

# **Global Sales Data Analytics**

## **A PROJECT REPORT**

**Submitted By**

|                      |          |                           |
|----------------------|----------|---------------------------|
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**In Partial fulfilment for the award of the degree**

**of**

**BACHLOR OF ENGINEERING**

**in**

**COMPUTER SCIENCE AND ENGINEERING**

**NANDHA COLLEGE OF TECHNOLOGY , ERODE**

**ANNA UNIVERSITY , CHENNAI 60025**

**JUNE 2022**

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GitHub & Project Demo Link Global Sales Data Analytics

## **1.Introduction:**

### **1.1 Project Overview:**

Shopping online is currently the need of the hour. Because of this COVID, it's not easy to walk in a store randomly and buy anything you want. So, try to understand a few things like, Customer Analysis and Product Analysis of this Global Super Store.

## **1.2 Purpose:**

By the end of this Project, you will:

- Know fundamental concepts and can work on IBM Cognos Analytics.
- Gain a broad understanding of plotting different visualizations to provide a suitable solution.
- Able to create meaningful Visualizations and Dashboard(s).

## **2.Literature Survey:**

### **2.1 Existing Problem:**

Crafting a good sales pitch from sales data analysis can be difficult. Getting the right data, hitting the right client pain points, crystallizing why your services are better than the competitors, all takes hard work. One of the best ways we've found to build a good sales pitch is to use data you already have.

In the digital world, there is no shortage of data, which translates into no shortage of potential competitive insights and advantages. With databases, data warehouses, corporate intranets, best practice sharing, web analytics, voice of the customer information, and QA or Six Sigma data, you are well-poised for discovering good information.

### **2.2 References:**

1.Han Jiawei, Micheline Kamber and Jian Pei, "**Data Mining Concepts and Techniques**" in , MK Publications, 2009. [Show in Context Google Scholar](#)

2. M. Tennekes and E. de Jonge, "**Top-down Data Analysis with Tree maps**"  
Proceedings of the International Conference on Information Visualization Theory and Applications (IVAPP' 11), pp. 236-241, March 2011. [Show in Context Google Scholar](#)

3. P. Hoek, "**Parallel Arc Diagrams: Visualizing Temporal Interactions**",  
Journal of Social Structure, vol. 12, 2011. [Show in Context Google Scholar](#)

### **2.3 Problem Statement Definition:**

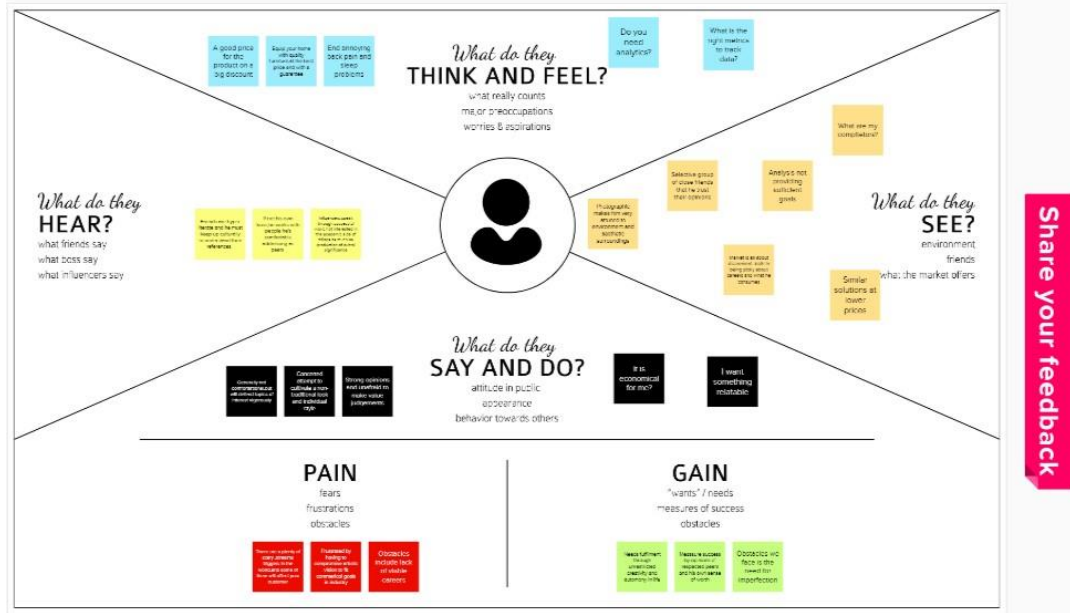
Our goal is to design and create a Dashboard using the Superstore Sales data (which is really close to reality) to provide answers to the following questions:

1. What are the performance indicators values for the past month? It's necessary for stocktaking and comparing it against the same period last year.
2. What key factors do affect profit growth?
3. What categories, subcategories, products and clients generate more profits, and what ones that bring losses?

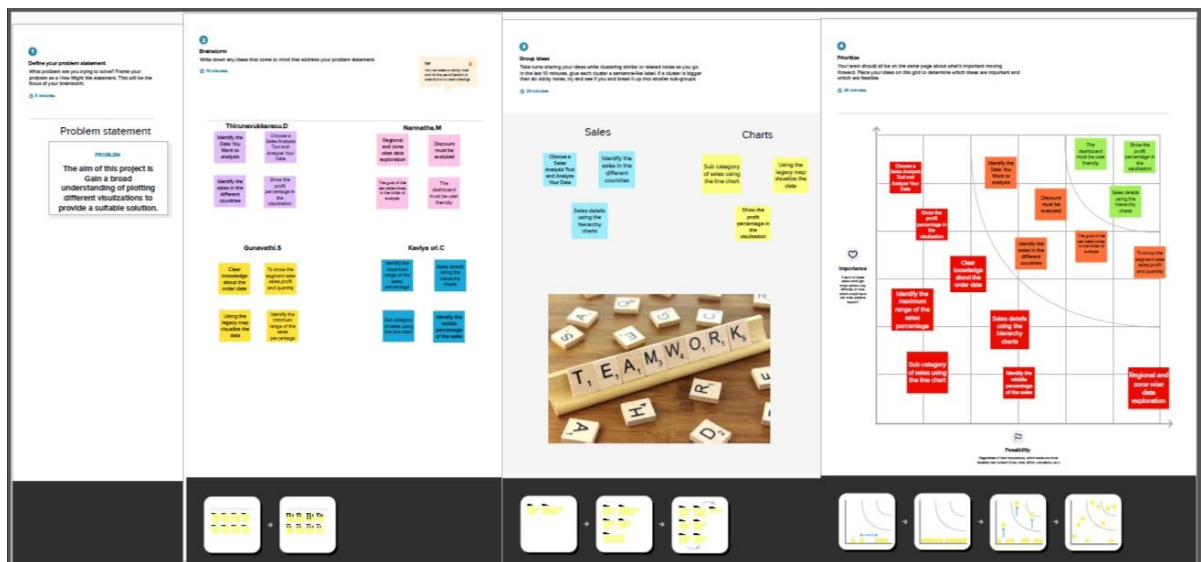
## **3. IDEATION & PROPOSED SOLUTION:**

### **3.1 Empathy Map Canvas:**

Build empathy and keep your focus on the user by putting yourself in their shoes.



