The project on

Pharmacy Management System

Submitted To :

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Chapter 1

Introduction

Introduction

Many of pharmacist's work is redundant, they should check for expiry dates of medications , manage inventory: keep track of each medication quantity, record any shortages to order them from suppliers.

Not just their job include organizational task , it also has a healthcare side, they should maintain their customers' satisfaction: this may include consultant, provide a substitute medication if a certain medicine doesn't exist.

Most of their work can be automated, if we provide a proper software in can reduce error, increase efficiency, add sense of organization and increase revenue by guaranteeing customer's satisfaction and providing a more personalized experience.

Purpose

The purpose of this software is to save time and effort for pharmacist’s to make them focus on more important tasks like providing a better health care services for patients.

Help the owner be updated, get an overview about performance ,order medications in time to guarantee customer's satisfaction which increase his revenue and ensure that his business runs smoothly and efficiently.

Scope

The main purpose of the system is to make day-to-day work at the pharmacy easier and reduce error. This can be achieved through various features: provide a database to manage inventory, report shortages and exceeded expiry dates, centralized database give employees quick access to each medicine, each medicine data ,the ability to add new medications easily and edit medication's information easily.

It also automate billing and invoices creating , provide a full history for every purchase which help the owner monitor his revenue.

The system also provides a service of providing medication's substitutes if it is not available which is a great help for pharmacists.

Objectives

1.Inventory system:

-A detailed database includes: each medication's name, id, medicine group name, quantity in stock

-we can add new medicine

-edit an existing one

-monitor expiry date

-get a notification when we have any shortage

2.Billing system:

-create invoice with every new purchase including (date, medicine , quantity ,price)

-keep a full history of every transaction

-calculates total revenue earned

3.Medications' substitutes system:

-Include a database that keeps record of every medication's substitutes

- when we search for medication's name it provides a list containing each substitute available in the inventory and its quantity.

Common Terminology

-prescription : e-prescription

-dispending : giving out medicine based on prescription

-**expiry date**: date after which we can no longer use the medicine

-dead stock : medicine no longer in demand

-**batch number** : a number assigned to specific batch of medication for tracking purposes

-**drug interaction** : a situation in which one drug effects the efficiency

-**controlled substances**: medications controlled by law due to its addictive nature

References

Interview:

Link:(https://drive.google.com/drive/folders/1GN_tedTU6fwbCtiqDQho3Jj5sEXxck6s)

- Google

- LinkedIn

-Reviewing another pharmacy management systems as EASY SOFT

(to ensure that our approach aligns with industry standards)

Chapter 2

Feasibility

Feasibility study

1.Technical feasibility

Compatibility with Proposed Solutions:

-The software can be integrated with the current system, the software is flexible, easy to use, it meet pharmacy's needs as well.

Technology and tools:

-Desktop-based system

Programming languages:

-back-end: python(Django) as it's for small to medium scale projects

-front-end: HTML, CSS, JavaScript

-database: MySQl (to create centralized database for medications and their substitutes)

Risks and Constraints

-Time: time may not be enough to finish all features before deadline.

-Budget: limited financial resources may lead to difficulty in implementing all features

-Unauthorized access to sensitive data

-Medication errors due to incorrect data entry

Solution

-maintain often to check for security problems and medication errors

-find alternatives for expensive software.

2.Operational feasibility

This study looks at how to make an effective system and a role-based access control system work for the pharmacist , manager and owner. It focuses on solving challenges to ensure smooth operations and secure data management.

Paying Management:

Risks:

Challenges include ensuring handling failed payments.

Alternatives:

- Provide support for payment and offering many ways to pay like (fawry, VC, Visa)

– This ensures a smooth payment process.

Role-Based Access Control:

Risks:

Control who can access data based on their job to stop leaks.

Alternatives:

Use QR codes for automated attendance recording.

– Sync the system with medicine count and status and send reminders to refill medicines.

– This improves accuracy and saves time.

Impact on Stakeholders:

End-Users: Improved ease of use, secure role-based access.

Managers: Simplified attendance tracking and access management make things faster and more accurate, saving time.

Owner: update medicine data and control who can access data based on their job.

Patient: Smooth access to past bills and their history.

Stakeholder Acceptance:

Stakeholders are likely to accept the proposed solutions as they address current pain points, reduce manual work, and enhance user experience.

Achieving Requirements:

The proposed solutions fulfill the system's functional and non-functional requirements, improving efficiency, security, and accuracy.

3.Economic feasibility

One-Time Costs:

-Tangible Costs:

Purchase or update of software necessary to develop the pharmacy management system (e.g., inventory management system, electronic patient records, billing system).

-Intangible Costs:

Time and effort are required to study the pharmacy's requirements and design the system.
Employees will be trained on how to use the new system.
Policy and procedure updates to ensure alignment with the system created.

Ongoing (Recurring) Costs:

-Tangible Costs:

Costs for system maintenance and technical support.
Costs associated with upgrading the database to maintain continuous service.
Salaries of staff tasked with managing the new system.

-Intangible Costs:

Employees are continuously trained on system updates and new features.
Continuous data management and analysis to improve services and satisfy client expectations.

Monitoring technical advances to verify the system's compatibility with the most recent criteria.

One-Time Benefits:

-Tangible Benefits:

Access to a modern management system that reduces human labor and boosts work productivity.
Improved the precision of activities such as inventory management and billing.

-Intangible Benefits:

Enhanced reputation of the pharmacy by offering exceptional customer services.

Ongoing (Recurring) Benefits:

-Tangible Benefits:

Enhanced inventory management to minimize waste and boost profits.
Enhanced customer satisfaction by providing quick and tailored services.
Decreased mistakes in preparing medications and issuing prescriptions.

-Intangible Benefits:

Fostering customer loyalty and enhancing their confidence in the pharmacy.

Improving the pharmacy's analytical skills to create new approaches based on sales information.

