SMART LENDER-APPLICANT CREDIBILITY PREDICTION FOR LOAN APPROVAL

A PROJECT REPORT

Submitted by

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ACKNOWLEDGEMENT

We would like to express our special thanks of gratitude to our Faculty Mentor and Industry Mentor for their support and guidance in completing our project on the Smart Fashion Recommender Application We would like to extend our gratitude to the IBM for Nalaiya Thiran project for providing us with all the facility that was required. It was a great learning experience. We would like to take this opportunity to express our gratitude.

Date:20/11/202

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Chapter 1: INTRODUCTION

1.1 Project Overview

The credit system governed by the banks is one of the most important factors which affect our country's economy and financial condition. Also, credit risk is one of the main functions of the banking community. The prediction of credit defaulters is one of the difficult tasks for any bank. This problem occurs when the banks need to provide loans to the customers who are in need of the money. But by forecasting the loan defaulters, the banks definitely may reduce their loss by reducing their non-profit assets.

1.2 Purpose

People who need loan and want to check whether they are eligible for loan or not

Chapter 2: LITERATURE SURVEY

2.1 Existing Problem

Dream Housing Finance company deals in all home loans. They have a presence across all urban, semi-urban and rural areas. Customers first apply for a home loan after that company validates the customer's eligibility for a loan. The company wants to automate the loan eligibility process (real-time) based on customer detail provided while filling out the online application form. These detailsare Gender, Marital Status,Education, Number of Dependents, Income, Loan Amount, Credit History, and others.

To automate this process, they have given a problem to identify the customer segments, that are eligible for loan amounts so that they can specifically target

these customers.

2.2 References

Ashwini S. Kadam, Shraddha R Nikam,Ankita A. Aher, Gayatri V. Shelke, Amar S Chandgude (2021)[1]. Our financial framework has a ton of merchandise to offer to banks, yet the principal kind of revenue for all banks is using a loan line. So,you can get the interest in advance. The bank's financing cost or misfortune is exceptionally reliant upon the loan, for instance, regardless of whether the client is reimbursing the advance. By prompting non-moneylenders, banks can lessen non-performing resources. This makes learning these things vital. Momentum research shows that there are numerous ways of concentrating on repayment. In any case, it is essential to concentrate on the construction in a manner that is not quite the same as contrasting, similarly as evident prediction is vital for benefit. Loan Assumptions (I) Data assortment, (ii) Data cleaning, (iii) Basic element examination strategies are utilized to concentrate on execution evaluation issues. Research tests have shown that the Naive Baye s model performs best in loan arranging.

Sivasree M S, Rekha Sunny T (2015) [2]. Used efficient Decision Tree is formulated with Decision Tree Induction Algorithm. It produces a model with the most relevant 6 attributes. A decision is made at each node and the leaf node gives us the final result. That is, if the customer possesses the minimumloan repayment capacity, then the futurerisks can be avoided. implemented the proposed model in ASP.NET-MVC5. A Decision Tree is developed by performing data mining on an existing bank dataset containing 4520 records and 17 attributes. The accuracy croreis 81.7.

Anuja Kadam, Pragati Namde, Sonal Shirke, Siddhesh Nandgaonkar, Dr.D.RIngle (2021)[3]. Data mining algorithms are used to study the loan-approved data andexact patterns, which would help in predicting the reasonable defaulters, thereby helping the banks for making better choices in the future. Data Mining is the process of examining underlying and potentially useful patterns in big chunks of source data. For the packages of three algorithms (Logistic regression, Decision tree and Random Forest) were imported. The model was then defined and the accuracy score was evaluated. Logistic Regression was the best fit with the highest accuracy score 81.12%.

Pidikiti Supriya, Myneedi Pavani, Nagarapu Saisushma, Namburi Vimala Kumari, K Vikas (2019) [4]. This Problem is done by mining the Big Data of the previous records of the people to whom the loan was granted before and on the basis of these records/experiences the machine was trained using the machine learning model which gives the most accurate result.

The dataset collected for predicting loan default customers is predicted into a Training set and testing set.Generally, an 80:20 ratio is applied to split the training set and testing set. For predicting the loan defaulter and non- defaulter's problem, a Decision tree algorithm is used. The best accuracy on a public test set is 81.1%.

1. Ashwini S. Kadam, Shraddha R Nikam, Ankita A. Aher, Gayatri V. Shelke, Amar S. Chandgude, 2021, "Prediction for Loan Approval using Machine Learning Algorithm", No "Apr" / "2021".
2. Sivasree M S, RekhaSunny T, (2015), "LoanCredibility Prediction System Based on Decision Tree Algorithm", No "September" / "2015".
3. Anuja Kadam, Pragati Namde, Sonal Shirke, Siddhesh Nandgaonkar, Dr.D.R

Ingle, 2021, "Loan Credibility Prediction System using Data Mining Techniques" No "May" / "2021".

4. Pidikiti Supriya, Myneedi Pavani, Nagarapu Saisushma , Namburi Vimala Kumari , K Vikas, 2019, "Loan Prediction by using Machine Learning Models",

No "April" / "2019".

5. https:/ medium.com/swlh/lending-club-data-web-app-ada56ff64cee
6. https:/ github.com/smartinternz02/SI-GuidedProject-48927-1652694502 7.

https:/ www.academia.edu/77162007/BANK_LOAN_PREDICTION_USING

_MACHINE_LEA
RNIG

2.3 Problem statement definition

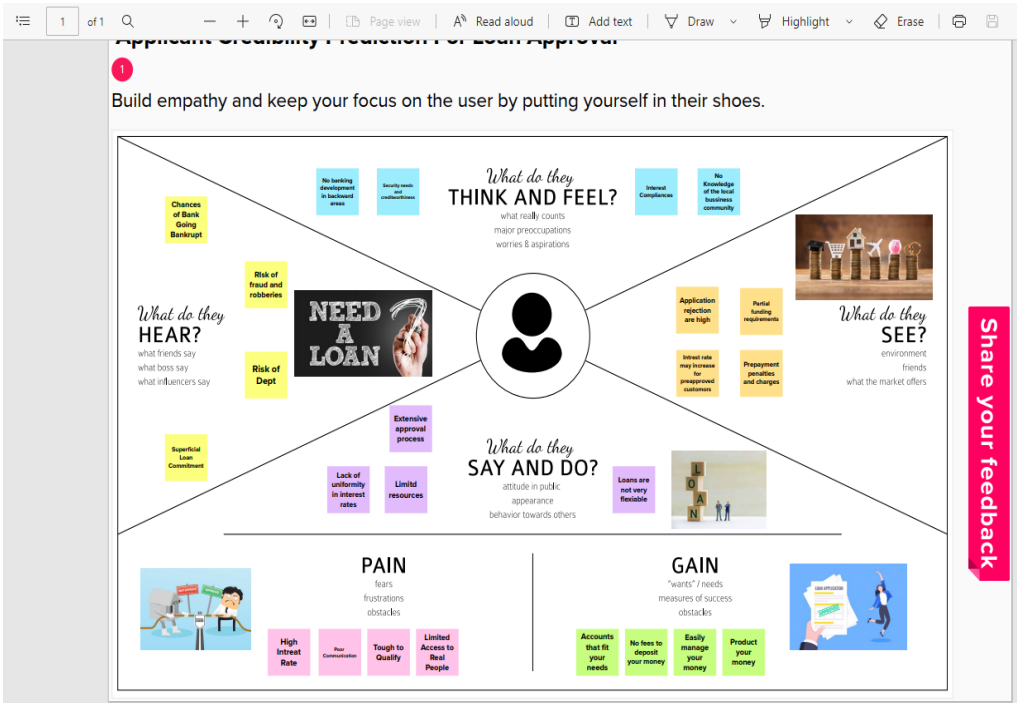
1. Company wants to automatethe loan eligibility process (real time) based on customer detail provided while filling online

application form.

