

Medalyze - Deliverable #1 - Technical Report

1. System Vision Document

1.1 Purpose

The purpose of **Medalyze** is to streamline and digitize healthcare operations by integrating appointment scheduling, electronic health records (EHR), prescriptions, and billing into one unified platform.

The system aims to minimize administrative workload, reduce errors in medical data, and enhance coordination among doctors, patients, and hospital staff.

By providing secure access to accurate, real-time information, Medalyze improves healthcare service quality and patient experience.

1.2 Scope

Medalyze will serve as a web-based healthcare information system that allows:

- **Patients** to register, book appointments, receive prescriptions, and access medical histories.
- **Doctors** to manage schedules, view and update patient records, and issue electronic prescriptions.
- **Administrators** to oversee hospital operations, billing, and reporting.

The system focuses on software functionality and does not include hardware or third-party device integration.

External integrations are limited to simulated connections with pharmacies and insurance providers for data exchange.

1.3 Goals and Objectives

- Provide a **centralized platform** for managing appointments, prescriptions, and billing.
- Enhance **data accuracy** and **security** across all user roles.
- Automate **notifications and reminders** to reduce missed appointments.
- Offer **analytics and reporting** tools for administrators.
- Improve **workflow efficiency** and **communication** between departments and stakeholders.

2. Stakeholder Identification

Stakeholder Type	Stakeholder	Interest / Objective
Internal – Operational	Receptionist	Schedule and manage patient appointments efficiently.
Internal – Operational	Doctor	Access and update patient records; issue prescriptions easily.
Internal – Executive	Hospital Administrator	Monitor performance metrics and ensure efficient hospital operation.
External – Operational	Patient	Book appointments, view results, and communicate with doctors.
External – Executive	Insurance Company	Validate electronic claims and streamline billing.
External – Operational	Pharmacy	Receive and process electronic prescriptions from doctors.

3. Functional Requirements

The main functional requirements of the **Medalyze** healthcare information system are as follows:

1. User Registration and Authentication

2. The system shall allow patients, doctors, and administrators to create accounts and log in securely using validated credentials.

3. Appointment Scheduling and Management

The system shall allow patients to view available doctors, book, reschedule, or cancel appointments, and automatically update doctor schedules.

4. Electronic Health Record (EHR) Management

The system shall store, update, and retrieve patient medical records while ensuring access only to authorized users.

5. Electronic Prescription Management

The system shall allow doctors to create and transmit electronic prescriptions to connected pharmacies.

6. Billing and Insurance Integration

The system shall automatically generate invoices and process insurance claims or direct payments.

7. Notification and Reminder System

The system shall send automated reminders for appointments, lab results, and medication schedules to both patients and doctors.

8. Search and Filter Functionality

The system shall allow users to search for doctors by name, specialty, or location and filter available appointments by date and doctor.

9. Administrative Dashboard and Reporting

The system shall provide analytics on appointments, billing, and performance metrics, and allow administrators to generate reports.

10. Data Backup and Recovery

The system shall automatically back up all medical records and billing data and support recovery in case of data loss.

11. Access Control and Role Management

The system shall define roles (patient, doctor, admin, pharmacy, insurance) and restrict access based on user authorization levels.

4. Requirements Elicitation Techniques

To ensure that the Medalyze system addresses real stakeholder needs, several elicitation techniques will be used:

1. Interviews

Face-to-face and virtual interviews will be conducted with doctors, receptionists, and administrators to understand their workflows, daily challenges, and expectations.

This technique is useful for gathering in-depth qualitative insights and clarifying ambiguous requirements.

2. Questionnaires and Surveys

Structured questionnaires will be distributed to healthcare staff and patients to collect quantitative data about satisfaction, pain points, and desired features.

This allows feedback from a larger audience and helps identify patterns in user needs.

3. Document Analysis

Existing hospital forms, medical records, and billing templates will be reviewed to identify missing functions and inefficiencies in the current process.