Gantt chart

Week / Task	1	2	3	4	5	6
Create team	■					
planning	■					
Midterm		✕				
Interview			■			
Chapter1(introduction)& Rest of chapter3			■			
Chapter2(feasibility study)				■		
Chapter4(modeling)					■	
Chapter5(UI)						■
SDLC model						■

Chapter 3

Interview and system analysis

1.Pharmacy Owner:

Opened :

- هل تستخدم حاليا اى نظام يساعدك فى اداره الصيدليه ؟ (نعم - لا)

-هل يقوم النظام الحالى بتقديم تقارير مفصلة للمبيعات ؟ (نعم - لا)

-هل تفضل نظاما يضم بيانات شركات الادوية الموردة للصيدلية؟ (نعم -لا)

-هل من الممكن انشاء قاعدة بيانات خاصة بالموظفين القائمين بالصيدلية؟ (نعم - لا)

Closed:-

ما هى الصعوبات التي تواجهها اثناء ادارتك للصيدلية؟

- متابعة مخزون الادوية داخل الصيدلية من حيث كمياتها وتاريخ صلاحيتها بشكل دورى اسبوعى

- جدولة شيفتات الموظفين وتحديد الرواتب على حسب ساعات العمل

- عدم القدرة على تحديد اداء الموظفين فى خلال ساعات العمل

- صعوبة تحديد المنتج الاعلى والاقل مبيع

كيف تتعامل مع مهمتك فى تحديد مرتبات الموظيفين ؟

- بشكل ورقى من خلال حساب عدد ساعات عمل الصيدلى خلال الشهر وتحديد المرتب على اساس سعر ساعة العمل

ما اقتراحتك لتطوير النظام الحالى لخدمة متطلباتك ؟

ارسال اشعارات تنبيهية قبل شهر من انتهاء الدواء , والادوية التى على وشك النفاذ

انشاء تقارير يومية وشهرية بالمبيعات وعمل احصائيات شهرية وسنوية بارادات الصيدلية

قائمة باسماء شركات الادوية المتوفر فيها الادوية المطلوبة ونسبة الخصم المحددة

كيف يمكن ان يساعدك الن ظام الجديد فى تحسين ادارتك للصيدلية ؟

تحسين خدمة العملاء عن طريق توافر الدواء المطلوب دون اى عجز فى كمية المنتج

استهلاك وقت ومجهود اقل فى جرد المخزون للصيدلية

تحسين جودة العمل وتسهيل المهام على الموظفين

Pharmacy Data entry officer:

Opened:

-هل يقوم النظام الحالى بتتبع الادويه المن تهية الصلاحية واظهار تقارير بها وبكمياتها ؟
(نعم - لا)

-هل يتم تسجيل الموردين على النظام؟(نعم - لا)

Closed:

ما هى المهام التى تقوم به ؟

اقوم باستلام الطلبيات من الموردين وادخالها على النظام

متابعة تاريخ الصلاحية للادوية الموجودة حاليا وكمياته ا و ابلاغ المدير بالكميات التى نحتاجها

ما هى اكثر المهام استهلاكا للوقت ؟

- عملية تعديل البيانات على المنتج

اصدار الفواتر الورقة الخاصة بطلبيات الادوية

كيف تتم عمليه التعديل على بيانات المنتج ؟

لا يتيح النظام الحالى المرونة فى عملية التعديل فيتم مسح جميع البيانات المدخلة للقيام بعملية التعديل

ما هى مقتراحاتك للتعديل على السيستم الحالى؟

ان تكون عملية التعديل اكثر مرونة

ان يتم ارسال اشعارات بالادوية التى تم انتهاء صلاحيتها و والادوية المقاربة على النفاذ

Pharmacist:

Opened:

هل تقوم باستخدام برامج اخرى بجانب السيستم الحالى؟ (نعم - لا)

هل ترغب فى سجل الكترونى للوصفات الطبية؟ (نعم - لا)

هل تقوم باصدار الفواتير الكتروني؟ (نعم - لا)

Closed:

ما هى المشكلات التى تواجهها فى النظام الحالى ؟

عدم عرض بيانات مفصلة عن الادوية (الجرعة المناسبة لكل سن , الاعراض الجانبية للدواء)

كيف ترى وجود خاصية تعرض البدائل للادوية تفيدك فى عملك وكيف يمكن تنفيذها من وجهه نظر ك ؟

فى حالة وجود عجز فى دواء معين او عدم توافره فى السوق المصرى يتم عرض البدائل بناءا على المادة

Customer:-

Opened:

هل تواجه صعوبة فى الحصول على الادوية التى تحتاجها؟ (نعم - لا)

هل تفضل وجود فاتورة الكترونية مطبوعة من الصيدلية ؟ا (نعم - لا)

Closed:

ما هى اكبر مشكلة تواجهها عند شراء الادوية من الصيدليات ؟

عدم توافر الادوية فى الصيدليات لنفاذها

- وصف الصيدلى الغير دقيق لجرعة الدواء

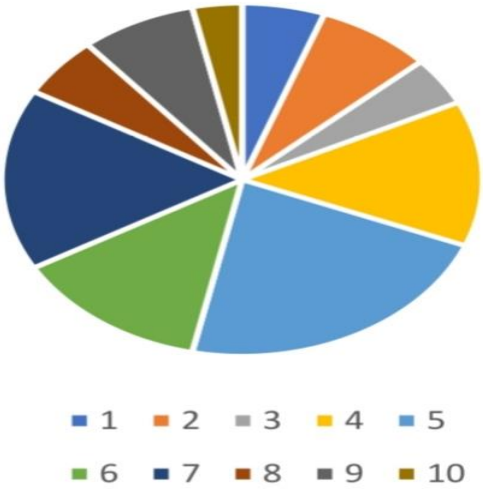
كيف يمكن للصيدلية تحسين تجربتك كعميل ؟

- التواصل معى عند توافر الدواء المطلوب

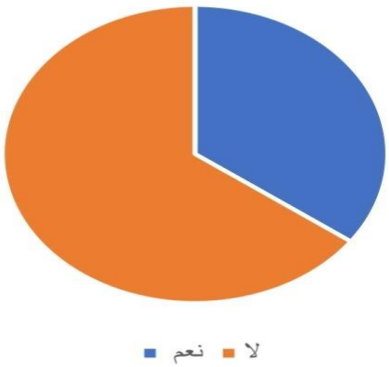
وجود فاتورة الكترونية مسجلة باسمى وذلك تسهيلا فى حالة ارجاع الدواء المشتر ى -

