the restaurants and bars.

6. **What are some of the requirements that you would like the system to have? Ex. Communicate with specific applications, run on certain machines?**
   I would like it very much if the system could do a budget summary of pay periods for the maximum number of hours that a group of employees worked. Also, I would like it if it had the ability to produce reports on whatever data that the supervisor would like in a variety of formats.

7. **What does your current schedule look like?**
   We currently use a paper based system at the casino. I can have my assistant provide you with a copy of the current housekeeping schedule as an example.

8. **What programs do you require compatibility with? Ex. Outlook, excel**
   I cant think of any programs off the top of my head that we would require compatibility with. Again, Michael the chef would be able to answer this question a little better.

9. **In addition, what would you like to see compatibility with (non-essential but nice)?**
   I would like to see a portion of the system to be available on blackberry and potentially the iphone as well. So that employees had the ability to access their schedules on some type of mobile device. This would increase the usefulness and ease of access of the system.

10. **What does security look like currently on your scheduling system? Are there anything you want for security? Ex. Encryption, secure connection, use of VPNs**
    Currently, as our system is completely paper based at the moment, we dont have much in the form of security. Obviously since we are dealing with personal employee information, there has to be some type of security implemented so that the data cannot be accessed from outside the system.

11. **When using the new system, who should have access to personal information (employees, supervisors, higher) and to what extent?**
    Obviously employees shouldnt be able to change certain things. The supervisors however maybe should have the ability to change personal information for the employees. Things like passwords and stuff should be ok for employees to change but birth date should not.

12. **How are vacations scheduled (Christmas day, new years) and are there requirements when working a holiday? How about forcing employees to work days based on some other requirements?**
    Again, I havent dealt with employee scheduling in a while. This would be a better question for Michael the chef or Dorine from payroll. Dorine would be better to talk to about the vacations.

13. **Do hours change during holidays based on the regular schedule?**
    Dorine from payroll would be able to tell you about the specifics on holidays, or vacation information for employees.

14. **What is the management structure at the Deerfoot?**
    Each department has their own supervisors/department heads. They are the ones that schedule the employees directly under them for their department. Also, higher executives should be able to pull certain information from the system such as budget information from different departments.

15. **How far in advance are new employee schedules created?**
    This defers from department to department. It can range anywhere from 2 weeks to one month. This would have to be able to be set by the supervisors in order to accommodate all the different departments.

Appendix B

API Documentation

B.1 API Document Template

In addition to the following template for API method calls, the external API document will have sections on our licence agreement, API usage or "Legend" for the document, Widget usage, and the collection of methods that can be used. (This is only a prototype visual representation and is subject to change)

Example

Description

Usage

```
This is the colour and font of code
```

Parameters

Examples

Notes

Pre-Conditions
Post-Conditions
Errors

This is the colour of an error block

Warnings

This is the colour of warnings to the user

Date [In Bottom Right] [Date]

B.2 API Web Template

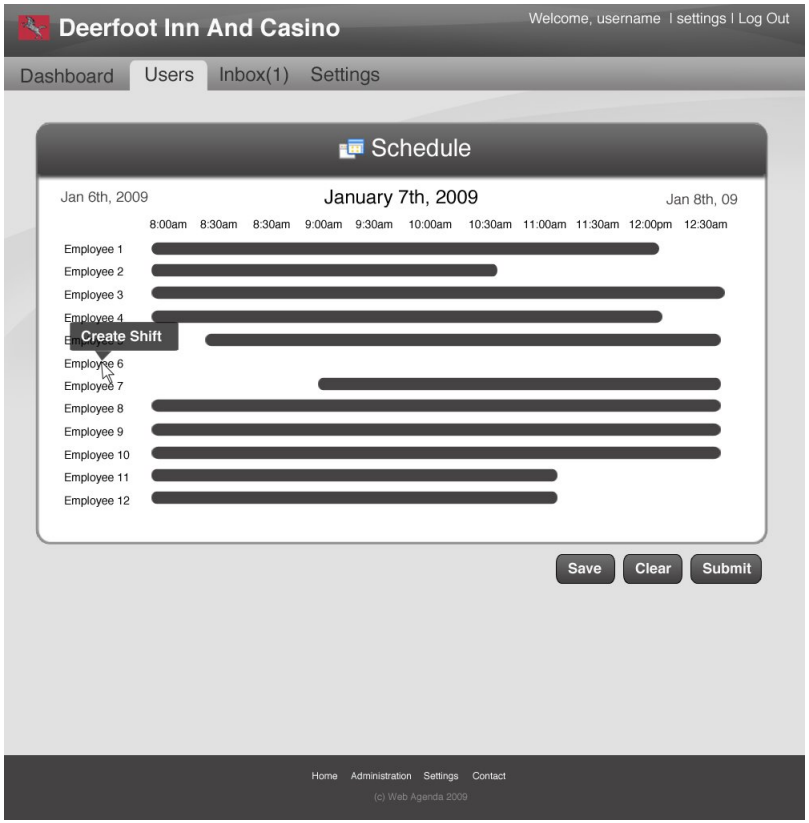
```
<h2>Title Of API Method</h2>
  <h3>Description</h3>
    <p>The destiption of the API method goes here</p>

  <h3>Usage</h3>
    <p>Usage Description if required</p>
      <code>Code Goes Here for an example</code>

  <h3>Parameters</h3>
    <p>Parameter Descriptions if required</p>
        <ul>
          <li>Parameter 1 - Parameter description</li>
          <li>Parameter 2 - Parameter description</li>
          <li>Parameter 3 - Parameter description</li>
        </ul>

  <h3>Examples</h3>
    <p>Example description if required</p>
      <code>Code Goes Here for an example on how to use it in a real life
            scenario</code>

  <h3>Notes</h3>
    <p>Notes go here</p>

  <h3>Pre-Condition</h3>
    <p>Pre conditions go here</p>

  <h3>Post-Conditions</h3>
    <p>Post conditions go here</p>

  <h3>Errors</h3>
    <p>Errors go here</p>

  <h3>Related Methods</h3>
    <p><a href="#">Related Method 1 Link</a></p>
```