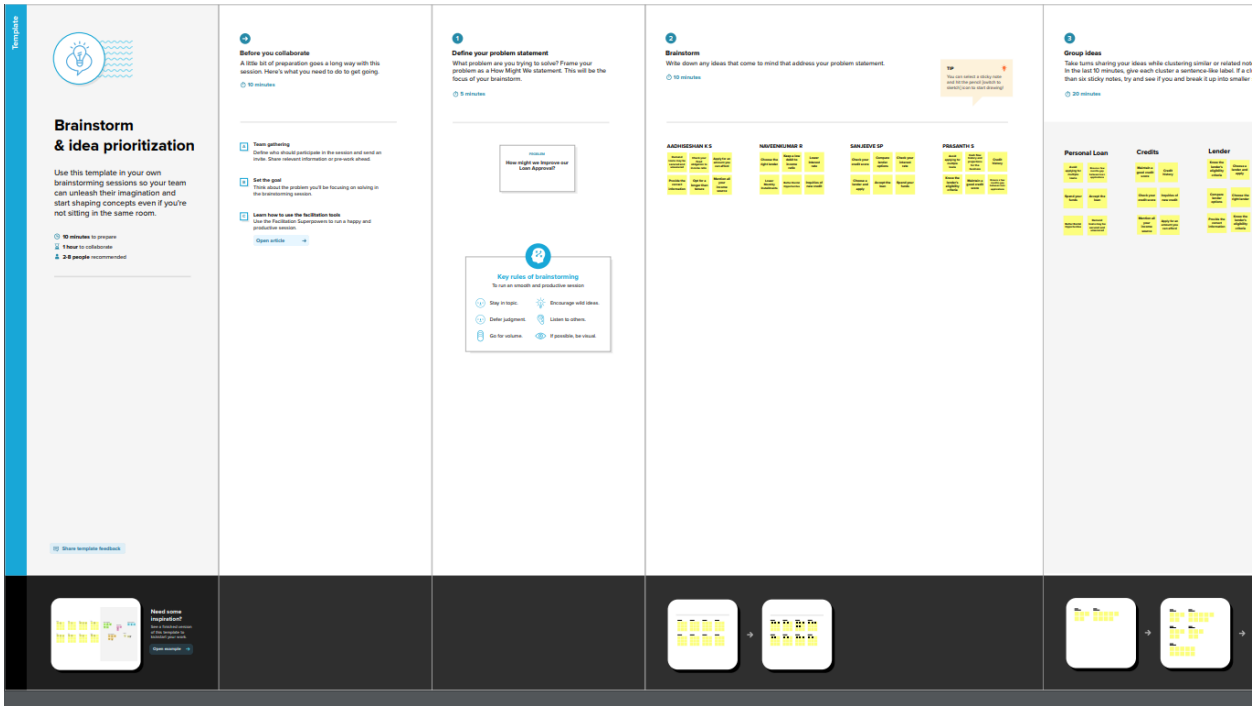
2. These details are Gender, Marital Status, Education, Number of Dependents, Income, Loan Amount, Credit History and others.
3. To automate this process, they have given a problem to identify the customers segments, those are eligible for loan amount so that they can specifically target these customers.
4. It is a classification problem where we have to predict whethera loan would be approved or not.

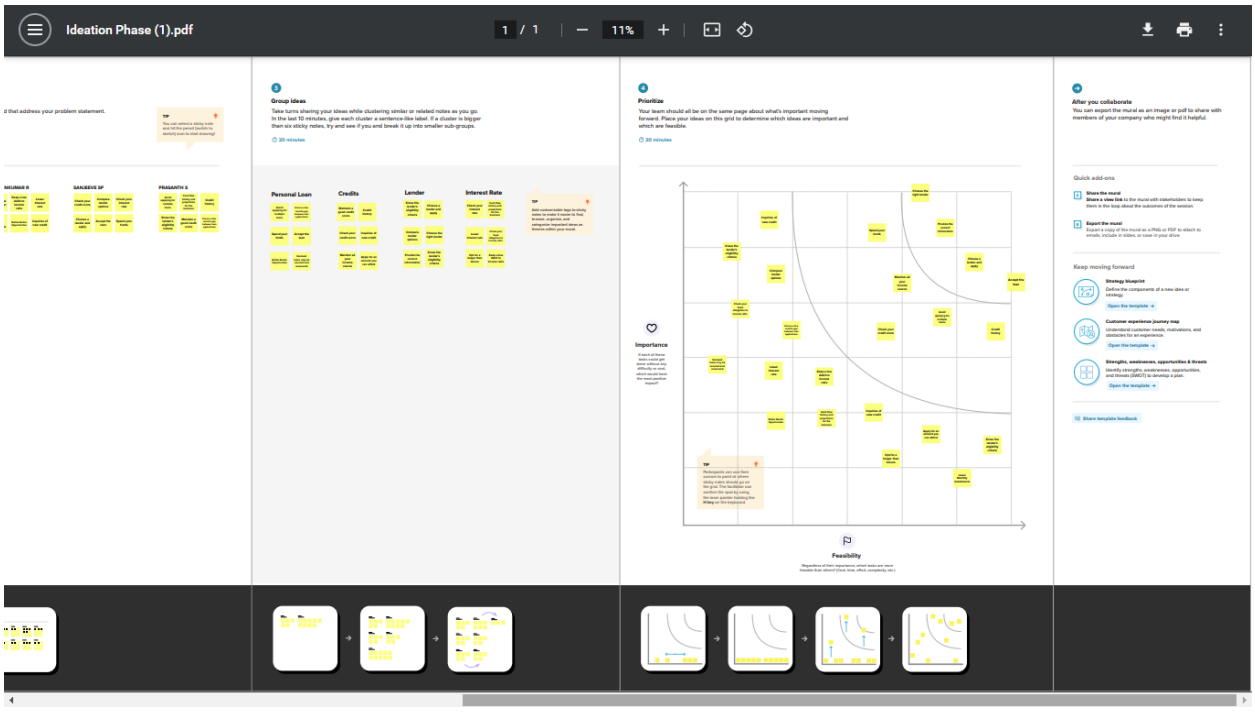
Chepter 3. IDEATION & PROPOSED SOLUTION

3.1 Empathy map canvas



3.2 Ideation & Brainstorming





3.3 Proposed solution

MACHINE LEARNUING BASED LOAN APPROVAL-PROPOSED SOLUTION

PROBLEM STATEMENT :

- Inaccurate Details in Application
- Too Many Pending Loans
- Job Instability and Low Income
- Difficult to manage the time.
- Bank employees cannot provide instant responses and quick answers.

IDEA/SOLUTION DESCRIPTION :

- To deal with the problem, we developed automatic loan prediction using machine learning techniques.
- We will train the machine with previous dataset. so machine can analyses and understand the process.
- Then machine will check for eligible applicant and give us result.