This technique provides a factual baseline for designing improved digital workflows.

4. Observation

Key users (receptionists, nurses, and doctors) will be observed performing daily tasks in their actual environment.

Observation reveals real user behavior and uncovers unspoken issues that might not appear in interviews or surveys.

Justification

These techniques were chosen to balance **depth and coverage**.

Interviews and observation capture qualitative, experience-based insights, while questionnaires provide measurable trends.

Document analysis ensures that the system aligns with existing operational standards and regulations.

Together, they offer a comprehensive understanding of user needs, technical constraints, and process requirements for Medalyze.

5. Interview Agendas

5.1 Internal Operational Stakeholder – Receptionist / Nurse

Objective:

To understand daily operational challenges in appointment handling, patient communication, and data management, and to identify how Medalyze can simplify these tasks.

Stakeholder Type: Internal – Operational

Role Example: Receptionist or Nurse

Discussion Topics & Questions:

1. How do you currently manage patient appointments and scheduling?
2. What common issues or delays occur when handling appointments or patient data?
3. How do you communicate changes in appointments or doctor availability to patients?
4. What system features would make your daily workflow easier or faster?
5. How do you currently access or update patient medical information?
6. What difficulties do you face when using existing hospital systems or software?
7. What are your expectations from a new system like Medalyze?

5.2 Internal Executive Stakeholder – Hospital Administrator

Objective:

To gather insights on management needs, system integration goals, and performance tracking requirements from an administrative perspective.

Stakeholder Type: Internal – Executive

Role Example: Hospital Administrator

Discussion Topics & Questions:

1. What metrics or reports do you rely on most for hospital performance tracking?
2. What challenges do you face in managing billing, insurance, or patient data at scale?
3. How do you currently ensure data security and access control across departments?
4. What features or dashboards would help you make faster, data-driven decisions?
5. How important is system integration with pharmacies or insurance systems to you?

6. What are your main priorities when adopting a new healthcare management system?
7. How do you think Medalyze could improve the hospital's overall efficiency and quality of care?

Note:

Each interview agenda focuses on collecting targeted qualitative insights from different internal stakeholders.

The operational stakeholder discussion identifies day-to-day pain points, while the executive interview explores strategic requirements and performance expectations.

6. Questionnaire

6.1 Overview

This questionnaire aims to gather feedback to help design a user-friendly and efficient healthcare information system (**Medalyze**) that improves appointment scheduling, electronic health record management, and overall service delivery.

Responses will assist the Medalyze team in building a more effective and secure digital healthcare platform for both patients and staff.

6.2 Target Audience

Operational Users (Receptionists, Nurses, Technicians, Doctors, and Administrators)

6.3 Summary of Key Questions

#	Question	Type
1	How often do you encounter duplicate or missing patient records?	Scale (1–5)

2	How easy is it to communicate appointment changes to patients?	Scale (1–5)
3	Which features would most improve your workflow?	Multiple Choice
4	How reliable is the current billing system?	Scale (1–5)
5	What features do you think are most important in a new hospital system?	Short Answer
6	Would you prefer a web or mobile interface for accessing data?	Multiple Choice
7	How satisfied are you with current tools for record keeping?	Scale (1–5)
8	Any additional suggestions for system improvement?	Open-ended

6.4 Full Questionnaire Form

Purpose:

To gather insights from healthcare professionals and patients regarding their experience with current hospital systems and their expectations for the Medalyze platform.

