



كلية علوم الحاسوب والمعلومات
College of Computer and Information Sciences



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Development of The electronic schedules for the ambulance services

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Table contents:

1 Description.....	4
1.1 Objectives.....	4
1.2 Main functionality and characteristics.....	7
1.3 Purpose.....	8
1.4 Product scope.....	8
1.5 Challenges.....	8
1.6 Team members.....	9
2 Software Development Lifecycle(SDLC)	
2.1 Reasons for choosing Scrum as our SDLC.....	11
2.2 Detailed plan.....	12
3 Software Requirements Specification (SRS)	
3.1 Milestone.....	14
3.2 Scrum Role.....	14
3.3 Requirement process and activities.....	15
3.4 Functional Requirements.....	17
3.5 Non-functional Requirements.....	20
3.6 Sprint Backlog.....	22

3.7 Burndown Chart.....	24
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4 Business Requirements Specification (BRS)

4.1 Project Description.....	26
4.2 System Users.....	26
4.3 System Components.....	26
4.4 Scope.....	26
4.5 Stakeholders.....	27

5 Design

5.1 Sequence Diagram.....	29
5.2 Use case Diagram.....	30
5.3 State Diagram.....	31
5.4 Class Diagram.....	32

6 Architecture pattern

6.1 The Layered Architecture pattern.....	34
6.2 Reasons for choosing Layered Architecture.....	34
6.3 Sprint Backlog.....	35
6.4 User Interface.....	37
6.5 Admin Interface.....	40

1.Description

“The electronic schedules for the ambulance services” are a new application system which facilitate that provision of services to any employee in the ambulance and ambulance crew. To create database for time scheduling, it depends on categories working hour electronically.it should be fully built on goals Operational emergency work for the workers around the year. It can be used in any smart device, an internet connection is required to operate the system.

1.1 Objectives

The features of an application are as follows:

- **high accurate information**
 - about the crew holidays and attendance
- **Resilient**
 - to allow the crew to choose the shifts that suits them
- **Electronic scheduling**
 - 1- Automatically creating bases and schedules based on specified classifications and working hours that are comprehensive and based on the operational emergency job objectives for workers throughout the year.
 - 2- Flexible scheduling allowing employees to choose their schedules to boost productivity, track attendance and leave, and locate them geographically.
 - 3- The schedule should always be up-to-date and accurate and easily available to all service providers and employees at any time in any device
 - 4- Any procedure that is carried out in the software electronically is sent, received, and reviewed.

5- Diagrams of emergency operational work via it to understand the performance indicators for workflow and workers and improve them to expectations and ease of data withdrawal and export

- **Personal page**

Every employee should have a personal page in the application that shows his information and his position

- **Notification and alerts:**

Allow the user to choose the method of notification and alerts received through the application

- **E-mail:**

Providing E-mail services for the workers through the computer program combining different things together so they work as one unit with e-mail server and active directory

- **Short messages service:**

Securing the services of the short message so that it can be used in notification and alerts and making the necessary combination with the application to allow the workers to choose short messages as a way to receive messages related to the changes.

- **Monthly search engine:**

Providing a search engine for employees in the app to restore and revert to previous schedules at any moment.

- **Service request:**

Provide a requesting system (changing shifts, monitoring vacations, coverages, delays, and calculating overtime and costs).
- **List types:**

Provide list types in the schedule to make choosing shifts and requesting services easier.
- **Working hours:**

Include an icon to show the employee's required hours for the month as well as the hours that were covered as extra working hours electronically.
- **Printing:**

Provide a schedule printing system in the application
- **File type:**

Provide a choosing schedule file format system so the employee can choose any format he wants (For example PDF).

1.2 Main functionality and characteristics

The program aims to help the employee through an easy way to use the application for their needs. It provides services for their use, and it designed to be simple and easy for them. We included these features in the application to make the employees tasks organized and schedule.

We provided this features in our program:

1. Electronic scheduling
2. Profile
3. Alerts and notifications
4. E-mail
5. SMS delivery service
6. Monthly search engine
7. Request a service
8. Dropdown menus
9. Working hours
10. Printing
11. File format.
12. Flexible scheduling
13. Diagrams of emergency operational work
14. precise with the worker's information

1.3 Purpose

The purpose of this document is to give a detailed description of the requirements of “The electronic schedules for the ambulance services”. Flexible scheduling for employees to improve productivity and to make the schedule be up to date, accurate and easily available to all service providers.

1.4 Product Scope

The electronic schedules for the ambulance services is application that provide electronic services to improve the connection and time schedule between the ambulance and the crew. To make it accurate and easier for the employees to manage the services through the application by design a program with understandable interface.

1.5 Challenges

- 1- Challenges may occur during the project because we chose that there will be no leader in the project that might cause poor planning and delays in phases of the project.
- 2- One of the biggest challenges is having no experience making mobile applications, since it's the first time we worked together there might be conflicts between each other.

1.6 Team Members:

Skills	Abdulrahman Moharib	Ahmad Alroqi	Abdulaziz Althuwaini	Abdulmajeed alrashoudi	Omar Alessa
Coding	√	√	√	√	√
Designing				√	√
Problem solving		√			
Back-end			√		√
Front-end	√		√	√	
Data base	√	√	√		
Decision making	√	√		√	

Software Development

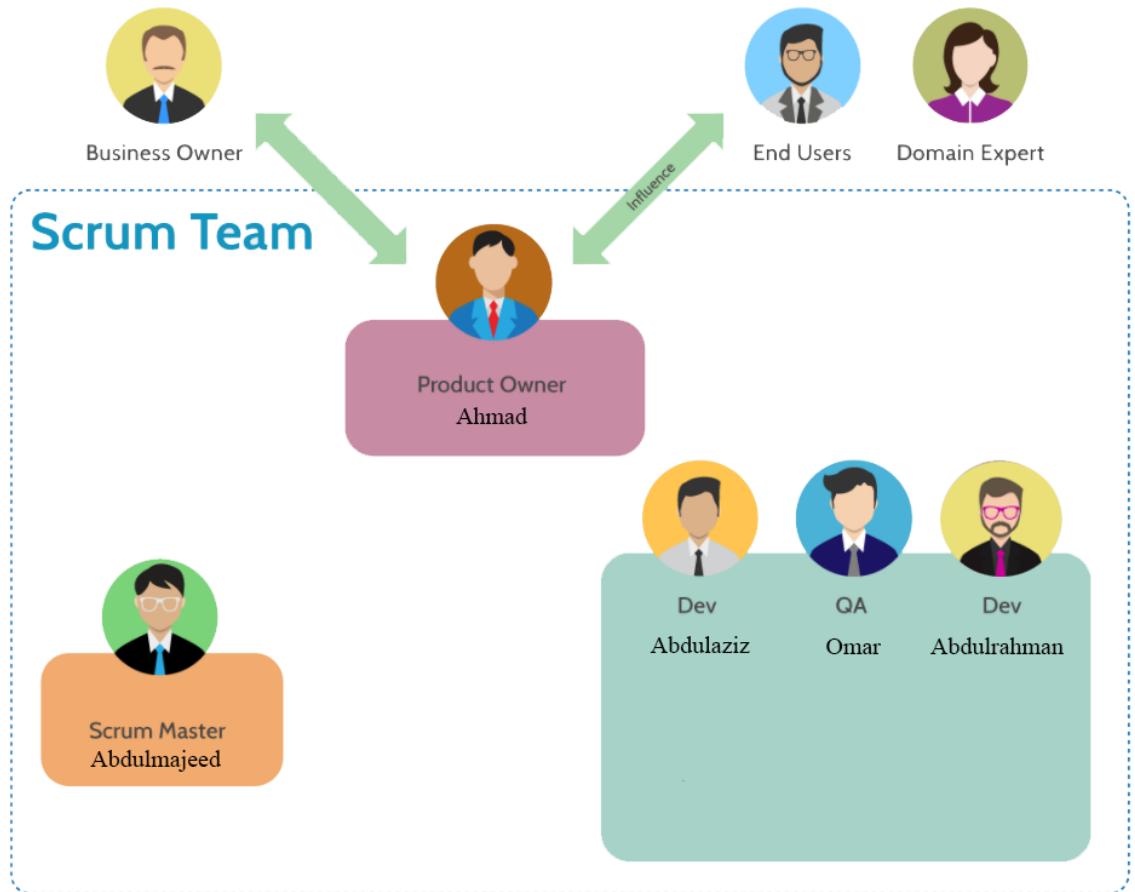
Lifecycle SDLC

2.1 Reasons for choosing Scrum as our SDLC:

We chose Scrum for these reasons:

- Because it allows modification, which reduces the cost due to the readiness in this type to go back and modify easily, unlike other types that require the demolition of the previous stage for modification.
- The ability of the developer or programmer to know “feedback” because of the presentation of each completed version to the customer.
- Also because of the features mentioned, the time period in "Scrum" becomes short.
- Because the customer usually cannot define and express exactly what he wants from the beginning.
- To make a high-quality program that can be modified at any time.

