Student Name	Mosete Cardicia Masemola
Student Number	ST10179192
Module Code	APPR6312
Assessment Type	POE(PART 1)

ASSESSMENT DECLARATION

	SIGN
I have read the assessment rules provided in this declaration.	
This assessment is my own work.	
I have not copied any other student's work in this assessment.	
I have not uploaded the assessment question to any website or App offering assessment assistance.	
I have not downloaded my assessment response from a website.	
I have not used any AI tool without reviewing, re-writing, and re-working this information, and referencing any AI tools in my work.	
I have not shared this assessment with any other student.	
I have not presented the work of published sources as my own work.	
I have correctly cited all my sources of information.	
My referencing is technically correct, consistent, and congruent.	
I have acted in an academically honest way in this assessment.	

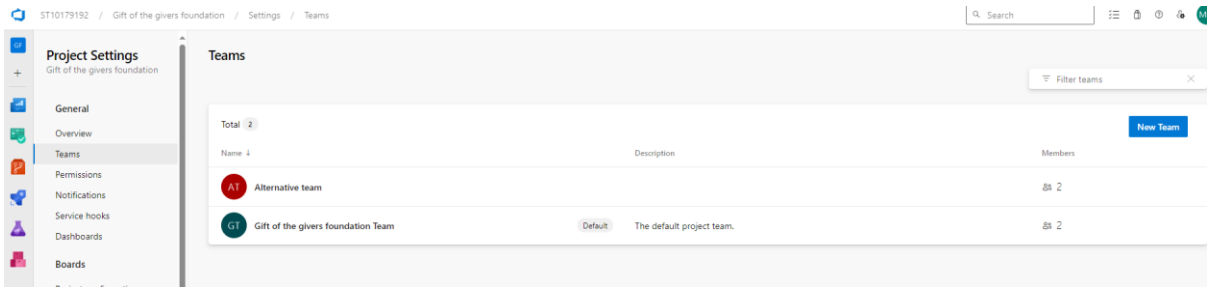
POE PART 1

QUESTION 1

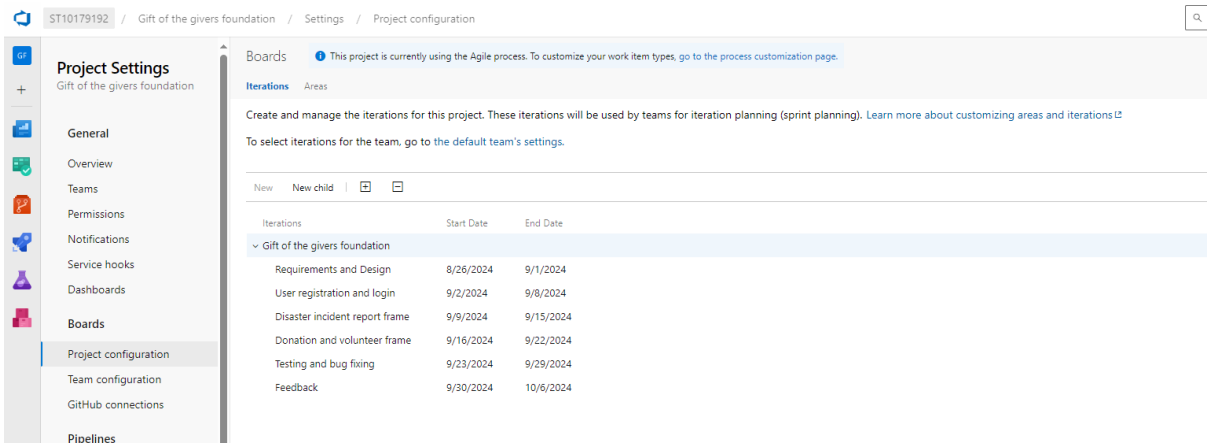
LINK FOR DevOps :

https://dev.azure.com/ST10179192/Gift%20of%20the%20givers%20foundation

1.1. **TEAMS :**



ITERATIONS :



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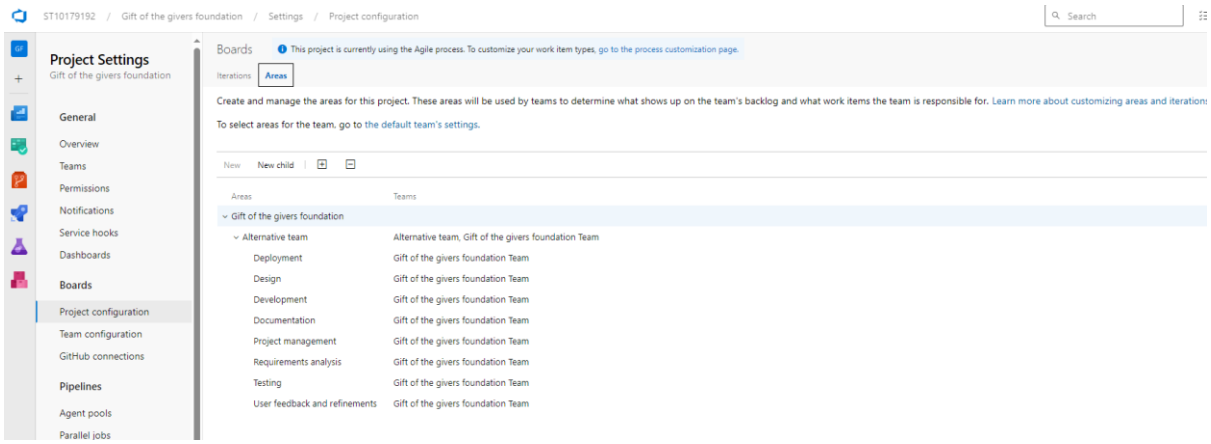
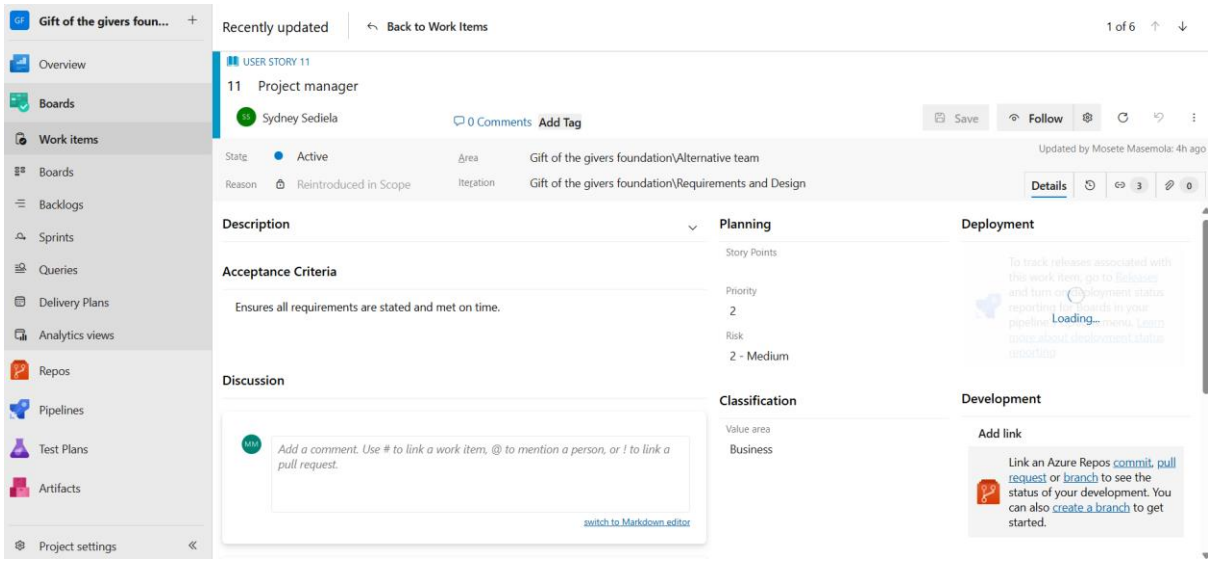
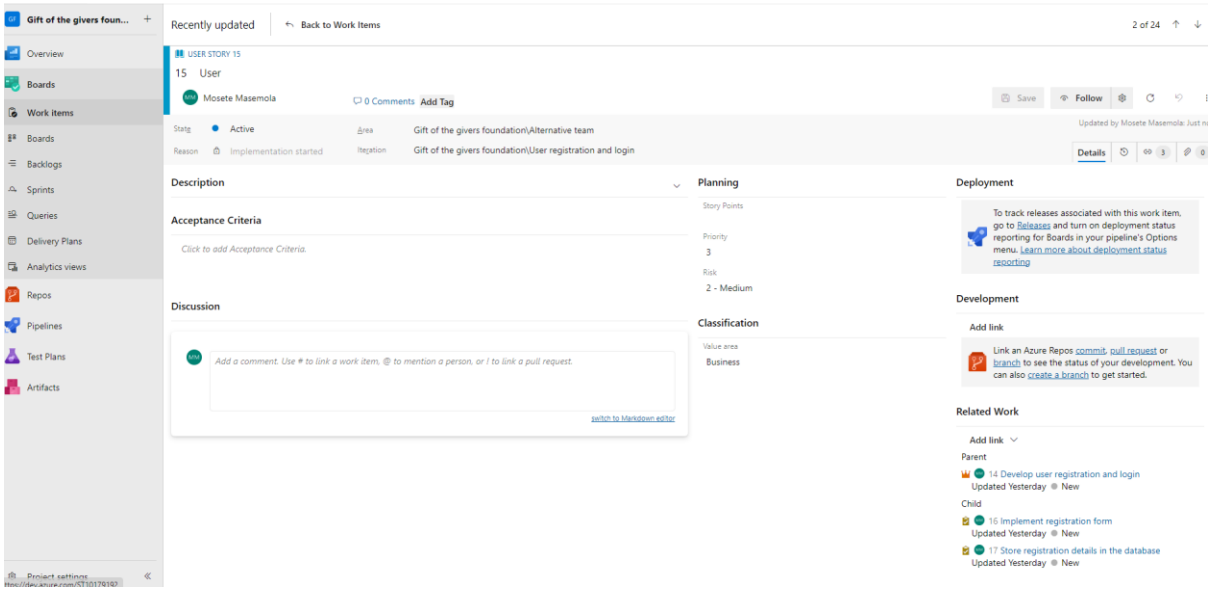


1.2.

