American International University-Bangladesh (AIUB)
Department of Computer Science
Faculty of Science & Technology (FST)

Final-Transit: Streamlined Repatriation Assistance for Loved Ones

A Software Engineering Project Submitted
By

Semester: Summer_21_22		**Section:**	**Group Number:03**	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
01	Eshika Biswas	22-46243-1	20%	
02	Mir Md. Mofakkar Hossain	22-46245-1	20%	
03	Nazifa Tabushum Turaba	22-46271-1	20%	
04	Md. Shafin Ahamed	22-46274-1	20%	
05	Asif Uddin Sazid	22-46282-1	20%	

The project will be Evaluated for the following Course Outcomes

CO3: *Select* appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	
CO4: *Develop* project management plan to manage software engineering projects following the principles of engineering management and economic decision process	Total Marks	
Develop the project plan, its components of the proposed software products	[5Marks]	
Identify all the activities/tasks related to project management and categorize them within the WBS structure. Perform detailed effort estimation correspond with the WBS and schedule the activities with resources	[5Marks]	
Identify all the potential risks in your project and prioritize them to overcome these risk factors.	[5Marks]	

Description of Student's Contribution in the Project work

Student Name: Eshika Biswas
Student ID: 22-46243-1
Contribution in Percentage (%): 20%
Contribution in the Project:

- Project Proposal
- SRS Template
- UML Diagram
- Project Background Analysis and Feasibility
- UI Design
- Test Cases
- WBS
- COCOMO
- Timeline-1
- Timeline-2
- Eva Analysis
- Risk Management

_____Eshika_____
Signature of the Student

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- Test Cases
- WBS
- COCOMO
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- Timeline-2
- Eva Analysis
- Risk Management

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- UI Design
- Test Cases
- WBS
- COCOMO
- Timeline-1
- Timeline-2
- Eva Analysis
- Risk Management

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- UML Diagram
- Project Background Analysis and Feasibility
- UI Design
- Test Cases
- WBS
- COCOMO
- Timeline-1
- Timeline-2
- Eva Analysis
- Risk Management

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- UI Design
- Test Cases
- WBS
- COCOMO
- Timeline-1
- Timeline-2
- Eva Analysis
- Risk Management

_____Asif_____
Signature of the Student

1.PROJECT PROPOSAL

1.1 Background to the problem

This project aims to develop a software application designed to streamline and simplify the complex process of repatriating deceased individuals from foreign countries to Bangladesh. The software will guide users through each step of the repatriation process, provide necessary information, and offer support, thereby reducing the burden on grieving families. Moreover, there is currently no automated software specifically designed to handle the complex repatriation process in Bangladesh. This makes Final-Transit particularly valuable, as it will significantly reduce the hassle faced by Bangladeshi families dealing with the repatriation of their loved ones from abroad.

Root Cause and Importance

Repatriating deceased individuals from foreign countries to their home country is a complex and emotionally taxing process. Families are often overwhelmed with grief and face numerous bureaucratic hurdles, legal requirements, and logistical challenges. In Bangladesh, the repatriation process is particularly challenging due to the lack of streamlined and automated systems. The root cause of this problem lies in the fragmented nature of the repatriation process, which involves multiple stakeholders, varying legal requirements across countries, and a lack of centralized information and support. This fragmentation leads to delays, increased costs, and additional emotional stress on grieving families. The importance of addressing this problem is underscored by the need to provide a dignified and respectful final journey for deceased individuals while alleviating the burden on their families.

1.2 Solution to the problem

Objectives

To provide a comprehensive, user-friendly guide for repatriating deceased individuals. To ensure families can access and understand all necessary documentation and procedures. To offer support and resources, including contact information for relevant authorities. To develop a tracking system to monitor the status of the repatriation process.

Proposed Solutions

The proposed solution includes the development of a software application that offers the following features:

1. **User Registration and Authentication**: Secure login and registration for users.
2. **Step-by-Step Process Guide**: Tailored instructions based on user input regarding the deceased's country and circumstances.
3. **Document Checklist**: Comprehensive list of necessary documents and instructions on where to acquire them.
4. **Embassy and Consulate Information**: Detailed contact information for relevant authorities.
5. **Form Templates**: Downloadable and fillable templates for all required forms.
6. **Tracking System**: Real-time tracking of the repatriation process with integration to major logistics providers like DHL and FedEx.
7. **Support System**: Integrated chatbot for common queries and direct customer support contact information.
8. **Multilingual Support**: Accessibility for non-English speaking users.
9. **Mobile Application**: Easier access and usability on-the-go.

Key Features

User Registration and Authentication: Secure login and registration for users.

Step-by-Step Process Guide: Tailored instructions based on user input regarding the deceased's country and circumstances.

Document Checklist: Comprehensive list of necessary documents and instructions on where to acquire them.

Embassy and Consulate Information: Detailed contact information for relevant authorities.
Form Templates: Downloadable and fillable templates for all required forms.

Tracking System: Real-time tracking of the repatriation process.

Support System: Integrated chatbot for common queries and direct customer support contact information.

Technical Requirements

Frontend: HTML, CSS, JavaScript (React.js or Angular for responsive interface).

Backend: Node.js with Express or Python with Django/Flask for server-side logic.

Database: MongoDB or PostgreSQL for user data and process status storage.

Authentication: OAuth2 for secure user authentication.

API Integration: Integration with logistics providers like DHL, FedEx for tracking shipments.

Deployment: Cloud hosting using AWS, Azure, or Google Cloud.

Development Phases

Phase 1: Planning and Research

- Research the repatriation process and identify key stakeholders.
- Gather requirements and define user stories.

Phase 2: Design

- Create UI/UX mockups.
- Design database schema.

Phase 3: Set up the development environment.

- Develop frontend and backend components.
- Implement user authentication and management.
- Develop the step-by-step guide module.
- Integrate embassy and consulate information.
- Implement form templates and document checklist.
- Develop the tracking system.

Phase 4: Testing

- Conduct unit testing and integration testing.
- Perform user acceptance testing (UAT).

Phase 5: Deployment and Maintenance

- Deploy the application to a cloud platform.
- Monitor the application, fix issues, and provide updates.

Potential Challenges

Ensuring the accuracy and currency of legal and procedural information for multiple countries. Maintaining up-to-date contact information for embassies and consulates. Ensuring data security and privacy for sensitive user information.

Future Enhancements

Multilingual support to serve a broader audience. Integration with additional shipping and logistics providers. Development of a mobile application for easier access.

Functional Requirements

1.User Registration and Authentication

- The software shall allow users to register with an email address and password.
- The system shall send a verification email to the user upon registration.
- The software shall allow users to log in with their registered email and password.
- The login credentials (email and password) will be verified with database records.
- If the login is successful, the home page of the user account will be displayed.
- If the email and/or password is incorrect, an error message will be displayed.
- The system shall provide a password reset functionality via email.

Priority Level: High
Precondition: User has a valid email address and password

2.Step-by-Step Process Guide

Step 1: Initial Information Collection

- Enter deceased's passport number.
- Select the country where the death occurred.
- Provide details about the cause of death (optional).
- Upload a copy of the death certificate (if available).
- Confirm and submit the information.

Step 2: Legal Documentation

- Submit official death certificate (if not already done).
- Confirm a local burial permit or transit permit.
- Secure an embalming certificate (if required by the country of origin or destination).
- Obtain an affidavit from the funeral home.
- Compile and notarize all required documents.

Step 3: Communication with Authorities

- Contact the local embassy or consulate of Bangladesh to the country of death.
- Notify local authorities about the intention to repatriate the deceased.
- Submit all required documentation to the embassy or consulate.
- Schedule an appointment (if required) with the consulate for verification.

Step 4: Logistics and Transportation

- Choose a logistics provider specializing in human remains transportation (e.g., DHL, FedEx).

- Arrange for the transportation of the body to the airport in the foreign country.
- Book a flight for the repatriation of the deceased.
- Ensure compliance with airline regulations regarding the transportation of human remains.
- Arrange for transportation from the airport from Bangladesh. **Step 5: Final Arrangements in Bangladesh**
- Notify local authorities and customs in Bangladesh about the incoming repatriation.
- Arrange for a hearse or appropriate vehicle for transportation from the airport.
- Complete any remaining legal and administrative procedures upon arrival.
- Arrange for the final burial or cremation.

Priority Level: High
Precondition: User has entered required information about the deceased body

3.Document Checklist

- The system shall generate a checklist of required documents based on user input.
- Each document on the checklist shall have detailed instructions on where and how to obtain it.
- The software shall allow users to upload scanned copies of their documents.

Priority Level: High
Precondition: User has entered required information about the deceased body

4.Embassy and Consulate Information

- The system shall maintain an up-to-date database of embassy and consulate contact details.
- The software shall provide detailed contact information for embassies and consulates, including addresses, phone numbers, email addresses, and office hours.
- The system shall provide an interactive map to help users locate the nearest embassy or consulate.

Priority Level: Medium
Precondition: System has access to embassy and consulate contact information

6.Tracking System

- The system shall track the status of the repatriation process in real-time.
- Users shall receive notifications (email/SMS) for important updates.
- The system shall integrate with logistics providers like DHL and FedEx to provide shipment tracking for deceased body

- The software shall display real-time tracking information within the user interface

Priority Level: High
Precondition: User has initiated the repatriation process

5.Form Templates

- The software shall provide downloadable templates for all required forms in various formats (PDF, DOCX).
- The system shall provide instructions for filling out each form.
- The software shall allow users to auto-fill form templates with information they have already provided to the system.

Priority Level: Medium
Precondition: User has entered required information about the deceased

6.Support System

- The software shall implement a chatbot to handle common queries and provide instant support.
- The system shall provide users with contact details for customer support, including phone numbers and email addresses.
- The software shall ensure support is available during specified hours.

Priority Level: Medium
Precondition: User has access to the support system

7.User Profile

- The software shall allow users to view and edit their profile information, including personal details and contact information.
- The system shall provide users with the ability to change their password.
- The software shall allow users to view their document uploads and repatriation status history.
- The system shall enable users to delete their account and associated data.

Priority Level: Medium
Precondition: User has valid credentials and access to their profile

Non-Functional Requirements

1. Performance:

- **Load Handling:** The system must handle up to 1,000 concurrent users efficiently. This includes dynamic load balancing and caching mechanisms to optimize performance under peak usage.
- **Response Time:** Ensure that the application's response time for user actions does not exceed 2 seconds, maintaining a seamless user experience.

2. Reliability:

- **High Availability:** The system should maintain an uptime of 99.9%, using redundancy for critical components to avoid single points of failure.
- **Health Monitoring:** Implement automated health checks and self-healing processes to detect and rectify issues without manual intervention.

3. Scalability:

- **Elastic Scaling:** Utilize microservices architecture and containerization (e.g., Docker, Kubernetes) to independently scale different modules as needed.
- **Resource Management:** Efficiently manage resources to accommodate growing user numbers and data volumes, ensuring smooth operation as demand increases.

4. Usability:

- **User-Centered Design:** Conduct regular UX testing to refine the interface, making it intuitive and easy to navigate. Provide a context-sensitive help system for real-time assistance.
- **Accessibility Features:** Ensure the software is accessible to users with disabilities, including options for voice control, adjustable font sizes, and high-contrast modes.

5. Security:

- **Data Protection:** Implement end-to-end encryption for all data transmissions and multi-factor authentication (MFA) for user accounts.
- **Vulnerability Management:** Regularly conduct penetration testing and vulnerability assessments to identify and mitigate security risks.

6. Maintainability:

- **Code Quality:** Maintain a well-documented codebase following best practices, and implement automated testing frameworks to ensure new code is reliable.
- **Continuous Integration/Deployment:** Use a CI/CD pipeline to streamline updates, allowing for frequent and reliable software releases without significant downtime.

