
Deliverable 3 documentation

for

Secure Data Sharing using Blockchain Technology

Version 1.0

Prepared by Team Sigma

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1.1.Requirements for Phase - 1 : Laying the Foundations

Each of the below requirements is imperative to achieve the intended functionality and seamless operation of the system, ensuring secure and efficient interactions between different components and users.

1.1.1 Home Page

- Development of Home page with Title, Project Description and Team member names.
- Creation of a Menu with ability to navigate to all the five modules namely Data Owner, Data User, Trusted Authority, Proxy Server and CSP.
- On clicking on a menu item, the home page should be redirected to the respective login pages.

1.1.1 Data Owner Requirements

1. Registration: The system should facilitate secure registration and login functionality for the Data Owner. New owners should be able to open the registration page by clicking hyperlink on the login page. Owners can register by providing Username, Password, Date of Birth, Email Id, Address and Mobile Number. All of these fields are mandatory to register successfully and there is a constraint on Password fields to have a minimum length of eight to ensure security. On submitting, the owner record should be created in the database.

2. Login: Existing users should be able to login to his account by providing valid Username and Password. If credentials are wrong, an error message should display.

3. Home: On successful login, Data Owner should be redirected to the home page, and the menu should be displayed with items such as Home, Upload, View Files and logout. On clicking logout it should be navigated to the owner login page.

4. Upload File: Once logged in, the data owner should have the ability to upload files. The system should allow the uploading of text files of different sizes.

5. View Files: Data owners should have a clear and concise dashboard that lists all their uploaded files with metadata such as upload date, file size and file Name.They should also have the ability to filter and sort this list based on the metadata.

1.1.2 Data User Requirements

1. Registration: Similar to data owners, the system should have a secure and user-friendly interface for registration and login for the Data User. New users should be able to open the registration page by clicking hyperlink on the login page. Owners can register by providing Username, Password, Date of Birth, Email Id, Address and Mobile Number. All of these fields are mandatory to register successfully and there is a constraint on Password fields to have a minimum length of eight to ensure security. On submitting, user record should be created in the database.

2. Login: Existing users should be able to login to his account by providing valid Username and Password. If credentials are wrong, an error message should display.

3. Home: On successful login, Data User should be redirected to the home page, and menu should be displayed with items as Home, Search File and Logout. On clicking logout it should be navigated to the user login page.

4. Search File: Data users, post-login, should have the capability to search for files uploaded by the owner based on specific criteria. Results should be displayed in a tabular format and users should be able to download those files. The interface should be intuitive, with clear indications.

1.1.3 Trusted Authority(Blockchain) Requirements

1.Login: The Trusted Authority should be able to log in securely, accessing. If Invalid credentials are entered, an error message should display.

1.1.4 Proxy Server Requirements

1.Login: The proxy server should have a secure login. The proxy server should be capable of managing the documents. If Invalid credentials are entered, an error message should display.

1.1.5 Cloud Service Provider Requirements

1. Login: The cloud service provider must have secure login functionality. If Invalid credentials are entered, an error message should display.

1.2 Non functional requirements - Phase-1

1.2.1 Security Requirements

Data Protection: The system must employ strong encryption algorithms to protect user data during transmission and while at rest.

1.2.2 Scalability Requirements

Load Management: The system should be able to handle a large number of simultaneous users. Ensuring file uploads/download without degrading performance.

Extension Capability: The architecture should allow for the addition of new features Components with minimal disruption to existing services.

1.2.3 Performance Requirements

Response Time: The system must respond to user requests, whether for uploading, downloading, or processing data, within acceptable time frames, ensuring a smooth user experience.

Throughput: The system should be able to process a high volume of data efficiently and should be capable of managing multiple transactions simultaneously.

1.2.4 Usability Requirements

User Friendly Interface: Usability plays an important role as this application works as a bridge between the user interface and should be well-designed. We will be using java server pages for making web pages user friendly and the UI will be intuitive and user-friendly, enabling users to easily navigate through the system and perform required operations without unnecessary complications.

Accessibility: The system should be accessible from various devices and browsers ensuring a broad user base can access it.

1.2.5 Maintainability Requirements

Modularity: The system should be modular to allow for easier maintenance, updates. The addition of new features.