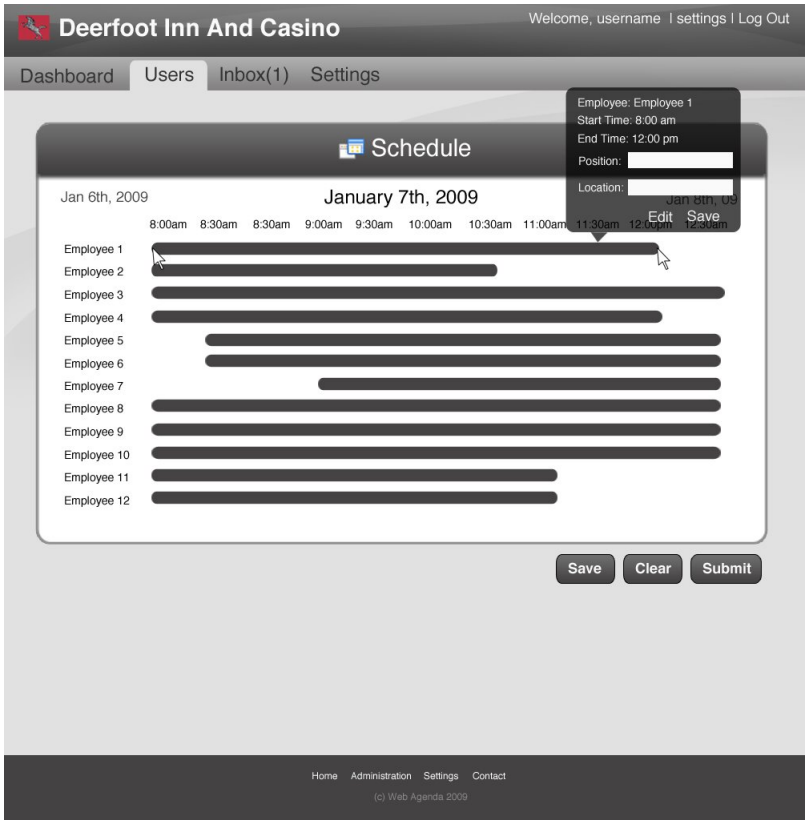
Appendix C

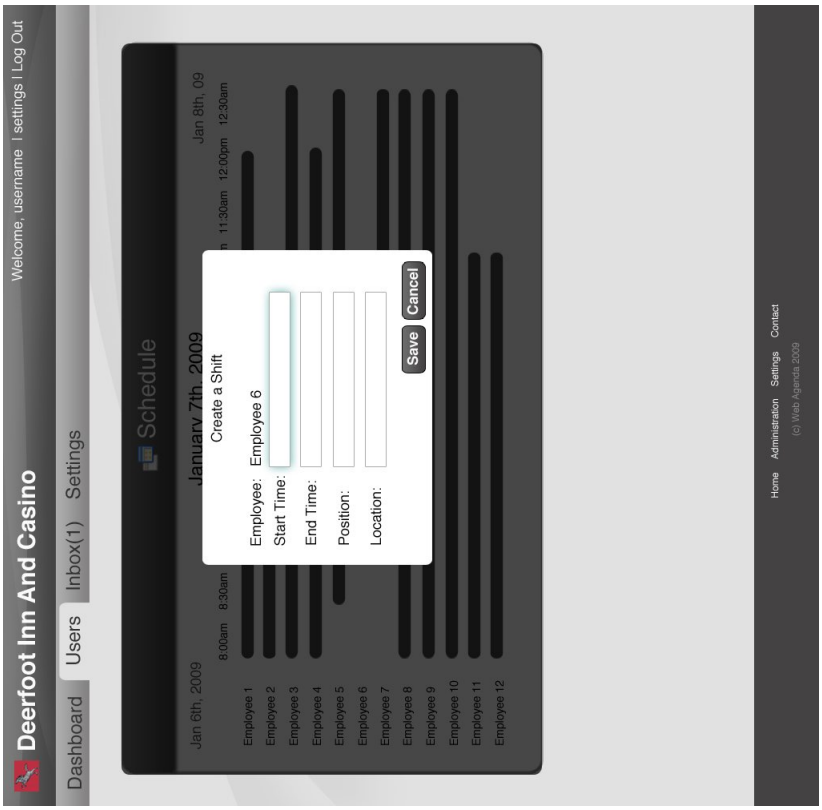
Prototypes - First Edition

The following prototypes are the first conceptual drawings of the system and there is no effort put towards consistency at this point.