7. Compatibility:

- **Browser and Device Support:** Ensure compatibility with all major web browsers (Chrome, Firefox, Safari, Edge) and develop a progressive web app (PWA) for enhanced mobile access.
- **Assistive Technology:** Ensure the software works seamlessly with assistive technologies like screen readers and alternative input devices.

8. Compliance:

- **Regulatory Adherence:** Ensure the software complies with international legal standards and regulations related to repatriation processes, including GDPR and other data protection laws.
- **Audit Trail:** Maintain a comprehensive audit trail of all user interactions and data changes to support regulatory compliance and accountability.

9. Interoperability:

- **API Integration:** Use standardized data exchange formats (e.g., JSON, XML) for seamless integration with external systems such as logistics providers and government databases.
- **Real-Time Updates:** Implement webhooks for real-time notifications and updates to partner services, ensuring timely and accurate information flow.

10.Data Integrity:

- **Secure Records:** Implement blockchain or other advanced technologies to ensure secure and immutable records of repatriation processes.
- **Validation and Consistency:** Use advanced data validation algorithms to maintain the accuracy and consistency of data across the system, preventing errors and duplication.

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2. SOFTWARE DEVELOPMENT LIFE CYCLE

2.1 Process Model - Scrum

The Scrum model was chosen for the development of the **Final-Transit** Repatriation Assistance Software due to its flexibility, iterative approach, and focus on delivering working software in short cycles (sprints). Given the complexity and multi-faceted nature of the repatriation process, Scrum allows us to manage changing requirements and ensure timely delivery of valuable features.

Why Scrum is the Best Choice:

1. **Adaptability to Changing Requirements:** The repatriation process is subject to varying legal and procedural requirements from different countries. Scrum's iterative nature allows the team to adjust as new information or changes in legal frameworks emerge.
2. **Frequent Delivery of Functional Software:** By breaking down the project into smaller, manageable sprints, we ensure the development and delivery of working features incrementally. This is important for delivering core functionalities (e.g., document management, embassy contact information) earlier for feedback.
3. **Customer and Stakeholder Collaboration:** Scrum emphasizes collaboration with stakeholders, which is vital for the success of **Final-Transit**, as we need continuous input from funeral homes, embassies, logistics providers, and grieving families.
4. **Incremental Progress and Transparency:** Scrum's daily stand-ups, sprint reviews, and retrospectives create transparency, ensuring that the development team stays aligned with the project's goals and deadlines.

The Scrum model also aligns well with the **Final-Transit** project's objectives and non-functional requirements by ensuring high-quality delivery in a flexible, scalable, and user-focused manner.

Scrum Process Breakdown:

- **Sprint Length:** Each sprint will last for 2 weeks, delivering working increments of the product.
- **Product Backlog:** The product backlog will contain all user stories related to the software, prioritized based on importance and urgency. Example backlog items include "User Registration and Authentication," "Document Checklist," and "Tracking System Integration."
- **Sprint Planning:** At the beginning of each sprint, the development team will select high-priority items from the product backlog and define the sprint goal.
- **Daily Stand-ups:** The team will meet every day for short, focused stand-ups to discuss progress, blockers, and next steps.
- **Sprint Review:** At the end of each sprint, the team will present the completed features to stakeholders for feedback.

- **Sprint Retrospective:** After the sprint review, the team will conduct a retrospective to reflect on the sprint, discussing what went well, what could be improved, and how to enhance the process moving forward.

Why we are not selecting other models:

- Waterfall model was not chosen due to its inherent inflexibility in accommodating changes once the project has started. Unlike Scrum, where requirements can be adjusted throughout the development process, Waterfall demands upfront and accurate requirement definitions, making it unsuitable for our dynamic agricultural software project. The V-model, while emphasizing early testing, lacks the continuous adaptability feature of Scrum, and its expensive nature makes it less cost-effective. Prototyping model, not adopted, is time- consuming and does not prioritize risk analysis, a critical aspect for our safety-focused project. Evolutionary and incremental development models, though providing adaptability, fall short in the frequency of reassessment that Scrum offers. RAD, requiring extensive user involvement, may pose challenges in the agricultural context. Component-based development models, while modular, may not align seamlessly with our integrated software needs. Agile models like XP, DSDM, and FDD were not chosen for specific reasons. XP's emphasis on pair programming and constant user presence may not align with the project's requirements. DSDM's prototyping focus might not be essential for our initial development phase, and FDD's resource-intensive nature, requiring 50 persons for the project, makes it costlier compared to the efficiency of Scrum in managing our project's complexities. Additionally, other Agile models might introduce unnecessary complexities or resource requirements that Scrum's flexible and iterative approach effectively addresses in our context.

2.2 Project Role Identification and Responsibilities

1. Product Owner

- **Role:** Represents the stakeholders and users, manages the product backlog, prioritizes features, and ensures the team delivers maximum value.
- **Responsibilities:**
    - Define and communicate the product vision.
    - Prioritize the product backlog items.
    - Collaborate with stakeholders to gather and refine requirements.
    - Ensure that the delivered features align with business goals and user needs.

2. Scrum Master

- **Role:** Facilitates the Scrum process, ensures the team follows Scrum practices, and removes impediments.
- **Responsibilities:**
    - Organize daily stand-ups, sprint planning, reviews, and retrospectives.
    - Coach the team on Scrum practices and principles.
    - Remove obstacles that prevent the team from achieving sprint goals.
    - Ensure that communication flows smoothly between the team and stakeholders.

3. Development Team

- **Role:** Responsible for designing, developing, and testing the software.
- **Responsibilities:**
    - Break down user stories into tasks.
    - Implement features based on sprint goals.
    - Conduct testing, debugging, and code reviews.
    - Ensure the software meets technical and user requirements.

4. Stakeholders

- **Role:** Users, clients, and others who have an interest in the software.
- **Responsibilities:**
    - Provide feedback on delivered features.
    - Share insights on the user experience and additional requirements.
    - Ensure the software aligns with the needs of grieving families and logistical/legal requirements.

5. QA/Testers

- **Role:** Ensure that the product is tested for quality and meets the set acceptance criteria.
- **Responsibilities:**
    - Write test cases based on user stories.
    - Conduct automated and manual testing.
    - Report bugs and verify fixes.
    - Ensure that the software meets functional and non-functional requirements.

6. UX/UI Designers

- **Role:** Responsible for creating an intuitive and user-friendly interface.
- **Responsibilities:**
    - Design mockups and prototypes.
    - Ensure the UI is accessible and easy to navigate for all users.
    - Collaborate with stakeholders and the development team to iterate on design based on feedback.

By utilizing the Scrum model, **Final-Transit** will be developed iteratively, ensuring frequent feedback and continuous improvement throughout the development cycle. This approach ensures that the software is adaptive, meets user needs, and can quickly respond to changes in legal requirements or user feedback.

3. Impact of Final-Transit Platform

i) Accessibility:

- Ensures compassionate and efficient repatriation services are accessible to families worldwide, regardless of location.

Key Points:

- ✓ **Global Reach:** Services available globally to accommodate expatriates and travelers.
- ✓ **Cultural Sensitivity:** Services designed to respect diverse cultural practices.
- ✓ **Multi-Language Support:** Platform supports multiple languages for broader accessibility.
- ✓ **User-Friendly Design:** Easy-to-navigate interface for users of all ages and tech proficiency.

ii)Engagement:

- Provides a platform for real-time interaction and support, increasing user engagement during difficult times.

Key Points:

- ✓ **Real-Time Updates:** Users receive real-time updates on the repatriation process.
- ✓ **Interactive Features:** Features like chat and video calls enhance user engagement.
- ✓ **Community Support:** Access to support groups and forums for community engagement.
- ✓ **Personalization:** Personalized user experiences based on individual needs and preferences.

iii)Collaboration:

- Facilitates collaboration between families and service providers, ensuring a seamless repatriation process.

Key Points:

- ✓ **Integrated Services:** Collaboration between different service providers for seamless operation.
- ✓ **Shared Workspaces:** Shared workspaces for families and providers to manage tasks.
- ✓ **Coordination Tools:** Tools to coordinate logistics, documentation, and communication.

- ✓ **Partnerships:** Strong partnerships with legal advisors, transport providers, and support services.

iv)Efficiency:

- Tools like task lists and notifications help users manage repatriation processes efficiently.

Key Points:

- ✓ **Automated Processes:** Automation of repetitive tasks to save time and reduce errors.
- ✓ **Efficient Workflows:** Streamlined workflows for faster service delivery.
- ✓ **Task Management:** Task management features to keep track of necessary steps.
- ✓ **Resource Allocation:** Efficient allocation of resources to avoid delays.

v)Privacy and Security:

- Strong privacy measures protect user data and information, ensuring a safe environment.

Key Points:

- ✓ **Data Encryption:** Encryption of sensitive data to ensure privacy.
- ✓ **Access Controls:** Role-based access controls to limit data access.
- ✓ **Compliance:** Compliance with global data protection regulations.
- ✓ **Secure Communication:** Secure communication channels for user interactions.

vi)Performance Tracking:

- Dashboards provide insights into the progress of repatriation processes.

Key Points:

- ✓ **Progress Indicators:** Visual indicators for tracking repatriation progress.
- ✓ **Performance Metrics:** Metrics to measure the efficiency of services.
- ✓ **User Analytics:** Analytics to understand user behaviour and improve services.
- ✓ **Real-Time Monitoring:** Real-time monitoring of system performance and user activity.

vii)Feedback and Improvement:

- Mechanisms for collecting user feedback help in refining the platform and services.

Key Points:

- ✓ **User Surveys:** Regular surveys to gather user feedback.
- ✓ **Feedback Forms:** Easy-to-use feedback forms integrated into the platform.

- ✓ **Review Meetings:** Regular review meetings to discuss feedback and improvements.
- ✓ **Continuous Updates:** Regular platform updates based on user feedback.

viii)Resource Management:

- A centralized repository for necessary documents and resources ensures easy access for users.

Key Points:

- ✓ **Document Storage:** Secure storage for important documents.
- ✓ **Resource Library:** Library of resources for user reference.
- ✓ **Access Control:** Controlled access to sensitive documents.
- ✓ **Search Functionality:** Advanced search features for quick access to resources.

ix)User Experience:

- Interactive features enhance the overall user experience, making the repatriation process as smooth as possible.

