# CITI-BRIDGE 2022

## Group 19: Project Title- Clearing Feed Generation

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**Mentor**: Mr. Jatin Varshney

### Group Members & Responsibilities:

| Name | Class | Contribution |
|---|---|---|
| Ananya Joshi | B. Tech Comp | Front end: UI design, development, Documentation, presentation |
| Isha Shivalkar | B. Tech Comp | Back end logic, coding, integration |
| Prachi Narlawar | B. Tech Comp | Back end coding, presentation |
| Samruddhi Deode | B. Tech Comp | Back end logic, coding, integration |
| Swati Borse | B. Tech Comp | Front end: UI design, development, Connectivity with back-end, presentation |

### Introduction:

In a banking system, there are certain conventions or format set by the system for maintaining the record of each transaction. Clearing Feed Generation System is the software component in banking system used to validate the transaction entries and make the data ready for the clearing process.

The **objectives** of the clearing feed generator system are to :

- Simulate the clearing feed generator in banks that processes the input transactions.
- Generate the feed file towards the clearing system containing the valid transactions in the required format.
- Automate the validation of transaction records and gain higher visibility into the clearing feed generation pipeline.

## Project Overview:

The application is web based where the user can upload a set of transactions and view the output for each transaction: whether transaction record is valid or not.

The key benefits of the system are the increase in the efficiency and an easy remote access to stakeholders. It will help the bank authority understand the common reasons behind invalid records and creates opportunity to improve the business logic.

## Project Scope:

The system allows a user to poll the local file system to select the input file containing transactions. Each transaction, from the input file is picked and screened. Every field in the record, such as payer and payee names, date of transaction, amount, etc. must conform to the conventions/ format expected by the bank software. When all fields of a transaction pass the checks, it is declared validation pass or fail.

All the records that are in accordance with the expected conventions are written to another file and stored in the system. The records which have passed validation and those that failed validation are displayed on two separate sections of the the web interface. The data table can be sorted according to any of the columns, i.e. on the basis of Ref ID, Transaction date, Payee Name, Amount, etc. Additionally, the user can download the file containing valid records.

An overview of the results for the entire set of records in a file can be visualized on the web application. It provides quick insights into the quality of input data passed to the system and the most frequent reasons leading to invalidation of records can be analyzed.

## Operating Environment:

The clearing feed generation system will be windows based supporting windows version 10 and above. The minimum configuration required on the server platform is 2.4 GHZ, 4 GB RAM. Users can use any PC based browser clients with IE 7.0 upwards.

## Functional Requirements:

1) Transaction Management System

- Maintain a state model for transaction traversing workflow: Upload -> Validate-Pass or Validation-Fail -> Feed-Generated
- Cater to exception handling along the workflow.

2) Input File Upload

- Poll a local folder to pick up input transactions file.
- Perform validation on the file format, i.e. file naming convention, record length, number of fields within records, field length, date format, currency format.
- Once the file is read, move the file to another folder to archive it.

