Global Sales Data Analytics

A PROJECT REPORT

Submitted By

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1.Indroduction:

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:

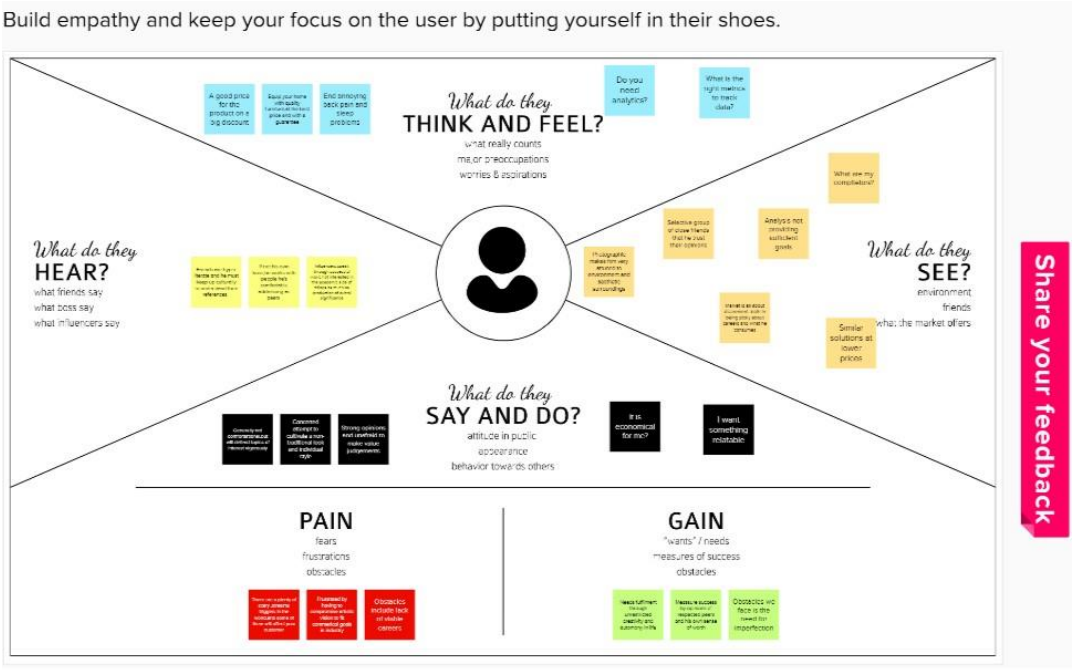
1. What are the performance indicators values for the past month? It's necessary for stocktaking and comparing it against the same period last year.

2. What key factors do affect profit growth?

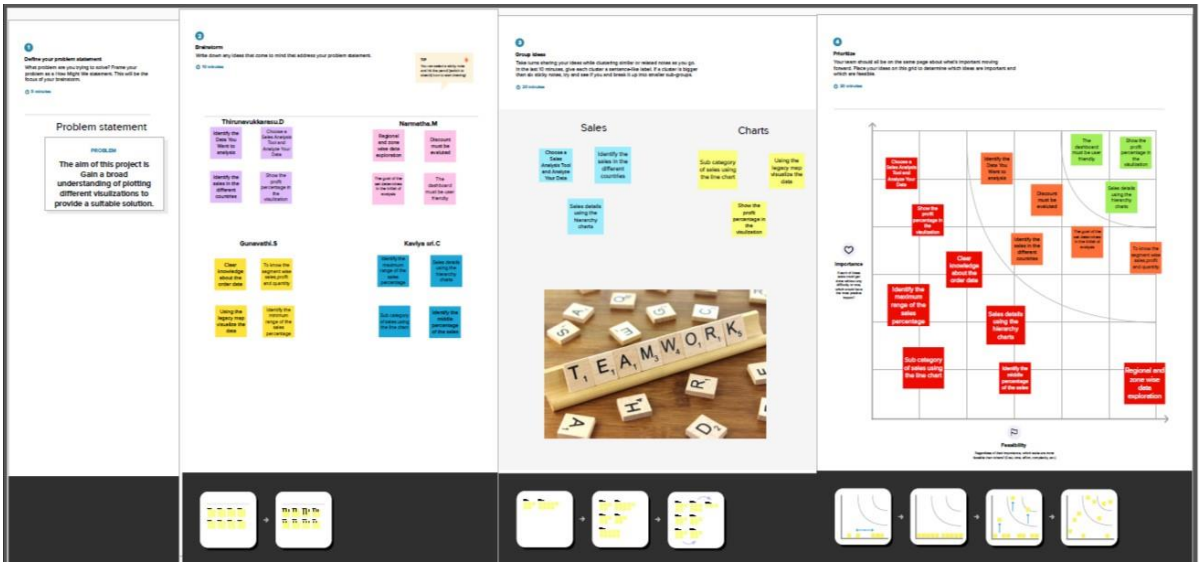
3. What categories, subcategories, products and clients generate more profits, and what ones that bring losses?

