COMSATS University
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ASSIGNMENT 2:

SUBMITTED BY:

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REGISTRATION NO:

SP22-BSE-150

SEMESTER:

BSE 8TH 'C'

COURSE:

BUSINESS PROCESS ENGINEERING

SUBMITTED TO:

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DATE:

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QUESTION NO 1:

Do you think all the three business processes are correctly identified and modeled? Discuss at least one positive and negative point against each business process modelled?

ANSWER:

OUR FYP IS:

AI-BASED MEDICAL DECISION SUPPORT SYSTEM:

“Our FYP is an AI-based medical decision support system. The user uploads a medical image, and the system first performs image quality validation. If the image is valid, it is sent to the AI model for disease classification. Along with the diagnosis, the system generates an explainable heatmap using Grad-CAM to visually show which region of the image contributed to the AI decision. After diagnosis, the system retrieves the clinical guideline from the database according to the detected disease. These guidelines are pre-stored rule-based recommendations mapped disease-wise inside the system. Based on those guidelines, the system generates treatment recommendations for the user.

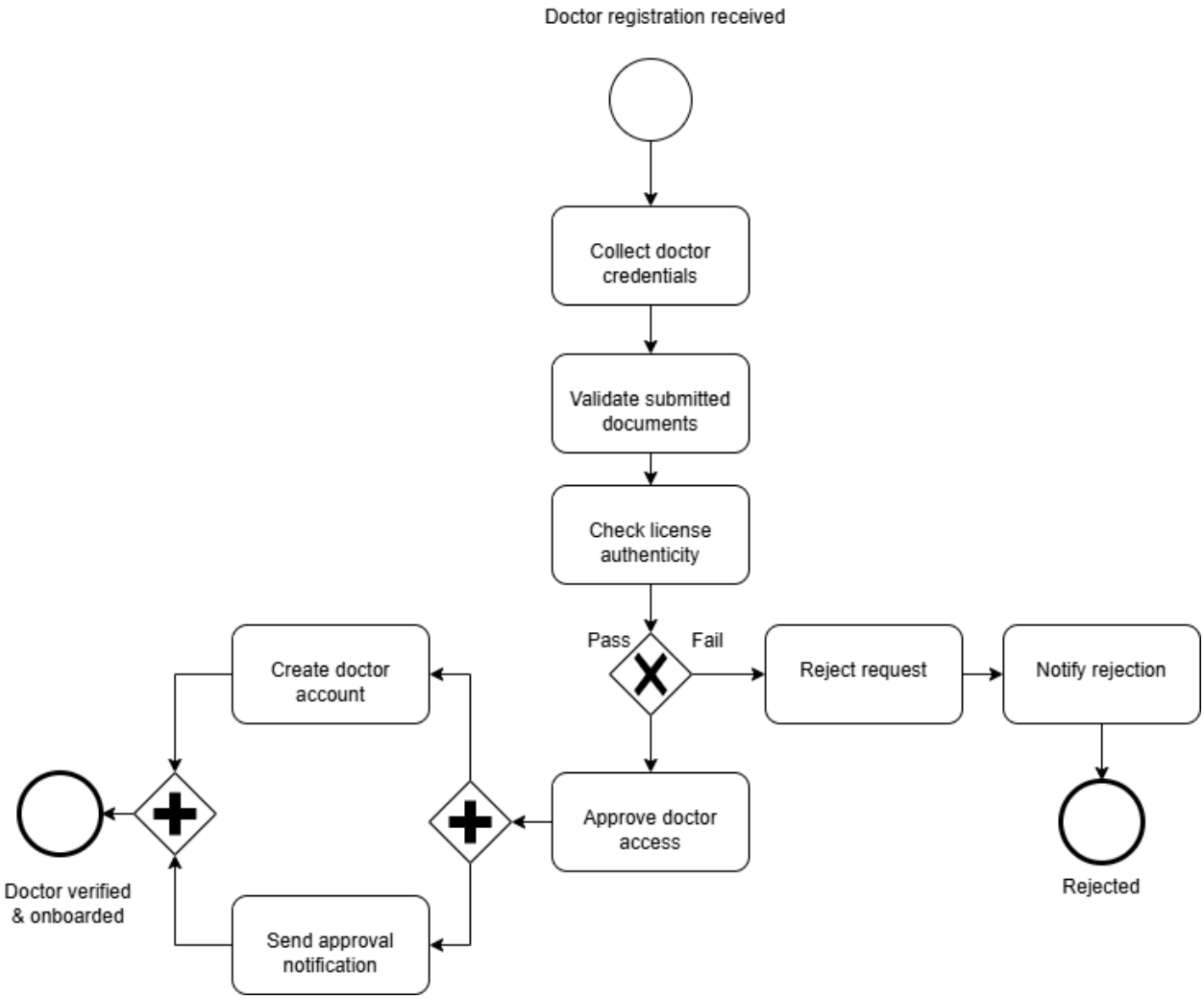
The final report including diagnosis, explanation heatmap, and guideline-based recommendation is displayed to the user and stored into the database for future history access. Doctors can also review and give feedback, which is logged for AI model improvement later. If a critical disease trend is detected, the system can generate public health alerts.

