Group 19 - MAHLOAN
Deliverable 1 - Inception Phase

Members: Naysa Chopra, Genesis Navarro, Katie Choi, & Samantha Albo

User Stories:

As a borrower I want to be able to use a platform to present my projects in any format and for my lenders to view and engage in so that I can clearly and effectively present my projects.
Acceptance Criteria: - Solution includes multiple formats, like photo, video, etc., on the site for posting projects. - Solution makes sure that there is a clear separate page for projects to be posted. - Solution includes social media features like liking, commenting, or sharing a borrower's post

As a lender, I want a system that will deal with borrower late payments and penalties which includes escrow agreements and have loan defaults to be taken care of, so that I can protect my investment.
Acceptance Criteria: - Solution provides notifications to the lender regarding the status of payments being met or not. - Solution will pass warning to borrower if payment has not been met before a certain amount of days before the payment date. - Solution includes having a signed agreement that shows both parties must provide the funds by the respective date that is mutually agreed on. - Solution involves having the money the lender provides be held by a third party through an escrow agreement until the first deliverable, which is set by the lender, has been met based on terms of agreement - Solution having loan default if payment not met by certain date

As a lender, I want there to be a credit-rating system from third-party credit agencies in order to make an informed decision regarding whether or not the borrower is trustworthy.
Acceptance Criteria: - The solution will enable lenders to see a borrower's rating directly on their profile - Solution will enable lenders to be able to see the reasonings behind ratings produced by credit agencies.

- Solution will utilize general rates in correspondence with specific ratings in order to provide an estimate of what the interest rate should be so the lender can either choose the estimated rate or set their own

As a lender I want to be able to see multiple projects and information about them that should include the target amount, the interest rate, and information about the tasks and people involved in the project in order to have full transparency regarding what my money would be going toward.

Acceptance Criteria:

- Solution involves having a scrolling page feature where all projects are listed.
- Solution makes it so any posts about projects have information regarding the objective, the people, and the expenses involved in the projects.

As a borrower, I should have the ability to agree to pay the interest rate or reject the interest rate so that there is equal say in the transaction between the lender & borrower.

Acceptance Criteria:

- Solution will make it so borrower has full visibility to the offer presented by the lender for the agreement for the funds.
- If borrower does not agree to the interest rate presented, the solution can present a reject or pay button which the borrower can press upon their discretion.
- Solution will provide notification for lender if interest rate has not been agreed to and can either have lenders send in new numbers for negotiation or end the agreement.

As a site borrower, I want to be able to securely recieve my money to individuals and have assurance that my information or data will not be stolen in order to have trust in the site when making choices for investments.

Acceptance Criteria:

- Solution will include encryption in the site's data structure to keep it secure
- Solution will involve the site to build partnerships with banks in order to have verified cards be used on the site
- Solution will involve having two-factor authentications to protect login information
- Solution will make it so any transaction made with the card information on the site will be sent as a notification/message to the respective user

As a borrower, I want to be able to have a questionnaire that build and organizes my profile in order to reach the specific audience that would be most interested in my project.
Acceptance Criteria: - Solution includes a questionnaire upon making an account that asks the borrower about information regarding their project and background - Solution will include a questionnaire for lenders as well in order to group the borrowers with them - Solution will utilize machine learning in order to sort borrowers into respective groups by using common goals/traits - Solution will have an algorithm that targets specific posts towards specific lenders who have shared traits on their respective profiles

User Diagram:

[on next page]

For our use case diagram, we made the assumption that the primary users for this application will be business owners and private money lenders. With this in mind we were able to narrow our focus on key aspects for business transactions and user experience that benefit all parties involved. We also assumed that there is a third party bank associated with their own systems and business processes. This simplified our process of collecting credit scores, escrow agreements and loan defaults. There is also an understanding that business owners will be able to create a desirable business plan to attract the loaners.

Activity Diagram-

Business Processes:

The security business process is an important part of the Mahloan's structure as if not done correctly, could result in potential lawsuits, important data being scrutinized, and putting customers on risk. The process includes making sure the site is secured on the browser and having the site user's data and information be protected. Implementing various security protocol will ensure that user's are aware when transactions are made on the site and will make sure that the card information is verified by the Bank itself.

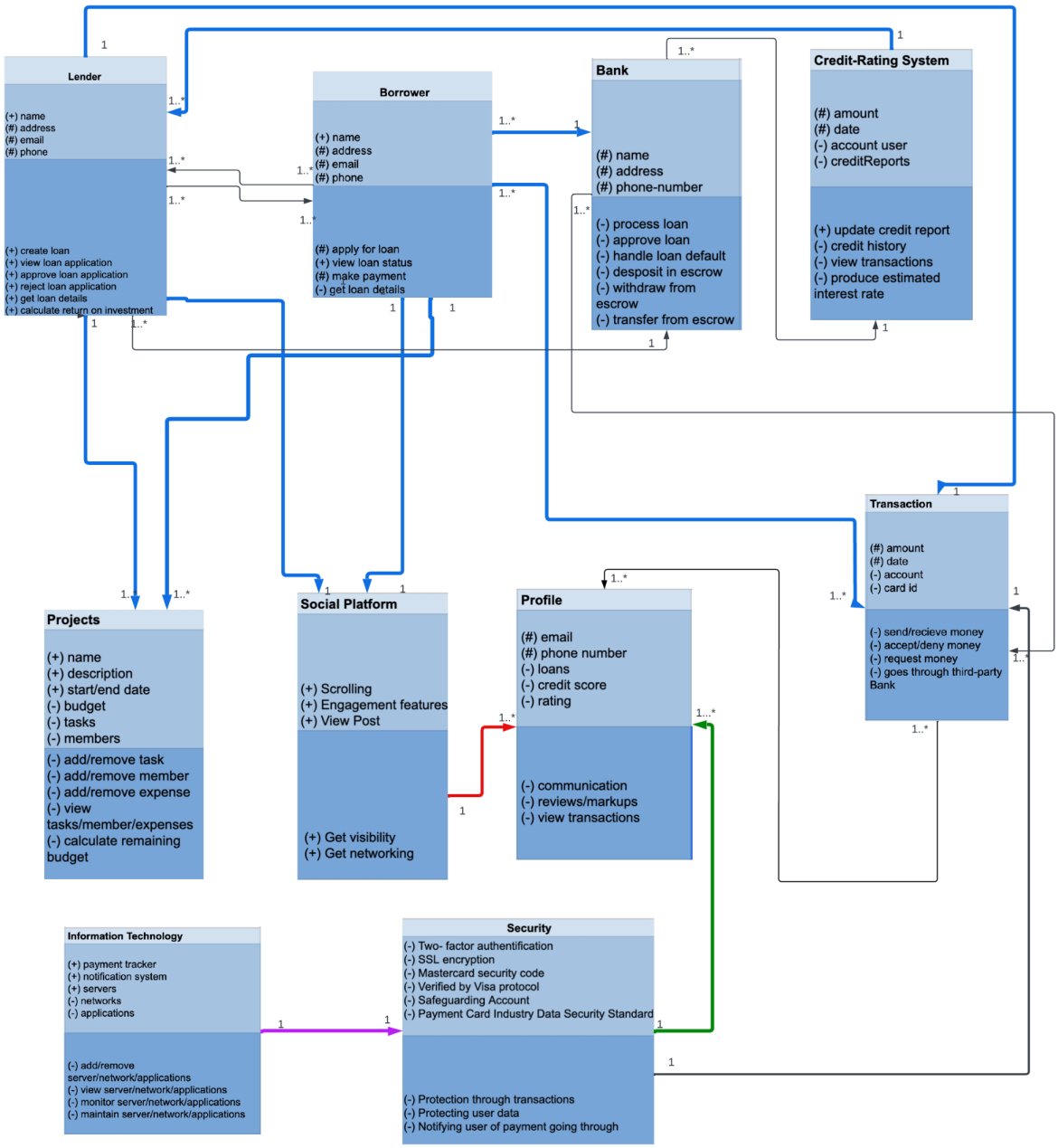
Partnering with a third-party bank in order to safe-guard loans and payments is another important business process. The process includes setting conditions between the borrowers and lenders to ensure both parties are in agreement with their partnership. When an escrow agreement is made, promised funds are withdrawn from the bank and held until the first deliverable is met; however, if the first deliverable is not met, the funds are returned to the bank account. Money must also follow security procedures in order to be taken out of the bank. The money ultimately returns to the bank if the first payment was not made on schedule.

