MAY 3, 2020

FINAL PROJECT

LEAVE MANAGEMENT SYSTEM

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SWDV 630: OBJECT-ORIENTATED PROGRAMMING

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Project Overview

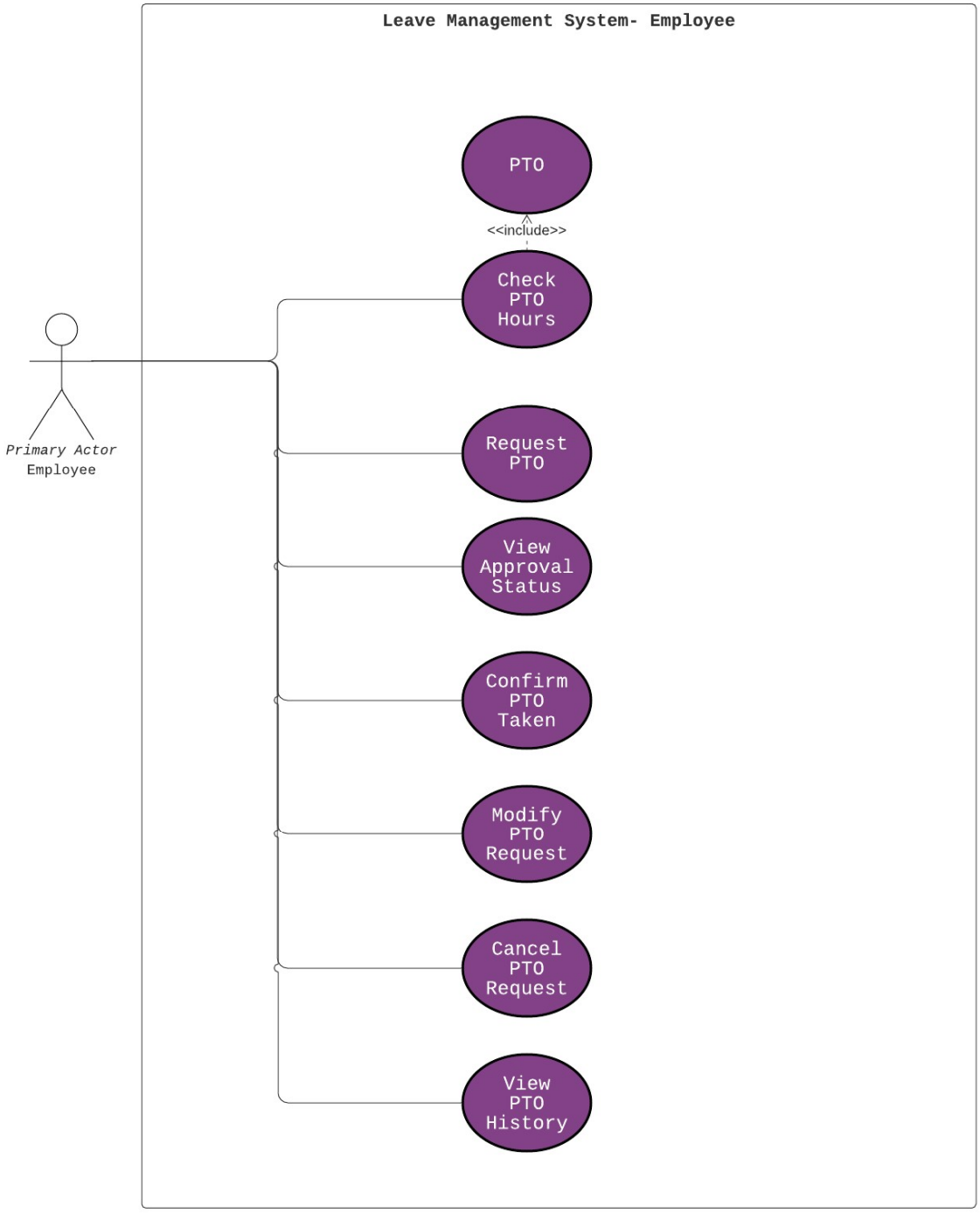
Ben and Billie Muzzy developed a Leave Management System (LMS). An LMS is an all-in-one platform that handles all time off requests from employees. Time off request types included in this LMS will be: Paid Time Off (PTO), Unpaid Time Off (UTO), and Bereavement.

Employees will be able to check available PTO hours, request to use PTO hours, view approval status, modify PTO requests, cancel PTO requests, and view PTO history.

