



American International University-Bangladesh (AIUB)

Department of Computer Science
Faculty of Science & Technology (FST)

SMART PORCHA: YOUR DIGITAL OWNERSHIP

A Software Engineering Project Submitted to
FARZANA BENTE ALAM
Submitted By

Semester: Fall_23_24		Section: G	Group Number: 4	
SN	Student Name	Student ID	Contribution (CO2+CO3)	Individual Marks
1	Abu Talha Mohammad Muyeed	20-44028-2		
2	Md. Unisa Mahadi	21-45405-3		
3	Toufiq Ahmed Shishir	22-46260-1		
4	Shah Rahat Hoissain	22-47411-2		
5	Syed Rayhan Masud	21-45276-2		

The project will be Evaluated for the following Course Outcomes

CO2: <i>Analyze</i> the impact of software engineering models over various context of software development to assess societal, health, safety, legal and cultural issues.	Total Marks
Project Background Analysis and feasibility (needs, goal, benefits, etc.)	[5 Marks]
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]
Review of existing Studies and Relevant Example	[5Marks]
CO3: <i>Explain</i> appropriate software engineering model, project management roles and their skills in the context of professional engineering practice and solutions to complex engineering problems in a software development environment.	Total Marks
Appropriate Process Model Selection and Argumentation with Evidence	[5Marks]
Evidence of Argumentation regarding process model selection	[5Marks]
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]

Student Name: **Abu Talha Mohammad Muyeed**

Student ID: **20-44028-2**

Contribution in Percentage (%): 20 Contribution
in the Project:

- Project proposal
- Functional requirements
- Class Diagram
- User interface
- sequence diagram
- activity diagram
- Use case diagram
- WBS
- Test Cases
- COCOMO
- Timeline Charts
- Activity Key
- EVA Calculation
- Risk Management

Signature of the Student

Student Name: **Md. Unisa Mahadi**

Student ID: **21-45405-3**

Contribution in Percentage (%): 20 Contribution
in the Project:

- Project proposal
- Functional requirements
- Class Diagram
- User interface
- sequence diagram
- activity diagram
- use case diagram
- WBS
- Test Cases
- COCOMO
- Timeline Charts
- Activity Key
- EVA Calculation
- Risk Management

Signature of the Student

Student Name: **Toufiq Ahmed Shishir**

Student ID : **22-46260-1**

Contribution in Percentage (%): 20 Contribution in the Project:

- Project proposal
- Functional requirements
- Class Diagram
- User interface
- sequence diagram
- activity diagram
- use case diagram
- WBS
- Test Cases
- COCOMO
- Timeline Charts
- Activity Key
- EVA Calculation
- Risk Management

Signature of the Student

Student Name: **Shah Rahat Hoissain**

Student ID: **22-47411-2**

Contribution in Percentage (%): 20 Contribution in the Project:

- Project proposal
- Functional requirements
- Class Diagram
- User interface
- sequence diagram
- activity diagram
- use case diagram
- WBS
- Test Cases
- COCOMO
- Timeline Charts
- Activity Key
- EVA Calculation
- Risk Management

Signature of the Student

Student Name: **Syed Rayhan Masud**

Student ID: **21-45276-2**

Contribution in Percentage (%): 20 Contribution
in the Project:

- Project proposal
- Functional requirements
- Class Diagram
- User interface
- sequence diagram
- activity diagram
- use case diagram
- WBS
- Test Cases
- COCOMO
- Timeline Charts
- Activity Key
- EVA Calculation
- Risk Management

Signature of the Student

PROJECT PROPOSAL

Background Description:

The idea of ownership has expanded beyond physical goods in our quickly developing digital era to include a wide range of digital belongings, such as cryptocurrencies, digital artwork, intellectual property, and personal data. Despite being beneficial, this change has brought forth a significant challenge: the efficient management and verification of digital ownership rights.

Similarly, paper-based systems are still widely used in the real-estate and land property management sectors to manage and verify property rights. These traditional methods often turn out to be time-consuming, prone to errors, and contribute to property rights conflicts. The lack of comprehensive and secure way for asserting and authenticating ownership in the digital age is the common root cause of both domains. It is essential to address these issues as neglecting them has consequences in societal trust, data privacy, and cultural preservation while also impacting property ownership in the modern era.

Project Objective:

The project, ‘Smart Porcha’, aims to develop a user-centric, secure, and innovative digital platform that harnesses the possibilities of blockchain technology to establish and validate digital ownership rights effectively and efficiently.

Proposed Solution:

‘Smart Porcha’ presents the following key solutions:

- 1. Blockchain-Based Ownership Verification:** Leveraging the immutability and transparency of blockchain technology, ‘Smart Porcha’ will establish a tamper-proof digital ownership registry for assets which will work as a digital certificate of land and real estate ownership. It will act as an unalterable online ledger for property ownership information.
- 2. User-Centric Interface:** Acknowledging that not everyone is tech-savvy, we intend to design an intuitive user-friendly interface for the application. This will allow property owners to manage their ownership records with ease, requiring no specialized technical knowledge.
- 3. Legal Compliance:** Smart Porcha's success will be founded upon collaboration with legal experts to ensure strict adherence to relevant legal and regulatory frameworks. This will guarantee the legality of property transactions conducted through our platform.

Key Functionalities:

Smart Porcha's solution optimally exploits state-of-the-art technology through the following:

- **Immutable Ownership Records:** Utilizing blockchain technology, Smart Porcha will establish immutable property records.
- **User Profiles:** Secure profiles will be accessible to property owners for effective management.
- **Ownership Transfer:** A secure and straightforward mechanism for transferring property ownership seamlessly.
- **Encryption:** Robust encryption protocols will be implemented to safeguard data privacy.
- **Smart Contracts:** Implementation of smart contracts will automate complex processes.
- **Legal Framework Integration:** Seamless integration with legal frameworks to ensure legality and compliance.

Target User Group:

The primary beneficiaries of our solution include property owners, real estate agencies, and legal entities involved in property transactions. They will benefit from an efficient, secure, and legally compliant platform for managing land and real estate ownership.

Contribution to Scientific Development:

Smart Porcha aims to contribute to scientific knowledge by pioneering a blockchain-powered approach to property ownership management. By comprehensively documenting our research, methodologies, and findings, enhancing the understanding of property ownership in the digital era.

Literature Review:

Our literature review identifies existing studies in the domain of property ownership and land management. Smart Porcha extends these studies by integrating blockchain technology, prioritizing user-friendliness, legal compliance, and security.

Existing Solutions:

Currently, comprehensive solutions for the complexities of digital land and real estate ownership are limited. Some partial solutions exist, but none offer the holistic approach and user-friendly design of Smart Porcha.

Extending Existing Solutions:

Smart Porcha extends existing solutions by providing a secure, user-friendly, and legally compliant platform that empowers property owners and real estate professionals to manage their assets effectively. Our approach enhances user confidence and legal compliance, thus offering substantial benefits to users.

Basic Functionalities:

- **User Login:** Users will have the ability to securely log into their accounts using their registered email and password, with the option for password recovery and reset. Enhanced security may include multi-factor authentication for user verification.
- **User Registration:** New users can create accounts by providing necessary personal information, including contact details, and email verification will be required to ensure data accuracy. Acceptance of terms and conditions may be part of the registration process.
- **User Dashboard:** After login, users will be directed to a personalized dashboard displaying relevant information, summaries of property ownership records, recent activities, and quick links to essential features, providing a seamless user experience.
- **User Wallet:** The platform will offer a digital wallet, allowing users to manage financial transactions related to property assets. This feature will display balances, transaction histories, and options for deposit and withdrawal while maintaining the security of wallet transactions.
- **Record Query:** Users will have the capability to search and retrieve specific property ownership records based on various criteria, such as property location, owner name, or transaction date. The query results will provide detailed information about the selected record.
- **Transfer/Sell/Lease Asset:** Users will initiate property asset transfers, sales, or leases through the platform. The process will include input fields for buyer/lessee details, asset information, and transaction terms. All transactions will generate necessary legal documentation.
- **Update Records:** Users can modify or update their property ownership records as needed, including changes to property details, ownership transfers, or status updates. All record updates will be securely documented and accessible in the audit trail for transparency and compliance.
- **Authentication/Ownership Verification:** The platform will provide robust mechanisms for verifying property ownership, which may include digital signatures, smart contracts, and other authentication methods to ensure the legitimacy of transactions while adhering to legal standards and regulations.

- **Report Generation:** Users will be able to generate reports related to their property ownership records, financial transactions, or other relevant data. These reports will be customizable, allowing users to select specific data elements and timeframes, and can be downloaded in various formats for offline reference. The reporting feature aims to provide comprehensive insights for users.

Selection of Appropriate Process Model for Smart Porcha:

In the context of the "Smart Porcha" project, which aims to develop a secure and innovative blockchain-based platform for effective management and validation of digital ownership rights, the choice of an appropriate process model is of paramount significance. The project addresses the challenges associated with digital ownership rights, specifically in the domains of real estate and land property management.