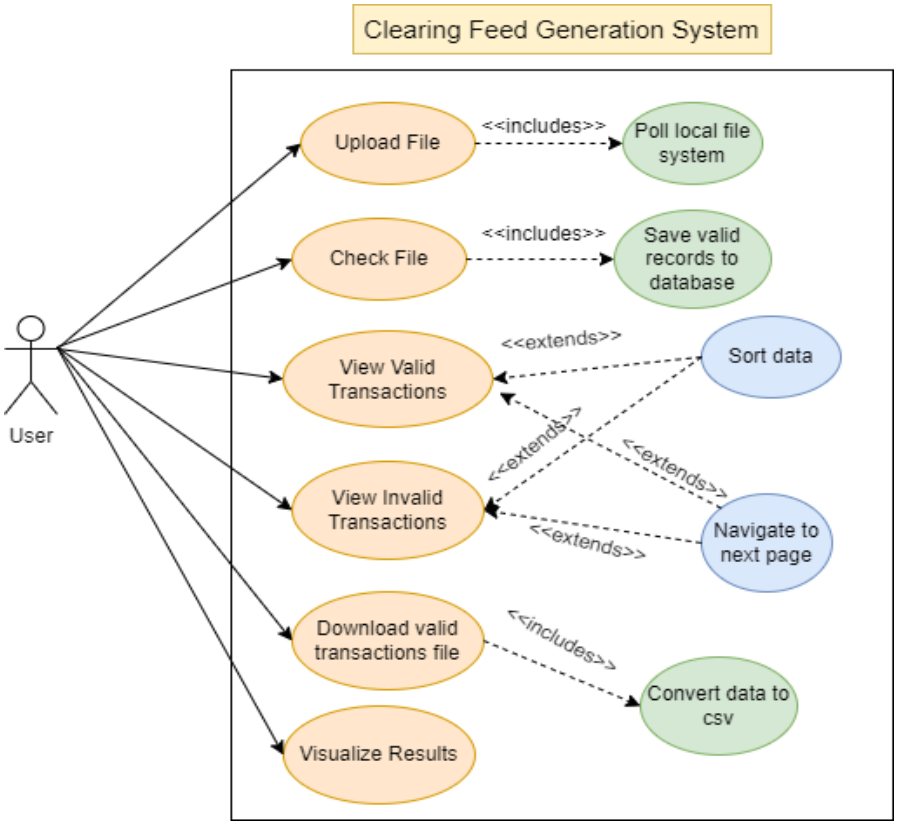
3) Clearing Feed Generation

- Provide a UI screen to show all the transactions that have been validated successfully.
- Provide a function to generate a Clearing Feed File having transactions in a given format.
- Mark the transaction as “Feed-Generated” once it has been written to feed file
- Provide a UI screen to show all the transactions that have validation failed. Users must not be able to change any field.

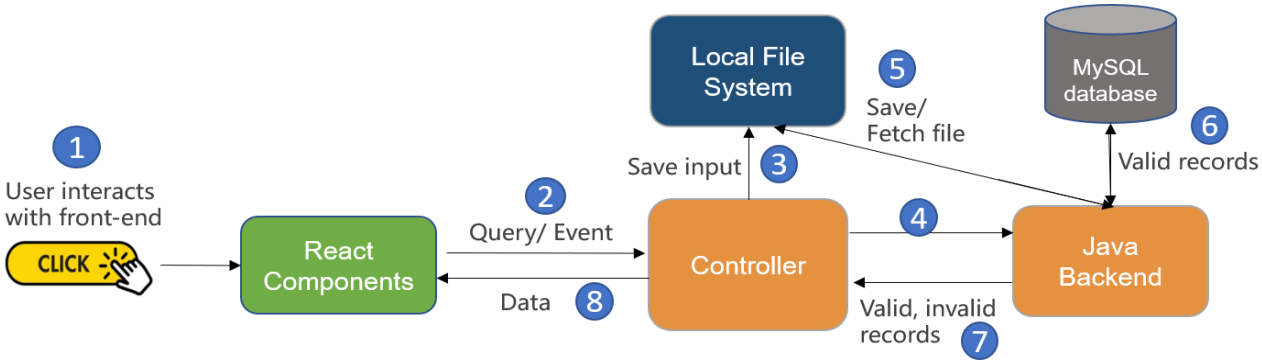
## Performance Requirements:

- User should be allowed to upload only 1 file at a time.
- System should handle input files of .txt format and maximum size= 1 mb
- Time taken for the input file processing should be less than 30 sec.

## Use Case Diagram:




## System Diagram:




Description:

The user ineracts with the UI components by clicking, hovering, typing, etc. Accordingly, events are generated, which trigger the respective callback functions for handling the events. When the user uploads a file and clicks on the 'Check' button, a query is fired to the controller. Controller stores this input file to the local file system and calls the functions from the Java classes to process this file.

The file is processed at the back-end, each record is validated and the valid records from the file are stored to the MySQL database. The valid records are also written to a file, in csv format, and archived at another folder in the file system.