In short, the system not only diagnoses using AI, but also explains the decision and supports treatment using database-stored clinical guidelines.”

BUSINESS PROCESSES:

PROCESS 1:

DOCTOR VERIFICATION & ACCESS APPROVAL:



DOCTOR VERIFICATION & ACCESS APPROVAL:

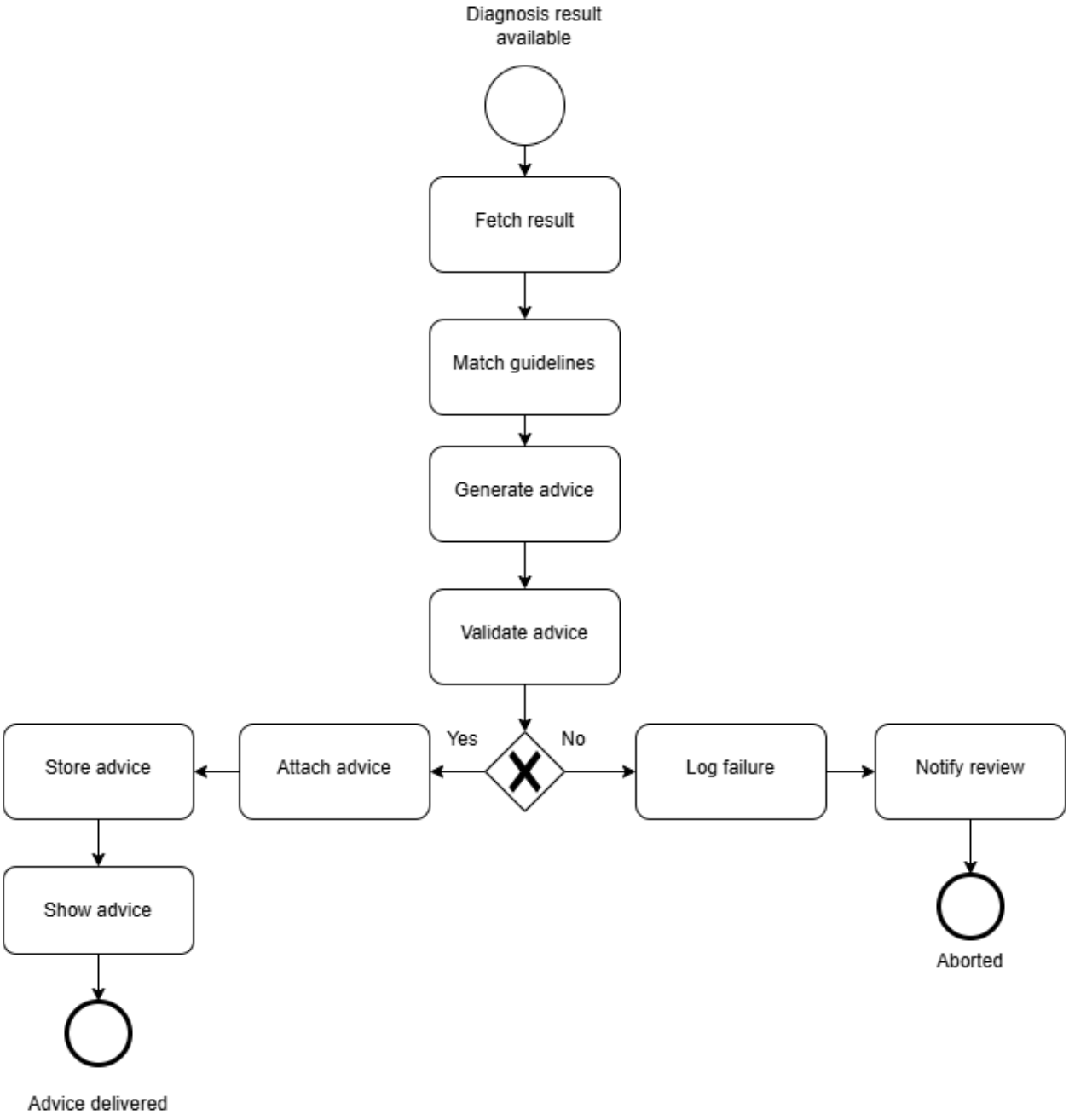
Before allowing a doctor to access the system features, this process verifies their credentials such as license number, certificates, and identity documents. If the documents are authentic, the system creates and activates the doctor's account. If anything is invalid, the request is rejected, and the doctor is notified.