2.2 Detailed Plan



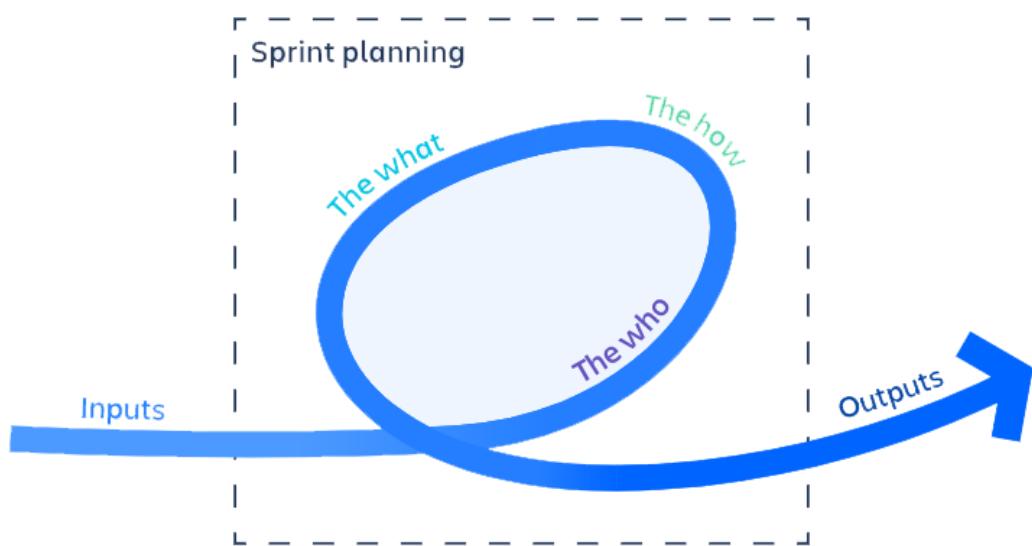
Software Requirements Specification (SRS)

3.1 Milestone

Timeline for the project(Milestones)

Specify main goals and objectives of the project, and the challenges may occur.	Specify function and non-functional requirement, and making the diagrams and charts.	
1 March – 2 March	3 March - 5 March	
Start project and create a cover page.	Choosing the appropriate SDLC, product backlog, sprint backlog.	
6 March - 8 March	9 March – 11 March	12 March – 14 March

3.2 Scrum Role



3.3 Requirement process and activities

Requirement Engineering is the process of defining, documenting and maintaining the requirements. The group should gather and define what the system should do. Requirements Engineering Process

Do some activities:

The first one is Requirements elicitation:

It is the ways of how to gain knowledge about the project domain and requirements.

The second one is Requirements specification:

This activity should be used to produce formal software requirement models for all type of requirements such as functional and non-functional requirements.

The third one is Requirements verification and validation:

Verification: is set of task which make you sure that your software is correctly implemented for a specific function.

Validation: it is a set of tasks which makes you sure that your software has been built and traceable to customer requirements. If the requirements has an error or not validated this well need a lot of modifications and rework to get to the successive stage.

The main steps in this process is

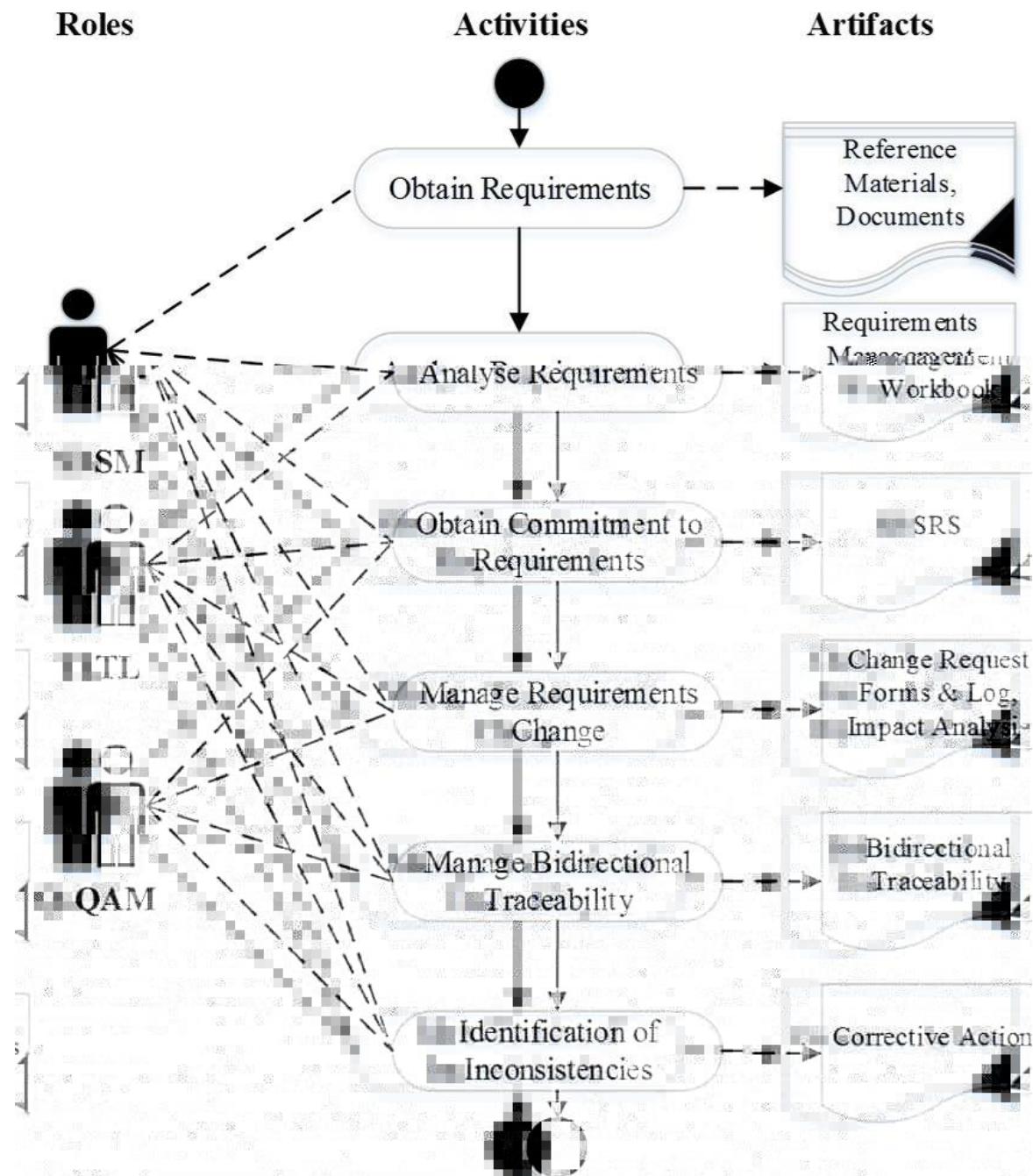
The requirements should not be conflict with other requirements it should be consistent.

The requirements should be complete

The requirements should be achievable.

Requirement management:

As part of requirement management, an analyst analyses, documents, tracks, prioritizes, agrees on, and communicates requirements to the stakeholders. During this stage, requirements are taken into consideration as they change over time.