Key Points:

- ✓ **Intuitive Design:** User-friendly interface for easy navigation.
- ✓ **Personalized Experience:** Personalization features to cater to individual needs.
- ✓ **User Support:** Comprehensive user support options, including chat and phone support.
- ✓ **Accessibility Features:** Features to ensure accessibility for users with disabilities.

x)Flexibility:

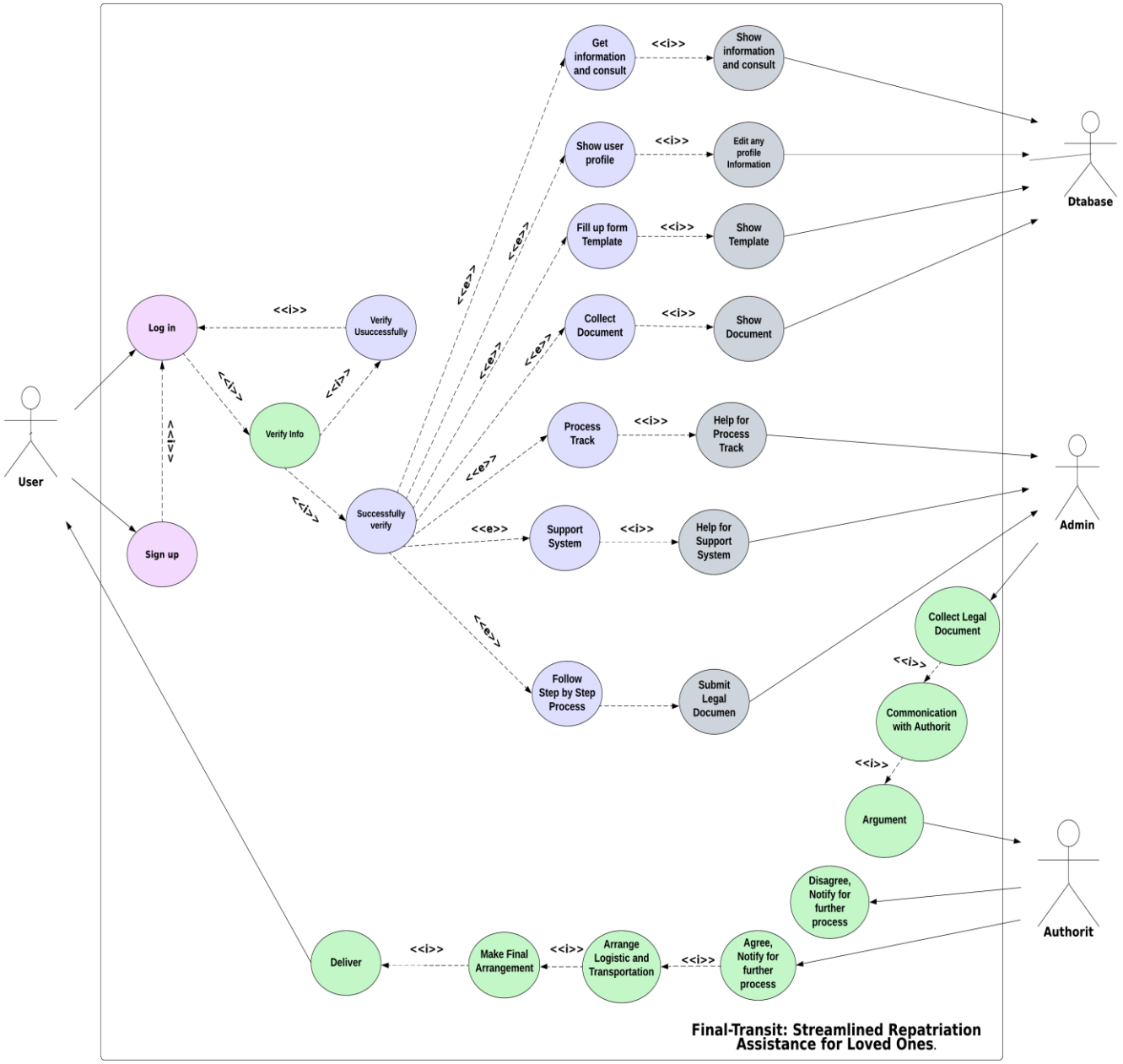
- The platform's design accommodates different repatriation needs and schedules, providing flexibility to users.

Key Points:

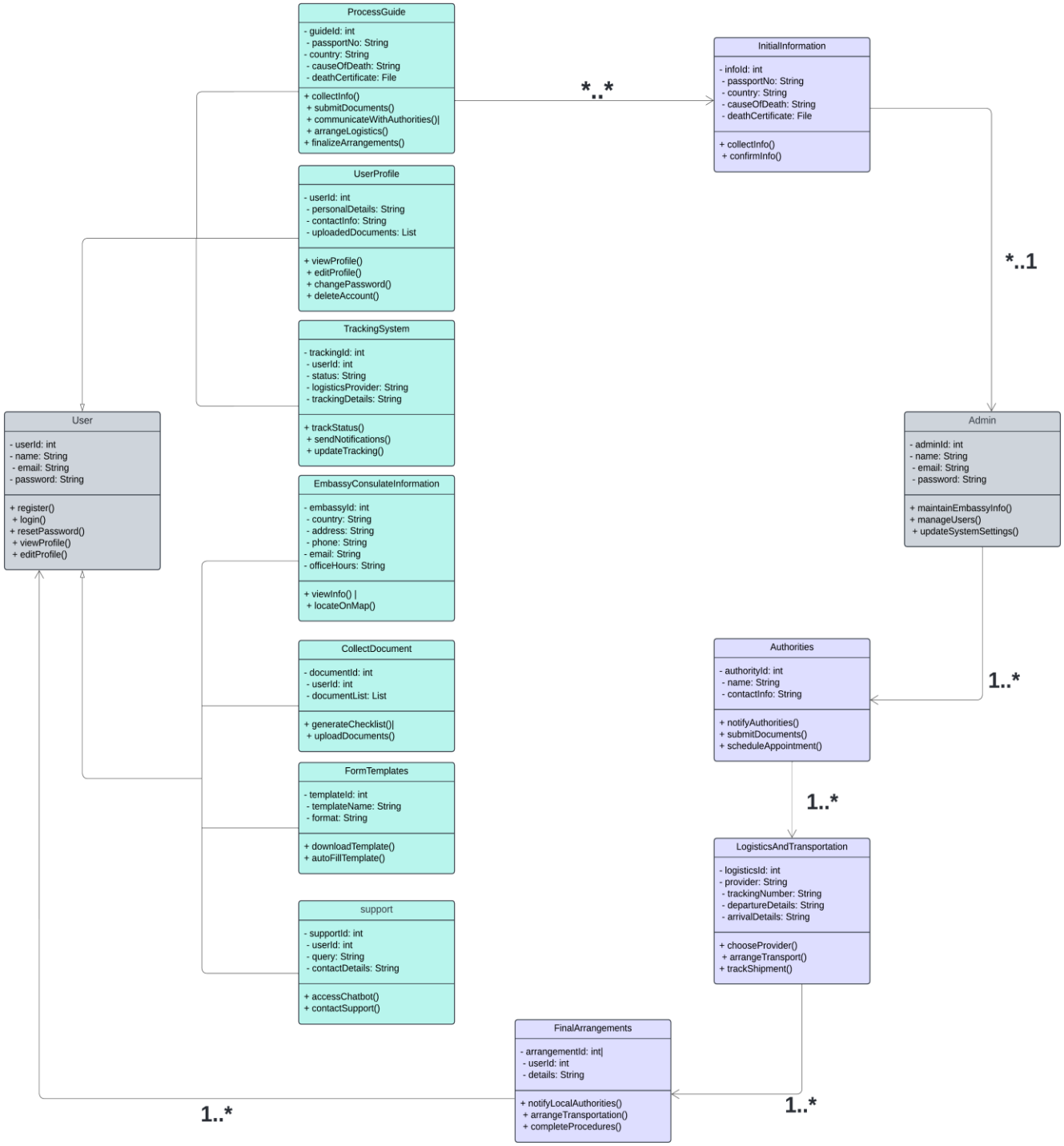
- ✓ **Customizable Options:** Customizable service options to meet specific needs.
- ✓ **Flexible Scheduling:** Flexible scheduling for various repatriation processes.
- ✓ **Adaptable Processes:** Adaptable processes to handle unique repatriation cases.
- ✓ **User Preferences:** Ability to set user preferences for personalized service delivery.

UML Diagram:

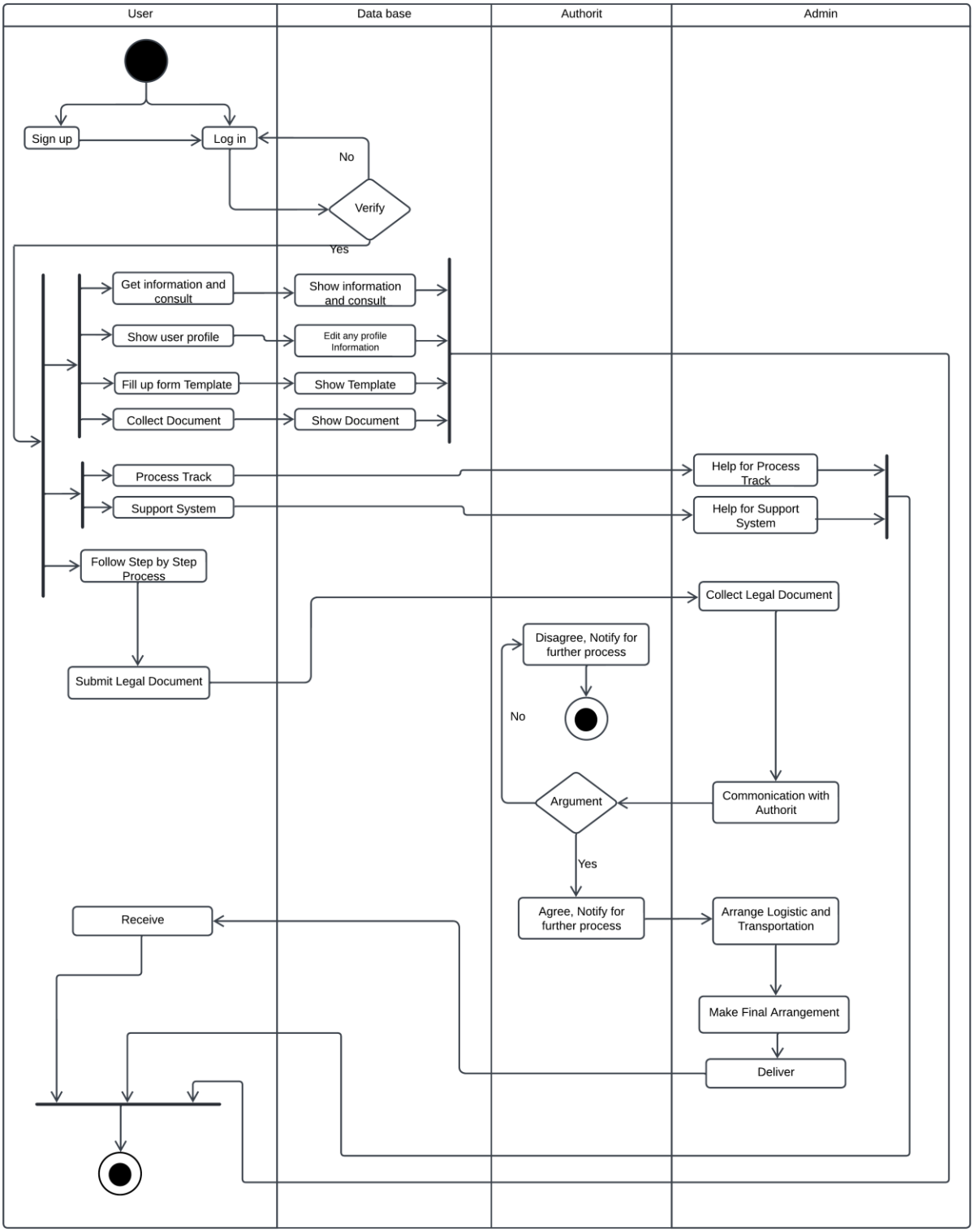
1.Use Case Diagram:



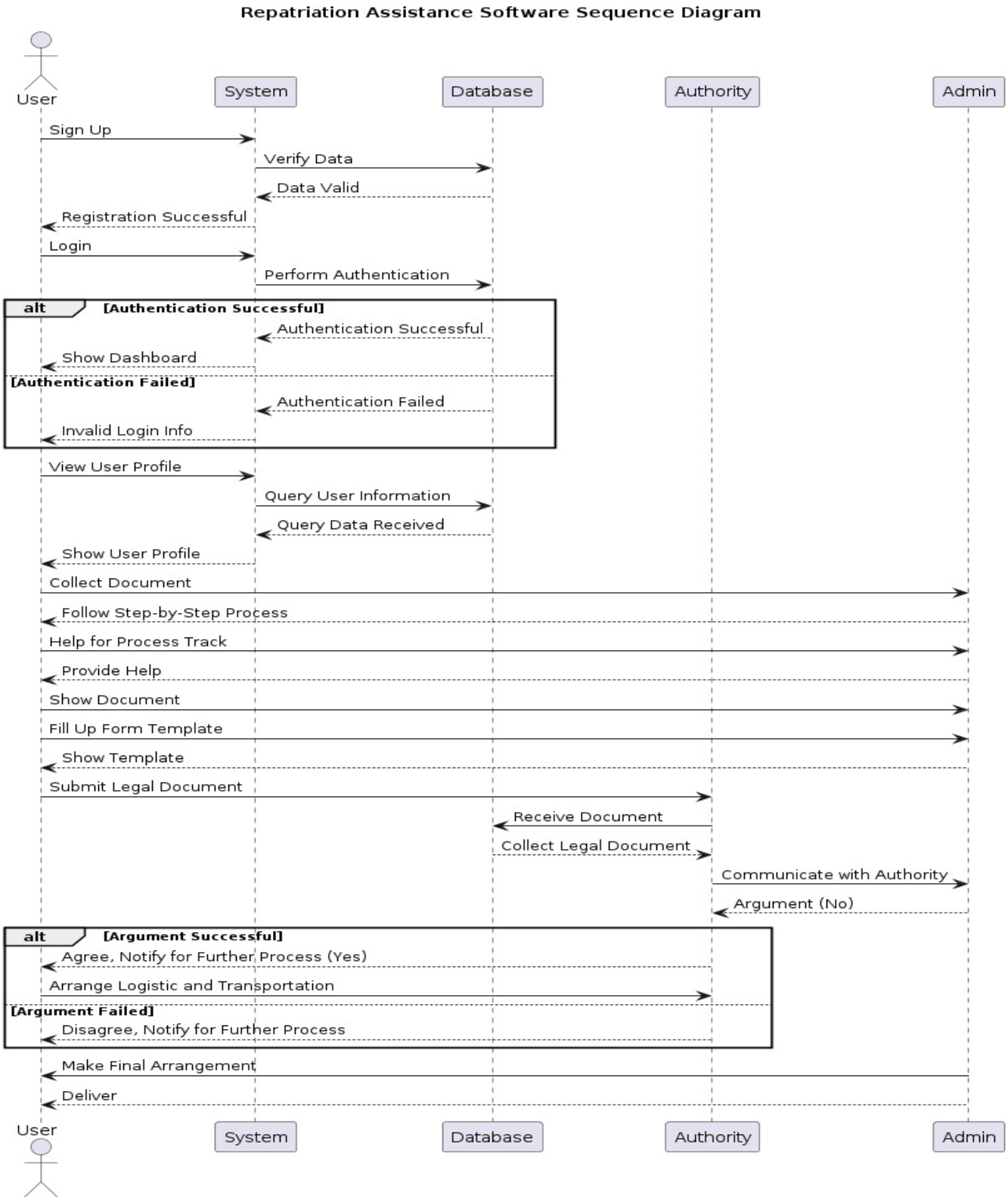
2.Class Diagram:



3.Activity Diagram:

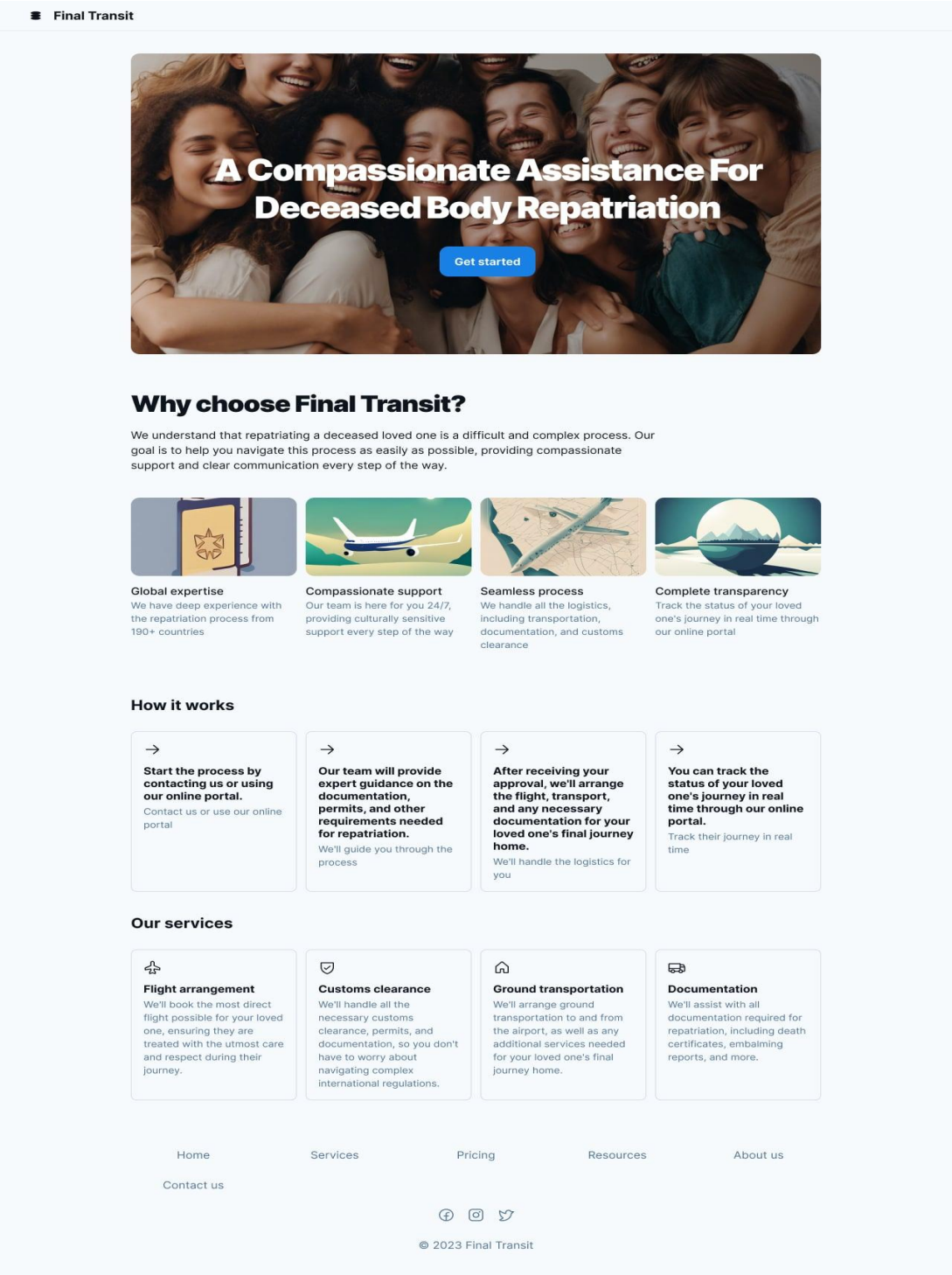


4.Sequence Diagram:

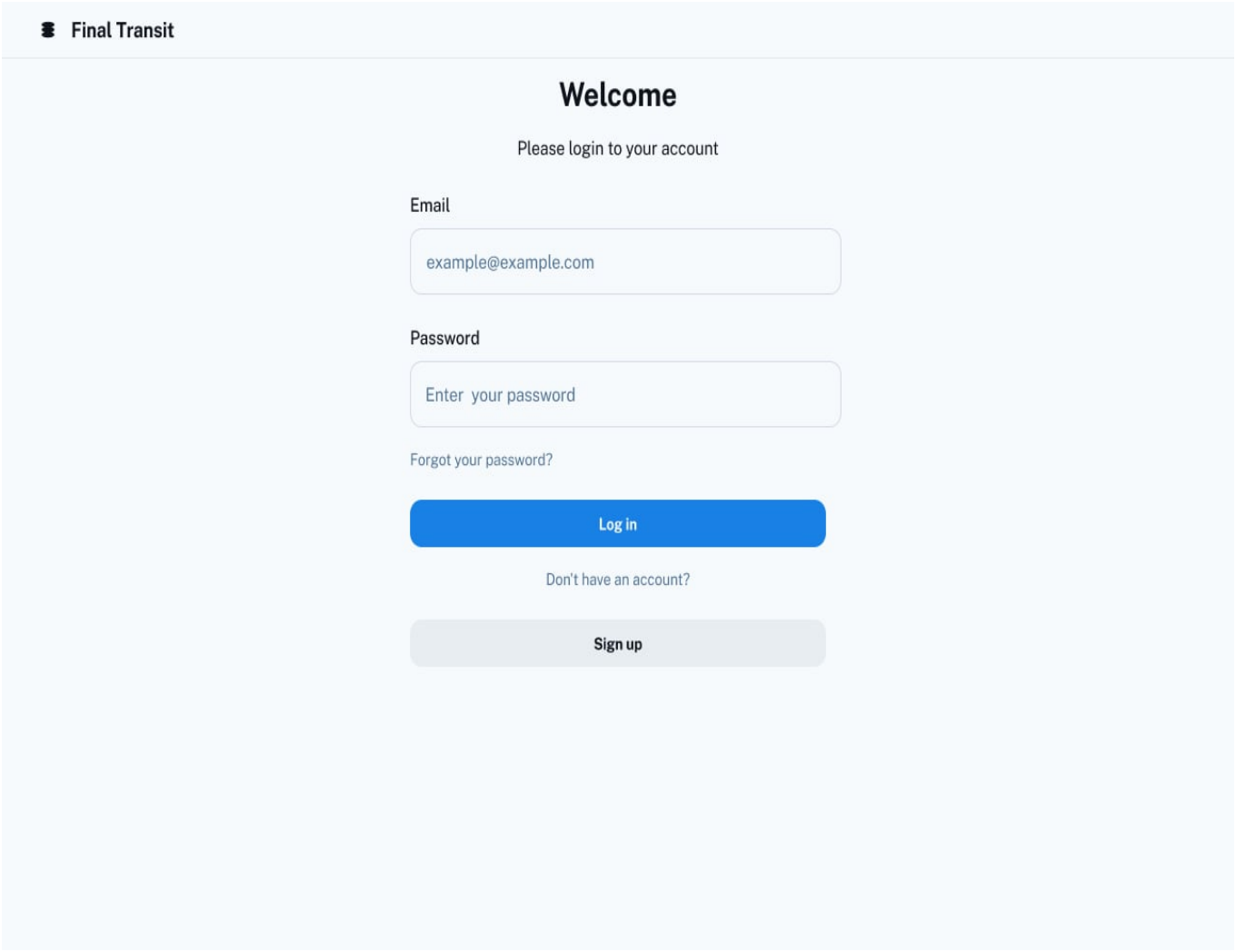


Ui design

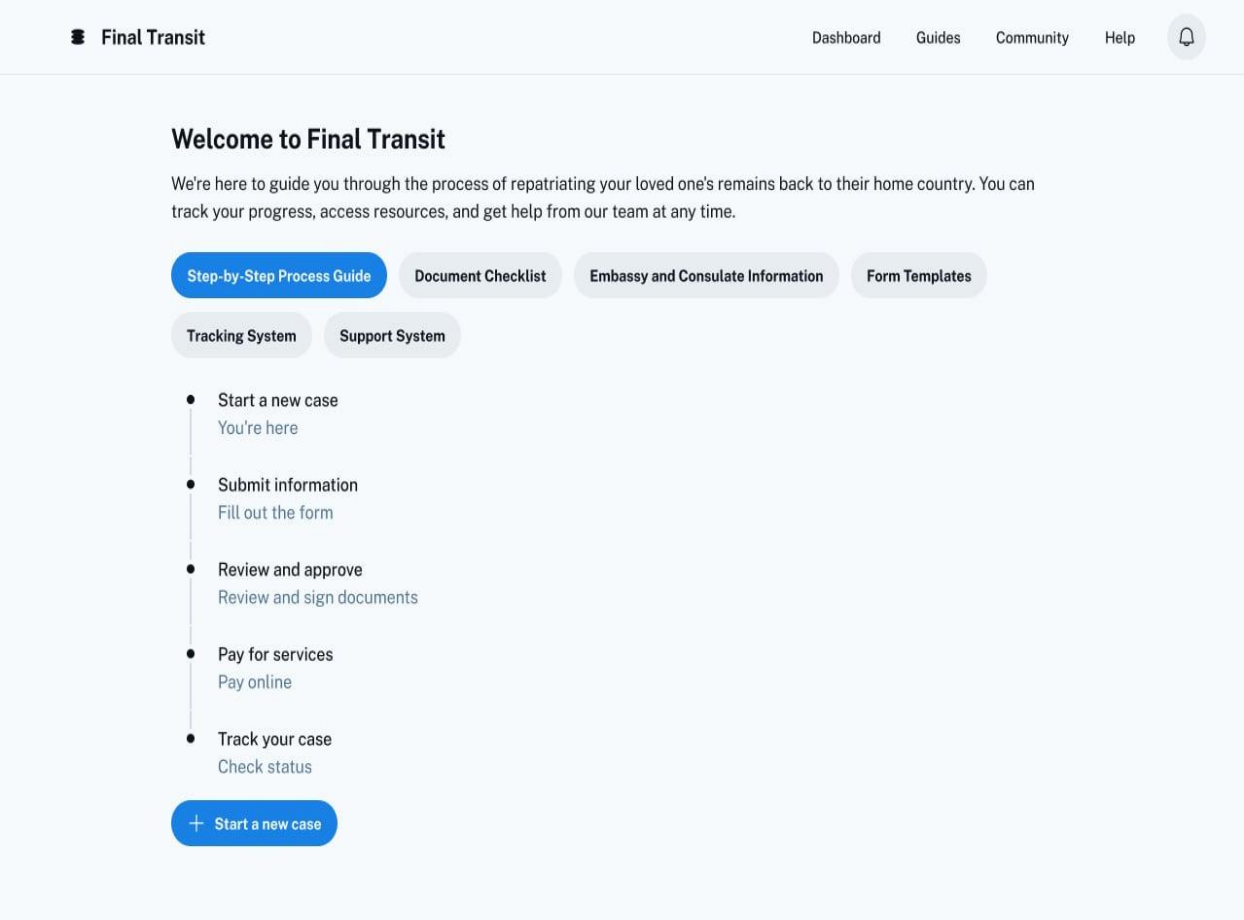
- **Landing page:**



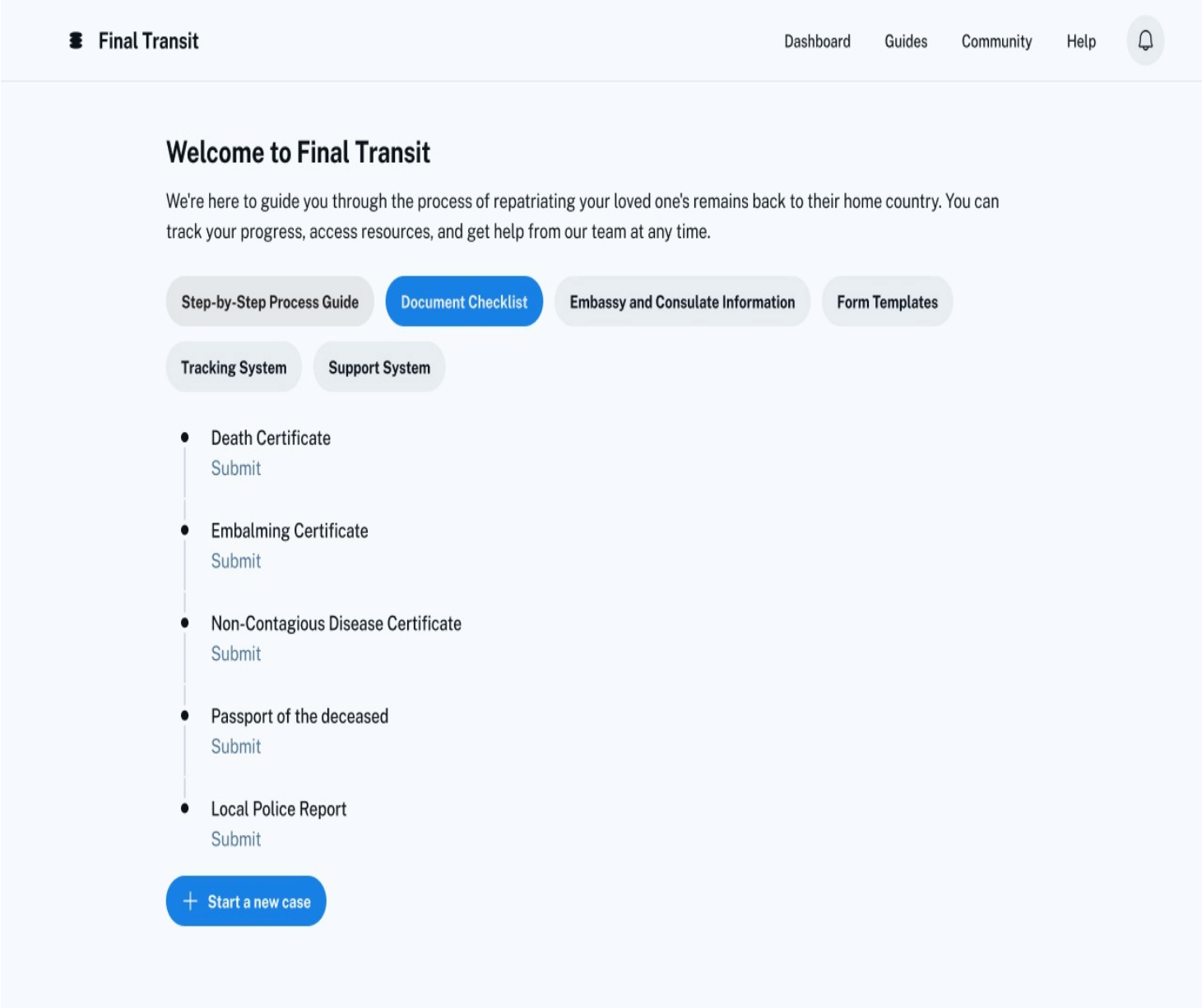
- **Log-in Page:**


Final Transit
Welcome
Please login to your account
Email
example@example.com
Password
Enter your password
Forgot your password?
Log in
Don't have an account?
Sign up

