

International Trade Settlement System

long internship Project Submitted

In partial fulfillment of the requirements for the award of the
degree

Of

BACHELOR OF TECHNOLOGY

By

C.Reddy Nowziya

Roll No: R170296

Under the supervision of

A.Mahendra

(Assistant Professor)



Department of Computer Science and Engineering
Rajiv Gandhi University of Knowledge Technologies, RK
Valley Idupulapaya, Kadapa(Dist), Andhra Pradesh



Rajiv Gandhi University of Knowledge Technologies, RK Valley
Idupulapaya, Kadapa (Dist), Andhra Pradesh, 516330

CERTIFICATE

This is to certify that the project work titled “ **International Trade Settlement System**” is a long internship submitted by C Reddy Nowziya (R170296) in the dept of Computer Science and Engineering in partial fulfillment of requirements for the award of degree of Bachelor of Technology for the year 2022-2023 carried out the work under the supervision

Internal Guide
Mr. Mahendra
(Assistant Professor)

HEAD OF THE DEPARTMENT
Mr. SATYANANDARAM
(Assistant Professor)

Project Coordinator
M. MUNI BABU
(Assistant Professor)



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RGUKT-RKValley, Kadapa Dist -516330

CERTIFICATE OF EXAMINATION

This is to certify that the work entitled, “ International Trade Settlement System ” is the bonafied work of C Reddy Nowziya (R170296) Here by accord our approval of it as a study carried out and presented in a manner required for its acceptance Major of Bachelor of Technology for which it has been submitted. This approval does not necessarily endorse or accept every statement made, opinion expressed or conclusion drawn, as a recorded in this thesis. It only signifies the acceptance of this thesis for the purpose for which it has been submitted.

Mahendara

Project Supervisor

Dept. of CSE

RGUKT IIIT RKValley

Examiner

Project Examiner

Lecturer Dept. CSE

RGUKT IIIT RKValley



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DECLARATION

I am C Reddy Nowziya hereby declare that the project report entitle ,” International Trade Settlement System” done under the guidance of Mr.Mahendra is submitted for minor project of Bachelor of Technology in Computer Science and Engineering, is an authentic record of our own work carried out under the supervision of C.Nowziya, the Major Project December 2022 - January 2023 at RGUKT – RK Valley. We also declare that this project is a result of our own effort and has not been copied orimitated from any source. Citations from any websites are mentioned in the references. The results embodied in this project report have not been submitted to any other universityor institute for the award of any degree or diploma.

C. Reddy Nowziya(R170296)

Date: 10-02-2023

Place: RK Valley

ACKNOWLEDGEMENT

The satisfaction that accompanies the successful completion of any task would be incomplete without the mention of the people who made it possible and whose constant guidance and encouragement crown all the efforts success. We are extremely grateful to our respected Director, Prof. K. Sandhya Rani Mam for fostering an excellent academic climate in our institution. We also express my sincere gratitude to our respected Head of the dept Mr. SatyaNandaram Sir for his encouragement, overall guidance in viewing this project a good asset and effort in bringing out this project. We would like to convey thanks to my project guide Mr. Mahendra Sir for his guidance, encouragement, co-operation and kindness during the entire duration of the course and academics.

My sincere thanks to all the members who helped me directly and indirectly for the completion of project work. I express my profound gratitude to all our friends and family members for their encouragement.

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1. ABSTRACT

The Volume Dashboard Project is a data visualization tool designed to help users gain insights into key performance indicators related to their business operations. The project involves collecting data from various sources and presenting it in a user-friendly dashboard that allows users to quickly and easily understand trends and patterns in their data. The dashboard includes interactive charts and graphs that allow users to drill down into specific data points and explore different aspects of their business performance. The goal of the Volume Dashboard Project is to provide users with a powerful and flexible tool for monitoring their business metrics and making informed decisions based on the insights provided by the dashboard.

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2.Introduction

The Volume Dashboard Project is a data visualization tool that is designed to help users gain insights into key performance indicators related to their business operations. This project is an effort to provide users with a powerful and flexible tool for monitoring their business metrics and making informed decisions based on the insights provided by the dashboard. In today's world, businesses generate vast amounts of data from various sources, such as sales transactions, customer interactions, and operational activities. However, this data is often difficult to interpret and can be overwhelming. The Volume Dashboard Project aims to solve this problem by providing users with a comprehensive overview of their business metrics in an easily accessible and understandable way.

The project involves collecting data from various sources, such as databases, spreadsheets, and APIs, and presenting it in a user-friendly dashboard that allows users to quickly and easily understand trends and patterns in their data. The dashboard includes interactive charts and graphs that allow users to drill down into specific data points and explore different aspects of their business performance.

The Volume Dashboard Project is a valuable tool for business owners, managers, and analysts who need to make informed decisions based on data insights. With this tool, users can monitor key performance indicators, such as sales revenue, customer satisfaction, and operational efficiency, and take proactive steps to improve their business performance.

We will explore the Volume Dashboard Project in more detail, including its features, benefits, and potential use cases. We will also discuss the project's technical aspects, including the tools and technologies used to develop the dashboard.

3.Gloss Overview:

3.1 International Trade Settlement System

GLOSS STP Bureau is a real-time STP system which automates the trade processing life cycle from trade capture and enrichment through confirmation, clearing agency reporting and settlement. The GLOSS STP Bureau provides fast-track access to market leading functionality in a complete serviced environment .