3.4 Functional Requirements

Functional Requirements			
Task Number:	Task:	Estimated time(hours):	Priority:
1	System should automatically create bases based on specified classifications and working hours that are comprehensive and based on the operational emergency job objectives for workers throughout the year.	5	High
2	System should have flexible scheduling allowing employees to choose their schedules to boost productivity, track attendance and leave, and locate them geographically.	4	Medium
3	System should make the schedule always be up-to-date for all employees at any time on any device.	3	High
4	System should make any procedure that is carried out in the software electronically sent, received, and reviewed.	3	Medium
5	System should make diagrams of emergency operational work via it to understand the performance indicators for workflow and workers and improve them to expectations and ease of data withdrawal and export	3	Medium

6	System should make every employee have a personal page in the application that shows his information and his position	3	High
7	System should allow the user to choose the method of notification and alerts received through the application	3	Medium
8	System should provide E-mail services for the workers through the computer program combining different things together so they work as one unit with e-mail server and active directory	4	High
9	System should secure the services of the short message so that it can be used in notification and alerts and making the necessary combination with the application to allow the workers to choose short messages as a way to receive messages related to the changes.	3	High
10	System should provide a search engine for employees in the app to restore and revert to previous schedules at any moment.	4	High

11	System should provide a requesting system (changing shifts, monitoring vacations, coverages, delays, and calculating overtime and costs).	3	Low
12	System should provide list types in the schedule to make choosing shifts and requesting services easier.	3	Low
13	System should include an icon to show the employee's required hours for the month as well as the hours that were covered as extra working hours electronically	4	Medium
14	System should provide a schedule printing system in the application	3	Medium
15	System should provide a choosing schedule file format system so the employee can choose any format he wants (For example PDF).	3	Low
16	System should automatically creating schedules based on specified classifications.	3	Medium
17	System should make the schedule accurate and precise for all employees	3	High
18	System should make the schedule easily available to all service providers and employees at any time in any device	3	High

3.5 Non-functional Requirements:

- **Performance**
 - Improve performance by using computers with high ram and high processor.
 - The system must support the possibility can be done periodically and automatically.
- **Security**
 - Security requirement is very important in this project, including privacy. The administrator (including course admin and system admin) should provide high security interface for user and protect their personal data. In order to achieve this requirement, the project team should set up some standards such as security policy, system management handbook. In addition, use software and hardware to prevent, detect and correct the system, such as firewall, antivirus software, will reduce the risk of security.
 - The external security should be provided by given the login authentication.
 - There should be proper security regarding to the accessing of data by unauthorized user.
- **Usability**
 - The ability to support Arabic and English in the system interface.
- **Availability**
 - The system to its users with or without internet connection because users can have access to it using the local internet.
- **Correctness**
 - The system should have a correct data and information.

- **Confidentiality**
 - Preserve information access control and disclosure restrictions.
- **Integrity**
 - Avoid the improper modification or destruction.
- **Availability**
 - The information must be available to access and use all the time.
- **Portability**
 - The software shall be deployed at any machine.
- **Quality Control**
 - Another crucial necessity is system quality control.
All users should be served quickly and efficiently by the system.
The primary challenges of this need are adaptability, availability, flexibility, and reliability. This need can be met by developing the system with appropriate software and hardware.

3.6 Sprint Backlog

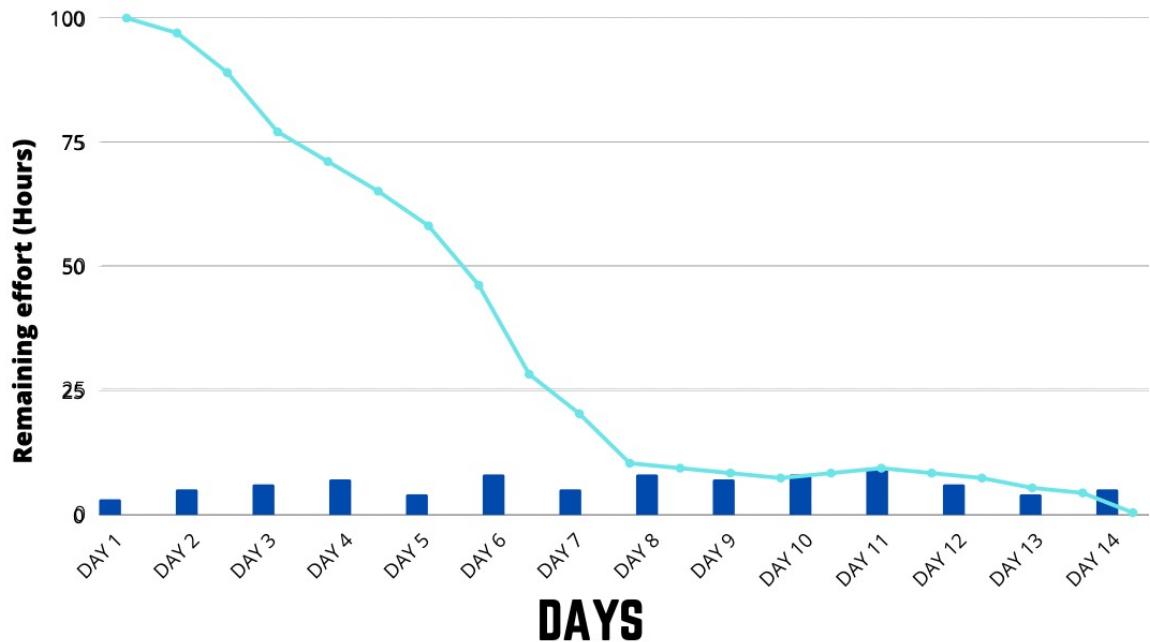
Sprint Backlog (Week1)

Task	Day1	Day2	Day3	Day4	Day5	Day6	Members
Design user interface	4	5	4		3	4	Omar
Creating user interface	3	2	3	4	2	2	Omar
Test user interface	3	3	2	3		4	Ahmad
Design login page	4	5	4	4	3	5	Abdulmajeed
Creating login page	5	3	4	4	3		Abdulaziz
Testing login page	3	4	2	2		4	Abdulrahman

Sprint Backlog (Week2)

Task	Day1	Day2	Day3	Day4	Day5	Day6	Members
Personal pages design	4	5	4		3	4	Omar
SMS Services and connecting it to the database	3	2	3	4	2	2	Ahmad
Diagrams to make the schedules more obvious	3	3	2	3		4	Abdulrahman
Transfer the schedules into the program	4	5	4	4	3	5	Abdulmajeed
Automatically creating schedules based on specified classifications	5	3	4	4	3		Abdulaziz
Providing a search engine for employees in	3	4	2	2		4	Ahmad

3.7 Burndown Chart



Business Requirements Specifications (BRS)

4.1 Project description:

Creating an application that serves the employees of the "Saudi Red Crescent Authority" to make the schedules more obvious and can be used easily, and include a communication system between the employees (E-mails, and SMS) by using the electronic schedules which will help the employees changing shifts and making it more flexible, and the project requires providing them to employees through a professionally developed mobile application as the schedules are already developed by the "Saudi Red Crescent Authority" the program is made to change it from schedules to electronic schedules

4.2 System users:

Employees.

Administrators.

4.3 System components:

Electronic schedules.

Monthly search engine.

4.4 Scope:

The program will provide services to employees through an application that has been linked to the electronic schedules, which will improve the productivity of the employees, which will organize their tasks, which will eventually save them a lot of time. Therefore the electronic schedules will be more flexible.

4.5 Stakeholders

- Administrators:**

Administrators will gain the following benefits after delivering the project:

1- Enhance gross revenue management systems for the ambulance.

2-Increase the quality level of the ambulance.

3-The system will enable the clients to give feedback which makes the ambulance gain more improvement.

4-The administrator's information (email, password) must be stored in the database of the program. To manage system content, administrators must log in using their email addresses. The application's homepage will appear first, as it does for all other users.

Provide clients and employees with services that facilitate their operations

- Employee:**

After delivering the project the employee will benefit the following:

1-the employee can complete operations, whether related to the ambulance or any other operations through these systems.