Documentation: Comprehensive documentation should be maintained for every component. Functionality of the system to facilitate maintenance and further development.

2. Interfaces(User/Hardware/Software, and/or Communication)Developed Under phase-1

2.1 Hardware interface requirements

This application would need a browser installed on Laptop / PC.

2.2 Software interface requirements

1. HTML : We will be using html to structure our website.
2. CSS : We will be using css to design our website.
3. SQL: We will be using SQL for accessing the database.
4. JAVA : We will be using java to write our main components.
5. Apache Tomcat: Embedded web server.
6. NETBeans IDE: We will be using net beans as Integrated Development Environment for the Project.

2.3 User Interface

2.3.1 Main Page : Users will have the capability to access various modules on the home page, which include Data Owner, Data User, Trusted Authority, Proxy Server, Cloud Service Provider(CSP).

2.3.2 Sign Up Page : In the registration interface, users will be able to complete the registration process by providing the following essential details:

1. Username: Users must select a unique and non-repetitive username to proceed; otherwise, an error will be generated.

2. Password: It is imperative to create a secure and suitable password during registration.
3. Date of Birth: Users are required to furnish their date of birth.
4. Email Address: The registration process necessitates the provision of a valid and functioning email address.
5. Gender: Users have the flexibility to select their gender from the available options, including male, female, or other.
6. Mobile Number: The registration process includes the entry of the user's mobile number.

2.3.3 Login Interface : Users can access the various modules by providing the following details during the login process Username/Password,In addition, two buttons are available:

1. Login: This button enables data owners to access their account by submitting the provided credentials.
2. Clear: The "Clear" button offers users the convenience of swiftly removing or resetting their entries, enhancing the user experience for data owners.

2.3.4 Upload/Download Interface : Both the data owner and data user will have the capability to upload and download documents using a dedicated button that facilitates the effortless transfer of files to and from their local hard disks.

2.3.5 Dashboard Interface : Upon logging into each module, users will have access to multiple pages, each offering a range of distinct options. These options include:

1) Data Owner View:

1. Home: The default landing page for data owners.
2. Upload: This option empowers users to upload files securely.
3. View Files: This feature allows users to access and view their uploaded files.
4. View Requests: This option, although currently under development for Phase 1, will offer access to viewing incoming requests.
5. Logout: This function provides a streamlined process for data owners to log out of the module.

2)Data User View:

Search File: This option empowers data users to search for specific files of interest.View Response: Users can utilize this option to access and review responses to their requests.

Download: This function allows data users to securely download files they have been granted access to.

Logout: The "Logout" option provides a convenient means for data users to log out from the data user module when they have completed their session.

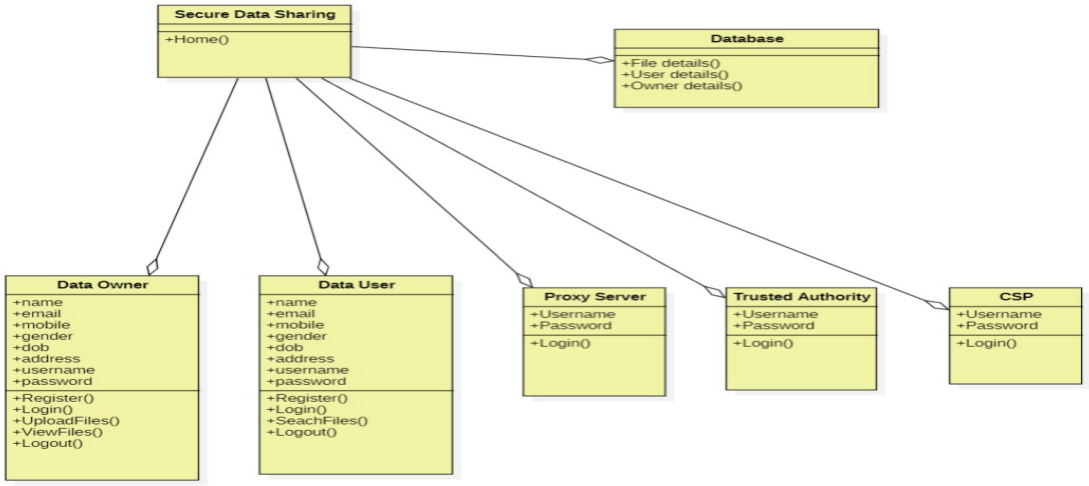
3) Proxy Server Module : You will be able to see the login page and the homepage of proxy server module

4) CSP module view : You will only be able to see the login page.