3. IDEATION & PROPOSED SOLUTION:

3.1 Empathy Map Canvas:



3.2 Ideation & Brainstorming:

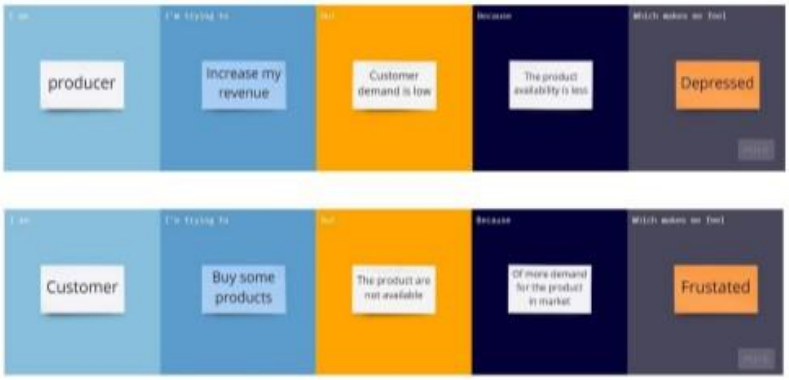


3.3 Proposed Solution:

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:

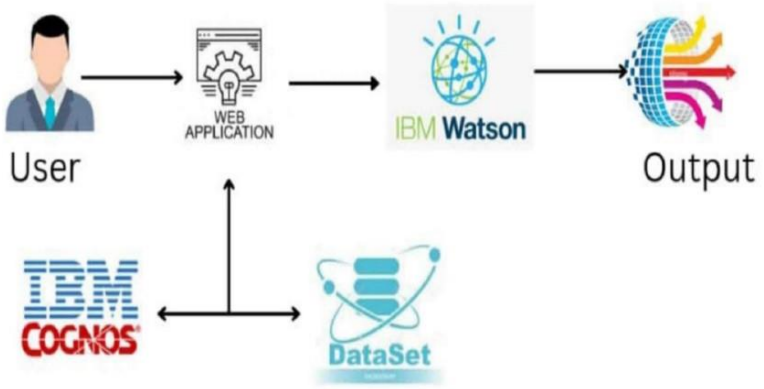
FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIN
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login	Login via Email and Password
FR-4	User Uploading 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:

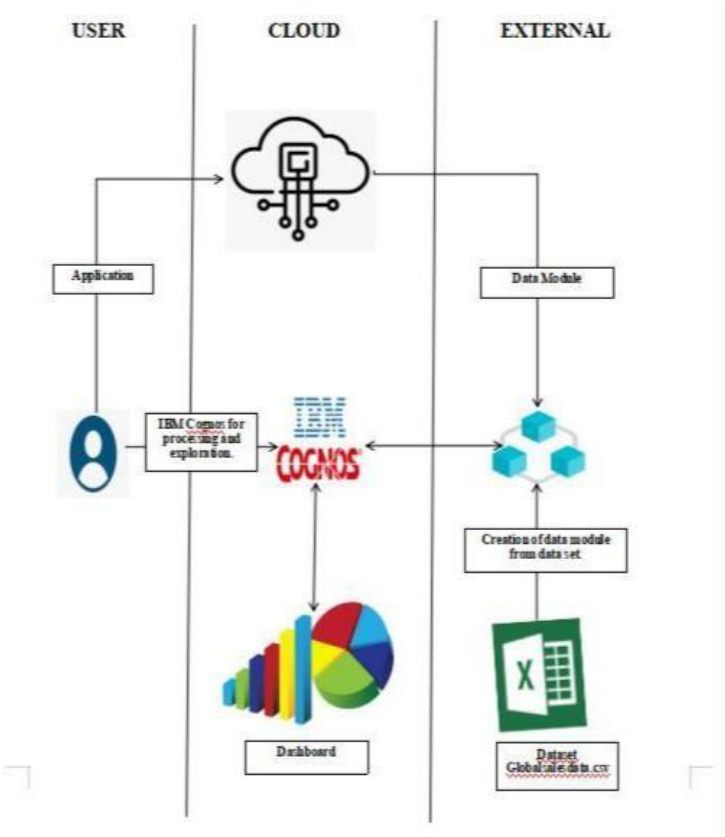
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Optimized resources and it can be used by every one.
NFR-2	Security	It has an end to end encryption.
NFR-3	Reliability	The reliability was based on the development.
NFR-4	Performance	Requires minimum system requirements, hence could be accessible 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:

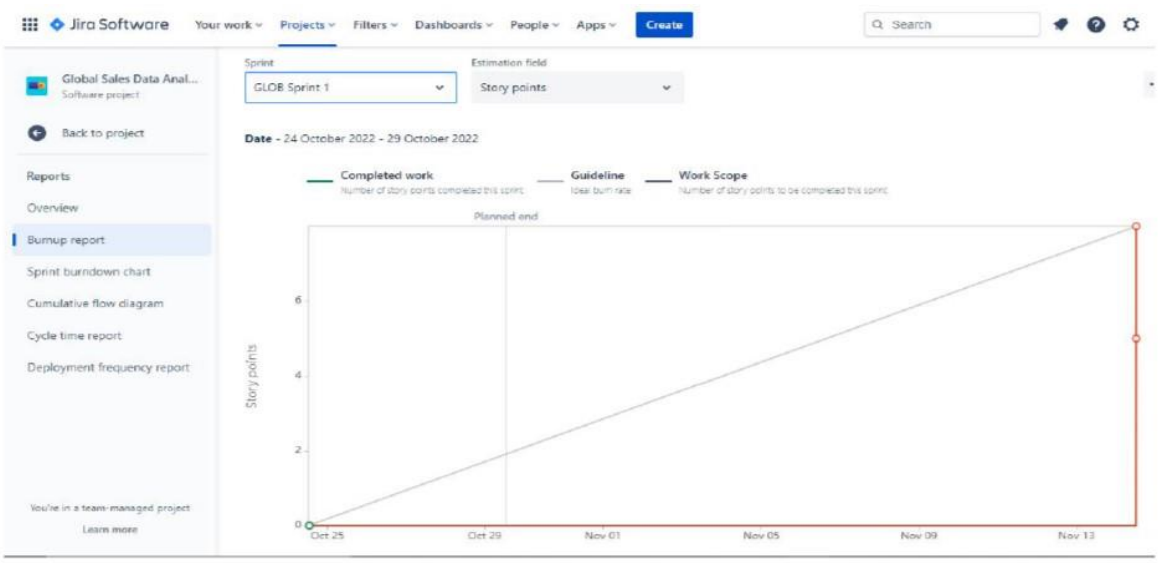
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Datasets	USN-1	As a user, I can enter the details of the employees working in our organization for the attrition detail.	5	High	Narmatha.M
Sprint-1		USN-2	As an Analyst, I Prepare the 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