2-A client's information and services can be accessed by the employee. Allowed him to approve contracts, manage bills, track violations, etc.

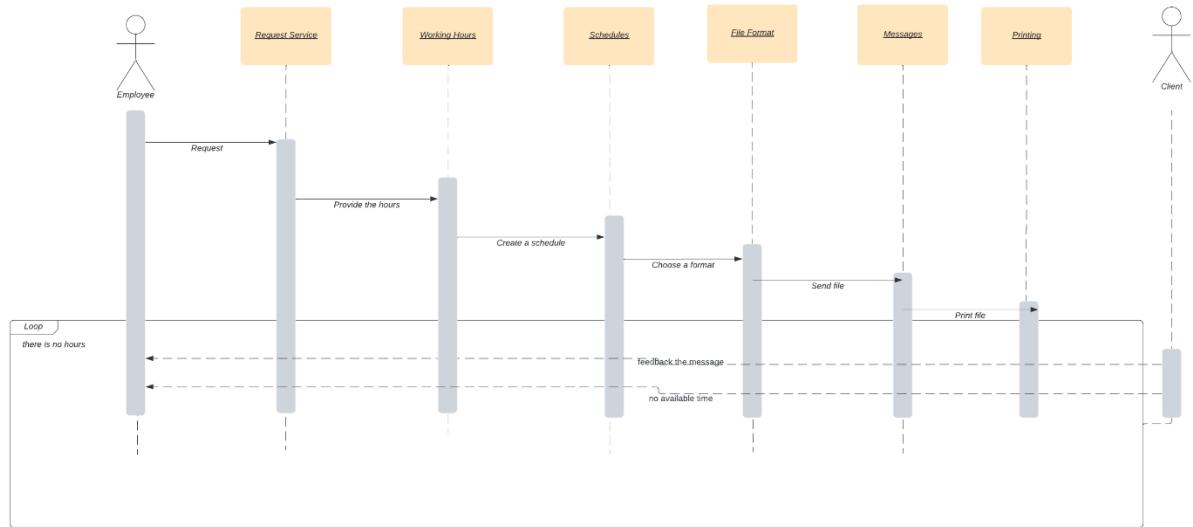
- Client:**

After delivering the project the client will benefit the following:

The client can perform many operations electronically on the system without the need to attend the administrator

Design the System model

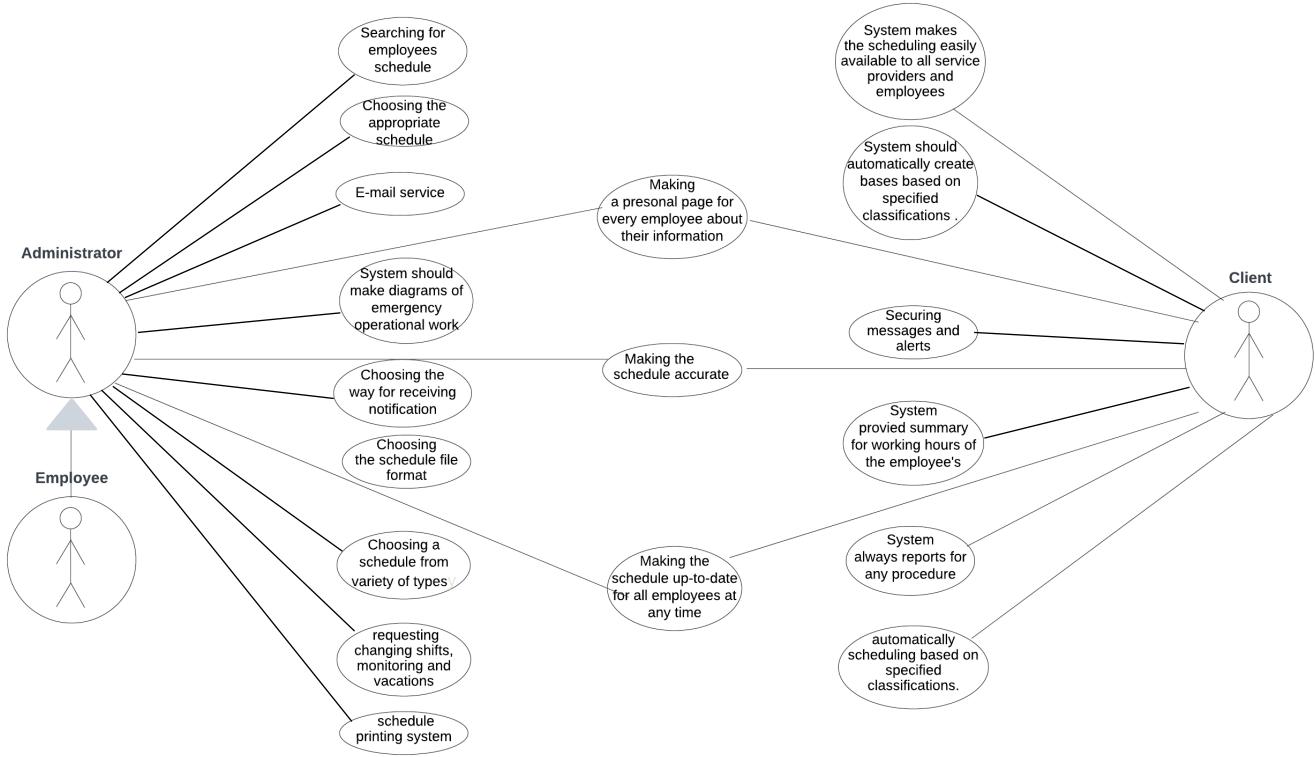
5.1 Sequence diagram



Description:

The sequence diagram shows how the program works as a sequence first the employee sent the request from request services and inter the requested working hours to create the schedules and choose the format from several formats as sms message or email or print the schedule then the request go through the client to the employee.

5.2 Use case diagram



Description:

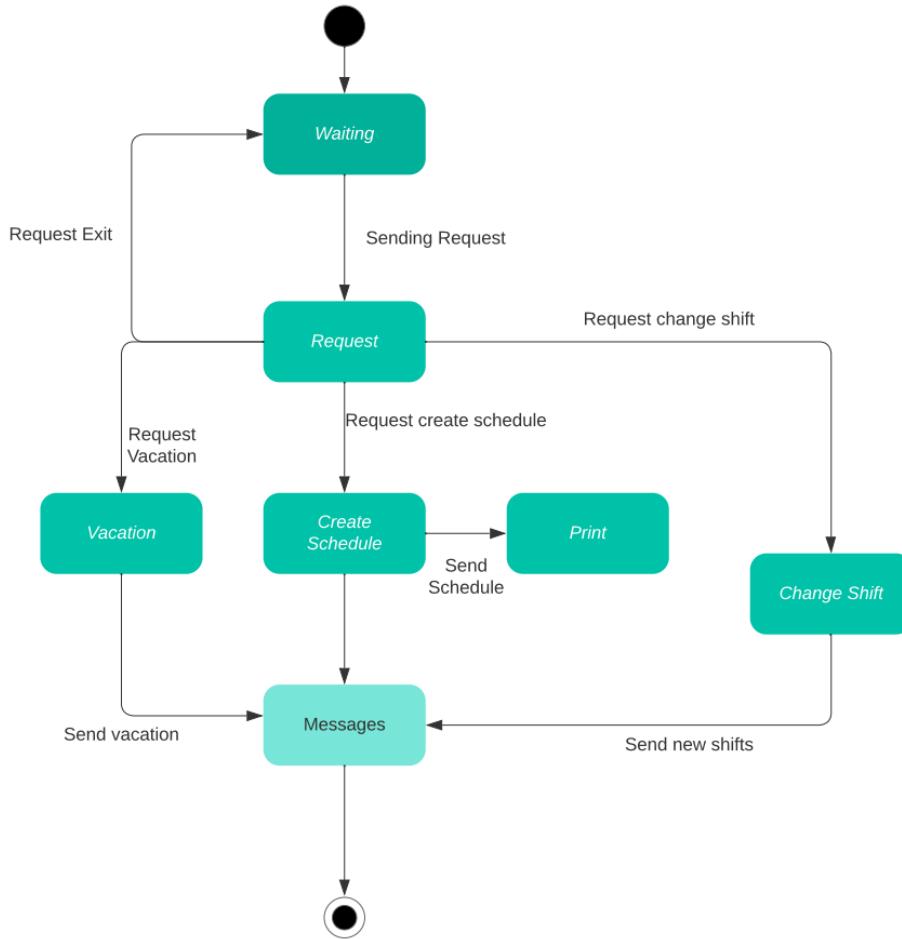
Use case diagram are used to represent a discrete task that involves external interaction with the system