Section A: General Information

1. Your role in the healthcare system:

2. ☐ Patient ☐ Doctor ☐ Nurse ☐ Receptionist ☐ Administrator

3. How long have you been using medical systems or hospital software?

☐ Less than 1 year ☐ 1 – 3 years ☐ 4 – 6 years ☐ More than 6 years

4. How frequently do you use digital systems for healthcare tasks?

☐ Daily ☐ Weekly ☐ Occasionally ☐ Rarely

Section B: Current System Experience

4. What type of system do you currently use?

☐ Paper-based ☐ Software ☐ Both ☐ None

5. Main problems faced with the current system (check all that apply):

☐ Slow access ☐ Data loss ☐ Difficult interface ☐ Poor communication
☐ Security concerns ☐ Other: _____

6. How satisfied are you with the accuracy of current patient-data management?

(1 = Very Dissatisfied → 5 = Very Satisfied)

☐1 ☐2 ☐3 ☐4 ☐5

Section C: System Requirements and Preferences

7. Which features are most important to you? (check all that apply)

☐ Appointment scheduling ☐ Electronic health records ☐ Prescription management
☐ Billing and insurance ☐ Notifications ☐ Dashboard

8. How important is system security and patient-data privacy?

☐ Not important ☐ Slightly important ☐ Important ☐ Very important
☐ Extremely important

9. How helpful would it be to access the system through a mobile app?

(1 = Not helpful → 5 = Essential)

☐1 ☐2 ☐3 ☐4 ☐5

10. Would you like the system to integrate with pharmacies and insurance companies?

☐ Yes ☐ No ☐ Not sure

Section D: Usability and Design

11. Preferred interface type (check all that apply):

☐ Simple ☐ Detailed ☐ Mobile-friendly

12. Importance of automatic notifications/reminders (appointments, lab results):

(1 = Not important → 5 = Essential)

☐1 ☐2 ☐3 ☐4 ☐5

13. Rate the importance of the following aspects:

Aspect	1	2	3	4	5
Ease of use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Speed & performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual design	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section E: Feedback

14. What improvements would you like to see in hospital or clinic systems?

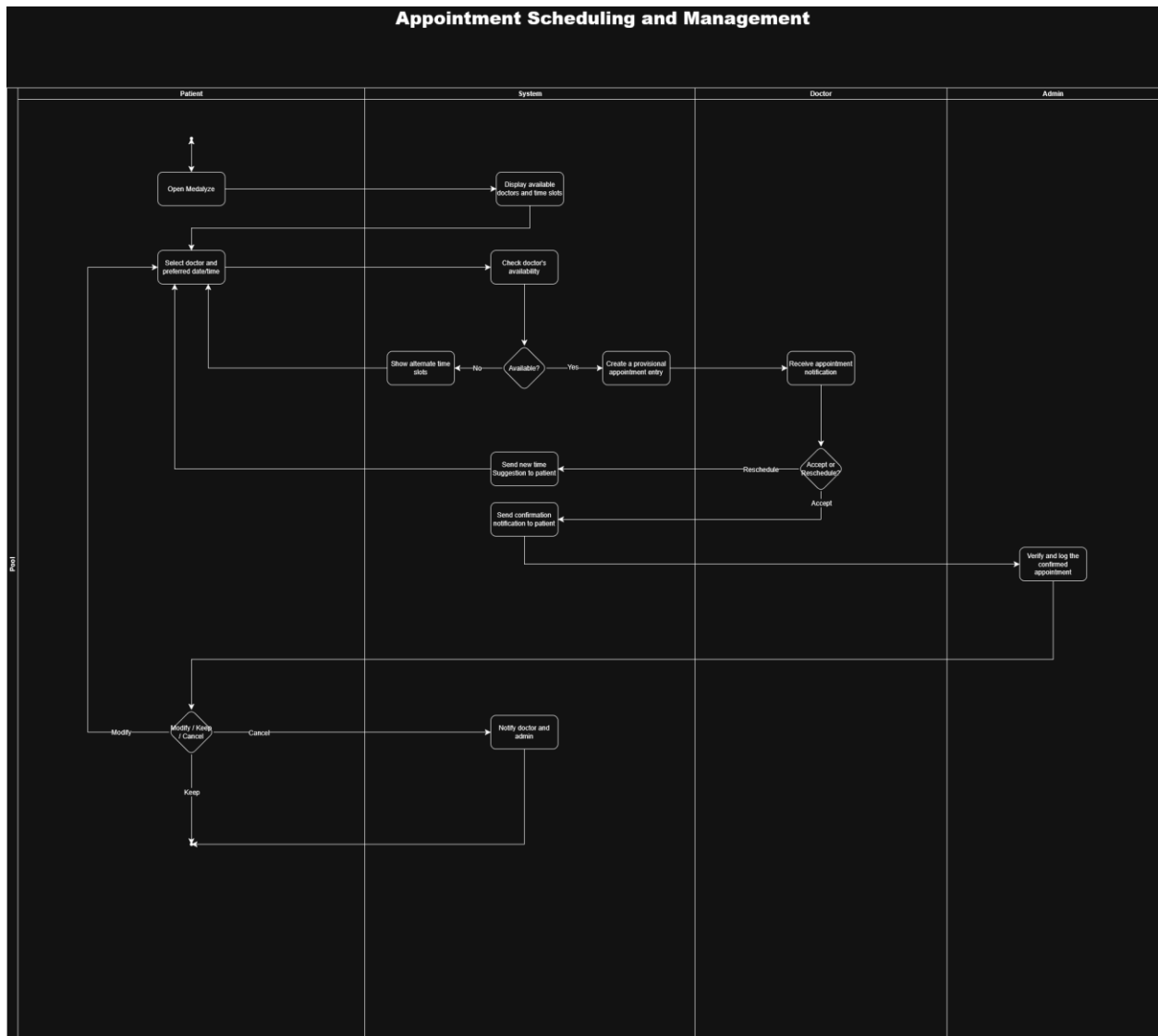
15. Any additional suggestions or comments to improve Medalyze?