### 3.2 Ideation & Brainstorming:



### 3.3 Proposed Solution:

Proposed Solution Template:

| S.No. | Parameter                             | Description   |
|-------|---------------------------------------|---|
| 1.    | Problem Statement                     | Increase the customer buying capacity                                       |
| 2.    | Idea / Solution description           | Identify the customer's priority  |
| 3.    | Novelty / Uniqueness                  | Analyzing the previous buying products to get an idea about future purchase |
| 4.    | Social Impact / Customer Satisfaction | Customer will identify their needs even they don't know                     |
| 5.    | Business Model (Revenue Model)        | Good analyzing of previous products   |
| 6.    | Scalability of the Solution           | 100% possible   |

### 3.4 Problem Solution fit:



| Problem Statement (PS) | I am (Customer ) | I'm trying to       | But                           | Because                                  | Which makes me feel |
|------------------------|------------------|---------------------|-------------------------------|--|---------------------|
| PS-1                   | producer         | Increase my revenue | Customer demand is low        | The product availability is less         | Depressed           |
| PS-2                   | Customer         | Buy some products   | The product are not available | Of more demand for the product in market | Frustrated          |

## 4. REQUIREMENT ANALYSIS:

**Project Design Phase-II**  
**Solution Requirements (Functional & Non-functional)**

|               |                                     |
|---------------|-------------------------------------|
| Date          | 03 October 2022                     |
| Team ID       | PNT2022TMID32191                    |
| Project Name  | Project –Global Sales Data Analysis |
| Maximum Marks | 4 Marks                             |

**Functional Requirements:**

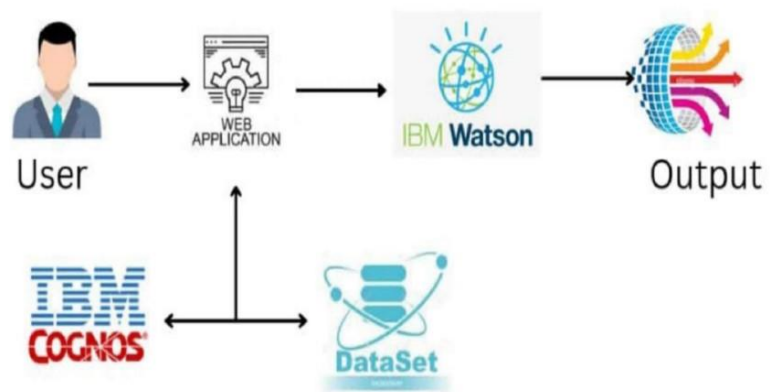
| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task)   |
|--------|-------------------------------|--|
| FR-1   | User Registration             | Registration through Form<br>Registration through Gmail<br>Registration through LinkedIn |
| FR-2   | User Confirmation             | Confirmation via Email<br>Confirmation via OTP   |
| FR-3   | User Login                    | Login via Email and Password   |
| FR-4   | User Uploading Data           | To store the data set through the cloud  |
| FR-5   | End User Benefits             | Getting higher state of efficiency and also to know entire data analysis                 |

**Non-functional Requirements:**

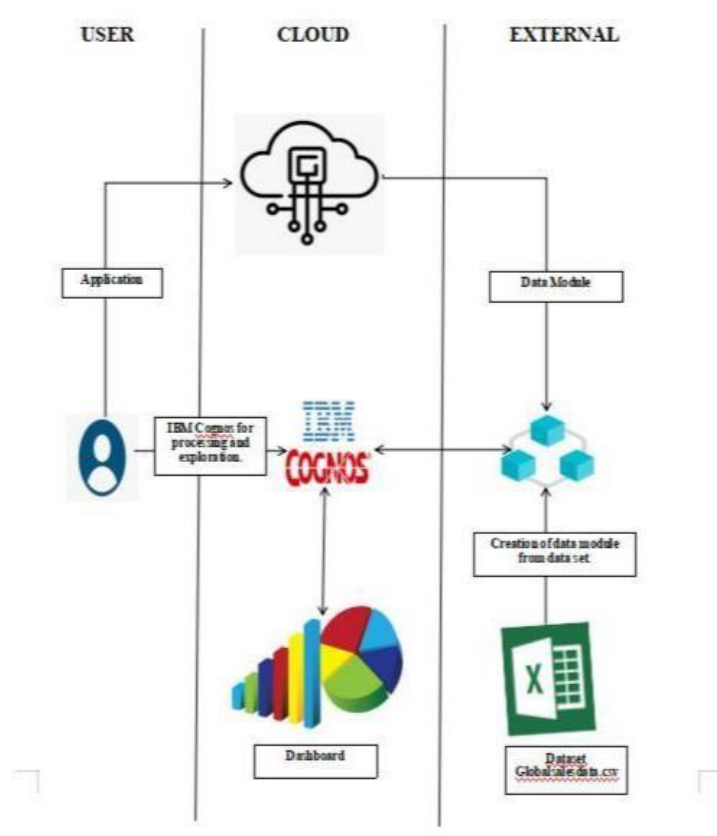
| FR No. | Non-Functional Requirement | Description   |
|--------|----------------------------|---|
| NFR-1  | Usability                  | Optimized resources and it can be used by every one.  |
| NFR-2  | Security                   | It has an end to end encryption.  |
| NFR-3  | Reliability                | The reliability was based on the development.   |
| NFR-4  | Performance                | Requires minimum system requirements, hence could be accessible in many devices with faster loading time. |
| NFR-5  | Availability               | It was available in all platforms and websites  |
| NFR-6  | Scalability                | Scalability reflects the ability of the software to grow or change with the user's demands.               |

## **5. PROJECT DESIGN:**

### **5.1 Data Flow Diagrams:**



## 5.2 Solution & Technical Architecture:





### 5.3 User Stories:

| User Type              | Functional Requirement (Epic) | User Story Number | User Story / Task   | Acceptance criteria                                       | Priority | Release  |
|------------------------|-------------------------------|-------------------|---|---|----------|----------|
| Customer (Mobile user) | Registration                  | USN-1             | As a user, I can register for the application by entering my email, password, and confirming my password. | I can access my account / dashboard                       | High     | Sprint-1 |
|                        |                               | USN-2             | As a user, I will receive confirmation email once I have registered for the application                   | I can receive confirmation email & click confirm          | High     | Sprint-1 |
|                        |                               | USN-3             | As a user, I can register for the application through Facebook  | I can register & access the dashboard with Facebook Login | Low      | Sprint-2 |
|                        |                               | USN-4             | As a user, I can register for the application through Gmail   |   | Medium   | Sprint-1 |
|                        | Login                         | USN-5             | As a user, I can log into the application by entering email & password                                    |   | High     | Sprint-1 |

|                         | Dashboard                     | USN-6             | As a user, I can create the visualization by using the dashboard In the application                     |  | High     | Sprint-3 |
|-------------------------|-------------------------------|-------------------|---|--|----------|----------|
| Customer (Web user)     | Login                         | USN-1             | As a user, I can register for the application by entering my email ,password and confirming my password | I can access my account and dashboard      | High     | Sprint-1 |
| User Type               | Functional Requirement (Epic) | User Story Number | User Story / Task   | Acceptance criteria                        | Priority | Release  |
| Customer Care Executive | Chat box                      | USN-1             | It can be used by easily access and responsible.  | I can access by easily through application | High     | Sprint-2 |
| Administrator           | Calling                       | USN-2             | It can be used by easily access and responsible.  | I can access by easily through application | High     | Sprint-2 |
|                         | Mail                          | USN-3             | It can be used by easily access and responsible   | I can access by easily through application | High     | Sprint-1 |