Key Elements to Consider:

- **Customer-Centric Nature:** The primary objective of Smart Porcha is to establish a usercentric, secure, and efficient digital platform. This platform is designed to cater to property owners, real estate agencies, and legal entities involved in property transactions. To meet the diverse needs of these stakeholders effectively, the selected process model should be customer-centric.
- **Security and Legal Compliance:** Given the criticality of property ownership and transactions, the process model must ensure a high level of security and legal compliance. Property ownership is a complex and legally regulated domain, and any solution developed must seamlessly integrate with legal frameworks.
- **Innovation and Efficiency:** The project seeks to harness the possibilities of blockchain technology to innovate in the management of digital ownership rights. Efficiency is crucial in streamlining property transactions and ensuring that property owners can manage their assets with ease. The chosen process model should promote innovation and efficiency.

Selection of the Appropriate Process Model: Extreme Programming (XP)

After careful consideration and analysis of various software development process models, the choice of Extreme Programming (XP) emerges as the most suitable for the Smart Porcha project.

Smart Porcha's project team consists of a limited number of engineers. In such a scenario, the Agile principles embedded within Extreme Programming (XP) become even more relevant. XP's lightweight and flexible approach aligns with the needs of small, closely-knit teams. It promotes open communication, shared responsibilities, and a collaborative development environment. With a small team, the ability to adapt to changing requirements quickly and maintain a high level of code quality becomes essential. XP's practices like pair programming and collective code

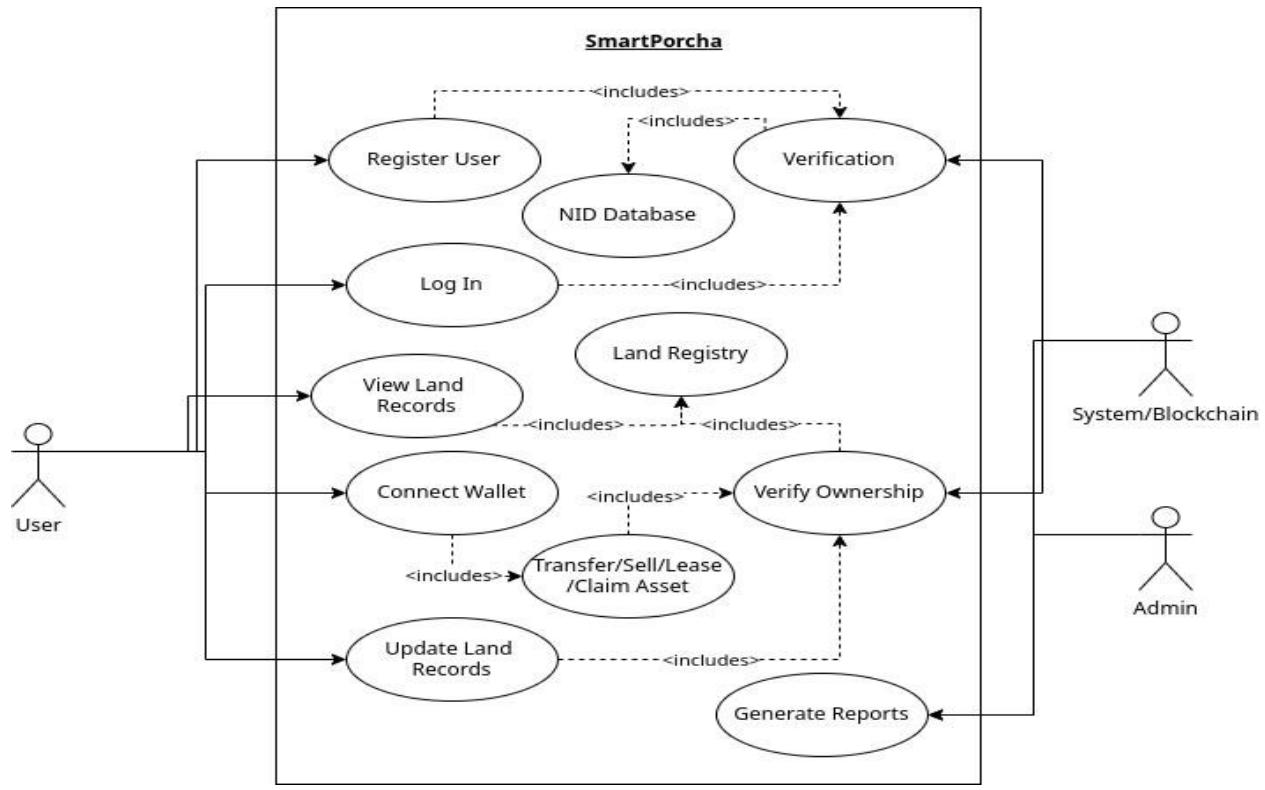
ownership facilitate knowledge sharing and help ensure that the project benefits from the collective expertise of the team. This approach, coupled with the iterative and incremental nature of XP, can significantly enhance the efficiency and effectiveness of a smaller development team like the one working on the Smart Porcha project.

- **Customer-Centric Approach:** XP places a strong emphasis on understanding and delivering what the customer truly needs. In the context of Smart Porcha, where userfriendliness and accessibility are pivotal, the customer-centric approach of XP aligns well with the project's objectives. It ensures that the final product caters to the needs of property owners, real estate agencies, and legal entities involved in property transactions.
- **Adaptability:** The project operates in an evolving digital landscape with changing regulatory and technological factors. XP's iterative and incremental approach allows for frequent changes to be accommodated, reducing risks associated with changing requirements and ensuring that the platform remains up to date.
- **Quality Assurance and Security:** XP promotes continuous testing and integration. This is essential in the context of Smart Porcha, which deals with sensitive property ownership data. Security and quality assurance are paramount to maintaining the integrity of the platform.
- **Transparent Communication:** Open and transparent communication is encouraged within XP teams. This ensures a shared understanding of project goals, potential challenges, and progress. It is a crucial element when developing a platform that needs to meet diverse user needs effectively.
- **Collaborative Development:** In the complex domain of property ownership management, collaborative development is key. XP encourages practices like pair programming and collective code ownership, which facilitate knowledge sharing and maintain high code quality.

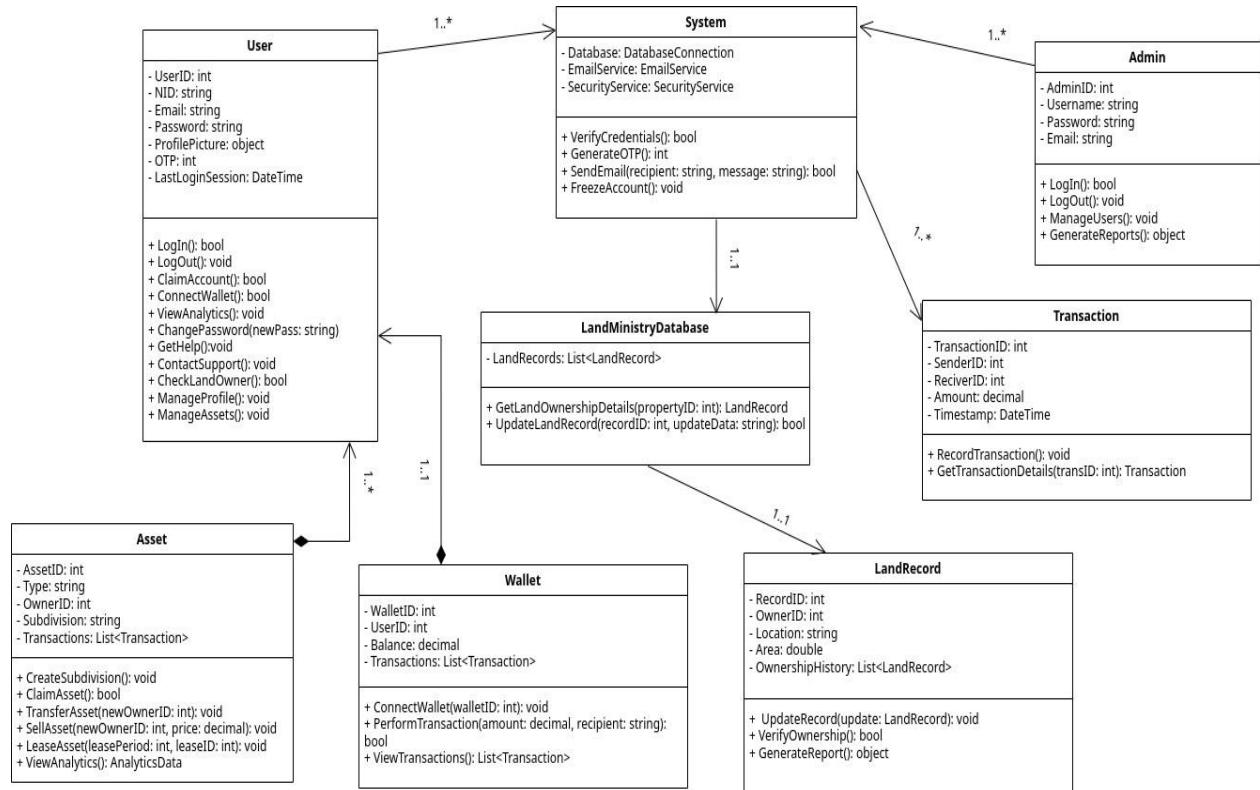
In conclusion, the selection of Extreme Programming as the process model for Smart Porcha is well-justified based on its customer-centric, adaptable, and quality-driven approach. It aligns with the key project elements, such as user-centric design, security, legal compliance, innovation, and efficiency, making it the most appropriate choice for the successful development of the platform.