We have 3 actors in the system

The administer and the employee have the same task interaction with the system such as searching for employee schedule, choosing the appropriate schedule, email service, making diagram of the emergency operational work, choosing the way for receiving notification, choosing the schedule file format, choosing a schedule from variety of types , requesting changing shifts and vacation, printing the schedule and we have the third actor which is the client have deferent interaction with the system such as making the schedule easily available to all services providers and employee, automatically create base's based on specified classification, searching for messages and alerts, providing summary for working hours of the employee, auto reports for any procedures , automatically scheduling based on specified classification

and we have some task the all the actors have the interactions with such as making a personal page for every employee about their information, making schedule accurate, making schedule up-to-date for all employee at anytime.

5.3 State diagram

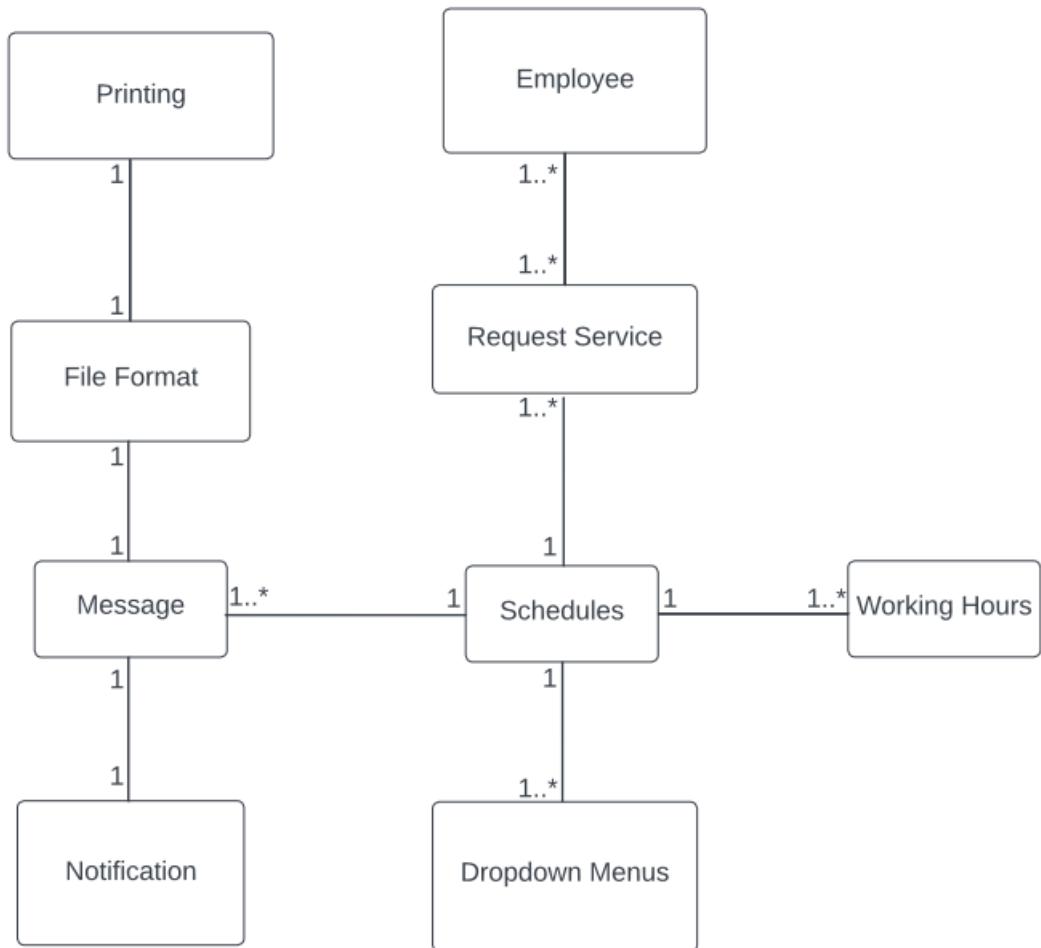


Description:

State diagram depicts how our system transitions between states.

- 1- The system goes into a waiting state as soon as the user logs in.
- 2- There's only one option after the idle state the Request State. "Sending Request" is the transition from the waiting state to the request state.
- 3- The user can pick from three options in the Request state: Vacation, Create schedule, and Change shift. "Request Vacation" is the transition from the Request state to the Vacation state, "Request Create Schedule" is the transition from the Request state to the Create schedule state, and "Request Change Shift" is the transition from the Request state to the Change Shift state.
- 4- After that, the system will be in Messages. In the state where the system will receive the request, the system will terminate.

5.4 Class Diagram



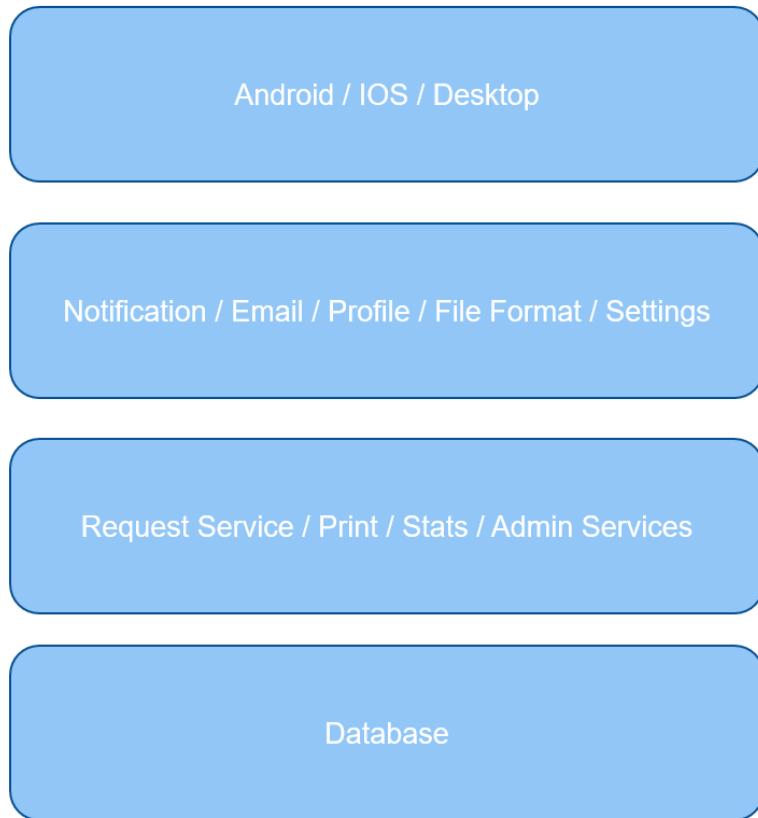
Description:

Class diagrams are used when developing an object-oriented system model to show the classes in a system and the associations between these classes.