Questionnaire and surveys

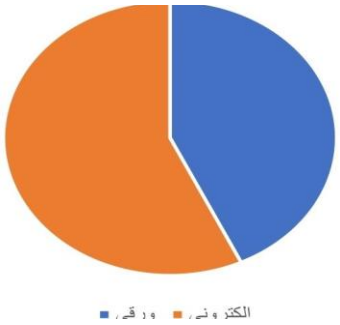
ما مدى رضاك عن النظام الحالى؟



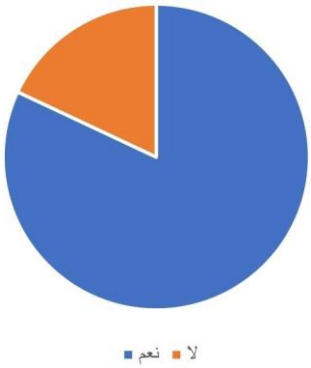
هل عملية تخزين بيانات العملاء على النظام جيدة؟



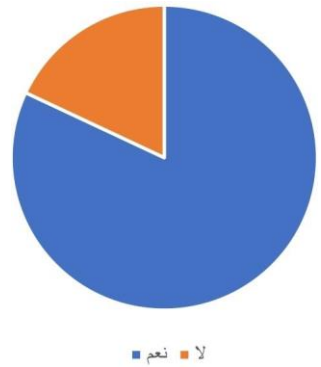
كيف تفضل اصدار الفواتير؟



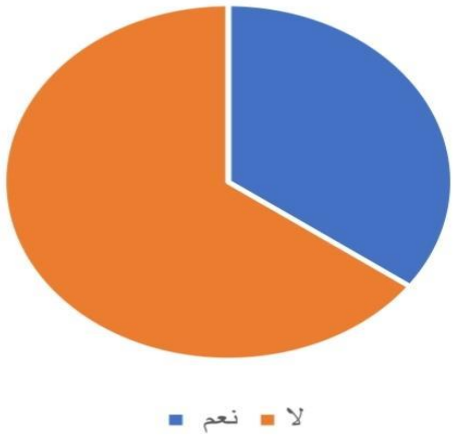
هل ترى نظام الاشعارات بكمية الادوية جيد؟



هل تفضل نظام يقيم عمل الموظفين و تقدير الرواتب ؟



هل تفضل نظام يقوم بطلب الادوية بشكل تلقائي عند نفاذها؟



Observations

It has been interviewed all the stakeholders and staff that are working in pharmacy to collect and understand their requirements to develop the existing system by enhancing and solving the problems that are facing ,and it have been observed some points as following:

Current problems

- Difficulty in scheduling staff shifts and determine their salary based on their working hours.
- Inability to determine employee performance during working hours
- Difficulty in determining the highest and lowest selling product.
- inability to modify the enter data of the product.
- Not displaying detailed drug data and its alternatives.

Requirements that is needed:-

-Sending notifications One month before the medicine expires.

-Sending notifications when there are at least two packages left of the medicine

-A list of the names of pharmaceutical companies that have the required medicines and the percentage of discount specified by the company's faculty.

- The presence of a feature that displays detailed reports on daily, weekly and annual sales.

- Issuing an electronic invoice to the customer in his name and data, with details of his purchases
- Integrating the system with the feature of displaying alternatives to the unavailable drug based on the active ingredient.

Suggestions for improving system performance:

- Improve system response speed for barcode Scanning.
- Automatic data saving feature during data entry.

Requirements Definition

•Functional requirements

• Watch Over Stock with Clear Reports

The system lets you watch stock well with clear reports. It shows the real-time counts of each

item you have. It also shows prices, when items will go bad, and sets low stock levels, sending

alarms when items are about to run out.

• Alarms for Close Expiry Dates

The system keeps track of when medicines will go bad and sends out alarms when a medicine is

close to its go bad date. It also arranges stock by go bad dates to use items well and cut down on

waste.

• Alarms for Low Stock

The system sends out alarms when the stock of medicines is low or needs more. This helps

make sure that important medicines are there when needed.

• Daily Sales Reports in Detail

The system makes full daily reports that show all sales work. These reports help track how sales

are doing, look at buying trends, and better manage stock and supplies.

• Edit Medicine Info

The system lets you change info on medicines with ease. You can add new medicines, change

current info, or take out items that are not available. This keeps the medical records up to date

and correct.

• Check Data to Find Popular Medicines

The system checks data to spot the medicines that people ask for the most, based on what they

need and what they buy. It can also work out medicine doses using medical past and body facts,

helping make smart choices.

• List of Replacements for Medicines You Can't Get

A full list of other choices for medicines, both from here and other places, is kept up to date.

These medicines are sorted by what they do, how to use them, and bad effects, helping pharmacists give the right ones fast.

• List of Doctor's Orders to Help Pharmacists and Cut Mistakes

The system keeps doctor's orders electronically and gives each one a code to track it, making

sure they are right. It also tells about bad mix-ups with other drugs or warnings, making it less

likely for mistakes to happen.

• Billing and Invoicing

Generate accurate bills based on services rendered, facilitate electronic billing and payment

processing, provide itemized invoices for transparency.

Integrate prescription information with patient records.

•Non-functional requirements

Usability: is not a priority, as staff can learn the technology with adequate training.

Performance High speed is not required as long as duties are accomplished in a reasonable

period.

User Interface Design: A visually pleasing design is unnecessary; clarity and usefulness take

precedence.

