Name	ID	Group/ Section	Grade
عمر ياسر سيد شفيق	932230124	G4/ S2	
عمر مصطفى عبدالستار	932230123	G4/ S2	
عبد الحميد محمد عبد الحميد	932230089	G4/ S2	
عبد الرحمن محمد عيد عبد الحميد	932230097	G4/ S2	
عمر عبد الحميد محمود	932230119	G4/ S2	

Introduction to the Proposed System:

_____

In light of the increasing reliance on digital systems within clinics, numerous challenges have emerged, such as appointment delays, loss of patient data, and difficulty in communication between various parties. Therefore, the system aims to enhance work efficiency by organizing internal processes digitally and keeping pace with technological advancements in the healthcare field.

The system seeks to automate daily operations within the clinic, such as:

- Appointment booking
- Patient data registration
- Sending notifications
- Managing medical records
- Organizing doctors' schedules
- Issuing electronic invoices
- Facilitating access to medical reports and lab results

The system also serves to improve structured communication between patients, doctors, and clinic staff. It helps reduce errors, saves time and effort for all parties involved, and enhances the overall service quality.

Additionally, the system is designed to be secure, user-friendly for both staff and patients, and scalable to accommodate future expansion, all while maintaining the confidentiality of medical information.

_____

- ◆ **First: Interviews (Fact-Finding Technique)**

  - ▪ **With Doctors – Questions:**

    1. How do you record the patient's medical condition and its development?

    2. Do you frequently reschedule patient appointments?

    3. How do you communicate with the receptionist?

4. How do you write prescriptions?

5. Do you follow up with patients after they leave?

6. Is it easy to access a patient's past records?

7. Does writing take up a large amount of your time?

8. Does the current system cause pressure or slow down your work?

- ## With Nurses – Questions:

    1. How do you record a patient's vital signs?

    2. How do you know your daily duties?

    3. Do you face coordination issues with the doctor?

    4. Do you experience delays in receiving medications or supplies?

    5. Do you need training to use the new system?

    6. Do you sometimes feel your work is unorganized?

- ## With Accountants Staff – Questions:

    1. How do you calculate the invoice?

    2. Can you easily access the service details?

    3. How do you record payments?

    4. Do you track pending and paid amounts?

    5. Do you issue receipts?

    6. Are there daily financial reports?

    7. Do you know the clinic's current balance?

    8. Do you send reports to the management?

    9. Do you face time pressure during busy hours?

- **With Patients – Questions:**

    1. How do you book your appointment?

    2. Have you experienced delays entering to see the doctor?

    3. Did you write your own personal data?

    4. Was the prescription clear?

    5. Was it easy to make the payment?

    6. Do you return for follow-up visits?

    7. Did a nurse assist you?

    8. Did you receive your lab results quickly?

    9. Were you satisfied with the overall service?

- **With Receptionist – Questions Only:**
    1. How do you book appointments for patients?
    2. Can you easily access the patient's information?
    3. How do you transfer appointments to the doctors?
    4. Do you know whether the doctor is available?
    5. How do you record the patient's attendance?
    6. Do patients complain about long waiting times?
    7. Does the patient receive a receipt after payment?

Interviews – With Doctors

Question 1:
How do you record the patient's medical condition and its development?

Answer:
We record the medical condition using paper sheets stored in the patient's physical file.

Problem:
The papers can get lost or become hard to access when needed, which may lead to losing important information or delays in following up on the case.

Proposed Solution:
Create an **electronic medical record** for each patient that includes all past visits and notes, with fast and easy access to the data.

Question 2:
Do you frequently reschedule patient appointments?

Answer:
Yes, we often must reschedule due to our circumstances or the patient's.

Problem:
There are frequent conflicts and double bookings, causing confusion and delays in receiving patients.

Proposed Solution:
Implement an **electronic system** that automatically updates appointments and sends **instant notifications to** both the patient and the doctor to confirm changes and avoid any conflicts.

Question 3:
How do you communicate with the receptionist?

Answer:
Either face-to-face or over the phone.

Problem:
We might forget or misunderstand patient appointments, leading to confusion in the schedule.

Proposed Solution:
Add a **real-time messaging feature** within the system between the doctor and the receptionist to facilitate instant and effective coordination.

Question 4:
How do you write prescriptions?

 We write prescriptions manually on paper.

 Handwriting might be unclear, which can lead to mistakes in medication names or dosages.