The Activity Digram is on the next page.

Class Diagram-

Comprehensive list of classes:

- Lender [blue]
  - Projects
  - Social Platform [red]
    - Profile [green]
      - Security [purple]
        - Information technology
  - Credit Rating Sytem
  - Bank
  - Transaction
- Borrower [blue]
  - Projects
  - Bank
  - Social Platform [red]
    - Profile [green]
      - Security [purple]
        - Information technology
  - Transaction



For our use case diagram, we made the assumption that the primary users for this application will be business owners and private money lenders. With this in mind we were able to narrow our focus on key aspects for business transactions and user experience that benefit all parties involved. We also assumed that there is a third party bank associated with their own systems and business processes. This simplified our process of collecting credit scores, escrow agreements and loan defaults. There is also an understanding that business owners will be able to create a desirable business plan to attract the loaners.

Deliverable 2 - G19

Made By: Samantha Albo, Naysa Chopra, Katie Choi, & Genesis Navarro

Reference:

We will be assigning numbers to our user stories and will be using said numbers throughout this deliverable to make it easier for readers to understand our decisions.

User Story Number	User Story
1	As a borrower, I want to be able to use a platform to present my projects in any format for my lenders to view and engage in so that I can clearly and effectively present my projects.
2	As a lender, I want a system that will deal with borrower late payments and penalties which includes escrow agreements and loan defaults systems, so that I can protect my investment.
3	As a lender, I want there to be a credit-rating system from third-party credit agencies that utilize an ML model in conjunction with the credit ratings to calculate the interest rate to be proposed to the borrower in order to make an informed decision regarding whether or not to make the particular investment.
4	As a lender, I want to be able to see multiple projects and information about them that should include the target amount, the interest rate, and information about the tasks and people involved in the project in order to have full transparency regarding what my money would be going toward.
5	As a borrower, I should have the ability to agree to pay the interest rate or reject the interest rate so that there is an equal say in the transaction between the lender & borrower.
6	As a site borrower, I want to be able to securely receive my money from individuals and have assurance that my information or data will not be stolen in order to have trust in the site when making choices for investments.
7	As a borrower, I want to be able to have a questionnaire that builds and organizes my profile in order to reach the specific audience that would be most interested in my project.

Project Estimation:

T-Shirt Sizing Chart[1]:

T-shirt Size (user story #)	Labor (FTE DAYS)
XX-small (7)	3
X-small(1)	7
Small (5)	10
Medium (3)	18
Large(4)	22
X-Large (2)	30
XX-Large (6)	40

Total FTE Months: 6.5 months

Story Point Consensus[2]:

The task that our team agreed upon as a simple coding task would be creating a simple web-page that is dynamic and we assign that a story point value of 1 and agree that the duration of that task would be 24 FTE Hours.

Story Point	Interpretation	Average Dev. Time (FTE Hours)	User Stories Numbers[3]
0	Item already complete or too small to estimate	0.75	-
1/2	tiny features, very little work needed	8	-
1, 2, 3	Small features, some work needed	24	7 → 3
5,8,13	Medium features, work requires more effort and attention to detail	72	1 → 8 5 → 13
20,40	Very important features, need large amount of time to complete	160	3 → 20 4 → 40
100	Extremely important features that has to be done efficiently and reviewed	280	6, 2

[1] We assume that FTEs work 50 weeks/year,4 weeks/month,20 days/month,and 8 hours/day
[2] 1 sprint = 2 weeks [80 hours], No. of Developers: 10
[3] User Story Number → Story Point assigned to it

	multiple times		
∞	Too large		-
?	Need more information/clarification about certain feature		-
☕	COFFEE BREAK!		:)

Number of Sprints: $\frac{Total\ Story\ Points \times Time\ per\ Story\ Point}{No.\ Of\ Developers \times Time\ per\ Sprint} = \frac{284 \times 24}{10 \times 40} = \frac{6816}{400} = 17.04$

Total Development Time: 681.6 hours

Use Case Point Analysis[4]:

Unadjusted Actor Weighting Table					
ACTOR TYPE	**DESCRIPTION**	**WEIGHTING FACTOR**	**NUMBER**	**RESULT**	**NOTES**
Simple	External system with well-defined API	1	1	1	peer-to-peer lending platform
Average	External system using a protocol-based interface, e.g., HTTP, TCT/IP, or a database	2	2	4	third-party credit agency and third-party bank
Complex	Human	3	2	6	lender and borrower
			Unadjusted Actor Weight Total (UAW)	11	
Unadjusted Use Case Weighting Table					
USE CASE TYPE	**DESCRIPTION**	**WEIGHTING FACTOR**	**NUMBER**	**RESULT**	**NOTES**
Simple	1-3 transactions	5	3	15	user stories: 1,5,7
Average	4-7 transactions	10	2	20	user stories: 3,4
Complex	> 7 transactions	15	2	30	user stories: 2,6
			Unadjusted Use Case Weight Total (UUCW)	65	
Unadjusted Use Case Points (UUCP) = UAW + UUCW				76	
Technical Complexity Factors					
FACTOR NUMBER	**DESCRIPTION**	**WEIGHT**	**ASSIGNED VALUE (0-5)**	**WEIGHTED VALUE**	**NOTES**

[4] The unit of measurement is UCP, a unit that doesn't have a fixed numerical value & and is relative to the values of different software applications

T1	Distributed system	2	2	4	credit system, notification system, bank system
T2	Response time or throughout performance objectives	1	3	3	make sure site is up to date with projects that are on listing/or done with listing
T3	End-user online efficiency	1	4	4	lender/borrower should find it easy to interact with
T4	Complex internal processing	1	1	1	not much complex work
T5	Reusability of code	1	4	4	have simple code structure
T6	Easy to install	0.5	1	0.5	not key factor
T7	Ease of use	0.5	4	2	important in order to retain users
T8	Portability	2	4	8	portability important for screen change support
T9	Ease of change	1	1	1	not key factor
T10	Concurrency	1	3	3	highly concurrent
T11	Special security objectives included	1	5	5	custom code necessary
T12	Direct access for third parties	1	4	4	third-party libraries needed
T13	Special user training required	1	1	1	non-complex app
			Technical Factor Value (TFactor)	40.5	
Technical Complexity Factor (TCF) = 0.6 + (0.01 * TFactor)				1.005	

Environmental Factors

FACTOR NUMBER	DESCRIPTION	WEIGHT	ASSIGNED VALUE (0-5)	WEIGHTED VALUE	NOTES
E1	Familiarity with system development process being used	1.5	4	6	experience is needed for lending domains
E2	Application experience	0.5	3	2	not much application experience needed
E3	Object-oriented experience	1	4	4	user-centric app requires OO
E4	Lead analyst capability	0.5	4	2	requirements are important
E5	Motivation	1	3	3	motivation is not key goal

E6	Requirements stability	2	2	4	requirements are stable
E7	Part time staff	-1	2	-2	staff do not need to part-time
E8	Difficulty of programming language	-1	3	-3	language not that complicated
			Environmental Factor Value (EFactor)	15.5	
Environmental Complexity Factor (ECF) = 1.4 + (-0.03 * EFactor)				0.935	
Adjusted Use Case Points (UCP) = UUCP * TCF * ECF				71.4153	
PHM (run the RunPHMComputattion macro after filling in the worksheet)				20	If PHM = 999, Then risk of Project Failure is too high
Effort in Personal Hours = UCP * PHM				1428.306	

Unadjusted Actor Weight: 11 → the weights of the actors that are in the system where weight is determined based on the amount of interactions the actor has with the respective system.
Unadjusted Use Case Weight: 65 → the weights of the user stories that are in the system where weight is determined based on the amount of interactions the actor has with the respective system.
Unadjusted Use Case Points: 76 → a measurement of the size and complexity of the software system.
Technical Factor Value: 40.05 → the complexity of the technical system need to implement the software system; used to adjust the raw use case points.
Technical Complexity Factor: 1.005 → level of technical complexity involved in implementing the use cases.
Environmental Factor Value: 15.5 → the uncertainty/complexity of the environment in which the program is implemented.
Environmental Complexity Factor (ECF): 0.935 → level of environmental complexity involved in implementing the use cases.
Effort in Personal Hours: 1428.306 → estimated number of hours for project completion.