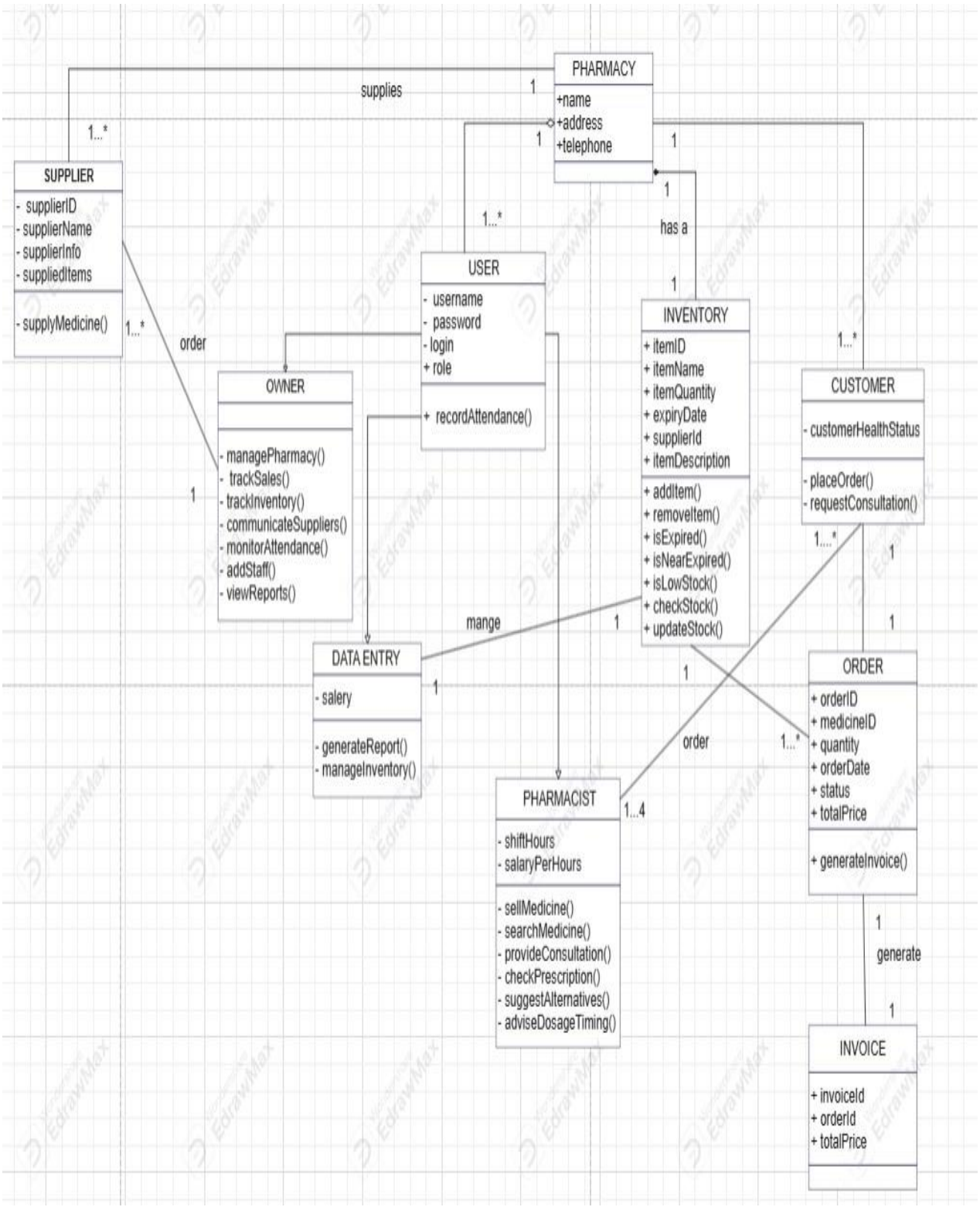
Security: Simple security measures are enough for small-scale systems that do not contain

highly sensitive data.