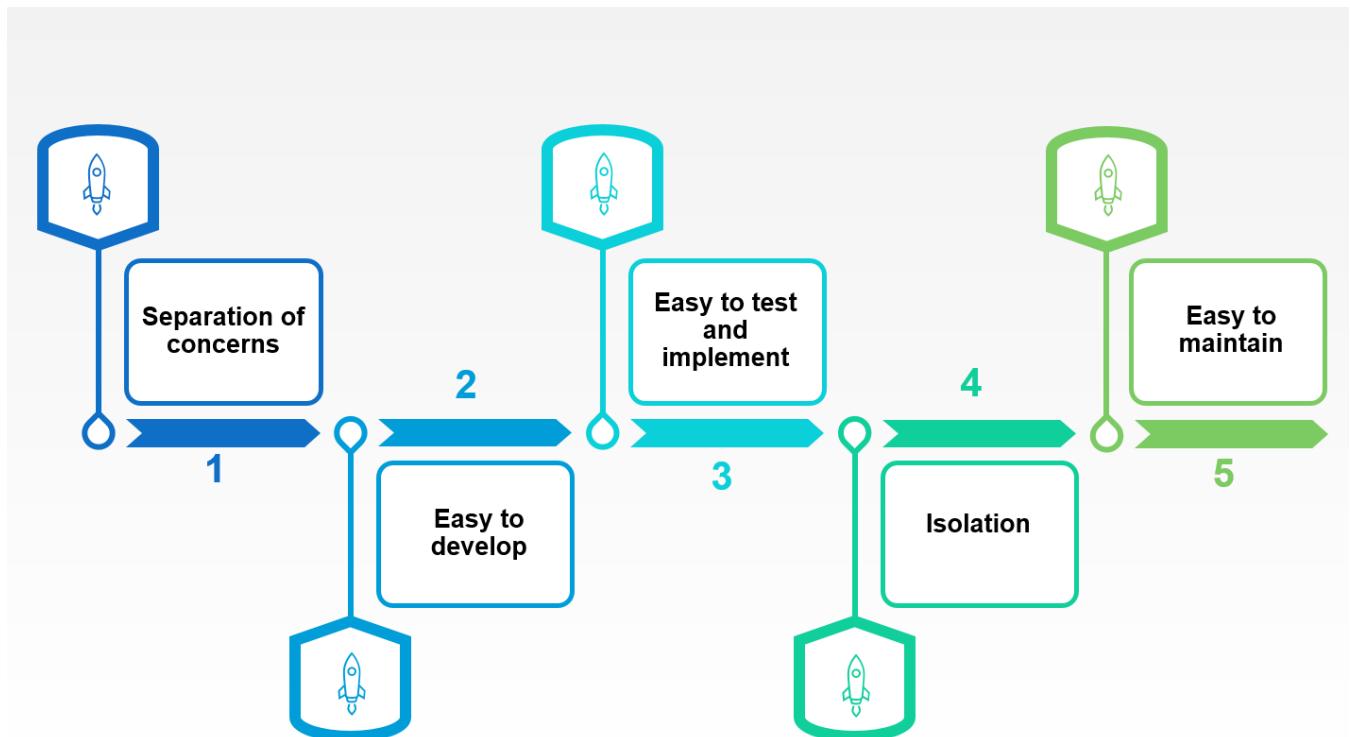
First, the employee sent the request to request service then request service handles the request if it's accepted it will be sent to the scheduling to start arranging the working hours and the dropdown menus and start sending SMS messages and emails to let everyone informed about the new updates after that it will start a file format and printing.

Architecture Patterns

6.1 The Layered Architecture pattern



6.2 Reasons for choosing Layered Architecture



6.3 Sprint Backlog

Sprint Backlog (Week1)							
Task	Day1	Day2	Day3	Day4	Day5	Day6	Members
Design user interface	4	5	4		3	4	Omar
Creating user interface	3	2	3	4	2	2	Omar
Test user interface	3	3	2	3		4	Ahmad
Design login page	4	5	4	4	3	5	Abdulmajeed
Creating login page	5	3	4	4	3		Abdulaziz
Testing login page	3	4	2	2		4	Abdulrahman

Sprint Backlog (Week2)

Task	Day1	Day2	Day3	Day4	Day5	Day6	Members
Personal pages design	4	5	4		3	4	Omar
SMS Services and connecting it to the database	3	2	3	4	2	2	Ahmad
Diagrams to make the schedules more obvious	3	3	2	3		4	Abdulrahman
Transfer the schedules into the program	4	5	4	4	3	5	Abdulmajeed
Automatically creating schedules based on specified classifications	5	3	4	4	3		Abdulaziz
Providing a search engine for employees in	3	4	2	2		4	Ahmad