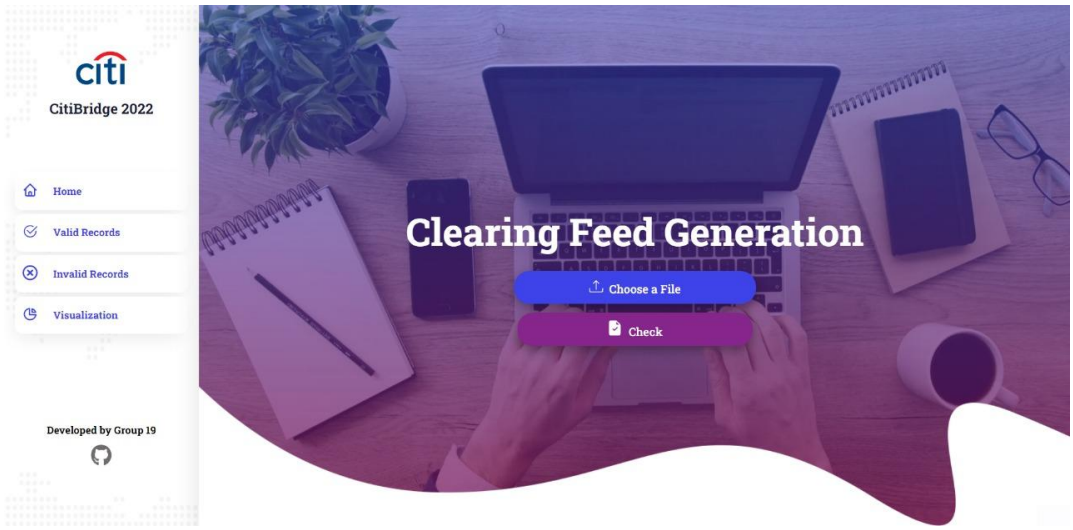
The data of both the valid and invalid records is returned back to the controller separately. This data is propagated to the front-end, which populates the tables in valid and invalid records tabs, and the charts in visualization tab.

**Technologies used:**

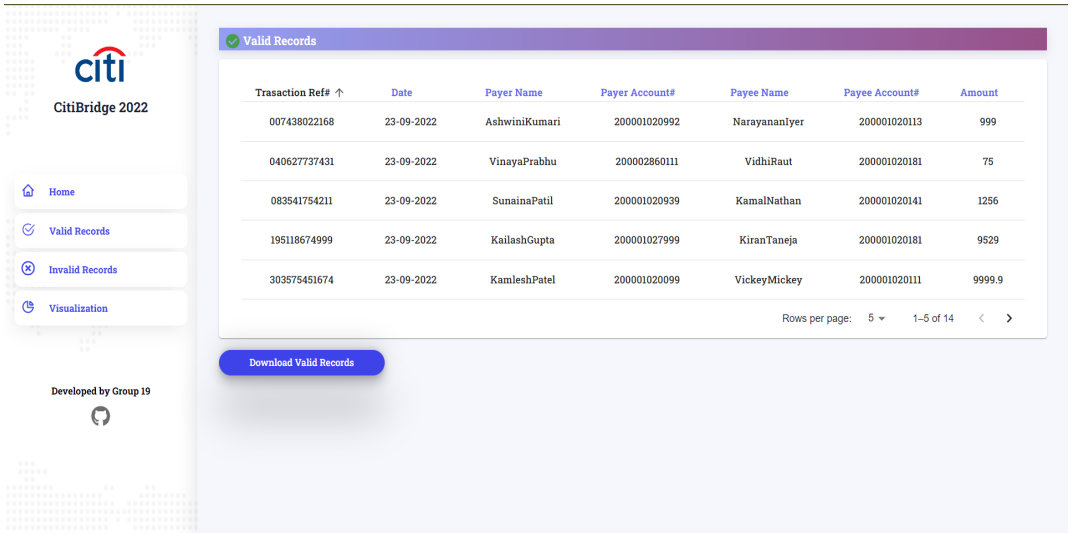
| Name | Description |
|---|---|
| React JS | React is a free and open-source front-end JavaScript library for building user interfaces based on UI components. |
| JavaScript | JavaScript is a text-based programming language used both on the client-side and server-side that allows you to make web pages interactive. It is a dynamic programming language that's used for web development, in web applications, for game development, and lots more |
| CSS3 | CSS3 stands for Cascading Style Sheet level 3, which is the advanced version of CSS. It is used for structuring, styling, and formatting web pages. |
| Java | Java is a programming language and computing platform first released by Sun Microsystems in 1995. It is a widely used object-oriented programming language and software platform that runs on billions of devices, including notebook computers, mobile devices, gaming consoles, medical devices, etc |
| Java Servlet | Servlets are the Java programs that run on the Java-enabled web server or application server. They are used to handle the request obtained from the webserver, process the request, produce the response, then send a response back to the webserver. It is a software component that extends the capabilities of a server. |
| Spring Tools Suite | Spring Tool Suite (STS) is a java IDE tailored for developing Spring-based enterprise applications. Powered by VMWare, it is easier, faster, free, open-source and based on Eclipse IDE |
| Apache Tomcat Server | Apache Tomcat is a popular open source web server and Servlet container for Java code. |