System Design Specifications:

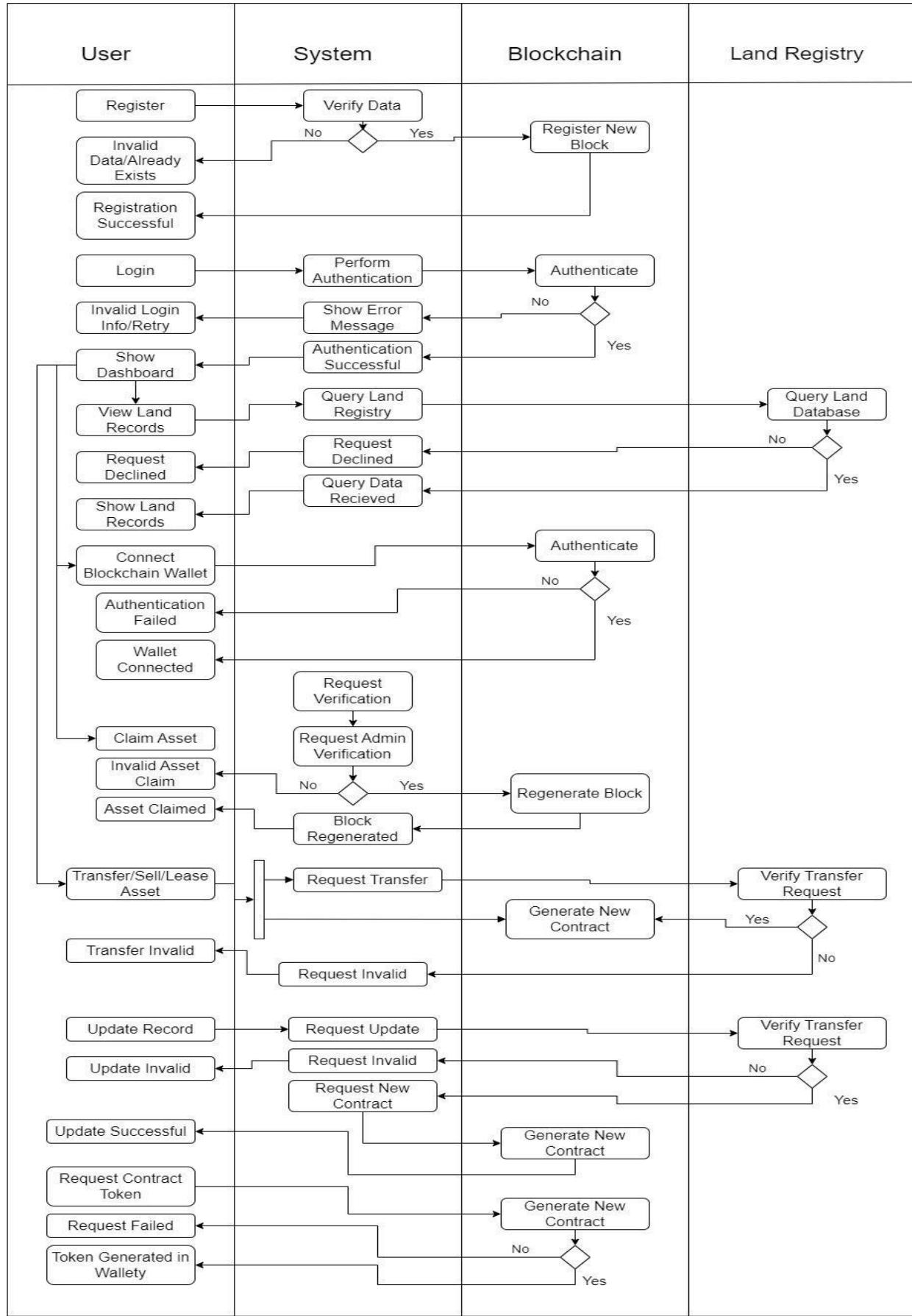
- Use Case Diagram



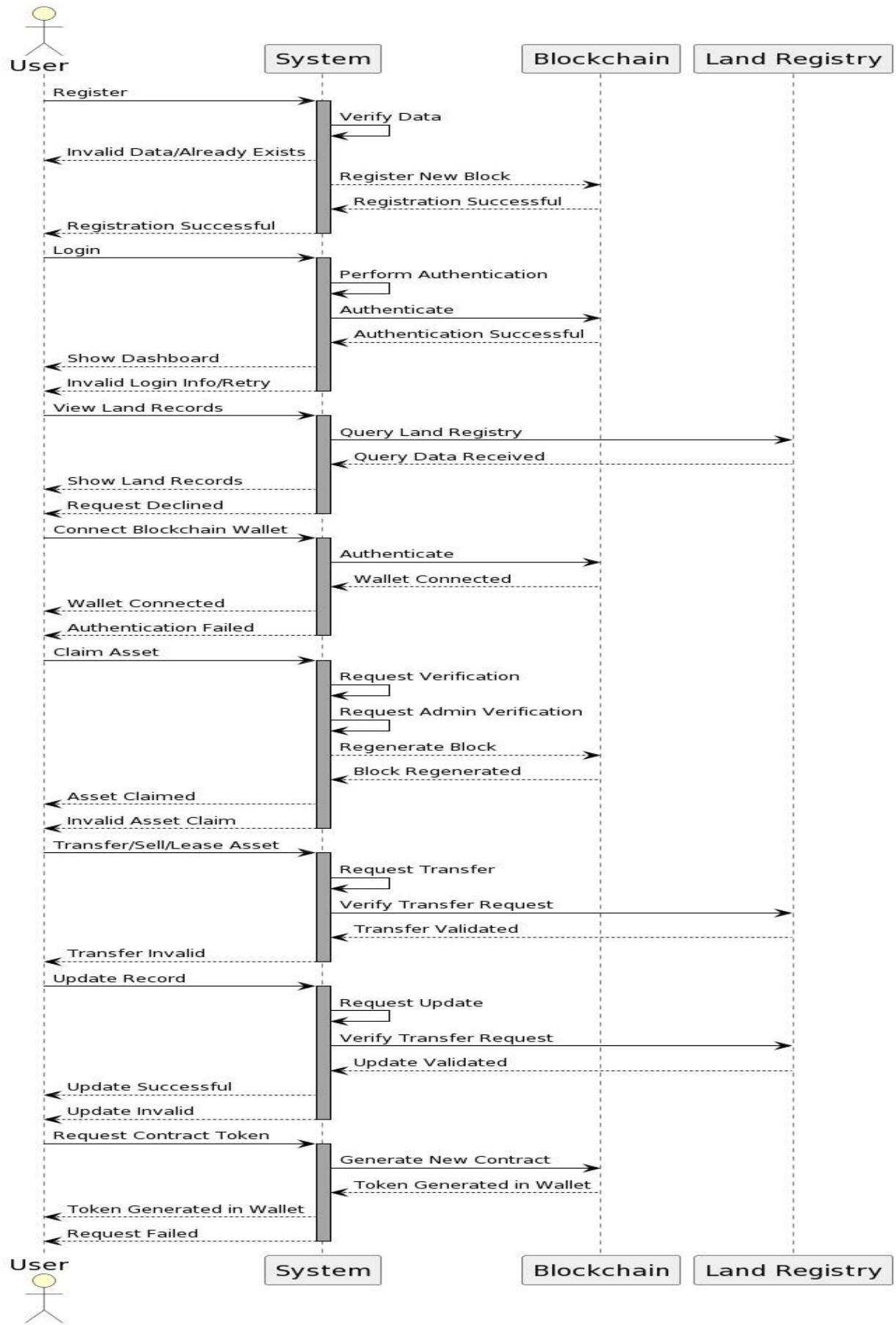
- Class Diagram



- Activity Diagram

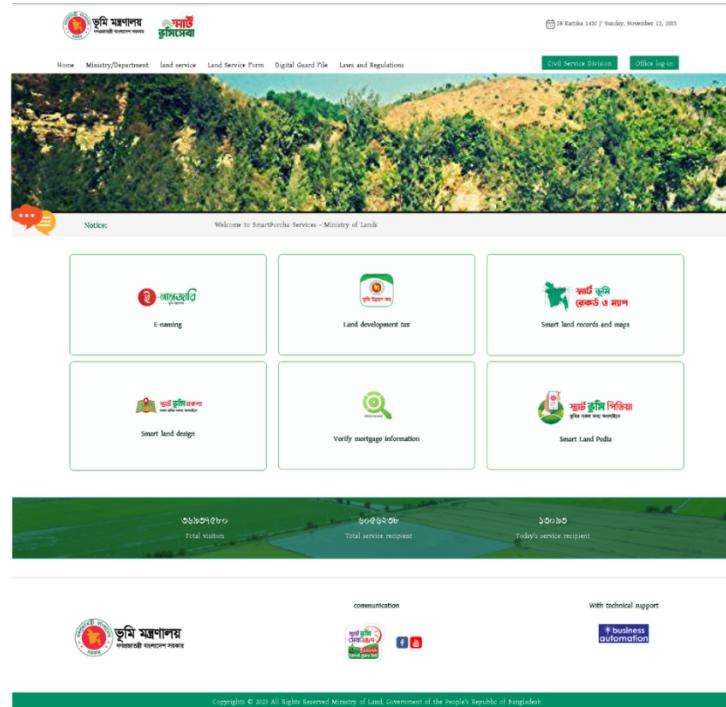


- Sequence Diagram



User Interface

Home page (Dashboard)



The screenshot shows the homepage of the Smart Porcha Services - Ministry of Land. At the top, there are navigation links: Home, Ministry/Department, land service, Land Service Form, Digital Guard File, Laws and Regulations, Log Service Officer, and Other Log in. The date is shown as ১৫ কৃত্তি ১৪২ / Sunday, November 12, 2023. Below the navigation is a large banner image of a green hillside. A notice icon and the text "Notice" are visible. The main content area features six service cards arranged in two rows of three:

- E-tanqim (E-Tanqim)
- Land development tax
- Smart land records and maps
- Smart land design
- Verify mortgage information
- Smart Land Pedia

Below the cards, three statistics are displayed: Total visitors (৭০৬৯৮১৮০), Total service recipient (৩৪৭১৮৮), and Today's service recipient (১০০৫৫). The footer contains the Ministry of Land logo, communication links (Email, Facebook, YouTube), technical support information (With technical support, # business automation), and a copyright notice: Copyright © 2023 All Rights Reserved Ministry of Land, Government of the People's Republic of Bangladesh.