 Implement **electronic prescriptions** that are automatically printed for the patient after selecting the treatment from a pre-defined list. This will reduce errors and make the prescription much clearer.

Question 5:
 Do you follow up with patients after they leave?

 Rarely, unless the patient returns on their own for another visit.

Chronic or serious cases may be lost, or there may be delays in following up with patients who need continuous care.

The system should send **automatic follow-up reminders** to both the doctor and the patient on a regular basis to ensure continuous care and monitoring.

Question 6:
Is it easy to access a patient's old medical records?

No, I must go through many paper files to retrieve the patient's past information.

This takes too much time and may result in losing some critical information due to repeated searches in physical files.

Proposed Solution:
Develop a **digital medical database** that stores all patient data in a well-organized and easily accessible format, making it quicker and more efficient to find old records.

Question 7:
Does it take you a long time to write reports?

Answer:
Yes, especially if the patient is suffering from a complex condition.

Problem:
 A lot of time is wasted writing medical reports, which affects the speed of service delivery.

Proposed Solution:
Use a **pre-built template** within the system to quickly record the patient's condition, reducing the time spent and increasing work efficiency.

Question 8:
Does the current system cause work pressure?

Answer:
Yes, the current system doesn't provide enough organization, which leads to mental stress and an increased workload.

Problem:
 Exhaustion and poor organization due to the lack of tools for task distribution or appointment scheduling.

Proposed Solution:
 Distribute tasks electronically and provide **automatic appointment scheduling,** which helps reduce pressure and improve organization within the clinic.

_____

Interviews – With Nurses

Question 1:
 How do you record the patient's vital signs?

Answer:
 We record the data on paper or in the patient's file.

Problem:
The data can get lost or mixed up between patients, leading to the loss of important information or its misuse.

Proposed Solution:
Add an **electronic field** within the system to record the patient's vital signs, ensuring that the data is stored in an organized and secure manner with easy access.

Question 2:
 How do you know your daily shift?

Answer:
Each nurse knows the cases they will follow up on through direct inquiry or by checking the paper schedule.

Problem:
Sometimes, there is a lack of clarity regarding shifts or daily assignments due to the manual use of the schedule.

Proposed Solution:
Create **electronic, editable shifts** within the system, sending alerts to nursing staff to clarify shift schedules and important appointments.

Question 3:
Do you face any problems coordinating with the doctor?

Answer:
Sometimes, especially if the doctor is not present in the clinic.

Problem:

Delays in care or unclear instructions can lead to treatment delays or errors.

Proposed Solution:

The system will link the doctor's instructions directly to nursing staff and provide real-time updates between departments to facilitate quick coordination.

Question 5:

Do you need training on the new system?

Answer:

Yes, most likely, since we are used to the traditional paper-based system.

Problem:

A lack of experience in using technology may lead to decreased performance and not fully utilizing the system.

Proposed Solution:

Provide simple **workshops** to train staff on the new system, with ongoing **technical support** to ensure smooth adaptation.

Question 6:

 Do you sometimes feel your work is disorganized?

Answer:

 Yes, especially during busy and high-density times, where it becomes difficult to organize work.

Problem:

 Pressure and crowding may cause difficulty in organizing work effectively, affecting the quality of service.

Proposed Solution:

 Add an **electronic task schedule** for everyone, with task assignments and priority setting for important tasks to reduce pressure and improve performance.

_____

Interviews – With Receptionists

Question 1:

How do you schedule patient appointments?

Answer:

We schedule appointments using a paper notebook.

Problem:

There is a **confusion** in appointments due to the lack of an effective mechanism to monitor the schedule.

Proposed Solution:

An **electronic calendar system** for scheduling appointments, which will **automatically prevent overlapping appointments** and show available slots.

Question 2:

Do you get patient data easily?

Answer:

If the patient has booked before, I can easily find their data. If the patient is new, I ask them and write the information manually.

Problem:

The delay in searching for new patient data may lead to **repeated errors** and **inaccuracy**.

Proposed Solution:

An **electronic system** with forms that patients can fill out **before their visit**, which helps speed up the process and reduces errors.

Question 3:

How do you transfer appointments to the doctors?

Answer:

I transfer appointments manually or via phone.

Problem:
There might be **delays** or **forgetfulness** in transferring appointments to doctors, which leads to confusion in the information.

Proposed Solution:
Automatic notifications sent to the doctor with the new patient appointments to ensure they are notified on time and reduce the chance of mistakes.

Question 4:
Do you know if the doctor is available?