Note:

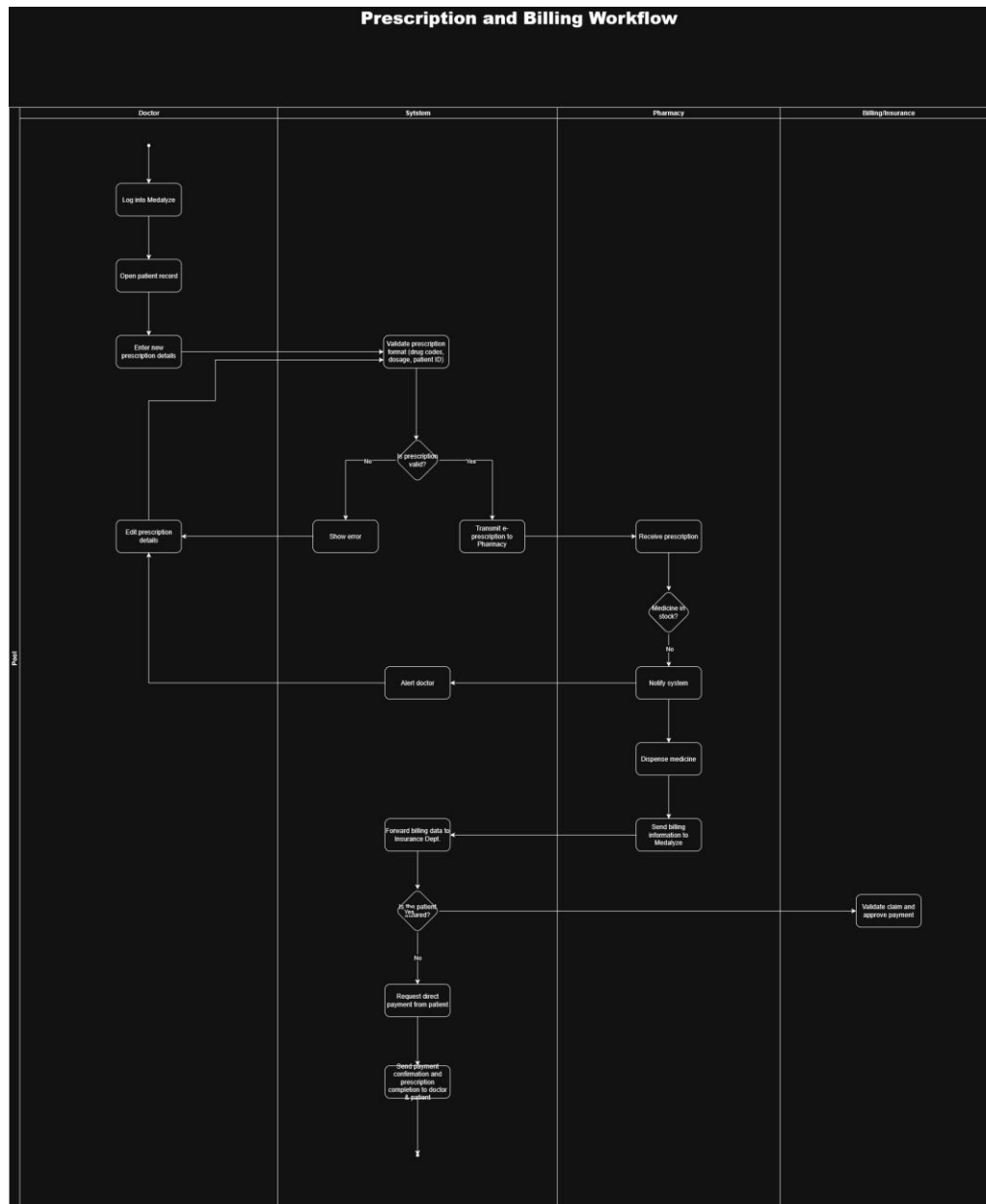
This questionnaire supports the requirement elicitation process by collecting practical insights from actual healthcare stakeholders, helping refine the design and usability of the Medalyze system.