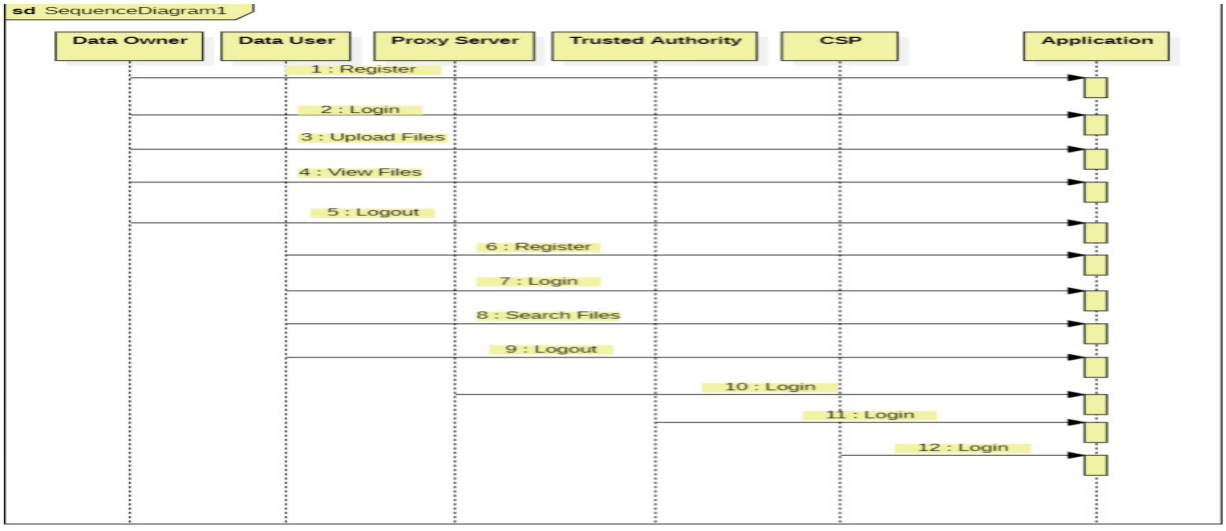
5) Trusted Authority : You will be able to see the login page and the homepage of the trusted authority module.

3. UML Diagrams :

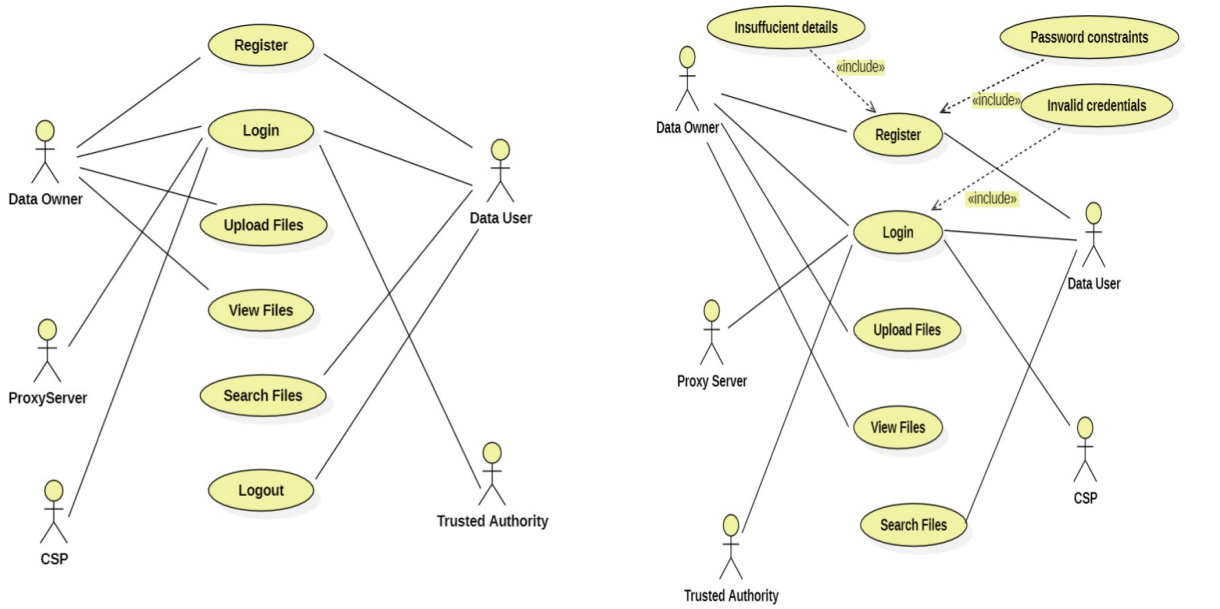
3.1 Class Diagram : Class diagram for "Data sharing using blockchain technology" with respect to the Phase – 1 Requirements. Rectangles are used to represent objects, with the class name in the top compartment and the attribute values in the bottom. Links show how different objects are related to one another. The connections between the objects are depicted as lines.