Answer:
No, I usually must ask them or wait to confirm if they are available.

Problem:
Conflicts in timing occur because the availability of the doctor isn't known in real-time.

Proposed Solution:
Display the doctor's status **"Available/Busy"** directly in the system, so the staff can schedule appointments easily.

Question 5:
How do you record patient attendance?

Answer:
I manually record the patient attendance on paper.

Problem:
The data might be inaccurate or easily lost.

Proposed Solution:
Record attendance electronically by entering the patient's code or file number, ensuring accuracy and easy access to the data.

Question 5:
Do patients complain about the waiting time?

Answer:

Yes, patients often complain about the long waiting time.

Problem:

Lack of precise appointment organization leads to **crowding** and an **increase** in waiting time.

Proposed Solution:

Organize **appointments accurately** with time gaps between each patient to reduce waiting time.

Question 5:

Does the patient receive a receipt after payment?

Answer:

Yes, but the receipt is written manually.

Problem:

Manually written receipts might get **lost** or contain **errors**.

Proposed Solution:

Generate an electronic receipt printed for the patient after payment, which reduces errors and provides an accurate record.

_____

Interviews – With Accounts/Treasury Staff

Question 1:

How do you calculate the invoice?

Answer:

I manually calculate the invoice after the consultation.

Problem:

There is a delay in calculating the invoice, in addition to possible errors that might occur during manual calculation.

Proposed Solution:

The system will automatically generate invoices based on the services provided, speeding up the process and reducing errors.

Question 2:

Do you get service details easily?

Answer:

No, I need to ask the doctor or receptionist to get the details.

Problem:

There is a delay in obtaining the details, and mistakes may be repeated due to unclear information.

Proposed Solution:

The system will immediately send the recorded service to the accounts department for accurate and timely updating of details.

Question 3:

How do you record payments?

Answer:

I settle accounts manually using a ledger or Excel.

Problem:

Human errors may occur in accounting or payment entry, leading to repeated work.

Proposed Solution:

The system will provide an automated electronic payment and recording method, ensuring accuracy and speed in registration.

Question 4:

Do you register the remaining balance or prepaid amount?

Answer:

Yes, I manually register the remaining or prepaid amounts.

Problem:
There is a possibility of forgetting or delaying the update of the remaining balance, which can lead to errors in the accounts.

Proposed Solution:
The system provides an automatic field to calculate the remaining or due amount, reducing errors and saving time.

Question 5:
Do you issue receipts?

Answer:
Yes, a receipt is sometimes manually issued and written by hand.

Problem:
There could be an error in the amount, or the manually written receipt could be lost.

Proposed Solution:
The system generates an electronic receipt that is printed, reducing errors and providing an accurate record.

Question 6:
Are there daily financial reports?

Answer:
Yes, but we must prepare them manually.

Problem:
This leads to delays in preparing the reports, and sometimes the data may not be accurate.

Proposed Solution:
The system automatically generates daily financial reports, saving time and ensuring data accuracy.

Question 7:
Do you know the current balance of the clinic?

Answer:

 No, I must manually check the accounts to verify the balance.

Problem:

 There is a delay in knowing the clinic's current balance, which may affect financial decision-making.

Proposed Solution:

 The system displays the current balance directly on the user interface, helping to make quick and accurate financial decisions.

Question 8:

 Do you send reports to the management?

Answer:

 Yes, but it is done manually at the end of the month.

Problem:

 There is a delay in sending reports, leading to delays in decision-making.

Proposed Solution:

The system automatically sends daily reports to the management, helping to make faster and more accurate decisions.

Question 9:

 Do you face pressure and congestion?

Answer:

 Yes, there is a lot of pressure, especially during busy times.

Problem:

 This leads to congestion and delays in payment, which causes customer anxiety.

Proposed Solution:

A fast payment system with predefined service options that speeds up the payment process and reduces congestion.

<u>Interviews – With Patients</u>

Question 1:

 How did you book your appointment?

Answer:

 I called or went to the clinic.

Problem:

 The booking process takes a long time and causes fatigue and delays.

Proposed solution:

The system provides online booking through the website or app, making the process easier and saving time.

Question 2:

Did you experience delays in seeing the doctor?

Answer:

 Yes, a lot.

Problem:

 Poor organization leads to delays in patients seeing the doctor.

Proposed solution:

The system schedules specific times for each patient and arranges them according to their assigned times, with a notification to the patient just before their turn.

Question 3:

Did you write your data yourself?

Answer:

 No, the receptionist writes it.

