

## Task 1: Analyze complex workflows

Based on the stakeholder feedback, here's an explanation identifying critical touchpoints, inefficiencies, and bottlenecks in the specified workflows:

### 1. Appointment Scheduling and Confirmation (Admin Staff, IT Team, Patients)

- Critical Touchpoints & Handoffs:
  - Patient interaction with the online system or calling the hospital.
  - Admin staff using the scheduling system to book/manage appointments.
  - IT system delivering (or failing to deliver) notifications to patients.
  - Potential handoff between online system issues and IT team intervention.
- Inefficiencies:
  - Unclear Role Ownership/System Faults: System glitches cause double bookings, suggesting issues in system logic or admin oversight. Patients receive billing complaints due to incomplete scheduling information, indicating poor data transfer or unclear responsibility between scheduling and billing.
  - System Limitations: The online system is difficult for some patients to use. Admin staff lack visibility into real-time doctor availability. The scheduling system isn't integrated with other systems, creating data silos. Appointments are cancelled without timely notifications.
- Bottlenecks:
  - Patients needing to call directly due to online system difficulties creates a bottleneck for phone lines and admin staff time.
  - Lack of real-time visibility for schedulers leads to delays and conflicts.
  - Frequent network downtimes impact online services, including scheduling.

### 2. Patient Check-in and Resource Allocation (Front Desk, Doctors, Nurses)

- (Note: Direct feedback from Front Desk staff isn't provided, but issues related to check-in flow and resource impact are mentioned by others.)\*
- Critical Touchpoints & Handoffs:
  - Patient arrival and check-in (Implied interaction with Front Desk).
  - Assignment of patients to doctors/consultation rooms.
  - Doctor/Nurse access to necessary equipment and rooms.
  - Coordination between departments for patient intake (e.g., ED to other units).

- Inefficiencies:
  - Resource Management: Doctors face overbooked schedules and lack access to diagnostic equipment or operating rooms during peak times. Nurses struggle with uneven patient ratios and limited essential supplies. High demand for resources during shift overlaps challenges ER nurses. Inadequate staffing on weekends reduces efficiency.
  - Unclear Role Ownership/Communication: Lack of updates during patient delays causes frustration. Poor coordination with the ED for patient intake and lack of advance transfer notifications impact nurses.
- Bottlenecks:
  - Long patient wait times past appointment schedules.
  - Limited availability of diagnostic equipment, operating rooms, beds, monitors, and essential supplies creates significant bottlenecks.
  - Staffing shortages, particularly during night shifts and weekends, delay care.

### 3. Discharge Planning Process (Nurses, Doctors, Administrative Staff)

- (Note: This workflow overlaps significantly with general inter-departmental communication issues.)\*
- Critical Touchpoints & Handoffs:
  - Doctor decision to discharge and communication of discharge orders.
  - Nurse preparation of patient for discharge, including instructions and medication reconciliation.
  - Communication with other departments (e.g., physiotherapy, labs, radiology) for final updates or results needed before discharge.
  - Administrative staff (Billing) processing final charges and paperwork.
  - Patient receiving final instructions and information.
  - Handoffs when transferring patients between departments (e.g., to ICU or other units before potential discharge).
- Inefficiencies:
  - Communication Gaps: Delays in receiving test results (lab, radiology) impact doctor decisions and potentially delay discharge. Doctors rarely receive timely updates from physiotherapy on patient progress, affecting follow-up and potentially discharge timing. Patients receive limited information about next steps after consultations. Miscommunication during patient transfers leads to duplicated efforts. The referral system is cumbersome.

- Record Management: Outdated patient record systems are difficult to navigate, causing delays in retrieving histories needed for discharge summaries or billing. Billing administrators struggle to reconcile records with treatment data.
- Bottlenecks:
  - Delays in receiving test results or updates from other departments act as a bottleneck for completing the discharge process.
  - Difficulties accessing and reconciling patient records slow down administrative processes required for discharge.
  - Inefficient patient transfer processes can delay moving patients through the system towards discharge.

## Task 2: Design advanced BPMN diagrams

### Patient Appointment Scheduling Workflow

This workflow outlines the process of scheduling a patient appointment, from the initial request to the final notification.

- **Tasks:** Appointment Request → Availability Check → Scheduling → Notification
- **Gateway:** "Is the preferred slot available?"

Here's a breakdown of how BPMN elements can be applied:

1. **Start Event:** The process begins with a "Start Event" representing the patient's appointment request.
2. **Task: Appointment Request:** A "Task" element labeled "Appointment Request" represents the action of the patient requesting an appointment. This could be via an online form, phone call, or in-person.
3. **Task: Availability Check:** The next "Task" is "Availability Check," where the system or staff checks the availability of doctors and resources (like rooms and equipment) for the requested time slot.
4. **Gateway: Is the preferred slot available?:** A "Decision Gateway" is used here to represent the decision point. The question "Is the preferred slot available?" is placed within the gateway.
  - **Yes Path:** If the preferred slot is available, the process follows the "Yes" path.
  - **No Path:** If the preferred slot is unavailable, an alternative flow is triggered, which might involve suggesting alternative time slots.

5. **Task: Scheduling:** Assuming the slot is available, a "Task" labeled "Scheduling" involves finalizing the appointment details and booking the slot for the patient.
6. **Task: Notification:** A "Task" element labeled "Notification" represents sending a confirmation to the patient with the appointment details. This could be via email, SMS, or a phone call.
7. **End Event:** The process concludes with an "End Event," signifying the completion of the appointment scheduling process.

### Discharge Process Workflow

This workflow illustrates the steps involved in discharging a patient from the hospital, from the doctor's review to patient feedback.

- **Tasks:** Doctor Review → Summary Generation → Billing Clearance → Patient Feedback
- **Trigger:** "Discharge request initiated"

Here's how BPMN elements can be used to map this process:

1. **Start Event:** The workflow begins with a "Start Event" triggered by "Discharge request initiated."
2. **Task: Doctor Review:** A "Task" element labeled "Doctor Review" represents the doctor reviewing the patient's condition and confirming the discharge.
3. **Task: Summary Generation:** The next "Task" is "Summary Generation," where a discharge summary is prepared, detailing the patient's treatment, medication, and follow-up instructions.
4. **Task: Billing Clearance:** A "Task" labeled "Billing Clearance" involves finalizing the patient's bill and ensuring all payments are settled.
5. **Task: Patient Feedback:** The final "Task" in this workflow is "Patient Feedback," where the hospital collects feedback from the patient about their experience during the stay.
6. **End Event:** The process concludes with an "End Event," indicating the completion of the discharge process.

These BPMN diagrams provide a visual representation of the workflows, making it easier to understand, analyze, and improve the processes.