7. Activity Diagrams

7.1 Activity Diagram 1 – Appointment Scheduling Workflow



7.2 Activity Diagram 2 – Prescription and Billing Workflow



8. Jira Project Management Evidence

Medalyze – Deliverable #1

[Summary](#)
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Work

16 17 18 19 October 20 21 22 23 24 25 26 October 27 28

- | | | | |
|--|---|------|------|
| <input checked="" type="checkbox"/> MED-1 | 1. Write System Vision Document | | AM |
| <input checked="" type="checkbox"/> MED-2 | 2. Stakeholder Identification Table | | AM |
| <input checked="" type="checkbox"/> MED-3 | 3. Functional Requirements List | YH ✓ | |
| <input checked="" type="checkbox"/> MED-4 | 4. Requirements Elicitation Techniques | YH ✓ | |
| > <input checked="" type="checkbox"/> MED-7 | 7. Activity Diagram 1: Appointment Schedu... | | MM ✓ |
| <input checked="" type="checkbox"/> MED-6 | 6. Questionnaire Design | S ✓ | |
| <input checked="" type="checkbox"/> MED-5 | 5. Interview Agendas | SS ✓ | |
| > <input checked="" type="checkbox"/> MED-8 | 8. Activity Diagram 2: Prescription & Billin... | | MM |
| <input checked="" type="checkbox"/> MED-9 | 9. Jira Project Management Evidence | | MM ✓ |
| <input checked="" type="checkbox"/> MED-10 | 10. Github Repository Setup | | MM |
| > <input checked="" type="checkbox"/> MED-11 | 11. Finalize and Compile Report (as PDF) | | MM |
| <input checked="" type="checkbox"/> MED-12 | 12. Submission on Canvas | | MM |