3.2 Sequence daigram : Sequence diagram for "Data sharing using blockchain technology" with respect to the Phase – 1 Requirements. The entities that communicate within the system are objects. The sequence diagram uses vertical lines to indicate them.



3.3 Use case diagram for Success and Error Case scenario: Use Case diagram for "Data sharing using blockchain technology" with respect to the Phase – 1 Requirements.



4.Unit Test Cases

Test Description	Input	Output	Test Result
Data Owner Login with valid credentials	user:test pw: 12345678	Login success	Pass
Data Owner Login with invalid credentials	user:test pw: test	Login fail	Pass
Data user Login with valid credentials	user:testuser pw: 12345678	Login success	Pass
Data user Login with invalid credentials	user:test pw: test	Login fail	Pass
Data Owner registration with password char less than 8	pw: 123	Unable to register	Pass
Data Owner registration with password char more than 8	pw: abcdefgh	Registration successful	Pass
CSP Login with valid credentials	user:csp pw: csp	Login success	Pass
CSP Login with invalid credentials	user:test	Login fail	Pass

	pw: 123		
Proxy Login with valid credentials	user:Server pw: server	Login success	Pass
Proxy Login with invalid credentials	user:test pw: 123	Login fail	Pass
TA Login with valid credentials	user:Authority pw: Authority	Login success	Pass
TA Login with invalid credentials	user:test pw: 123	Login fail	Pass
Data owner upload a .mov file	any .mov file	Upload fail	Pass
Data owner upload a .txt file	any .txt file	Upload success	Pass
Data user search for non existing file	search string: zzzzzz	empty list	Pass
Data user search for existing file	search string: abstract	file details displayed	Pass
Data user downloading file uploaded by Data owner	any .txt file	File downloaded	Pass

5. User Manual For Phase 1

The utilization of blockchain technology for data sharing is encapsulated within a web-based application, which serves as a platform for users to securely store and disseminate their data while preserving a comprehensive record of its usage. To initiate the implementation of this application's first phase on your local computer, kindly adhere to the program instructions delineated within this document.

5.1 Main page : On the main page, users will employ the navigation buttons positioned at the top of the interface to traverse through the various sections of the website. Multiple login options have been incorporated into the website to cater to diverse user profiles, each granting access to dedicated login pages. It is important to note that this page also encompasses a project description and introduction for further context and understanding.

5.2 Data Owner page : The Data Owner page will feature a registration and login interface, where data owners can create their accounts. To successfully register, data owners are required to furnish credentials like Username,password,date of birth ,email-id,gender and mobile number. Additionally, users will encounter both "Submit" and "Clear" buttons on the registration page.Following a successful login, the data owner will gain access to their dedicated page, which encompasses several tabbed options for navigation. These options include :

1. Home: The default landing page for the data owner.
2. Upload: This option enables the user to upload files.
3. View Files: This feature allows the user to view their uploaded files.