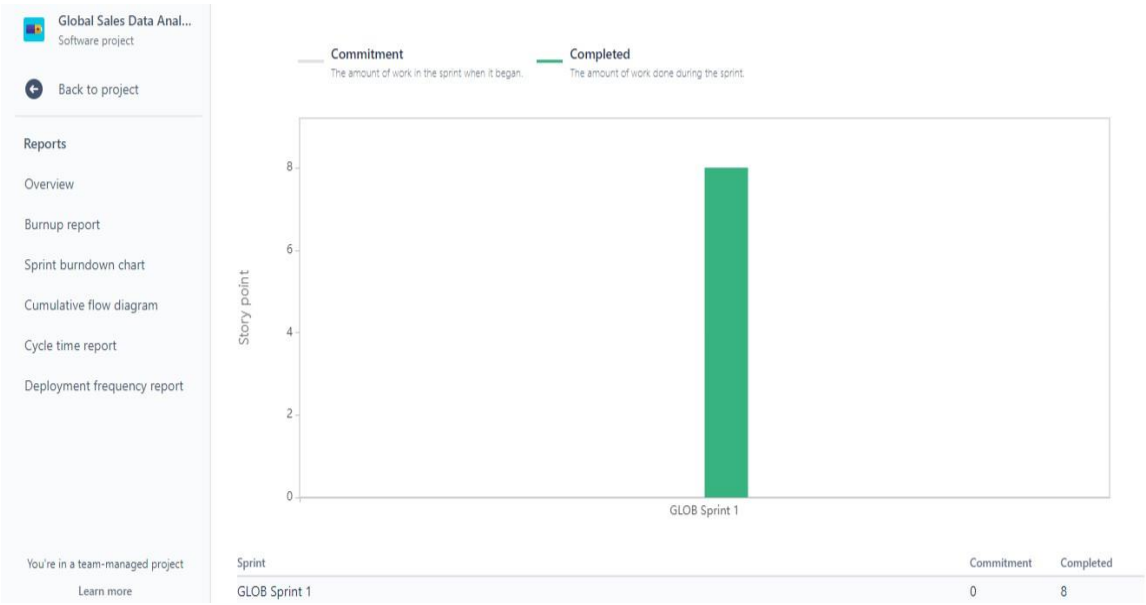
6.2 Sprint Delivery Schedule:

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:


Jira Software
Your work
Projects
Filters
Dashboards
People
Apps
Create
Search
Global Sales Data Anal...
Software project
Back to project
Reports
Overview
Burnup report
Sprint burndown chart
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Sprint
GLOB Sprint 1
Estimation field
Story points
Date - 24 October 2022 - 29 October 2022
Completed work
Guideline
Work Scope
Planned end
Story points
0
2
4
6
Oct 25
Oct 29
Nov 01
Nov 05
Nov 09
Nov 13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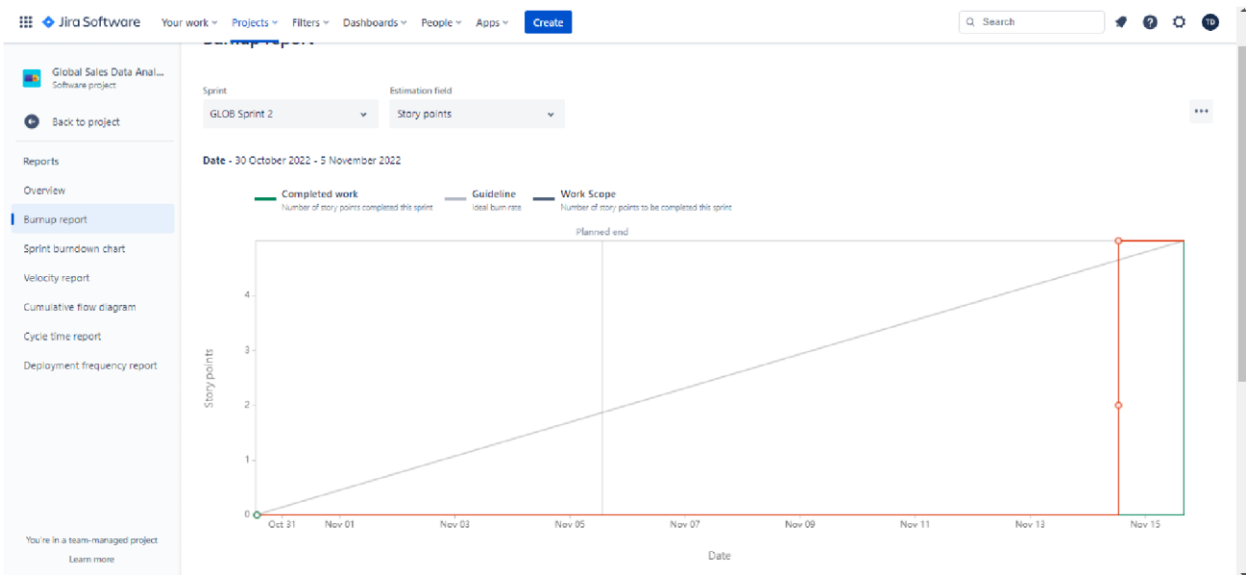
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Commitment
The amount of work in the sprint when it began.
Completed
The amount of work done during the sprint.
Story point
0
2
4
6
8
GLOB Sprint 1
Sprint
Commitment
Completed
GLOB Sprint 1
0
8