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Medalyze – Deliverable #1											
Summary Board List Calendar Timeline Approvals Forms Pages Attachments All work Reports Archived work items Shortcuts											
Search list Filter											
	Type	Key	Summary	Status	Comments	Collaborators	Assignee	Due date	Priority	Reporter	Created
		MED-3	3. Functional Requirements List	DONE	Add comment		Youssef Hamouda	Oct 23, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-4	4. Requirements Elicitation Techniques	DONE	Add comment		Youssef Hamouda	Oct 23, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-7	7. Activity Diagram 1: Appointment Scheduling Workflow	DONE	Add comment	AM SS TH	Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-15	7.1 Draft Diagram	DONE	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-16	7.2 Review & Feedback	IN PROGRESS	Add comment	AM SS TH	Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-17	7.3 Final Review & Export	TO DO	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-6	6. Questionnaire Design	DONE	Add comment		SalfAlaa	Oct 23, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-5	5. Interview Agendas	DONE	Add comment		Selfeldin Shady	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-8	8. Activity Diagram 2: Prescription & Billing Workflow	IN PROGRESS	Add comment	AM SS TH	Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-18	8.1 Draft Diagram	DONE	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-19	8.2 Review & Feedback	IN PROGRESS	Add comment	AM SS TH	Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-20	8.3 Final Review & Export	TO DO	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-9	9. Jira Project Management Evidence	DONE	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-10	10. Github Repository Setup	IN PROGRESS	Add comment		Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-11	11. Finalize and Compile Report (as PDF)	TO DO	Add comment	AM SS TH	Marwan Mostafa	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-13	11.1 Revise Iteration 1	TO DO	Add comment		Abdelrahman Amr ...	Oct 25, 2025	Medium	Marwan Mostafa	Oct 24, 2025
		MED-14	11.2 Revise Iteration 2	TO DO	Add comment	AM SS TH	Marwan Mostafa		Medium	Marwan Mostafa	Oct 24, 2025
		MED-12	12. Submission on Canvas	TO DO	Add comment		Marwan Mostafa	Oct 26, 2025	Medium	Marwan Mostafa	Oct 24, 2025

Summary:

We used Jira's **Project Management template** to assign and track Deliverable #1 tasks.

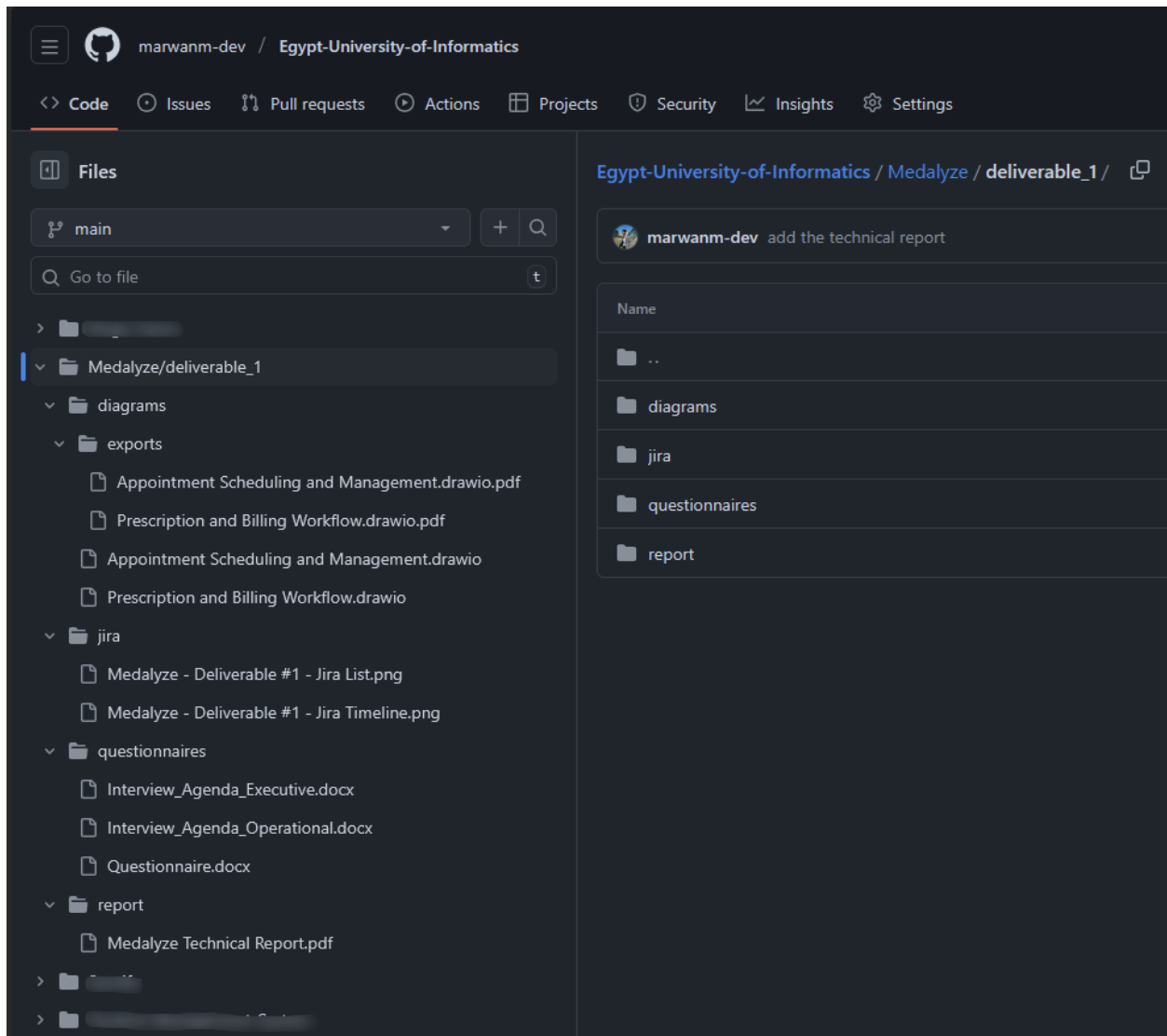
Each team member had clear responsibilities, deadlines, and progress updates, which were monitored through the **List** and **Timeline** views.

