

ATM Reconciliation

Nikhil Sharma, Akshay Jain , Guided by : Mrs Neetu Garg

Department of Computer Science , Maharaja Agrasen Institute Of Technology, Delhi, India

Abstract : Reconciliation in a basic language means a truce, agreement or resolution of a fact. ATM Reconciliation is a process to solve ATM Transaction disputes. ATM play a critical role in our daily lives as they allow people to make transactions without having to go to their bank branch. Whenever someone goes to ATM for any type of transaction such as a cash withdrawal transaction, disputes can occur. An example of disputes is like amount has been deducted from account but it did not come out of the machine, in such cases banks uses a process to reconcile transactions on daily basis. The objective of the project is to automate the process of ATM Reconciliation which was manually done by banks till yet. This project will cost half an yearly salary of the employee whom banks used to hire to do it manually. This project is not only cost effective but also saves other resources such as time. In this project user can configure a file format of their own choice for reconciliation. After configuring file format, user have to configure mapping/Reconciliation format which will be used to reconcile files. In this project we are helping the bank to easily reconcile any unstructured file into database and helping in the process of Reconciliation by configuring the Reconciliation format which will reduce the human effort that will go in doing in manually.

The main idea is to deal with different kinds of file in any format. The file can be a flat file, text file, CSV file, Excel file etc. and give user the feature to configure that file with a mapping format. Once this has been done, user can simply perform Reconciliation in just one click within seconds.

Keywords: ATM , MongoDB, NodeJS, React , reconciliation, transaction.

I. INTRODUCTION

ATM, also referred as Automated Teller Machine, is a electronic machine which serves as the outlet of bank that helps one to make transaction without physically going to the bank. All one need is either a debit card or credit card to make make transactions. These machines are user friendly which helps user to perform simple actions like withdrawal or deposit of cash , bill payments or transfer between different accounts.

ATM Reconciliation is an application that can be used to solve ATM Transaction disputes. Whenever a transaction is executed then that transaction can be either successful or unsuccessful or some dispute arises, this application can be used to solve such disputes and manage transaction records easily. Let me give you an example of a dispute. Suppose a person went to an ATM and withdraw some cash, now a situation can arise where that amount has been deducted from the account but the

cash did not came out of the ATM machine. In such cases banks follow a particular approach to solve such disputes and this application can help them in doing that thing faster instead of doing it manually.

Whenever a transactions occurs, it can hit 2 types of switches such as CBS database or NPCI. NPCI (National Payments Corporation Of India) is a subsidy of RBI and acts as a mediating agency between banks. NPCI helps 2 different banks to coordinate with each other as you may have a debit card of Bank A but there may be instances where you withdraw cash from ATM Machine of Bank B.

Banks on a daily basis gets files from NPCI and CBS database. They reconcile transaction from these two file and the objective of this project is to automate the entire process reconciliation.

The paper is organized as follows:

In Section 1, the introduction of the paper is provided along with the structure, important terms, objectives and overall description. In Section 2 we discuss related work. In Section 3 we have the complete information about the technology and stack that have been used to demonstrate end to end automated invoicing. Section 4 tells us about the methodology and the process description. Section 5 tells us about the future scope and concludes the paper with acknowledgement and references.

Objectives

This project aims to address some of the problems in current systems by greatly minimizing the human intervention in the process and thus reducing costs and errors. The aim is to ease the task of reconciliation. The objectives are concluded as :

- Help manage bank or any organisation deal with large amount of data easily.

- Help the convert the data in unstructured format into structured format.
- Help them trim and upload the data from flat files to database.
- Help them configuring the file format to be reconciled.
- Help them configuring the Reconciliation format for reconciliation.
- Reduce human effort for the process of reconciliation.
- Save time.

II. RELATED WORK

Lebbaeus Denis “Global ATM Reconciliation Error Codes Mapping for All OEM Manufacturers With Common Codes for Rectification and Reconciliation” , International Journal of Advanced Research in Engineering and Technology (IJARET), 11 (1), 2020, pp 52-60 has all the similar error codes that are generated by ATM machines can be categorized under some standard common codes that would be used widely.

The Key benefits of this theory is to minimize the amount of duplicate codes that are produced by various ATM manufactures by sharing a unique common code so that it gains recognition equivalent to existing numerous duplicate codes. This tends to result in a better

organization of codes providing simpler compilation that can even be interpreted by a common man.