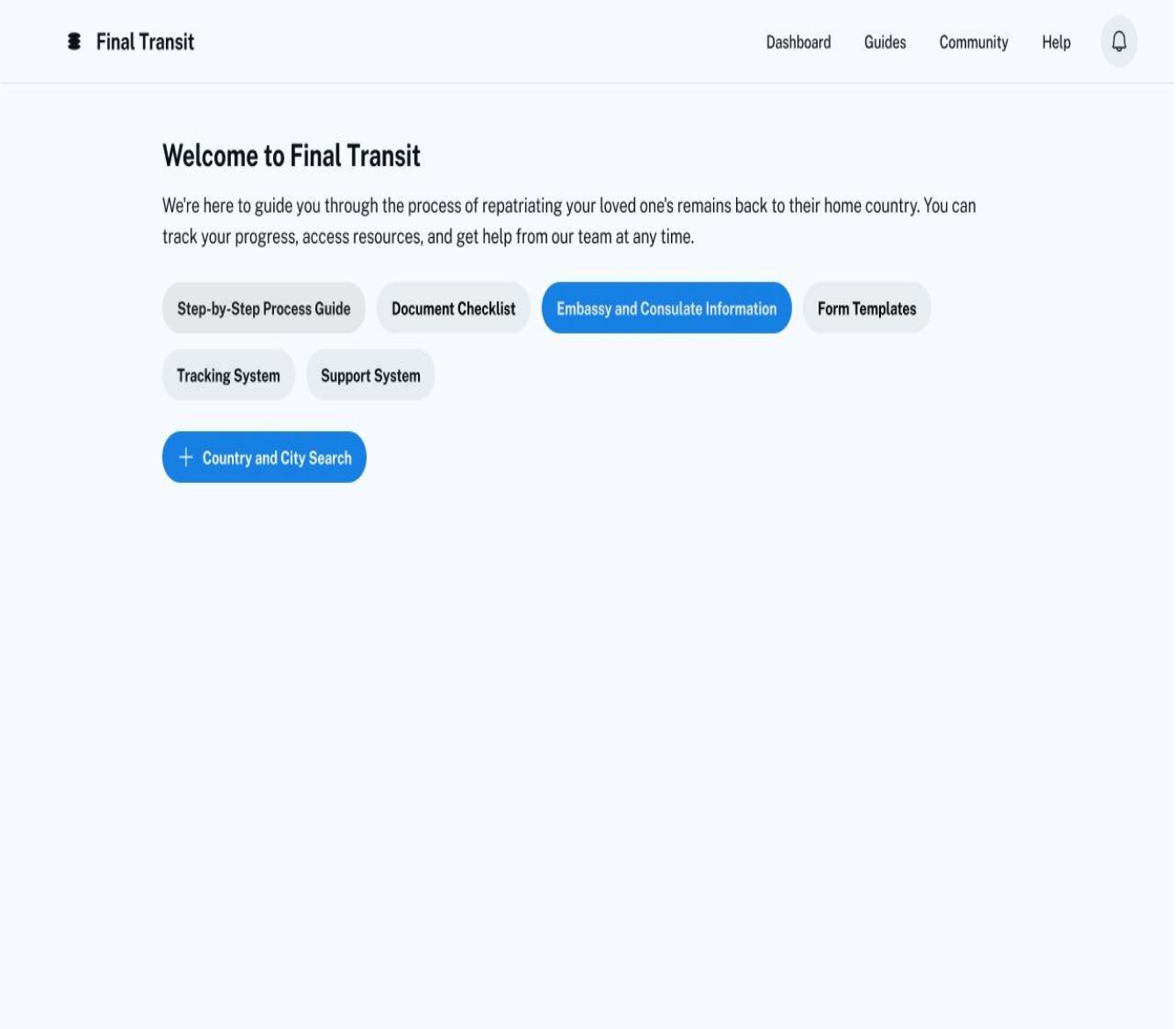
- **Step By Step Process Guide**



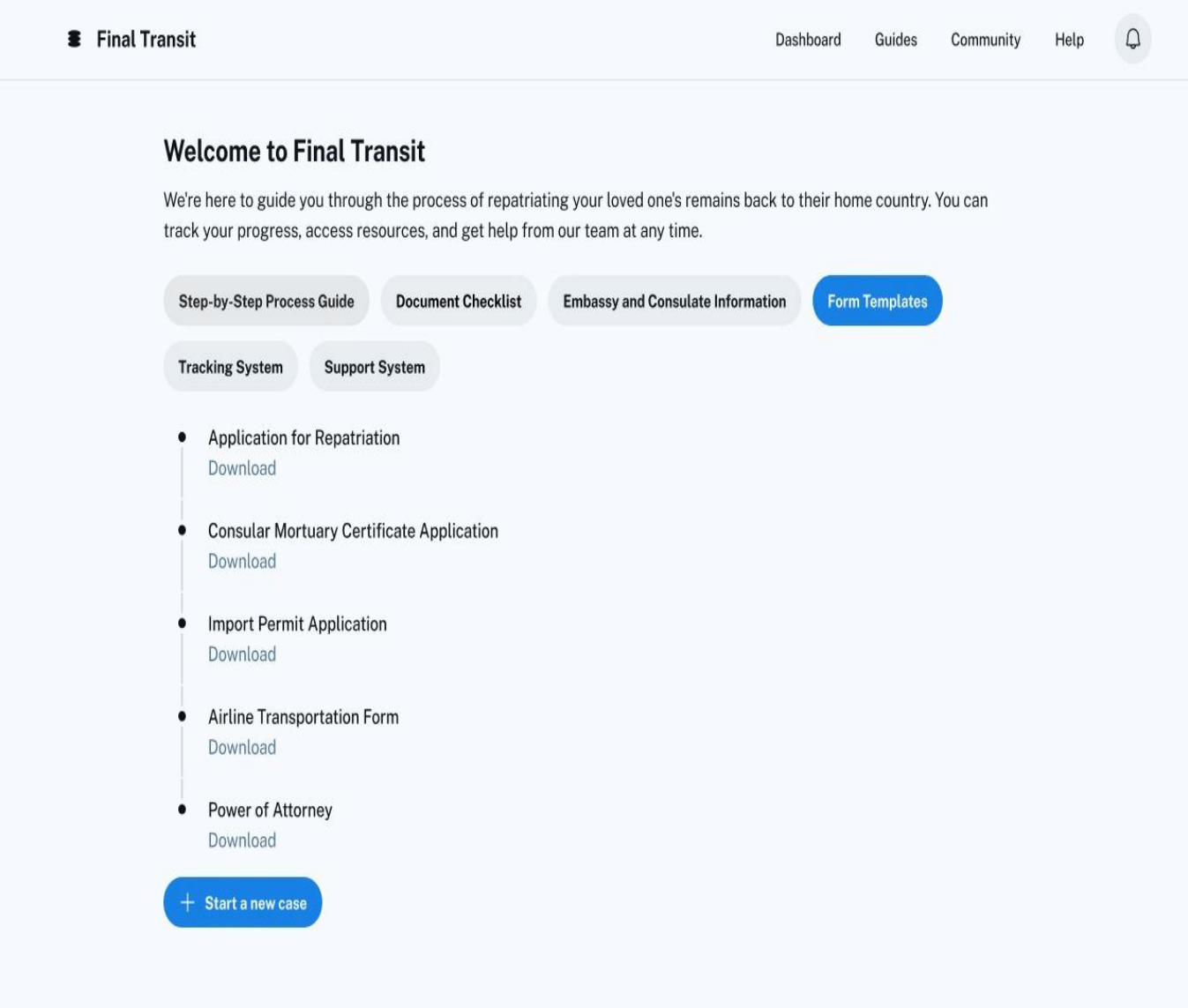
- **Document Checklist Page**



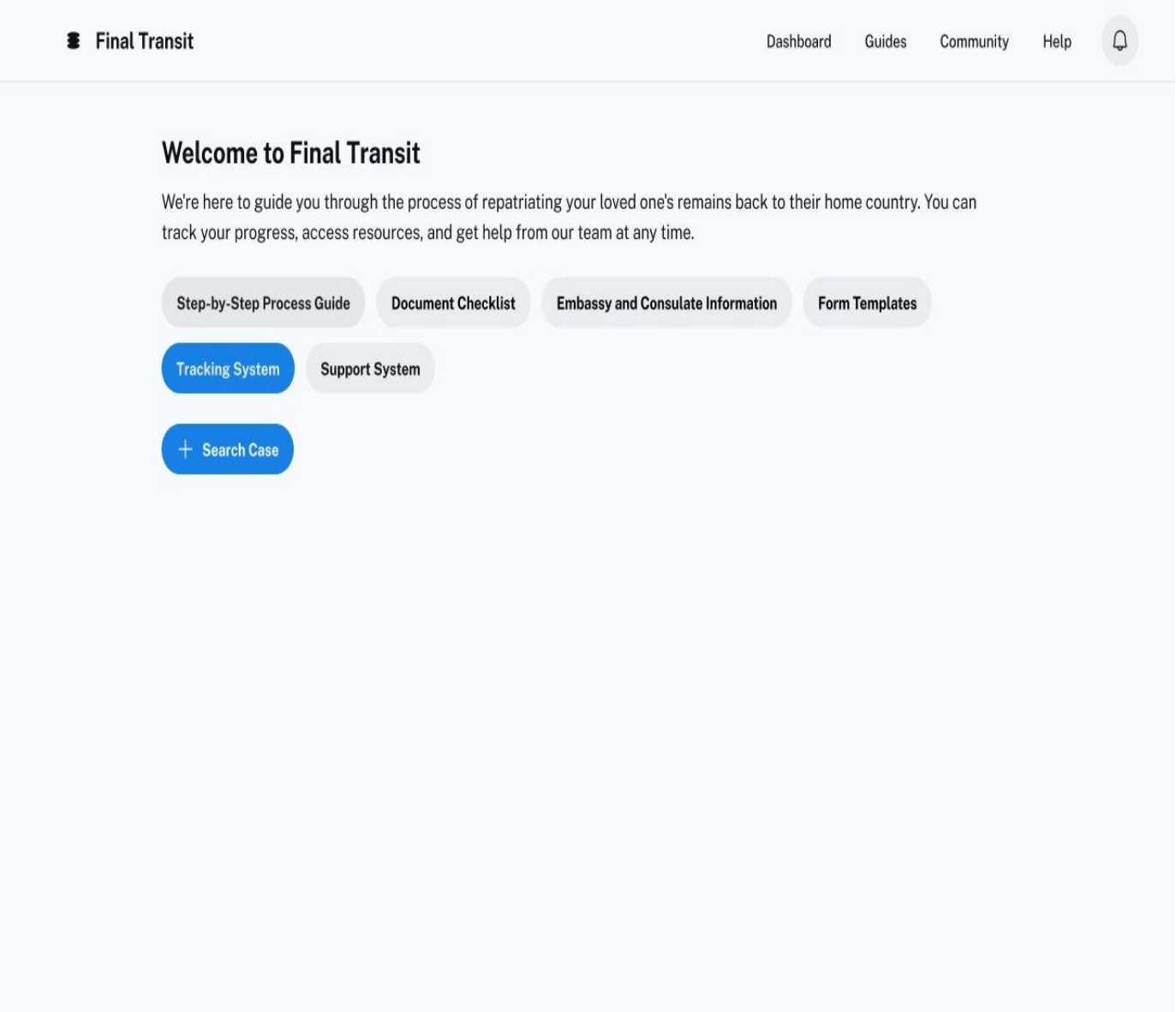
- **Embassy and Consulate Information**



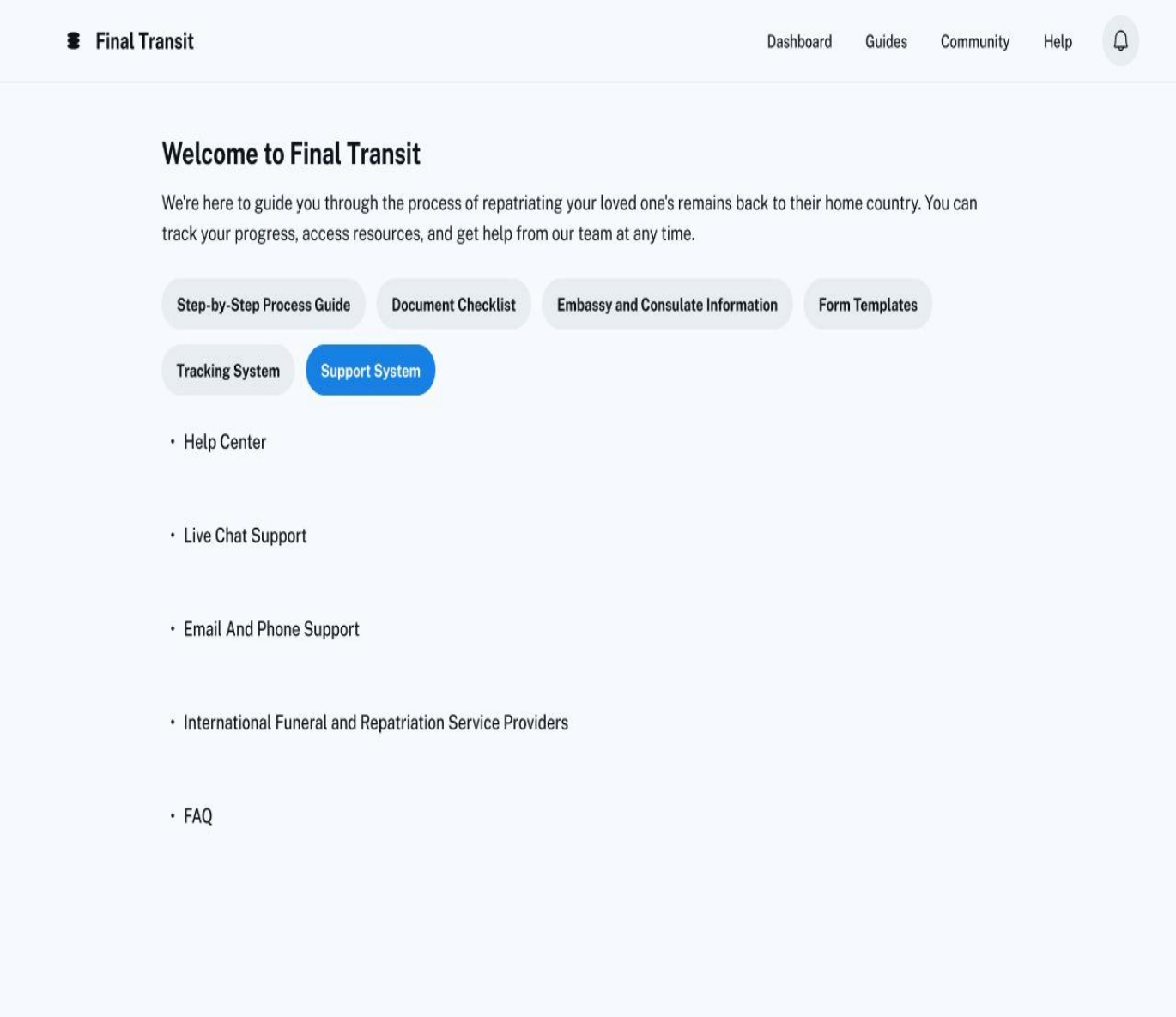
- **Form Template Page**



- **Tracking System**



- **Support System**



Test Planning for Final-Transit: Streamlined Repatriation Assistance for Loved Ones

The test planning for the **Final-Transit** project aims to ensure the quality, security, and reliability of the repatriation software solution. Given the sensitive and critical nature of the service, a thorough and structured testing approach is essential to validate the system's functionality, performance, security, and user experience.

Types of Tests Required:

1. Unit Testing

i. Purpose: To verify that individual components (functions, methods, or classes) of the software work as intended.
ii. Reason: Unit tests help identify bugs in the early stages of development, ensuring that each piece of the software functions correctly before integrating it with other components.

2. Integration Testing

i. Purpose: To test the integration of different modules and components to ensure they work together as expected.
ii. Reason: This type of testing ensures that the interfaces between modules are correctly implemented and that data is properly passed between them.

3. System Testing

i. Purpose: To evaluate the entire system’s compliance with the specified requirements.
ii. Reason: System testing is essential to verify that the software works as a complete system and meets all functional requirements, such as user registration, document management, and tracking system.

4. User Acceptance Testing (UAT)

i. Purpose: To validate that the software meets the needs of the end-users and is ready for deployment.
ii. Reason: UAT ensures that the software meets the business requirements and user expectations, and it is typically the last step before the software is released.