UNIQUENESS :

- Among all the algorithms logistic regression performs best on the validation data with an accuracy score of 82.7%
- Having a help-line 24/7 is not needed while we have Machine learning based application.
- With the help of application, we provide an interactive service to our customers.

SOCIAL IMPACT/ CUSTOMER SATISFACTION:

- Instant Approval and Disbursal
- Flexible loan repayment period.
- Low-interest rates.
- Usage flexibility.
- Easy documentation.

SOCIAL IMPACT/ CUSTOMER SATISFACTION:

- Instant Approval and Disbursal
- Flexible loan repayment period.
- Low-interest rates.
- Usage flexibility.
- Easy documentation.
- Quick processing.
- Several discounts.
- Paperless process.

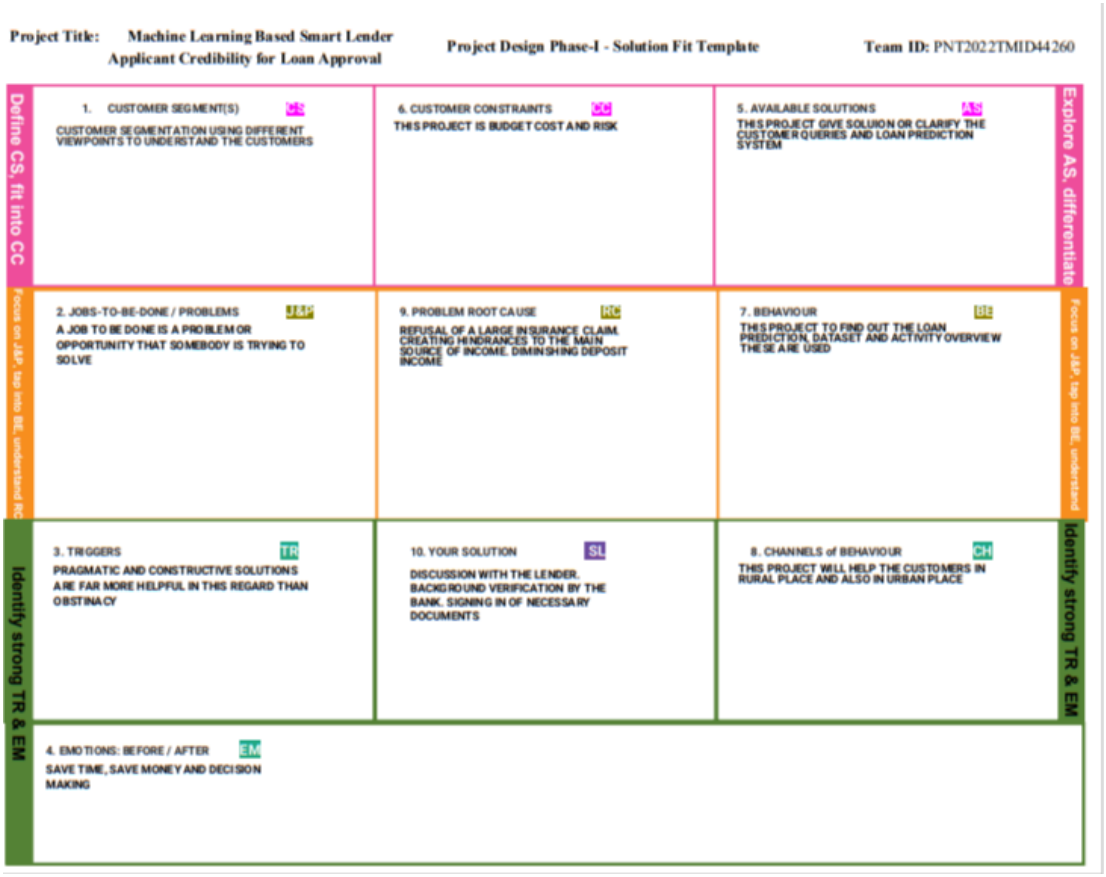
BUSINESS MODEL:

- As we are dealing with customers need, Implementing this will increase the trustamong the people.
- Feedback provides an opportunity to build a 2-way communication channel with your customers.
- With the amount of customers increase, during the growth of the application.We can provide premium features to the user with advanced options.

SCALABILITY OF SOLUTION :

- Go paperless and switch to digital documents.
- Loan origination, for many lending companies, still involves a series of manual steps.
- The processes usually require logging into multiple systems. This causes delays in the processing and decision making. To make more accurate and more informed lending decisions, it would be a better idea if lending companies could eliminate the manual steps in their processes.
- Analyze processes using modern analytic tools

Chepter 4. Problem Solution fit



Chepter 5. REQUIREMENT ANALYSIS

5.1Functionalrequirement

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Simple and understandable UI. Easy to navigate Smooth and seamless Easy to comprehend
NFR-2	**Security**	Restricted access to data. Login verification Registration verification Upholding privacy of user
NFR-3	**Reliability**	Backup to prevent data loss Negation of data loss due to lag.
NFR-4	**Performance**	Web based application. Requires minimum Intel Pentium 4 processor, 4 GB RAM, 1280x1024 screen with application window size 1024x680

5.2 Non-Functional requirements

Non-functional Requirements:

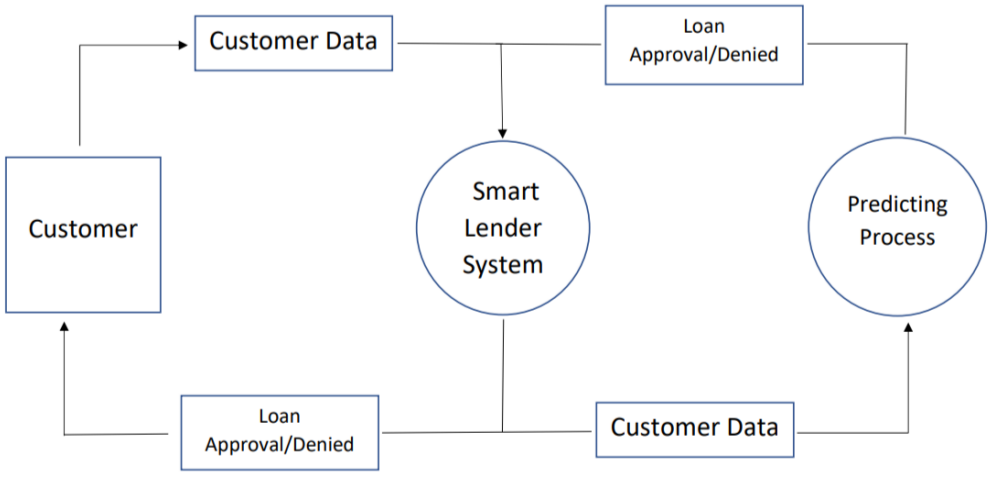
Following are the non-functional requirements of the proposed solution.