Problem:

There is a possibility of errors in the data entered manually.

Proposed solution:

The system allows the patient to enter their data electronically, reducing errors and ensuring the accuracy of information.

Question 4:

Was the prescription clear?

Answer:

Sometimes yes, but the handwriting was unclear.

Problem:

The handwriting on the prescription makes it hard to read.

Proposed solution:

The prescription will be printed electronically, ensuring clear writing and easy readability.

Question 5:

Did you pay easily?

Answer:

I had to wait in a long queue.

Problem:

The payment queue takes a long time and annoys patients.

Proposed solution:

The system offers electronic payment options through the app, making the payment process faster and reducing congestion.

Question 6:

Did you come back for follow-up?

Answer:

No, I forgot.

Problem:

Patients may forget follow-up appointments or have difficulty remembering them.

Proposed solution:

The system sends automatic reminders to patients about their upcoming follow-up appointments, helping organize follow-ups better.

Question 7:

Was there a nurse available to assist you?

Answer:

Not always.

Problem:

Delays in service due to the absence of a nurse available for assistance.

Proposed solution:

The system assigns a responsible nurse to each patient in the system and sends notifications to the responsible nurse for quicker assistance.

Question 8:

Did you receive your test results quickly?

Answer:

No, there was a delay.

Problem:

Lost or delayed test results due to poor coordination.

Proposed solution:

The system sends test results directly through the app or website, making it easier for patients to access them quickly.

Question 9:

Would you like better service?

Answer:
Yes, I want it to be faster and easier.

Problem:
Slow processes may cause inconvenience to the patient.

Proposed solution:
The system simplifies appointment booking, follow-ups, and online payments, improving the speed of service and making it easier for patients.

_____

◇ **Second: Observation (Fact-Finding Technique)**

During our visit to the clinic and observing the workflow, we noticed the following:

General Observations on the Current System:

- **Reliance on paper records** for appointment and attendance registration.

- **Loss of old patient data** and difficulty accessing it.
- **Long waiting times** for patients before seeing the doctor.
- **Handwritten prescriptions**, which leads to difficulty reading or understanding them.
- **Crowding and queues** at the payment desk.
- **Slow or absent communication** between departments (reception, accounts, doctor, nursing).
- **Frequent errors in accounting** due to manual processes.

Observations on Each Party of the System:

1. Reception:

- **Observations:**
    - Appointments are manually recorded in a notebook.
    - Repeated errors in entering patient data.
    - No clear schedule for distributing appointments.
    - Doctors and other departments are not notified immediately of appointments.
    - In case of crowding, confusion occurs in organizing the queue.
- **Proposed Solutions:**
    - An electronic appointment system with accurate scheduling.
    - Electronic entry of patient data to reduce errors.
    - Instant notifications to doctors and nurses about patient arrangements.
    - Electronic queue management and patient appointment reminders.

2. Nursing:

- **Observations:**
    - There is no comprehensive digital medical file for each patient
    - Communication with the doctor is done verbally, causing delays or misunderstandings.
    - Vital signs are manually recorded.
    - There is no organization or notification for daily tasks or appointments.
- **Proposed Solutions:**

- A digital medical file for each patient, accessible at any time.
- Automatic transmission of doctor's instructions to nurses via the system.
- Electronic entry of vital signs.
- A task management system with scheduling and reminders.

3. Doctors:

- **Observations:**
    - Reliance on paper and handwritten prescriptions.
    - Delays in seeing patients due to poor organization.
    - Doctors cannot easily access the patient's medical history.
    - Communication with nursing or accounts is not immediate.
- **Proposed Solutions:**
    - Electronic prescription writing.
    - Access to a comprehensive digital patient history.
    - Internal communication system for faster interactions with other departments.
    - Display of the patient waiting list with estimated waiting times.

4. Patients:

- **Observations:**
    - Difficulty in booking appointments via phone or in-person.
    - No reminders for appointments or follow-ups.
    - Handwritten prescriptions are sometimes unclear.
    - Long waiting times at the payment desk.
    - Patients don't know the results of lab tests or follow-up appointments unless they visit the clinic.
- **Proposed Solutions:**
    - An app or website for booking appointments.
    - Automatic reminders for follow-up appointments.
    - Receive prescriptions and lab results via the app.
    - Electronic payment options to reduce crowding at the payment desk.

