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# System Requirements Specification Index

For

## e-Loan Application (Collaborative)

Version 4.0

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# E-LOAN APPLICATION

## System Requirements Specification

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### 1. BUSINESS-REQUIREMENT:

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#### 1.1 PROBLEM STATEMENT:

E-Loan Application is .net core web API application with MongoDB, where it allows customers to apply for Loan Online, and the same would be processed by the loan clerk and sanctioned by the manager from the bank.

#### 1.2 FOLLOWING IS THE REQUIREMENT SPECIFICATION:

	E-LOAN
USERS	
1	Manager
2	Clerk
3	Customer
Customer Functionalities	
1	Can register itself ( <i>Contact Details (Contact Address, mobile, email)</i> )
2	Can apply for Mortgage loan on a property
	<i>While applying for loan, following information is required</i>
	<i>a. Loan Name (Description)</i>
	<i>b. Loan Application number (Auto generated)</i>
	<i>c. Loan Amount requested</i>
	<i>d. Loan Application Date</i>
	<i>e. Business structure (Individual/Organization)</i>
	<i>f. Billing Indicator (Salaried person or not)</i>
	<i>g. Tax indicator (Tax payer or not)</i>
3	Can track status of Loan Application
4	<b>Can get the details of all the loans that applied by user</b>
5	Can update the details of loan application
6	<b>Can delete the loan application</b>
Loan Clerk Functionalities	
1	Can list all Loan Application to be processed
2	Can Process Loan Application After Receiving and physical verification with following information added to it
	a. Acres of land
	b. Land Values in Rs

	c. Appraised by (Name of third-party appraiser)
	d. Valuation Date
	e. Address of property
	f. Suggested amount of loan that can be released on property
3	Can Update the process information
4	Can list all Loan Application Already Processed by himself
Manager Functionalities	
1	Can list all Loan Application processed by Loan clerk
2	Can Accept or reject a loan application (with remarks)
3	If Loan is sanctioned, following information should be furnished
	<i>a. Loan Amount Sanctioned</i>
	<i>b. Term of loan (Duration- in months)</i>
	<i>c. Payment start Date</i>
	<i>d. Loan closure Date (Auto calculated from Payment start date and Term)</i>
	<i>e. Monthly payment (Calculated)</i>
	<i>Formulae:</i>
	<i>a. Term payment amount = (Sanctioned loan amount) * (1 + interest rate/100) ^ ((term of loan/12))</i>
	<i>b. Monthly payment = (Term payment amount) / (Term of loan)</i>
4	Can list all Loan Application Finalized(Accepted or Rejected) by himself
	Interest Rate to be used: 6%

## 2. ASSUMPTIONS, DEPENDENCIES, RISKS / CONSTRAINTS

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### 2.1 CUSTOMER CONSTRAINTS

- While applying for a loan by a customer, all fields should be filled if not filled then operation should throw custom exception.
- While fetching loan status, if the loan application id does not exist then the operation should throw a custom exception.
- While fetching all loan details of a customer, if customer id does not exist then operation should throw custom exception.
- While fetching all loan details of a customer, if the customer is disabled then the operation should throw a custom exception.
- While updating the loan details by customer, if loan application id does not exist then operation should throw custom exception.
- While deleting the loan details by customer, if loan application id does not exist then operation should throw custom exception.
- While updating the loan details by the customer, if the loan application is already processed by the clerk, then the operation should throw a custom exception.
- While deleting the loan application by the customer, if the loan application is already processed by the clerk, then the operation should throw a custom exception.

### 2.2 CLERK CONSTRAINTS

- While processing the loan by the loan clerk, make sure loan application status is in "Received" status and then operation should throw custom exception.
- While processing a loan by a loan clerk, if the clerk is disabled then operation should throw a custom exception.
- While processing a loan by the loan clerk, if the loan application id does not exist then operation should throw a custom exception.
- While processing a loan by the loan clerk, if the loan has already been processed then the operation should throw a custom exception.
- While updating the processing info by the loan clerk, if the clerk id does not exist then the operation should throw a custom exception.
- While updating the processing info by the loan clerk, if the clerk is disabled then operation should throw a custom exception.
- While updating the processing info by the loan clerk, if the loan application id does not exist then operation should throw a custom exception.

- While updating the processing info by the loan clerk, if the loan application has already been finalized (accepted or rejected and Done) by the manager, then the operation should throw a custom exception.
- While fetching all loans processed by the clerk, if the clerk id does not exist then the operation should throw a custom exception.
- While fetching all loans processed by the clerk, if the clerk is disabled then the operation should throw a custom exception.