5. Regression Testing

i. Purpose: To verify that new code changes do not negatively impact the existing functionality of the software.
ii. Reason: As new features are added, regression testing ensures that previously working functionalities continue to work as expected.

6. Security Testing

i. Purpose: To identify vulnerabilities, threats, and risks in the software and ensure that data is protected against unauthorized access.
ii. Reason: Given the sensitive nature of the data involved (user information, document uploads), security testing is crucial to safeguard against potential breaches and data leaks.

7. Performance Testing

i. Purpose: To assess the performance of the software under various conditions, including load testing and stress testing.
ii. Reason: Performance testing is necessary to ensure that the system can handle high loads (e.g., multiple users registering simultaneously) and operates efficiently under stress.

8. Usability Testing

i. Purpose: To evaluate the software's ease of use, user interface, and overall user experience.
ii. Reason: Usability testing helps identify areas where the user interface might be confusing or difficult to use, ensuring a positive user experience.

9. Compatibility Testing

iii. Purpose: To ensure the software works across different devices, operating systems, and browsers.
iv. Reason: This testing ensures that users can access the software from various platforms without any issues.

10. Backup and Recovery Testing

v. Purpose: To ensure that the software's backup and recovery mechanisms work as expected.
vi. Reason: It is crucial to verify that data can be recovered in case of system failure or data loss.

Roles for Testing:

Project Manager

- **Responsibilities**: Plan, coordinate, manage risks, and report progress.

Software Developer

- **Responsibilities**: Code, implement functionalities, and fix issues.

Quality Assurance (QA) Engineer

- **Responsibilities**: Test software, identify bugs, and ensure quality.

Business Analyst

- **Responsibilities**: Gather and document requirements, and ensure alignment with business needs.

UI/UX Designer

- **Responsibilities**: Design user interfaces, create prototypes, and improve user experience.

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Md. Shafin Ahamed		
Test Case ID: TC-001		Test Designed date: 8-09-2024		
Test Priority : High		Test Executed by:		
Module Name: User Registration and Authentication		Test Execution date:		
Test Title: Verify User Registration with Valid Email and Password				
Description: This test case verifies that a user can register successfully with a valid email and password.				
Precondition (If any): The user does not have an existing account with the email provided.				
Test Steps	Test Data	Expected Results	Actual Results	Status

1.Navigate to the registration page. 2. Enter a valid email address in the "Email" field. 3.Enter a valid password in the "Password" field. 4. Confirm the password in the "Confirm Password" field. 5. Click on the "Register" button.	1. **Email:** example@test.com 2. **Password:** ValidPassword123	1. The system sends a verification email to the provided email address. 2. A confirmation message is displayed stating that the registration was successful.		
Post Condition: A verification email is sent to the user's email address.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Md. Shafin Ahamed		
Test Case ID: TC-002		Test Designed date: 8-09-2024		
Test Priority : High		Test Executed by:		
Module Name: User Registration and Authentication		Test Execution date:		
Test Title: Verify User Login with Correct Credentials				
Description: This test case verifies that a user can log in successfully using a registered email and password.				
Precondition (If any): The user has successfully registered and verified their email.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the login page. 2.Enter the registered email address	**1.Email:** example@test.com **2.Password:** ValidPassword123	1.The user is redirected to the home page of their account. 2.The home page displays a		

in the "Email" field. 3.Enter the correct password in the "Password" field. 4.Click on the "Login" button.		welcome message or user-specific content.		
Post Condition: The user is logged in and the session is active.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Nazifa Tabushum Turaba		
Test Case ID: TC-003		Test Designed date: 8-09-2024		
Test Priority : High		Test Executed by:		
Module Name: User Registration and Authentication		Test Execution date:		
Test Title: Verify Password Reset via Email				
Description: This test case verifies that a user can reset their password via email if they forget it.				
Precondition (If any): The user is registered and has a valid email associated with their account.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the login page. 2.Click on the "Forgot Password?" link. 3.Enter the registered email address.	**1.Email:** example@test.com **2.New Password:** NewValidPassword123	1.The system sends a password reset email to the user. 2.Upon clicking the link and entering a new password, the system		

4.Click on the "Submit" button. 5.Check the email inbox for the password reset link. 6.Click on the password reset link received in the email. 7.Enter a new password and confirm it. 8.Click on the "Reset Password" button.		successfully updates the user's password.		
Post Condition: The user can log in with the new password.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Nazifa Tabushum Turaba		
Test Case ID: TC-004		Test Designed date: 8-09-2024		
Test Priority :High		Test Executed by:		
Module Name: Step-by-Step Process Guide		Test Execution date:		
Test Title: Verify Initial Information Collection for Deceased.				
Description: This test case verifies that users can enter initial information about the deceased.				
Precondition (If any): The user is logged in and has access to the step-by-step guide.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the step-by-step process guide.	1.Passport Number: AB1234567	1.The system accepts the information and displays a		

2.Enter the deceased's passport number. 3.Select the country where the death occurred. 4.Optionally provide details about the cause of death. 5.Upload a copy of the death certificate (if available). 6.Confirm and submit the information.	2.Country: USA 3.Cause of Death: Heart Attack 4.Death Certificate: death_certificate.pdf	confirmation message. 2.The user is directed to the next step in the process.		
Post Condition: The initial information is saved, and the user can proceed to the next step.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Eshika Biaswas		
Test Case ID: TC-005		Test Designed date: 8-09-2024		
Test Priority : High		Test Executed by:		
Module Name: Document Checklist		Test Execution date:		
Test Title: Verify Document Checklist Generation Based on User Input				
Description: This test case verifies that the system generates a checklist of required documents based on user-provided information.				
Precondition (If any): The user has completed the initial information collection step.				
Test Steps	Test Data	Expected Results	Actual Results	Status
Test Steps:	1. User Input:	1. The system		

1.Navigate to the document checklist section. 2.Review the generated checklist based on the provided information. 3.Follow the instructions provided for obtaining each document. 4.Upload scanned copies of the required documents.	Deceased information provided in TC-004	generates a customized checklist. 2. Users can view detailed instructions for obtaining each document. 3. Users can upload scanned copies of their documents.		
Post Condition: Uploaded documents are saved and associated with the user's account.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Eshika Biaswas		
Test Case ID: TC-006		Test Designed date: 8-09-2024		
Test Priority : Medium		Test Executed by:		
Module Name: Embassy and Consulate Information		Test Execution date:		
Test Title: Verify Display of Embassy and Consulate Contact Information				
Description: This test case verifies that the system correctly displays contact information for embassies and consulates.				
Precondition (If any): The system has access to up-to-date embassy and consulate contact information.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the embassy	Country: USA	The system displays		

and consulate information section. 2. Select the country where the death occurred. 3. View the contact details for the local embassy or consulate.		detailed contact information, including addresses, phone numbers, email addresses, and office hours for the selected embassy or consulate.		
Post Condition: Contact information is accessible and can be used for communication.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Mir Md Mofakkar Hossain		
Test Case ID: TC-007		Test Designed date: 8-09-2024		
Test Priority : High		Test Executed by:		
Module Name: Tracking System		Test Execution date:		
Test Title: Verify Real-Time Tracking of Repatriation Process				
Description: This test case verifies that the system accurately tracks the status of the repatriation process in real-time and provides updates to the user.				
Precondition (If any): The user has initiated the repatriation process and the system is integrated with a logistics provider (e.g., DHL, FedEx).				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the tracking section. 2.View the real-time status of the repatriation process. 3.Verify that notifications	1.Tracking Number: DHL1234567890 2.Notification Email: example@test.com 3.Notification Phone	1.The system displays real-time tracking information. 2.Notifications are sent to the user for important updates.		

(email/SMS) are received for any status updates.	Number: +1234567890			
Post Condition: The user is informed of the repatriation status through the system and notifications.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Mir Md Mofakkar Hossain		
Test Case ID: TC-008		Test Designed date: 8-09-2024		
Test Priority : Medium		Test Executed by:		
Module Name: Form Templates		Test Execution date:		
Test Title: Verify Auto-Fill Functionality for Form Templates				
Description: This test case verifies that the system can auto-fill form templates with user-provided information.				
Precondition (If any): The user has entered the required information about the deceased in previous steps.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the form templates section. 2.Select a form template (e.g., burial permit). 3.Verify that the form is auto-filled with the user's previously entered information. 4.Download the completed form.	1.Selected Form: Burial Permit 2.Deceased Information: As provided in TC-004	1.The form is correctly auto-filled with the provided information. 2.The user can download the completed form.		

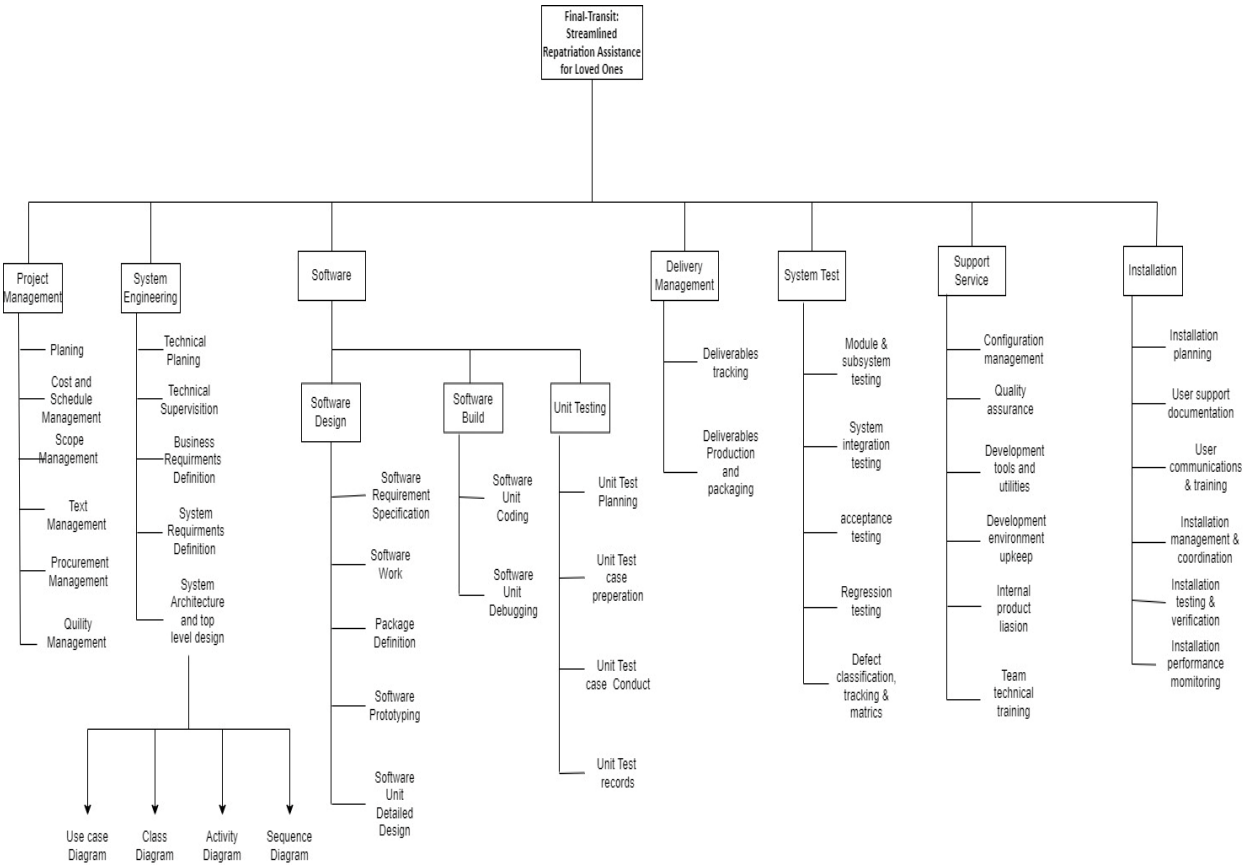
Post Condition: The auto-filled form is ready for submission or further processing.