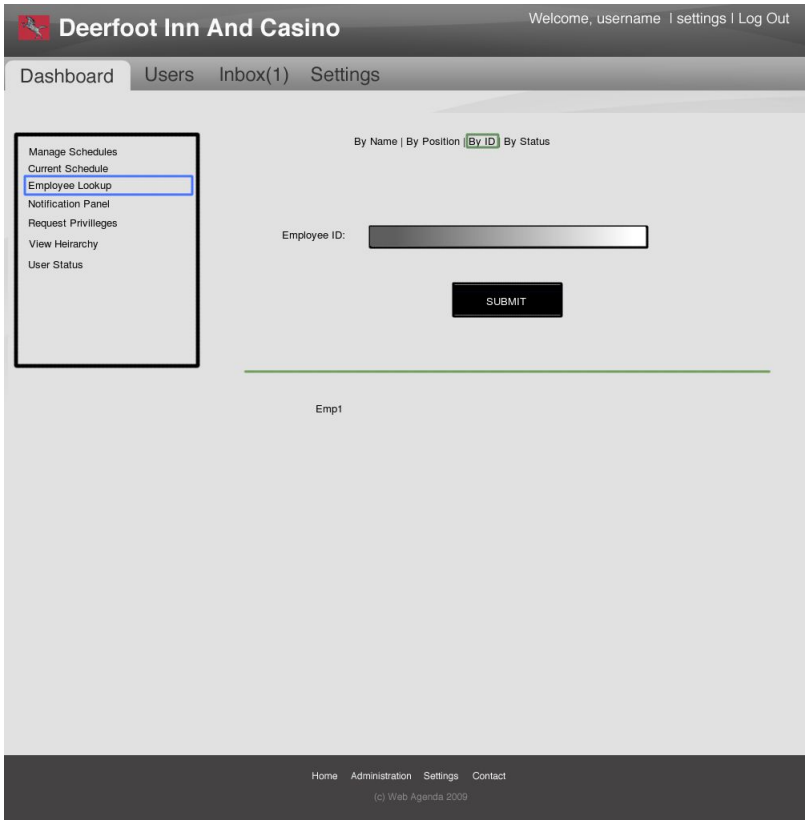
C.1 Creating a Schedule Prototype Screens

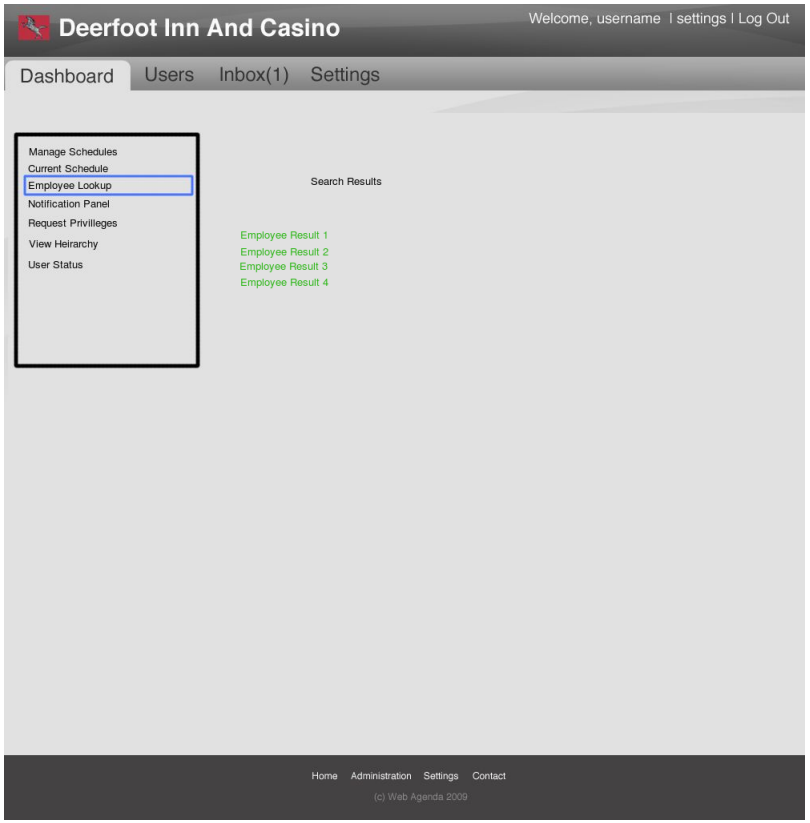


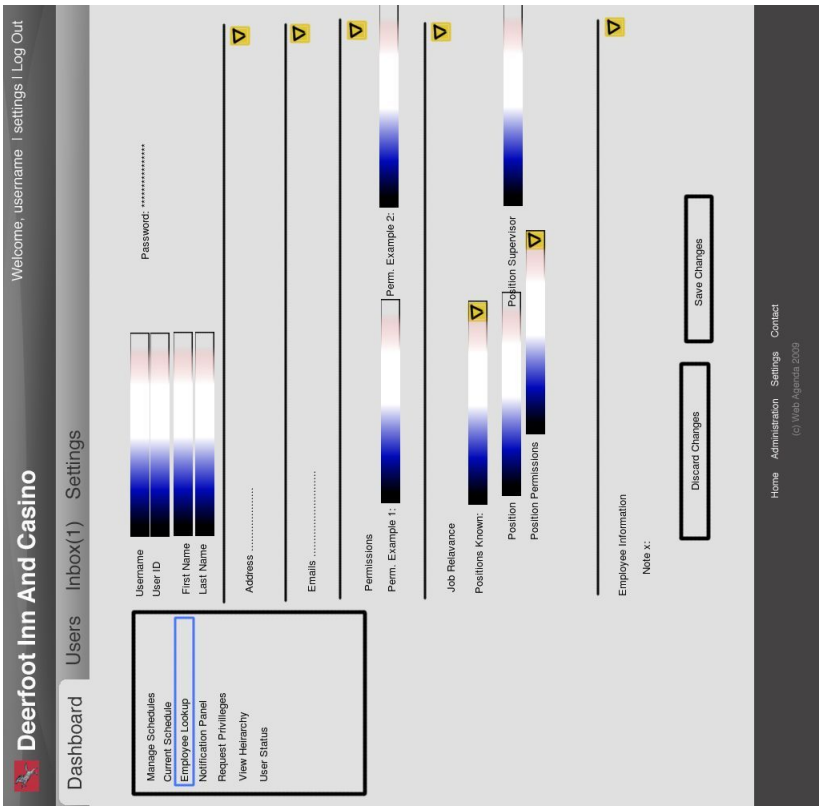



Deerfoot Inn And Casino
Welcome, username I settings I Log Out
Dashboard
Users
Inbox(1)
Settings
Schedule
January 7th, 2009
Jan 6th, 2009
Jan 8th, 09
8:00am
8:30am
11:30am
12:00pm
12:30am
Employee 1
Employee 2
Employee 3
Employee 4
Employee 5
Employee 6
Employee 7
Employee 8
Employee 9
Employee 10
Employee 11
Employee 12
Create a Shift
Employee: Employee 6
Start Time:
End Time:
Position:
Location:
Save
Cancel
Home
Administration
Settings
Contact
(c) Web Agenda 2009