Login



F&Q

The screenshot shows a web page titled "General information and queries related to Namjari". It includes a navigation bar with links to Home, ask, communication, Online examination, and Statistics. Below the title is a detailed description of Namjari, mentioning its definition as a change of ownership in land matters and the information recorded in it. A section titled "Namjari service receipt time" lists various processing times based on factors like location and type of landowner. At the bottom, there's a feedback section asking if the article was helpful, with "yes" and "no" buttons.

General information and queries related to Namjari

Namjari or mutation is the change of ownership in land matters. When a person or institution acquires ownership of land/land through any legal means, updating the record in his name by correcting the government records is called Namjari. When a person's registration is completed, he is given a khatian containing a brief account of the land acquired by him. The statement of accounts is the name of the owner or owners, the name and number of the mauza (JL number), the dug number of the land, the amount of land in the dug, the owner's share of the land and the amount of land etc. are recorded. The comment column may contain some related information.

(1) Time of receipt of Namjari service

Namjari service receipt time

- 28 (twenty eight) working days in general case.
- 12 (twelve) working days for expatriates (metropolitan areas).
- For expatriates (other areas) 09 (nine) working days.
- 10 (ten) working days for certified freedom fighters.
- 07 (seven) working days for important/export oriented foreign invested industries.

Was this article helpful?

Conditions Nomenclature steps Notification / Rules regarding Nomination Grievance Redressal Mechanism

Suggestions for improving the quality of the portal

With technical support
*business automation

Contact

The contact page features several green rounded rectangular buttons with white text: "ভিশন ও মিশন", "অভ্যন্তরীণ ই-সেবাসমূহ", and "মতামত এবং অভিযোগ". To the right, a large red button displays a black phone icon and the number "456789" followed by the text "হটলাইন নাম্বার". Below this are five green boxes, each containing a white checkmark and a corresponding service: "ই - নামজারি", "ওয়েব মেইল", "ভূমি উন্নয়ন কর", "ডিজিটাল রেকর্ড রুম", and "অভিযোগ প্রতিকার ব্যবস্থাপনা". The background features stylized green hills and a white cloud.

ভিশন ও মিশন

অভ্যন্তরীণ ই-সেবাসমূহ

মতামত এবং অভিযোগ

456789
হটলাইন নাম্বার

ই - নামজারি

ওয়েব মেইল

ভূমি উন্নয়ন কর

ডিজিটাল রেকর্ড রুম

অভিযোগ প্রতিকার ব্যবস্থাপনা

Survey Research

≡ ⟳ Login

 Guidelines  Survey research   

Survey research

Division ▾

- Barishal
- Chittagong
- Dhaka
- Kholna
- Rajshahi
- Rangpur
- Mymensingh

District ▾

Upazila ▾

Type ▾

Search 

Check list 

Important links

- ⌚ Ground service delivery
- 📞 Hotline service
- 📍 Namjari
- %" Land development tax

social communication



In planning and implementation



With technical support



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Namjari Documentary

Documentary
(Last 90 days of entire Bangladesh)

the office 8,598	New application 12,06,913	Total disposed applications 13,33,000	Average score 27 days	Allowance rate 99%
Unclaimed as of yesterday Total application 3,05,903 Above 28 days 9%				

* Average disposal days calculated considering disposal time of applications submitted from July 1, 2022 onwards

sequencer	department	In the last 90 days				Unclaimed as of yesterday		
		New application	Total disposed applications	Average score *	Allowance rate	Total application	Above 28 days	#
১	Dhaka	5,03,050	5,03,050	23 days	92%	5,03,25	9%	↗
২	Chittagong	2,21,013	2,21,013	25 days	82%	8,288	8%	↗
৩	Mymensingh	1,95,066	1,95,066	25 days	95%	2,95,20	6%	↗
৪	Rajshahi	1,93,528	1,93,528	27 days	82%	8,93,18	5%	↗
৫	Sylhet	1,21,082	1,21,082	28 days	95%	1,21,22	12%	↗
৬	Bansal	1,11,970	1,11,970	30 days	94%	1,11,20	12%	↗
৭	Khulna	1,04,814	1,04,814	35 days	93%	1,04,90	10%	↗
৮	Rangpur	1,01,008	1,01,008	38 days	93%	1,01,05	18%	↗

নথ্য দফতরের ২০২২.১.১৫ রেজিস্ট্রেশন

Conditions Nomenclature steps Notification / Rules regarding Nomination Grievance Redressal Mechanism

Suggestions for improving the quality of the portal

With technical support
★ business automation

Test Cases

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Syed Rayhan Masud					
Test Case ID: SR-2023-001		Test Designed date: 14-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Masud					
Module Name: User Login		Test Execution date: 14-11-2023					
Test Title: Login with Valid Credentials							
Description: Test the functionality of security logging into the application with valid email and password.							
Precondition (If any): The user must be registered in the system.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Navigate to the login page 2. Enter valid email and password 3. Click on the login button	1. Email: example1@mail.com Password: passwd123 2. Email: example2@mail.com Password: passwd124	User should be redirected to the user dashboard.	As expected, user is redirected to the user dashboard.	Pass			
Post Condition: The user is successfully logged into the application. User session is established.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Syed Rayhan Masud					
Test Case ID: SR-2023-002		Test Designed date: 14-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Masud					
Module Name: User Registration		Test Execution date: 14-11-2023					
Test Title: Register with Valid Information							
Description: Test the functionality of creating a new user account with valid personal information.							
Precondition (If any): The user should not be registered in the system.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
<ol style="list-style-type: none"> 1. Navigate to the registration/sign up page. 2. Enter valid personal information asked. 3. Click on the register button. 4. Verify email by following the verification link sent to the registered email. 	<p>1. Name: Syed Ahmed Email: ahmedsyed@mail.com Password: passwd125 Contact Details:</p> <ul style="list-style-type: none"> - Address: 1132, Sector 7, Uttara - Phone: +8801000000007 - NID: 4123837223 	User should be registered, and email verification should be successful.	As expected, as excepted user is registered and email is verified.	Pass			
Post Condition: User is registered with the provided personal information. Email verification is successful.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Abu Talha Mohammad Muyeed					
Test Case ID: SR-2023-003		Test Designed date: 14-11-2023					
Test Priority (Low, Medium, High): Medium		Test Executed by: Muyeed					
Module Name: User Dashboard		Test Execution date: 14-11-2023					
Test Title: View Personalized Dashboard							
Description: Test the functionality of displaying a personalized dashboard after user login.							
Precondition (If any): The user must be logged in.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application.	1. Email: example1@mail.com Password: passwd123	User should be directed to a dashboard displaying relevant information, summaries of property ownership records, recent activities, and quick links.	As expected, user is directed to the personalized dashboard.	Pass			
Post Condition: User is directed to a personalized dashboard displaying relevant information. Dashboard summaries, property ownership records, recent activities, and quick links are accessible.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Abu Talha Mohammad Muyeed					
Test Case ID: SR-2023-004		Test Designed date: 14-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Muyeed					
Module Name: User Wallet		Test Execution date: 14-11-2023					
Test Title: Perform Deposit and Withdrawal							
Description: Test the functionality of managing token transactions related to property assets using the digital wallet.							
Precondition (If any): User must have a registered and verified wallet.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Navigate to the wallet section in the user dashboard. 2. Perform a deposit. 3. Perform a withdrawal.	Deposit Amount: 100LC Tokens Withdrawal Amount: 50LC Tokens	Wallet balance should reflect the deposited and withdrawn amounts accordingly.	The wallet balance is updated after deposit and but not after withdrawal.	Fail			
Post Condition: Investigate and address the bug in the confirm purchase option. The order is confirmed, and the purchase details are stored in the database. The purchased item(s) are deducted from the inventory. The payment is processed successfully.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Toufiq Ahmed Shishir					
Test Case ID: SR-2023-005		Test Designed date: 15-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Shishir					
Module Name: Record Query		Test Execution date: 15-11-2023					
Test Title: Search and Retrieve Property Ownership Records							
Description: Test the functionality of searching and retrieving specific property ownership records based on various criteria.							
Precondition (If any): User must be logged in.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application. 2. Navigate to the record query section. 3. Enter search criteria (e.g., property location, owner name, transaction date). 4. Click on the search button.	Search: Property Location - "456 Oak Street"	Query results should provide detailed information about the selected property ownership record.	As expected, query results display detailed information about the property ownership record.	Pass			
Post Condition: Detailed information about the selected property ownership record is displayed. The record query results are stored for reference.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Toufiq Ahmed Shishir					
Test Case ID: SR-2023-006		Test Designed date: 15-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Shishir					
Module Name: Asset Transactions		Test Execution date: 15-11-2023					
Test Title: Initiate Property Asset Transfer							
Description: Test the functionality of initiating property asset transfers, sales, or leases through the platform.							
Precondition (If any): User must be logged in, and the property asset details should be available.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application. 2. Navigate to the asset transaction section. 3. Select the option for asset transfer. 4. Enter buyer/lessee details, asset information, and transaction terms. 5. Click on the submit button.	Buyer/Lessee Details: Name: Ahmed Khan Email: ahmedkhan@mail.com Contact Number: +1 (555) 123-4567 Asset Information: Property Address: 789 Maple Avenue Property Type: Residential Transaction Type: Lease Transaction Terms: Lease Duration: 12 months Monthly Rent: 1500 LC Tokens	A legal documentation should be generated, and the transaction should be successfully initiated.	As expected, legal documentation is generated, and the transaction is initiated.	Pass			
Post Condition: Legal documentation for the initiated transaction is generated and stored. If applicable, the property ownership record is updated to reflect the transaction details. LC tokens are deducted or added from/to the respective user accounts.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Md Unisa Mahadi					
Test Case ID: SR-2023-007		Test Designed date: 15-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Shishir					
Module Name: Record Updates		Test Execution date: 15-11-2023					
Test Title: Modify Property Ownership Records							
Description: Test the functionality of modifying or updating property ownership records, including changes to property details, ownership transfers, or status updates.							
Precondition (If any): User must be logged in.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application. 2. Navigate to the record updates section. 3. Modify property ownership record details. 4. Click on the save changes button.	Modified Details: Property Address: 789 Maple Avenue (changed from 456 Oak Street) Property Type: Commercial (changed from Residential) Owner's Name: Abrar Khan	Record updates should be securely documented, and changes should be reflected in the audit trail.	Updates are securely documented, and changes are not reflected as the update generates a completely new token.	Fail			
Post Condition: Investigate and address the bug related to the update generating a completely new token. Property ownership records are successfully updated with modified details. Changes are securely documented in the audit trail.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Shah Rahat Hossain					
Test Case ID: SR-2023-008		Test Designed date: 15-11-2023					
Test Priority (Low, Medium, High): High		Test Executed by: Shishir					
Module Name: Ownership Verification		Test Execution date: 15-11-2023					
Test Title: Verify Property Ownership							
Description: Test the functionality of verifying property ownership using robust mechanisms such as digital signatures, smart contracts, etc.							
Precondition (If any): User must be logged in, and the property ownership details should be available.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application. 2. Navigate to the ownership verification section. 3. Choose a property for verification. 4. Initiate the verification process.	Selected Property: 789 Maple Avenue	The platform should successfully verify property ownership using the chosen authentication methods.	As expected, property ownership is successfully verified using the chosen authentication methods.	Pass			
Post Condition: Property ownership is successfully verified using the chosen authentication methods. If applicable, verification results are securely documented.							