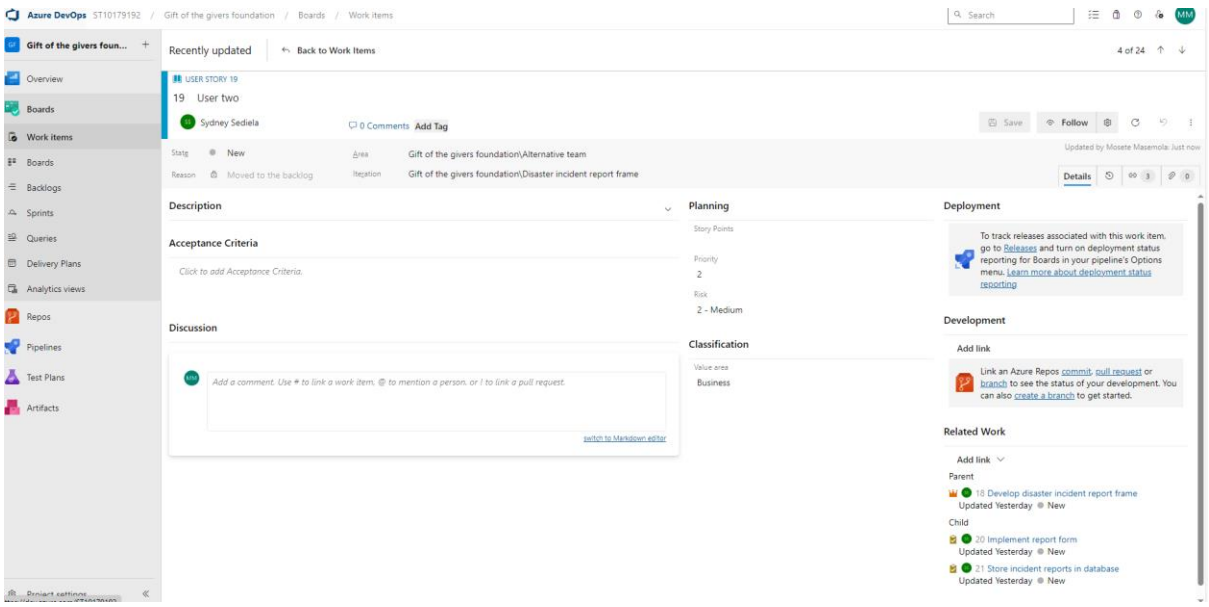
USER STORY : Project Manager user story



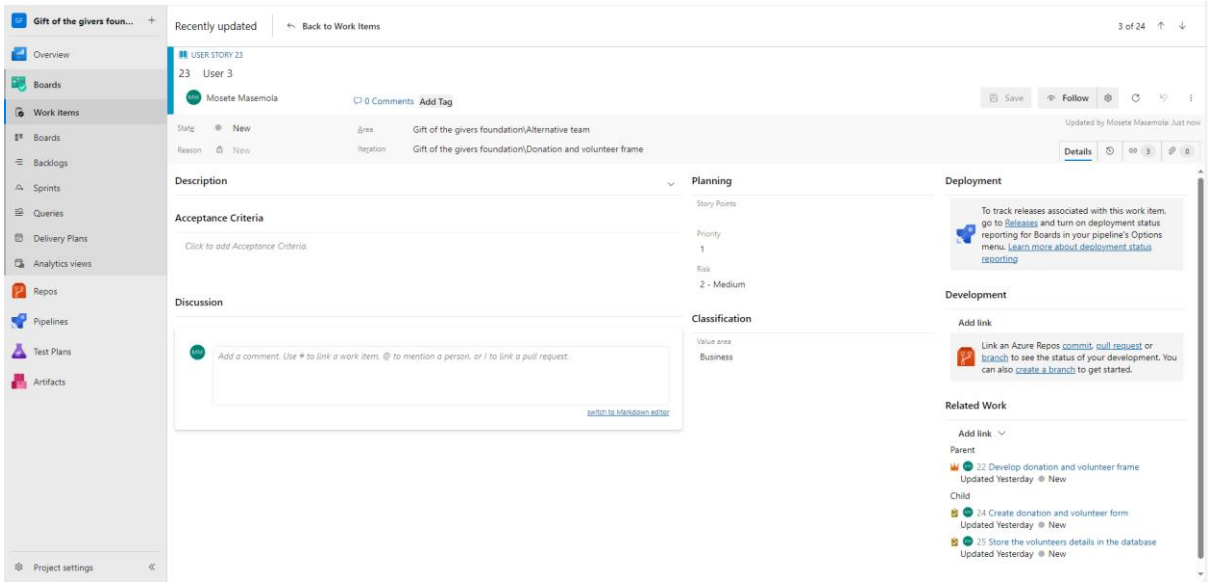
User Story : User



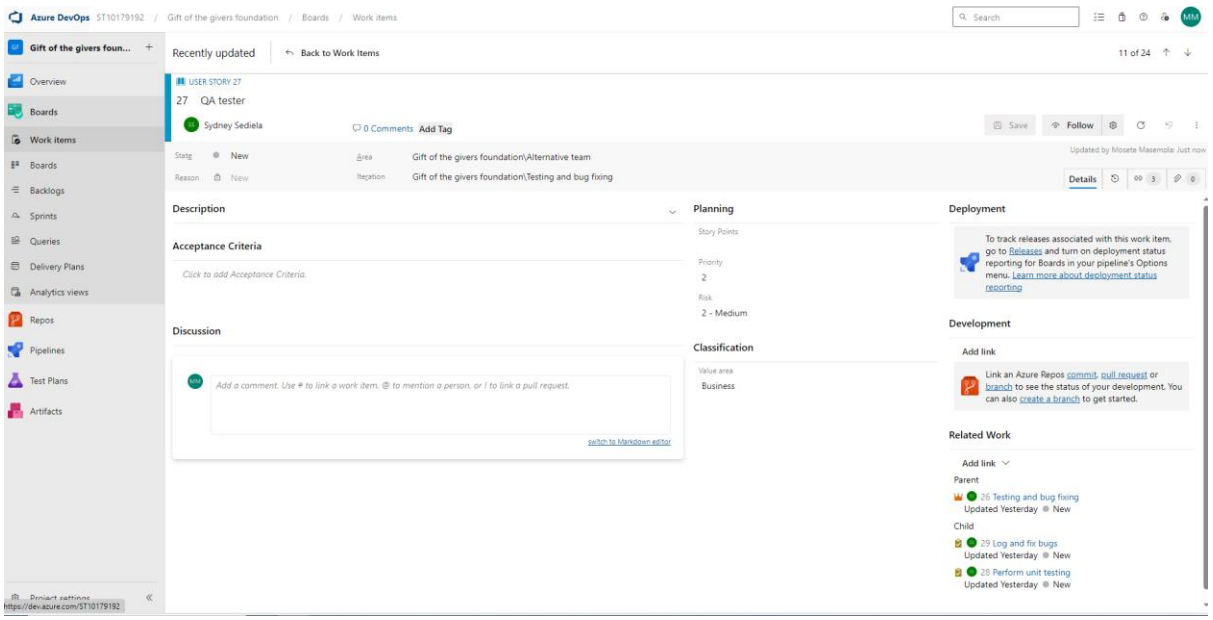
User Story : User two



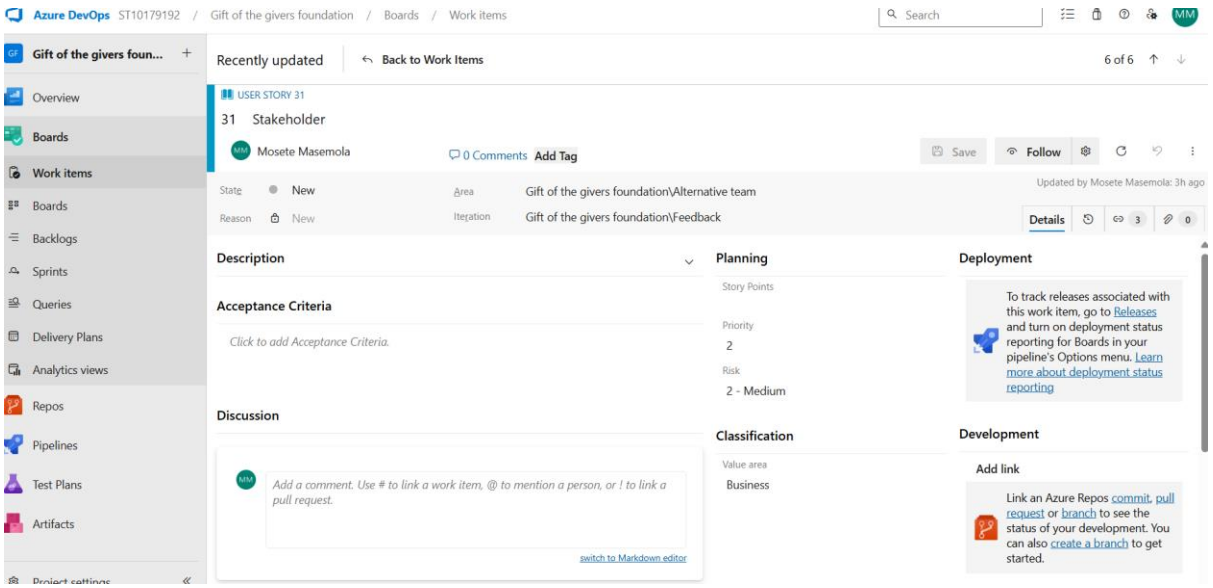
User Story : User3



User Story : QA tester

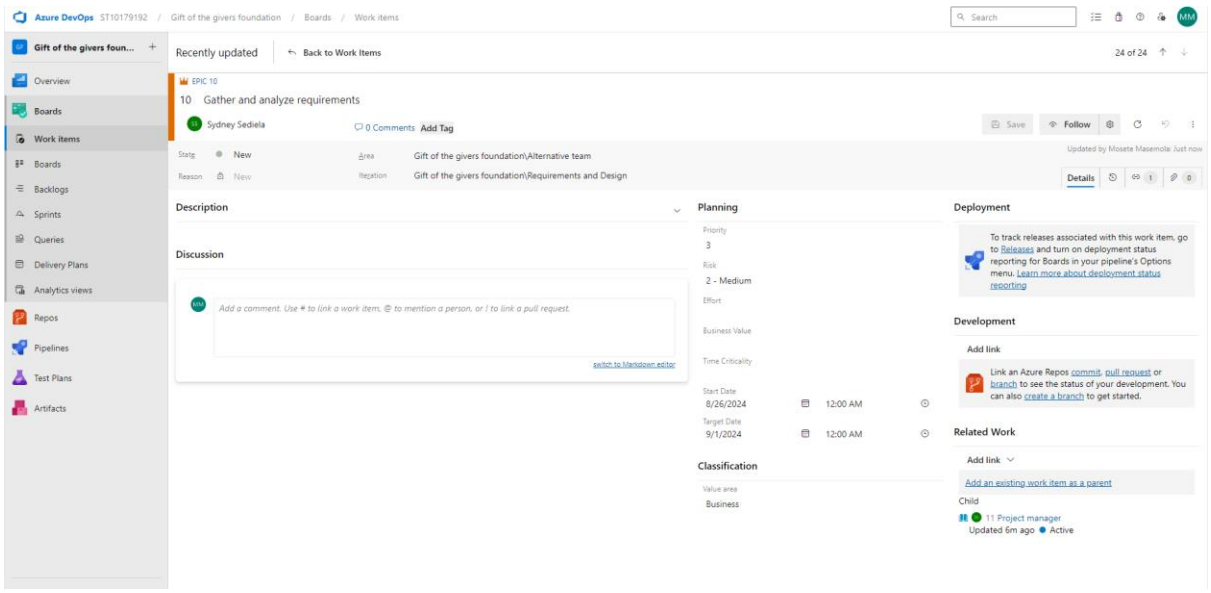


User Story : Stakeholder



- **Epics**

Epic 1:


Azure DevOps ST10179192 / Gift of the givers foundation / Boards / Work items
Search
Gift of the givers foun...
Recently updated
Back to Work Items
24 of 24
Overview
Boards
Work items
Boards
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Delivery Plans
Analytics views
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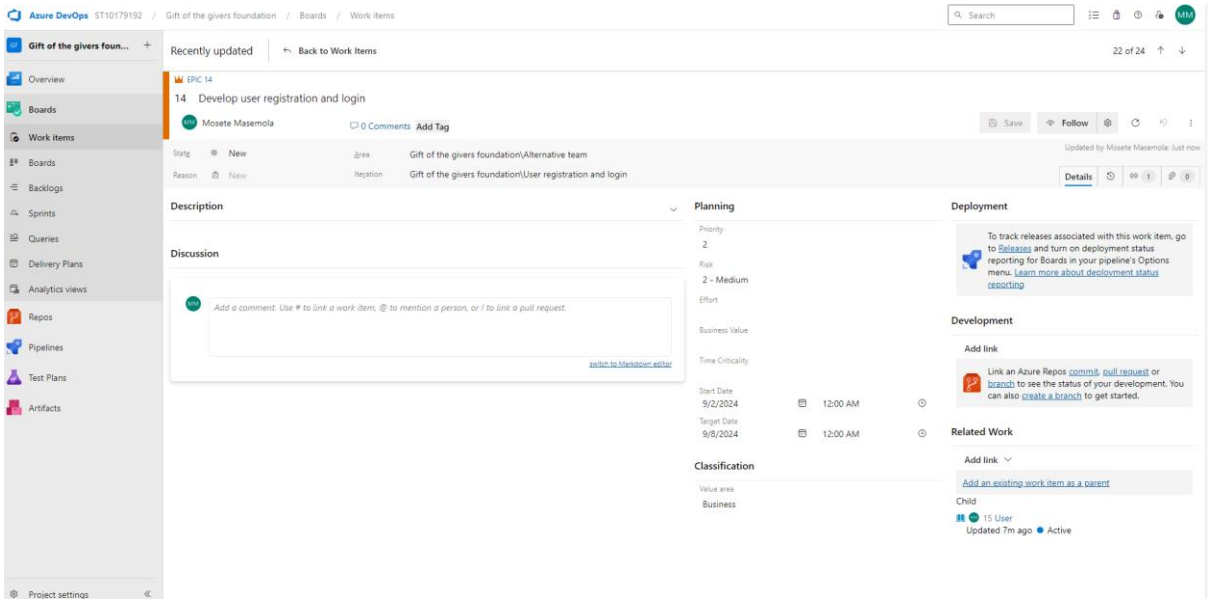
Test Plans
Artifacts
EPIC 10
10 Gather and analyze requirements
Sydney Sediela
0 Comments Add Tag
Save
Follow
State New
Area Gift of the givers foundation\Alternative team
Reason New
Iteration Gift of the givers foundation\Requirements and Design
Updated by Mosete Masemola: Just now
Details
Description
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
3
Risk
2 - Medium
Effort
Business Value
Time Criticality
Start Date
8/26/2024
12:00 AM
Target Date
9/1/2024
12:00 AM
Classification
Value area
Business
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.
Related Work
Add link
Add an existing work item as a parent
Child
11 Project manager
Updated 6m ago Active

Epic 2 :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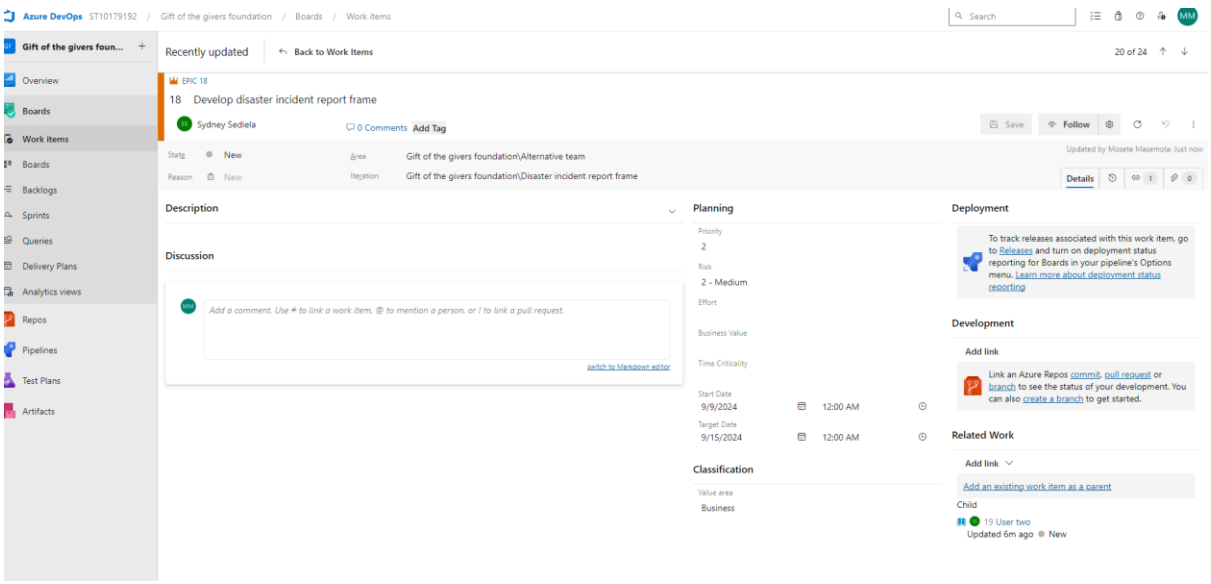
Project settings
EPIC 14
14 Develop user registration and login
Mosete Masemola
0 Comments Add Tag
Save
Follow
State New
Area Gift of the givers foundation\Alternative team
Reason New
Iteration Gift of the givers foundation\User registration and login
Updated by Mosete Masemola: Just now
Details
Description
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Risk
2 - Medium
Effort
Business Value
Time Criticality
Start Date
9/2/2024
12:00 AM
Target Date
9/8/2024
12:00 AM
Classification
Value area
Business
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.
Related Work
Add link
Add an existing work item as a parent
Child
15 User
Updated 7m ago Active

Epic 3 :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Pipelines
Test Plans
Artifacts
EPIC 18
18 Develop disaster incident report frame
Sydney Sediela
0 Comments
Add Tag
Save
Follow
Updated by Mosete Masemola: Just now
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Disaster incident report frame
Details
Description
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Risk
2 - Medium
Effort
Business Value
Time Criticality
Start Date
9/9/2024
12:00 AM
Target Date
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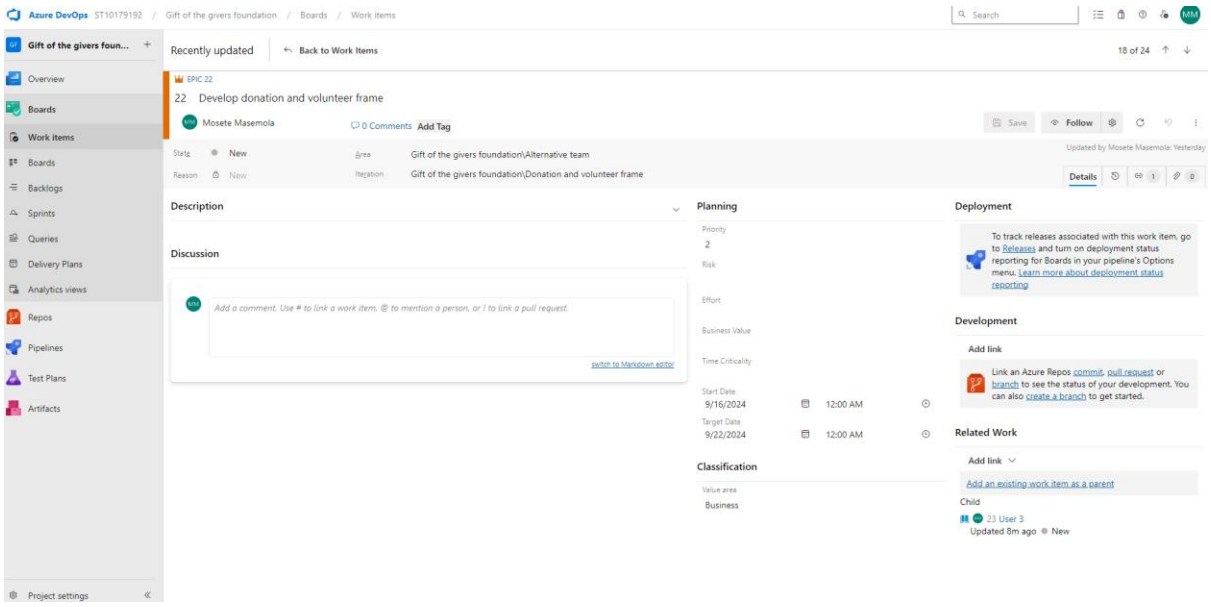
12:00 AM
Classification
Value area
Business
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.
Related Work
Add link
Add an existing work item as a parent
Child
19 User two
Updated 6m ago
New

Epic 4 :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Project settings
EPIC 22
22 Develop donation and volunteer frame
Mosete Masemola
0 Comments
Add Tag
Save
Follow
Updated by Mosete Masemola: Yesterday
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Donation and volunteer frame
Details
Description
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
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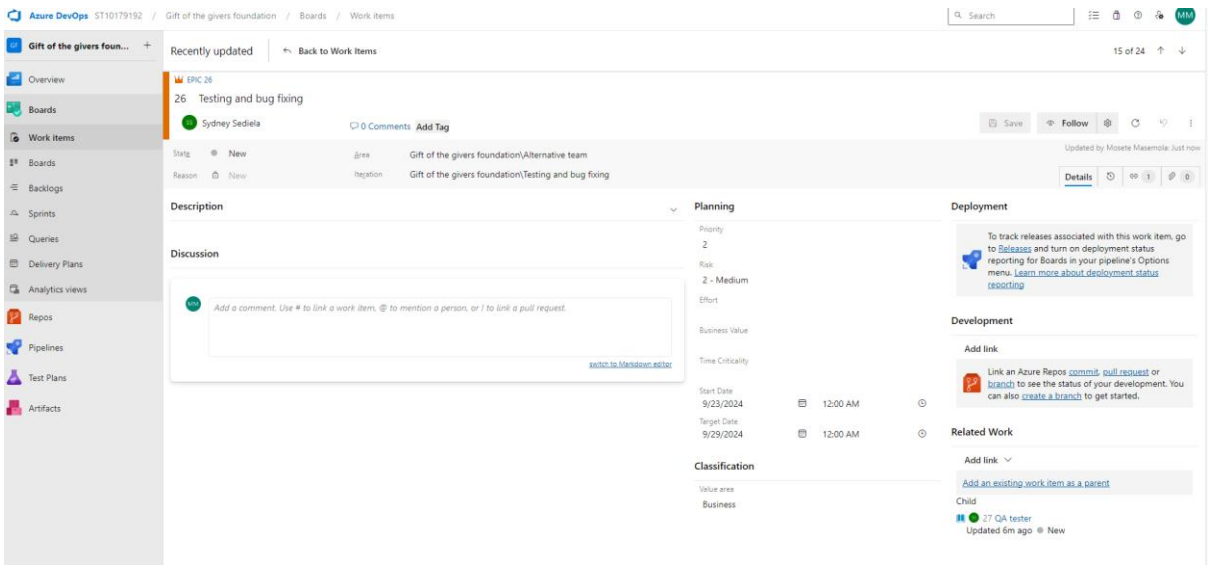
Risk
Effort
Business Value
Time Criticality
Start Date
9/16/2024
12:00 AM
Target Date
9/22/2024
12:00 AM
Classification
Value area
Business
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.
Related Work
Add link
Add an existing work item as a parent
Child
23 User 3
Updated 8m ago
New