From Broadridge advanced data centers in the US and Europe the service offers comprehensive transaction processing as well as hardware maintenance , backup and data management, round-the-clock support and disaster recovery facilities. Fully scalable to any size of operations the Gloss STP Bureau is easily integrated into existing platforms and infrastructure.simply its a software package and a service bureau product offering for the processing of international equities and international fixed-income products. It Automates the securities trade processing life cycle from trade capture through confirmation, clearing and settlement.

It enhanced the fixed income and financing functionality of its leading multi-asset trade processing and settlement solution, Gloss. The platform offers users additional processing support for tri-party repurchase agreements, auto-borrows and mortgage-backed securities as well as new P&L methodology and a Bloomberg interface.

Broadridge's International Trade Settlement System (ITSS) is a comprehensive platform designed to automate and streamline the process of settling international trades. ITSS is built on a flexible and scalable architecture that can be customized to meet the specific needs of each client.

The system provides a range of features to support the entire trade settlement lifecycle, including pre-settlement matching, confirmation, and settlement instruction generation. It also supports a wide range of asset classes, including equities, fixed income, and derivatives.

ITSS is designed to integrate seamlessly with existing trading and settlement systems, enabling clients to leverage their existing infrastructure while improving efficiency and reducing risk. The system also provides real-time access to settlement status and reporting, allowing clients to monitor their trades and identify potential issues before they become problems.

In addition to the core settlement functionality, ITSS includes a range of value-added features, such as corporate actions processing, tax reclamation, and regulatory reporting. These features are designed to help clients reduce costs, improve accuracy, and comply with regulatory requirements.

Overall, Broadridge's International Trade Settlement System is a comprehensive and flexible platform that enables clients to streamline their international trade settlement operations while reducing risk and improving efficiency. The system's modular architecture and customizable features make it a powerful tool for financial services firms operating in today's global markets.

3.2 Gloss Architecture

A typical architecture diagram for a trade settlement system might show these components as boxes, with arrows indicating the flow of data and messages between them. The diagram might also include details about the hardware and software infrastructure supporting the system, such as servers, databases, and network connections.

A typical trade settlement system might have the following components:

1. **Front-end Interface:** This is the user-facing part of the system, where traders and other users interact with the system to submit trade orders, monitor trade status, and access reports.
2. **Trading Platform:** This is the core trading engine that matches buy and sell orders and executes trades in real-time.
3. **Trade Capture and Confirmation:** This component captures and confirms trade details, including trade date, time, quantity, and price.
4. **Trade Matching:** This component matches trades between counterparties and reconciles trade details.
5. **Settlement Processing:** This component processes settlement instructions, including delivery versus payment (DVP) and payment versus payment (PVP) instructions, and ensures that securities and funds are delivered correctly.
6. **Risk Management:** This component monitors trades for potential risks, such as counterparty default or market volatility, and takes appropriate actions to mitigate those risks.
7. **Regulatory Reporting:** This component generates and submits reports to regulatory authorities, such as trade and transaction reports, to ensure compliance with regulatory requirements.

4. Functional Requirements

The functional requirements of a volume dashboard project may vary depending on the specific needs of the business or organization. However, some common functional requirements for a volume dashboard project could include:

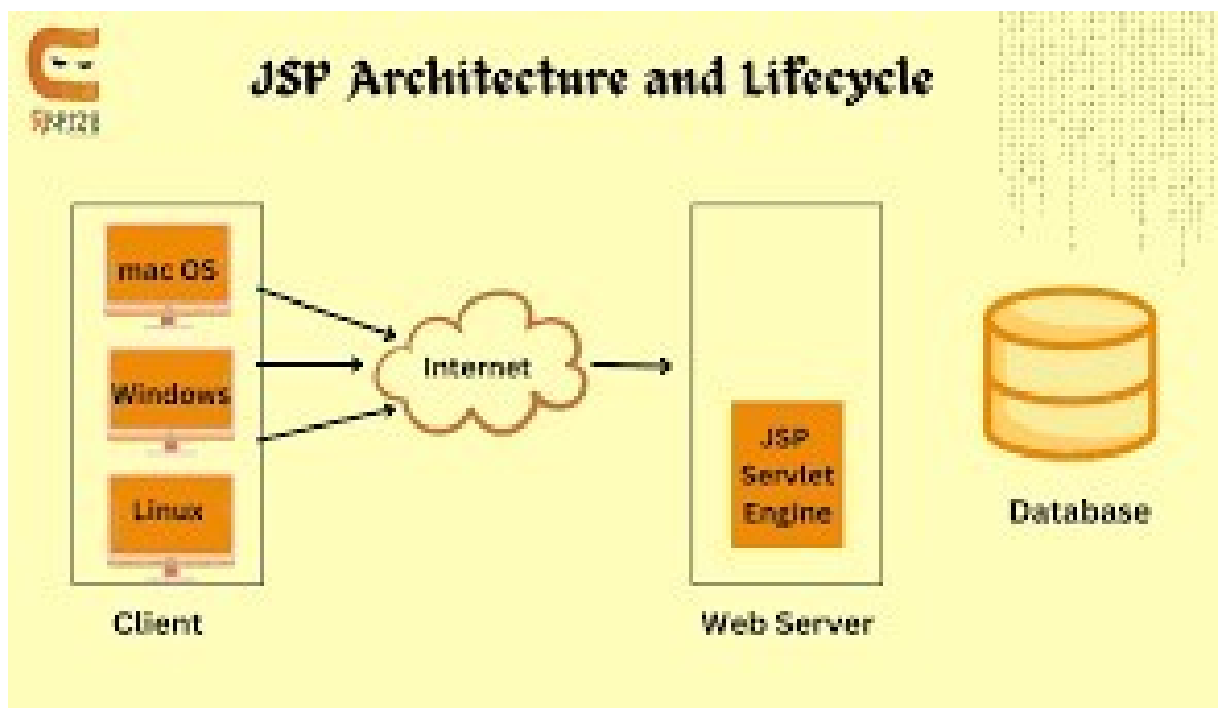
1. **Displaying Volume Data:** The dashboard should be able to display volume data in an easy-to-understand format. This could include bar charts, line graphs, or other visualizations.
2. **Filtering Data:** The dashboard should allow users to filter volume data based on various criteria, such as time periods, product types, or geographic regions.
3. **Real-time Updates:** The dashboard should be capable of providing real-time updates of volume data, allowing users to monitor volume levels as they change.
4. **Alerting:** The dashboard should be able to generate alerts when volume levels exceed or fall below predefined thresholds, allowing users to take timely action.
5. **User Authentication:** The dashboard should require users to authenticate themselves before accessing the data, to ensure data security and prevent unauthorized access.
6. **User Access Controls:** The dashboard should allow administrators to control user access to data, based on roles or permissions.
7. **Integration with Data Sources:** The dashboard should be able to integrate with various data sources, such as databases, APIs, or other systems, to retrieve volume data.
8. **Exporting Data:** The dashboard should allow users to export volume data to various formats, such as CSV, PDF, or Excel, for further analysis or reporting.
9. **Customization:** The dashboard should allow users to customize the appearance and layout of the dashboard to suit their preferences.
10. **Mobile Compatibility:** The dashboard should be mobile-friendly, allowing users to access volume data from their smartphones or tablets.

Overall, the functional requirements of a volume dashboard project should be designed to meet the needs of the business or organization, and provide users with timely and accurate insights into volume data.

5.Techonology Stack

5.1 JSP:

JSP (JavaServer Pages) is a technology used for developing dynamic web applications in Java. It allows the creation of web pages that can contain dynamic content, such as Database records, user input, or server-side logic. Eclipse is an integrated development environment (IDE) that supports JSP development.

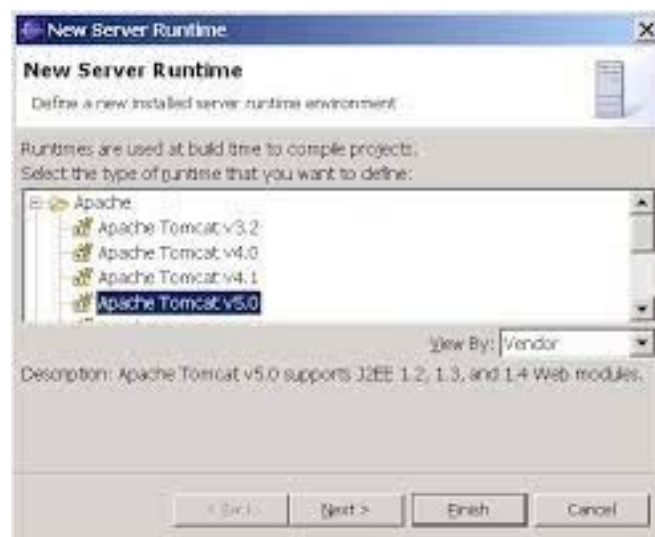


5.2. Apache Tomcat

Tomcat server is a popular open-source web server and servlet container developed by the Apache Software Foundation. It is widely used for hosting Java web applications, including JSP pages and servlets.

Servlet Container: Tomcat provides a servlet container that implements the Java Servlet and JavaServer Pages (JSP) specifications. This allows developers to create dynamic web applications using Java.

- **HTTP Server:** Tomcat is also a web server that can serve static web pages, handle HTTP requests, and communicate with other servers and clients over HTTP.
- **Cross-Platform:** Tomcat is written in Java and can run on a variety of operating systems, including Windows, Linux, and macOS.
- **Lightweight:** Tomcat is designed to be lightweight and fast, with a small memory footprint and low CPU usage.
- **Easy Configuration:** Tomcat can be configured through XML files or a web-based administration console. This makes it easy to customize its behavior and settings.



5.3 Db2 Database:

DB2 is a database product from IBM. It is a Relational Database Management System (RDBMS). DB2 is designed to store, analyze and retrieve the data efficiently. DB2 product is extended with the support of Object-Oriented features and non-relational structures with XML.