We also utilized **subtasks** within major items (such as Activity Diagrams and Final Report) to represent review iterations and collaborative revisions.

This structure allowed the team to visualize task dependencies, track progress at a detailed level, and ensure smoother coordination before submission.

9. GitHub Evidence

Commits		
main	All users	All time
Commits on Oct 25, 2025		
add png exports to the diagrams marwanm-dev committed now	9885a34	
refactor: edit github evidence and conclusion marwanm-dev committed 1 minute ago	224c5a1	
add the technical report marwanm-dev committed 8 minutes ago	d1b382a	
add jira screenshots marwanm-dev committed 11 minutes ago	1c7cd9	
fix: rename jira folder to diagrams marwanm-dev committed 12 minutes ago	f52eda0	
add questionnaire and interview agenda marwanm-dev committed 13 minutes ago	3255767	
add jira evidence draw.io and pdf exports marwanm-dev committed 14 minutes ago	f72f68f	



Link to repository: https://github.com/marwanm-dev/Egypt-University-of-Informatics/tree/main/Medalyze/deliverable_1

Summary:

We used **GitHub** for version control, file organization, and collaboration throughout Deliverable #1.

Each team member worked on different components such as the documents, diagrams, and questionnaires, while I was responsible for organizing the repository structure and pushing all finalized materials.

The repository maintains clearly labeled folders for each deliverable section to ensure traceability and consistency.

Descriptive commit messages were used to document progress, and screenshots of the repository structure and commit history are included below as evidence of organization and contribution.

10. Conclusion

Deliverable #1 marks the successful completion of the initial phase of the Medalyze project.

Our team defined the system's purpose, scope, and requirements, supported by stakeholder analysis, UML diagrams, and well-organized documentation.

By coordinating tasks through Jira and maintaining version control on GitHub, we ensured consistency and collaboration across all components.

These efforts created a clear roadmap for the upcoming design and implementation stages of Medalyze.