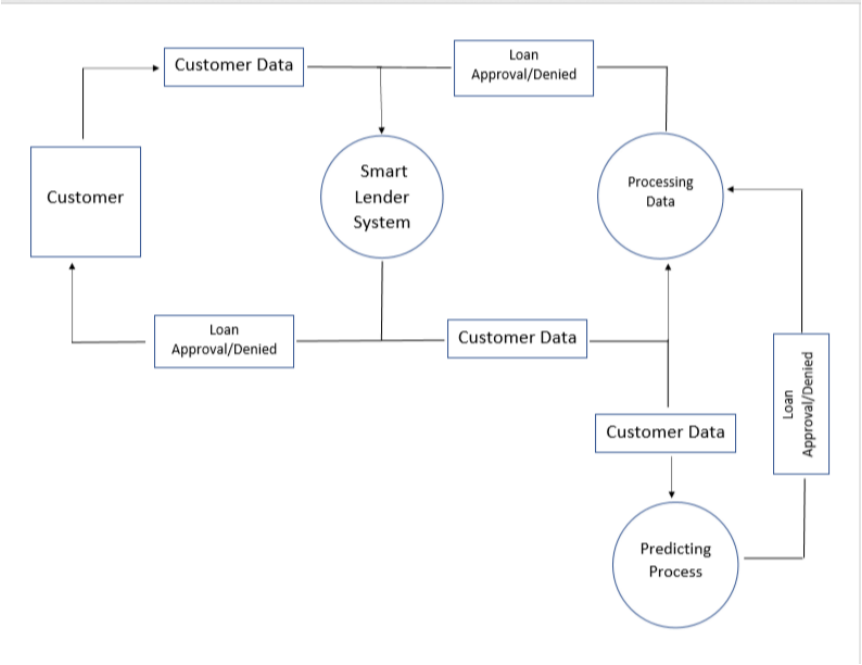
FR No.	Non-Functional Requirement	Description
NFR-1	**Usability**	Easy to access
NFR-2	**Security**	User proofs
NFR-3	**Reliability**	Based on the customer Income
NFR-4	**Performance**	Previous history of the user bank account
NFR-5	**Availability**	Based on the customer Address
NFR-6	**Scalability**	Based on the customer Assets proofs

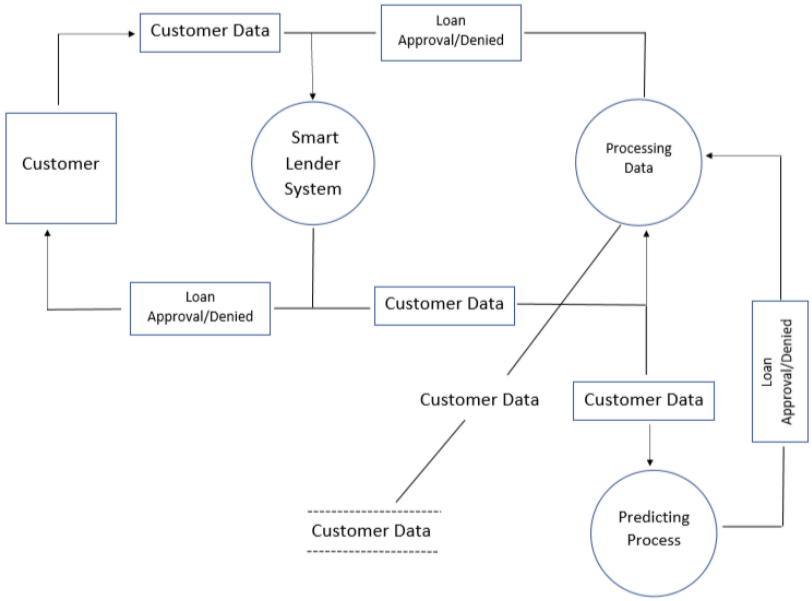
Chepter 6. PROJECT DESIGN

6.1. Data Flow Diagrams

DATA FLOW DIAGRAM




Customer Data
Loan Approval/Denied
Customer
Smart Lender System
Processing Data
Loan Approval/Denied
Customer Data
Loan Approval/Denied
Customer Data
Predicting Process


Customer Data
Loan Approval/Denied
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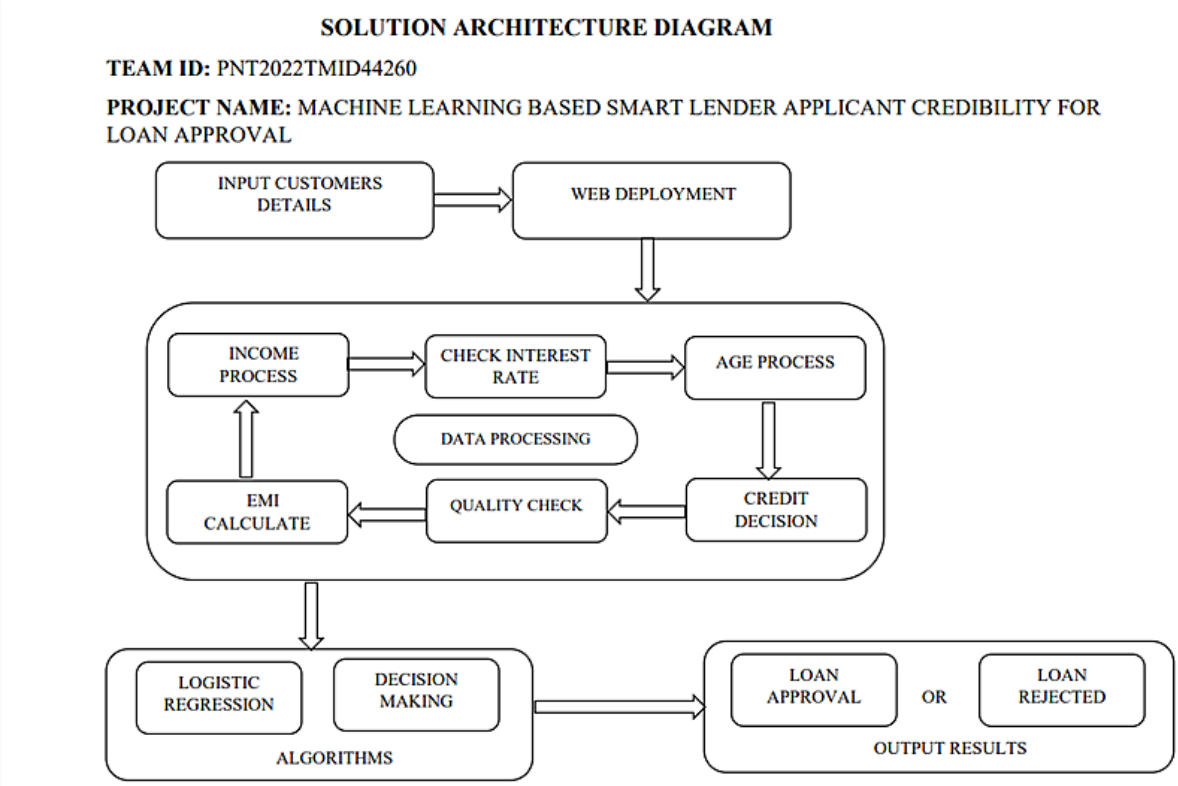
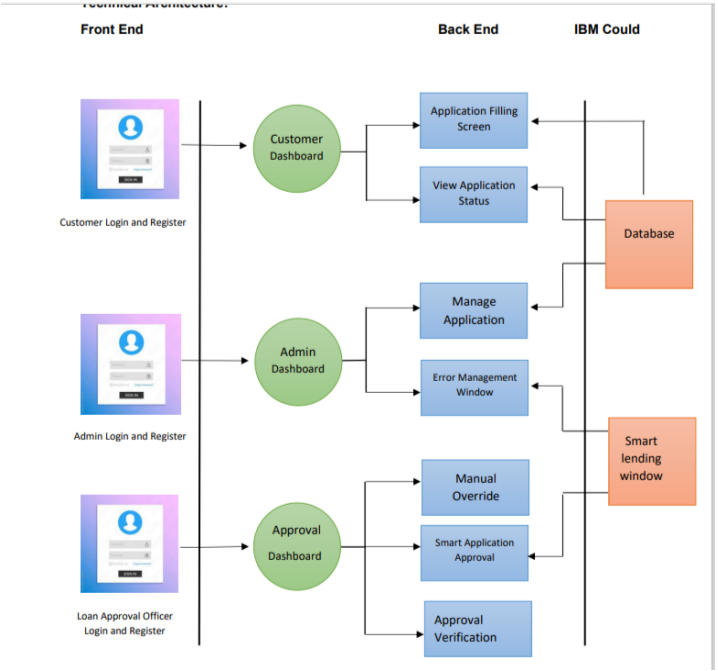
Loan Approval/Denied
Customer Data
Loan Approval/Denied
Customer Data
Customer Data
Customer Data
Predicting Process