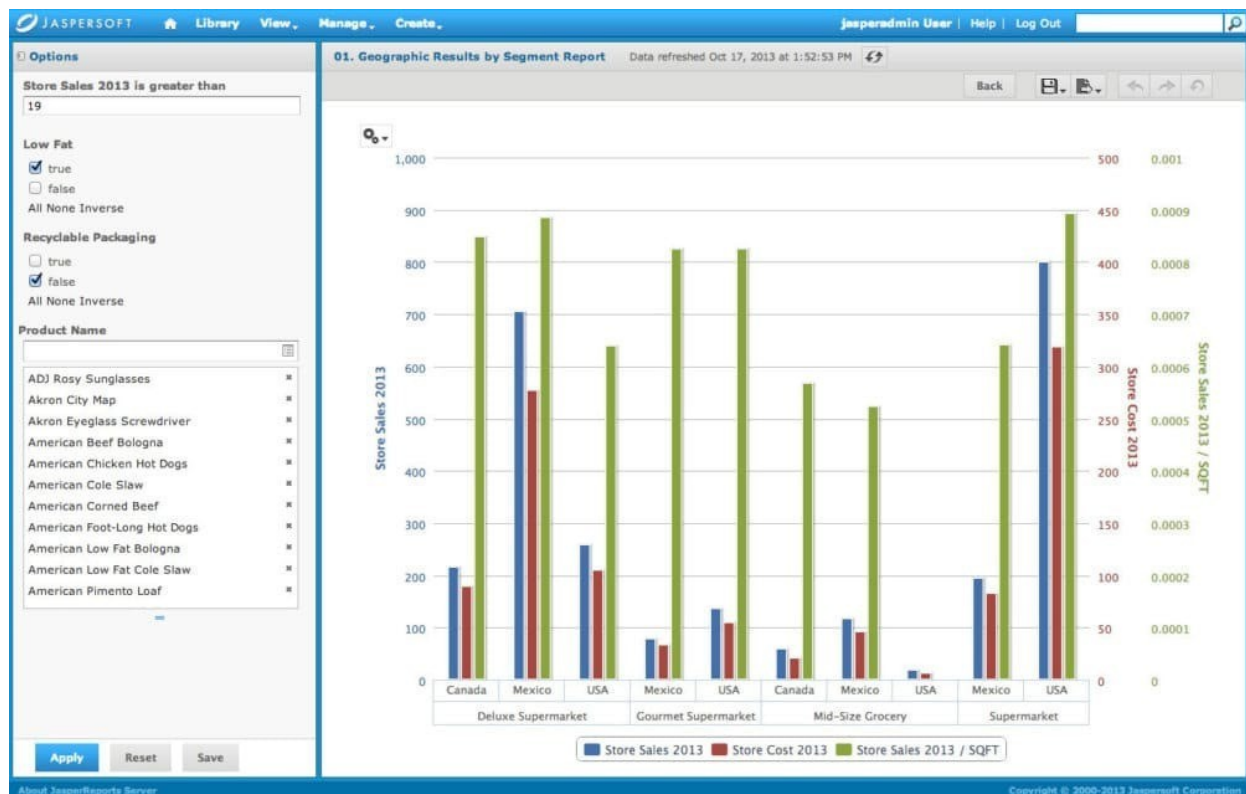
By Using Db2 database we can store the multiple clients data we can access, store, Manage, retrieve the records.



5.4. Jasper Soft Reports

JasperReports is an open source Java reporting tool that can write to screen, to a printer or into PDF, HTML, Microsoft Excel, RTF, ODT, Comma-separated values and XML files. It can be used in Java-enabled applications, including Java EE or Web applications, to generate dynamic content. It reads its instructions from an XML or .jasper file. JasperReports is an open source reporting library that can be embedded into any Java application

Multiple sources can be merged together. The data can be retrieved from defined data sources such as JDBC, CALS Table Models, JavaBeans, EJBQL, XML, Hibernate, and Comma-separated values, and additional data sources can be added to the [JasperReports](#) framework by plugging in a custom JRQueryExecuter. An extension is available to use Oracle PL/SQL stored procedures as a data source.



6.Non- Functional Requirements

Non-functional requirements are the attributes of a system that describe how well it operates, rather than what it does. Here are some examples of non-functional requirements that may be relevant for a volume dashboard project:

1. **Performance:** The dashboard should be able to handle large amounts of data and display it quickly, without any significant lag or delays.
2. **Availability:** The dashboard should be available for use at all times, with minimal downtime or maintenance required.
3. **Reliability:** The dashboard should be reliable and accurate, providing users with consistent and trustworthy data.
4. **Security:** The dashboard should be secure, protecting user data from unauthorized access or data breaches.
5. **Usability:** The dashboard should be easy to use, with an intuitive interface that allows users to quickly and easily access the data they need.
6. **Scalability:** The dashboard should be able to scale up or down to accommodate changes in data volume or user traffic, without affecting performance or reliability.
7. **Compatibility:** The dashboard should be compatible with a range of devices and platforms, allowing users to access the data from various locations and devices.
8. **Maintainability:** The dashboard should be easy to maintain and update, with a well-documented codebase and clear instructions for any necessary changes.
9. **Interoperability:** The dashboard should be able to integrate with other systems and data sources, allowing for a seamless flow of data between different applications.
10. **Accessibility:** The dashboard should be designed to be accessible for all users, including those with disabilities, by complying with accessibility guidelines and standards.

7. Software Requirements

Operating System : Windows 11

Web Server : Apache Tomcat

Database : Db2 Database

Client-side Requirements

Browser: Any HTML 4.0 or prior version compliance browser with a minimum screen resolution of 800X600 pixels (best viewed in 1024X768 resolution).