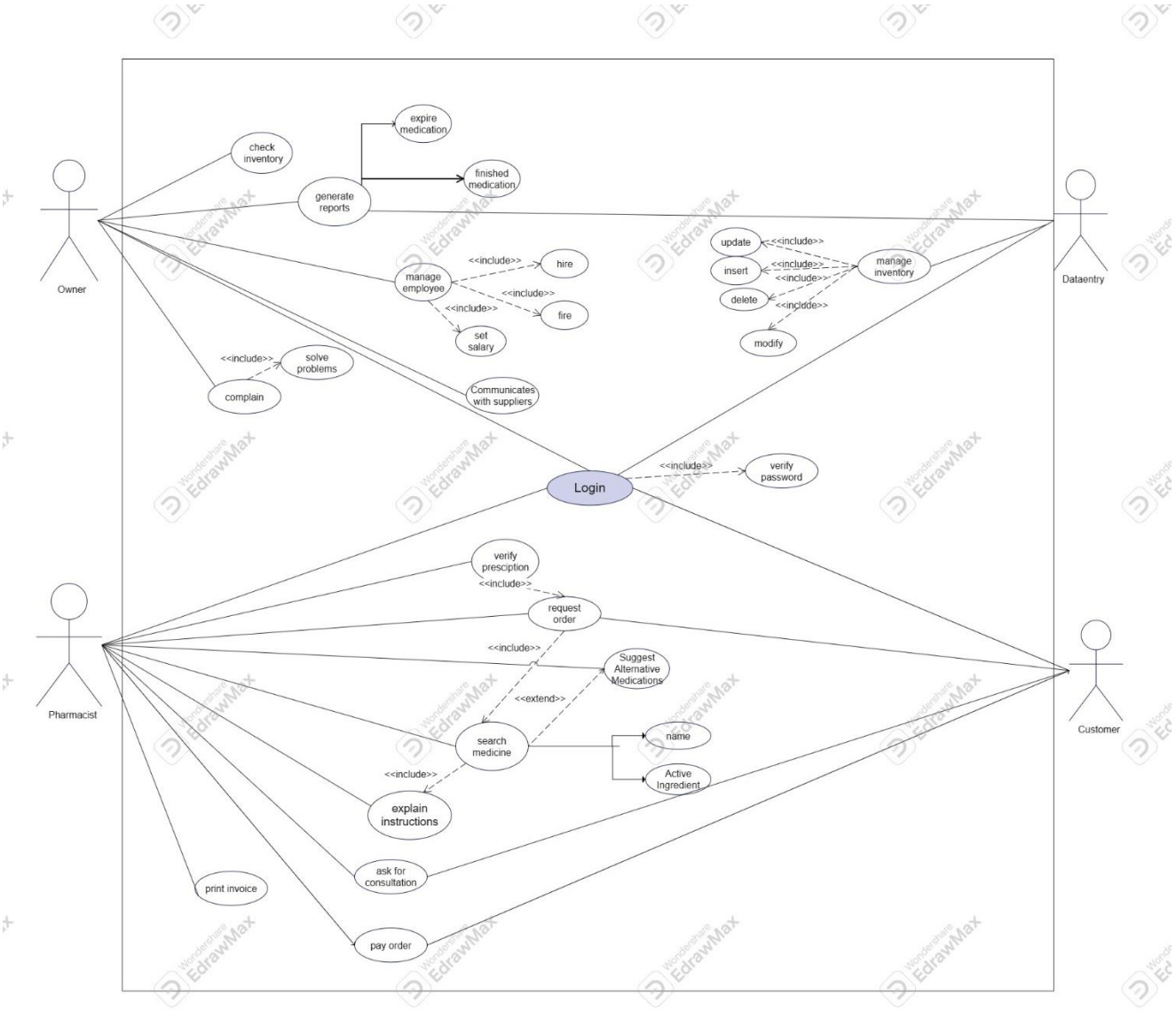
chapter 4

system modeling

1.class diagram



2.Use case


Owner
Dataentry
Pharmacist
Customer
check inventory
expire medication
finished medication
generate reports
manage employee
hire
fire
set salary
update
insert
delete
modify
manage inventory
<<include>>
solve problems
complain
Communicates with suppliers
Login
verify password
verify presciption
request order
Suggest Alternative Medications
<<extend>>
search medicine
name
Active Ingredient
explain instructions
ask for consultation
print invoice
pay order

FLOW OF EVENT:

Flow of event#1

Use case : Login

Actors: Owner, Data entry and Pharmacist

Description: All of them have access to the system, but their permissions vary, and these permissions are managed by the owner.

Flow of event#2

Use case : Communicates with suppliers

Actors: Owner

Description: The Owner communicates with suppliers and places orders for the medicines needed by

the pharmacy.

Flow of event#3

Use case: manage employee

Actors: Owner

Description: The Owner manages employees, which includes hiring, dismissing employees, and setting

salaries based on attendance.

Flow of event#4

Use case : check inventory

Actors: Owner

Description: The Owner can view the quantities of medicines available in inventory.

Flow of event#5

Use case :solve problems

Actors: Owner

Descrip□on: The Owner handles any problem or complaints submitted by employees or customers.

Flow of event#6

Use case : manage inventory

Actors: Data entry

Description: The data entry adds orders requested from suppliers into the database and updates it by

insert, deleting, or modifying data.

Flow of event#7

Use case : generate reports

Actors: Data entry ,owner

Descrip□on: Data entry creates reports to owner on the available quantities of medicines and the

orders she has received and added to the system.

Flow of event#8

Use case : verify prescription

Actors: Pharmacist

Description: The pharmacist verifies the prescription , and may also cancel it.

Flow of event#9

Use case : search medicine

Actors: Pharmacist

Descrip□on: The pharmacist searches for the medicine using the name or active ingredient, and may

suggest an alternative to the patient if the specified medicine is not available.

Flow of event#10

Use case : explain instructions

Actors: Pharmacist

Descrip□on: The pharmacist explains the doctor's instructions to the patient and answers any questions

the patient has about the medication.

Flow of event#11

Use case : request order

Actors: Pharmacist , customer

Description: The pharmacist charges the customer and prints the invoice.

Flow of event#12

Use case : pay order

Actors: Customer , Pharmacist

Descrip□on: The customer pays for the medications to Pharmacist.

Flow of event#13

Use case : ask for consulta□on

Actors: Customer

Description: The customer asks the pharmacist for medical consultations.