Epic 5 :



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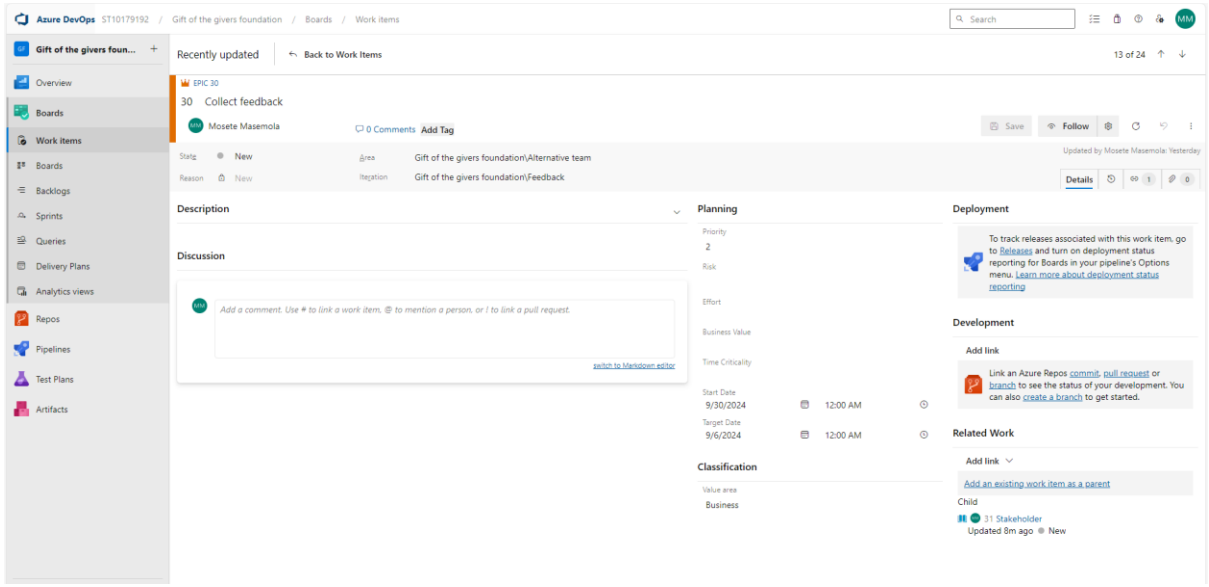
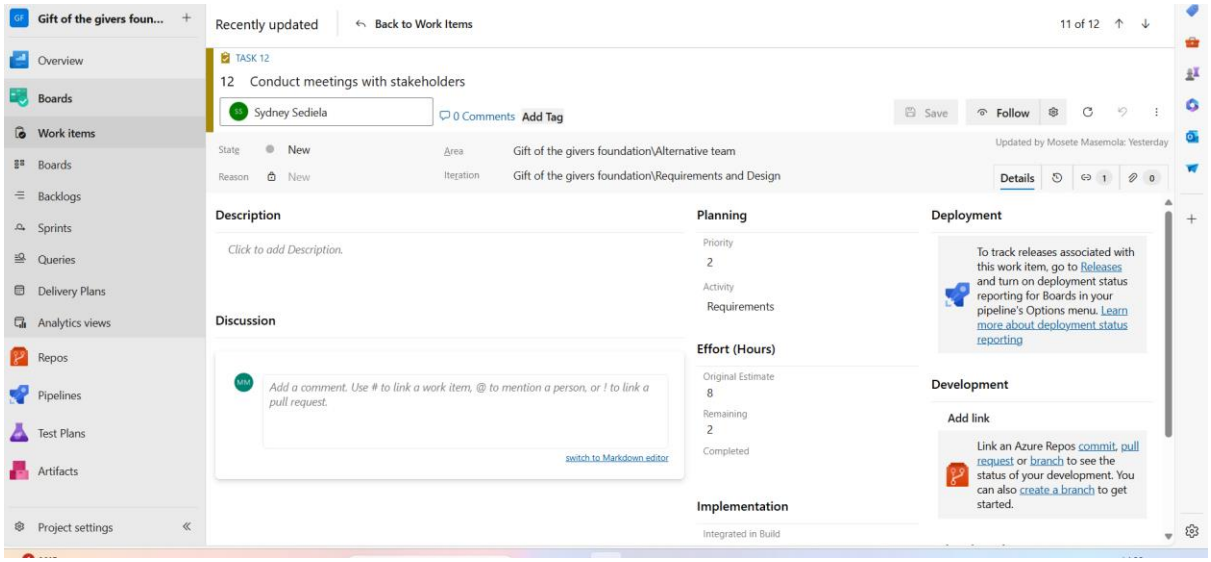


- **Tasks**

Task 1 :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Pipelines
Test Plans
Artifacts
Project settings
Recently updated
Back to Work Items
11 of 12
TASK 12
12 Conduct meetings with stakeholders
Sydney Sediela
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Requirements and Design
Updated by Mosete Masemola: Yesterday
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Requirements
Effort (Hours)
Original Estimate
8
Remaining
2
Completed
Implementation
Integrated in Build
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
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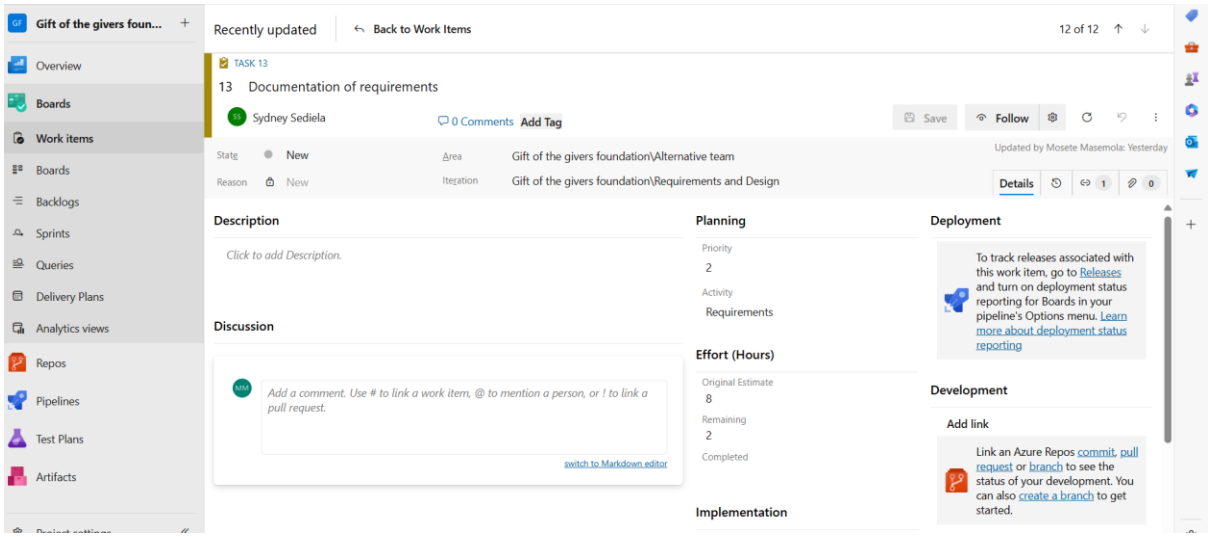
Task 2 :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Analytics views
Repos
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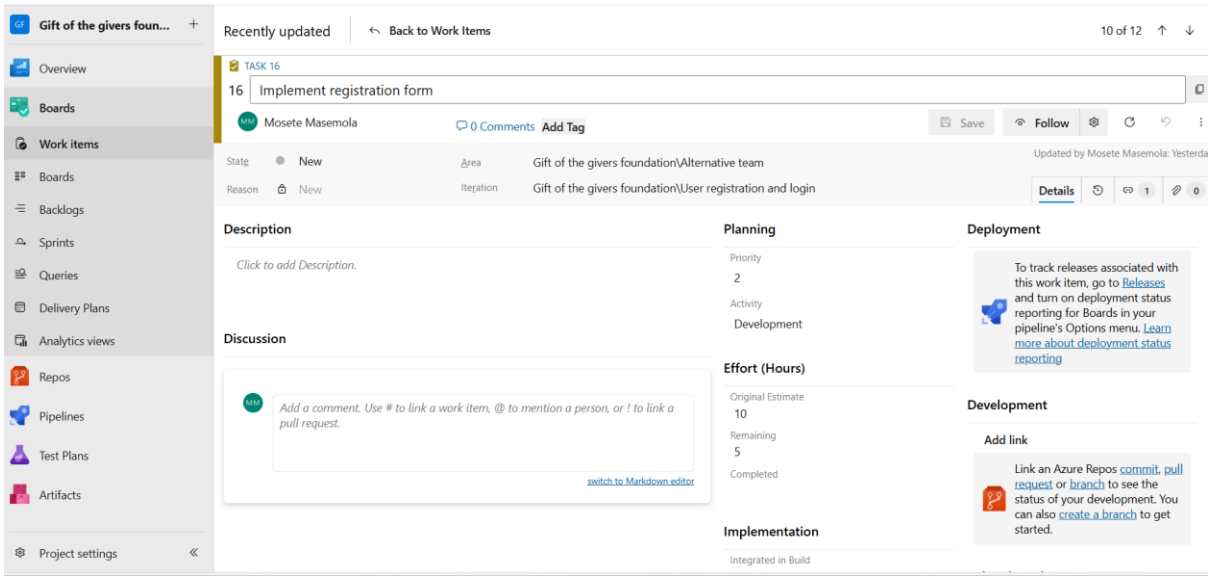
Test Plans
Artifacts
Recently updated
Back to Work Items
12 of 12
TASK 13
13 Documentation of requirements
Sydney Sediela
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Requirements and Design
Updated by Mosete Masemola: Yesterday
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Requirements
Effort (Hours)
Original Estimate
8
Remaining
2
Completed
Implementation
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 3 :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Analytics views
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Pipelines
Test Plans
Artifacts
Project settings
Recently updated
Back to Work Items
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TASK 16
16 Implement registration form
Mosete Masemola
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\User registration and login
Updated by Mosete Masemola: Yesterda
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Development
Effort (Hours)
Original Estimate
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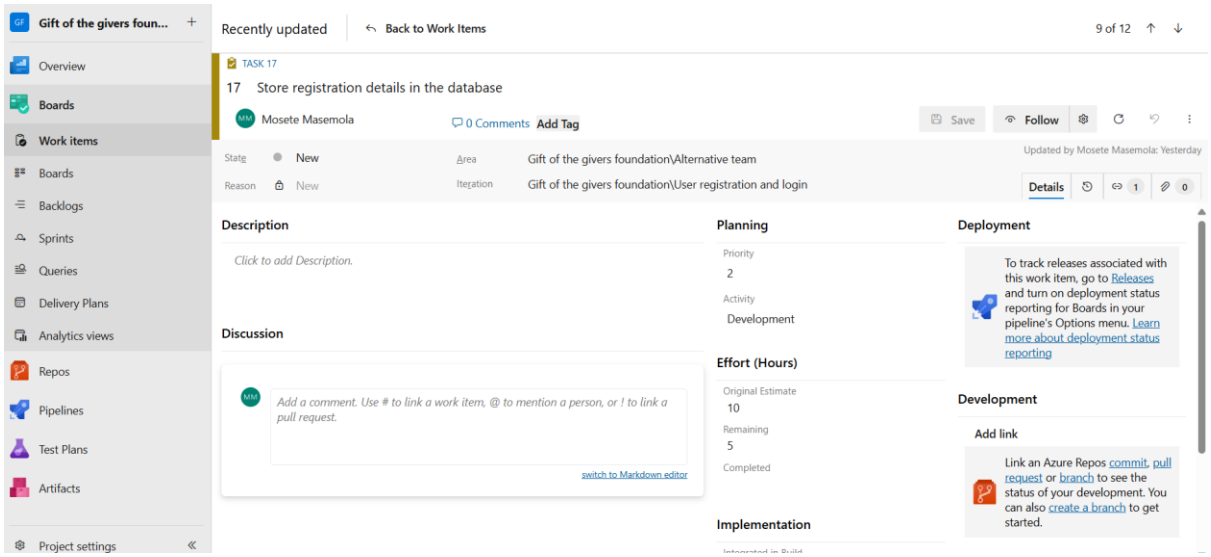
Remaining
5
Completed
Implementation
Integrated in Build
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 4 :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Pipelines
Test Plans
Artifacts
Project settings
Recently updated
Back to Work Items
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TASK 17
17 Store registration details in the database
Mosete Masemola
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\User registration and login
Updated by Mosete Masemola: Yesterday
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Development
Effort (Hours)
Original Estimate
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Remaining
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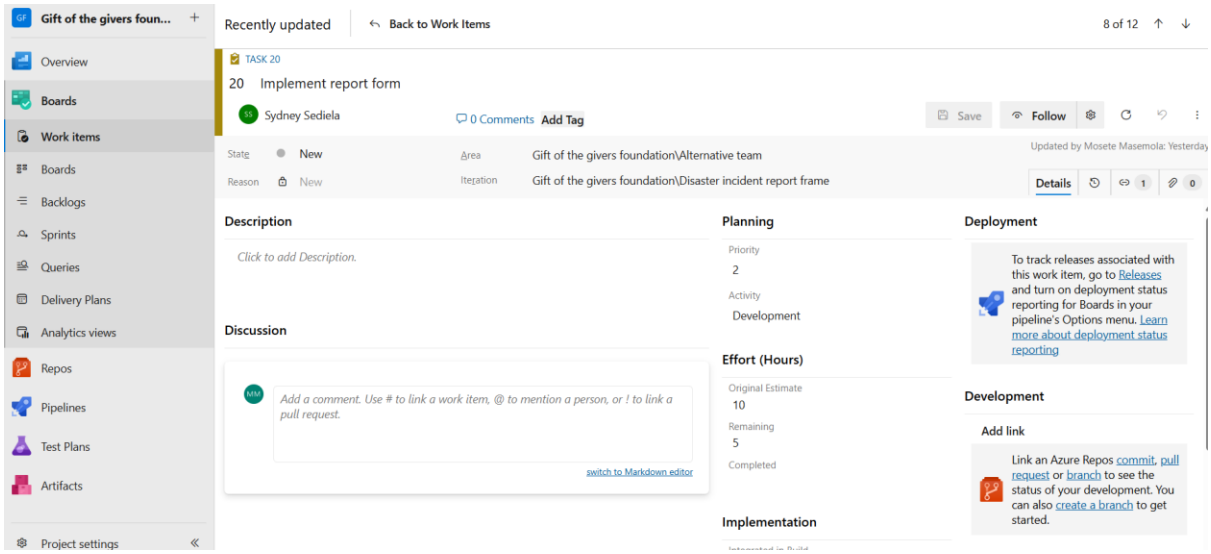
Completed
Implementation
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 5:


Gift of the givers foun...
Overview
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Analytics views
Repos
Pipelines
Test Plans
Artifacts
Project settings
Recently updated
Back to Work Items
8 of 12
TASK 20
20 Implement report form
Sydney Sediela
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Disaster incident report frame
Updated by Mosete Masemola: Yesterday
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
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Activity
Development
Effort (Hours)
Original Estimate
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Remaining
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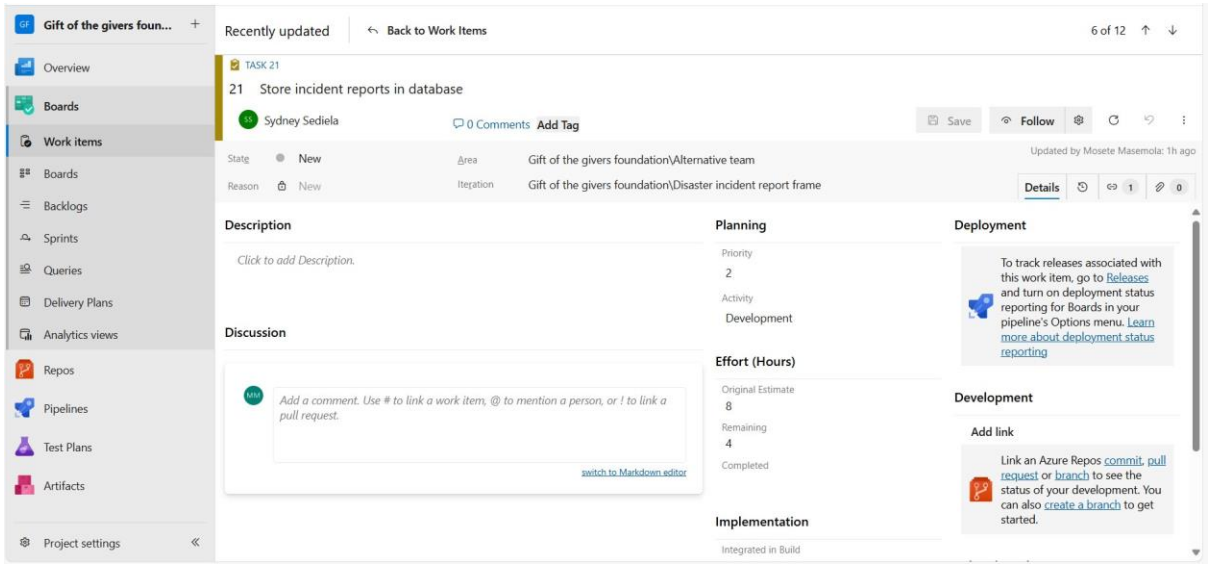
Completed
Implementation
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 6 :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Test Plans
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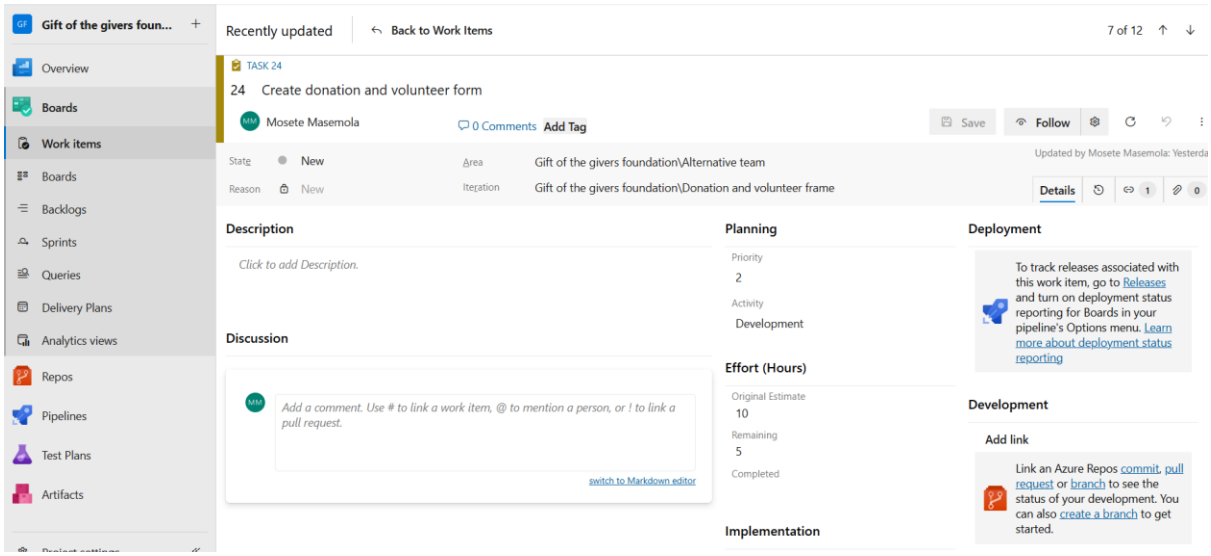
Project settings
Recently updated
Back to Work Items
6 of 12
TASK 21
21 Store incident reports in database
Sydney Sediela
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Disaster incident report frame
Updated by Mosete Masemola: 1h ago
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Development
Effort (Hours)
Original Estimate
8
Remaining
4
Completed
Implementation
Integrated in Build
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 7 :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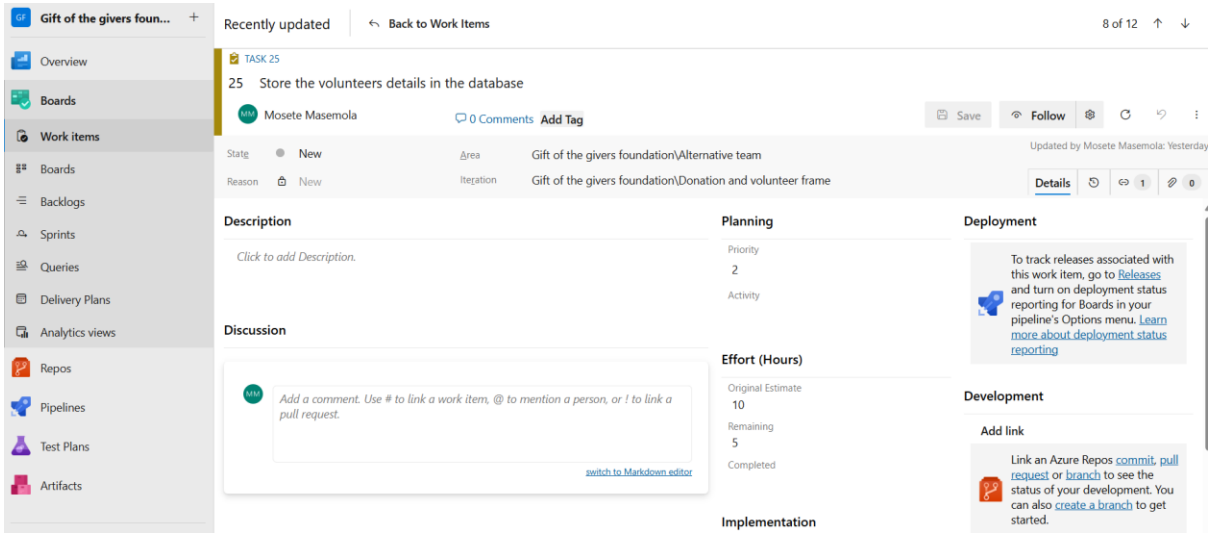
TASK 24
24 Create donation and volunteer form
Mosete Masemola
0 Comments
Add Tag
Save
Follow
State
New
Reason
New
Area
Gift of the givers foundation\Alternative team
Iteration
Gift of the givers foundation\Donation and volunteer frame
Updated by Mosete Masemola: Yesterda
Details
Description
Click to add Description.
Discussion
Add a comment. Use # to link a work item, @ to mention a person, or ! to link a pull request.
switch to Markdown editor
Planning
Priority
2
Activity
Development
Effort (Hours)
Original Estimate
10
Remaining
5
Completed
Implementation
Deployment
To track releases associated with this work item, go to Releases and turn on deployment status reporting for Boards in your pipeline's Options menu. Learn more about deployment status reporting
Development
Add link
Link an Azure Repos commit, pull request or branch to see the status of your development. You can also create a branch to get started.