## 2.3 MANAGER CONSTRAINTS

- While sanctioning or rejecting loan by manager, loan application status must be in "Accept" status, if it does not exist then operation should throw custom exception.
- While sanctioning or rejecting a loan by the manager, if the manager is disabled then the operation should throw a custom exception.
- While sanctioning or rejecting loan by manager, if loan application id does not exist then operation should throw custom exception.
- While sanctioning or rejecting loan by manager, if loan has already been finalized (rejected or sanctioned) then operation should throw custom exception.
- While fetching all loans finalized by manager, if manager id does not exist then operation should throw custom exception.
- While fetching all loans finalized by the manager, if the manager is disabled then operation should throw a custom exception.

## 2.4 Common Constraints

- All users must be registered as basic users and after admin can make them clerk and manager.
- All users must be registered as UserEnabled to use this application. Later, the admin can disable or enable it.
- For all rest endpoints receiving @RequestBody, validation check must be done and must throw custom exception if data is invalid
- All the business validations must be implemented in model classes only.
- All the database operations must be implemented on entity object only
- Do not change, add, remove any existing methods in service layer
- In Repository interfaces, custom methods can be added as per requirements.
- All RestEndpoint methods and Exception Handlers must return data wrapped in **ResponseEntity**.

## 3. BUSINESS VALIDATIONS

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### 3.1 Loan\_Master Entity:

- LoanId string is not null, mongodb object key
- LoanName string is not null, min 3 and max 100 characters.
- LoanAmount double is not null, min 3 and max 100 characters.
- Date DateTime is not null
- BusinessStructure enum value is not null
- Billing\_Indicator enum value is not null
- Tax\_Indicator enum value is not null
- ContactAddress string is not null
- Phone long is not null, min 10 and max 12 characters.
- Email string is not null, valid format
- CreatedOn auto update date and time
- ManagerRemark string
- LStatus enum value is not null

### 3.2 User\_Master Entity:

- UserId string is not null, mongodb object key
- Name string is not null, min 3 and max 100 characters.
- Email string is not null, valid format
- ContactNumber long is not null, min 10 and max 12 characters.
- Address string is not null, min 10 and max 100 characters.
- IdProofType string value is not null
- IdProofNumber string is not null
- Enabled bool

### 3.2 Loan\_Sanctioned Entity:

- Id string is not null, mongodb object key
- SanctionedAmount double is not null, > 0
- Termofloan double is not null, > 0
- PaymentStartDate DateTime
- LoanCloserDate DateTime
- MonthlyPayment double is not null, > 0.
- UpdatedOn DateTime

## 4. CONSIDERATIONS

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A. For Role of application users 3 possible values must be used: -

1. Customer
2. Clerk
3. Manager

B. For Loanstatus of loan following 4 possible Enum values must be used.

1. NotReceived = 1,
2. Received = 2,
3. Accept = 3,
4. Rejected =4,
5. Done = 5

C. For BillingStatus of loan following possible Enum values must be used.

1. Salaried_Person = 1
2. Not_Salaried_Person = 2

D. For BusinessStatus of loan following possible Enum values must be used.

1. Individual = 1
2. Organisation = 2

E. For TaxStatus of loan following possible Enum values must be used.

1. Tax_Payer = 1
2. Not_tax_Payer = 2



## 5. REST ENDPOINTS

Rest End-points to be exposed in the controller along with method details for the same to be created

### 5.1 CUSTOMERCONTROLLER

URL Exposed		Purpose
api/customer/loan-status/{loanId}		Fetches details/status of applied loan
Http Method	GET	
Parameter 1	Integer (loanId)	
Return	loanStatus	
api/customer/apply-mortgage		Apply for new mortgage/loan
Http Method	POST	
Parameter 1	LoanMaster	
Return	HttpResponse status code	
api/customer/update-mortgage/{loanId}		Update an existing loan application if it is not received status.
Http Method	POST	
Parameter 1	LoanMaster	
Return	HttpResponse status code	

### 5.2 CLERKCONTROLLER

URL Exposed		Purpose
api/clerk/GetAllApplication		Fetches list of applied loans not yet processed
Http Method	GET	
Parameter 1	-	
Return	<IEnumerable<LoanMaster>>	
/clerk/not-received		Get the list of loan allocation that is only applied by customer and not processed by clerk
Http Method	Get	
Return	<IEnumerable<LoanMaster>>	
api/clerk/received		Get the list of loan allocation that is only applied by customer and processed by clerk
Http Method	GET	
Parameter 1	-	
Return	<IEnumerable<LoanMaster>>	

api/clerk/process-loan/{loanId}		Process the applied loan by clerk and put the assess data for loan that can manager review, before process loan make first loan as accepted by calling method "ReceivedLoan(loanId)".
Http Method	POST	
Parameter 1	Integer (loanId)	
Parameter 2	LoanProcesstrans model	
Return	HttpResponse status code	