Project Name: Smart Porcha – Your Digital Ownership		Test Designed by: Shah Rahat Hossain					
Test Case ID: SR-2023-009		Test Designed date: 15-11-2023					
Test Priority (Low, Medium, High): Medium		Test Executed by: Mahadi					
Module Name: Report Generation		Test Execution date: 15-11-2023					
Test Title: Generate Property Reports							
Description: Test the functionality of generating reports related to property ownership records, financial transactions, or other relevant data.							
Precondition (If any): User must be logged in, and relevant data should be available.							
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)			
1. Log in to the application. 2. Navigate to the report generation section. 3. Select report parameters (e.g., data elements, timeframes). 4. Click on the generate report button.	Report Parameters: Data Elements: Property Ownership Records, Financial Transactions Timeframe: Last 6 months	A customizable report should be generated, allowing users to download it in various formats for offline reference.	As expected, a customizable report is generated, and users can download it in various formats.	Pass			
Post Condition: A customizable report is generated based on the selected parameters. Users can download the report in various formats for offline reference. These post-conditions provide a summary of the expected outcomes and changes in the system after the execution of each test case. Keep in mind that the specific post-conditions may vary based on the actual implementation and requirements of your project.							

Smart Porcha (cocomo)

Let's assume Source Line of Code is 6000.

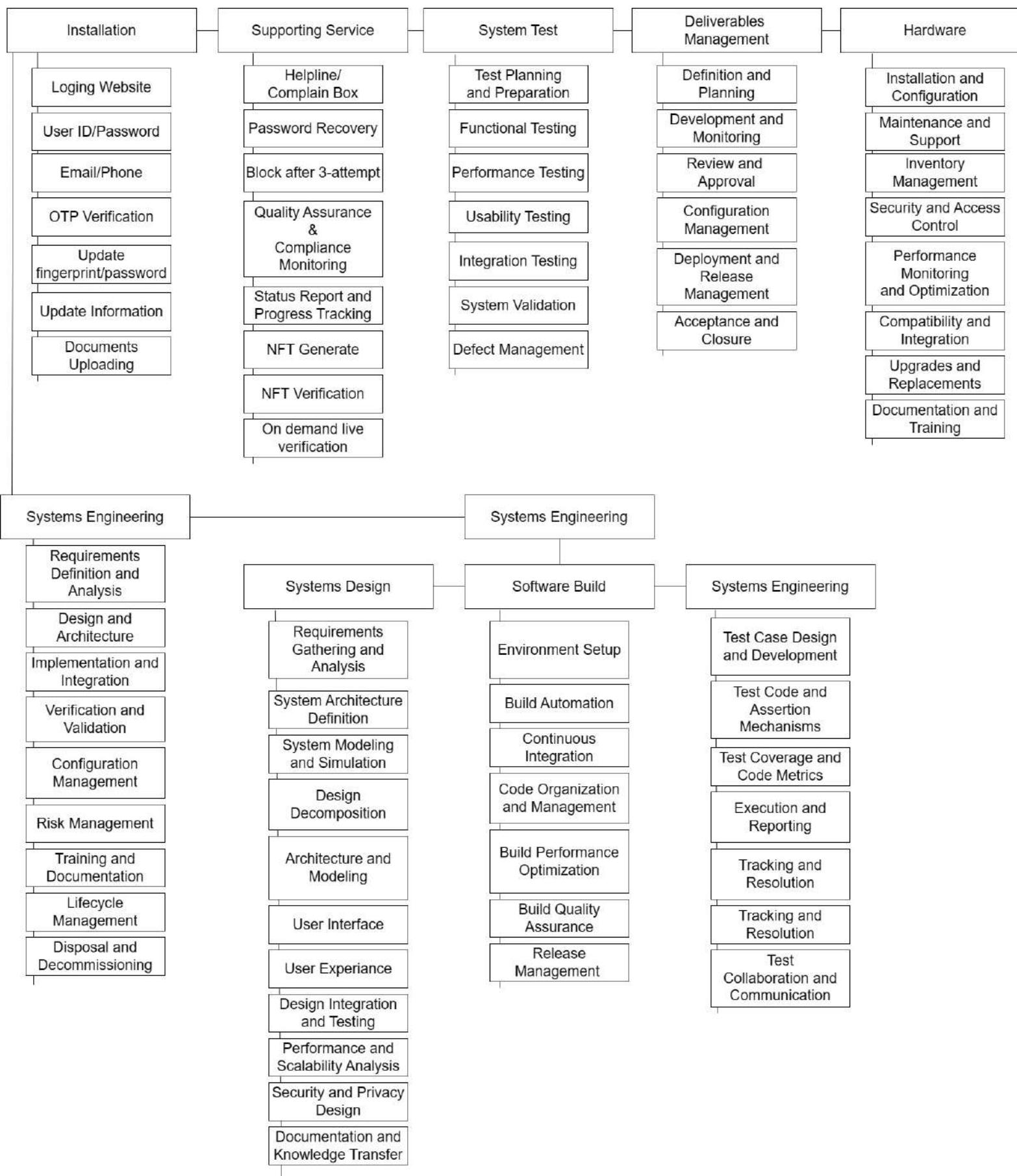
So, effort need to be, $PM = 2.4 \times (6000/1000)^{1.05} = 15.75$ Months

Development time, $DM = 2.5 \times (PM)^{0.38} = 7.13$ Months

Required number of people, $ST = PM/DM = 15.75/7.13 = 2.209$ = 2 Months

That means we need to work for (4*7) =28 weeks.