## **6. PROJECT PLANNING & SCHEDULING:**

## 6.1 Sprint Planning & Estimation:

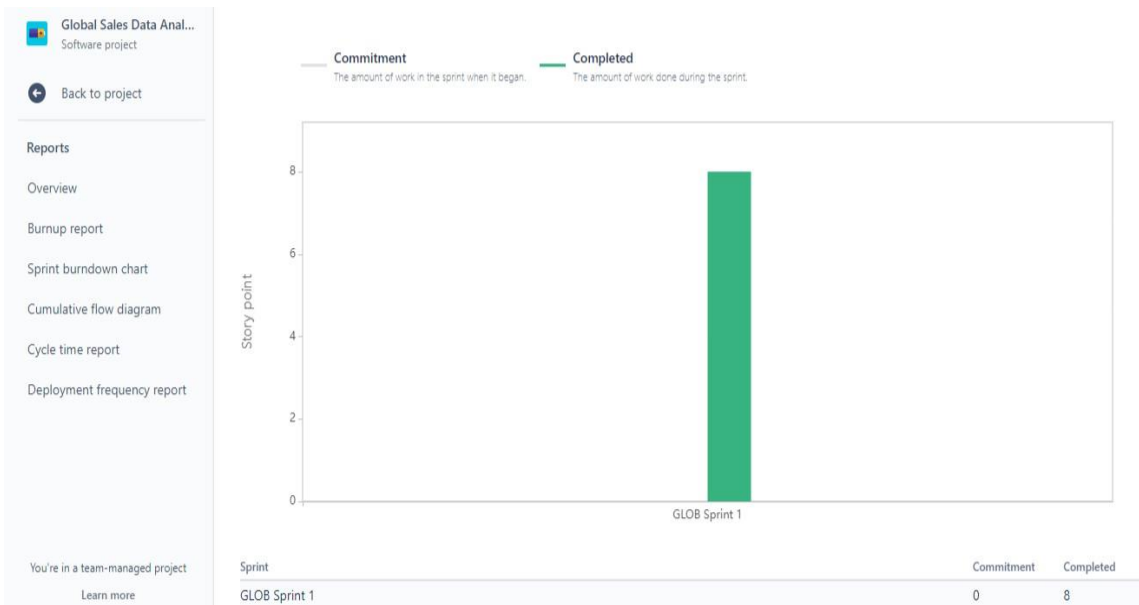
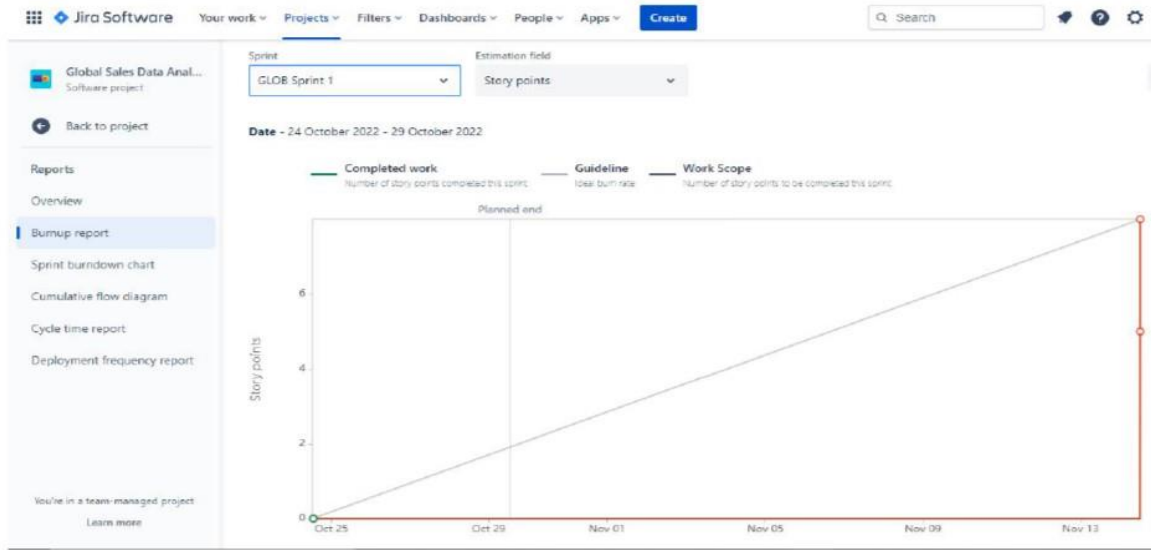
| Sprint   | Functional Requirement (Epic)     | User Story Number | User Story / Task   | Story Points | Priority | Team Members       |
|----------|-----------------------------------|-------------------|---|--------------|----------|--------------------|
| Sprint-1 | Datasets                          | USN-1             | As a user, I can enter the details of the employees working in our organization for the attrition detail. | 5            | High     | Narmatha.M         |
| Sprint-1 |                                   | USN-2             | As an Analyst, I Prepare the data & Provide meaningful insights through EDA in Cognos Analytics           | 3            | High     | Kaviya.sri.C       |
| Sprint-2 | Exploring data and creating model | USN-3             | As a user, I want to find connections between various visualization that leads to attrition               | 2            | Low      | Gunavathi.S        |
| Sprint-2 |                                   | USN-4             | As an Analyst, I will create a prediction model for predicting the attrition.                             | 3            | Medium   | Thirunavukkarasu.D |
| Sprint-3 | Prediction                        | USN-5             | As an Analyst, I will create different type of model to identify which give the correct prediction.       | 3            | Medium   | Narmatha.M         |
| Sprint-3 |                                   | USN-6             | As an Analyst, I will use Cognos Analytics to generate a report   | 3            | Medium   | Kaviya.sri.C       |
| Sprint-4 | Creation of web-page              | USN-7             | As a user, I can only understand the Analysis in animated presentation of dataset                         | 5            | Medium   | Gunavathi.S        |
| Sprint-4 |                                   | USN-8             | As an Analyst, I use Cognos Analytics to create an animated presentation (Story) of the dataset           | 3            | High     | Thirunavukkarasu.D |