6.4 User interface

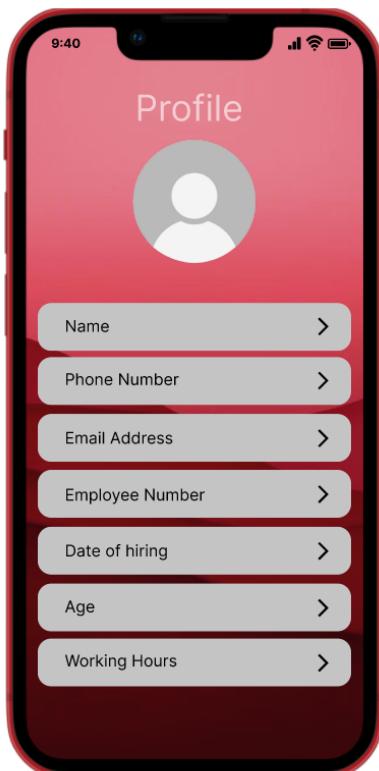
Login Page



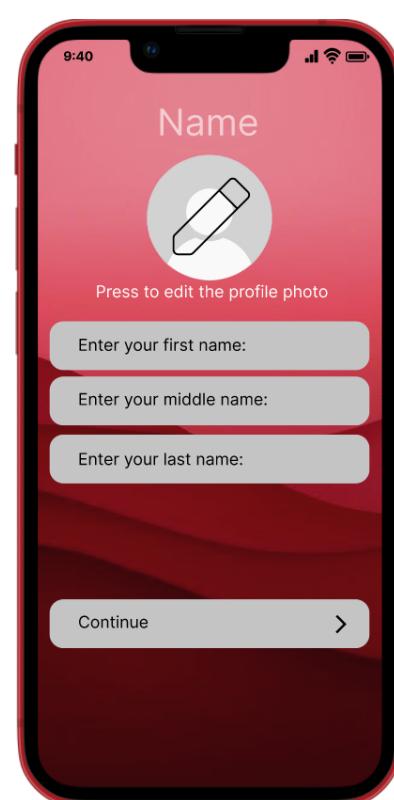
Home Page



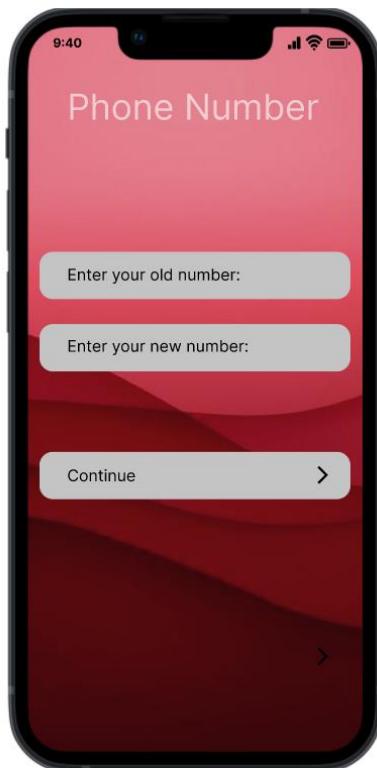
Profile Page



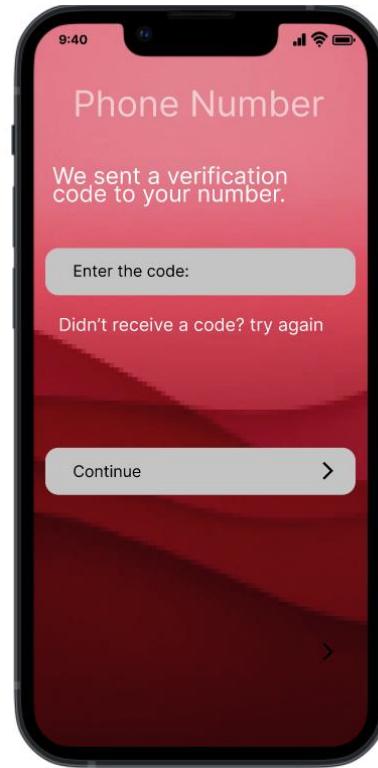
Name



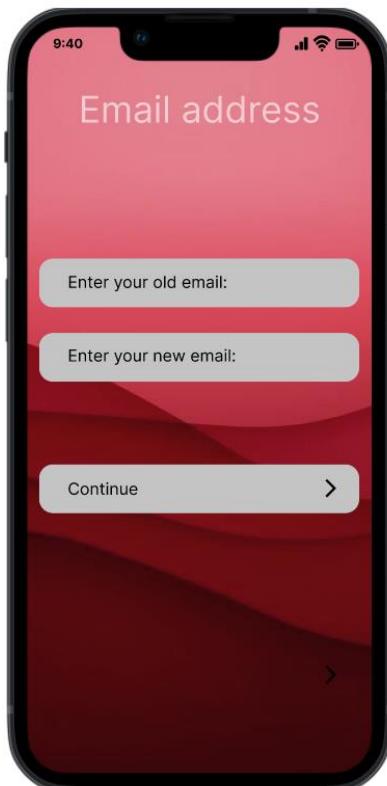
Phone Number



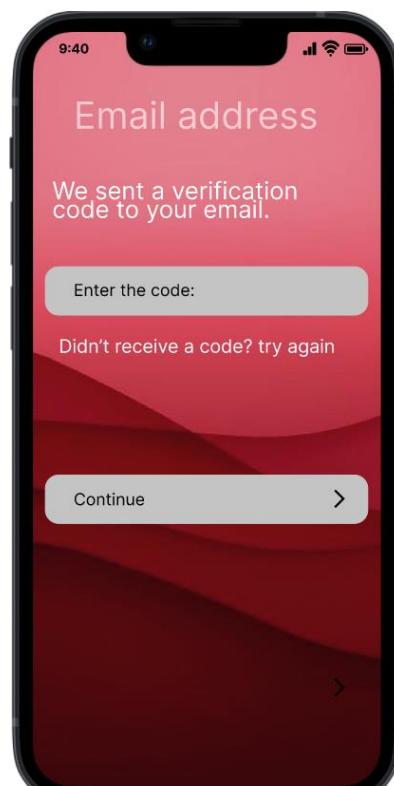
Number Verification



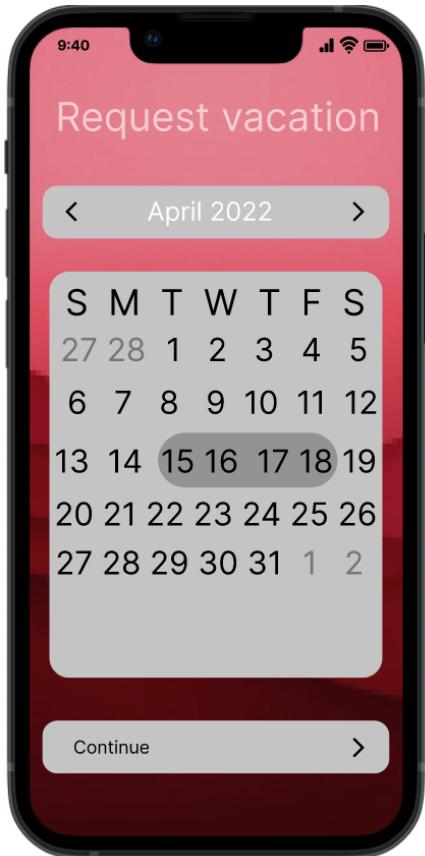
Email address



Email Verification

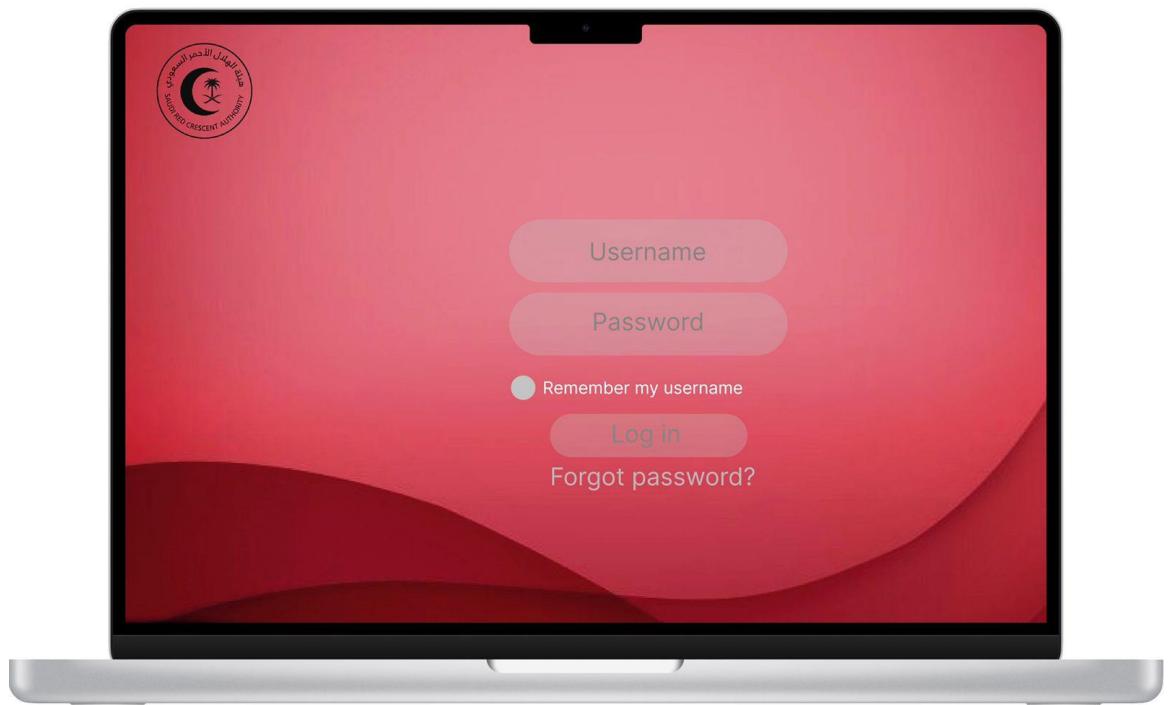


Request vacation

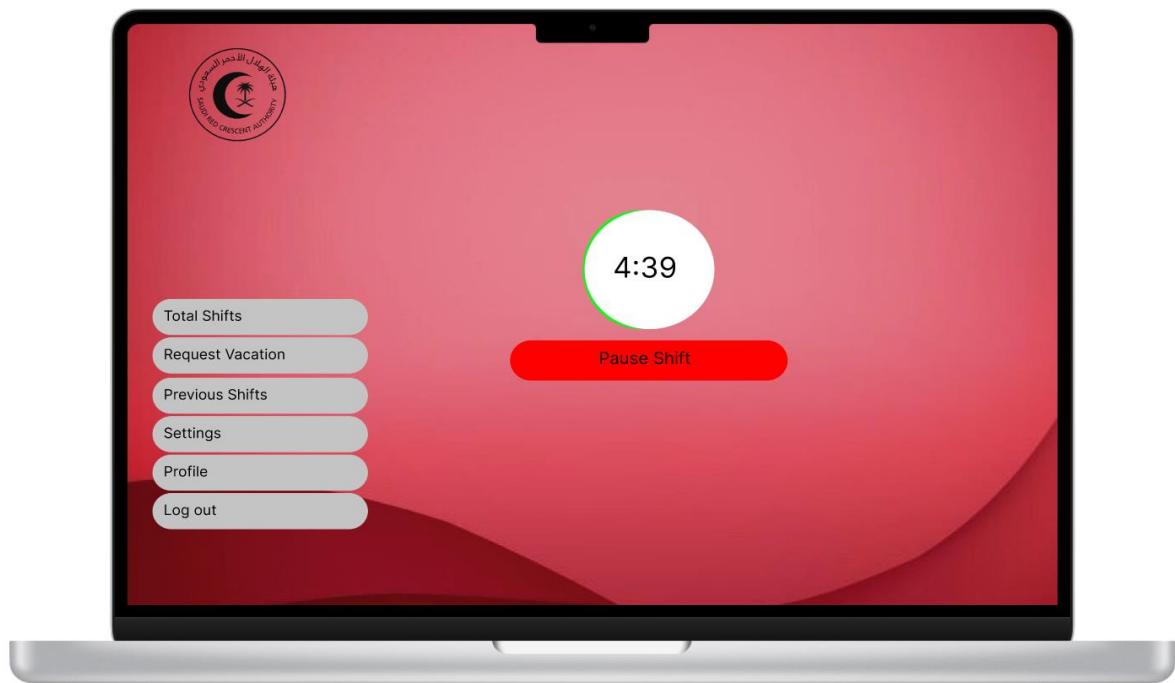


6.5 Admin interface

Login Page



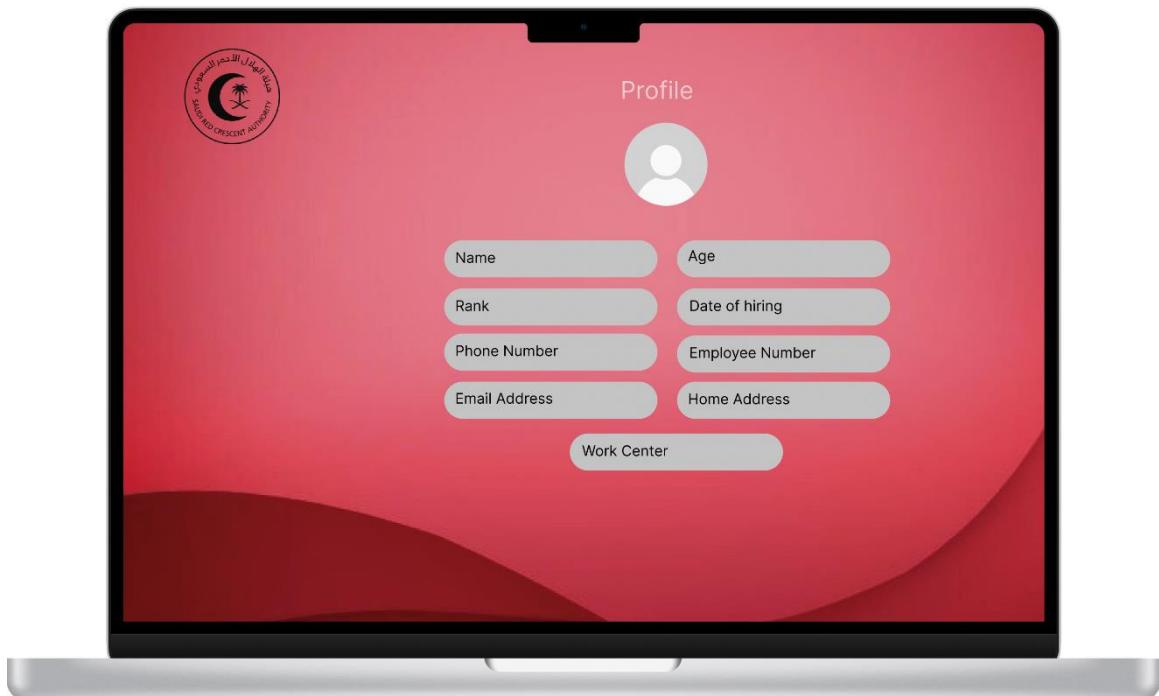
Home Page



Request vacation



Profile Page



Test Activities

Test Case ID	BU_001	Test Case Description	Test the System login Page		
Created By	Abdulrahman	Reviewed By	Abdulmajeed	Version	2.0

Tester's Name	Abdulrahman	Date Tested	11/May/2022	Test Case (Pass/Fail/Not Executed)	Pass
----------------------	-------------	--------------------	-------------	---	------

S #	Prerequisites:
1	Access to Chrome Browser
2	Access to the application
3	
4	

S #	Test Data
1	Userid = khaled_1234
2	Pass = Kk@1212
3	
4	

Test Scenario: Entering a valid userid and password, then the employee can login

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to https://saudiredcresent.co	Site should open	As Expected	Pass
2	Enter userid and password	Credential can be entered	As Expected	Pass
3	Click Login	Employee is logged in	As Expected	Pass

Test Case ID	BU_002	Test Case Description	Test the login function		
Created By	Abdulmajeed	Reviewed By	Abdulaziz	Version	2.0

Tester's Name	Abdulmajeed	Date Tested	11/May/2022	Test Case (Pass/Fail/Not Executed)	Pass
----------------------	-------------	--------------------	-------------	---	------

S #	Prerequisites:
1	Access to Chrome Browser
2	Access to the application
3	
4	

S #	Test Data
1	Userid = mg1234
2	Pass = df12@3cc
3	
4	

Test Scenario: Verify on entering a valid userid and password

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Open the application	The application should open	As Expected	Pass
2	Enter id and password	The id and password are valid	As Expected	Pass

Test Case ID	BU_003	Test Case Description	Test the profile number change		
Created By	Ahmad	Reviewed By	Abdulaziz	Version	2.1

Tester's Name	Ahmad	Date Tested	11-may-2022	Test Case (Pass/Fail/Not Executed)	Pass
---------------	-------	-------------	-------------	------------------------------------	------

S #	Prerequisites:
1	Access to Chrome Browser
2	Access to Chrome Application
3	
4	

S #	Test Data
1	Userid = aalroqi
2	Pass = otb@511
3	
4	

Test Scenario Verify on entering valid userid and password, the customer can login