6.2 Solution & Technical Architecture

a.Solution Architecture



6.3 Technical architecture



6.4 User Stories

S.No	Components	Description	Technology
1.	User Interface	How user interacts with application e.g. Web UI, Mobile App, Chatbot etc	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for a process in the application	Java / Python
3.	Application Logic-2	Logic for a process in the application	IBM Watson STT service
4.	Application Logic-3	Logic for a process in the application	IBM Watson Assistant
5.	Database	Data Type, Configurations etc.	MySQL, NoSQL, etc.
6.	Cloud Database	Database Service on Cloud	IBM DB2, IBM Cloudant etc
7.	File Storage	File storage requirements	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	Purpose of External API used in the application	IBM Weather API, etc.
9.	External API-2	Purpose of External API used in the application	Aadhar API, etc.
10.	Machine Learning Model	Purpose of Machine Learning Model	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration: Cloud Server Configuration.	Local, Cloud Foundry, Kubernetes, etc

S.NO	Characteristics	Description	Technology
1.	Open-Source Frameworks	Flask is used to host the website. Scikit, NumPy and TensorFlow are all open source python machine learning frameworks.	Sckit
2.	Security Implementations	OpenSSL is a program and library that supports many different cryptographic operations, including: Symmetric key encryption. Public/private key pair generation. Public key encryption. Hash functions	OpenSSL
3.	Scalable Architecture	Since the application servers can be deployed on many machines. Also, the database does not make longer connections with every client – it only requires connections from a smaller number of application servers. It improves data integrity.	3 Tier
4.	Availability	Decentralized storage and distribution along-with web application approach make the service highly available.	IBM cloud online
5.	Performance	Long term header expiration.	AJAX

Chepter 7. PROJECT PLANNING & SCHEDULING

7.1 Sprint Planning & Estimation

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-3	As a user, I can register for the application through Facebook	1	Low	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1	Dashboard	USN-6	As a user, I should be able to access the dashboard with everything I am allowed to use.	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 1	Registration	USN-7	As a user, I can register for the application by entering my email, password, and confirming my password.	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-8	As a user, I will receive confirmation email once I have registered for the application	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-9	As a user, I can register for the application through Facebook	1	Low	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1		USN-10	As a user, I can register for the application through Gmail	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1	Login	USN-11	As a user, I can log into the application by entering email & password	3	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-1	Dashboard	USN-12	As a user, I should be able to access the dashboard with everything I am allowed to use	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Register	USN-13	As a loan approval officer, I should be able to register myself as one using a unique email and password	5	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint-2	Login	USN-14	As a loan approval officer, I should be able to login myself as one using a unique email and password.	5	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 3	Automated analysis of credit history	USN-15	As a loan approval officer, I can access the dashboard where I feed applications for loan prediction.	10	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 3		USN-16	As a loan approval officer, I can get a decision followed by some details for the decision when I feed an application for loan prediction.	15	High	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 4	Register	USN-17	As an admin, I should be able to register myself as one using a unique email and password	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 4	Login	USN-18	As an admin I should be able to login myself as one using a unique email and password.	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R
Sprint - 4	Dashboard	USN-19	As an admin, I should be able to access the dashboard with everything I am allowed to use	2	Medium	PRASANTH S SANJEEVE S P AADHISESHAN K NAVEEN KUMAR R

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)	Sprint Release Date (Actual)
Sprint-1	20	6 Days	24 Oct 2022	29 Oct 2022	28	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	10	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	25	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	6	19 Nov 2022

Velocity:
Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

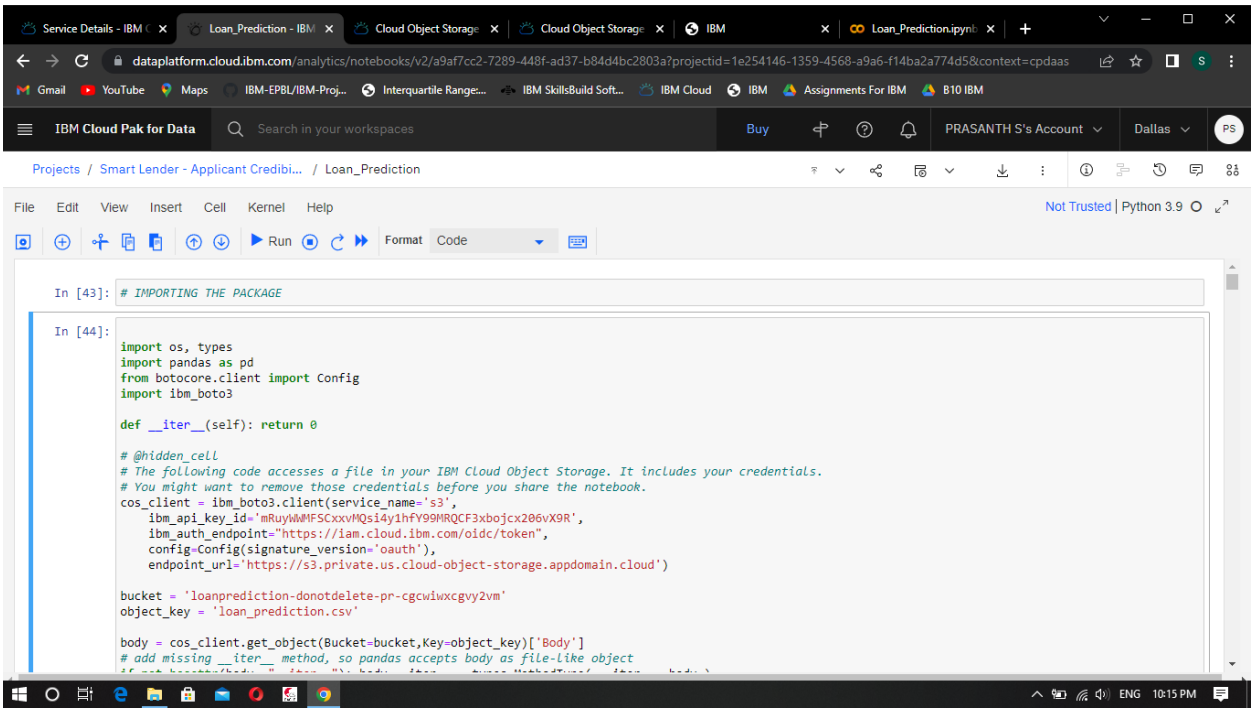
$$AV = \frac{sprint\ duration}{velocity} = \frac{20}{10} = 2$$