Most Accurate Estimate:

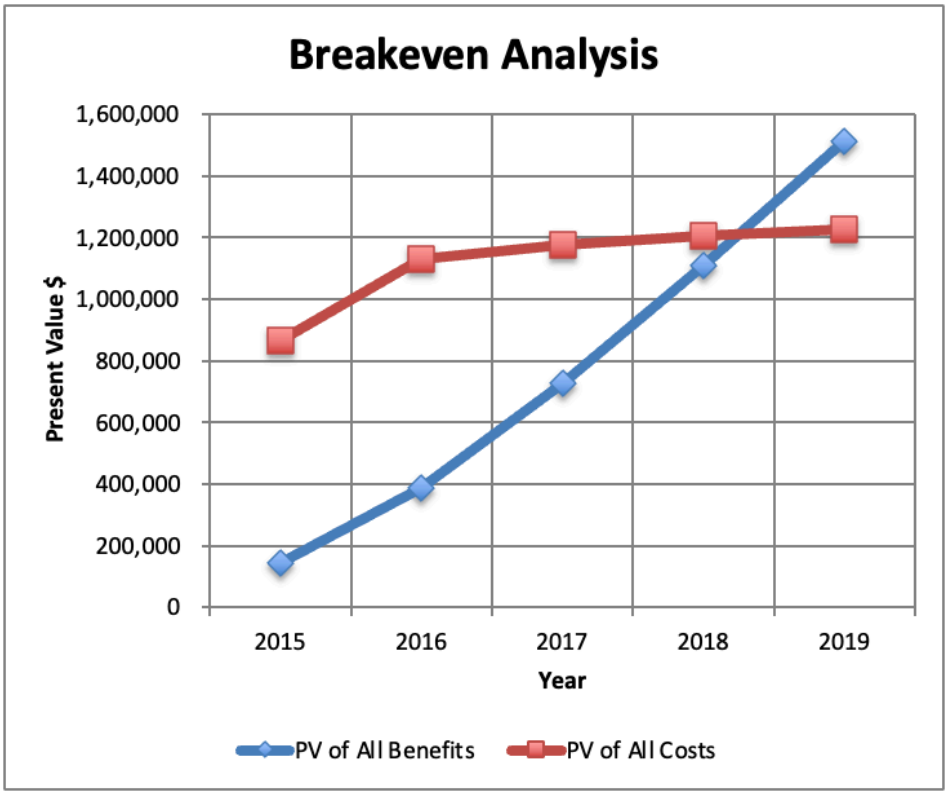
The three estimates we developed in this deliverable are for the time it would take to implement our software application. For the first estimate, we used T-Shirt Sizing, an estimation process where we analyze the size of each user story and how long it would take to create each of the respective factors in the product. This estimation took the least time out of all three and doesn't posses any complexity in terms of the estimation itself. The subsequent estimation we did was the Story Point Consensus in which we found out that the project would take 17.04 sprints which amounts to 681.6 hours in

development time. This process was more complex in comparison to its predecessor and involves calculations to analyze the time. Our last estimation is the Use Case Point Analysis in which we assigned values to the technical & environmental aspects of our project in tandem with raw values for the actors & user stories. Through the calculations we reached a time of 1428.306 hours for completing the project which we believe is the most accurate as it takes into account of factors, that weren't mentioned in the previous estimation techniques.

Economic Feasibility

Discount Rate (WACC)	**15.00%**					
	2015	**2016**	**2017**	**2018**	**2019**	**Total**
Year	1	2	3	4	5	
Increased sales	0	150,000	350,000	500,000	650,000	
Reduction in cost	167,601	167,601	167,601	167,601	167,601	
TOTAL BENEFITS:	167,601	317,601	517,601	667,601	817,601	
PV of BENEFITS:	**145,740**	**240,152**	**340,331**	**381,703**	**406,492**	**1,514,418**
Cumulative PV of ALL BENEFITS:	**145,740**	**385,892**	**726,223**	**1,107,926**	**1,514,418**	
Cost of Hardware	18,000	0	0	0	0	
Cost of Computing Equipment	18,000	0	0	0	0	
Cost of Software	12,900	6,000	0	0	0	
Development & Installation Costs	900,000	300,000	20,000	0	0	
TOTAL DEVELOPMENT COSTS:	948,900	300,000	20,000	0	0	
On-Going Maintenance (Suppliers)	3,240	3,240	3,240	3,240	3,240	
Internal Maintenance & Support	45,486	45,486	45,486	45,486	45,486	
TOTAL OPERATIONAL COSTS:	48,726	48,726	48,726	48,726	48,726	
TOTAL COSTS:	997,626	348,726	68,726	48,726	48,726	
PV of COSTS:	**867,501**	**263,687**	**45,188**	**27,859**	**24,225**	**1,228,461**
Cumulative PV of ALL COSTS:	**867,501**	**1,131,188**	**1,176,376**	**1,204,236**	**1,228,461**	

Total Project Benefits - Costs:	-830,025	-31,125	448,875	618,875	768,875	
Yearly NPV:	-721,761	-23,535	295,143	353,844	382,267	285,957
Cumulative NPV:	-721,761	-745,296	-450,153	-96,309	285,957	
Project NPV:	285,957					
Return on Investment:	23.28%					
Breakeven Point:	4.2721807					



Break Even point is the time when there is no loss or gain for the business.
ROI(return on Investment) is how much you earn relative to the amount you invested. Therefore, our ROI means that we gain 65% of our investment and our net revenue will increase by that amount.
NPV is how much an investment would be worth now if it were discounted throughout it was discounted to present value.
PV(cost) is how much money in the future will be worth in today's value.
WACC is average rate that a business pays to finance its assets, like an interest rate.

Conclusion

In order to build a strong peer-to-peer lending platform, there are a multitude of technical challenges that need to be addressed. One of the overarching challenges is creating a scalable system that can handle various transactions and users. In order to do this, there needs to strong designs and proper planning which require a lot of effort. Another challenge is making the platform user-friendly so it is easy and fast to navigate through the reusability of code, which in turn, also reduces development costs & helps with maintaining the site. Security objectives is another challenging factor as it requires a lot of attention to details due to sensitive data being prone to theft. This requires for the platform to be secure through data encryption and user authentication. Despite the amount of technical challenges mentioned here, the project is still technically feasible as these challenges are not strong enough to harbor any obstructions throughout the implementation.

The application's organizational challenges are determined by the project's champions; the champions in this application include: stakeholders & platform operators. The organization structure of this application will rely on a strong sense of communication between the operators & stakeholders in order to produce a clear product. If this level of transparency is not met, then that can result in delayed time for development & increase the complexity of the project. We will make it a priority to respect this transaction of information between the two parties so we can provide the system's users, lenders & borrowers to be able to use the platform effectively and have their operations be fulfilled.

Our team would strongly advise our stakeholders to invest in our project due to the feasibility of the implementation. We have reached this conclusion on the basis of our estimations of development time and economic feasibility. Through our Use Case Point analysis, we determined that the effort in personal time would amount to around 8.9 months for implementation. In tandem, our economic feasibility calculations provided us with vital information like how our ROI will be 23.28%, a breakeven point in just 4.27 years, & our project NPV being $285,957. In the event that our project's requirements change, there are two potential risks that may arise. There may be unseen costs in development which may lead to an increased maintenance cost for future years. In addition, it is possible that we lose our competitive edge, thus decreasing our total benefits which can cause a longer breakeven point and a lower ROI. However, our resources and perseverance prepare us for such risks, in turn, building a confident, positive outlook about our future in this field. All in all, we believe that with the combined, relatively short period of implementation & positive economic data,

we can strongly recommend this application towards our stakeholders for investment.