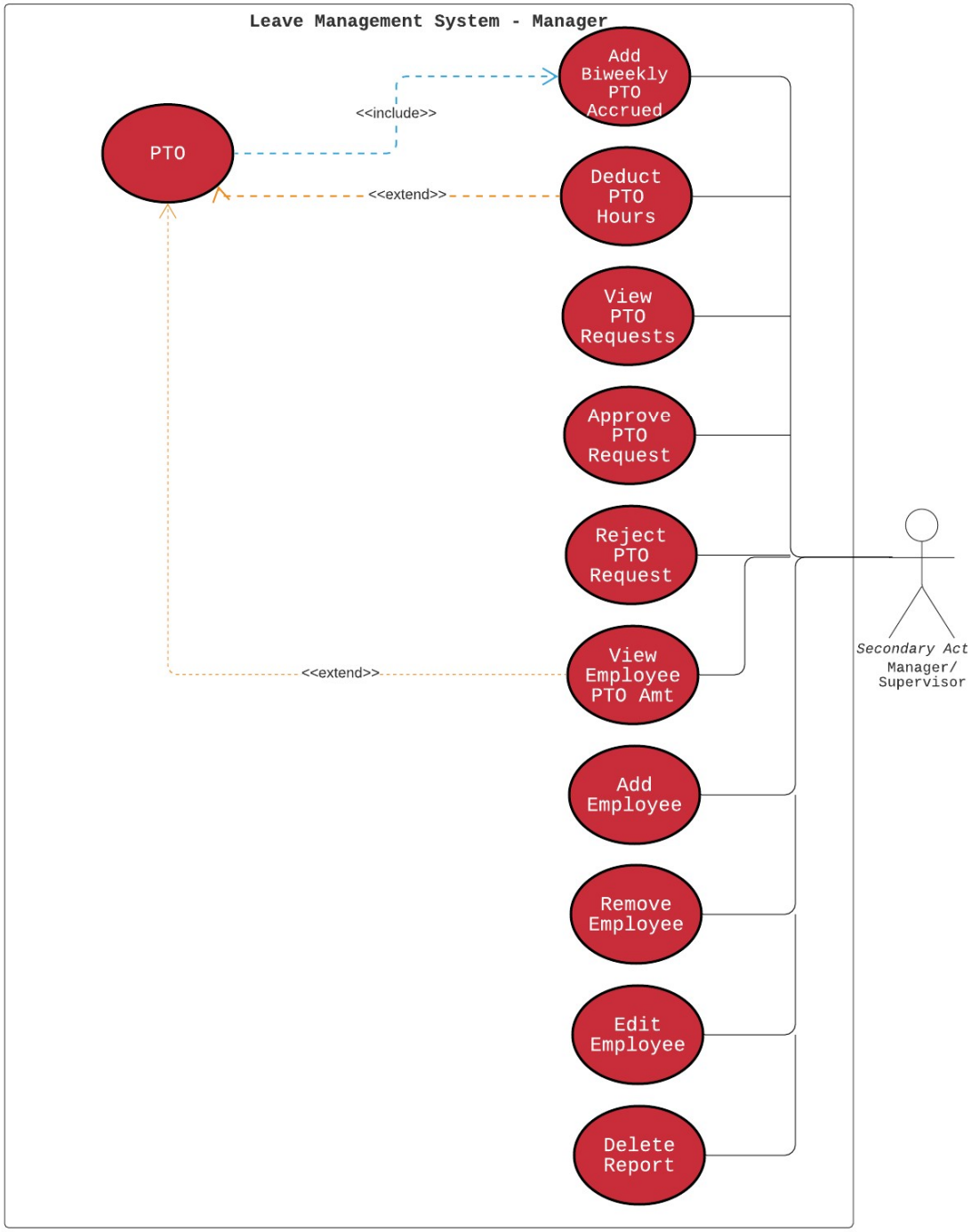
Manager/Supervisors will be able to view PTO requests, approve PTO requests, reject PTO requests, and view an employee's available PTO.

Use Cases

Employee



Manager



Use Case Elaborations

Use Case Name	Check PTO Hours
ID	UC1
Scenario	Employee Checks Hours
Triggering Event	Employee considering taking time off
Brief Description	Employee thinking about taking a mental health day. First time using system.
Actors	Employee, Manager
Assumptions	Full time employee eligible for PTO
Frequency of Use	As needed
Related Use Cases	PTO, Add Biweekly PTO Accrued, Deduct PTO Hours
Stakeholders	Manager
Preconditions	Does not know how much PTO available
Postconditions	Now knows PTO available
Main Course	1.) Employee logs on to portal 2.) Employee selects the view PTO hours buttons 3.) System responds with total PTO available a. User has enough PTO and proceeds to Request PTO b. User does not have enough PTO and logs off
Alternate Course	1.) User receives login error 2.) Employee reaches out to Manager 3.) Manager adds employee to portal 4.) Employee follows Main Course

Use Case Name	Request PTO
ID	UC02
Scenario	Employee wants to request PTO
Triggering Event	Employee see they have enough hours to take PTO.
Brief Description	Employee sees they have enough PTO hours and wants to take a mental health day.
Actors	Employee, Manager
Assumptions	Full time employee eligible for PTO
Frequency of Use	As needed
Related Use Cases	Check PTO Hours
Stakeholders	Manager
Preconditions	Employee wants to take PTO
Postconditions	Employee requested PTO
Main Course	1.) Employee logs on to portal 2.) Employee selects the view PTO hours buttons 3.) System responds with total PTO available a. User has enough PTO and proceeds to Request PTO 4.) Employee requests PTO 5.) Request forwarded to Manager for approval 6.) Employee logs out of system 7.) Employee waits for email notification that approval status is available
Alternate Course	1.) Employee logs on to portal 2.) Employee selects the view PTO hours buttons 3.) System responds with total PTO available a. User has enough PTO and proceeds to Request PTO 4.) Employee requests PTO 5.) Error Message received when requesting that there was not enough PTO available 6.) Manager reaches out to developer 7.) Developer corrects bug 8.) Employee follows Main Course

Use Case Name	View PTO Requests
ID	UC03
Scenario	Manger views PTO requests
Triggering Event	Notification that an employee requested PTO
Brief Description	Employee requested PTO, email notification that there is a PTO request available was emailed to manager.
Actors	Manager, Employee
Assumptions	Manager has access to employee's schedules
Frequency of Use	Daily
Related Use Cases	Request PTO
Stakeholders	Employee
Preconditions	Request pending for approval
Postconditions	Request approved or rejected
Main Course	1. Notification received that there is a new PTO request available. 2. Manger logs into portal 3. Manager checks staff schedule to ensure that there is enough coverage for the day a. Coverage is sufficient and Manager approves b. Coverage is not sufficient, and Manager rejects 4. Notification sent to employee 5. Manager logs off
Alternate Course	1. Employee has waited 24 hours for approval and has not received approval 2. Employee reaches out to Manager to ask status 3. Manager did not see notification 4. Manager checks for spam messages a. Message is in Spam, manager unblocks address b. Message is not in Spam manager reaches out to Developer 5. Manager follows main course steps 2-5

Use Case Name	View approval status
ID	UC04
Scenario	Employee email notification that approval status is available
Triggering Event	Manager approved PTO request
Brief Description	Employee submitted for PTO and manager approved/rejected request. Employee received notification that approval status available
Actors	Employee, Supervisor
Assumptions	Employee Requested PTO
Frequency of Use	As needed
Related Use Cases	Approve PTO Request, Reject PTO Request
Stakeholders	Manager
Preconditions	1.) PTO has been approved or reject 2.) Employee received notification approval status available
Postconditions	Employee knows if PTO has been approved or rejected
Main Course	1.) Employee receives notification that PTO status is available 2.) Employee logs into portal 3.) Employee clicks on link to view status a. Approved b. Rejected – if rejected reason provided such as "not enough coverage" 4.) Employee logs out of portal
Alternate Course	1.) Employee receives notification that PTO status is available 2.) Employee logs into portal 3.) Employee clicks on link to view status 4.) Status was rejected, but no reason provided because Manager did not enter a reason. 5.) Employee consults with Manager as to why rejected 6.) Manager tells employee reason 7.) Manager updates portal with reason code 8.) Manager selects option to not send out a notification 9.) Manager logs off