JavaScript: It should be enabled in the browser

Hardware Requirements

The following is a list of minimum requirements on server side.

Hard Disk: 40GB Hard disk with minimum 4GB free space

Interface: Mouse, Keyboard

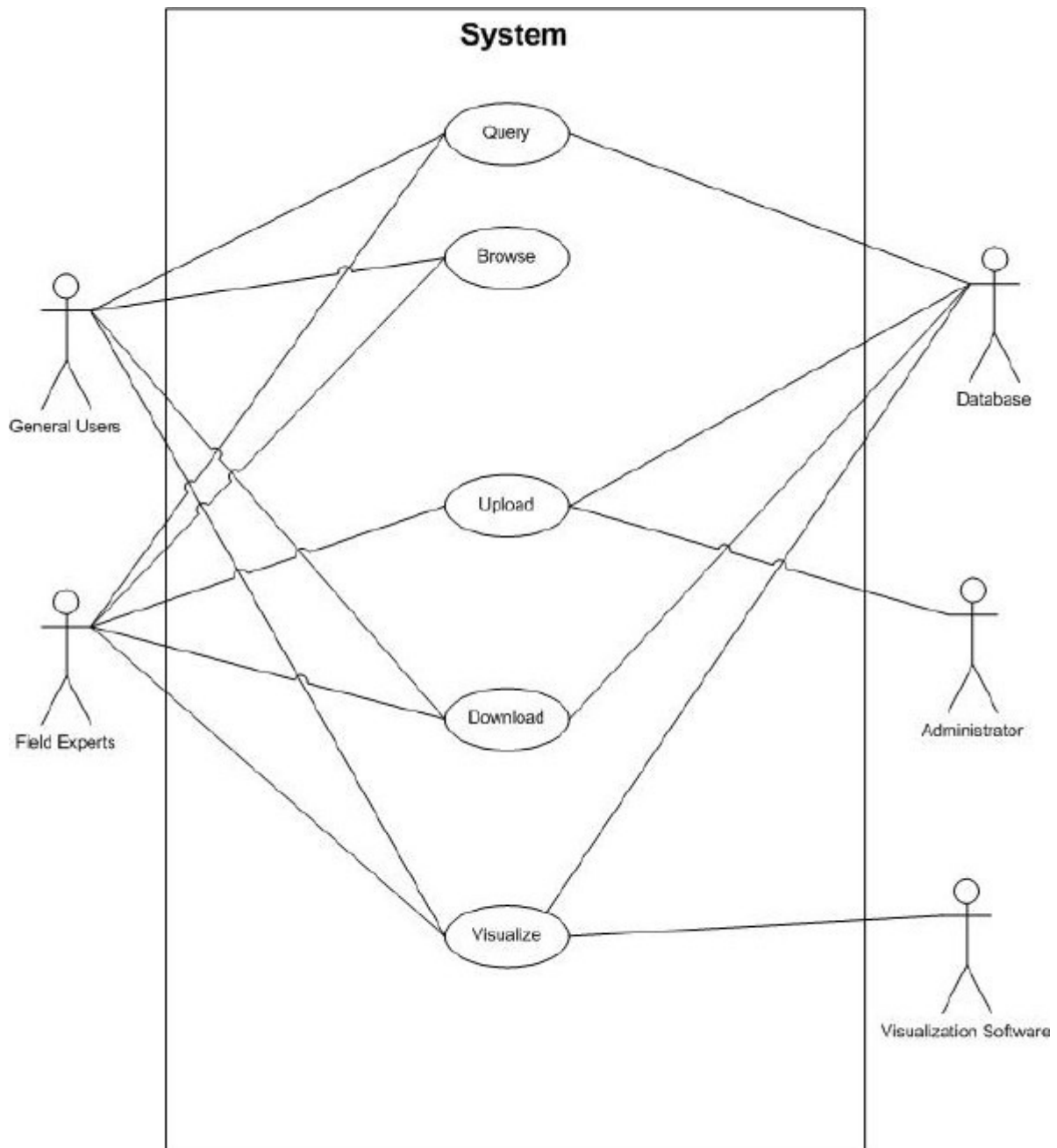
On client side any hardware that can run a Web browser