Deliverable 3 - Project Management

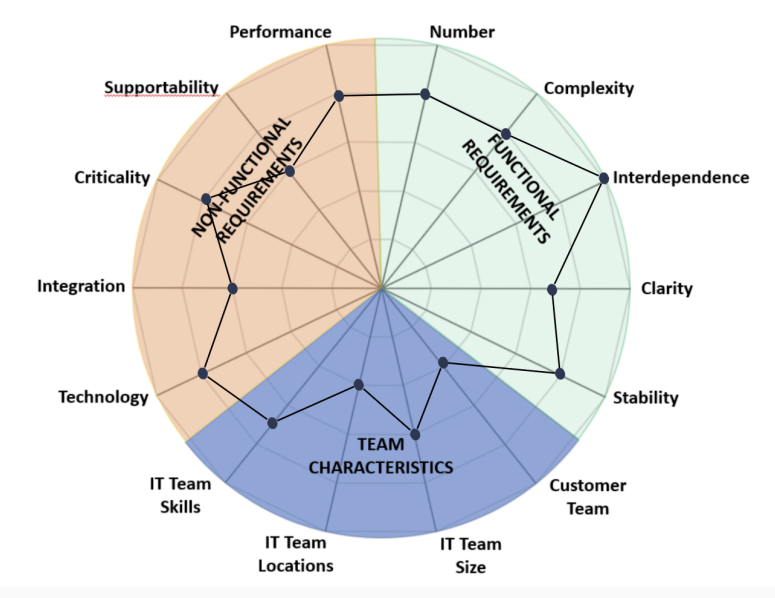
Group 19 - Mahloan

Authors: Naysa Chopra, Samantha Albo, Genesis Navarro, & Katie Choi

Project Approach

Characteristic	Rating	Reason
Number	4	The number of features in this system falls towards the larger spectrum in terms of quantity.
Complexity	4	The new system has a lot of intricately intertwined parts and is quite multidimensional; thus increasing its complexity.
Interdependence	5	It can be seen that the new system's elements and parts are very interdependent and well-connected. Yet, alterations to the system have a direct impact on others.
Clarity	3.5	The prerequisites are quite strong and distinct. The requirements are obvious, but the anticipated outcome is not quite definite.
Stability	4	It has been determined that while the needs, wants, and requirements remain constant, there may be some modifications as the project moves forward.
Performance	4	The system should be able to handle large influxes of user data simultaneously.
Supportability	3	The new system should be simple to use and maintain from the initial release. The system should be easily reconfigured and easily updated with new features.
Criticality	4	The system is vital to the company's performance, and any disruption can result in considerable financial loss.
Integration	3	The new system must be linked, interconnected and integrated with existing complex business systems.
Technology	4	The technological aspect of the system is high due to the

		confidentiality needs of user data; in correspondence with having protected connections with external systems.
IT team size	3	IT Team size should be moderately large in order to complete high-nonfunctional/functional requirements.
IT team location	2	The IT team does not need to necessarily be located near one another for implementation.
IT team skills	3.5	With a technical complexity factor of 40.5, the IT team's skills should generally be high but no need for specialists.
Customer Team	2	System does not need to serve a variety of customers, customers will be in general persons in the field of entrepreneurship and business.



This project would benefit from the **BRUF** approach which will allow for iterative development and close communication between stakeholders and the development team to ensure that the application satisfies their demands. This method will help the organization to prepare key components of the project, particularly those related to criticality and technology, in order to guarantee that any risks and concerns are detected and handled as soon as possible. With the peer-to-peer lending platform, it is vital that the groundwork is layed out before any development begins as it is important to visualize the framework for the system and understand the customer's needs.

Based on the facts and analysis presented above, the firm will adopt a **hybrid** approach. We chose this management approach as it coexists with a BRUF approach very well and due to the scope of our project. The project has a semi-flexible scope as seen in our previous deliverables containing specific requirements layout for the product itself. In addition, with these clear requirements, any adjustments to be made will be done following customer feedback via sprint reviews which works perfectly with the project as the product's base framework should not be altered to much to avoid risk of security breaches. Finally, the hybrid approach will enable the company to focus on putting their efforts towards critical elements like security and focus on non-functional requirements through iterative development.

Product Backlog Items (PBIs)

New set of user stories & epics:

Epic 1 [**Security**]: As the user of the platform, I want my data to be protected, transactions to be secure, & have full transparency about where my money will be through regular security updates from the platform in order to have confidence in using the platform for my personal projects.

- **User Story SEC1**
    - As a site borrower, I want to be able to securely recieve my money to individuals and have assurance that my information or data will not be stolen in order to have trust in the site when making choices for investments.
- **Acceptance Criteria:**
    - Solution will include encryption in the site's data structure to keep it secure
    - Solution will involve the site to build partnerships with banks in order to have verified cards be used on the site
    - Solution will involve having two-factor authentications to protect login information
    - Solution will make it so any transaction made with the card information on the site will be sent as a notification/message to the respective user
- **User Story SEC2:**
    - As a lender, I want a system that will deal with borrower late payments and penalties which includes escrow agreements and have loan defaults to be taken care of, so that I can protect my investment.
- **Acceptance Criteria:**

- Solution provides notifications to the lender regarding the status of payments being met or not.
- Solution will pass warning to borrower if payment has not been met before a certain amount of days before the payment date.
- Solution includes having a signed agreement that shows both parties must provide the funds by the respective date that is mutually agreed on.
- Solution involves having the money the lender provides be held by a third party through an escrow agreement until the first deliverable, which is set by the lender, has been met based on terms of agreement
- Solution having loan default if payment not met by certain date

Epic 2 [**Information & Interest Rate**]**:** As a lender, I want to be able to see projects in any format alongside having information about the project to be easily accessible, specifically about the budgeting of the project and its target interest rate that a third-party credit site can provide and verify in order to have a full understanding of where my potential investment would go.

- **User Story INFOINT1:**
    - As a borrower I want to be able to use a platform to present my projects in any format and for my lenders to view and engage in so that I can clearly and effectively present my projects.
- **Acceptance Criteria:**
    - Solution includes multiple formats, like photo, video, etc., on the site for posting projects.
    - Solution includes having the platform to be usable on computers, phones, etc.
    - Solution makes sure that there is a clear separate page for projects to be posted.
    - Solution includes social media features like liking, commenting, or sharing a borrower's post
- **User Story INFOINT2:**
    - As a lender, I want there to be a credit-rating system from third-party credit agencies in order to make an informed decision regarding whether or not the borrower is trustworthy.
- **Acceptance Criteria:**
    - The solution will enable lenders to see a borrower's rating directly on their profile

    - Solution will enable lenders to be able to see the reasonings behind ratings produced by credit agencies.
    - Solution will utilize general rates in correspondence with specific ratings in order to provide an estimate of what the interest rate should be so the lender can either choose the estimated rate or set their own
- **User Story INFOINT3:**
    - As a lender I want to be able to see multiple projects and information about them that should include the target amount, the interest rate, and information about the tasks and people involved in the project in order to have full transparency regarding what my money would be going toward.
- **Acceptance Criteria:**
    - Solution involves having a scrolling page feature where all projects are listed.
    - Solution makes it so any posts about projects have information regarding the objective, the people, and the expenses involved in the projects.
- **User Story INFOINT4:**
    - As a borrower, I should have the ability to agree to pay the interest rate or reject the interest rate so that there is equal say in the transaction between the lender & borrower.
- **Acceptance Criteria:**
    - Solution will make it so borrower has full visibility to the offer presented by the lender for the agreement for the funds.
    - If borrower does not agree to the interest rate presented, the solution can present a reject or pay button which the borrower can press upon their discretion.
    - Solution will provide notification for lender if interest rate has not been agreed to and can either have lenders send in new numbers for negotiation or end the agreement.

Epic 3 [**Chatting & Posting**]**:** As a user of the platform, I want the platform to show me projects that would cater towards my interests and goals, include a chatting feature to talk to potential partners, & enable me to see trending posts or posts that are new in order to have a full view and understanding of what parents and projects I can join.

- **User Story CHAPOS1:**

    - As a borrower, I want to be able to have a questionnaire that build and organizes my profile in order to reach the specific audience that would be most interested in my project.
- **Acceptance Criteria:**
    - Solution includes a questionnaire upon making an account that asks the borrower about information regarding their project and background
    - Solution will include a questionnaire for lenders as well in order to group the borrowers with them
    - Solution will utilize machine learning in order to sort borrowers into respective groups by using common goals/traits
    - Solution will have an algorithm that targets specific posts towards specific lenders who have shared traits on their respective profiles
- **User Story CHAPOS2:**
    - As a lender, I want to be able to chat to the people who post their projects in order to form a business relationship and gain an understanding of my potential investments.
- **Acceptance Criteria:**
    - Solution includes having a navigating bar on the bottom of the page that will include the following widgets: home, profile, chat (direct messaging), & saved posts
    - Solution includes chatting feature to incorporate sending media of any format
    - Solution includes a follower feature and for users to limit those who can chat with them to their followers or to the public
- **User Story CHAPOS3:**
    - As a user of the platform, I want to see popular posts and posts that have recently been posted, alongside the ability to favorite posts, in order to have an updated view of the platform at all times.
- **Acceptance Criteria:**
    - Solution will incorporate home page to have 2 widgets that help users to sort posts by popularity or time posted
    - Solution will enable a search bar for users to search for specific posts/users
    - Solution will enable users to favorite multiple posts and keep it in a saved posts container

- Solution will notify users if their posts have been favorite or put on the "trending" tag

User Story ID	MoSCoW Priority	Story Point
SEC1	MH	100
SEC2	SH	40
INFOINT1	SH	13
INFOINT2	MH	100
INFOINT3	SH	20
INFOINT4	SH	20
CHAPOS1	CH	5
CHAPOS2	SH	13
CHAPOS3	CH	5

The task that our team agreed upon as a simple coding task would be creating a simple container that is dynamic and we assign that a story point value of 1 and agree that the duration of that task would be 1 (8 hour) day.