Use Case Name	Cancel PTO Request
ID	UC05
Scenario	Employee wants to cancel PTO request.
Triggering Event	Employee remembers they requested PTO for a day they no longer need.
Brief Description	Employee's family no longer coming for a visit and realized they need to cancel their PTO request.
Actors	Employee
Assumptions	Previously requested PTO amount hasn't already been deducted from available PTO.
Frequency of Use	Whenever needed.
Related Use Cases	Request PTO, Modify, PTO Request, View PTO Request History
Stakeholders	Employee, supervisor
Preconditions	Employee wants to cancel a PTO Request
Postconditions	Employee has cancelled a PTO Request
Main Course	1. Employee logs into LMS. 2. Clicks "View PTO Request History" and sees his current PTO request still listed as approved. 3. Employee selects the PTO request and clicks cancel. 4. Employee's requested PTO gets added back to their available PTO balance. Supervisor gets notification of the cancellation request but needs to take no action on it as PTO cancellations do not need supervisor approval.
Alternate Course	1. Employee logs into LMS. 2. Clicks "View PTO Request History" and sees his current PTO request still listed as approved. 3. Employee selects the PTO request and clicks cancel. 4. Employee receives error, "UNABLE TO CANCEL PTO REQUEST". Employee contacts his supervisor about the error. Supervisor views the PTO request again and sees it's for tomorrow's date. Reminds employee that PTO cancellation requests must be submitted 36 hours prior to date of the PTO Request.

Use Case Name	Modify PTO Request
ID	UC06
Scenario	Employee wants to modify a PTO request
Triggering Event	Employee wanted to adjust his PTO request from 4 hours to 8 hours
Brief Description	Employee got a call their doctor, based on test results just received the doctor would like to run additional tests at the Employee's next appointment. Employee then realizes they will need to take additional hours PTO for that appointment.
Actors	Employee, supervisor
Assumptions	Employee has enough available PTO.
Frequency of Use	Whenever needed.
Related Use Cases	Check available PTO, Request PTO, Cancel PTO Request
Stakeholders	Employee, supervisor
Preconditions	Employee needed modify the number of hours on a PTO Request
Postconditions	Employee successfully modified the number of hours on a PTO Request
Main Course	1. Employee logs into LMS. 2. Clicks "View PTO Request History" and finds the PTO Request to modify 3. Employee selects the PTO request and clicks modify and enters the new PTO amount and clicks submit. 4. Supervisor gets notification of the PTO Request Modification and approves the change. Employee gets email notification that the PTO change has been approved.
Alternate Course	1. Employee logs into LMS. 2. Clicks "View PTO Request History" and finds the PTO Request to modify 3. Employee selects the PTO request and clicks modify and enters the new PTO amount and clicks submit. 4. Supervisor gets notification of the PTO Request Modification and clicks approve on the request, but receives error, "Request previously approved, unable to approve again". 5. Supervisor contacts Dev Team about the issue. 6. Dev Team deploys fix to allow modification of previously submitted PTO Requests. 7. Supervisor tries to approve the request again this time it was successful.

Use Case Name	Deduct PTO Hours
ID	UC07
Scenario	Employee wants view if the PTO they took 2 week ago was deducted from their available PTO
Triggering Event	Employee wants view if the PTO they took 2 week ago was deducted from their available PTO
Brief Description	Employee wants view if the PTO they took 2 week ago was deducted from their available PTO
Actors	Employee
Assumptions	Employee had used PTO
Frequency of Use	Whenever needed.
Related Use Cases	Request PTO, Cancel PTO Request, Approve PTO Request, Reject PTO Request
Stakeholders	Employee, Supervisor
Preconditions	Employee wants to see if the PTO they recently used was deducted
Postconditions	Employee was able to verify the PTO they used recently was deducted from their available PTO amount
Main Course	1. Employee logs into LMS. 2. Clicks "Available PTO" and see they have 16 hours of PTO when previously they had 24 hours, so the PTO was deducted.
Alternate Course	1. Employee logs into LMS. 2. Clicks "Available PTO" and sees they still have 24 hours of available PTO. 3. Employee contacts their Supervisor about the issue 4. Supervisor contacts Dev Team about the issue 5. Dev Team looks into the issue and sees the approval status in the system, but the PTO was never deducted. Dev Team looks into the issue and finds that the time and date was off on the LMS Server which prevented the "Deduct PTO Hours" service from running. 6. Dev Team applies fix to the LMS application to use a different source for correct date and time. Supervisor asks Employee to check their available PTO again. Employee checks and sees the correct available PTO amount.

Use Case Name	Confirm PTO Taken
ID	UC08
Scenario	Employee used PTO recently and wants to confirm it was deducted from their available PTO
Triggering Event	Employee wants to confirm the PTO they used got deducted correctly from their available PTO amount
Brief Description	Employee used PTO recently and wants to confirm it was deducted from their available PTO
Actors	Employee
Assumptions	That the previous PTO Request was approved and not denied
Frequency of Use	Whenever needed
Related Use Cases	Request PTO, Approve PTO Request
Stakeholders	Employee
Preconditions	Employee used PTO and wants to confirm it was deducted from their available PTO.
Postconditions	Employee was able to confirm their PTO Request was deducted correctly.
Main Course	1. Employee logs into LMS. 2. Clicks "available PTO" 3. Employee sees that they have the correct available PTO amount.
Alternate Course	1. Employee logs into LMS. 2. Clicks "Available PTO" 16 hours of PTO were taken when it should have only been 8. 3. Employee contacts their Supervisor about the issue. 4. Supervisor contacts Dev Team about the issue. 5. Dev Team sees that the PTO Request had been originally submitted for 16 hours and then later modified to 8 hours. 6. Dev Team applies fix for when PTO Requests are modified the original request is removed. Supervisor asks Employee to check their available PTO again and now the correct amount shows.