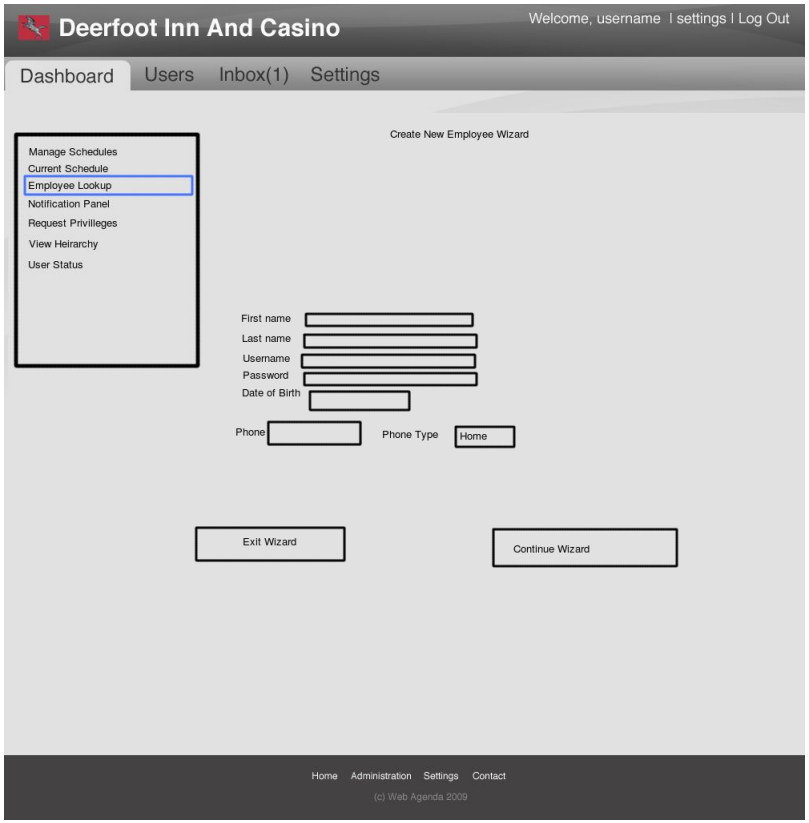
C.2 Maintaining an Employee

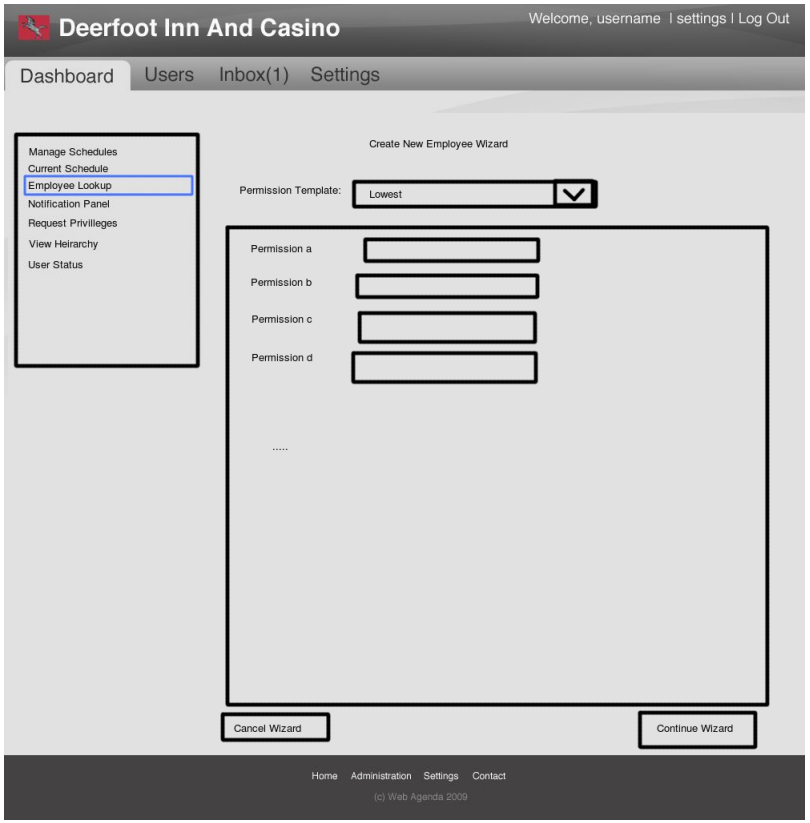


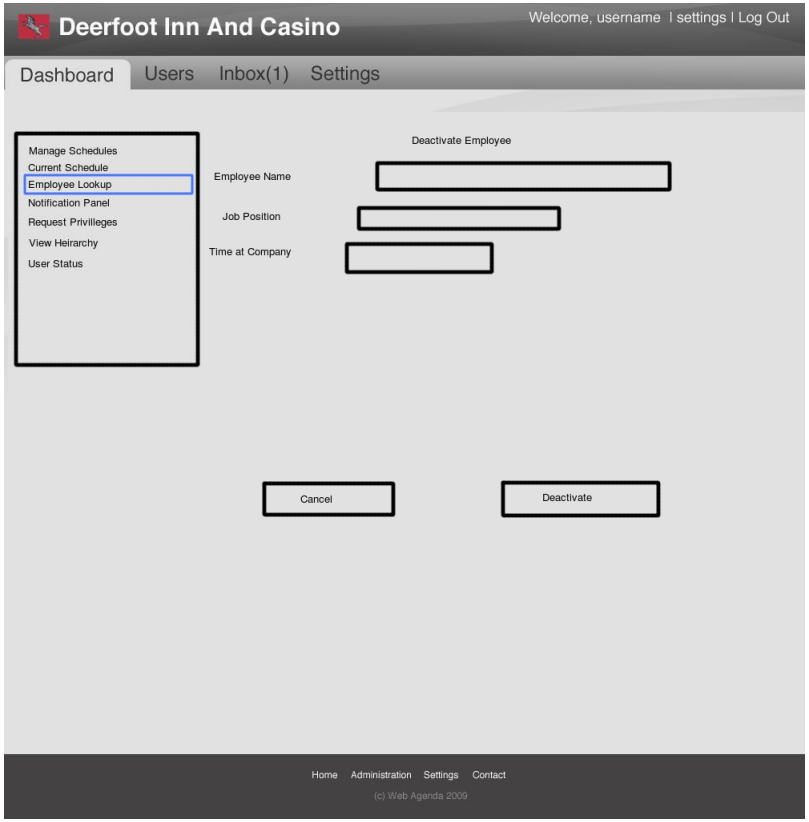



Deerfoot Inn And Casino
Welcome, username | settings | Log Out
Dashboard
Users
Inbox(1)
Settings
Manage Schedules
Current Schedule
Employee Lookup
Notification Panel
Request Privileges
View Heirarchy
User Status
Username
User ID
Password: **********
First Name
Last Name
Address .....
Emails .....
Permissions
Perm. Example 1:
Perm. Example 2:
Job Relavance
Positions Known:
Position
Position Supervisor
Position Permissions