Work Breakdown Structure



Timeline Charts

		Weeks	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
	Task: Person																													
Exploration	D: Tony																													
	E: Bill																													
	F: Henry																													
	A: Tony																													
	B: Bill																													
	C: Henry																													
Planning	H: Bill																													
	I: Henry																													
	J: Tony																													
	G: Henry																													
	K: Tony																													
	M: Tony																													
Iteration	N: Henry																													
	O: Bill																													
	L: Bill																													
	P: Bill																													
	Q: Henry																													
	R: Tony																													
Release	S: Henry																													
	T: Tony																													
	U: Bill																													
	V: Bill																													
	W: Henry																													
	X: Tony																													
	Y: Henry																													
	Z: Tony																													
	AA: Tony																													
	AB: Bill																													

Person	Task (Week)
Tony	1, 2, 3, 4, 5, 9, 11, 17, 20, 21, 23, 24
Bill	1, 2, 3, 5, 6, 7, 12, 13, 24, 25, 26, 27, 28
Henry	1, 2, 3, 4, 5, 8, 10, 14, 15, 17, 18, 19, 23

Activity Key(s)

Exploration	Planning	Iteration		Releases
		Iteration 1	Iteration 2	
A: Planning	G: Overall Design	L: Develop Initial System	S: Customer services	Y: Documentation
B: Blockchain	H: Structural Design	M: Develop Database	T: Data analysis	Z: User training
C: NFT	I: Develop Initial Plan	N: Data entry & verification	U: Modification	AA: Deployment
D: Define Goals	J: Prioritize Features & User Stories	O: Security	V: User acceptance testing	AB: Monitor and Maintenance
E: Identify Stakeholders & Requirements	K: Create a High-level Architecture	P: Continuous integration	W: Performance testing	
F: Initial Risk Assessment		Q: Code reviews	X: Refactoring	
		R: Automated testing		

EVA Calculation

Task	Planned Effort	Actual Effort
1	12.0	11.2
2	15.0	15.5
3	13.3	14.1
4	8.0	7.2
5	9.5	8.6
6	10.2	11.0
7	18.0	19.8
8	7.8	8.5
9	11.6	10.4
10	12.1	11.8
11	8.0	8.9
12	5.0	4.6
13	7.6	8.1
14	6.2	6.1
15	4.2	4.4
16	9.4	10.0
17	12.0	11.1
18	16.3	17.8
19	8.3	9.1
20	5.1	5.4
21	10.2	10.1
22	12.1	11.6
23	5.0	5.0
24	6.3	20.1
25	8.7	0.0
26	6.2	0.0
27	9.1	0.0
28	19.5	0.0
	BCWP = 276.7 BCWS = 233.2	ACWP = 250.4

BAC = 882

SPI = BCWP / BCWS

$$= 276.7 / 233.2$$

$$= 1.187$$

SV = BCWP – BCWS

$$= 276.7 - 233.2 = 43.5 \text{ person-day}$$

$$CPI = BCWP / ACWP$$

$$= 276.7 / 250.4$$

$$= 1.1050$$

$$CV = BCWP - ACWP$$

$$= 276.7 - 250.4$$

$$= 26.3 \text{ person-day}$$

$$\% \text{ Schedule for completion} = BCWS / BAC$$

$$= 233.2 / 882$$

$$= 26.439 \%$$

$$\% \text{ Complete} = BCWP / BAC$$

$$= 276.7 / 882$$

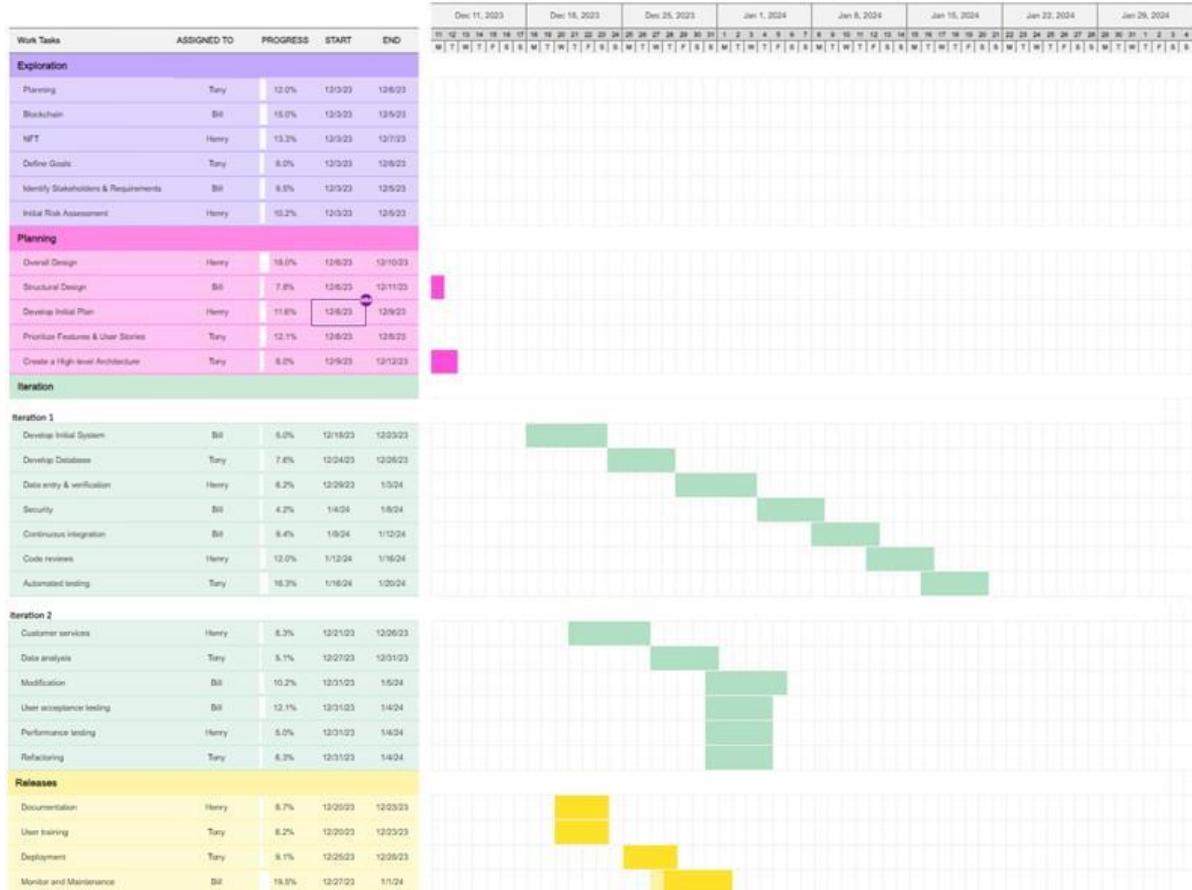
$$= 31.371 \%$$

Timeline charts

SmartPorcha

Project start: **Sun, 12/3/2023**

Display week: **2**



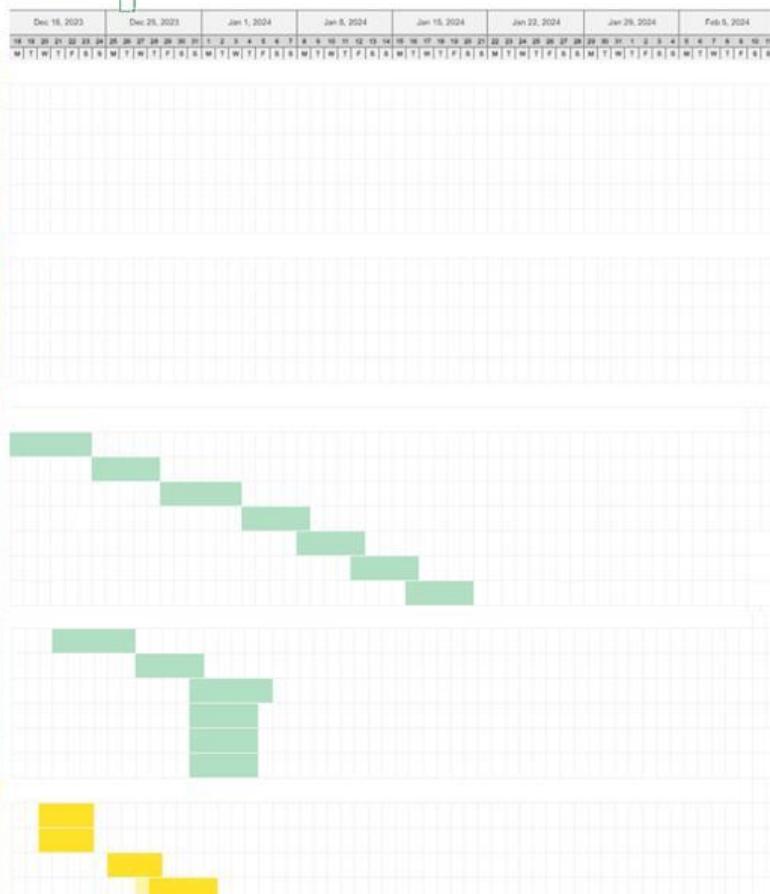
Timeline charts

SmartPorcha

Project start: Sun, 12/3/2023

Display week:

Work Tasks	Assigned To	Progress	Start Date	End Date
Exploration				
Planning	Tony	12.0%	12/3/23	12/6/23
Blockchain	Bill	18.0%	12/3/23	12/5/23
NFT	Henry	13.5%	12/3/23	12/5/23
Define Goals	Tony	8.0%	12/3/23	12/8/23
Identify Stakeholders & Requirements	Bill	9.5%	12/3/23	12/9/23
Initial Risk Assessment	Henry	10.2%	12/3/23	12/9/23
Planning				
Overall Design	Henry	18.0%	12/6/23	12/10/23
Structural Design	Bill	7.8%	12/6/23	12/11/23
Develop Initial Plan	Henry	11.8%	12/6/23	12/9/23
Prioritize Features & User Stories	Tony	12.1%	12/6/23	12/8/23
Create a High-level Architecture	Tony	8.0%	12/6/23	12/12/23
Iteration				
Iteration 1				
Develop Initial System	Bill	5.0%	12/18/23	12/20/23
Develop Database	Tony	7.6%	12/24/23	12/28/23
Data entry & verification	Henry	6.2%	12/26/23	1/3/24
Security	Bill	4.2%	1/4/24	1/8/24
Continuous Integration	Bill	9.4%	1/8/24	1/12/24
Code reviews	Henry	12.0%	1/12/24	1/16/24
Automated testing	Tony	10.3%	1/16/24	1/20/24
Iteration 2				
Customer services	Henry	8.3%	12/21/23	12/26/23
Data analysis	Tony	5.1%	12/27/23	12/31/23
Modification	Bill	10.2%	12/31/23	1/8/24
User acceptance testing	Bill	12.1%	12/31/23	1/4/24
Performance testing	Henry	5.0%	12/31/23	1/8/24
Refactoring	Tony	6.3%	12/31/23	1/4/24
Releases				
Documentation	Henry	8.7%	12/26/23	12/30/23
User training	Tony	6.2%	12/26/23	12/30/23
Deployment	Tony	9.1%	12/26/23	12/28/23
Monitor and Maintenance	Bill	10.5%	12/27/23	1/1/24



Timeline charts

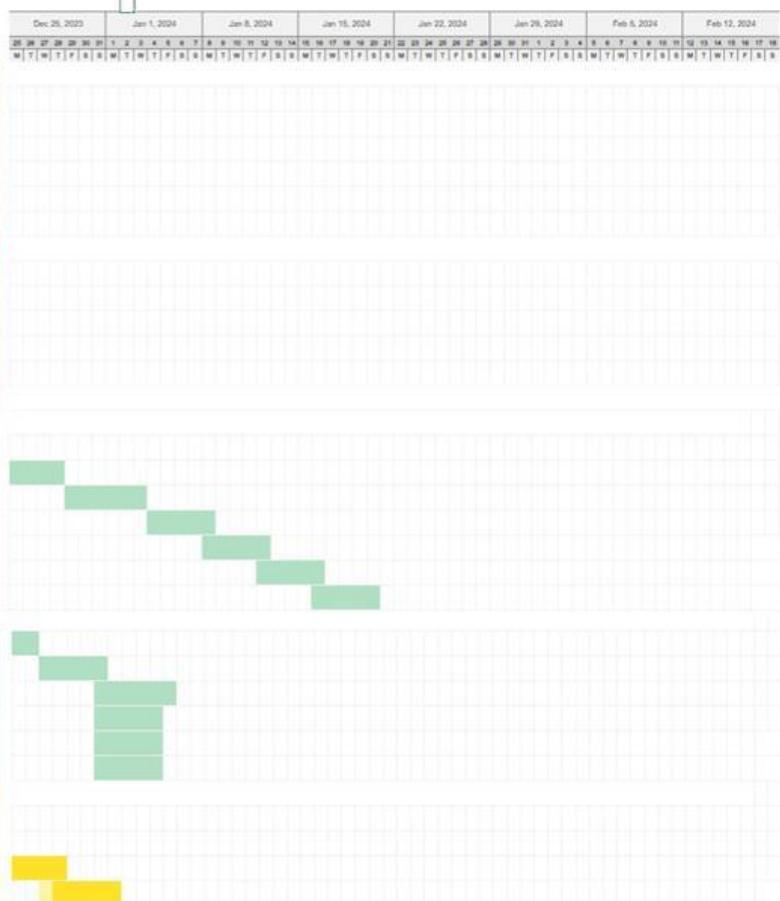
SmartPorcha

Project start: Sun, 12/3/2023

Display week:

4

Work Tasks	ASSIGNED TO	PROGRESS	START	END
Exploration				
Planning	Tony	12.0%	12/3/23	12/6/23
Blockchain	Bill	18.0%	12/3/23	12/5/23
AI/ML	Henry	13.0%	12/3/23	12/7/23
Define Goals	Tony	8.0%	12/3/23	12/6/23
Identify Stakeholders & Requirements	Bill	8.0%	12/3/23	12/5/23
Initial Risk Assessment	Henry	10.0%	12/3/23	12/5/23
Planning				
Overall Design	Henry	18.0%	12/6/23	12/10/23
Structural Design	Bill	7.0%	12/6/23	12/10/23
Develop Initial Plan	Henry	11.0%	12/6/23	12/9/23
Prioritize Features & User Stories	Tony	12.0%	12/6/23	12/8/23
Create High-level Architecture	Tony	8.0%	12/6/23	12/12/23
Iteration				
Iteration 1				
Develop Initial System	Bill	5.0%	12/18/23	12/23/23
Develop Database	Tony	7.0%	12/24/23	12/28/23
Data entry & verification	Henry	6.0%	12/29/23	1/5/24
Security	Bill	4.0%	1/4/24	1/8/24
Continuous Integration	Bill	8.0%	1/8/24	1/10/24
Code reviews	Henry	12.0%	1/12/24	1/16/24
Automated testing	Tony	10.0%	1/16/24	1/20/24
Iteration 2				
Customer services	Henry	8.0%	12/21/23	12/26/23
Data analysis	Tony	5.0%	12/27/23	12/31/23
Migration	Bill	10.0%	12/31/23	1/5/24
User acceptance testing	Bill	12.0%	1/3/24	1/4/24
Performance testing	Henry	5.0%	1/3/24	1/4/24
Refactoring	Tony	8.0%	1/3/24	1/4/24
Releases				
Documentation	Henry	8.0%	12/20/23	12/23/23
User training	Tony	6.0%	12/20/23	12/23/23
Deployment	Tony	8.0%	12/25/23	12/28/23
Monitor and Maintenance	Bill	10.0%	12/27/23	1/1/24