Story Point	Interpretation	Average Dev. Time (FTE Days)
0	Item already complete or too small to estimate	0.75
1/2	tiny features, very little work needed	1
1, 2, 3	Small features, some work needed	3
5,8,13	Medium features, work requires more effort and attention to detail	6
20,40	Very important features, need large amount of time to complete	10
100	Extremely important features that has to be done efficiently and reviewed multiple times	20

Release Plan

**The ideal day estimates are based on the average FTE Days associated with the story points; the day estimate will be around or the same as the FTE days*

Story ID	Story Description	Story Points	MoSCoW Priority	Dependencies	Ideal Day Estimate	Sprint
Security Epic					40	
SEC1.1	System securing user personal data	100	MH		10	1
SEC1.2	System securing transactions made on platform		MH	SEC1.1	10	1
SEC2.1	System sends notifications/warnings for payments	40	SH	SEC1.2	10	1
SEC2.2	System diverts money towards third-party through signed escrow agreement made on platform		SH	SEC2.1	10	1
Information & Interest Rate Epic					36	
INFOINT1	System presents projects in any format	13	SH		6	2
INFOINT2	System interacts with third-party credit rating system for interest rates	100	MH	INFOINT1	10	2
INFOINT3	System displays information about project	20	SH	INFOINT1	10	2
INFOINT4	System allows users to agree/disagree to provided interest rates	20	SH	INFOINT2	10	2

Chat & Posting Epic					20	
CHAPOS1	Sysems uses ML to sort users through questionnaires	13	CH		8	3
CHAPOS2	Systems has chatting feature	13	SH	CHAPOS1	6	3
CHAPOS3	System has favoriting posts feature	5	CH	CHAPOS1	6	3
Product Backlog:	Ideal Days Estimate				96	

Requirements: Go live in 4 months

Currently: From deliverable 2, we got the following calculation:

Effort in Personal Hours: 1,428 hours

The average size of a web development team ranges from 4 - 7 members depending on the scope. After taking into consideration the external and internal factors that impact this project & the total ideal days estimate of 96 days, as a team we have come to the conclusion to have the web dev team to consist of 4 members. The following represents a calculation that supports our consensus:

$$1428.306 / (8\ hours\ x\ 4\ developers) = 44.63\ days,\ 44.63/20 = 2.23\ months < 4\ months$$

$$Sprint\ Capacity:\ 10\ days\ x\ 4\ developers = 40\ ideal\ days$$

Mahloan

Hybrid Release Plan (Flight Plan)

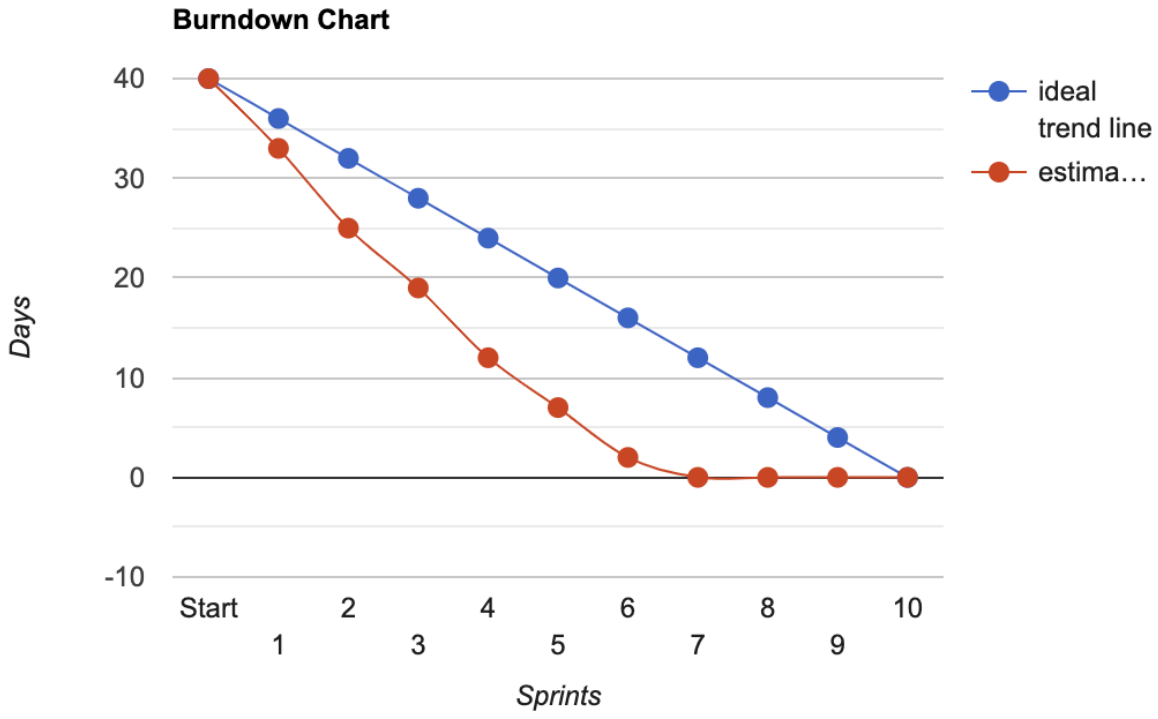
	Sprint 1	**Sprint 2**	**Sprint 3**
Security Epic	- Securing user data and transactions - Protecting loan agreements through escrow		
Information & Interest Rate Epic		- Presenting projects in any format alongside displaying information - third-party credit rating system where	

		users can agree/disagree to interest rate	
Chat & Posting Epic			- Sysems uses ML to sort users through questionnaires - Systems has chatting feature - System has favoriting posts feature

Burndown Chart - Sprint 1

Sprint Day	**BA**	**Dev**	**Start**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Story 1.1 Task 1	Naysa	Katie	**5**	**4**	**3**	**3**	**2**	**1**	0	0	0	0	0
Story 1.1 Task 2	Naysa	Katie	**2**	**1**	0	0	0	0	0	0	0	0	0
Story 1.1 Task 3	Naysa	Katie	**3**	**3**	**2**	**1**	0	0	0	0	0	0	0
Story 1.2 Task 1	Sam	Naysa	**5**	**5**	**4**	**3**	**2**	**2**	**1**	0	0	0	0
Story 1.2 Task 2	Sam	Naysa	**5**	**4**	**3**	**2**	**1**	0	0	0	0	0	0
Story 2.1 Task 1	Gen	Sam	**5**	**4**	**3**	**3**	**3**	**2**	**1**	0	0	0	0
Story 2.1 Task 2	Gen	Sam	**5**	**4**	**3**	**2**	**1**	**1**	0	0	0	0	0
Story 2.2 Task 1	Katie	Gen	**5**	**4**	**4**	**3**	**2**	**1**	0	0	0	0	0
Story 2.2 Task 2	Katie	Gen	**5**	**4**	**3**	**2**	**1**	0	0	0	0	0	0
Estimated days remaining			40	33	25	19	12	7	2	0	0	0	0
Ideal Trend Line			40	36	32	28	24	20	16	12	8	4	0

**Burndown Chart on next page*


Burndown Chart
40
30
20
10
0
-10
Days
Start
1
2
3
4
5
6
7
8
9
10
Sprints
ideal
trend line
estima…

Deliverable 4

Group 19: Naysa Chopra, Genesis Navarro, Katie Choi, & Samantha Albo

1) Use Case Narratives:

Use Case Section	Comment
Story	As the user of the platform, I want my data to be protected, transactions to be secure, & have full transparency about where my money will be through regular security updates from the platform in order to have confidence in using the platform for my personal projects.
Use Case Title	Use case 1: Security
Story owner	Malon
Story Creator	Team 19
Revision and Interests	Version 1
Stakeholders and intrests	Malon, TA
Scope,Context, and Background	This task specifically falls under a specific task in security when creating the sight there should not be aleak of information.
Dependencies	Assumes: • Robust security protocols: The platform must have robust security protocols in place to protect user data and transactions. This may include measures such as encryption, firewalls, intrusion detection, and prevention systems, and regular security audits. • Transparency: The platform must provide clear and transparent information about how user data is being used, where their money is going, and how transactions are being processed. This includes providing users with access to real-time updates on their transactions and balances. • Regular security updates: The platform must provide regular security updates to ensure that their security protocols are up-to-date and effective against emerging threats.