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Enter setting	setting should open	As Expected	Pass
2	Enter profile	profile should open	As Expected	Pass
3	Enter phone	phone should open	As Expected	Pass
4	Change Phone Number	SMS notification	As Expected	Pass

Test Case ID	BU_004	Test Case Description	Test the request vacation function		
Created By	Abdulrahman	Reviewed By	Abdulmajeed	Version	2.0

Tester's Name	Abdulrahman	Date Tested	11/May/2022	Test Case (Pass/Fail/Not Executed)	Pass
---------------	-------------	-------------	-------------	------------------------------------	------

S #	Prerequisites:
1	Login Successfully
2	Select the vacation days
3	
4	

S #	Test Data
1	Userid = Osama1983
2	Pass = qwer@1234
3	
4	

Test Scenario Requesting a vacation days from the system

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Access Home page	Login successfully	As Expected	Pass
2	Open request vacation	The dates must be shown	As Expected	Pass
3	Select the days	Days will be selected	As Expected	Pass
4	Select Confirm	The System will show the	As Expected	Pass

Test Case ID	BU_005	Test Case Description	Test the profile email change		
Created By	Ahmad	Reviewed By	Omar	Version	2.0

Tester's Name	Ahmad	Date Tested	11-may-2022	Test Case (Pass/Fail/Not)	Pass
----------------------	-------	--------------------	-------------	----------------------------------	------

S #	Prerequisites:
1	Access to Chrome Browser
2	Access to Chrome Application
3	
4	

S #	Test Data
1	Userid = aalroqi
2	Pass = otb@511
3	
4	

Test Scenario Verify on entering valid userid and password, the customer can login

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Enter setting	setting should open	As Expected	Pass
2	Enter profile	profile should open	As Expected	Pass
3	Enter Email	Email should open	As Expected	Pass
4	Enter Old Email and New email	Email notification	As Expected	Fail

Test Case ID	BU_006	Test Case Description	Test the SMS function		
Created By	Omar	Reviewed By	Ahmad	Version	2.1

Tester's Name	Omar	Date Tested	11-May-2022	Test Case (Pass/Fail/Not)	Pass
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S #	Prerequisites:
1	Access to Chrome Browser
2	Access to the application
3	
4	

S #	Test Data
1	Userid = tariq231ab
2	Pass = tariqab1234567
3	SMS Message
4	

Test Scenario Sending SMS messages between employees

Step #	Step Details	Expected Results	Actual Results	Pass / Fail / Not executed / Suspended
1	Navigate to https://saudiredcresent.co/	Site should open	As Expected	Pass
2	Enter Userid & Password	Credential can be entered	As Expected	Pass
3	Click Submit	Customer is logged in	As Expected	Pass
4	Click on SMS feature	SMS page appears	As Expected	Pass
5	Sending message to other employee	The other employee receives the SMS message	As Expected	Pass