Task 8 :



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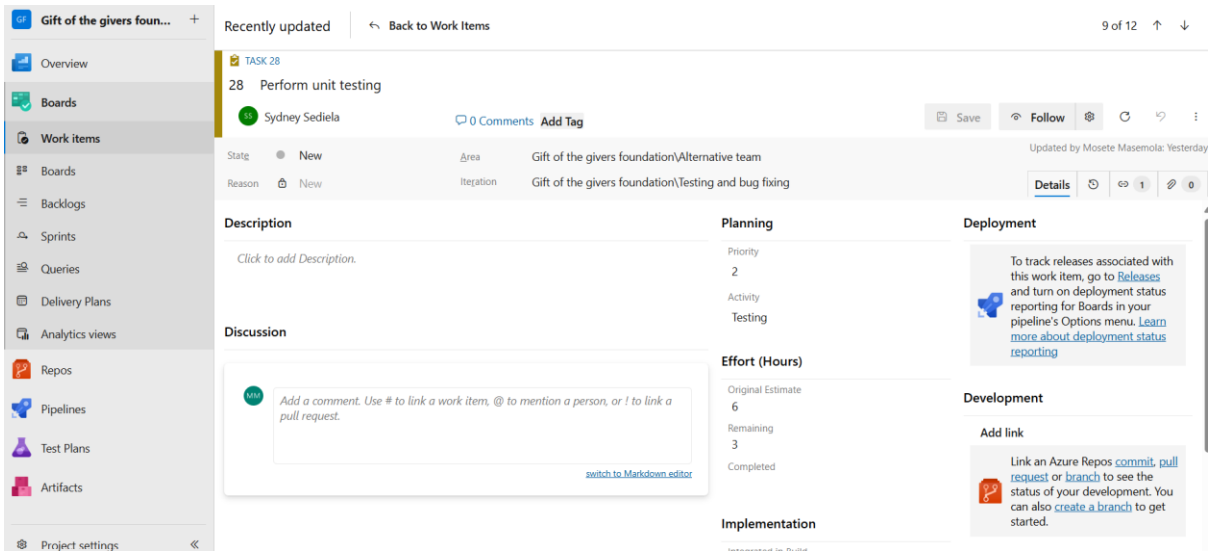

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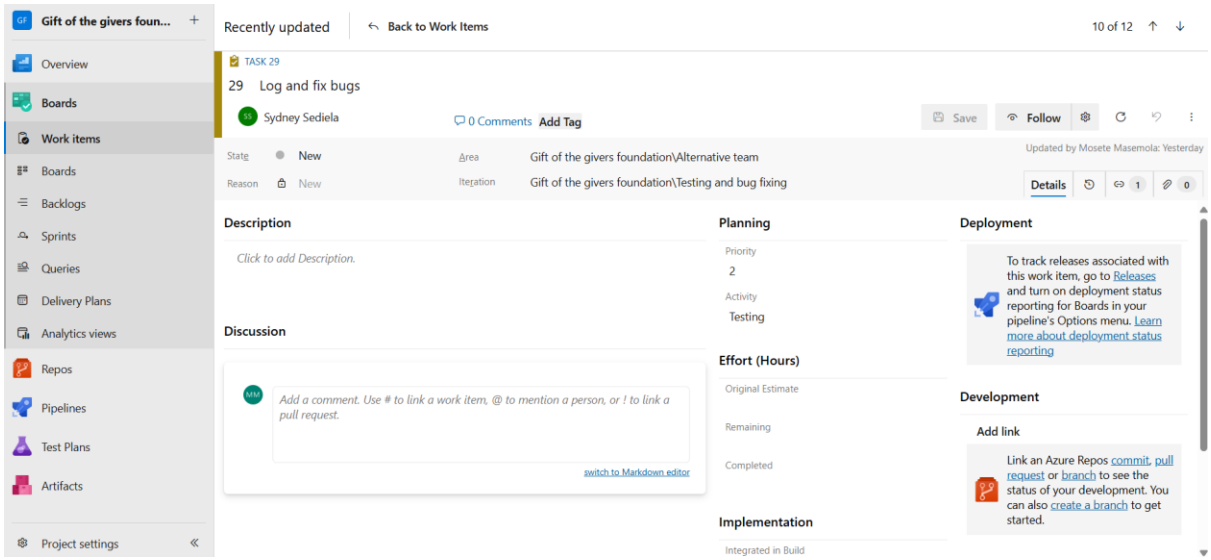
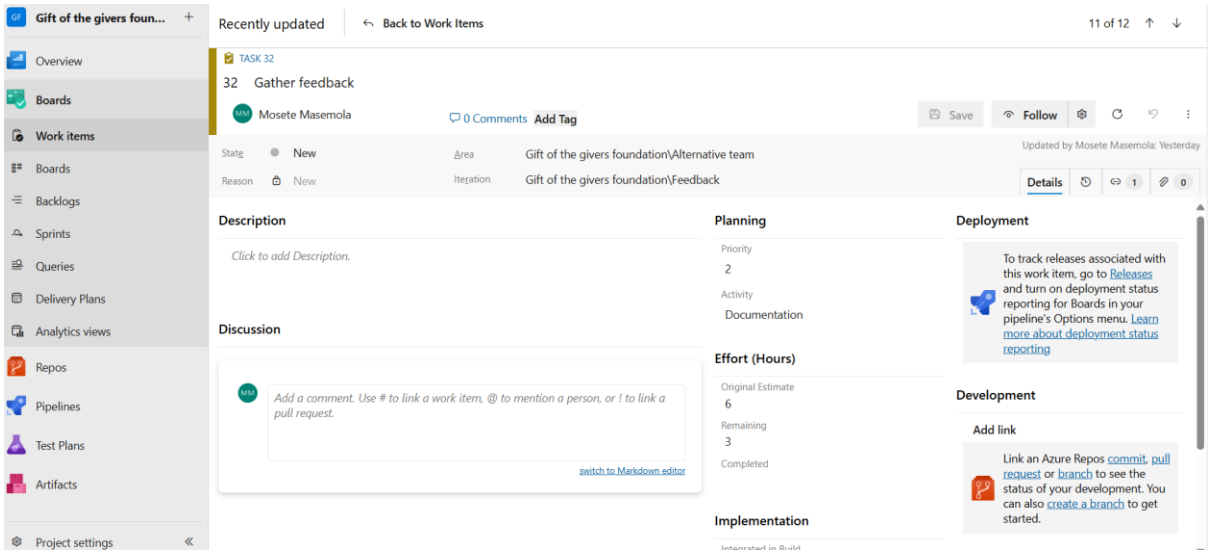


Task 11 :



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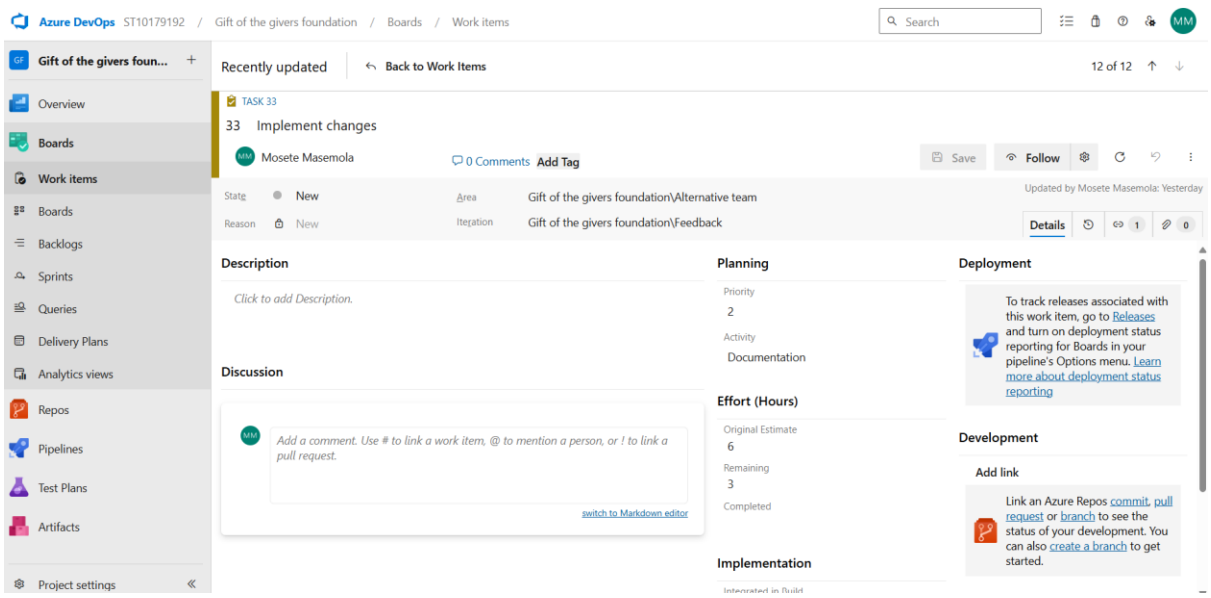
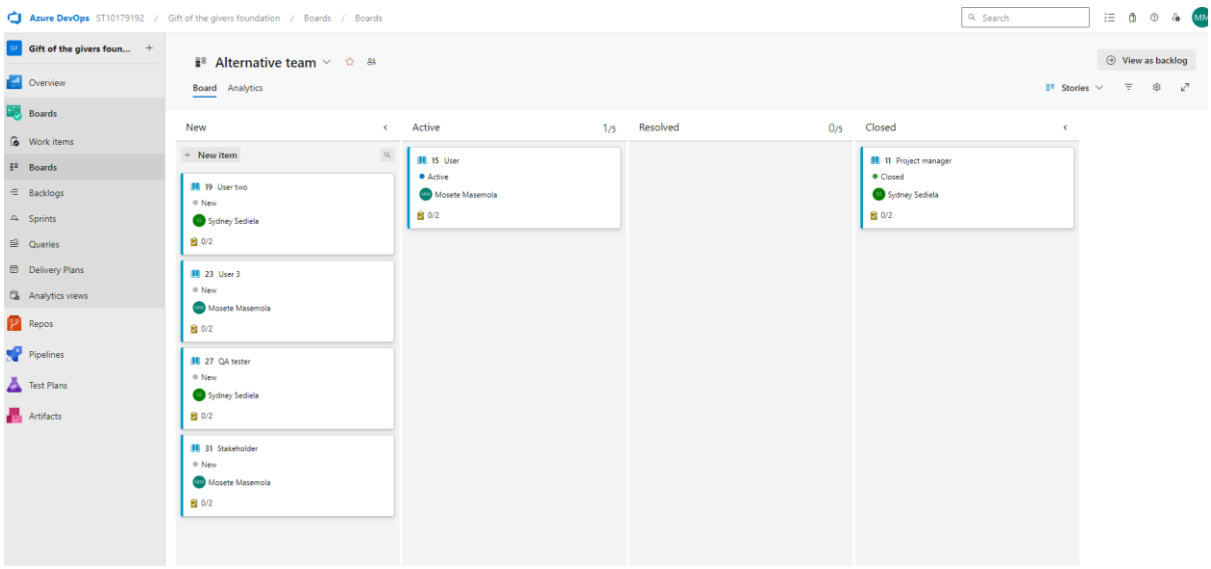
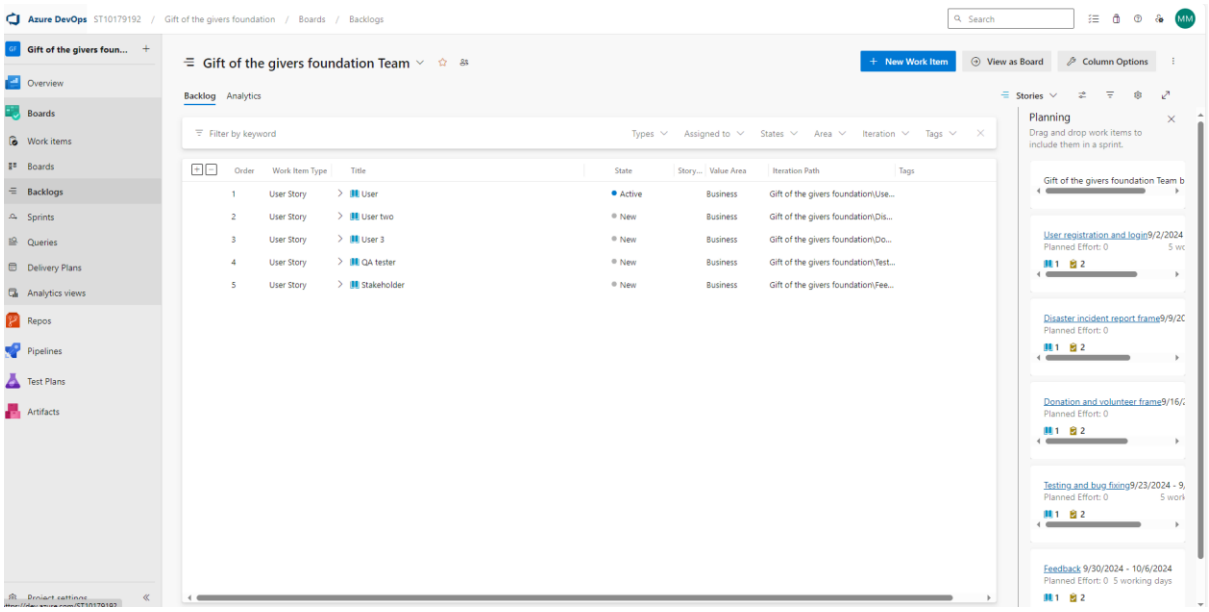