	• User education: Users must be educated about how to protect their own data and avoid common security pitfalls, such as phishing scams or insecure passwords. • Trustworthiness: The platform must establish a reputation as a trustworthy and reliable service provider, which can be built through transparent communication, prompt resolution of issues, and a track record of keeping user data safe and secure.
Actor Role(s)	Lender and Bowers for money
Precondition(s)	To fulfill the user's request for data protection, transaction security, and transparency, the platform must have a secure and reliable infrastructure with robust security protocols, such as encryption and multi-factor authentication. Additionally, a clear and transparent privacy policy outlining how user data is collected, stored, and protected, along with a system for providing regular security updates and a dedicated team of security experts, is necessary. In correspondence, there should be a signed agreement between both parties upon a financial engagement that ensures that lended money is secure through escrow. Lastly, there must be a process in place for responding to security incidents and resolving any issues that may arise promptly and effectively.
Success Guarantee	Ensure secure transactions, and provide transparency about where user money is going can be guaranteed by implementing robust security protocols, regular updates, and having a dedicated team of security experts. This should be complemented with clear and transparent privacy policies and user education to avoid security pitfalls. A process for responding to security incidents and resolving issues in a timely and effective manner is essential, as is establishing a reputation as a trustworthy and reliable service provider. Ultimately, success would be providing a secure, reliable, and transparent platform that users can trust with their personal data and projects.
Minimal Guarantee	To guarantee protection of user data and secure transactions with transparency, the platform should have robust security protocols, provide regular security updates, and have a clear privacy policy that outlines data collection and protection.
Triggers	Users may have concerns about privacy and security, transparency, and trust when using online platforms dealing with personal data and financial transactions. Past security breaches and general skepticism about such platforms may lead to these concerns, and users may want to know how their personal data is being used. They may also worry about potential financial loss if their data or transactions are

	compromised, especially for personal projects with financial impacts. Legal or regulatory obligations may also require users to use platforms that meet specific security and transparency standards for compliance.
Main Scenario	1. Implement strong security measures, such as encryption and multi-factor authentication, to protect user data and prevent unauthorized access upon user logging in. 2. During any business transactions, notify user of any activity on their account and keep business payments through the platform secure. 3. Provide regular security updates and patches to address any vulnerabilities that may arise, ensuring the platform is up-to-date with the latest security technologies. 4. A clear and transparent privacy policy that outlines how user data is collected, stored, and used, as well as how it is protected that is shown when users make an account. 5. Educate users on how to protect their own data and avoid common security pitfalls, such as phishing scams or insecure passwords through notification system. 6. The platform should have a process in place for responding to security incidents and resolving any issues that may arise in a timely and effective manner. 7. Keep any signed agreements, like escrow agreements, secured and protected from any changes if not authorized 8. Establish a reputation as a trustworthy and reliable service provider through transparent communication, prompt resolution of issues, and a track record of keeping user data safe and secure.
Alternative Scenarios or Extensions	1. Enhanced transparency: a. The user may want more detailed information about where their money is going, such as the specific fees or charges associated with each transaction. 2. Personalized security options: a. The user may want the ability to customize their security options, such as setting their own password complexity requirements or choosing which types of notifications they receive regarding their account activity. 3. Integration with other security tools: a. The user may want the platform to integrate with other security

	tools, such as antivirus software or firewalls, to provide an additional layer of protection. 4. Support for multiple currencies: a. The user may want the platform to support multiple currencies, so they can easily manage their finances across different countries or regions. 5. Seamless user experience: a. The user may want a platform that provides a seamless user experience, with intuitive interfaces and fast response times, to ensure they can easily and efficiently manage their personal projects. 6. Strong customer support: a. The user may want a platform that offers strong customer support, with fast response times and knowledgeable representatives, to ensure any issues or concerns can be addressed quickly and effectively.
Acceptance Criteria	Minimum: ● All user data and transactions must be encrypted both at rest and in transit using industry-standard encryption protocols. ● The platform must provide multi-factor authentication options, such as SMS or email-based one-time passwords or biometric login, to ensure the security of user accounts. ● The platform must provide regular security updates, including vulnerability assessments and software patches, to protect user data and transactions from potential security threats. Should Have: ● The platform must provide detailed information about all fees and charges associated with each transaction, including any currency conversion fees or processing fees. ● The platform must allow users to customize their security options, such as setting their own password complexity requirements or choosing which types of notifications they receive regarding their account activity. ● The platform must provide integration with other security tools, such as antivirus software or firewalls, to provide an additional layer of protection for user data and transactions.

	• The platform must support multiple currencies to allow users to manage their finances across different countries or regions. • The platform must provide a seamless user experience with intuitive interfaces and fast response times to ensure users can easily and efficiently manage their personal projects. Nice to Have: • The platform must have a dedicated and knowledgeable customer support team, with fast response times and multiple communication channels, to address any issues or concerns that users may have regarding their data or transactions. • The platform must provide a clear and detailed explanation of how user data is collected, used, and shared, including any third-party vendors that have access to user data. • The platform must have an intuitive and user-friendly interface, with fast response times and minimal downtime, to ensure a seamless user experience. • The platform must support multiple currencies, with clear and accurate conversion rates, to allow users to easily manage their finances across different countries or regions.
Test case	1. Open the platform and login to the user account. 2. Navigate to the user profile and check if all personal data is encrypted both at rest and in transit using industry-standard encryption protocols. 3. Attempt to perform a transaction and verify that multi-factor authentication options, such as SMS or email-based one-time passwords or biometric login, are available to ensure the security of user accounts. 4. Verify that the platform provides regular security updates, including vulnerability assessments and software patches, to protect user data and transactions from potential security threats. 5. Check if the platform provides a clear and detailed explanation of how user data is collected, used, and shared, including any third-party vendors that have access to user data. 6. Verify that the platform provides detailed information about all fees and charges associated with each transaction, including any currency conversion fees or processing fees. 7. Attempt to customize the security options, such as setting the password complexity requirements or choosing which types of notifications to receive regarding account activity.

	8. Verify that the platform integrates with other security tools, such as antivirus software or firewalls, to provide an additional layer of protection for user data and transactions. 9. Check if the platform supports multiple currencies and if the conversion rates are clear and accurate. 10. Verify that the platform provides a seamless user experience with intuitive interfaces and fast response times to ensure users can easily and efficiently manage their personal projects. 11. Contact customer support and verify that the team is dedicated and knowledgeable, with fast response times and multiple communication channels, to address any issues or concerns that users may have regarding their data or transactions. 12. Check if the platform provides a clear and detailed explanation of how user data is collected, used, and shared, including any third-party vendors that have access to user data. 13. Verify that the platform has an intuitive and user-friendly interface, with fast response times and minimal downtime, to ensure a seamless user experience. 14. Attempt to use the platform in different countries or regions and verify that it supports multiple currencies to allow users to easily manage their finances across different countries or regions.
Exclusion/Out-of-Scope Items	The article lists several types of testing that are not directly related to security and transparency of the platform, such as performance testing, compatibility testing, integration testing with third-party services, regulatory compliance testing, backup and disaster recovery testing, scalability testing, user interface testing, and marketing testing.
Assumptions	The user expects the platform to protect their personal data and ensure secure transactions. They want transparency about where their money goes and expect regular security updates to maintain the platform's security. The user seeks confidence in using the platform for their personal projects, suggesting they plan to use it regularly.
Non-Functional Requiements	The non-functional requirements for the platform include secure systems and protocols with regular updates, transparency about money flow and user data practices, high performance and scalability, an intuitive and user-friendly interface, backup and disaster recovery processes, and compliance with regulatory frameworks like GDPR and HIPAA.