Acceptance Criteria

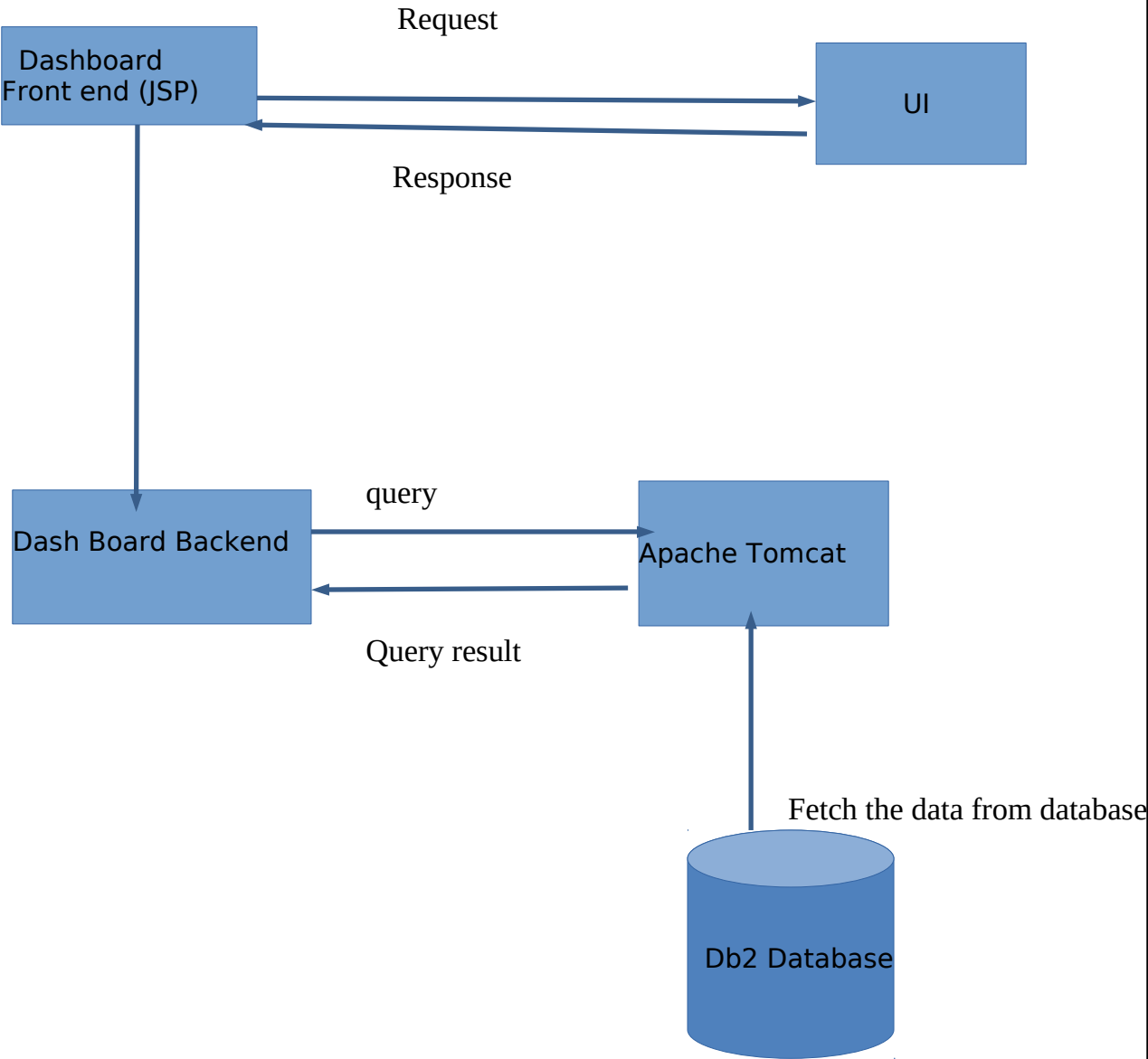
The dashboard shall be tested and validated to ensure that all functional and non-functional requirements are met. The portal shall be launched and made available to the public. The portal shall receive positive feedback from users, including high user engagement, user satisfaction, and successful report generation.