### 5.3 MANAGERCONTROLLER

URL Exposed		Purpose
api/manager/		Fetches list of all loan application
Http Method	GET	
Parameter 1	-	
Return	<IEnumerable<LoanMaster> >	
api/manager/accept/{loanId}/{remark}		Accept loan application by providing remark before processing loan sanction.
Http Method	POST	
Parameter 1	Integer (loanId)	
Parameter 2	string (remark)	
Return	LoanMaster	
api/manager/reject/{loanId}/{remark}		Reject loan by providing remark info if not possible to pass.
Http Method	POST	
Parameter 1	Integer (loanId)	
Parameter 2	string (remark)	
Return	LoanMaster	
api/manager/sanctioned-loan/{loanId}		Sanction loan with adding relevant info and amount.
Http Method	GET	
Parameter 1	Integer(loanId)	
Parameter 2	LoanApprovalViewMode 1 model	
Return	HttpResponse status code	

## 6. TEMPLATE CODE STRUCTURE

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### 6.1 PACKAGE: E-LOAN

#### Resources

Names	Resource	Remarks
Package Structure		
controller	Admin, Clerk, Customer, Manager Controller	These controllers handle all application Function, update/Edit show information and login existing users.
Startup.cs	Startup CS file	Contain all Services settings and SQL Db Configuration.
Properties	launchSettings.json file	All URL Setting for API

### 6.2 PACKAGE: E-LOAN.BUSSINESSLAYER

#### Resources

Names	Resource	Remarks
Package Structure		
Interface	ILoanClerkServices, ILoanCustomerServices, ILoanManagerServices interface	Inside all these interface files contains all business logic functions..
Service	LoanClerkServices, LoanCustomerServices, LoanManagerServices CS file	Using this all class we are calling the Repository method and use it in program and on controller.
Repository	ILoanClerk, ILoanCustomer, ILoanManager, Repository CS file and interface.	All these interfaces and class files contain all CRUD operation code for MongoDB.
ViewModels, Enum	LoanApprovalViewModel , UserMasterRegister ViewModel.	Contain all view Domain entities for show and bind data.

### 6.3 PACKAGE: E-LOAN.DATALAYER

#### Resources

Names	Resource	Remarks
Package Structure		
DataLayer	Mongosettings, IMongoDBContext, IMongoDBContext cs file	All MongoDB Connection and collection setting class

## 6.4 PACKAGE: E-LOAN.ENTITIES

### Resources

Names	Resource	Remarks
Package Structure		
Entities and Enum	UserMaster, LoanMaster, LoanProcesstrans, LoanApprovaltrans, Response CS file and BillingStatus, BusinessStatus, IdProofType, LoanStatus, TaxStatus are Enum file	All Entities/Domain attribute are used for pass the data in controller and check the various constants using enum

## 6.5 PACKAGE: E-LOAN.TESTS

### Resources

The E-Loan.Tests project contains all test case classes and functions for code evaluation. Don't edit or change anything inside this project.

## 7. EXECUTION STEPS TO FOLLOW

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- All actions like build, compile, running application, running test cases will be through Command Terminal.
- To open the command terminal the test takers need to go to the Application menu (Three horizontal lines at left top) Terminal → New Terminal.
- On command prompt, cd into your project folder (**cd <Your-Project-folder>**).
- To build your project use command:  
(Project\_directory/E-Loan / **dotnet build**)
- To launch your application, Run the following command to run the application:  
(Project\_directory/E-Loan / **dotnet run**)
- This editor Auto Saves the code.
- To test any Restful application, the last option on the left panel of IDE, you can find ThunderClient, which is the lightweight equivalent of POSTMAN.

- To test any UI based application the second last option on the left panel of IDE, you can find Browser Preview, where you can launch the application.
- To run the test cases in CMD, Run the following command to test the application:  
**dotnet test --logger "console;verbosity=detailed"**  
(You can run this command multiple times to identify the test case status, and refactor code to make maximum test cases passed before final submission)
- If you want to exit(logout) and continue the coding later anytime (using Save & Exit option on Assessment Landing Page) then you need to use CTRL+Shift+B - command compulsorily on code IDE. This will push or save the updated contents in the internal git/repository. Else the code will not be available in the next login.
- These are time bound assessments the timer would stop if you logout and while logging in back using the same credentials the timer would resume from the same time it was stopped from the previous logout.
- You need to use CTRL+Shift+B - command compulsorily on code IDE, before final submission as well. This will push or save the updated contents in the internal git/repository, and will be used to evaluate the code quality.