Use Case Name	View PTO History
ID	UC09
Scenario	Employee sees they only have 16 hours of PTO available and they thought they had more, so they go to View PTO History
Triggering Event	Employee shows less available PTO then they thought they had
Brief Description	Employee sees they only have 16 hours of PTO available and they thought they had more, so they go to View PTO History
Actors	Employee
Assumptions	That the Employee previously has submitted a PTO request and their Supervisor approved it
Frequency of Use	Whenever needed
Related Use Cases	Check PTO Hours, Request PTO, Modify PTO Request, Cancel PTO Request
Stakeholders	Employee, Supervisor
Preconditions	Employee wants to verify if they used PTO or not
Postconditions	Employee is able to verify they did indeed use more PTO than they thought
Main Course	1. Employee logs into LMS. 2. Clicks "View PTO History" 3. Employee is able to see that they did use more PTO than they thought and the available PTO amount is correct.
Alternate Course	1. Employee logs into LMS. 2. Clicks "View PTO History" 3. Employee is able to see that they have an extra PTO Request they don't' remember submitting. 4. Employee contacts their Supervisor about the issue 5. Supervisor contacts Dev Team about the reported issue 6. Dev Team looks into the issue and finds that the recent company holiday got applied as regular PTO use for all employees 7. Dev Team applies fix, so company holidays do not trigger PTO use 8. Supervisor contacts Employee and asks them to verify their available PTO amount 9. Employee is now able to see the correct available PTO is showing

Use Case Name	Approve PTO Request
ID	UC10
Scenario	Supervisor needs to approve a PTO request
Triggering Event	Supervisor received a PTO Request notification
Brief Description	An employee on the Supervisor's team submitted a PTO Request
Actors	Employee, Supervisor
Assumptions	Employee actually submitted a PTO Request
Frequency of Use	Whenever needed
Related Use Cases	Reject PTO Request, View Employee Amt
Stakeholders	Employee, Supervisor
Preconditions	Supervisor logs into LMS and approves the PTO Request
Postconditions	Supervisor approved PTO request and Employee receives PTO approved notification
Main Course	1. Supervisor logs into LMS. 2. Supervisor clicks "View PTO Requests" 3. Supervisor clicks "Approve PTO" and the PTO Request gets and approved note added and a notification is sent to the Employee
Alternate Course	1. Supervisor logs into LMS. 2. Supervisor clicks "View PTO Requests" 3. Supervisor clicks "Approve PTO" and nothing happens 4. Supervisor contacts Dev Team about the issue 5. Dev Team looks into the reported issue and doesn't find any application or system issues. 6. Dev Team asks Supervisor to reboot their PC and try again. 7. Supervisor reboots and tries the approval again and time it goes through

Use Case Name	View PTO Requests
ID	UC11
Scenario	Manager/Supervisor needs to view PTO requests
Triggering Event	Manager/Supervisor gets a notification via email that there are new PTO requests pending
Brief Description	Manager/Supervisor gets an alert that there are PTO requests that need approval.
Actors	Manager
Assumptions	PTO requests pending
Frequency of Use	daily
Related Use Cases	Add PTO Request
Stakeholders	Employee
Preconditions	Receives notification that there is a PTO request
Postconditions	PTO request approved or rejected
Main Course	1.) Employee submits request for PTO 2.) Manager receives notification that there is a PTO request pending 3.) Manager goes to Portal and approves/rejects
Alternate Course	1.) Employee submits request for PTO 2.) Manager does not get notification 3.) Employee waits for status. After 24 hours asks manager for status 4.) Manager checks portal request is there, but no notification 5.) Manager approves request 6.) Manager notifies developer

Use Case Name	Reject PTO Request
ID	UC12
Scenario	Manager rejects PTO request
Triggering Event	Manager receives notification that there is a PTO request
Brief Description	After receiving notification manager sees that there are already too many people taking time off.
Actors	Employee, Manager
Assumptions	PTO request submitted
Frequency of Use	Monthly
Related Use Cases	Add PTO request
Stakeholders	Employee, Manager
Preconditions	PTO Requested
Postconditions	PTO rejected
Main Course	1.) Employee submits request for PTO 2.) Manager gets notification 3.) Manager checks calendar and sees multiple employees already have the day off 4.) Manager rejects PTO and receives success message
Alternate Course	1.) Employee submits request for PTO 2.) Manager gets notification 3.) Manager checks calendar and sees multiple employees already have the day off 4.) Manager clicks on reject PTO option, but the page is spinning. 5.) Manager notifies employee in person that PTO request is denied and provides reason. 6.) Manager notifies development

Use Case Name	View Employee PTO Amount
ID	UC13
Scenario	Manager checks to see if employee has enough PTO
Triggering Event	PTO request
Brief Description	Employee has been taking a lot of PTO recently and Manager suspects that employee does not have enough PTO.
Actors	Manager, Employee
Assumptions	A PTO request is submitted, and employee qualifies for PTO
Frequency of Use	Weekly
Related Use Cases	Request PTO
Stakeholders	Manager
Preconditions	Employee requests PTO
Postconditions	Manager views hours
Main Course	1.) Employee submits request for PTO 2.) Manager gets notification 3.) Manger checks PTO hours and confirms suspicion.
Alternate Course	1.) Employee submits request for PTO 2.) Manager gets notification 3.) Manger checks PTO hours but there is an excessive amount of PTO available 4.) Manager confirms PTO with payroll and confirms there is an error 5.) Manager reports error.

Use Case Name	Add New Employee
ID	UC14
Scenario	Manager needs to add a new hire to portal
Triggering Event	New hire qualifies for PTO
Brief Description	New hire qualifies for PTO and manager needs to add to portal
Actors	Manager
Assumptions	New hire qualifies for PTO
Frequency of Use	Monthly
Related Use Cases	NA
Stakeholders	Manager, Employee
Preconditions	Employee qualifies for PTO
Postconditions	Employee can use portal
Main Course	1.) Employee qualifies for PTO 2.) Manager creates new user for employee 3.) Employee confirms can log in
Alternate Course	1.) Employee qualifies for PTO 2.) Manager creates new user for employee 3.) Employee unable to login 4.) Manager checks Portal and sees that they did not enter all required information 5.) Manager completes information 6.) Employee can login

Use Case Name	Remove Employee
ID	UC15
Scenario	Employee terminated and needs to be removed from portal
Triggering Event	Employee terminated
Brief Description	Employee terminated and needs to be removed from portal
Actors	Manager
Assumptions	Employee qualified for PTO
Frequency of Use	Monthly
Related Use Cases	Add New Employee
Stakeholders	Manager
Preconditions	Employee has access to portal
Postconditions	Employee does not have access to portal
Main Course	1.) Employee Terminated 2.) Manager clicks remove employee, and confirms 3.) Employee is removed from system
Alternate Course	1.) Employee Terminated 2.) Manager clicks remove employee, and receives an error to check VPN 3.) Manager notices they are not logged into VPN and logs back in. 4.) Manager removes employee