## 6.2 Sprint Delivery Schedule:

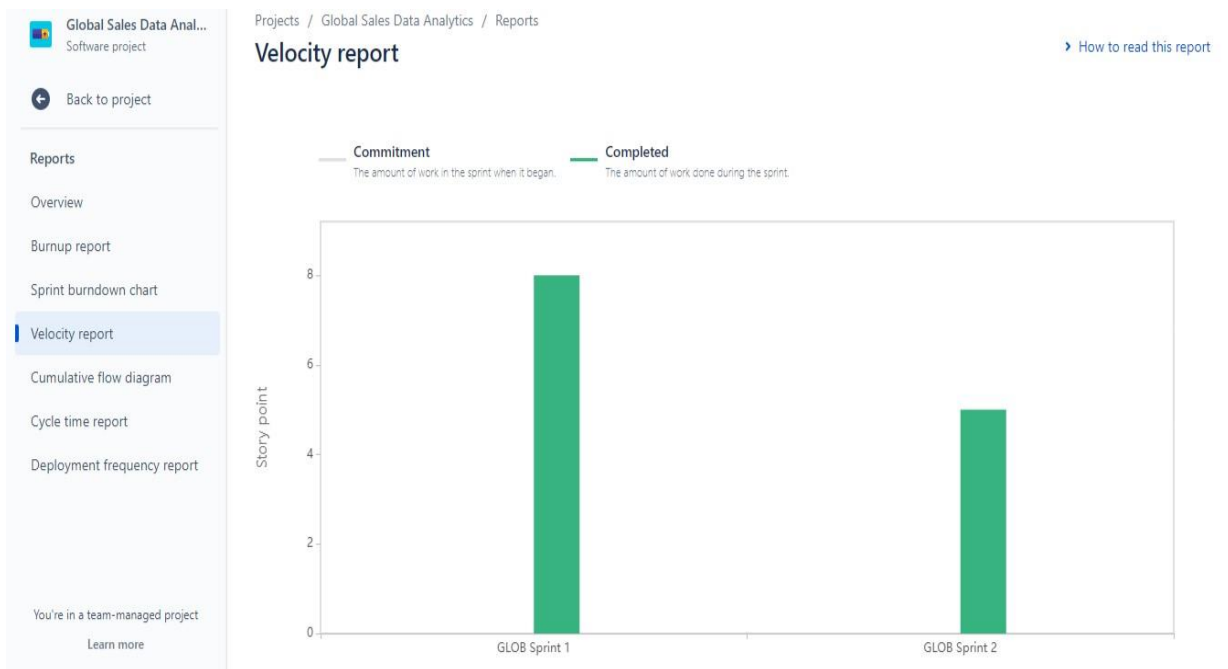
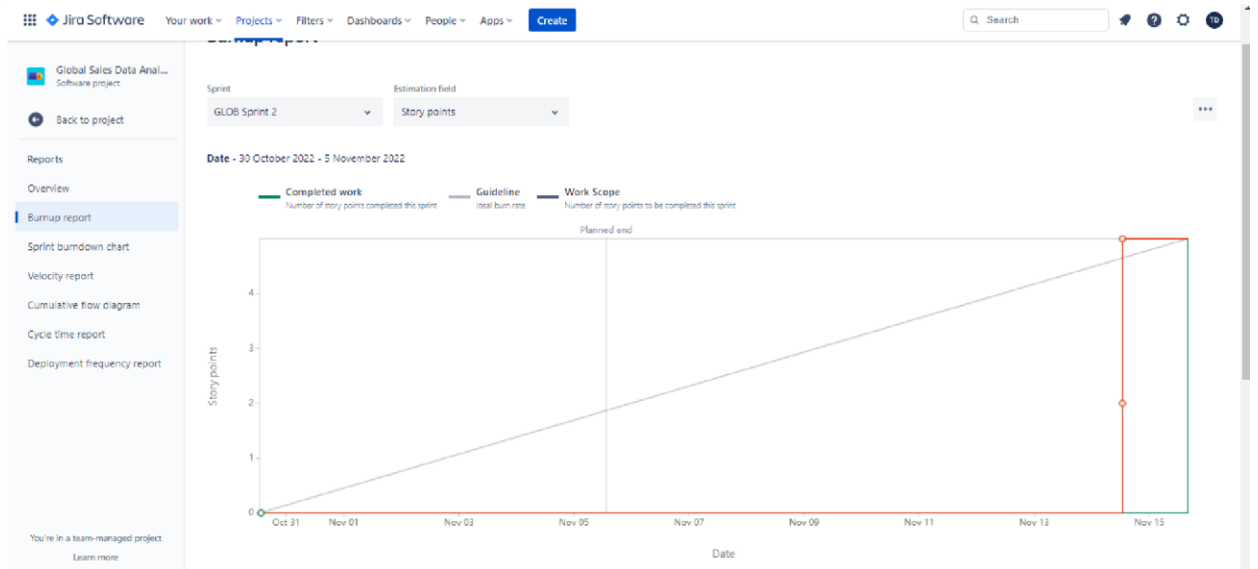
| Sprint   | Total Story Points | Duration | Sprint Start Date | Sprint End Date (Planned) | Story Points Completed (as on Planned End Date) | Sprint Release Date (Actual) |
|----------|--------------------|----------|-------------------|---------------------------|---|------------------------------|
| Sprint-1 | 5                  | 6 Days   | 24 Oct 2022       | 29 Oct 2022               | 5   | 29 Oct 2022                  |
| Sprint-2 | 5                  | 6 Days   | 31 Oct 2022       | 05 Nov 2022               | 5   | 05 Nov 2022                  |
| Sprint-3 | 5                  | 6 Days   | 07 Nov 2022       | 12 Nov 2022               | 5   | 12 Nov 2022                  |
| Sprint-4 | 5                  | 6 Days   | 14 Nov 2022       | 19 Nov 2022               | 5   | 15 Nov 2022                  |

## 6.3 Reports from JIRA:

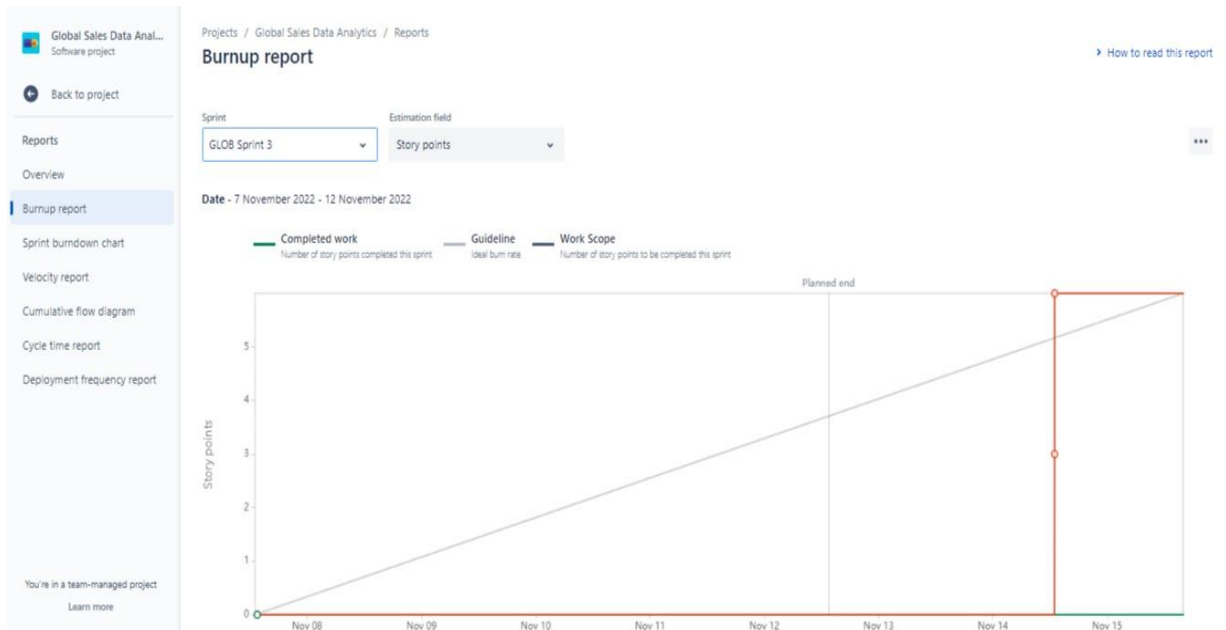
### Sprint 1:



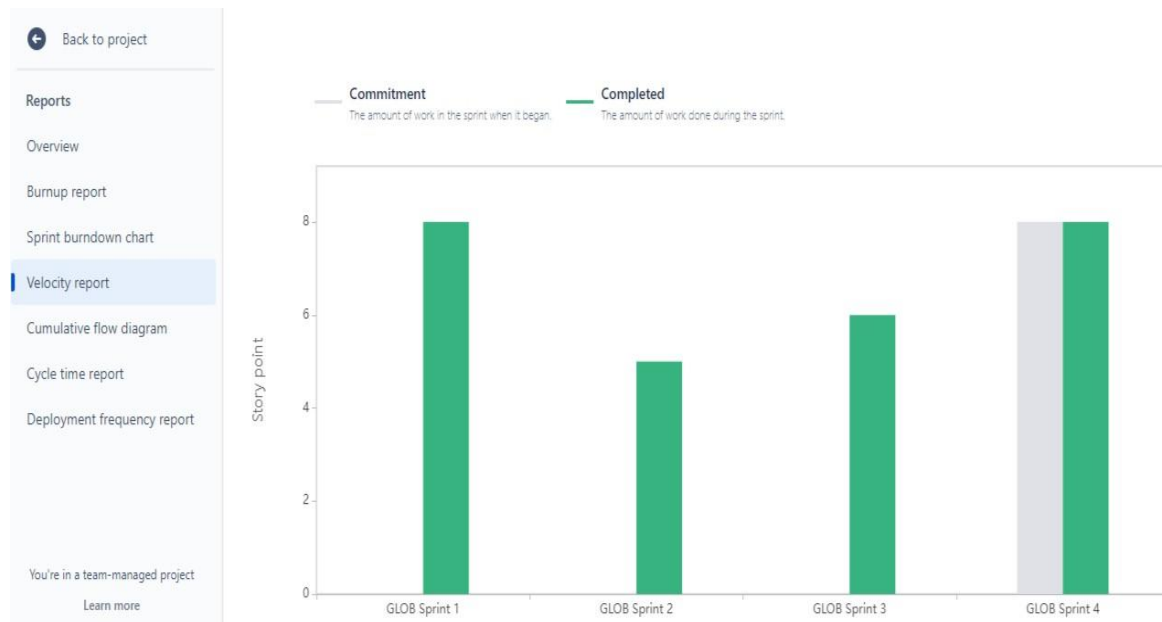
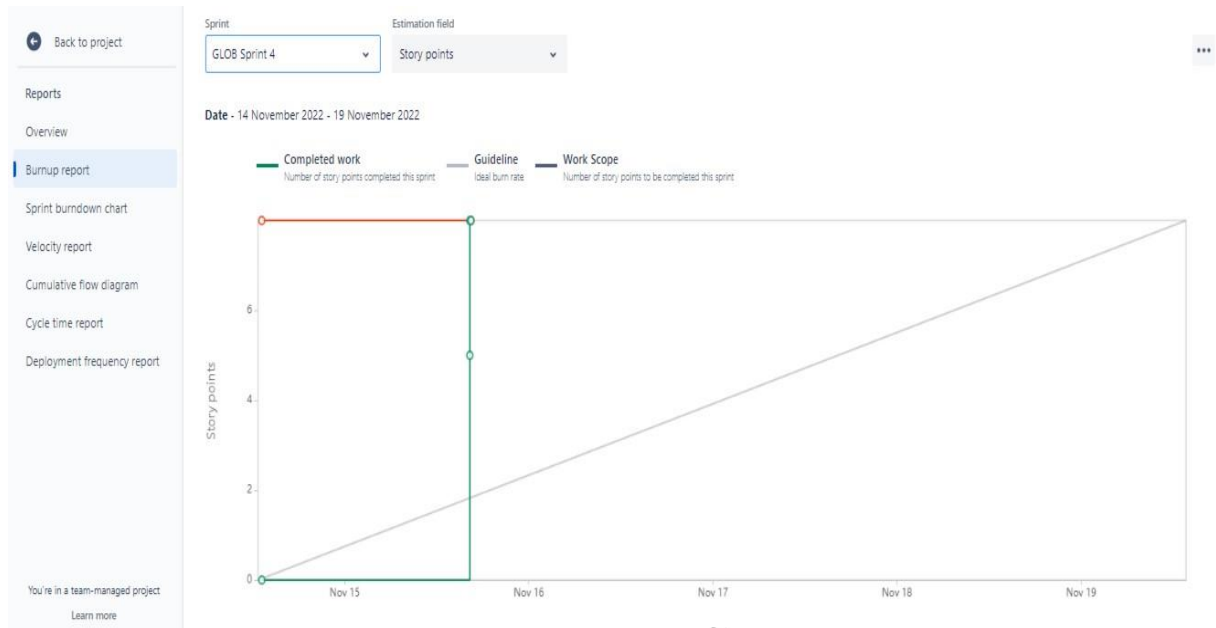
## Sprint 2:



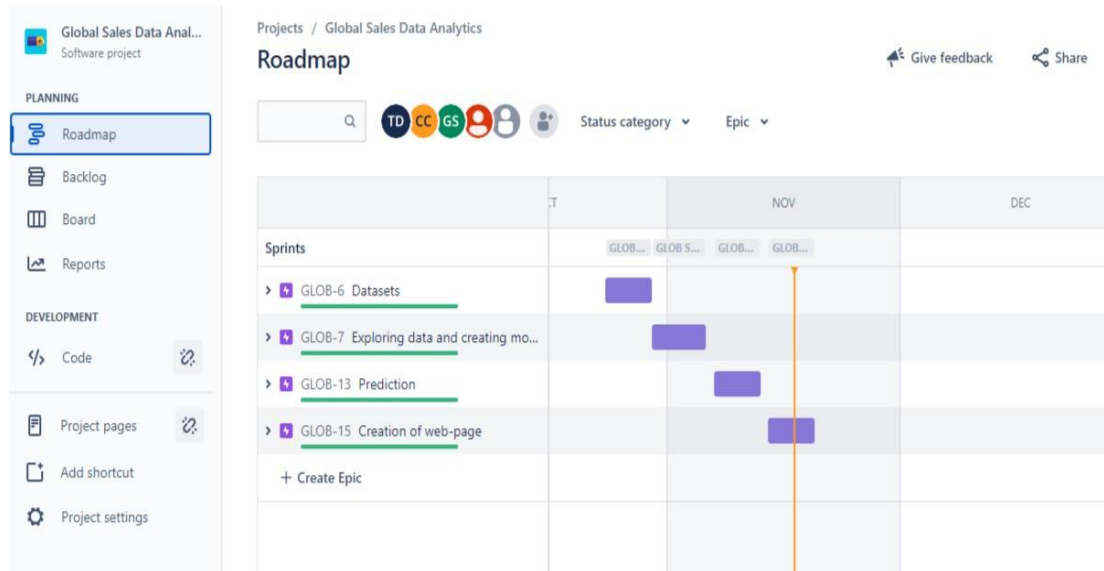
**Sprint 3:**



**Sprint 4 :**



**Road Map:**



## 7.CODING & SOLUTIONING:

### 7.1 Feature 1:

The screenshot shows a web registration form titled 'Registration'. The form is centered on a dark background and contains the following elements:

- Registration** (Title)
- Username
- Email Address
- Password
- (Blue button)
- Already have an account? [Login here](#)

At the bottom right, there is a footer that reads 'Powered by 000webhost'.