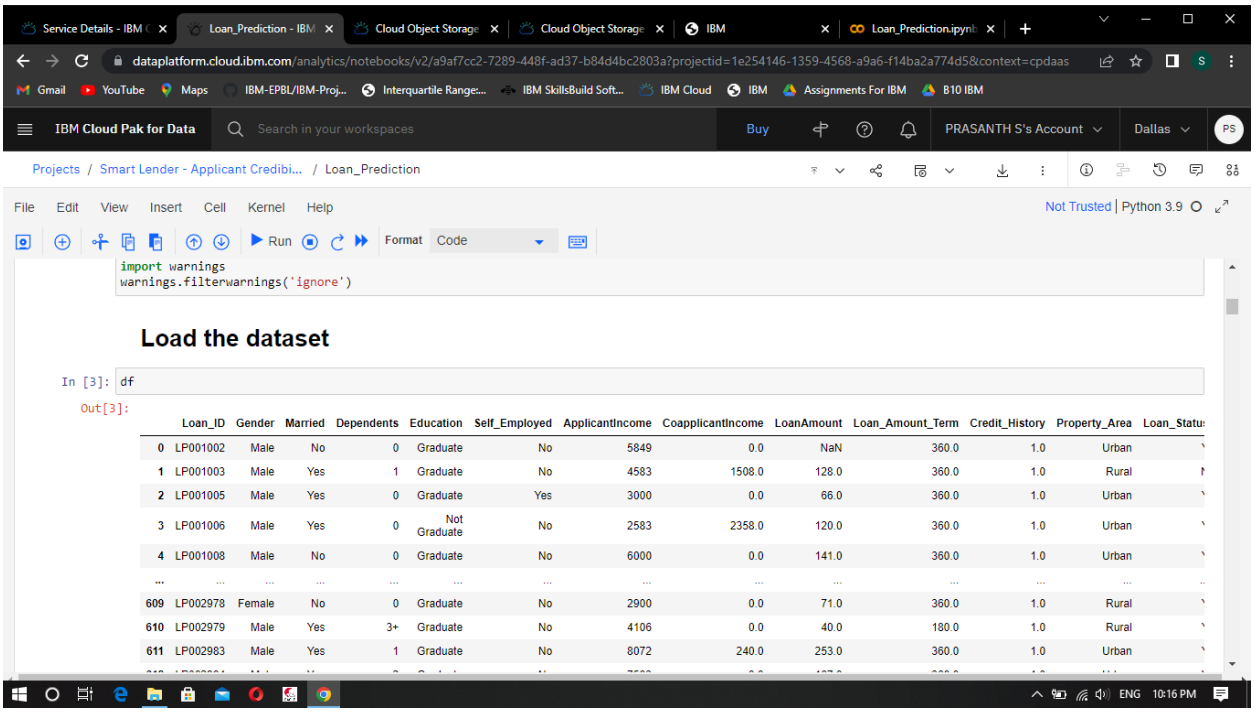
Burndown Chart:

A burndown chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.

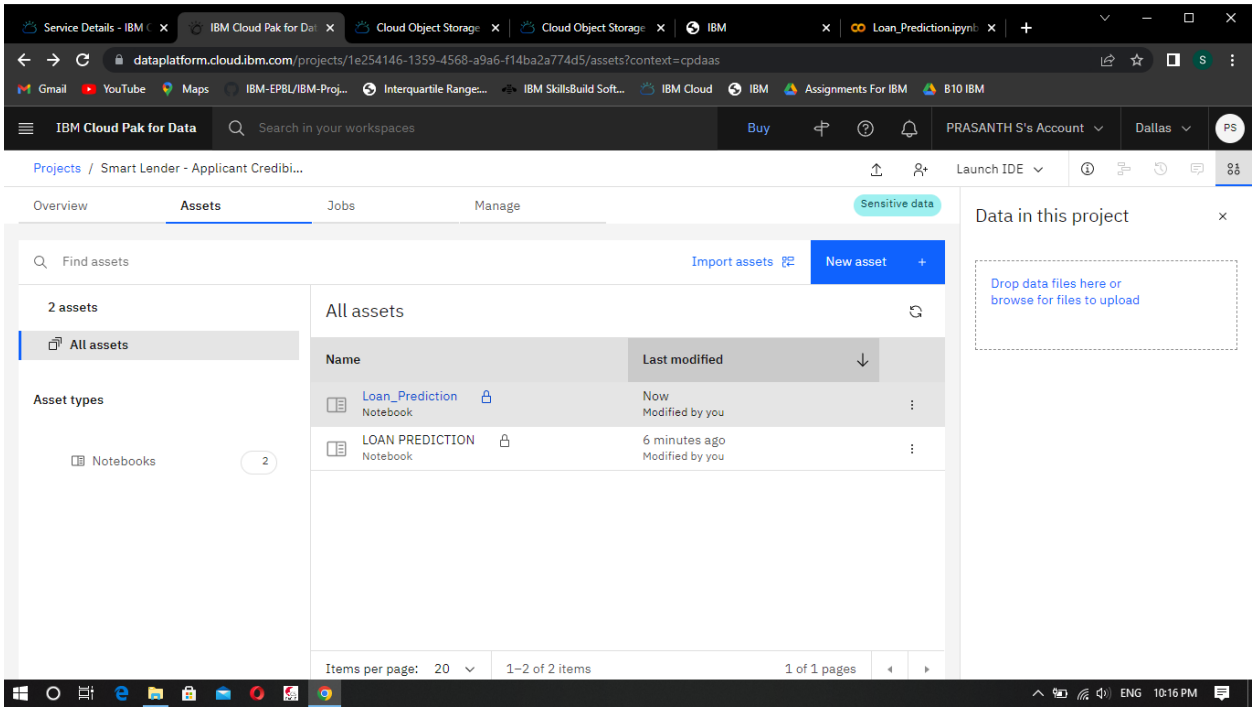
Burndown Chart

7.2 Reports from JIRA





Chepter 8. CODING & SOLUTIONING (Explainthe features addedin the project along with code)



Chepter 9. TESTING

9.1Test Cases

TEST CASES

Test case ID	Feature Type	Component	Test Scenario	Steps To Execute	Test Data	Expected Result	Actual Result	Status	Comments	TC for Automatio n(Y/N)	BUG ID	Executed By
LoginPage_T C_OO1	Functional	Home Page	Verify user is able to see the Login/Signup page when user clicked on Sign up button	1.Enter URL and click go 2.Scroll down 3.Verify login/Singup popup displayed or not	http://169.51.2 10: 213:30106/	Login/Signup popup should display	Working as expected	PASS	Successful			Manju T Jasmine Mary
LoginPage_T C_OO2	UI	Home Page	Verify the UI elements in Sign in/Signup popup	1.Enter URL and click go 2.Click on Signup button for User 3.Verify login/Singup popup with below UI elements: a.id text box b.password text box c.Login button d.New customer? Create account link e.Last password? Recovery password link	http://169.51.2 10: 213:30106/	Application should show below UI elements: a.email text box b. password text box c.Login button d.New customer? Create account link	Working as expected	PASS	Successful			Manju T
LoginPage_T C_OO3	Functional	Home page	Verify user is able to log into application with Valid credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid ID in ID text box 4.Enter valid password in password text box 5.Click on login button	ID: 5342 password: Testing123	User should navigate to user account homepage	Working as expected	PASS	Successful			Manju T Jasmine Mary