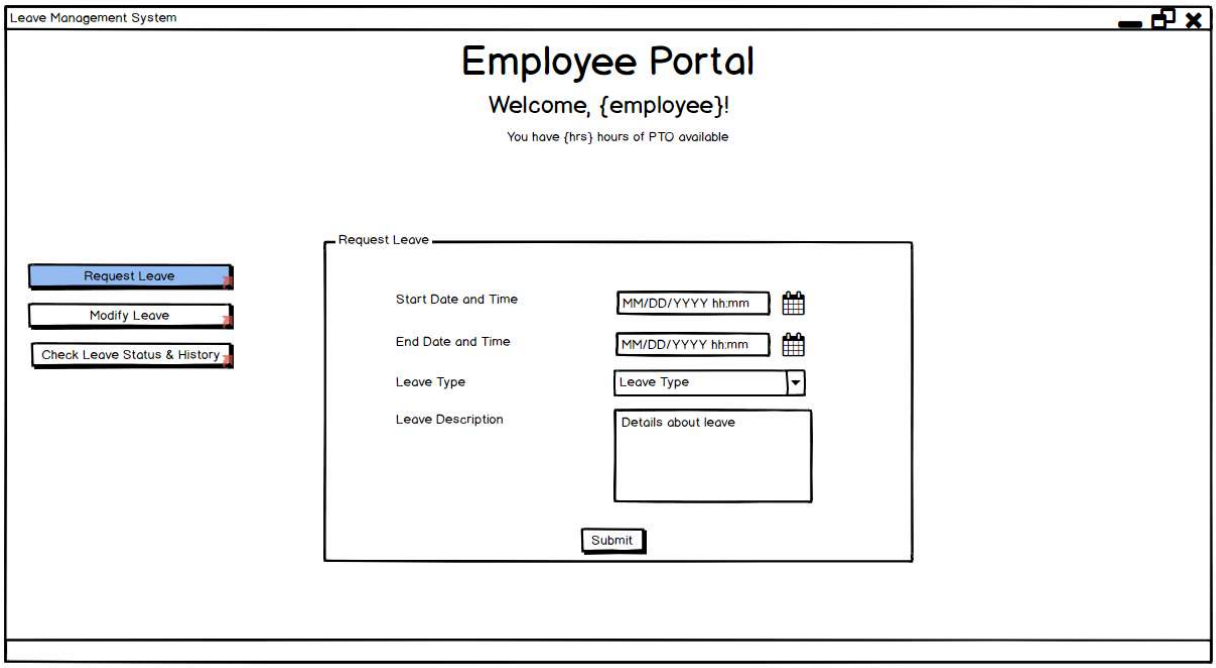
Use Case Name	Edit Employee
ID	UC16
Scenario	An employee gets married and needs a name change
Triggering Event	Employee notifies manager that they need to have their name changed.
Brief Description	Employee needs to be edited because last name changed
Actors	Employee, Manager
Assumptions	Employee has access to portal
Frequency of Use	Few times per year
Related Use Cases	Add Employee
Stakeholders	Employee
Preconditions	Last name needs updating
Postconditions	Last name is correct.
Main Course	1.) Employee notifies manager of name change 2.) Manager edits the employee name 3.) Employee's name is updated
Alternate Course	1.) Employee notifies manager of name change 2.) Manager edits the employee name 3.) Employee's name is updated 4.) Employee checks their portal and name is not correct 5.) Employee tries logging out and logging back in and name is corrected

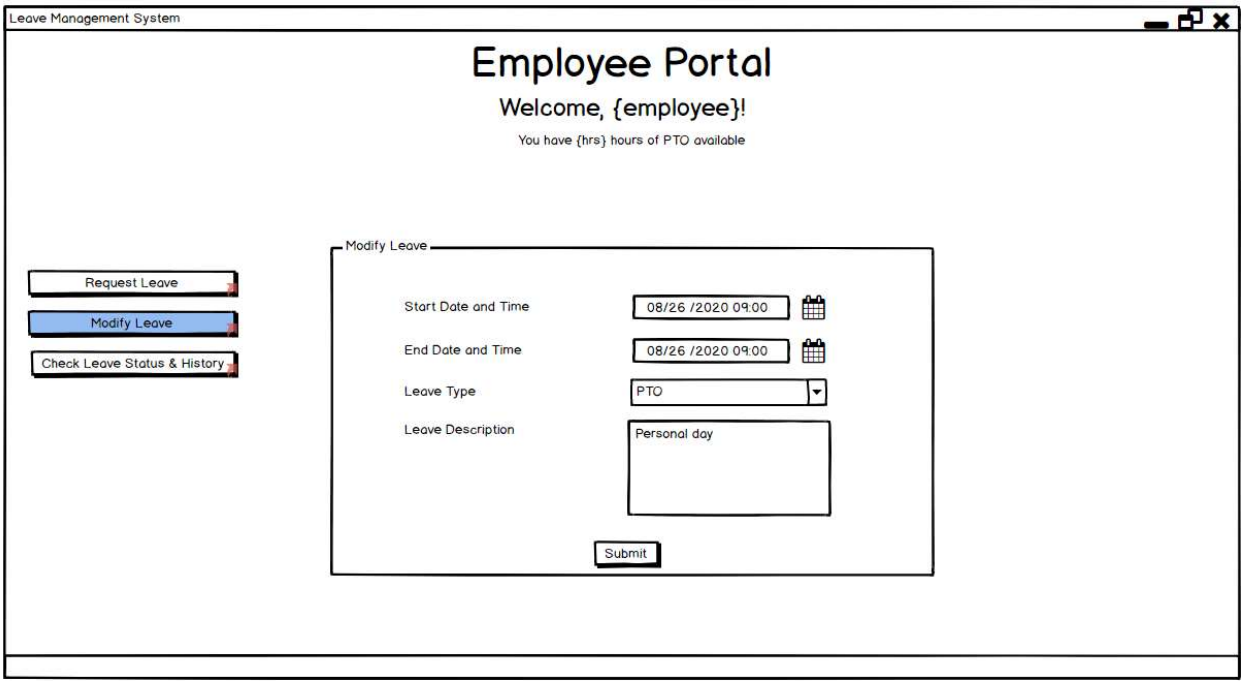
Use Case Name	Delete Report
ID	UC17
Scenario	Report is no longer needed
Triggering Event	Receives notification that report has not been utilized in 6 months.
Brief Description	Report is no longer needed, and manager wants it removed from dashboard.
Actors	Manager
Assumptions	Report was created by Manager
Frequency of Use	1-2 times a yar
Related Use Cases	Add report
Stakeholders	Manager
Preconditions	Report displays in dashboard
Postconditions	Report no longer in dashboard.
Main Course	1.) Manager receives notification that report has not been used in six months 2.) Manager deletes report 3.) Report is no longer in dashboard
Alternate Course	1.) Manager receives notification that report has not been used in six months 2.) Manager deletes report 3.) Report is still in dashboard 4.) Manger checks with development and learns that they cannot delete the report because they were not the creator of the report. 5.) Development removes the report and adds the option for reports to be deleted by anyone in the Manager's role.