Timeline charts

SmartPorcha

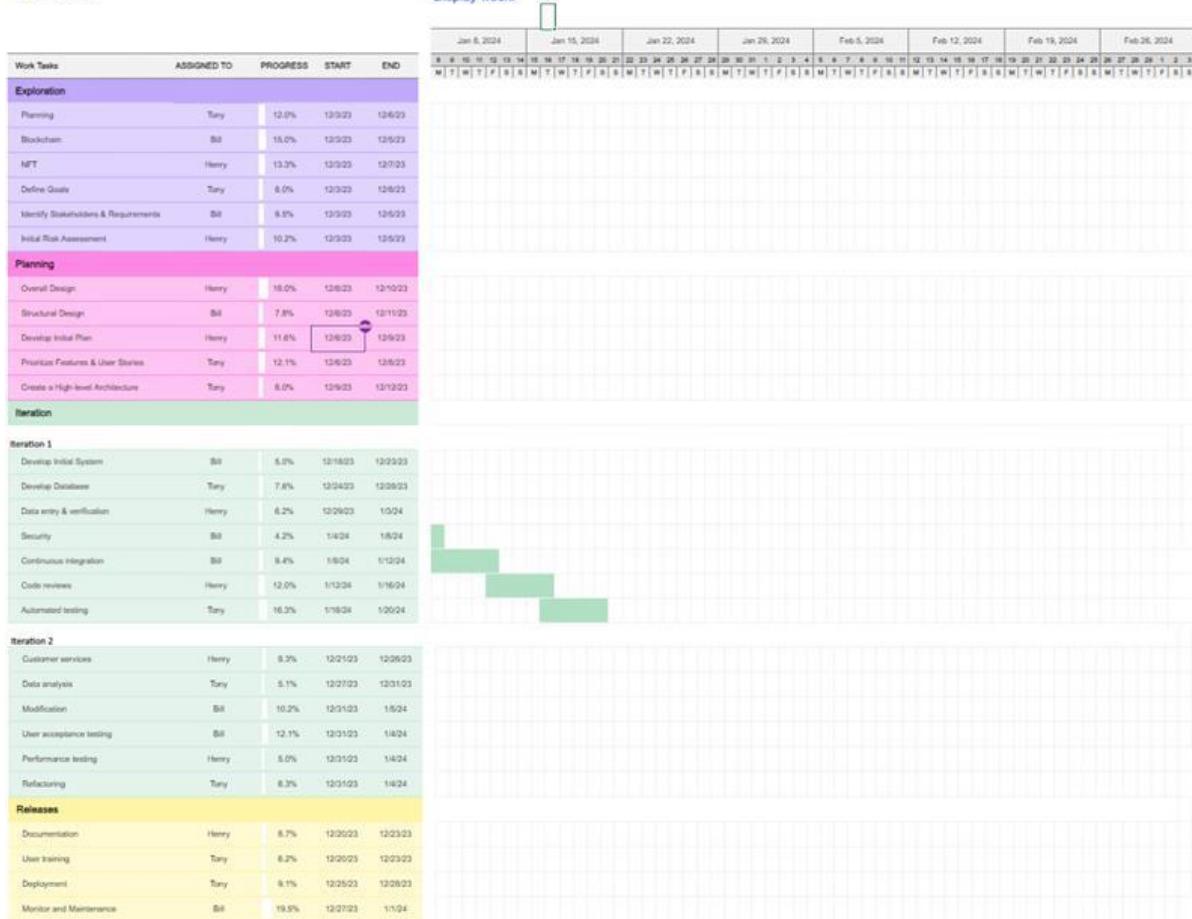
Project start: Sun, 12/3/2023

Display week: 5

Work Tasks	ASSIGNED TO	PROGRESS	START	END	
Exploration					
Planning	Tony	12.0%	12/3/23	12/6/23	
Blockchain	Bill	15.0%	12/3/23	12/6/23	
NFT	Henry	13.2%	12/3/23	12/6/23	
Define Goals	Tony	8.0%	12/3/23	12/6/23	
Identify Stakeholders & Requirements	Bill	9.5%	12/3/23	12/6/23	
Initial Risk Assessment	Henry	10.2%	12/3/23	12/5/23	
Planning					
Overall Design	Henry	18.0%	12/6/23	12/10/23	
Structural Design	Bill	7.8%	12/6/23	12/11/23	
Develop Initial Plan	Henry	11.8%	12/6/23	12/9/23	
Prioritize Features & User Stories	Tony	12.1%	12/6/23	12/6/23	
Create a High-level Architecture	Tony	8.0%	12/9/23	12/12/23	
Iteration					
Iteration 1					
Develop Initial System	Bill	5.0%	12/16/23	12/23/23	
Develop Database	Tony	7.8%	12/24/23	12/26/23	
Data entry & verification	Henry	6.2%	12/29/23	1/2/24	
Security	Bill	4.2%	1/4/24	1/8/24	
Continuous integration	Bill	9.4%	1/8/24	1/12/24	
Code reviews	Henry	12.0%	1/12/24	1/16/24	
Automated testing	Tony	16.3%	1/16/24	1/20/24	
Iteration 2					
Customer services	Henry	8.3%	12/21/23	12/26/23	
Data analysis	Tony	5.1%	12/27/23	12/31/23	
Migration	Bill	10.2%	12/31/23	1/5/24	
User acceptance testing	Bill	12.1%	1/3/24	1/4/24	
Performance testing	Henry	5.0%	1/3/24	1/4/24	
Refactoring	Tony	6.3%	1/3/24	1/4/24	
Releases					
Documentation	Henry	8.7%	12/20/23	12/23/23	
User training	Tony	6.2%	12/26/23	12/29/23	
Deployment	Tony	9.1%	12/25/23	12/26/23	
Monitor and Maintenance	Bill	19.0%	12/27/23	1/1/24	

Timeline charts

SmartPorcha



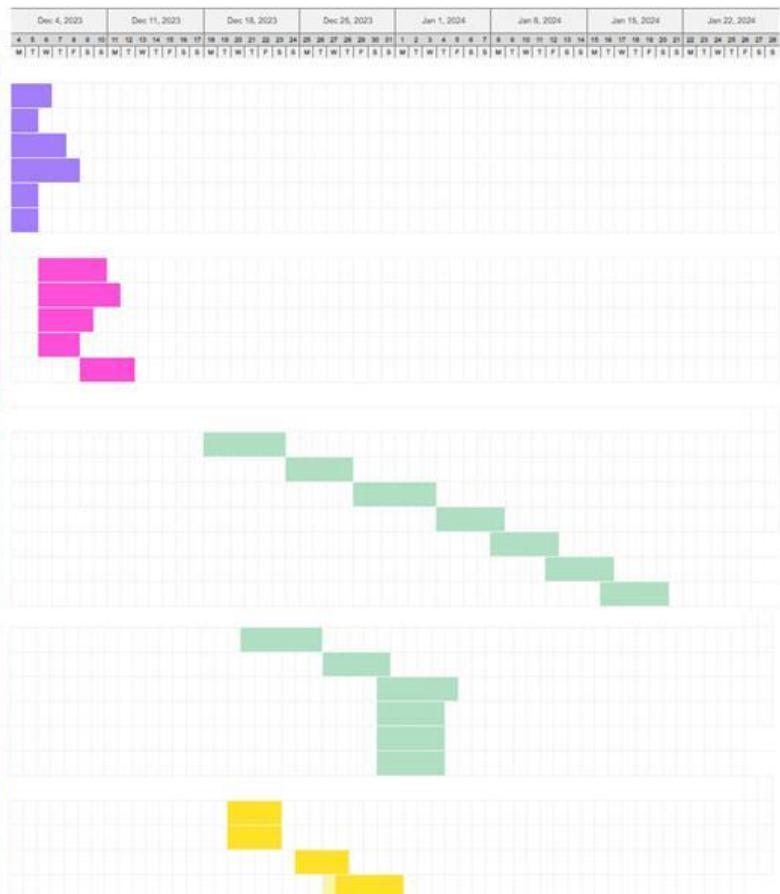
Timeline charts

SmartPorcha

Project start: **Sun, 12/3/2023**

Display week: **1**

Work Tasks	ASSIGNED TO	PROGRESS	START	END
Exploration				
Planning	Tony	12.0%	12/3/23	12/6/23
Blockchain	Bill	15.0%	12/3/23	12/6/23
NFT	Henry	13.5%	12/3/23	12/7/23
Define Goals	Tony	8.0%	12/3/23	12/8/23
Identify Stakeholders & Requirements	Bill	9.5%	12/3/23	12/9/23
Initial Risk Assessment	Henry	10.2%	12/3/23	12/9/23
Planning				
Overall Design	Henry	18.0%	12/6/23	12/10/23
Structural Design	Bill	7.8%	12/6/23	12/11/23
Develop Initial Plan	Henry	11.6%	12/6/23	12/9/23
Prioritize Features & User Stories	Tony	12.1%	12/6/23	12/8/23
Create a High-level Architecture	Tony	8.0%	12/9/23	12/12/23
Iteration				
Iteration 1				
Develop Initial System	Bill	5.0%	12/15/23	12/23/23
Develop Database	Tony	7.8%	12/24/23	12/29/23
Data entry & verification	Henry	6.2%	12/29/23	1/3/24
Security	Bill	4.2%	1/4/24	1/8/24
Continuous Integration	Bill	9.4%	1/9/24	1/12/24
Code reviews	Henry	12.0%	1/12/24	1/16/24
Automated testing	Tony	16.3%	1/16/24	1/20/24
Iteration 2				
Customer services	Henry	8.3%	12/21/23	12/26/23
Data analysis	Tony	6.1%	12/27/23	12/31/23
Modifications	Bill	10.2%	12/31/23	1/6/24
User acceptance testing	Bill	12.1%	12/31/23	1/4/24
Performance testing	Henry	8.0%	12/31/23	1/4/24
Reflecting	Tony	6.3%	12/31/23	1/4/24
Releases				
Documentation	Henry	8.7%	12/20/23	12/23/23
User training	Tony	6.2%	12/20/23	12/23/23
Deployment	Tony	6.1%	12/25/23	12/28/23
Monitor and Maintenance	Bill	18.0%	12/27/23	1/1/24



12. Risk Management Table

Risks	Category	Probability	Impact	RMMM
Technical issues during development	TE	70%	2	
Market competition	MC	20%	3	
Budget overruns	FR	50%	2	
Regulatory changes	LR	30%	2	
Key team member leaves	HR	75%	1	
Data security breaches	SR	30%	1	
Supply chain disruption	SC	25%	2	
Product defects or recalls	PR	20%	1	
Economic downturn	MC	50%	3	
Changes in consumer preferences	MC	30%	3	
Technology obsolescence	TE	60%	2	
Intellectual property disputes	ST	50%	2	
Political instability	ER	35%	1	
Natural disasters or environmental issues	ER	17%	1	
Third-party service failures	ER	20%	2	
Talent acquisition and retention challenges	HR	30%	2	
Cybersecurity threats and attacks	SR	60%	2	
Changes in tax regulations	MR	40%	3	
Customer dissatisfaction or negative reviews	CR	45%	3	
Failure of critical infrastructure	ER	60%	2	
Legal disputes with business partners	LR	45%	1	
Health and safety incidents	ER	40%	2	
Technology infrastructure failure	DE	20%	3	

Loss of key business partners or clients	HR	50%	1	
Loss of sensitive data	SR	30%	2	
Currency exchange rate fluctuations	FR	60%	4	
Employee burnout and low morale	HR	50%	3	
Loss of intellectual property	PR	10%	3	
Inadequate project management	PR	40%	3	
Technology integration challenges	TE	10%	1	
Failure to meet regulatory deadlines	PR	30%	1	
Software or hardware compatibility issues	TE	10%	1	
Political instability	PR	20%	3	
Adverse economic conditions	MC	10%	4	
Intellectual property infringement	LR	30%	2	
Failure to meet customer expectations	PR	70%	3	
Loss of critical business documents	HR	40%	2	
Failure to meet project milestones	PR	40%	3	
Changes in technology standards	MC	20%	2	
Inadequate disaster recovery plan	TE	30%	2	
Changes in customer behavior	MC	70%	3	
Unplanned system downtime	TE	10%	3	

Impact values:

- Economic
- Legal
- Operations
- Reputation
- Political
- Technology
- Financial
- Security
- Quality

- Compliance
- Safety
- Project
- HR