5.3 Data User page : The Data User page provides a login and registration interface, similar to the one used by data owners. Data users can create an account and log in to place requests to access files from other users. To register or log in we need to use username and password.Upon successful login, data users will have access to various options within their tab. These options include:

1.Search File: This option enables data users to search for specific files of interest by entering a key word in the space and entering the search button all the related files will be displayed on the page

5.4 Proxy Server : The "Proxy Server" tab encompasses a server login page. To access this server, users are required to provide the following inputs Username/Password.Upon successful login we will be able to view the home page of the proxy server.

5.5 Trusted Authority : The Trusted Authority page requires users to provide the following details for authentication and login: Username/Password.

5.6 Cloud Service Provider : The CSP (Cloud Service Provider) login page requires users to provide the following details for authentication and login: Username/Password.

6. Program Compilation and Run Instructions

In this project, we are diligently addressing specific requirements to ensure a seamless installation process, guarding against potential intrusions. Prior to commencing the installation, please observe the following measures:

1) Navigate to the Control Panel on your Windows device within the Program Folder. Delete any components associated with Apache Tomcat by right-clicking and selecting 'Uninstall' for all related directories.

2) Proceed to remove any existing Java Development Kit installations on your device, as we will be utilizing Java SE 8 (version 202 and later).

3) Uninstall any applications in your Programs folder related to MySQL Server.

4) To ensure the complete removal of certain files from the C drive, navigate to the Program Files and perform a permanent deletion (Shift + Delete) of the following items:

1. Apache Software Foundation
2. All files associated with MySQL
3. All files related to Java Development Kits

6.1 Program Run Instructions

Now, let's proceed to the steps necessary to run this project on your device:

1) Clone the designated GitHub repository using the Command Prompt with the command 'git clone' followed by the path to the GitHub repository containing all project software.(https://github.com/NitinReddyUNT/SE_Project_Teamsigma)

2) We have to install multiple software components to make our project feasible.

3) we need to install jdk-8u144 windows-x64" on our computer from https://www.oracle.com/java/technologies/javase/javase8-archive-downloads.html

4) We need to install my sql version “mysql-essential-5.0.67-win32” from the github program file “SE_Project_Teamsigma”

5) After the installation is complete, access the Control Panel and search for "MySQL Server Instance Config Wizard." Start the installation process and set the new root password as "root" before completing the installation.

6)Install apache tomcat version 8.0.27 with the following link: https://ipt.gbif.org/manual/en/ipt/latest/tomcat-installation-windows.

7) We need to download netbeans ide version “"netbeans-8.1-windows" and Configure the NetBeans IDE installer by opening the file. Choose the 'Customize' option and select Apache Tomcat 8.0.27. Complete the installation process.

8) Download "Webyog_SQLyog_6.5.6_enterprise" and use the key “TaMaBMBolo” and serial : “270c1144ab1730d”.

9) Launch "Webyog_SQLyog_6.5.6_enterprise/SQLyog656Ent" to initiate the installation process, and input the give key and serial

10) After entering the credentials, create a new connection named "New Connection," with the password set as "root." You will be presented with a window labeled "SQLyog Enterprise - MYSQL GUI - [New Connection - root@localhost]."

11) As we have already cloned our github repository for SE_Project_Teamsigma.

12) Open the "Proxy.sql" file in Notepad and copy the included queries.

13) Paste the Queries in SQLyog Enterprise -MySQL GUI and click the execute all queries button on the top menu bar to execute the queries after the execution you will be able to see the test folder and we can view the tables in the database in the proxy folder in SQLyog Enterprise.

14) Now open netbeans ide 8.1 in the system and select the file option /select open project option from the dropdown box and select the file which has been cloned from github.

15) Now we will be able to view all the code files in Netbeans IDE. Next we have to import all the libraries. For that we need to right click on the project main folder named “SE_project_teamsigma” a drop down box will appear and we need to select the properties option.

16) Click on libraries on the options in the properties menu click on add.jar folder option in the menu and navigate to the “SE_Project_Teamsigma/libs” folder in your local computer select all the libraries in that folder and click open.

17) Delete all the previously existing references and only keep the newly added libraries.

18) After completing the process, enter ok and close the window and click the run option in the netbeans library to run the project on your local host.