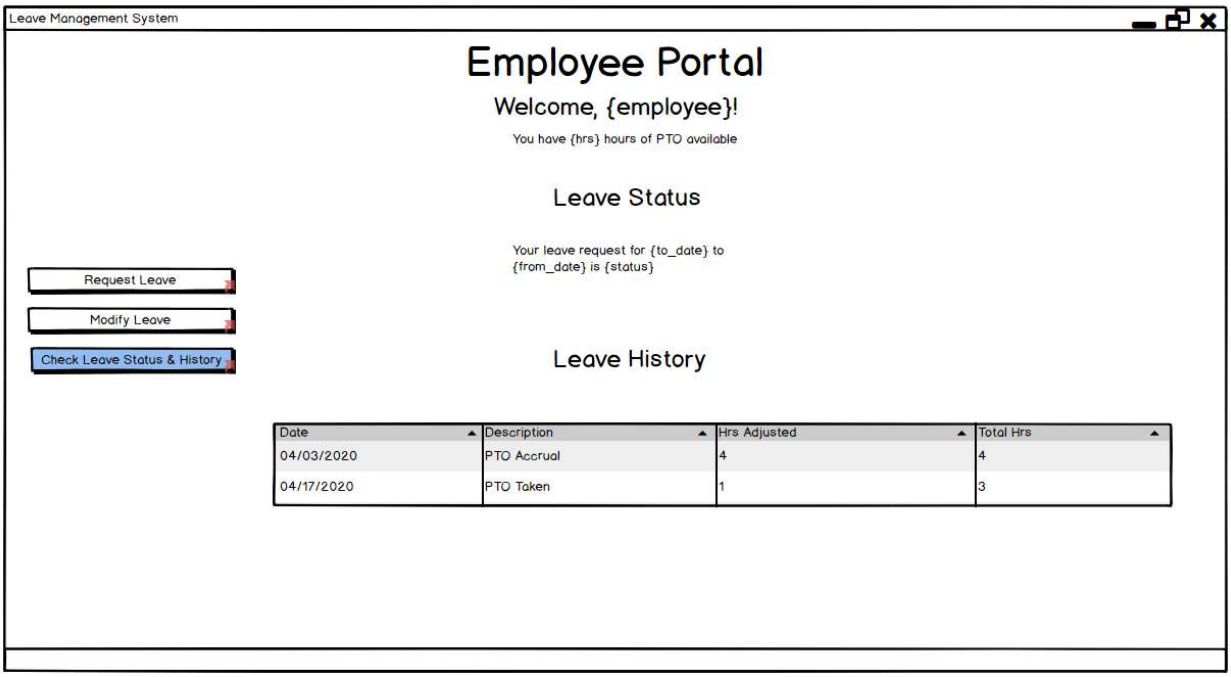
Use Case Name	Add PTO Accrued
ID	UC18
Scenario	PTO is to be added every two weeks
Triggering Event	Payday
Brief Description	Every two weeks employee's get PTO added
Actors	System
Assumptions	Employee qualifies for PTO
Frequency of Use	Biweekly
Related Use Cases	View PTO
Stakeholders	Employee
Preconditions	New hours have not been added
Postconditions	New hours added
Main Course	System auto adds PTO
Alternate Course	1.) Employee checks balance and sees no PTO added 2.) Employee consults with manager to see why 3.) Manager informs employee that they were out on leave for the past two weeks and PTO does not accrue while on leave.

UI Sketches

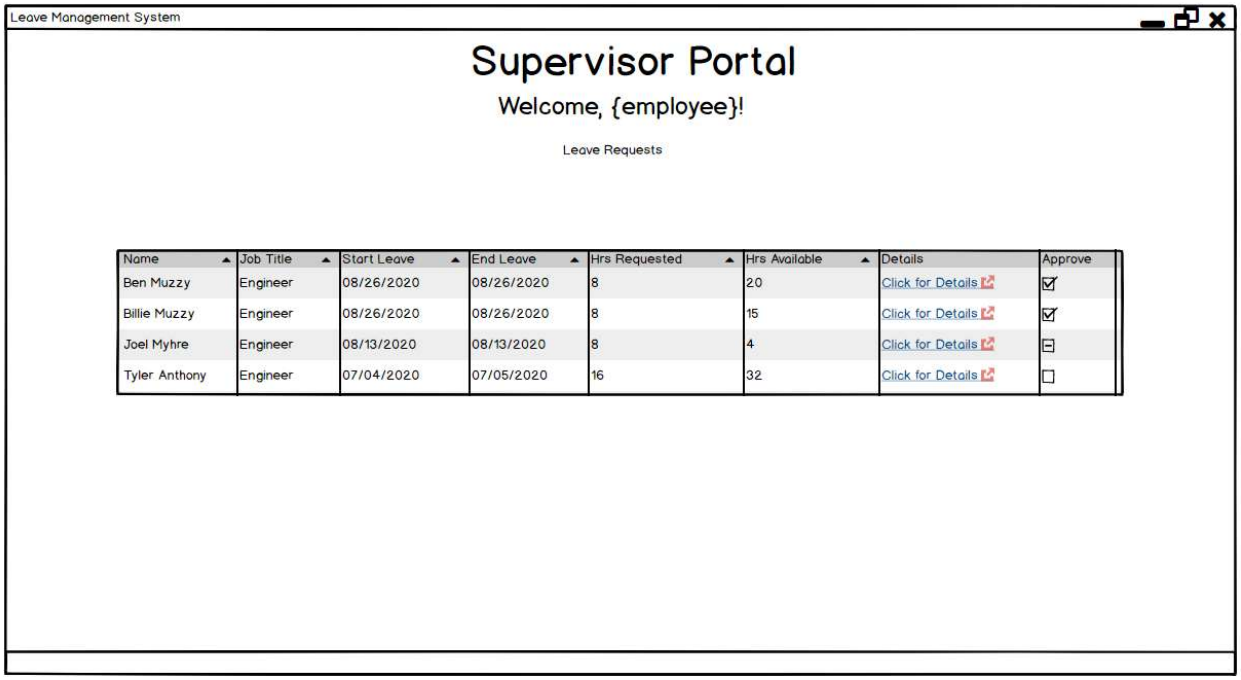
Employee






Leave Management System
Employee Portal
Welcome, {employee}!
You have {hrs} hours of PTO available
Leave Status
Your leave request for {to_date} to {from_date} is {status}
Request Leave
Modify Leave
Check Leave Status & History
Leave History
Date
Description
Hrs Adjusted
Total Hrs
04/03/2020
PTO Accrual
4
4
04/17/2020
PTO Taken
1
3