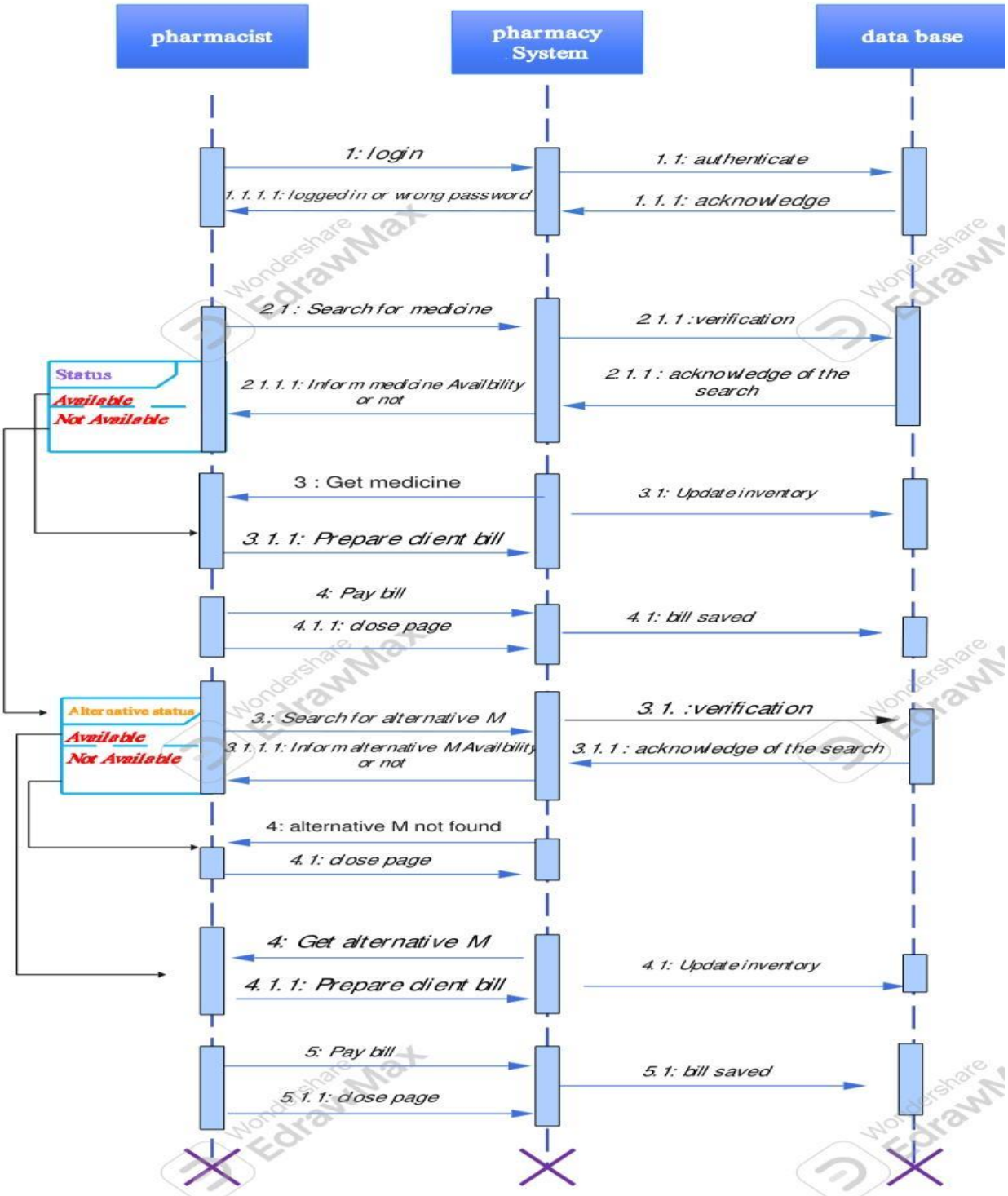
Flow of event#14

Use case : complain

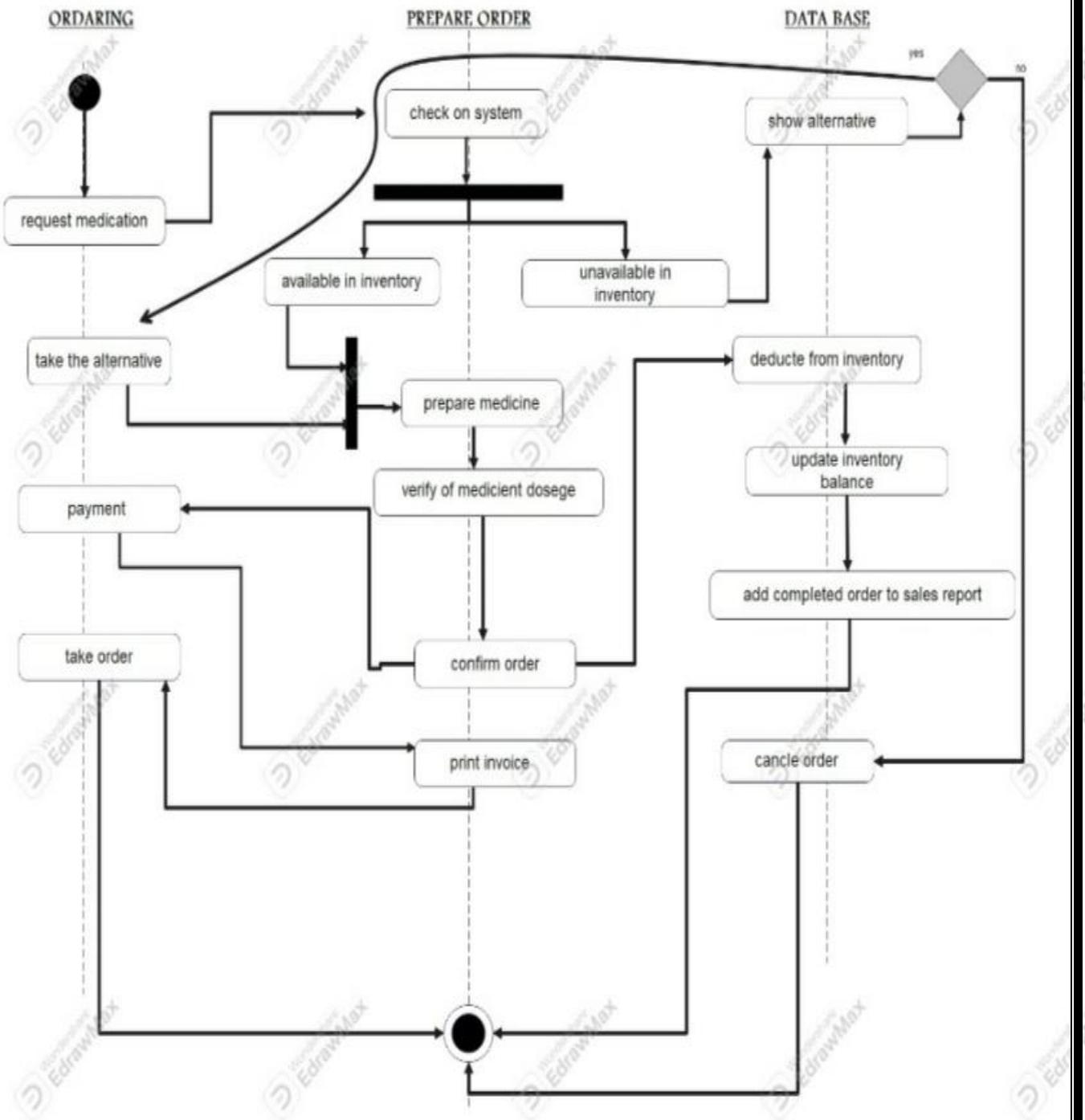
Actors: Customer , owner

Description: The customer can complain to owner about anything they are not satisfied with.