## Screen Shots:

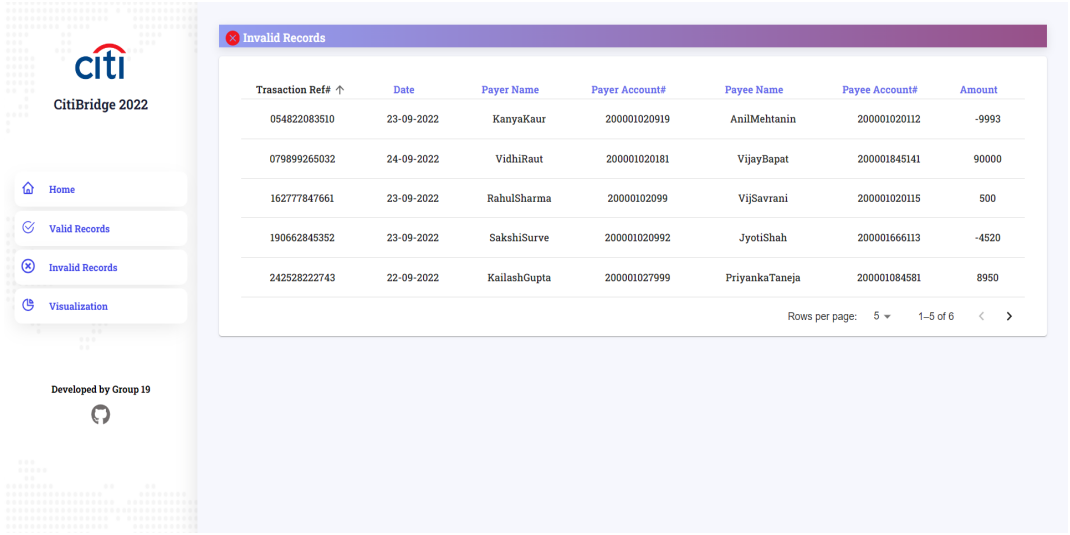
1. Home screen



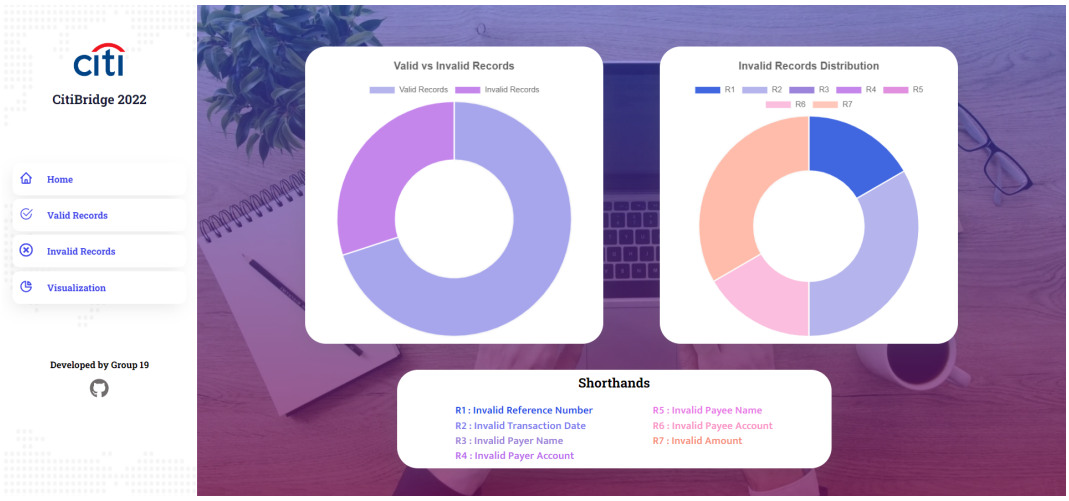

2. Valid Records




3. Invalid Records



4. Visualization




**Source Code URL:** https://github.com/ishashivalkar25/CitiBridge-ClearingFeedGenerator.git

## Future Scope:

- UI screen that allows the user to access the last 5 validation results
- Feature for the bank authorities to enable a daily email report containing count of valid and invalid transactions.
- Weekly/ monthly analysis reports based on the transaction history stored in a database.
- The analysis of results generated by the system over a certain time period can help in smart prediction or auto rectification of certain types of errors.

## Conclusion:

If the submitted data for the transactions is as per the format required by the bank, only then the transaction is considered valid and gets forwarded to the clearing system. Clearing feed generator acts as the mediator in validating transactions and ensures that the data reaching the downstream components is error-free.

A clearing feed generator is built, that satisfies both, the functional and non-functional requirements. The system generates the valid-feed file, which serves as the input to the clearing system.