### 7.2 Feature 2:

Login

Username

Password

Login

Don't have an account? [Registration Now](#)

Powered by 000webhost

Global Sales Data Analytics

DashBoard1

DashBoard2

DashBoard3

DashBoard4

GLOBAL SALES DATA ANALYTICS

TEAM ID :PNT2022TMID32191

TEAM MEMBERS:

GUNAVATHI S

KAVIYA SRI C

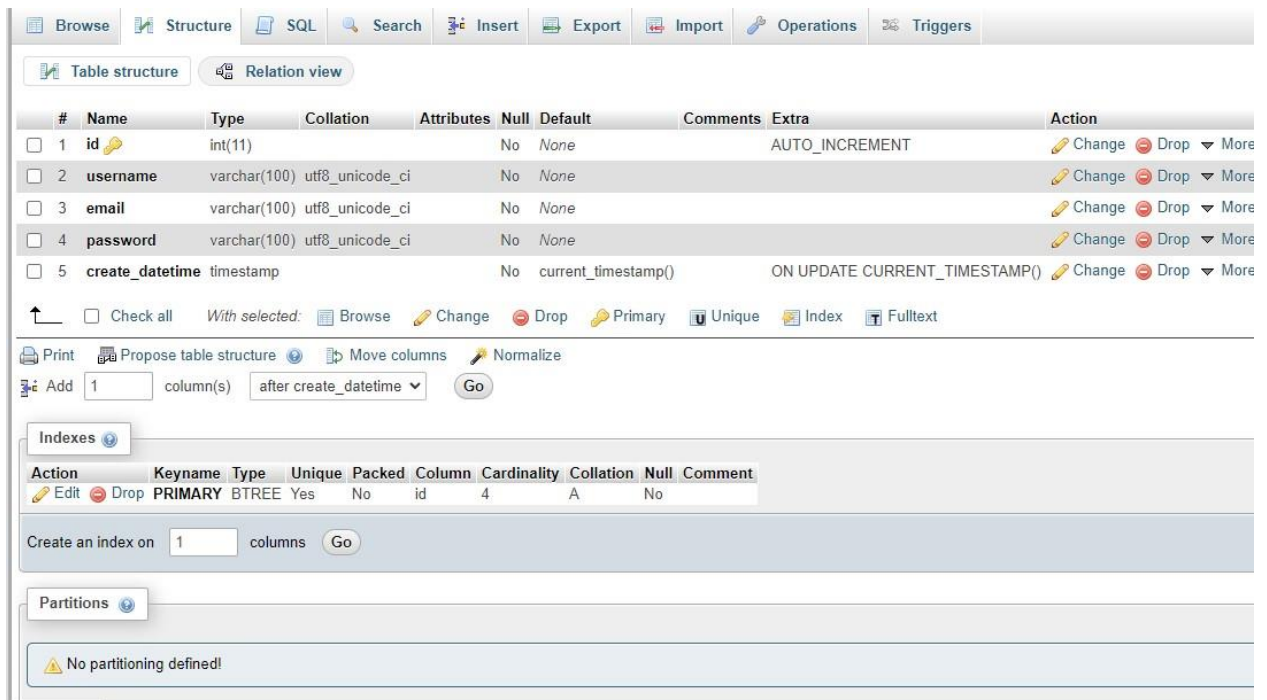
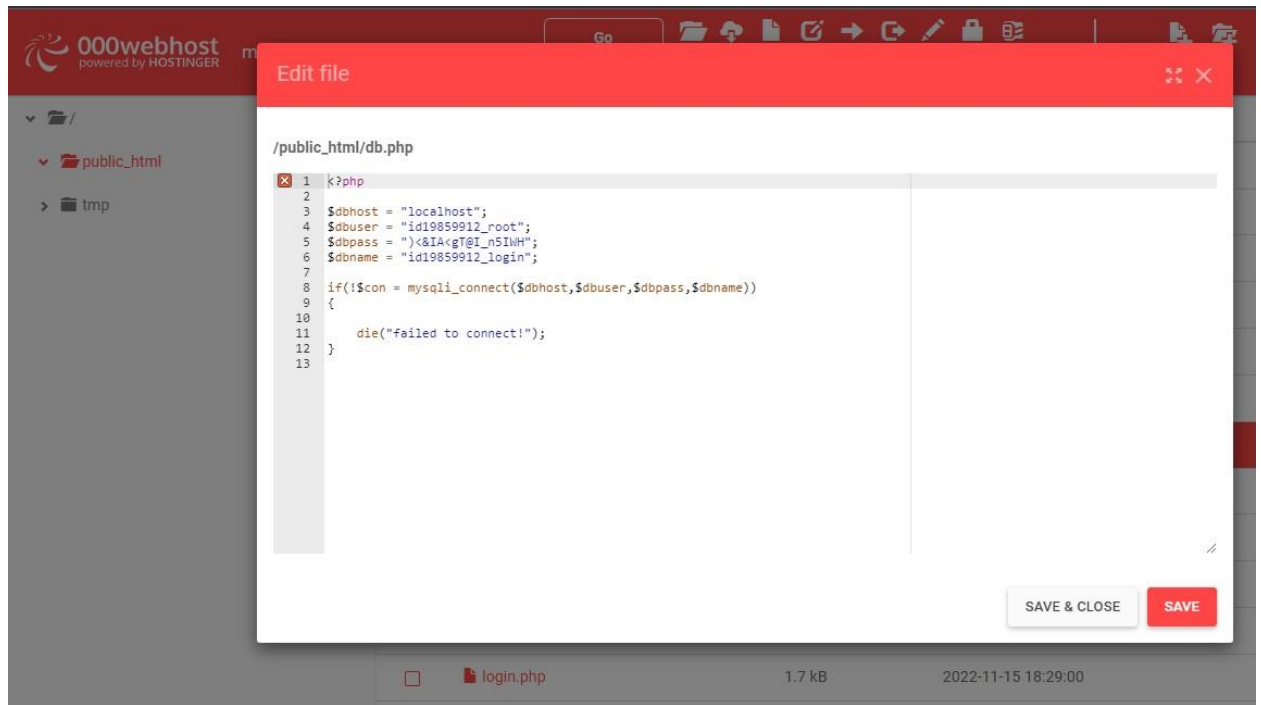
NARMATHA M

THIRUNAVUKKARASU D

Powered by 000webhost

### 7.3 Database Schema:





## 8. TESTING:

### 8.1 Test Cases:

**Model Performance Testing:**

Project team shall fill the following information in model performance testing template.

| S.No. | Parameter                             | Screenshot / Values                            |
|-------|---------------------------------------|--|
| 1.    | Dashboard design                      | No of Visualizations / Graphs - 14             |
| 2.    | Data Responsiveness                   | Users and Analyst or developers                |
| 3.    | Amount Data to Rendered (DB2 Metrics) | Specified area level informations.             |
| 4.    | Utilization of Data Filters           | Simple or Gravity , hot and vacuum Filtration. |
| 5.    | Effective User Story                  | No of scene added - 14                         |
| 6.    | Descriptive Reports                   | No of Visualizations / Graphs - 5              |

A testcase is a set actions performed on a system to determine if it is satisfies the software requirements and functions correctly. The purpose is to determine if different features within system are performing as expected or not. The process of writing testcase can also help reveal errors and defects within the system.

**8.2 User Acceptance Testing:**

User Acceptance Testing (UAT) is a type of testing performed by the end user or the client to verify/accept the software system before moving the software application to the production environment. UAT is done in the final phase of testing after functional, integration and system testing is done.