Supervisor


Leave Management System
Supervisor Portal
Welcome, {employee}!
Leave Requests
Name
Job Title
Start Leave
End Leave
Hrs Requested
Hrs Available
Details
Approve
Ben Muzzy
Engineer
08/26/2020
08/26/2020
8
20
Click for Details
Billie Muzzy
Engineer
08/26/2020
08/26/2020
8
15
Click for Details
Joel Myhre
Engineer
08/13/2020
08/13/2020
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4
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Engineer
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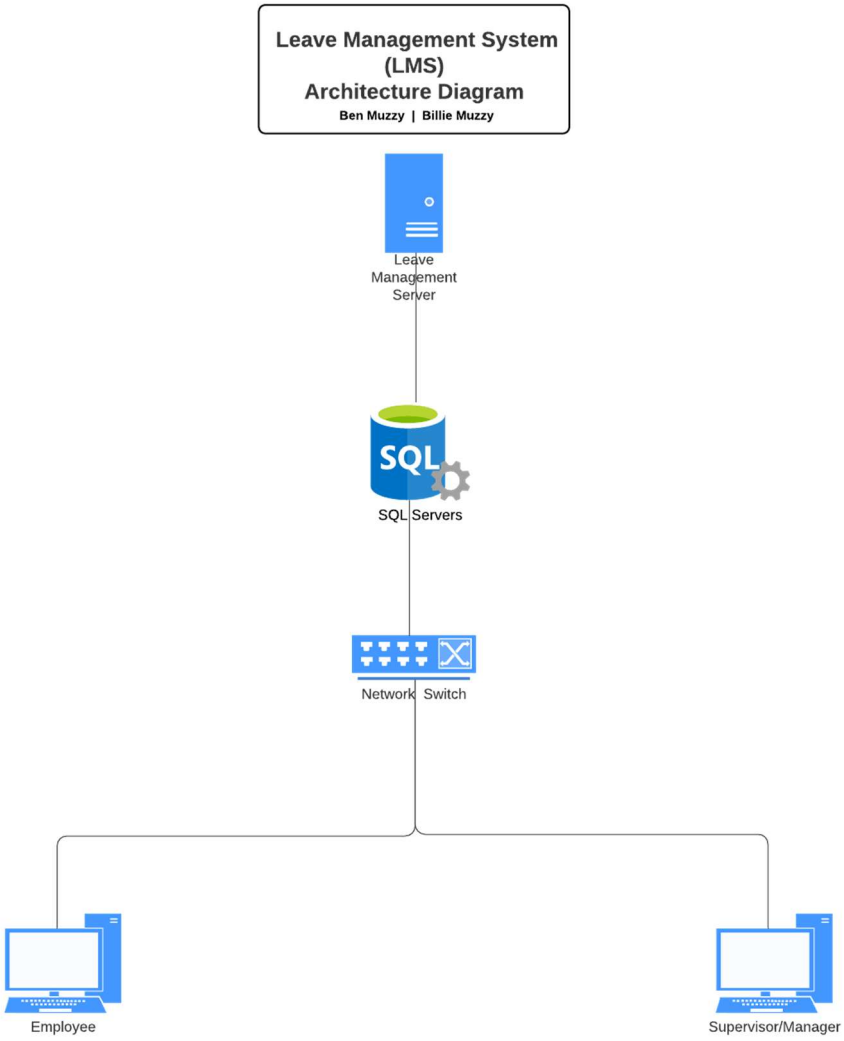
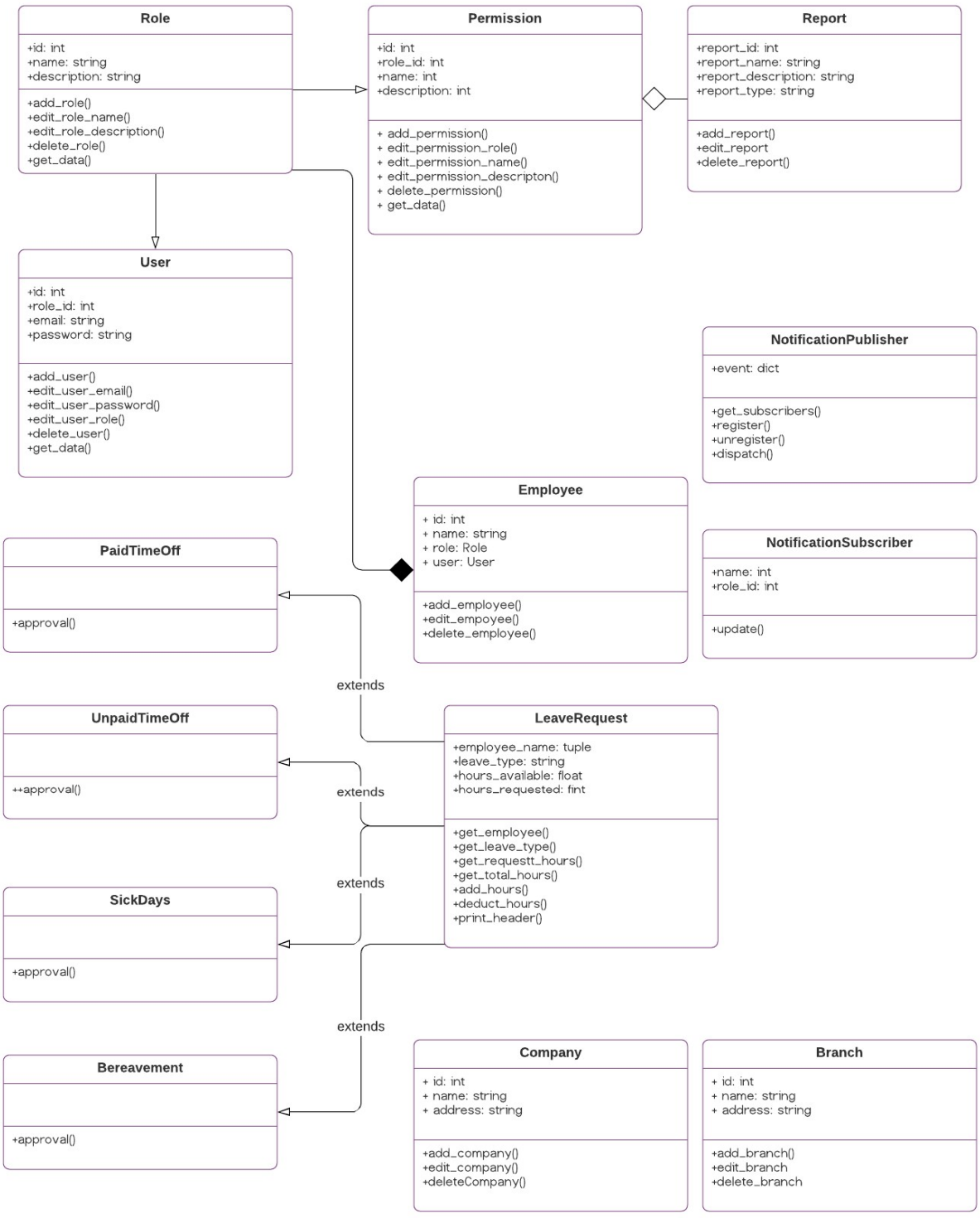
16
32
Click for Details