3.Sequence diagram



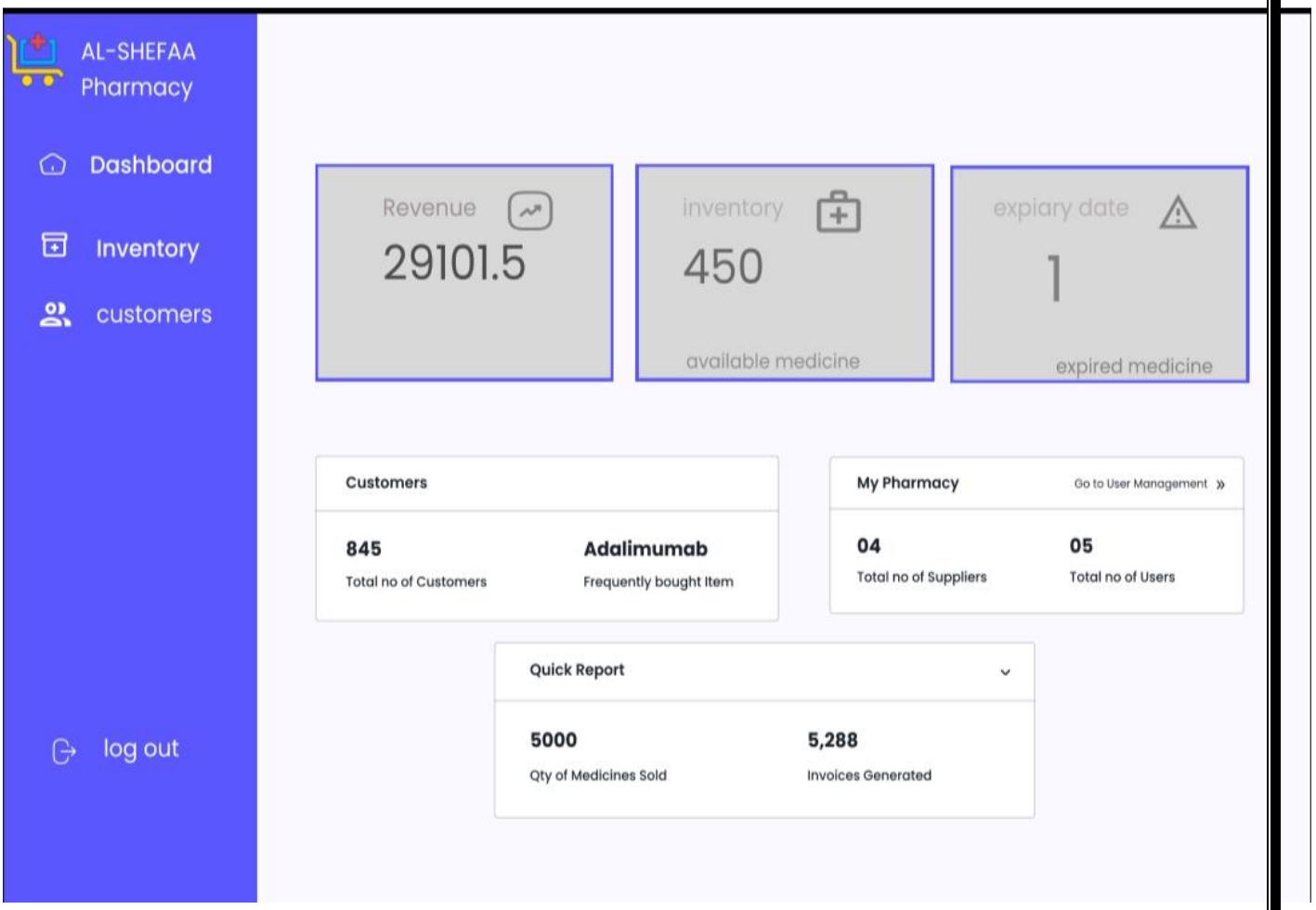
3. Activity diagram

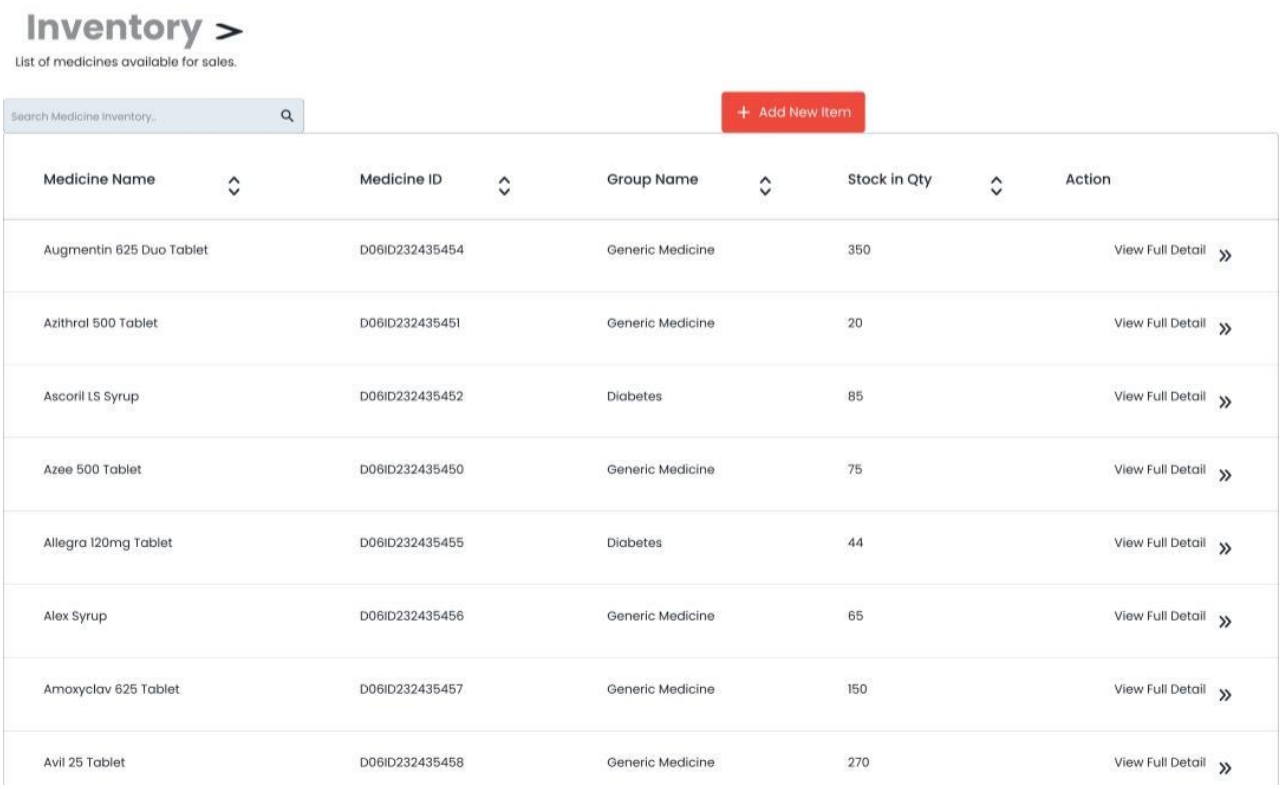


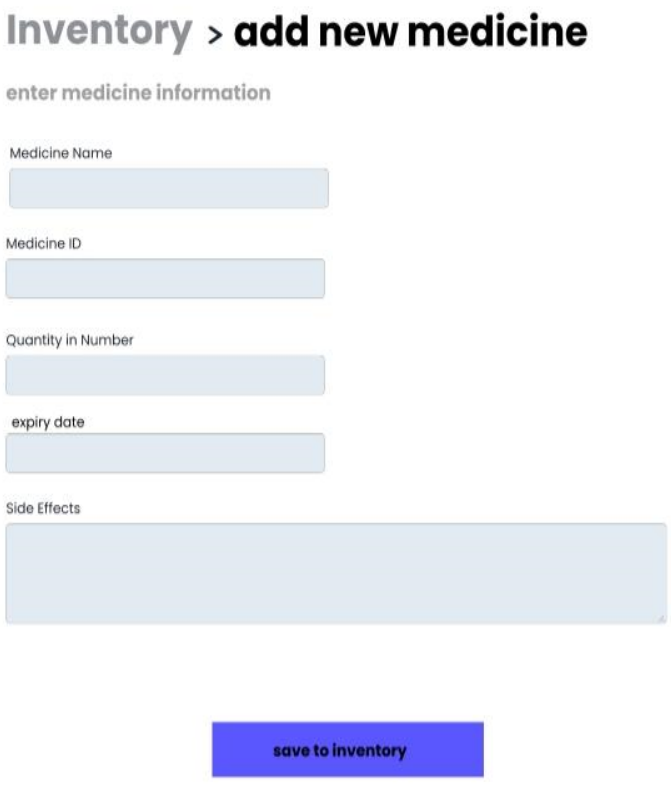
Chapter 5

System interface

UI


AL-SHEFAA
Pharmacy
Dashboard
Inventory
customers
log out
Revenue
29101.5
inventory
450
available medicine
expiary date
1
expired medicine
Customers
845
Total no of Customers
Adalimumab
Frequently bought Item
My Pharmacy
Go to User Management
04
Total no of Suppliers
05
Total no of Users
Quick Report
5000
Qty of Medicines Sold
5,288
Invoices Generated


Inventory >
List of medicines available for sales.
Search Medicine Inventory..
+ Add New Item
Medicine Name
Medicine ID
Group Name
Stock in Qty
Action
Augmentin 625 Duo Tablet D06ID232435454 Generic Medicine 350 View Full Detail
Azithral 500 Tablet D06ID232435451 Generic Medicine 20 View Full Detail
Ascoril LS Syrup D06ID232435452 Diabetes 85 View Full Detail
Azee 500 Tablet D06ID232435450 Generic Medicine 75 View Full Detail
Allegra 120mg Tablet D06ID232435455 Diabetes 44 View Full Detail
Alex Syrup D06ID232435456 Generic Medicine 65 View Full Detail
Amoxyclav 625 Tablet D06ID232435457 Generic Medicine 150 View Full Detail
Avil 25 Tablet D06ID232435458 Generic Medicine 270 View Full Detail


Inventory > add new medicine
enter medicine information
Medicine Name
Medicine ID
Quantity in Number
expiry date
Side Effects
save to inventory

Inventory >
Azithral 500 Tablet > search for substitute medications

here are the results for this medication alternatives

medication	quantity in stock
Alex Syrup	250
Augmentin 625 Duo Tablet	180
Allegra 120mg Tablet	11

customers > invoices

medicine name	Medicine ID	time	price	total amount
Augmentin 625 Duo Tablet	D06ID232435454	3:00 a.m	350	2
Azithral 500 Tablet	D06ID232435451	4:15 p.m	20	1
Ascoril LS Syrup	D06ID232435452	2:38 p.m	85	3
Azee 500 Tablet	D06ID232435450	5:16 p.m	75	4
Allegra 120mg Tablet	D06ID232435455	5:15 a.m	44	1
Alex Syrup	D06ID232435456	7:02 p.m	65	1
Amoxyclav 625 Tablet	D06ID232435457	9:23 a.m	150	1
Avil 25 Tablet	D06ID232435458	12:01 p.m	270	1

SDLC Model

SDLC (Software Development Life Cycle) is a process used in software development. SDLC is a precise plan that specifies how to create, maintain, replace, and improve specific software. The life cycle describes a way for enhancing software quality and the overall development process.

For this pharmacy system, the Agile model was chosen because of its flexibility and iterative nature, making it ideal for projects with changing requirements.

What is Agile Model?