### 3. Test Case Analysis

This report shows the number of test cases that have passed, failed, and untested

| Section             | Total Cases | Not Tested | Fail | Pass |
|---------------------|-------------|------------|------|------|
| Login Page          | 1           | 0          | 0    | 1    |
| Citi Bike details   | 1           | 0          | 0    | 1    |
| Database            | 2           | 0          | 0    | 2    |
| Dashboard           | 4           | 0          | 0    | 4    |
| Visualize the data  | 8           | 0          | 0    | 8    |
| Logistic Regression | 4           | 0          | 0    | 4    |

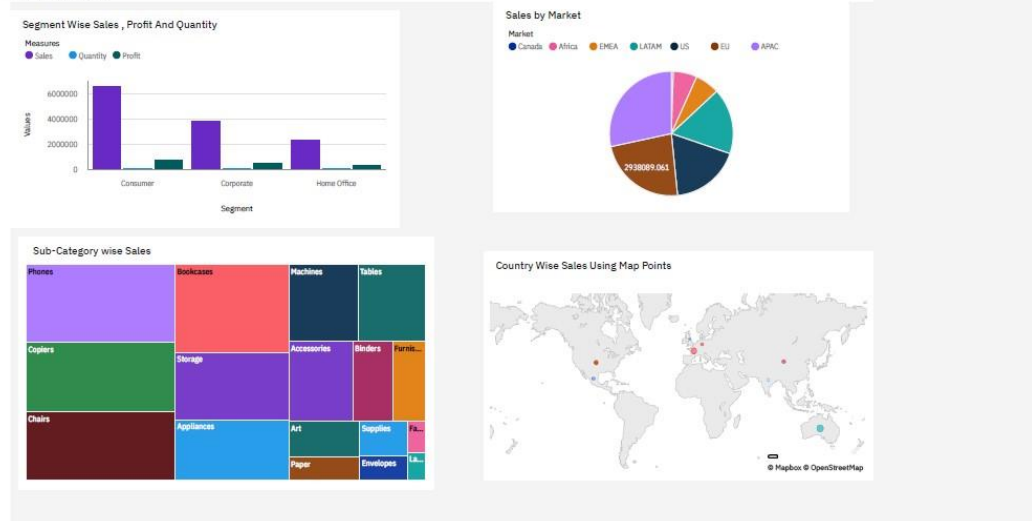
## 9.RESULTS:

### 9.1 Performance Metrics:

#### Dashboard 1

11/16/22, 7:01 PM

Dashboard 1



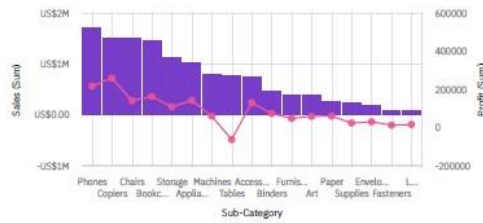
#### Dashboard 2

11/16/22, 6:53 PM

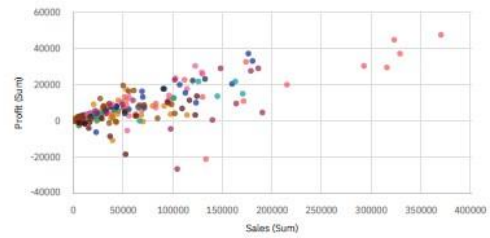
\* Global\_Superstore Dashboard

## Dashboard 2

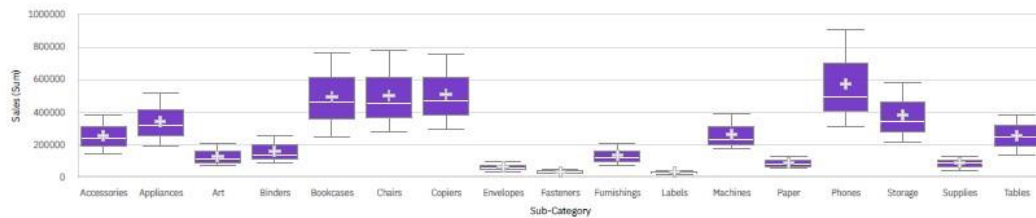
Sub Category Wise Sales And Profits Using Line And Bar Chart



Sales Vs Profit Scatter Plot With Sub Categories And Regions



Sales By Sub Category Analytics



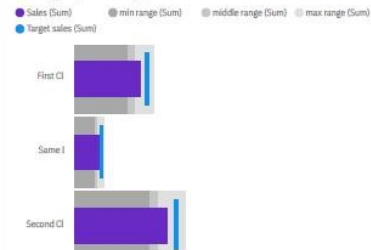
## Dashboard 3

11/16/22, 6:55 PM

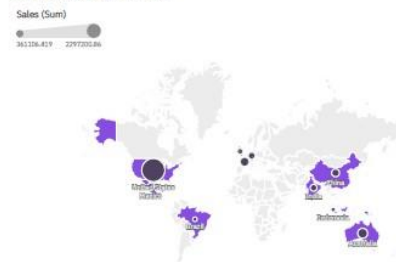
\* Global\_Superstore Dashboard

## Dashboard3

Sales By Segment Analysis



Sales Vs Profit By Countries



Regional Quantity And Sales Using Radar Chart



Country Wise Sales Vs Profit Using Word Cloud

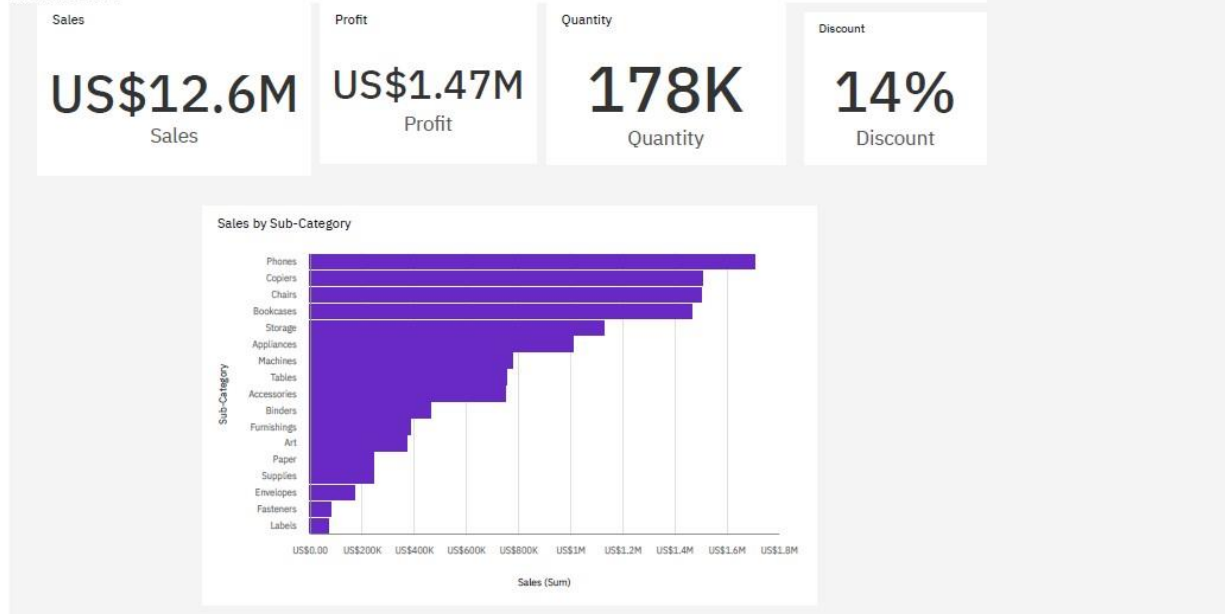


## Dashboard 4

11/16/22, 6:59 PM

\* Global\_Superstore Dashboard

Dashboard 4



## **10. ADVANTAGES & DISADVANTAGES:**

### **ADVANTAGES:**

- i) It was the cost efficiency project.
- ii) Receive full-scale services Maximize presentation
- iii) It was the timing saving project for peoples.