5. Accounts/Treasury Employees:

- **Observations:**
    - Invoices are manually created after consulting with the doctor or reception.
    - Payments are recorded in notebooks or Excel files, leading to errors.
    - There are no standard receipts, and sometimes they are handwritten.
    - Remaining or pre-paid amounts are not recorded accurately.
    - There is no real-time reporting system to monitor balances or make financial decisions.
    - Reports to management are sent manually at the end of the month.

- **Proposed Solutions:**
    - Automatic generation of invoices based on services provided.
    - Electronic recording of payments and receipts.
    - Real-time financial reporting system.
    - Monitoring of balances and pre-paid amounts via the system.
    - Automatic daily or weekly reports to management.

_____

◇ **Roles in the System:**

1. Receptionist:

Role in the System:

- **Booking Patients' Appointments:** The receptionist will use the electronic system to book patient appointments through the website or app, ensuring that there is no overlap in the schedules.
- **Collecting Patient Data:** The receptionist will register patients' data electronically instead of using traditional methods. This includes registering names, personal information, and contact details.
- **Recording Patient Attendance:** The receptionist will be able to record the patients' attendance in the system using a code or file number.

- **Notifying Doctors about Appointments:** After scheduling each patient's appointment, the system will send automatic notifications to doctors about the new appointments.
- **Managing Doctors' Schedules:** The receptionist will be able to check the doctors' availability (available or busy) in the system to avoid scheduling conflicts.

Key Functions:

- Electronic appointment booking
- Recording attendance
- Notifying doctors about appointments
- Managing and organizing appointments

2. Nurses:

Role in the System:

- **Recording Vital Signs:** Instead of paper, nurses will be able to enter vital signs electronically into the system, reducing errors and making it easier to access them.
- **Monitoring Daily Task Schedule:** They will have an electronic task schedule that can be adjusted, keeping track of the scheduled times for following up with patients.
- **Coordinating with Doctors:** Medical instructions will be sent directly to nurses through the system, saving time and eliminating manual coordination.
- **Managing Medications and Supplies:** Nurses will connect with the pharmacy via the system's database to request medications and supplies in a more organized way.

Key Functions:

- Entering vital signs
- Monitoring daily tasks
- Coordinating with doctors

3. Accounts / Treasury Staff:

Role in the System:

- **Issuing Invoices:** The employee will be able to issue invoices automatically based on the services provided to the patients, reducing errors and delays.
- **Recording Payments:** Payments will be recorded electronically in the system, with automatic updates to the accounts.
- **Issuing Receipts:** Electronic receipts will be issued instead of manual ones, making them easier to store and reducing errors.
- **Financial Reports:** The system will automatically generate daily financial reports, saving time and effort, and providing accurate reports.
- **Monitoring Balance:** There will be a direct display of the clinic's balance through the system.

Key Functions:

- Issuing invoices automatically
- Recording payments electronically
- Issuing electronic receipts
- Generating daily financial reports

4. Patients:

Role in the System:

- **Appointment Booking:** Patients will be able to book their appointments electronically through the website or app, without the need to go to the clinic or make a call.
- **Doctor Entry:** Patients will be notified of their appointment time through the system, with a reminder before entering the doctor's office.
- **Data Registration:** Patients will be able to enter their personal information electronically before the visit, reducing errors and saving time.
- **Payment:** Patients can pay their fees electronically through the system or via the app easily.
- **Laboratory Results:** Patients will be able to receive their lab results through the system without delay.

- **Follow-up:** The system will send automatic notifications to patients about their next follow-up appointment.

Key Functions:

- Booking appointments
- Entering personal data
- Electronic payment
- Receiving lab results
- Receiving follow-up notifications

5. Doctors:

Role in the System:

- **Interacting with Appointments:** Doctors will be able to see their available appointments and know which patients are waiting for them based on the electronic schedule.
- **Giving Instructions to Nurses:** Medical instructions will be sent to nurses directly via the system.
- **Monitoring Medical Conditions:** Doctors will update patients' medical conditions through the system, such as writing prescriptions that will be printed electronically.
- **Prescribing Medications:** Doctors will be able to prescribe medications for each patient directly through the system, making it easier for nurses to receive these instructions.

Key Functions:

- Interacting with appointments
- Giving instructions to nurses
- Monitoring medical conditions
- Prescribing medications

Beneficiaries of the System:

All parties involved will benefit from the system, as it will improve the level of coordination among everyone, including doctors, nurses, receptionists, accountants, and patients. The system will help reduce errors, minimize wasted time, and enhance overall work efficiency in the clinic or hospital.

_____