Test Case (SPRINT 01) 3

LoginPage_ TC_OO4	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Enter the url and click go 2.Click on My Account button 3.Enter InValid ID in ID text box 4.Enter valid password in password text box 5.Click on login button	ID: 5342 password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	PASS	Successful			Manju T
LoginPage_ TC_OO5	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Enter URL and click go 2.Click on My Account button 3.Enter Valid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	ID: 5342 password: Testing1236 7868 6786876876	Application should show 'Incorrect email or password ' validation message.	Working as expected	PASS	Successful			Manju T
LoginPage_ TC_OO6	Functional	Login page	Verify user is able to log into application with InValid credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	ID: 5342 password: Testing123	Application should show 'Incorrect email or password ' validation message.	Working as expected	PASS	Successful			Manju T

Test Case (SPRINT 01) 4

LoginPage_ TC_OO7	Functional	Login page	Verify User is able to log into application with Valid Credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login	ID: 5434 password: Testing123	Application should show 'correct email or password ' validation message.	Working as expected	PASS	Successful			Manju T Jasmine Mary

Test Case (SPRINT 01) 4

LoginPage_ TC_ OO7	Functional	Login page	Verify User is able to log into application with Valid Credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	ID: 5434 password: Testing123	Application should show 'correct emuil or password ' validation message.	Working as expected	PASS	Successful			Manju T Jasmine Mary
LoginPage_ TC_ OO8	Functional	Login page for ADMIN	Verify User is able to log into application with Valid Credentials	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter Valid ID in ID text box 4.Enter valid password in password text box 5.Click on login button	ID: 1111 password: 5678	Application should show 'correct emuil or password ' validation message.	Working as expected	PASS	Successful			Manju T Jasmine Mary
LoginPage_ TC_ OO9	UI	ADMIN PAGE	Verify all the Customer database is visible	1.Enter URL and click go 2.Click on My Account dropdown button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	http://169.51.204. 215:30106/	Customer database is visible	Working as expected	PASS	Successful			Manju T

Test Case (SPRINT 01) 5

LoginPage_ TC_ O10	Functional	USER REGISTER	Verify Id sent to customer email address	1.Enter URL and click go 1.Register the account by giving credentials 2. Click on button Submit	http://169.51.204 .215:30106/	Email sent successfull y	Working as expected	PASS	Successful			Manju T
LoginPage_ TC_ O11	Functional	AGENT REGISTER	Verify AGENT is able to log into application with Valid Credentials	1.Enter URL(http://169.51.20 4.21 5:30106/) and click go 2.Click on My Account dropdown button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	ID: 5342 password: Testing123	ID sent successfully	Application should show a 'correct emuil or pasword ' validation message.	PASS	Successful			Manju T
LoginPage_ TC_ O12	Functional	Login page for ADMIN	Verify User is able to log into application with InValid Credentials	1.Enter URL and click go 2.Click on account button 3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button	ID: 1111 password: 5678	Applicatio n should show 'Incorrect ID or password ' validation message.	Working as expected	PASS	Successful			Manju T PJasmine Mary
LoginPage_ TC_ O13	UI	Home page for Agent	Verify user is able to see the agent home page when user finish on submitting Credentials	1.Enter URLand click go 2. To the Agent Login page and submit Your Credentials	ID: 1111 password: 5678	AGENT Home Page popup should display	Working as expected	PASS	Successful			Manju T

				3.Enter InValid ID in ID text box 4.Enter Invalid password in password text box 5.Click on login button		ID or password ' validation message.						
LoginPage_ TC_ O13	UI	Home page for Agent	Verify user is able to see the agent home page when user finish en submitting Credentials	1.Enter URLand click go 2. To the Agent Login page and submit Your Credentials	ID: 1111 password: 5678	AGENT Home Page popup should display	Working as expected	PASS	Successful			Manju T

Test Case (SPRINT 01) 6

LoginPage_ TC_ O14	UI	Home page for USER	Verify user is able to see the User home page when user finish on submitting Credentials	1.Enter UR and click go 2. To the User Login page and submit Your Credentials	http://169.5 1.20 4.215:3010 6/	USER Home Page popup should display	Working as expected	PASS	Successful			Manju T PJasmine Mury
LoginPage_ TC_ O15	UI	Home page for ADMIN	Verify user is able to see the ADMIN home page when user finish on submitting Credentials	1.Enter URL and click go 2. To the User Login page and submit Your Credentials	http://169.5 1.20 4.215:3010 6/	ADMIN Home Page popup should display	Working as expected	PASS	Successful			Manju T
LoginPage_ TC_ O16	Functional	AGENT PAGE	On delete Button the user Credentials will be detected	1.Enter URL and click go 2. To the Admin Page and detect the User Credentials	http://169.5 1.20 4.215:3010 6/	ADMIN Home Page popup should display	Working as expected	PASS	Successful			Manju T

9.2 User Acceptance Testing

i. Purpose of Document

The purpose of this document is to brieflyexplain the lestcoverage and open issues of the [CUSTOMER CARE REGISTRY]project at !he {ime of tne reiease to User Acceptance Tesling (UAT)

ii. Defect Ana lysis

Thisreport shDws lhe numberof resolved or closedbugs at eachseverity level. and how they were resolved

Rosolutio n	Severity 1	Sovority 2		Sove rily 4	
By Design	10	3	1	2	17
Duplicate	1	0		0	4
External	2		0	1	6
Fixed	11		4	20	40
Nol Reproduced	O	0		0	
Skipped	0	0	1		2
Won'l Fix				1	8

Talals 24 13 12 25 78

iii. Test Case Anaiy sis

This report shows the number of test cases that have passed. failed. and untested

SoCT FOR	TolaI Casa s	Not Tostod	Fail	Pas s
Prin(Eng ine	10		0	10
Client Application	50	0	0	50
Security			0	1

Outsource Shipping		0	0	3
Exceplion Reporting	8	0	0	8
Final Report Oulput		0	0	4

Chepter 10. RESULTS

10.1 Performance Metrics

NFT - Risk Assessment

S.No	Project Name	Scope/feature	Functional Changes	Hardware Changes	Software Changes	Impact of Downtime	Load/Voluem Changes	Risk Score	Justification
1	Smart Fashion Recommender Application	New	Low	No Changes	Moderate		>1 to 10%	ORANGE	As we have seen the chnages

NFT - Detailed Test Plan

S.No	Project Overview	NFT Test approach	Assumptions/Dependencies/Risks	Approvals/SignOff
1	Smart Fashion Recommender Application	Manual testing	laptop or mobile with internet connection	vkparameshwaran

End Of Test Report

S.No	Project Overview	NFT Test approach	NFR - Met	Test Outcome	GO/NO-GO decision	Recommendations	Identified Defects (Detected/Closed/Open)	Approvals/SignOff
1	Smart Fashion Recommender Application	Manule		Worked as we expected		Use Laptop / desktop Mode	No Defects	Vkparameshwaran

ADVANTAGES & DISADVANTAGES

10.2 Advantages:

Keep Control of the Company

A bank loans money to a business based on the value of the business and its perceived ability to service the loan by making payments on time and in full. Unlike with equity finance where the business issues shares, banks do not take any ownership position in businesses. Bank personnel also do not get involved in any aspect of running a business to which a bank grants a loan. This means you get to retain full management and control of your business with no external interference.