8. System Design

Use case diagram

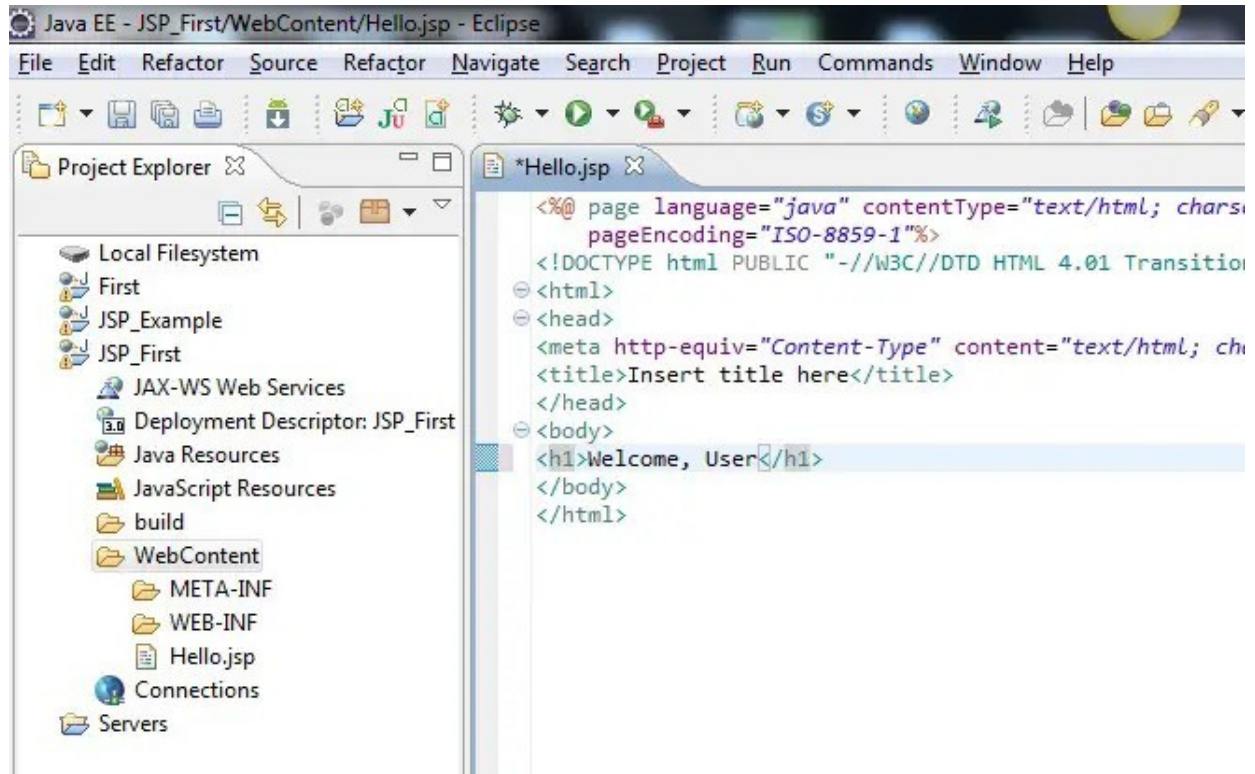


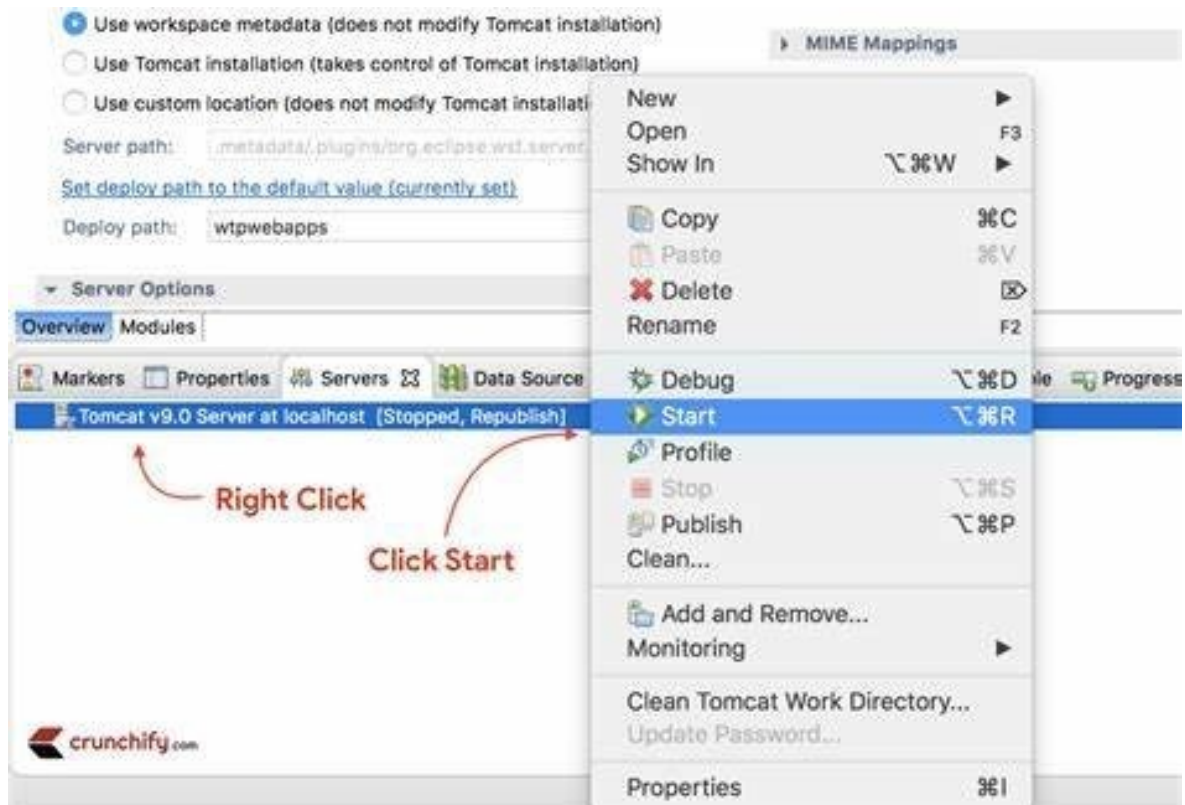
Data Flow Diagram



9.Implementation

We are writing code in JSP file on Eclipse IDE





10.Result

Name	B	Mid-Ordinate ...	Cut Factor	Fill Factor	Style	2d Area(sq.m)	Cut(adjusted)(Cu. ...	Fill(adjusted)(Cu. ...	Net(adjusted)(Cu. ...	Net Graph
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Select Reporting Period

1/1/2021

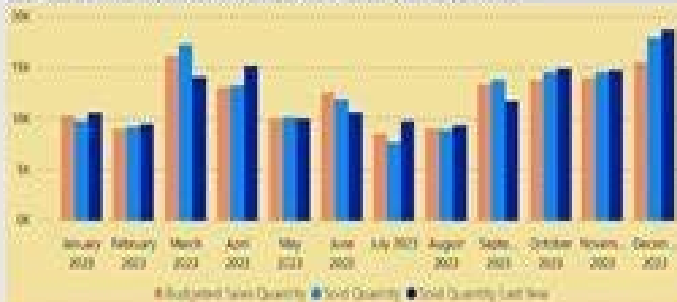
12/31/2021

Sold Quantities Per Product

Sold Quantities Per Product

Product Class	Budgeted Quantity	Sold Quantity	Deviation From Budget	Sold Quantity Last Year YTD	Deviation From Last Year YTD
Living & Entertainment	24,798	25,457	659	25,546	89
Furniture	42,087	44,278	2,191	42,388	-1,090
Bed & Bath	42,637	42,110	-527	44,062	1,952
Kitchen & Food	26,676	28,001	1,325	28,134	133
Total	145,151	149,879	4,729	148,130	-859