Stroy Details, Open issues, and Conversation	This story details the user's requirements for data protection, secure transactions, and transparency in using the platform for personal projects. However, open issues remain about how to achieve these requirements, such as specific measures for data protection and compliance with regulatory frameworks. The development team needs to have conversations with stakeholders and establish a clear plan for security updates and compliance to meet the user's expectations. Regular revisits and documentation of these conversations and plans are necessary to ensure the platform meets the user's needs.
Reference and Attachment	To be determined

Use Case Section	Comments
Story	As a lender, I want there to be a credit-rating system from third-party credit agencies in order to make an informed decision regarding whether or not the borrower is trustworthy.
Use Case Title	Use Case 2: Credit Rating System
Story Owner	Mahloan
Story Creator	Team 19
Revision and Approvals	Version 1, Initial Draft
Stakeholders and Interests	Professor Vroomen & Vidyasri Ravi
Scope, Context, and Background	Having a third-party credit rating agency provide ratings of borrowers: It is often the case that there will be an individual who will borrow a large sum of money but not have the financial backing to pay the money back. This can cause losses for both the borrower and lender and result in a loss of credibility for the borrower. In order to avoid this, it is important that borrowers share their credit score/credit rating in order to provide some scope of credibility for their ability to pay back a borrowed amount. This use case fits under the larger requirement of implementing details profiles for borrowers on the application in order for lenders to understand potential investments.

Dependencies	Assumes: • Implementation of platform displaying profiles and other user-related data • Implementation of necessary security features to keep data encrypted
Actor Role(s)	Lenders looking for potential investments
Precondition(s)	Borrower provides financial statements to the platform
Success Guarantee	Once the borrower inputs their information, the profile will display a "currently being calculated"; once the third-party credit rating agency has provided a rating, it will be displayed on the profile
Minimal Guarantee	In case a system failure during the interaction, the system will encrypt all data that has been sent to the credit-rating agency and reset the functionality of calculating the credit rating whilst letting developers know of the error.
Trigger(s)	Financial statements uploaded to application
Main Scenario	1. User uploaded financial statements to application 2. Third-party credit rating agency receives documents 3. Platform displays "currently being calculated" under credit rate widget 4. Third-party credit rating agency sends back rating 5. Platform displays rating on platform 6. Users can click for more information and credit-rating agency will provide a minimal explanation behind certain rating scores 7. Application will compare given rating with general rates in order to provide an estimated interest rate to the lender
Alternative Scenarios & Extensions	Alternative Scenario 1: User already has a rating from a credit-agency outside of interacting with the application a. System asks user if they want to use their rating and have it be displayed as "rating provided from [user name]" or get a new rating and have it be displayed as "rating provided from rating agency" b. Use case ends Alternative Scenario 2: User's provided financial statements are not enough for a rating to be provided a. Credit rating agency notified platform of inability to provide rating b. Platform messages user through various methods of communication to provide necessary documents c. User provides information i. Financial statements go back to credit-rating agency for review

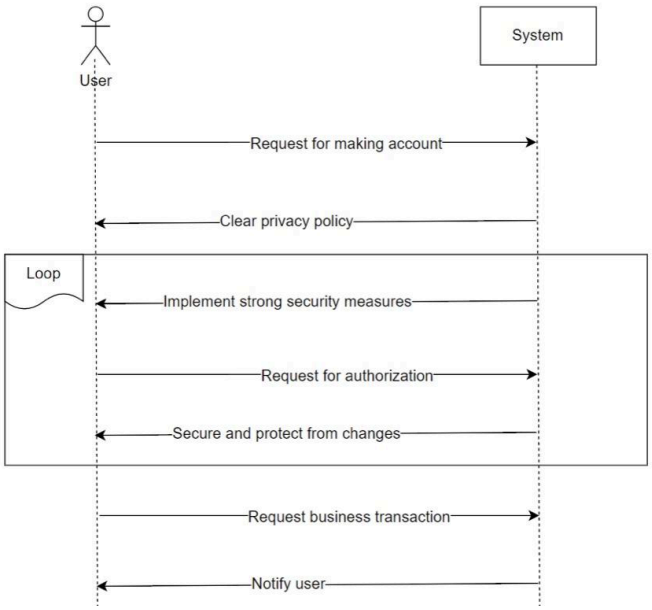
	ii. Use case done d. User does not provide information i. Application will not further transaction of data to agency for rating ii. User will not have a displayed rating iii. Use case done
Acceptance Criteria	Must Haves: • The credit rating system should be based on an analysis of the borrower's financial information. • The credit rating agency must be impartial, with no conflicts of interest that could compromise the credibility of the rating. • The credit rating system must be transparent in its reasonings for assigning credit ratings. • The credit rating system must be updated regularly to reflect changes in the borrower's financial status or other relevant factors. • The credit rating agency must comply with all relevant laws and regulations. Should Haves: • The credit rating system should utilize non-financial factors that could impact the borrower's creditworthiness, such as social or environmental performance • The application should offer a range of credit ratings, from high to low, to reflect the full spectrum of creditworthiness among borrowers. • The application should provide access to historical credit ratings, to enable lenders to track the borrower's creditworthiness over time if the borrower chooses to display such data. Nice to Haves: • The credit rating agency could offer customized credit ratings for specific industries or borrower types, to provide more tailored insights for lenders. • The application could include a benchmarking feature that compares the borrower's credit rating to other similar borrowers in the market. • Application can provide links for risk management or portfolio analysis. • Application could include a feedback mechanism that allows lenders to provide input or feedback on the accuracy and usefulness of the credit ratings.

Test Cases	1. Comparing the credit rating assigned by the credit rating agency to the actual creditworthiness of the borrower, as determined by historical data or other sources. 2. Reviewing the criteria and methodology used by the credit rating agency to assign credit ratings, and verifying that these are clearly explained and accessible to lenders. 3. Verifying that credit ratings are updated promptly to reflect changes in the borrower's financial status or other relevant factors. 4. Verify that the credit ratings can be cusotomized to specific industries or borrower types 5. Verifying that lenders can provide input or feedback on the accuracy and usefulness of the credit ratings, and assessing the responsiveness of the credit rating agency to this feedback. 6. Verifying that the credit rating agency uses advanced analytics or artificial intelligence to improve the accuracy and efficiency of the credit rating process, and assessing the effectiveness of these tools in predicting borrower creditworthiness.
Exclusion/Out-of-Scope Items	Having the credit rating system utilize financial documents from regions with different financial laws & regulations.
Assumptions	User expects platform to provide an accurate credit rating that represents their financial prowess.
Non-Functional Requirements	The non-functional requirements for the credit-rating system include accuracy, timeliness, privacy, non-discrimination, transparency, reliability, integration, scalability, flexibility, and security. The system should provide accurate and up-to-date information, comply with privacy laws, not discriminate, be transparent, reliable, and consistent, integrate with lenders' systems, handle large volumes, allow for customization, and have secure systems and protocols in place.
Story Details, Open Issues, and Conversations	As a lender, the user wants a credit-rating system from third-party credit agencies to make informed decisions about borrowers' trustworthiness. The credit-rating system should assess a borrower's creditworthiness based on factors such as credit history, outstanding debts, and payment history. However, several open issues must

	be addressed, including the specific factors to be included in the system, frequency of updates, accuracy checks, and privacy protections. To address these issues, the development team should engage with stakeholders and establish clear plans for regular updates and compliance with relevant laws and regulations.
References & Attachments	To be Determined