Employee Information
Note x:
Discard Changes
Save Changes
Home
Administration
Settings
Contact
(c) Web Agenda 2009

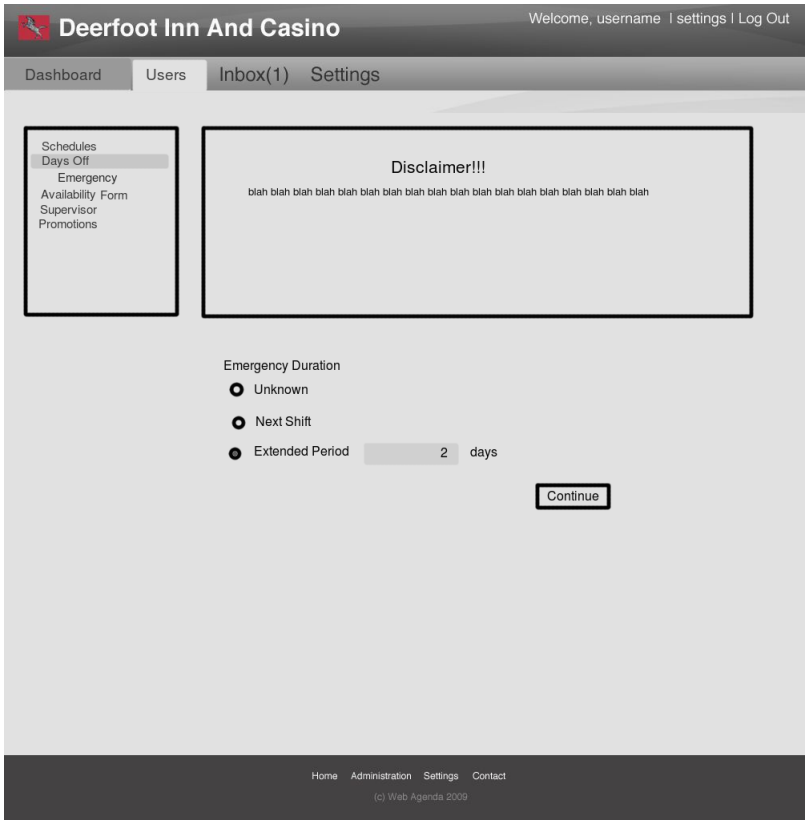
C.3 Creating a New Employee

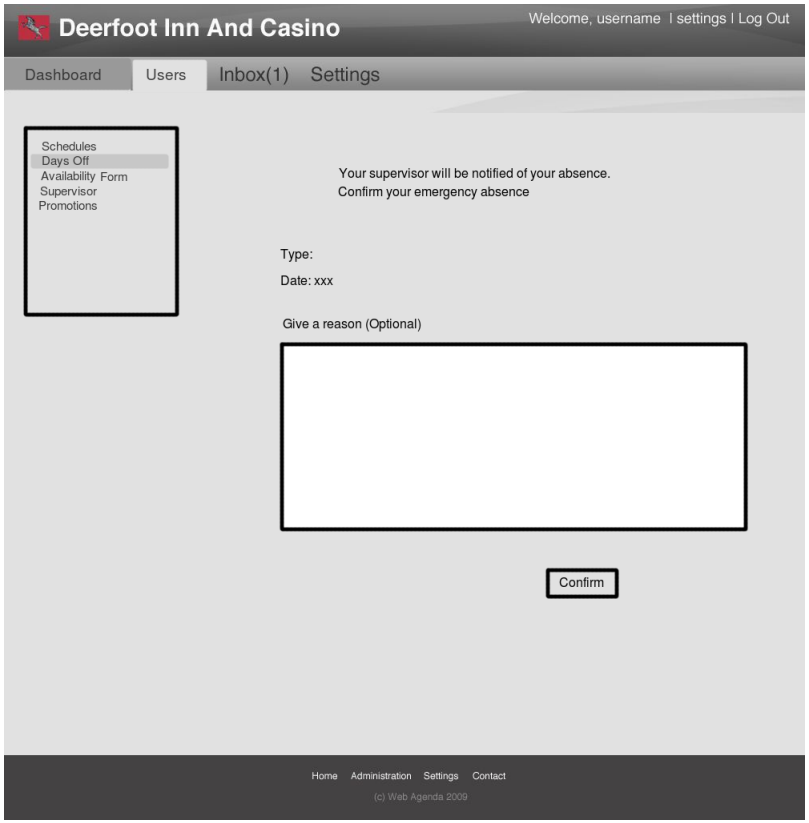





Deerfoot Inn And Casino
Welcome, username I settings I Log Out
Dashboard
Users
Inbox(1)
Settings
Manage Schedules
Current Schedule
Employee Lookup
Notification Panel
Request Privilleges
View Heirarchy
User Status
Deactivate Employee
Employee Name
Job Position
Time at Company
Cancel
Deactivate
Home
Administration
Settings
Contact
(c) Web Agenda 2009