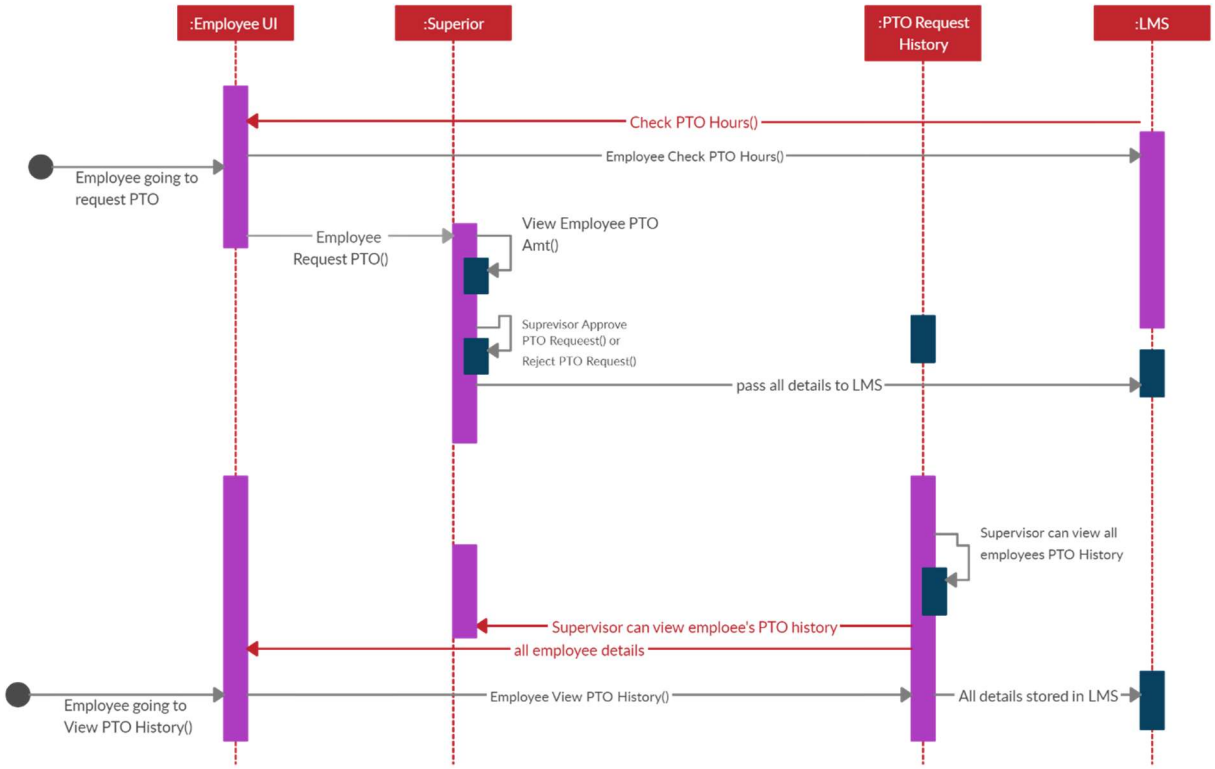
Architecture Diagram of Major Systems



Class Diagram for Major Classes in System



Sequence Diagram



Appendix

Coordination of Work Documentation

Requirement	*Primary*	*Notes*
Use Cases	Both	Ben and Billie both did separate use case diagrams in week 4. When comparing original diagrams Billie found that Ben had four unique use cases: • Modify PTO Requests • Cancel PTO Requests • View PTO Request History • View Employee PTO Amount Billie combined the two use cases diagrams and elaborations.
Rough Sketch of UI	Billie	Billie created rough sketch with feedback from Ben.
Architecture diagram	Ben	Ben created architecture diagram with feedback from Billie.
Class Diagram	Billie	Billie created the class diagram with feedback from Ben.
Sequence Diagram	Ben	Ben created the sequence diagram with feedback from Billie.

Coordination of Work Python Application

Class	*Primary*	*Files*
Role	Billie	Roles.py, Leave.db, driver.py
Permission	Billie	Permissions.py, Leave.db, driver.py
User	Billie	Users.py, Leave.db, driver.py
NotificationSubscriber	Billie	Notifications.py, driver.py
NotificationPublisher	Billie	Notifications.py, driver.py
LeaveRequest	Ben	LeaveRequest.py, driver.py
PaidTimeOff	Ben	LeaveRequest.py, driver.py
UnpaidTimeOff	Ben	LeaveRequest.py, driver.py
SickDays	Ben	LeaveRequest.py, driver.py
Bereavement	Ben	LeaveRequest.py, driver.py