Positive Point:
This process ensures **data security and professional authenticity** by validating doctors' credentials before granting access. It prevents unauthorized users from viewing or editing patient data.

Negative Point:
The process could be improved by adding **automated verification through medical licensing APIs**. Currently, manual verification may slow down onboarding and introduce human delays.

PROCESS 2:

CLINICAL RECOMMENDATION:



CLINICAL RECOMMENDATION:

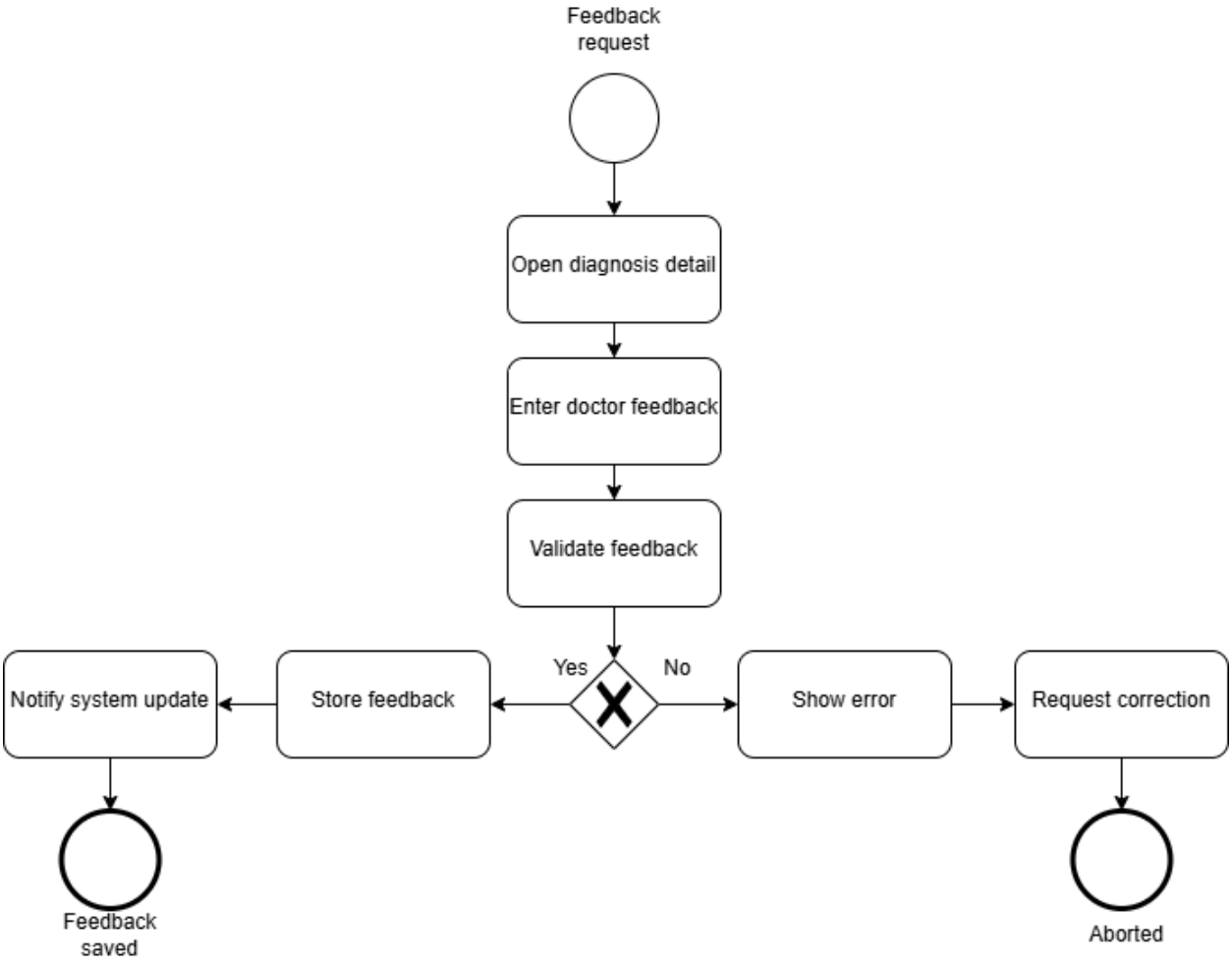
In this process, the system retrieves disease-specific clinical guidelines stored in the database. Using these guidelines, it automatically generates treatment recommendations or next-step instructions for the patient or doctor. The recommendations are validated for correctness and safety before being included in the final report. If guidelines cannot be validated, the process stops and sends it for review.