C.4 Taking Emergency Leave





C.5 Viewing the Schedule

Employee	Sun. 22	Mon. 23	Tue. 24	Wed. 25	Thu. 26	Fri. 27	Sat. 28
Employee 1	Off	5pm - 9pm	5pm - 9pm	Off	8am - 2pm	8am - 2pm	Off
Employee 2	Off	8am - 2pm	8am - 2pm	Off	5pm - 9pm	5pm - 9pm	Off
Employee 3	Off	5pm - 9pm	5pm - 9pm	Off	8am - 2pm	8am - 2pm	Off
Employee 4	Off	8am - 2pm	8am - 2pm	Off	5pm - 9pm	5pm - 9pm	Off
Employee 5	Off	5pm - 9pm	5pm - 9pm	Off	8am - 2pm	8am - 2pm	Off
Employee 6	Off	8am - 2pm	8am - 2pm	Off	5pm - 9pm	5pm - 9pm	Off
Employee 7	Off	5pm - 9pm	5pm - 9pm	Off	8am - 2pm	8am - 2pm	Off
Employee 8	Off	8am - 2pm	8am - 2pm	Off	5pm - 9pm	5pm - 9pm	Off

Appendix D

Permission Reference Documentation

D.1 Permissions Overview

What are permissions?

Permissions are variables that determine what is accessable by a user based on their governing permission level.

What is a permission level?

A level of permissions are a general pre-defined list of permissions, usually based around the job and functionality that a user needs from the system. The lowest permission level is 0, and each level above that must contain permissions that are equal or higher in value. There are possible multiple variations of one permission level. The level defines authority, not the job‘s requirements.

How do these permission levels work?

By default, a user is assigned a permission level of 0, the lowest possible level, when created. This should allow for general viewing of the current schedule, sending messages to other employees via the internal messaging system, being able to request booking days off, and being able to export their schedule into another format. Every consecutive permission level must have equal, or greater permission values set.

Every level that is represented by a number is a 'template' permission level, meaning that a user can create alternate permission levels that are recognized as a certain level but have varying degrees of permissions. These alternate permission levels are seen as the template number followed by a letter.

Example: 0 is a template for the minimum employee, 0a and 0b are alternate level 0 versions.

The reason for having template and alternate levels is so that employees can be grouped by their permission levels while retaining any varying permissions that they may require for their job AND so that supervisors can track and understand employees' needs better. If a new employee is hired from another division of the company as a supervisor, they might be given a new user account with permission level 0, but also have the permissions required to create a schedule (but not activate it, of course. They would have to notify a superior to have it put in an active state) which could then be called permission level 0x. As well, if an employee is found to be spamming the internal messaging system, they can have that privilege revoked under level 0z, where they are denied access to any component of the messaging system.

Levels are also useful for managers that need to temporary grant access to other employees. For instance, a manager is going on vacation. They can pass on their permission levels to a supervisor that they trust for a period of time. In this case, permission level 4 is granted to employee with permission level 3b for a period of 2 weeks. (Due to the nature of permissions, no user can elevate their own permission levels. Only one account has full permissions for a level, and that level is known as the Highest permission level +1.)

How is this a secure method of permission setting?

Good question. With levels, no one user can go above what they are given. No user can create an employee above their own level. When WebAgenda is first put into action, only one account exists: the administrator, or root account. It contains what is known as Highest permission level +1, where the permission level will always be the highest one. The actual level number is dynamic. If a company has 5 permission levels created (0-4), then the root account will be 5. If the company drops two levels, then root account will be 3, and so on and so forth. The root account is the only account that can create or delete permission levels. However, there is one exception if all goes according to plan. The root account can enable a maintenance account, one that is disabled by default. It's purpose is for full access to the entire system. **Database** backend, all employee information, all permission levels are ignored for this user. It should only be enabled when there is actual maintenance to be done, then disabled after. It requires a long password that is changed with each login to the system under it.

One more note. With permission level templates, anyone who understands the permissions for that level can make an educated guess on how everyone on that level functions; all 0 level employees are basic bread-and-butter workers for the company. All level 1's would be supervisors or senior employees. In any case, once the permission levels are set up, it makes monitoring employees much easier for the scheduling portion of a business. Once plug-ins get created, more and more functionality can be expected and perhaps WebAgenda will evolve into something more than a scheduling system.

Any additional information?

Permission level can have an alias that helps describe it; for instance, level 0b can be known as Supervisor's assistant, which has the ability to edit schedules that the supervisor works on. Level 3 can be known as Manager, even though it's a template.

A permission level can have a duration; this usually refers to an employee's working period a date that is used to determine when an employee's contract or work stops. For most employees, this will not have a value (no known date for termination) while for contract workers, this might end on dd/mm/yyyy. Having a permission level end on a date for a contract worker means the supervisor doesn't have to go in and disable them, it will be automatic. That also means that once an employee is fired, their account is deactivated, but until then wont' be.