7. Feedback

During the peer review session for our group project, we received some feedback from our peers and we made the following changes to our project.

1) As they suggested, we have revised our project proposal to provide more specific information and provided more detailed uml design.

2) We have worked and enhanced more on our project and worked about the security of our users details.

3) Suggestion : A classmate suggested to specify and enhance the details for UML diagram

Action Taken : Based on the suggestion we have performed the steps for UML diagram and enhanced it added specific details related to the project and prepared a well explained uml diagram

4) Suggestion: A peer suggested that our data for users and owners should be secured

Action Taken : Based on this suggestion we have worked on it for our data security by performing some steps like Data Encryption, Authentication and provided secured data for owners and users. Also we have increased the minimum length of password to eight characters

5) Suggestion : A peer suggested that provide me the details user manual for our application

Action Taken : For this we have provided a detailed user manual on how to run the application and how to use the application.

6) Suggestion: A classmate suggested to maintain a proper documentation to understand the things better

Action Taken : Based on the suggestion we have worked to provide detailed and specific documentation for better understanding. We worked a bit more on the documentation part .

7) Suggestion: A peer suggested to enhance the user interface to look better

Action Taken : Updated the user interface of our application to make it more understandable. We focused on improving the user interface to look even better.

Supplementing the feedback gained during the peer review session was crucial to making our secure blockchain project more secure and usable. We greatly appreciate the feedback provided by our classmates. It reflected our classmates' valuable insights and feedback on continuous improvement.

8. Report Reflection

We have accomplished the tasks that we have committed to do in the development phase-1 as specified in the requirement specification documentation. We have specified to develop Registration & Login Modules as well as implementing File Upload and Download Functionalities. So far we are good with login & registration with security policies intact.

Registration pages : We have implemented Registration pages for Data Owner and Data User. They can fill out the registration form with their username, password, dob, email address, Gender, Address, Mobile Number(we considered password suggestion received in our paired team connect and password policy of being 8 characters is implemented). Furthermore, we would like to add some other password constraints in the subsequent releases.

Login pages: We have implemented Login pages for Data Owner, Data User, Trusted Authority, Proxy Server, CSP. The user can enter their username and password to login. The system retrieves the user's password from the database and checks If it matches the user is successfully logged in.

Upload files page: We have implemented Upload Files functionality for the data owner page. The data owner can select the files they wish to upload. The system checks the files to ensure that they meet all its requirements. In the coming phases we would like to check and eliminate duplicate files while uploading.

View Files page: The Data Owner will be able to see all the files uploaded by him.

Search Files & Download page: Data users will be able to search for files using specific criteria after logging in. The user interface is simple to use and provides accurate status. The user can download the files uploaded by the owner.

9. Member Contribution table

Member Name	Contribution Description	Overall contribution (%)	Note(If Applicable)
Akhila pam(11711224)	Creating ownerReg,jsp,ownerlog.jsp files and documentation for report requirements	11.11	
Akshara Reddy Bathula (11713259)	Creating dataowner.jsp and ownerregister.jsp and	11.11	

	documentation for member contribution table		
Jyothi Anjan Manini (11715079)	Creating searchfile.jsp,searchaction.jsp, verifyaction.jsp and download.jsp and was part of UML Diagrams,Report Reflection.	11.11	
Lakshmichatura Medidi (11682526)	Creating upload.jsp,upload2.jsp,do_viewfiles.jsp and creating UML diagrams	11.11	
Manoj Kumar Bandari (11711378)	Creating userlogin.jsp,userlog.jsp and documentation for core functionalities	11.11	
Nimitha Bangalore Sathyanarayana (11649788)	Managing the project repository and writing all the unit test cases, designing project structure, building home page, reviewing/updating the documentation based on IEEE format.	11.11	
NitinReddy Balaiahgari (11698724)	Creating ownerhome.jsp,userhome.jsp, db connection and queries and documentation for deliverable -3	11.12	
Satya Laxman Pranav Vadlamani (11701928)	Creating the login pages to TA, PS and CSP and documentation for peer review feedback	11.11	
Sumuk Reddy Kalagiri (11702970)	Creating dataowner.jsp and ownerlog.jsp and documentation for code functionalities.	11.11	