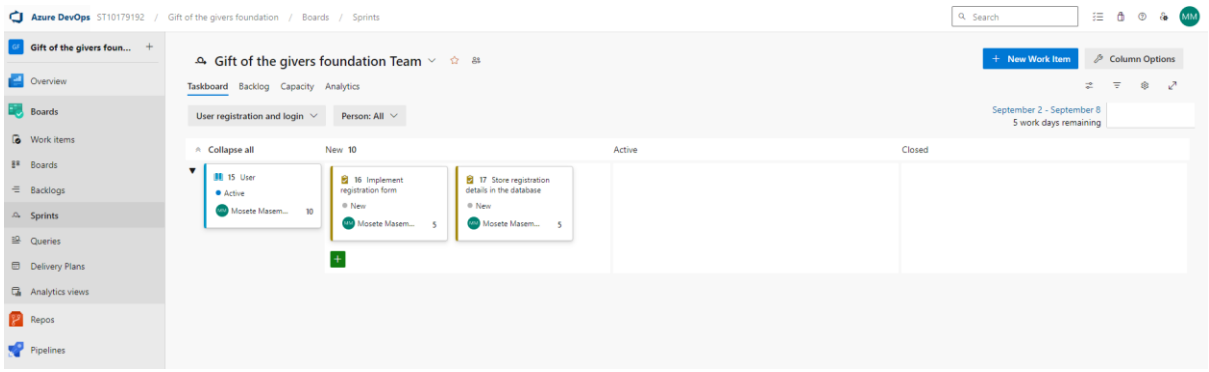
- **BOARDS**

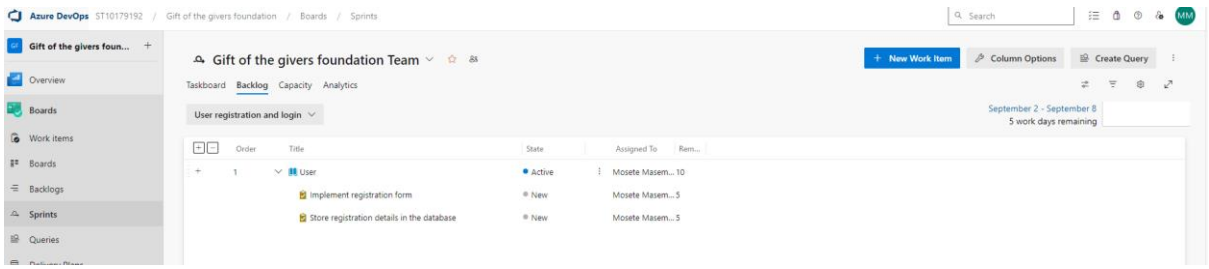


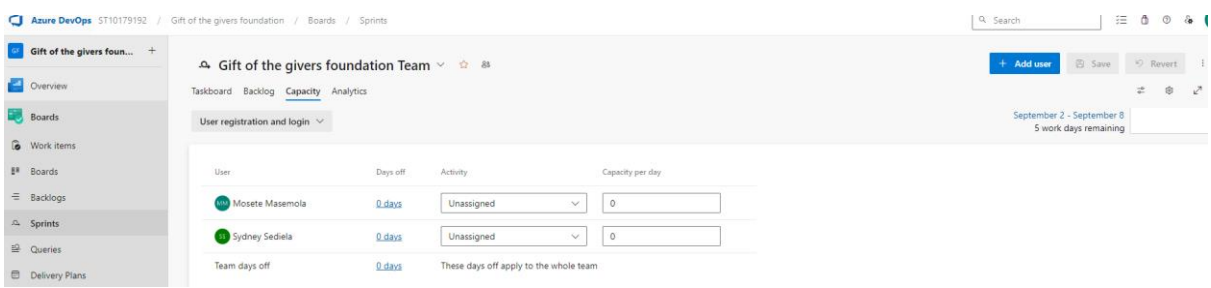
- **BACKLOG**

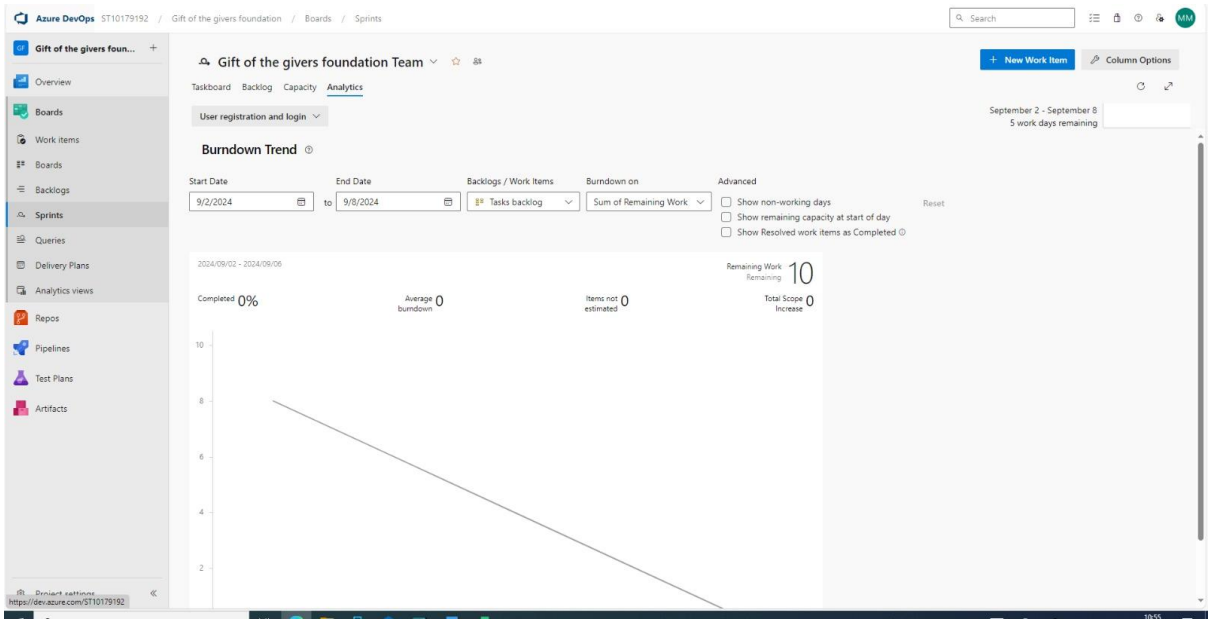

Azure DevOps
Gift of the givers foundation Team
Backlog
Analytics
New Work Item
View as Board
Column Options
Planning

- **SPRINTS**

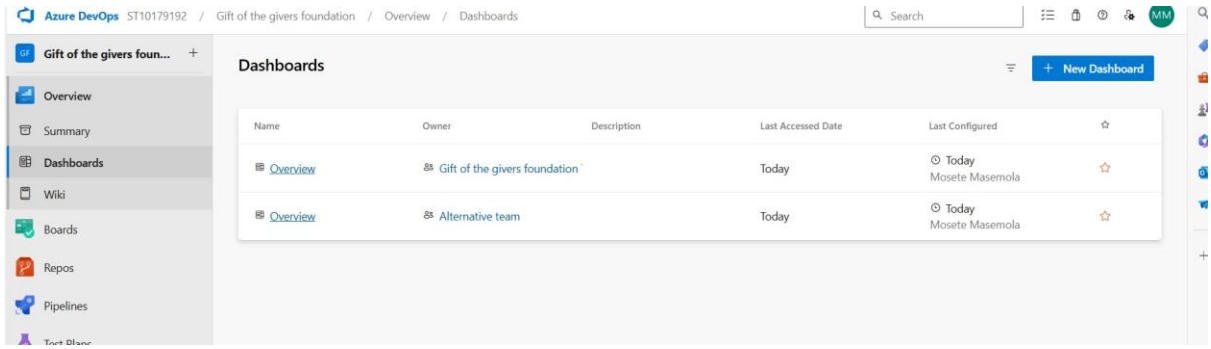

Azure DevOps
Gift of the givers foundation Team
Taskboard
Backlog
Capacity
Analytics
New Work Item
Column Options


Azure DevOps
Gift of the givers foundation Team
Taskboard
Backlog
Capacity
Analytics
New Work Item
Column Options
Create Query


Azure DevOps
Gift of the givers foundation Team
Taskboard
Backlog
Capacity
Analytics
Add user
Save
Revert



- **DASHBOARD**



1.3.