Positive Point:
This process enhances the **decision-support capability** of the system by automatically retrieving guideline-based treatment recommendations, making the system more helpful for doctors and patients.

Negative Point:
It heavily depends on **pre-stored guidelines**. If the database is outdated or incomplete, the recommendations may not reflect current clinical standards, reducing accuracy.

PROCESS 3:

DOCTOR FEEDBACK LOOP:



DOCTOR FEEDBACK LOOP:

Doctors can open any diagnosis and submit professional feedback or corrections. This process records that feedback and links it with the corresponding case. The stored feedback can later be used for audit, AI improvement, or critical case review. If feedback is invalid or incomplete, the system asks the doctor to revise it.

Positive Point:
This process promotes continuous AI improvement and medical validation by allowing doctors to review and provide corrections or feedback on diagnoses, ensuring model accuracy and reliability.

Negative Point:
If too much feedback is collected without proper categorization or analysis, it can become **difficult to manage and utilize effectively**, slowing down system learning or updates.

QUESTION NO 2:

Provide information artifacts with their types (Data Object, Data Storage etc.) from each business process modelled. Also mentioned the ones he missed or linked it to any activity?

ANSWER:

Process: Doctor Verification & Access Approval:

Information Artifact	Type	Linked Activity / Description
Doctor Registration Form	Data Object	Contains basic personal details and credentials submitted by the doctor.
Verification Documents (License, Certificates)	Data Object	Uploaded files checked for authenticity.
Doctor Database	Data Storage	Stores approved and verified doctor profiles.
Verification Status	Data Object	Output showing whether the doctor is approved or rejected.
Notification Message	Data Object	Sent to doctor after approval or rejection.

Missed Artifact:

- *Verification Log File* should be added to record verification actions for auditing.

Process: Clinical Recommendation:

Information Artifact	Type	Linked Activity / Description
Diagnosis Result	Data Object	Input from AI module used to determine related clinical guideline.
Clinical Guidelines Database	Data Storage	Repository of disease-wise treatment guidelines.
Recommendation Mapping Table	Data Object	Links each disease label with its guideline.
Treatment Recommendation	Data Object	Output advice generated for the patient or doctor.
Validation Log	Data Object	Records whether recommendations were verified for safety.

Missed Artifact:

- *Approval Record* (doctor-reviewed validation) should be linked to ensure that recommendations are medically verified.

Process: Doctor Feedback Loop:

Information Artifact	Type	Linked Activity / Description
Diagnosis Record	Data Object	Case or report reviewed by the doctor.
Feedback Form	Data Object	Contains comments or corrections from the doctor.
Feedback Database	Data Storage	Stores doctor feedback for AI learning and audit.
Feedback Validation Status	Data Object	Confirms whether feedback was complete or valid.

Information Artifact	Type	Linked Activity / Description
AI Improvement Log	Data Object	Tracks updates or changes made based on feedback.

Missed Artifact:

- *Doctor Identity Reference* should be explicitly linked to feedback entries to ensure accountability and traceability.