D.2 Permission Set

Employee Permission Set Revision 0.1 (First edition)

A series of permissions that affect employee actions on the system

Permission Name	Values	Description
CanReadActiveSched	Boolean	Employee can access times on a schedule under their name and lower plevels for the current date or period
CanReadPreviousSched	Boolean	Employee has access to times in the archive of schedules under their name and lower plevels
CanReadFutureSched	Boolean	Employee has access to times in schedules ahead of the current date under their name and lower plevels. Most likely they will be blank.
CanEditActiveSched	Boolean	! Employee can make changes to their time in the active schedule under their name and lower plevels
CanEditFutureSched	Boolean	! Employee can add or remove lower plevel employees and self to a schedule ahead of the active schedule.
CanViewResources	Boolean	! Resource view enabled: when viewing schedule, show employees **that are available**, are not available, have time booked off for that view, booked off for emergency, and are already working that view.
CanSearchResources	Boolean	! Employee can look up employees below their plevel and view information (provided permissions allow it)
CanChangePermissions	Boolean	! Although it only applies to lower plevel permissions, and cannot be raised past the default plevel set for Employee, this permission allows changing of other employee's permissions.
CanReadLogs	Boolean	!! This permission is held for the highest permission level and the SysMaintain account; system logfiles generated by the server can be read. Permission can be assigned to another plevel by highest plevel.
CanCreateReports	Boolean	! Can choose from a selection of reports to generate. When a report is generated, it must be sent to an employee.
CanReadReports	Boolean	If a report is sent to employee, it won't be discarded and logged if they have this permission.
CanExportReports	Boolean	! Administrators may want information to be manipulated by trusted employees. This option may provide export methods when viewing report.
CanExportSchedule	Boolean	Why you wouldn't want this is beyond me. But there might be use for it.
CanRequestDaysOff	Boolean	Disable this for abuse or contractors
MaxDaysOff	Number	How many days off an employee can take during a

		schedule period. Decimal values should be allowed, or base this off a month/year value.
CanTakeVacations	Boolean	Days off generally refers to days employee is available that are turned to not available. Vacation is a period of time and generally reserved for full-time employees.
MaxVacationDays	Number	Number of total days in a time period that employee can take.
CanTakeEmergencyDaysOff	Boolean	If this is abused, it can be disabled
CanViewInactiveEmployees	Boolean	! View information on inactive employees
CanSendNotifications	Boolean	! Unlike messages, internal e-mails, this actually displays a notification on an employee's dashboard.
Trusted	Boolean	Similar to a permission promotion (which cannot be given by self), trusted is a permission that allows any employee to perform actions that affect the next highest level without requiring authorization from a superior. However, a notification will still be sent notifiying the supervisor (n/a if highest plevel) explaining actions. This only applies to permissions that are currently enabled. Ex: If an employee cannot book days off, a trusted employee cannot book days off either.
PreferredRank	Number	Starting with 0 as the highest priority employee and then incrementing, this differentiates seniority within the same plevel. For instance, if there are 3 supervisors (emps with same plevel) in the same workgroup, only one can override the decisions of the other two. While the Trusted permission trumps any rank, if more than one employee is trusted or none are, preferred rank is used to set decisions. If two supervisors are promoted at the same time and no rank 0 supervisor is found, promoter will be prompted to set the preffered supervisor. If only one supervisor is set in a workgroup, rank is automatically 0. If more are added, system will assign ranks by the specified System permission rule. If two employees with the same preferred rank exist, the System's SeniorityRule permission takes presidence.

Descriptions prefixed with a '!' mean that permissions are not recommended for permission levels assigned to anyone lower than a supervisor or manager position.The business should determine who retains such control permissions.

'plevels' is the short form for permission levels, a set of the above permissions that define an employee's authority in the system.

Schedule Permission Set

A series of permissions that affect system interaction with schedules. The employee's permission level that created the schedule becomes the schedule's permission level.

Permission Name	Values	Description
LowestReadPermission	Number	The lowest permission level that can read the schedule when it's active Default = 0. Future schedules are determined by employee permission levels and permissions.
DefaultTimeRef	Char	When referring to time values, when 'Y' use a per year reference, 'M' use per month, 'W' use week, 'D' use day. Can be changed, can be converted to and from this value. Exists for ease of use. Defaults to Week.
Active	Date	The date that schedule is active from.
ScheduleDuration	Number	The number of days that a schedule can stay active for. DefaultTimeRef will be converted into days if a different value is given. (Ex: 2W = 14, month would be determined by # of days in it)
EmployeeCreator	Number	Employee ID that created schedule, value will automatically be assigned when created.

If no schedules are active, no one is expected to come into work. A warning system should be implemented so that if there is a period that no schedules exist, affected employees that can create schedules should be warned.

Anyone with higher permission levels than the EmployeeCreator value can view and modify the schedule regardless, provided they have CanEdit[x]Sched permission. (Where x = Future or Active)

System Permission Set

Permission Name	Value	Description
DenyShiftRequest	Date	The time duration before a shift starts that any requests for that shift will be cancelled and user is notified that no takers for shift were found.
MinShiftDuration	String (hh:mm)	How long (in hours/minutes) that a shift will last. Shifts may actually be smaller, but payment for a shift will last for that duration. (Ex: work for an hour, but minimum shift is 3 so 3hours of work is paid out. Value=03:00)
MinAvailabilityShifts	Number	The number of minimum shifts that must be applied for an availability to be proper, as per week. Can be 0.
AvailabilityChangePause	Date	How long user must wait before changing availability again (ie. Cannot change every day, must wait n amount of weeks)
SeniorityRule	Number	0 – Prompt for preferred rank (display in a list from highest to lowest) 1 – Default: Oldest worker is given authority 2 – Greatest availability (works most hours) 3 – Most permissions enabled (if there is a tie, will set to 0) 4 – First come, first serve (FIFO, aka queue) 5 – Alphabetical 6 – Reverse Alphabetical
MaxEmergencyDuration	Number	Number of consecutive days can be taken off. Default is 2 weeks. If more time is required, employee must speak to administration or an authoritative figure in the company.