Budgeted And Actual Volumes and Last year's Volumes, YTD Per Month



149K

Sold Quantity

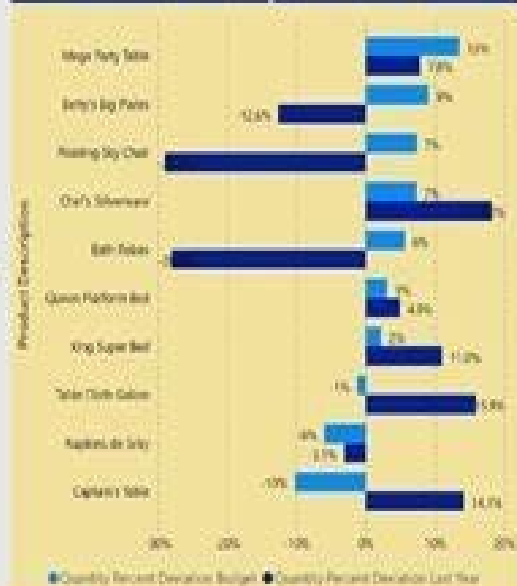
145K

Budgeted Quantity

149K

Quantity YTD LY

Deviation Of Sold Units Versus Budget And Last Year YTD



11.My Learnings during internship

I have undergone 5-month long training program, in which I gained the knowledge on financial markets includes types of markets, different asset classes, bonds, equities, derivatives, mutual funds, forwards, options, futures etc. Along with the basic/advanced understanding on technical sessions which includes java, SQL, No SQL, Python, RPA, AWS, DEVOPS with some assignments. The trainings were followed by The complete understanding of various Broadridge products such as IMPACT, GLOSS, BPS, BPSA, FINPRO, GPTM etc Details of the topics provided as below, which are covered in Interns Training Program.

Business	Technology	Product
Financial Markets	SQL /No SQL	Impact
Equity Markets	Python	C- PRO/NINA/BEES
Mutual Funds	Basic & Advanced Java	MBSE
US Bond Market	Cloud Fundamentals	FINPRO
Derivates/Forwards/ Futures	AWS	BIMS
Wealth Management	Dev-ops	RPA/FXL
Life Cycle of Trade	SDLC & STLC	GPTM
	RPA	Gloss
		Aspire

12 .Skills Learned

I had a good understanding of Business, Technology and Products, where they were very interactive during the sessions. On the business topics team gained a good understanding on US Bond Market, Mutual Funds, Equity Markets, Life cycle of a trade and etc.

In technology, team learned about writing and compiling program in basic Java Syntax, using Java data types and incorporate branches and loops. Also few concepts such as encapsulation, abstraction, polymorphism and inheritance followed by introducing basic Java concepts regarding classes, enabling us to start writing simple Java classes with attributes and methods and also introduced instances, or objects created from classes. This section also covered working with Strings, print output and use advanced math functions.

Finally, this section covered namespaces and Java Libraries to explain how Java Packages classes, so that everyone can develop code without name collisions and to able to organize and access classes, as well as use selected standard classes from the Java runtime environment, And also gained good understanding of the Arrays, list, data structures etc

13 .Conclusion

The Volume Dashboard project is a powerful tool for monitoring and visualizing the flow of data through various systems in real-time. It provides real-time metrics and charts that help businesses to identify trends, performance issues, and potential bottlenecks. The project's architecture is designed to be scalable, secure, and highly available, with support for various data sources, processing techniques, and visualization tools. The project's functional and non-functional requirements have been carefully defined and implemented to ensure that it meets the needs of businesses of all sizes. Overall, the Volume Dashboard project is an effective solution for businesses looking to monitor and optimize the flow of data through their systems.

14.Future Scope

The Volume Dashboard project has a wide range of potential future scope and can be further developed to provide even more advanced features and functionalities. Here are some potential future scopes for the Volume Dashboard project:

1. **Predictive Analytics:** The project can be extended to include predictive analytics features that use machine learning algorithms to predict future trends and patterns based on historical data.
2. **Advanced Visualization:** The project can be enhanced with advanced visualization tools, such as augmented reality and virtual reality, to provide an immersive and interactive experience for users.
3. **Real-time Alerts:** The project can be extended to provide real-time alerts and notifications to users when certain metrics exceed predefined thresholds, helping businesses to proactively identify and address issues.
4. **Integration with Cloud Services:** The project can be integrated with cloud services, such as Amazon Web Services (AWS) or Microsoft Azure, to provide a more scalable and cost-effective solution for businesses.
5. **Mobile App:** The project can be extended with a mobile app that provides real-time access to the dashboard from anywhere, allowing users to monitor the flow of data even when they are on the go.

15. References

- [1]** <https://www.broadridge.com/financial-services/capital-markets/transform-trade-life-cycle/equity-trade-processing>
- [2]** <https://www.javatpoint.com/jsp-tutorial>
- [3]** <https://tomcat.apache.org/>
- [4]** <https://www.ibm.com/products/db2/database>