### **DISADVANTAGES:**

- i) The lack of data security is the big disadvantages in this project.
- ii) Risk of choosing the wrong provider .

## **11. CONCLUSION:**

By implementing this analytics solution, the company brought their competitive and sales data reporting in-house, cut costs and increased the accuracy of their reporting and analysis. As the company moves forward with this new solution, their sales reporting costs will most likely be reduced by 50 to 70%.

They are now able to analyse raw data themselves, respond more quickly to changes in market trends and perform root cause analysis to determine those shifts in the market. By securing quicker access to their data with the new solution, the company was also able to reduce the risk associated with delayed responses to changes in their markets.

With the new solution, the company can now process sales reports faster than the outsourced solution, reducing turnaround time between 50% to 60%. The reporting needs of the company have been streamlined, consolidating over 10 reports into the centralized dashboard solution.

The company's competitive analysis group is also able to more quickly respond to internal data requests given they have the ability to pull the information themselves. With this quicker response, the company is better able to react to changes in the market and predict opportunities for its sales force.

The business also experienced an increase in the overall understanding of their sales data throughout the organization. The company now has great flexibility in the presentation of their sales and competitive data, while also being able to integrate sales data with other key data points for the organization.

## **12. FUTURE SCOPE:**

Sales analytics refers to the use of technology to collect and use sales data to derive actionable insights. It is used to identify, optimize, and forecast sales. It uses different metrics and KPIs to plan an efficient sales model that generates higher revenue for the business.

## **13. APPENDIX:**

**1.Index.php:**

```
1 <?php
2 header("Location: login.php");
3 ?>
```

## 2.Login.php

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <meta charset="utf-8"/>
5 <title>Login</title>
6 <link rel="stylesheet" href="style.css"/>
7 </head>
8 <body>
9 <?php
10 require('db.php');
```

```

11 session_start();
12 // When form submitted, check and create user session.
13 if (isset($_POST['username'])) {
14     $username = stripslashes($_REQUEST['username']);    // removes
    backslashes
15     $username = mysqli_real_escape_string($con, $username);
    $password = stripslashes($_REQUEST['password']);
16     $password = mysqli_real_escape_string($con,
    $password);
17     // Check user is exist in the database
18     $query    = "SELECT * FROM `users` WHERE
    username='$username'
19     AND password='" . md5($password) . "'";
20     $result = mysqli_query($con, $query) or
    die(mysql_error());
21     $rows = mysqli_num_rows($result);
22     if ($rows == 1) {
23         $_SESSION['username'] = $username;
24         // Redirect to user dashboard page
25         header("Location: dashboard.php");
26     } else {
27         echo "<div class='form'>
28         <h3>Incorrect Username/password.</h3><br/>
29         <p class='link'>Click here to <a
30         href='login.php'>Login</a> again.</p>
31         </div>";
32     }
33     } else {
34         ?>
35         <form class="form" method="post" name="login">
36         <h1 class="login-title">Login</h1>
37         <input type="text" class="login-input"
38         name="username" placeholder="Username"
39         autofocus="true"/>
40         <input type="password" class="login-input"
41         name="password" placeholder="Password"/>
42         <input type="submit" value="Login"
43         name="submit" class="login-button"/>
44         <p class="link">Don't have an account? <a
45         href="registration.php">Registration Now</a></p>
46     </form>

```



```
42     <?php
43     }
44     ?>
45     </body>
46     </html>
```

### 3.Loginout.php

```
1  <?php
2      session_start();
3      // Destroy session
4      if(session_destroy()) {
5          // Redirecting To Home Page
6          header("Location: login.php");
7      }
8  ?>
```

### 4.Registration.php

```
1      <!DOCTYPE html>
2      <html>
3      <head>
4          <meta charset="utf-8"/>
5          <title>Registration</title>
6          <link rel="stylesheet" href="style.css"/>
7      </head>
8      <body>
9          <?php
10         require('db.php');
```

```

11          // When form submitted, insert values into the
           database.
12          if (isset($_REQUEST['username'])) {
13              // removes backslashes
14              $username = stripslashes($_REQUEST['username']);
15              //escapes special characters in a string
16              $username = mysqli_real_escape_string($con,
              $username);
17              $email    = stripslashes($_REQUEST['email']);
18              $email    = mysqli_real_escape_string($con,
              $email);
19              $password = stripslashes($_REQUEST['password']);
20              $password = mysqli_real_escape_string($con,
              $password);
21              $create_datetime = date("Y-m-d H:i:s");
22              $query      = "INSERT into `users` (username,
              password, email, create_datetime)
23              VALUES ('$username', '" . md5($password) . "',
              '$email', '$create_datetime')";
24              $result    = mysqli_query($con, $query);
25              if ($result) {
26                  echo "<div class='form'>
27                  <h3>You are registered successfully.</h3><br/>
28                  <p class='link'>Click here to <a
29                  href='login.php'>Login</a></p>
30                  </div>";
31              } else {
32                  echo "<div class='form'>
33                  <h3>Required fields are missing.</h3><br/>
34                  <p class='link'>Click here to <a
35                  href='registration.php'>registration</a>
36                  again.</p>
37                  </div>";
38              }
39              } else {
40                  ?>
41                  <form class="form" action="" method="post">
42                  <h1 class="login-title">Registration</h1>
43                  <input type="text" class="login-input"
44                  name="username" placeholder="Username" required />

```

```

41     <input type="text" class="login-input" name="email"
placeholder="Email Adress">42     <input type="password" class="login-
input" name="password" placeholder="Password">43     <input
type="submit" name="submit" value="Register" class="login-button">
44     <p class="link">Already have an account? <a href="login.php">Login
here</a></p>
45     </form>
46     <?php
47     }
48     ?>
49     </body>
50     </html>

```

## 5. DB.php

```

1 <?php
2
3 $dbhost = "localhost";
4 $dbuser = "root";
5 $dbpass = "";
6 $dbname = "loginsystem";
7
8 if(!$con = mysqli_connect($dbhost,$dbuser,$dbpass,$dbname))
9 {
10
11     die("failed to connect!");
12 }
13 ?>

```

## 6. Dashboard.php

```

1 <?php
2 //include auth_session.php file on all user panel pages
3 include("auth_session.php");

```

```

4      ?>
5      <!DOCTYPE html>
6      <html>
7      <head>
8      <meta charset="utf-8">
9      <title>Dashboard - Client area</title>
10     <link rel="stylesheet" href="style.css" />
11 </head>
12 <body>
13     <div class="form">
14         <p><b><i>Hey,</b></i> <?php echo $_SESSION['username']; ?>!</p>
15         <p><b><i>You are in user dashboard page.</b></i></p>
16         <form method="POST" action="indexx.php"> 17
<center><input type="submit" value="DashBoard" name="submit" /></center>
18         </form>
19         <p><a href="logout.php">Logout</a></p></i>
20     </div>
21 </body>
22 </html>

```

### **GitHub & Project Demo Link:**

**Github Link :** <https://github.com/IBM-EPBL/IBM-Project-12592-1659454485>

**Project Demo Link :** <https://clipchamp.com/watch/Y9ehWgauzfQ>