Appendix E

Glossary

A

Actor Something or someone that interacts with the system, yet exist outside of it. Though actors are often people, they may also be hardware, or even other systems.

Administration Requirements Minimum expectations set by those in power that aid in management.

Aloha The Aloha Corporation provides payroll and payroll related services to small and midsize businesses. Aloha offers direct deposit, workers‘ compensation and other convenient, time-saving services.

Alpha Release A basic release of the software for testing purposes.

Apache An open source HTTP (and HTTPS) server for *nix, Windows NT, and other computing platforms.

API The Application Programming Interface is a set of methods for interacting with data of all types in the database. This item is mostly used for getting data from the database and storing data in the database.

B

Backup A copy made of existing information and data that is stored in a separate location. Should a failure result in the loss of the original source, the information and data can be restored from the backup to reduce the impact of the failure, and the time it takes to recover from it.

Beta Release A feature rich release of the software. This release may still have errors that need to be fixed.

Bug An error or unexpected / undesired behaviour in a program. Bugs can have large, small, or negligable impacts.

D

Database A Method of storing data on a computer/server that allows access of that data in an extremely efficient manner.

Department A specific unit or section of a company that performs or monitors a specific company-related task, such as food-service, cleaning, IT, etc.

Deployment The installation of a program or application to be used by the end user.

Deerfoot Inn and Casino The business client for which WebAgenda is currently being based off of.

Document Viewers An application that is installed on a client computer that displays a file containing relevent data.

E

Encrypted Data that is has been modified and cannot be used until decrypted, usually by specifying a password.

Encryption A series of modifications to the contents of data so that it cannot be read without undoing the modifications first.

Export The ability of a system to send information out to be used by other applications

F

Format A common language that multiple applications can understand.

Functional Requirements Features and components of the system that must be provided if the system is to fully meet its intended usage.

Fact-Finding Methodology A detailed account of the methods used to gain information about the needs of the client business, the work environment the system will be deployed in and, if applicable, any current systems that will be replaced by the new one.

Final Release A full featured release with little or no errors ready to be installed.

G

GPL (General Public License) A widely used free software license, originally written by Richard Stallman that provides free access to software published under its terms. Users are allowed to copy, modify, and redistribute GPL software as long as its conditions are met.

GNU/Linux KCal A calendar plugin used by KOrganizer, part of the personal information management suite found in the K Desktop Environment, one of the two most popular GNU/Linux system desktop managers.

J

J2EE Also known as Java 2 Platform Enterprise Edition, Java EE is an enterprise mainframe programming language derived from java to provide simple application development for thin clients, or low-powered computers.

JSP Java Server Page is a server-side technology that integrate html code from webpages into the Java and Java EE programming languages.

H

HTTP (Hyper Text Transfer Protocol) Used by web servers to transfer web pages and web applications so that users can use them.

HTTPS (Hyper Text Transfer Protocol) Secure is a protocol used to securely transfer data such as passwords to the server.

Javascript A simple, cross-platform, World-Wide Web scripting language created by Netscape that is used on browsers and servers to provide additional functionality.

I

Interface The presentation of communications between application and user.

L

LaTeX A programming language and word processor that is used for typesetting technical data into professional documents.

M

Mac OS X ICal Default calendar client included in Macintosh OS X installations and on products owned by Apple, such as the iPhone.

Maintainability The degree to which a product can be readily supported (upgraded, secured) over a period of time; usually the predicted lifecycle of the product.

Microsoft Outlook Default e-mail client included in Microsoft Windows installations that includes a calendar. Web versions of outlook exist with calendar functionality as well.

Mobile Web Refers to web browsing on a mobile device, where the screen size is much smaller than conventional computers that are used. Formats that a Mobile Web device can view must be clear, simple, reasonably small and concise. Can be in the form of a webpage, text file, or image.

MySQL The world‘s most popular open source database which can be distributed for no charge and is licensed under the GPL.

N

Non-Functional Requirements Requirements placed on a system that focus on the quality of the actions it provides and any constraints they must function within.

P

Project A temporary process, that provides a product to a client.

Project Scope Defines the limits of what a project will and will not cover. Elements determined to be outside of the project scope will not be addressed by the project team, though they may need to be covered by an outside party if the elements are desired.

R

RSS (Really simple Syndication) Familly of web feed formats to publish frequent updates.

S

SSL (Secure Sockets Layer) Provides a method to send data across a network securely.

Server A very powerful computer that hosts a variety of services to clients.

SMS Short Message Service, a cellphone-based messaging system that can send 160 character messages delivered by the digital cellular system.

Source Code Groupings of text that a computer can understand and create a product as result.

Sub Domain A domain that resides in a larger domain that is seen on a network. Is generally used to separate tasks that perform a function for clarity and purpose.

System A program or application used to help the user to accomplish a task.

System Interface How the end user interacts with the program or application to accomplish a task.

System Interface Requirements How easy the system is to use based on the end user.

System Requirements The minimum requirements that a program or application needs to run.

T

Testing A process through which aspects of the system are examined to ensure they work as expected, and meet all business requirements. This process may be repeated many times, as resolving some issues may reveal others that were previously unknown.

TSL (Transport Security Layer) A secure communications protocol that allows data to be sent over a computer network (such as the internet) while preventing outside parties from viewing or tampering with it.

U

Use Case A description of a system‘s behavior from the user‘s point of view, detailing the events that must occur for a user to accomplish a specific task.

W

WebAgenda Name of the Scheduling System developed by Daniel Kettle, Daniel Wehr, and Mark Hazlett as a useful and free web-based alternative to the proprietary commercial systems with emphasis on 24/7 access to schedules.

Appendix F

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