Project Name : Streamlined Repatriation Assistance for Loved Ones.		Test Designed by: Asif Uddin Sazid		
Test Case ID: TC-009		Test Designed date: 8-09-2024		
Test Priority : Medium		Test Executed by:		
Module Name: Support System		Test Execution date:		
Test Title: Verify Chatbot Functionality for Handling Common Queries				
Description: This test case verifies that the chatbot can handle common queries and provide instant support to the user.				
Precondition (If any): The chatbot is active and has access to relevant information.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the support section. 2.Initiate a chat with the chatbot. 3.Ask a common query (e.g., "How do I upload a death certificate?"). 4.Review the chatbot's response.	Query: "How do I upload a death certificate?"	1.The chatbot provides a clear and accurate response to the query. 2.The user receives guidance on how to upload the death certificate.		
Post Condition: The user’s query is resolved, and they are able to proceed with the required action.				

Project Name : Streamlined Repatriation Assistance for Loved Ones.	Test Designed by: Asif Uddin Sazid

Test Case ID: TC-0010		Test Designed date: 8-09-2024		
Test Priority : Medium		Test Executed by:		
Module Name: User Profile		Test Execution date:		
Test Title: Verify User Profile Update Functionality				
Description: This test case verifies that users can view and edit their profile information, including personal details and contact information.				
Precondition (If any): The user is logged in and has access to their profile.				
Test Steps	Test Data	Expected Results	Actual Results	Status
1.Navigate to the user profile section. 2.View the current profile information. 3.Edit the profile information (e.g., change the phone number). 4.Save the changes.	New Phone Number: +0987654321	1.The profile information is updated successfully. 2.A confirmation message is displayed, indicating that the changes have been saved.		
Post Condition: The updated profile information is reflected in the system.				

WBS: Work Breakdown Structure



Effort Estimation:
COCOMO (Constructive Cost Model)

Software Project Type	**Coefficient** <Effort Factor>	**P**	**T**
Organic	2.4	1.05	0.38
Semi-detached	3.0	1.12	0.35
Embedded	2.4	1.20	0.32

We assume our SLOC (Source Line of Code) is 6000 For

Organic,

Coefficient$_{\text{<Effort Factor>}}$=2.4

P= 1.05

T=0.38

So, Effort = PM= Coefficient* $(\frac{SLOC}{1000})^{P}$

$=2.4* (\frac{6000}{1000})^{1.05}$

= 15.75

Development Time = DM = 2.5* $(PM)^{T}$

$= 2.5*15.75^{0.38}$

=7.127

Requirement Number of People=ST = $\frac{PM}{DM}$

$=\frac{15.75}{7.12}$

=2.212

=3

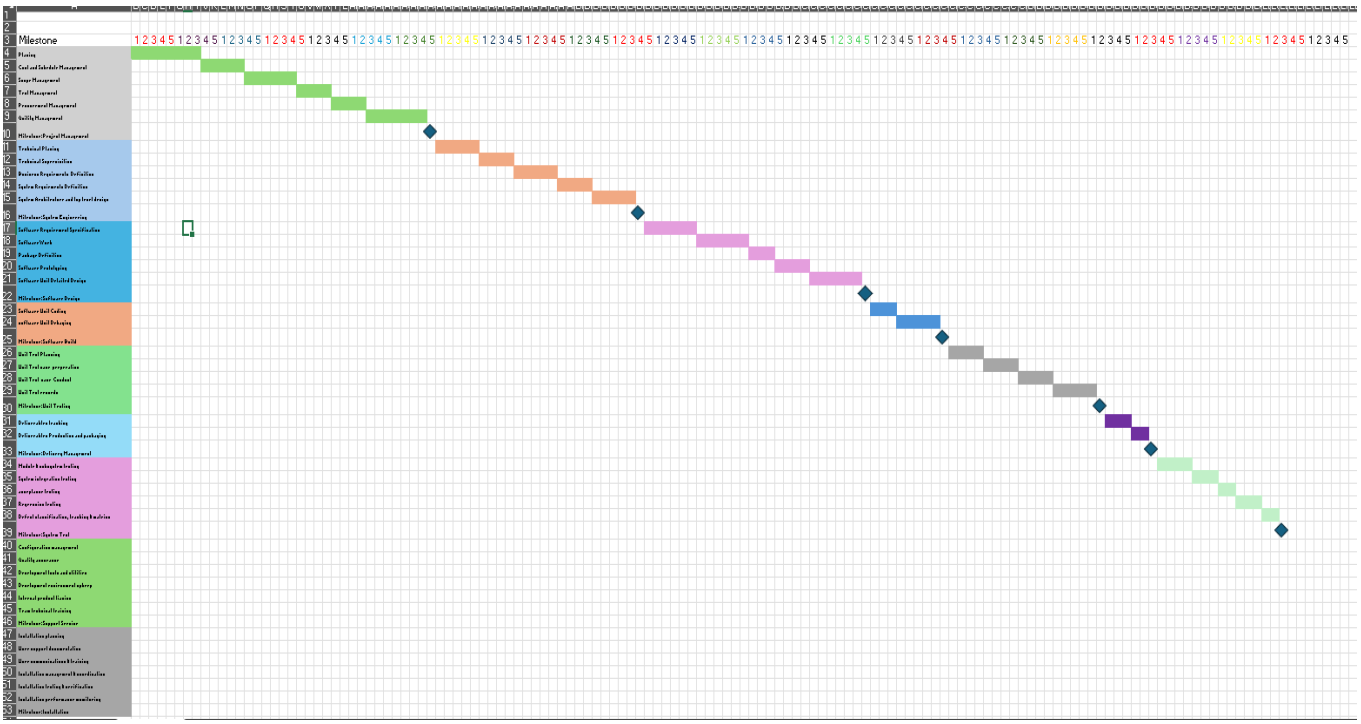
Thus, the project development will take three persons and seven and a half months, or nearly 29 weeks, to complete.

Timeline -1

	Pre Game				Game Phase																				Post Game				
					Sprint 1				Sprint 2				Sprint 3				Sprint 4				Sprint 5								
Task: Person	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
A:Role-1																													
B:Role-1																													
C:Role-1																													
D:Role-2																													
E:Role-3																													
F:Role-2																													
G:Role-3																													
H:Role-3																													
I:Role-1																													

A. Analysis
B. Specification
C. High Level Architecture Design
D. Coding
E. Delivery
F. Integration
G. System Testing
H. Documentation
I. Release

Timeline -2



Total Working days = PM*20 = 15.75*20 = 315

EVA Analysis :

The project consists of 41 planned tasks, with a total estimated effort of PM × 20 = 15.75 × 20 = 315 person-days to complete. As of now, 8 tasks have been completed, although the project schedule indicates that 13 tasks should have been finished by this time. The following scheduling data, presented in person-days, is available:

Tasks	Planned Effort	Actual Effort
1	13	12
2	12	10
3	7	8
4	13	14
5	12	11
6	6	6
7	8	7
8	11	11
9	6	
10	7	
11	11	
12		
13		

BCWS

BCWP

ACWP

Given ,
The total number of tasks = 41

Effort estimated, BAC = PM*20 = 315
BCWS = = (13+12+7+13+12+6+8+11+6+7+11)=106
BCWP = (13+12+7+13+12+6+8)=71
ACWP = 12+10+8+14+11+6+7+11=79

So,

- SPI = $\frac{BCWP}{BCWS} = \frac{71}{106}$ = 0.6698
- SV = BCWP – BCWS = 71-106 = -35 person-day

- CPI = $\frac{BCWP}{ACWP} = \frac{71}{79}$ = 0.8987
- CV = BCWP – ACWP = 71 – 79 = -8 person-day

- %schedule for completion = $\frac{BCWS}{BAC} = \frac{106}{315} \times 100\%$ = 33.65%
  [% of work scheduled to be done at this time]

- %completed = $\frac{BCWP}{BAC} = \frac{71}{315} \times 100\%$ = 22.54%
  [% of work completed at this time]

Here,

BAC is the budgeted cost of work scheduled.
SPI is schedule performance index.
SV is schedule variance.
CPI is cost
performance index.
CV is cost variance.
BCWP is the sum of BCWS for all work tasks that has been completed by a point of time.
BCWS effort planned for each task.
ACWP is the actual cost of work performed.

Risk management

Risks	Category	Probability	Impact
Size estimate maty be significantly low	PS	50%	2
Larger Number of users than planned	PS	30%	3
Less reuse than planned	PS	40%	1
End-users resist system	BU	40%	1
Delivery deadline will be tightened	BU	50%	2
Funding will be lost	CU	30%	1
Customer will change requirements	PS	70%	2
Technology will not meet expectations	TE	30%	1
Staff inexperienced	ST	40%	1
Staff turnover will be high	ST	50%	2
Technology Reliability and Dependency	DE	60%	2
Data Security and Privacy Breaches	CU	70%	2
Environmental Vulnerabilities	BU	50%	2
Lack of training	BE	60%	3

Improper data analysis	DE	15%	1
Wrong data collection	BE	10%	1

Risks	Risks Reduction technique
Size estimate maty be significantly low	To minimize the risk of significantly low size estimates, incorporate extra time or resources into the project plan as a buffer for potential underestimation.
Larger Number of users than planned	To minimize the risk of a larger number of users than planned, ensure scalability and robustness in the system architecture.
Less reuse than planned	To minimize the risk of less reuse than planned, consider diversifying resources across projects or components.
End-users resist system	To minimize end-users' resistance to the system, involve them early, address concerns promptly, and provide support throughout implementation.
Delivery deadline will be tightened	Focus on important tasks, streamline work, use resources well, talk clearly, be flexible with Agile, watch for risks, work together, check progress, and be ready for changes.
Funding will be lost	To reduce the risk of losing funding, teams can save money, seek additional funding sources, demonstrate project value, manage risks, maintain stakeholder engagement, and monitor project performance closely.
Customer will change requirements	To minimize the risk of changing customer requirements, maintain open communication, implement Agile methodologies, gather feedback regularly, document requirements clearly, and collaborate closely with stakeholders.
Technology will not meet expectations	To reduce the risk of technology not meeting expectations, ensure thorough assessment, stakeholder involvement, clear communication, realistic goal-setting, adequate training, rigorous testing, continuous improvement, and contingency planning.
Staff inexperienced	To mitigate the risk of inexperienced staff, provide comprehensive training and support, foster a supportive team environment, and consider hiring experienced personnel for critical roles.

Staff turnover will be high	To lower the risk of high staff turnover, offer good pay, opportunities to grow, a positive work atmosphere, work-life balance, and listen to and act on employee feedback.
Technology Reliability and Dependency	To lessen the risk of technology problems and dependence, use different solutions, keep technology up-to-date, have backups, train employees, and make plans for when things go wrong.
Data Security and Privacy Breaches	To lower the risk of data security and privacy breaches, protect data with encryption, train staff, update systems regularly, conduct audits, use multi-factor authentication, and comply with regulations.
Environmental Vulnerabilities	To reduce the risk of environmental vulnerabilities, plan for disasters, assess and mitigate risks, use resilient infrastructure, and educate staff on emergency procedures.
Lack of training on tour	To prevent the risk of not enough training, offer thorough training sessions and ongoing support for learning.
Improper data analysis	To lower the risk of improper data analysis, ensure proper training, quality control, collaboration among analysts, validation of findings, and use of data visualization tools.
Wrong data collection	To mitigate the risk of wrong data collection, establish clear procedures, provide training, implement quality checks, review collected data regularly, and use standardized tools.