Bank Loan is Temporary

Once a business borrower has paid off a loan, there is no more obligation to or involvement with the bank lender unless the borrower wishes to take out a subsequent loan. Compare this with equity finance, where the company may be paying out dividends to shareholders for as long as the business exists. Interest is Tax Deductible The interest on business bank loans is tax-deductible. In addition, especially with fixed-rate loans, in which theinterest rate does not changeduring the courseof a loan, loan servicing payments remain the same throughout the life of the loan. This makes it easy for businesses to budget and plan for monthly loan payments. Even if the loan is an adjustable-rate loan, business owners can use a simple spreadsheet to compute futurepayments in the event of a changein rates.

10.3 Disadvantages:

Tough to Qualify

One of the greatest disadvantages to bank loans is that they are very difficult to obtain unless a small business has a substantial track record or valuable collateral such as real estate. Banks are careful to lend only to businesses that can clearly repay their loans, and they also make sure that they are able to cover

losses in the event of default. Business borrowers can be required to provide personal guarantees, which means the borrower's personalassets can be seized in the event the businessfails and is unable to repay all or part of a loan.

High Interest Rates

Interest rates for small-business loans from banks can be quite high, and the amount of bank funding for which a business qualifies is often not sufficient to completely meet its needs. The high interest rate for the funding a business does receive often stunts its expansion, because the business needs to not only service the loan but also deal with additional funding to cover funds not provided by the bank. Loans guaranteed by the U.S. Small Business Administration offer better terms than other loans, but the requirements to qualify for these subsidized bank loans are very strict.

Chepter 11. CONCLUSION

The analysis starts from data cleaning and processing missing value, exploratory analysis and finally model building and evaluation of the model. The best accuracy on public test set is when we get higher accuracy score and other performance metrics which will be found out. This project can help to predict the approval of bank loan or not for a candidate.

Chepter 12. FUTURE SCOPE

In order to analyses the risk associated for the bank, credit evaluation largely involves gathering information about the customer and examining the project's technical, financial, and economic viability and this process developed a lot.

Chepter 13. APPENDIX Source Code

home.html

```
DOCTYPE
html>
                <html lang="en">
                  <head>
                    <meta charset="UTF-8" />
                    <meta http-equiv="X-UA-Compatible" content="IE=edge" />
                    <meta name="viewport" content="width=device-width, initial-scale=1.0"
                />
                    <link rel="stylesheet" href="style.css" type="text/css" />
                    <title>Loan Predictor</title>
                  </head>

                  <body>
                    <main>
                      <div class="mail">
                        <center>
                          <h1>Loan Prediction</h1>
                          <h3>Find your Loan Eligibility</h3>
                          <h5>
                            Click below button and fill the details to know your Loan
                            Eligibility.
                          </h5>

                          <div class="container">
                            <a href="predict.html">
                              <button class="btn" data-hover="Loan Predictor">
                                <div>Click to Check</div>
                              </button>
                            </a>
```

```
        </div>
      </center>
    </div>
  </main>
 </body>
</html>
```

Package.json

```
{
  "name": "static",
  "version": "1.0.0",
  "description": "This is a static template with no bundling",
  "main": "index.html",
  "scripts": {
    "start": "serve",
    "build": "echo This is a static template, there is no bundler or bundling
involved!"
  },
  "repository": {
    "type": "git",
    "url": "git+https://github.com/codesandbox-app/static-template.git"
  },
  "keywords": [
```

```
    "static",
    "template",
    "codesandbox"
  ],
  "author": "Ives van Hoorne",
  "license": "MIT",
  "bugs": {
    "url": "https://github.com/codesandbox-app/static-template/issues"
  },
  "homepage": "https://github.com/codesandbox-app/static-template#readme",
  "devDependencies": {
    "serve": "^11.2.0"
  }
}
```

Predict.html

```
<!DOCTY
PE html>
        <html lang="en">
          <head>
            <meta charset="UTF-8" />
            <meta http-equiv="X-UA-Compatible" content="IE=edge" />
            <meta name="viewport" content="width=device-width, initial-
        scale=1.0" />
            <link rel="stylesheet" href="style.css" type="text/css" />
            <title>Loan Predictor</title>
          </head>

          <body>
```

```
<div class="mail">
  <center>
  <h2>LOAN PREDICTOR FORM</h2>
  <h5>Fill the form to predict</p>
  </center>

  <form action="submit.html" method="post">
    <h3>
      <label>Name (in Caps)</label>
      <input type="text" required="" />
      <br />
      <label>Gender (Male/Female)</label>
      <input type="text" required="" />
      <br />
      <label>Married(Yes/No)</label>
      <input type="text" required="" />
      <br />
      <label>Dependents (Enter a number)</label>
      <input type="number" required="" />
      <br />
      <label>Education (Degree)</label>
      <input type="text" required="" />
      <br />
      <label>Self Employed (Yes/No)</label>
      <input type="text" required="" />
      <br />
      <label>Applicant Income (Enter a number without
commas)</label>
      <input type="number" required="" />
      <br />
      <label>Co-Applicant Income (Enter a number without
commas)</label>
```

```
          <input type="number" required="" />
          <br />
          <label>Loan Amount (Enter a number without commas)</label>
          <input type="number" required="" />
          <br />
          <label>Loan Amount Term (Enter a number in years)</label>
          <input type="number" required="" />
          <br />
          <label>Credit History (Yes/No)</label>
          <input type="text" required="" />
          <br />
          <label>
            Property Area (Enter a number without comma, If none - Enter 0)
          </label>
          <input type="text" required="" />
          <br />
        </h3>

        <div class="container">
          <a href="submit.html">
            <center>
              <submit class="submit" data-hover="Loan Predictor">
                  <input type="submit" name="submit" value="Submit">

              </submit>
            </center>
          </a>
        </div>
      </form>
    </div>
  </body>
</html>
```

Sandbox.config.json

```
{
  "template":
"static"
}
```

Style.css

```
li {
  list-style-type: none;
  font-size: 16pt;
}
.mail {
  margin: auto;
  padding-top: 100px;
  padding-bottom: 100px;
  width: 900px;
  background: #d8f1f8;
  border: 1px soild silver;
}
.mail h2 {
  margin-left: 38px;
}
.mail h5 {
  margin-left: 38px;
}
.mail h3 {
  margin-left: 38px;
}
```

```
input {
  font-size: 10pt;
}
input:focus,
textarea:focus {
  background-color:
lightyellow;
}
input submit {
  font-size: 28pt;
}
input button {
  font-size: 28pt;
}
.rq {
  color: #ff0000;
  font-size: 10pt;
}
```

Submit.html

```
!DOCTY
PE html>
        <html lang="en">
          <head>
            <meta charset="UTF-8" />
            <meta http-equiv="X-UA-Compatible" content="IE=edge" />
            <meta name="viewport" content="width=device-width, initial-scale=1.0"
        />
            <link rel="stylesheet" href="style.css" type="text/css" />
```

```
    <title>LOAN PREDICTION</title>
  </head>

  <body>
    <main>
      <div class="mail">
        <center>
          <h1>Loan Approval Prediction</h1>
          <h3>{{Check}}</h3>
        </center>
      </div>
    </main>
  </body>
</html>
```

13.2 GitHub& Project Demo Link

GitHub Link:

https://github.com/IBM-EPBL/IBM-Project-42859-1660710314/tree/main

Project Link:

https://youtu.be/0T41sVg7384