The Agile Model was created to assist a project respond quickly to change requests. So, the primary goal of the Agile methodology is to allow rapid project completion. To complete this activity, agility is essential. Agility is achieved by tailoring the process to the project and eliminating tasks that may not be required for that project. Also, everything that wastes time and effort is avoided. The Agile Model describes a collection of development methodologies. These processes have some basic properties in common, but they also differ slightly.

Steps in the Agile Model

The agile model is a combination of iterative and incremental process models. The steps involve in agile SDLC models are:

- Requirement gathering
- Design the Requirements
- Codeing
- Testing
- Deployment
- Feedback

1. Requirement Gathering: - In this step, the development team must gather the requirements, by interaction with the customer. development teams should plan the time and effort needed to build the project. Based on this information you can evaluate technical and economic feasibility.
   For example: -

Collaboration with stakeholders:

Pharmacy Owner: Identify needs such as detailed sales reports, improved inventory tracking, employee database creation, and alert notifications for expiring or running low drugs.....

2. Design the Requirements:- In this step, the development team will use user-flow-diagram or high-level UML diagrams to show the working of the new features and show how they will apply to the existing software. Designing user interfaces are done in this phase.

3. Coding: - In this step, development team members start working on their project, which aims to deploy a working product. Using **sprints** means the development team works on the project in short, focused periods (usually 1-2 weeks). During each sprint, they complete a specific set of tasks or features.

4. Testing / Quality Assurance:- Testing involves Unit Testing, Integration Testing, and System Testing.
5. Deployment: - In this step, the development team will deploy the working project to end users.

6. Feedback: - This is the last step of the Agile Model. In this, the team receives feedback about the product and works on correcting bugs based on feedback provided by the customer.

Why do we use this model in our project?

- Changes: Requirements may vary in response to feedback from pharmacists or end users.

- Collaboration: is the ability to work continually with stakeholders in order to minimize mistakes and maintain alignment with their needs.

- Early Problem Detection: Because development occurs in sprints, we can detect and resolve difficulties quickly. This enables faster modifications, fewer delays, and higher end product quality.

- Focus on User Needs: Agile stresses providing value to end users. By collaborating closely with stakeholders, we ensure that the final pharmacy system meets their concerns and enhances their everyday operations.