III. TECHNOLOGIES USED

Numerous technologies have been used to develop this end to end system.

NodeJS

Node.js is an open-source, cross-platform JavaScript run-time environment that executes JavaScript code outside of a browser. Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic web page content before the page is sent to the user's web browser. Consequently, Node.js represents a "JavaScript everywhere" paradigm, unifying web application development around a single programming language, rather than different languages for server side and client side scripts. Node.js distributed development project, governed by the Node.js Foundation, is facilitated by the Linux Foundation's Collaborative Projects program. Corporate users of Node.js software include GoDaddy, Groupon, IBM, LinkedIn, Microsoft, Netflix, PayPal, Rakuten, SAP, Voxer, Walmart, and Yahoo!

MongoDB

MongoDB is an open source database management system (DBMS) that uses a document-oriented database model which supports various forms of data. It is one of numerous nonrelational database technologies which arose in the mid-2000s under the NoSQL banner for use in big data applications and other processing jobs involving data that doesn't fit well in a rigid relational model. Instead of using tables and rows as in relational databases, the MongoDB architecture is made up of collections and documents.

React

React (also known as React.js or ReactJS) is a JavaScript library for building user interfaces. It is maintained by Facebook and a community of individual developers and companies. React can be used as a base

in the development of single-page or mobile applications, as it's optimal only for its intended use of being the quickest method to fetch rapidly changing data that needs to be recorded. However, fetching data is only the beginning of what happens on a web page, which is why complex React applications usually require the use of additional libraries for state management, routing, and interaction with an API. React was created by Jordan Walke, a software engineer at Facebook. He was influenced by XHP, an HTML component framework for PHP. It was first deployed on Facebook's newsfeed in 2011 and later on Instagram.com in 2012. It was open-sourced at JSConf US in May 2013. React Native, which enables native Android, iOS, and UWP development with React, was announced at Facebook's React.js Conf in February 2015 and open-sourced in March 2015. On April 18, 2017, Facebook announced React Fiber, a new core algorithm of React framework library for building user interfaces. React Fiber was to become the foundation of any future improvements and feature development of the React framework. On April 19, 2017, React 360 V1.0.0 was released to the public. This allowed developers with experience using React to jump into VR development.

ExpressJs

Express.js, or simply Express, is a back end web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js.

MySQL

MySQL is an open-source relational database management system (RDBMS). A relational database organizes data into one or more data tables in which data types may be related to each other; these relations help structure the data. SQL is a language programmers use to create, modify and extract data from the relational database, as well as control user access to the database. In addition to relational databases and SQL, an RDBMS like MySQL works with an operating system to implement a relational database in a computer's storage system, manages users, allows for network access and

facilitates testing database integrity and creation of backups.

MySQL is free and open-source software under the terms of the GNU General Public License, and is also available under a variety of proprietary licenses. MySQL was owned and sponsored by the Swedish company MySQL AB, which was bought by Sun.

Microsystems (now Oracle Corporation). In 2010, when Oracle acquired Sun, Widenius forked the open-source MySQL project to create MariaDB.

MySQL has stand-alone clients that allow users to interact directly with a MySQL database using SQL, but more often, MySQL is used with other programs to implement applications that need relational database capability. MySQL is a component of the LAMP web application software stack (and others), which is an acronym for *Linux, Apache, MySQL, Perl/PHP/Python*. MySQL is used by many database-driven web applications, including Drupal, Joomla, phpBB, and WordPress. MySQL is also used by many popular websites, including Facebook, Flickr, MediaWiki, Twitter, and YouTube.

V. METHODOLOGY

The main goal of the project is to make a tool that can deal with different kinds of file in any format. The file can be a flat file, text file, CSV file, Excel file etc. and give user the feature to configure that file with a mapping format. Once this has been done, user can simply perform Reconciliation in just one click within seconds.

A successful transaction hits 2 switches :-

1. Bank's database.
2. NPCI switch.

Now bank gets 2 kind of files daily, one from NPCI and one from own database. A transaction present in both the files can be a successful transaction others will be unsuccessful. Banks have to check other conditions as well for a transaction to be successful and that is not our

headache as we will be providing the feature to Reconcile any type of files by letting the admin configure file and mapping format in the database.

Each file, whether NPCI or bank's CBS file is of 2 types.

Types of NPCI file.