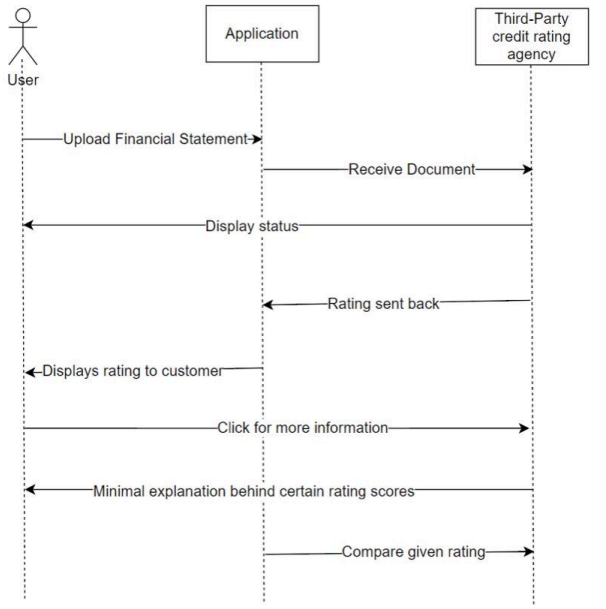
2) System Sequence Diagram

Use Case 1



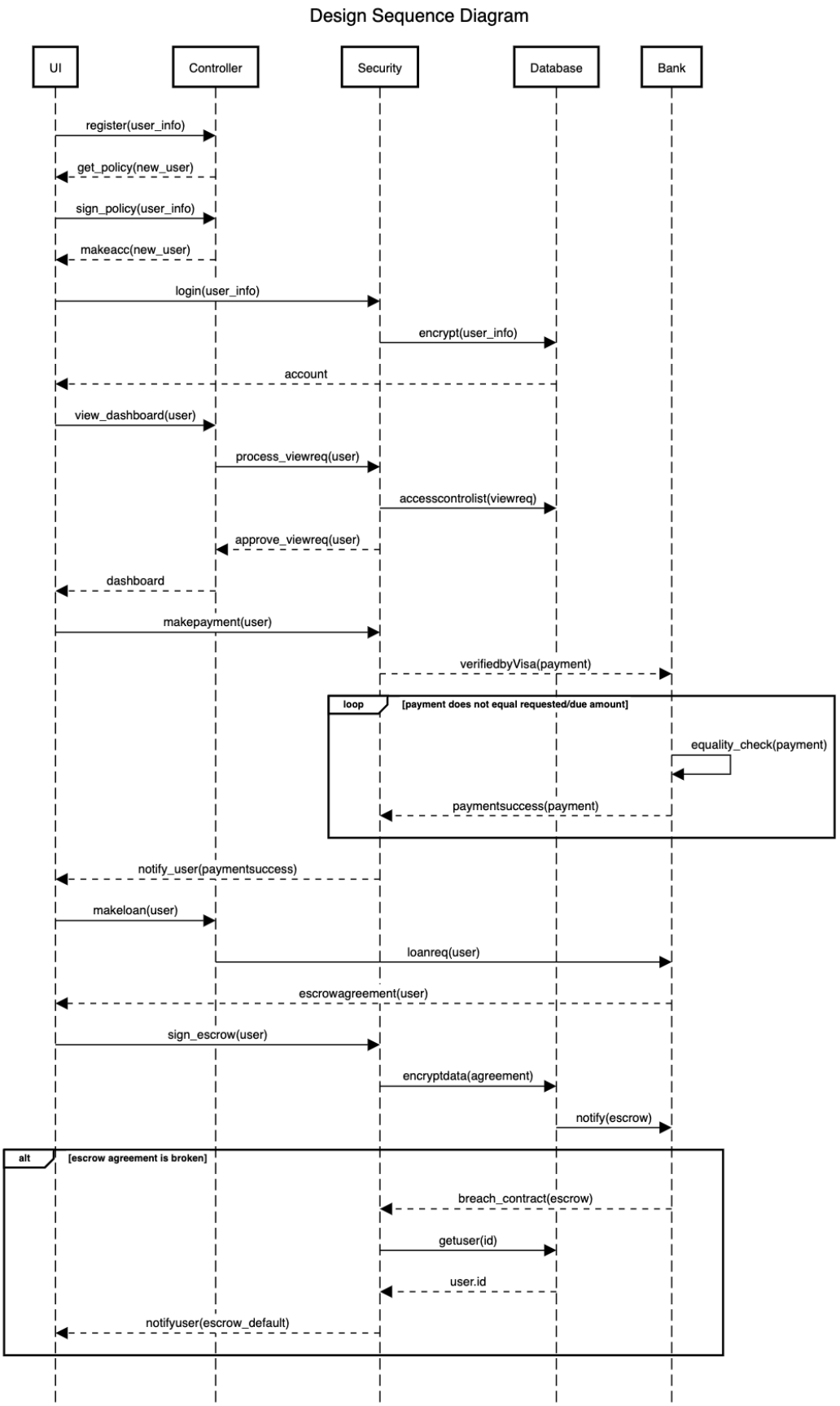
Use Case 1: Security → The system is responsible for protecting user data through the functions of the application. The user makes an account, accepts the privacy policy, & goes through a loop that keeps the user protected throughout various user actions.

Use Case 2



Use Case 2: Interest Rate → The system is responsible for handling the interactions between the third-party credit rating agency and the user. The user will upload financial statements to the application, through which, the credit rating agency will receive them and use methods to calculate the rating. Throughout this funcionaity, the agency will display the status of their actions to the user to keep them fully informed throughout the process. The agency will also provide a minimal explanation behind a rating so user's can have transparency.

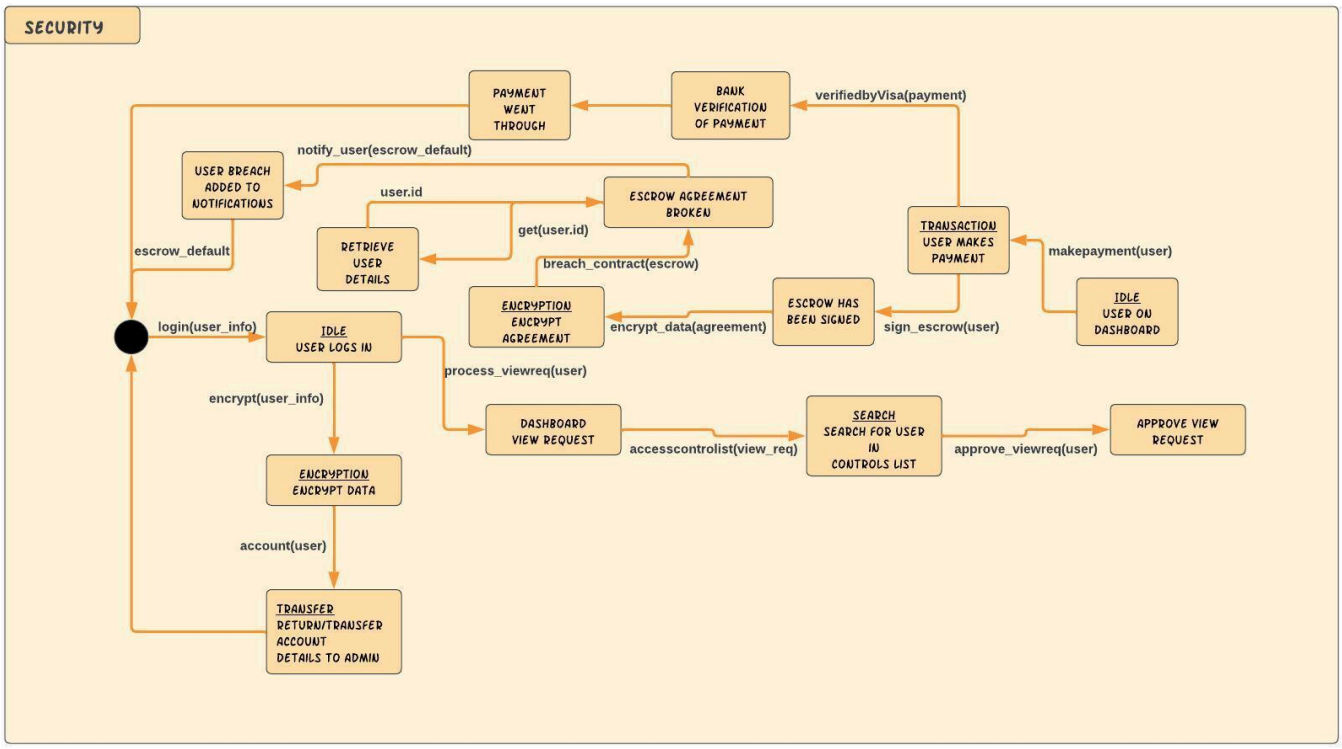
3) Design Sequence Diagram



Outline of Diagram:

- User registers for an account
- Controller gives privacy policy to user
- User signs policy
- Controller provides account form for user
- User makes account and logs in
- Security encrypts user-info and stores it in a database
- Database provides account to user
- User views dashboard simultaneously updating their permissions through security updating the control list on the dashboard
- User makes payment
- Security verifies the payment and sends it to the Bank
- Bank checks if payment sent is equal to payment requested by loaner, if equal sends a status update to Security
- Security notifies user of payment status
- Loaners send loan request to Controller which then sends it to the Bank which returns with an escrow agreement
- User signs it, and security encrypts it to store it on database & notifies the Bank
- Bank checks if there is a breach in contract and notifies User of status

4a) State Diagram



4b) Updated Class Diagram from Deliverable 1