Define clear goals and deliverables for each sprint to ensure progress and accountability :

Sprint 1: Requirements & Design

- **Goal:** Establish a clear understanding of project requirements and design the application.
- **Deliverables:** Requirements document, UI design mockups, and database schema.

Sprint 2: User Registration & Login

- **Goal:** Implement basic user functionality for registration and login.
- **Deliverables:** Functional user registration and login frames, with data stored in the database.

Sprint 3: Disaster Incident Report Frame

- **Goal:** Enable users to report disaster incidents via the application.
- **Deliverables:** A fully functional disaster incident report frame.

Sprint 4: Donation & Volunteer Frames

- **Goal:** Implement functionalities for users to donate and volunteer.
- **Deliverables:** Donation and volunteer frames fully integrated with the database.

Sprint 5: Testing & Bug Fixing

- **Goal:** Ensure the application is bug-free and works as expected.
- **Deliverables:** Completed testing cycles, bug reports, and fixes.

Sprint 6: Feedback & Refinements

- **Goal:** Gather user feedback and refine the application based on it.
- **Deliverables:** Implemented refinements and updated application.

This setup will help you keep the project on track, with clear goals and deliverables for each sprint ensuring progress and accountability.

QUESTION 2

2.1.

Understanding Database Design Principles

Importance of Database Design:

1. **Efficiency:**
   - Proper database design ensures that data retrieval and manipulation operations are fast and consume fewer resources. This is critical for web applications where performance can significantly impact user experience.
2. **Scalability:**
   - A well-designed database can handle increasing amounts of data and users without significant performance degradation. This is important for the Gift of the Givers Foundation web application as it grows in user base and functionality.
3. **Data Integrity:**
   - Database design principles like normalization and referential integrity help maintain the accuracy and consistency of data over time, ensuring that the data remains reliable and trustworthy.

- **Key Database Design Principles:**

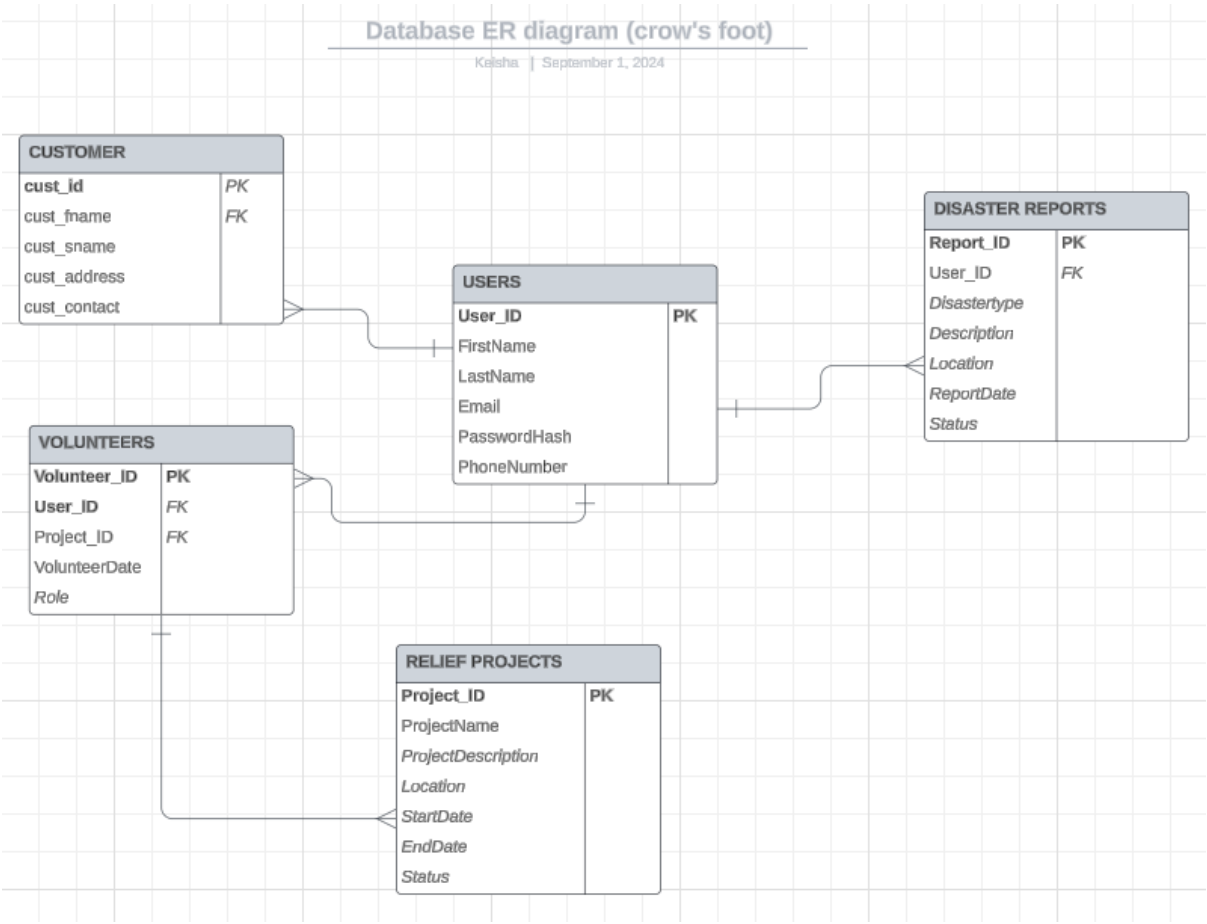
1. **Normalization:**

- The process of organizing data to reduce redundancy and improve data integrity. It involves dividing large tables into smaller, related tables and defining relationships between them.
- For example, instead of storing user and donation information in the same table, you would create separate tables for users and donations, linking them with a foreign key.

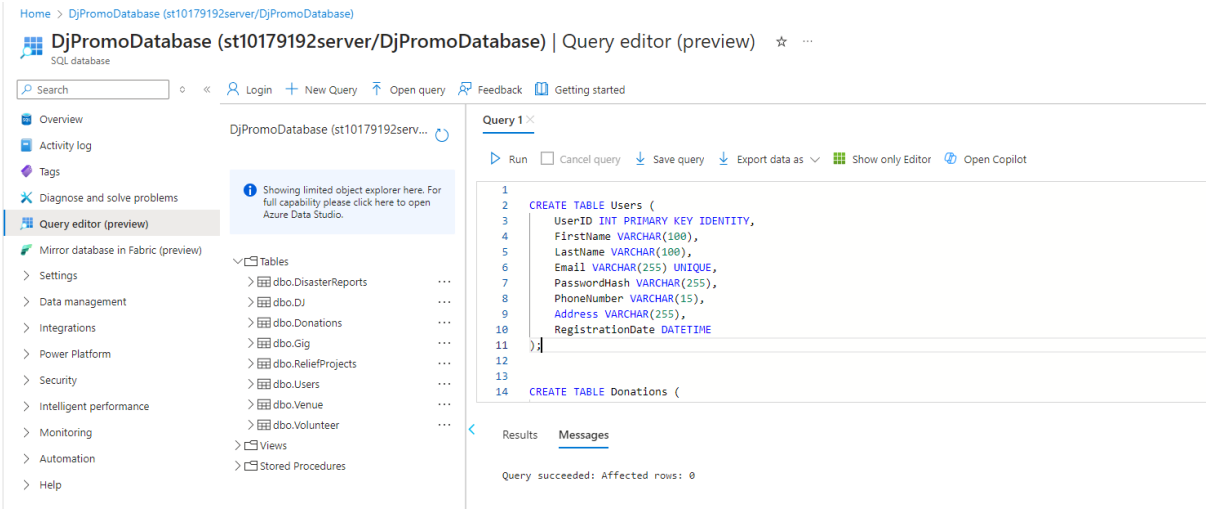
2. **Indexing:**
   - Indexes are used to speed up data retrieval operations. They act as lookup tables, allowing the database to find data more quickly.
   - For example, indexing the email column in the Users table would allow the application to quickly find users based on their email address.
3. **Referential Integrity:**
   - Ensures that relationships between tables remain consistent. This means that foreign keys in a child table must have corresponding values in the parent table.
   - For example, if a Donations table references a User , referential integrity ensures that every donation is linked to a valid user.

2.2.

- **ERD**



- **DATABASE**



-- Create Users Table

CREATE TABLE Users (

UserID INT PRIMARY KEY IDENTITY,

FirstName VARCHAR(100),

LastName VARCHAR(100),

Email VARCHAR(255) UNIQUE,

PasswordHash VARCHAR(255),

PhoneNumber VARCHAR(15),

Address VARCHAR(255),

RegistrationDate DATETIME

);

-- Create Donations Table

CREATE TABLE Donations (

DonationID INT PRIMARY KEY IDENTITY,

UserID INT,

DonationAmount DECIMAL(10, 2),

DonationType VARCHAR(50),

```
    DonationDate DATETIME,
    FOREIGN KEY (UserID) REFERENCES Users(UserID)
);

-- Create ReliefProjects Table
CREATE TABLE ReliefProjects (
    ProjectID INT PRIMARY KEY IDENTITY,
    ProjectName VARCHAR(255),
    ProjectDescription TEXT,
    Location VARCHAR(255),
    StartDate DATETIME,
    EndDate DATETIME,
    Status VARCHAR(50)
);

-- Create Volunteer Table
CREATE TABLE Volunteer (
    VolunteerID INT PRIMARY KEY IDENTITY,
    UserID INT,
    ProjectID INT,
    VolunteerDate DATETIME,
    Role VARCHAR(100),
    FOREIGN KEY (UserID) REFERENCES Users(UserID),
    FOREIGN KEY (ProjectID) REFERENCES ReliefProjects(ProjectID)
);
```

```
-- Create DisasterReports Table

CREATE TABLE DisasterReports (

   ReportID INT PRIMARY KEY IDENTITY,

   UserID INT,

   DisasterType VARCHAR(100),

   Description TEXT,

   Location VARCHAR(255),

   ReportDate DATETIME,

   Status VARCHAR(50),

   FOREIGN KEY (UserID) REFERENCES Users(UserID)

);
```

2.3.

Optimizing Database Performance

Optimization Techniques:

1. **Indexing Strategies:**
   - Create indexes on frequently searched columns such as email in the Users table,User_ID in the Donations table, and Project_ID in the Volunteer table.
   - Consider composite indexes for queries involving multiple columns, e.g.,Users and DonationDate in the Donations table.
2. **Query Optimization:**
   - Use efficient SQL queries by avoiding SELECT * statements and only retrieving necessary columns.
   - Optimize JOIN operations by ensuring indexed columns are used in JOIN conditions.
   - Analyze and refactor complex queries to reduce execution time.
3. **Partitioning:**
   - For large tables like Donations or DisasterReports , consider partitioning based on date or another logical segment. Partitioning can improve query performance by reducing the amount of data the database engine needs to scan.

4. **Caching:**
    - Implement caching for frequently accessed data to reduce database load, especially for static or rarely updated data.