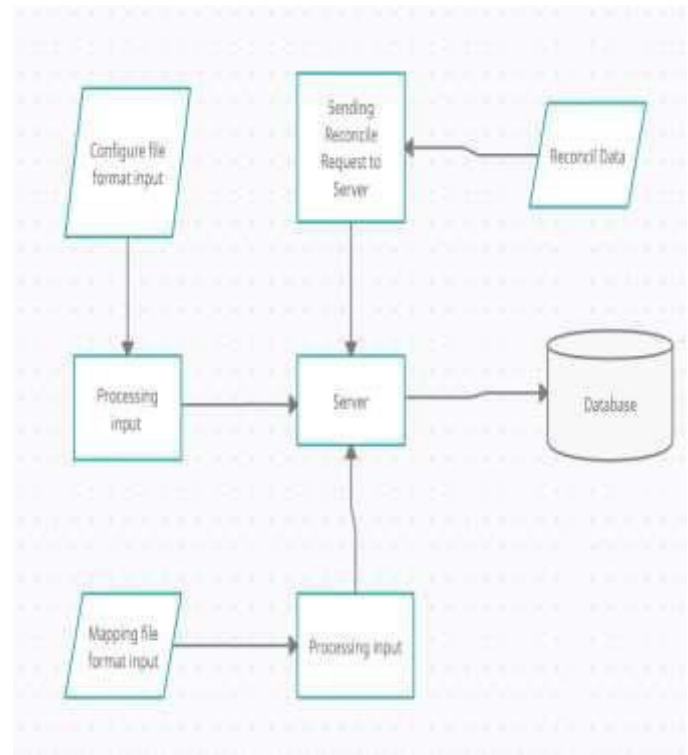
1. NPCI ACQUIRER.
2. NPCI ISSUER.

Types of Bank's CBS file.

1. CBS ACQUIRER.
2. CBS ISSUER.

NPCI ACQUIRER should be reconciled with CBS ACQUIRER and NPCI ISSUER should be reconciled with CBS ISSUER.

Banks get these files in flat format rather than any structured format like CSV or Excel. These files should have to be converted into structured format



and to do this they have a file which signifies the position of every attribute in the file. In order to use this application, user has to follow the following steps :-

1. Configure File format.

In this step if the file format is new then user has to configure that file in the database. Here if the file is not in structured format like csv or excel, the user creates file format in database along with the information of every attribute like position of attribute in file, datatype etc.

2. Configure Mapping Format.

For new file format corresponding mapping format has to be configured. In this format user will save matching conditions to be used while reconciliation. This is only one time work to be done if working with new files.

3. Reconcile data with single click.

After Reconciliation a report will be generated in CSV format which user can download.

VI. CONCLUSION

All organisations have to deal with large amount of data. Since this application is made for transaction Reconciliation with millions of transactions per day, it becomes difficult to manage and reconcile such data manually so a tool is needed to help in the process.

It is also important for the banks to keep track of day to day transactions either successful or unsuccessful. It helps to generate report on daily basis with minimal effort, cost and time. It also provides a nice user interface to give status of any transaction happened.

References

- [1] Lebbaeus Denis “Global ATM Reconciliation Error Codes Mapping for All OEM Manufacturers With Common Codes for Rectification and Reconciliation” , International Journal of Advanced Research in Engineering and Technology (IJARET), 11 (1), 2020, pp 52-60.
- [2] Laracey, Kevin. "Mobile Phone ATM Processing Methods and Systems 2018.
- [3] Shailesh N. Sisat, Duplicate and Fake Currency Note Tracking in Automated Teller Machine (ATM), International Journal of Electronics and Communication Engineering & Technology (IJECE), 5(1), 2014, pp. 11–15
- [4] <https://www.investopedia.com/terms/a/ATM.asp>
- [5] NodeJS – <https://NodeJS.org/en/>, <https://en.wikipedia.org/wiki/Node.js>
- [6] React - <https://Reactjs.org/>, [https://en.wikipedia.org/wiki/React_\(JavaScript_library\)](https://en.wikipedia.org/wiki/React_(JavaScript_library)) ,
- [7] ExpressJs - <https://expressjs.com/> , <https://en.wikipedia.org/wiki/Express.js>
- [8] MongoDB - [https://www.MongoDB\[2\].com/](https://www.MongoDB[2].com/), <https://en.wikipedia.org/wiki/MongoDB>
- [9] MySql - <https://www.mysql.com/> , <https://en.wikipedia.org/wiki/MySQL>