Sprint 2: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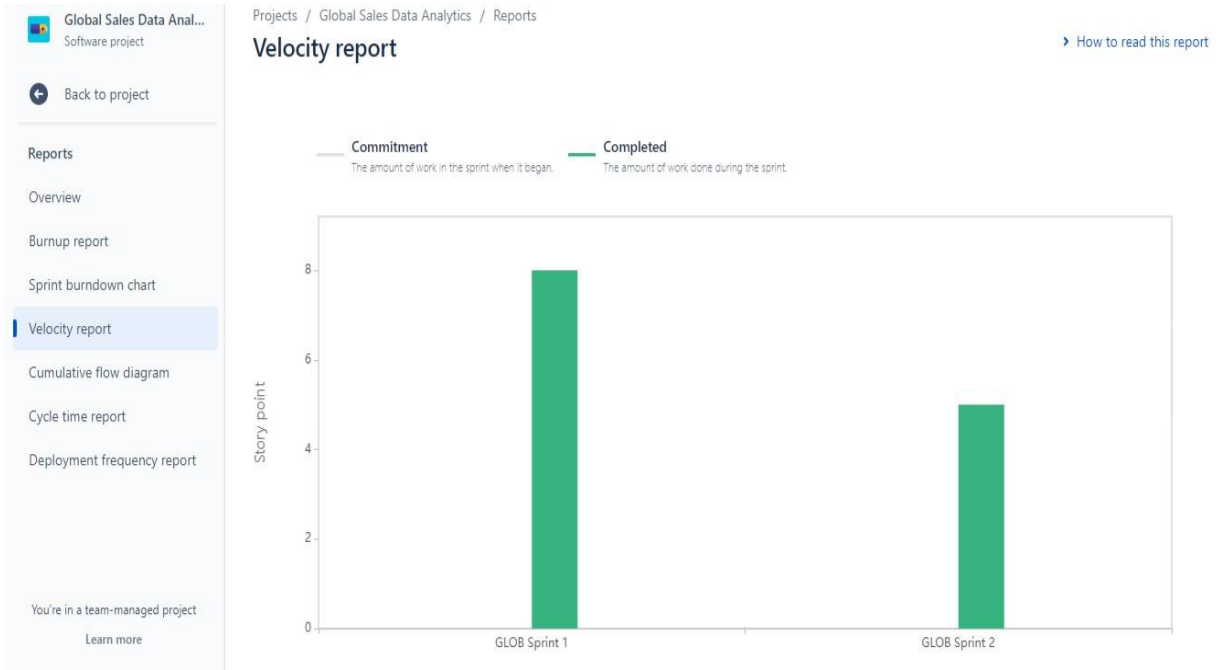
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Sprint
GLOB Sprint 2
Estimation field
Story points
Date - 30 October 2022 - 5 November 2022
Completed work
Number of story points completed this sprint
Guideline
Ideal burn rate
Work Scope
Number of story points to be completed this sprint
Planned end
Story points
0
1
2
3
4
Oct 31
Nov 01
Nov 03
Nov 05
Nov 07
Nov 09
Nov 11
Nov 13
Nov 15
Date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Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
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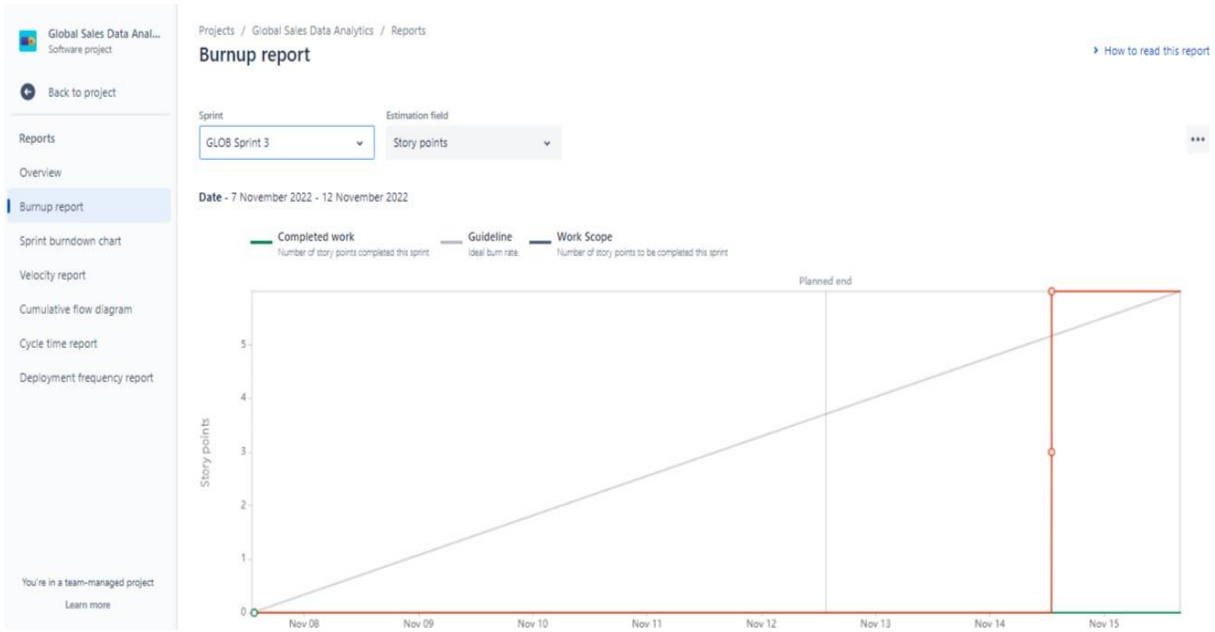
Projects / Global Sales Data Analytics / Reports
Velocity report
How to read this report
Commitment
The amount of work in the sprint when it began.
Completed
The amount of work done during the sprint.
Story point
0
2
4
6
8
GLOB Sprint 1
GLOB Sprint 2

Sprint 3: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Software project
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Reports
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Burnup report
Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Projects / Global Sales Data Analytics / Reports
Burnup report
How to read this report
Sprint
GLOB Sprint 3
Estimation field
Story points
Date - 7 November 2022 - 12 November 2022
Completed work
Number of story points completed this sprint
Guideline
Ideal burn rate
Work Scope
Number of story points to be completed this sprint
Planned end
Story points
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1
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5
Nov 08
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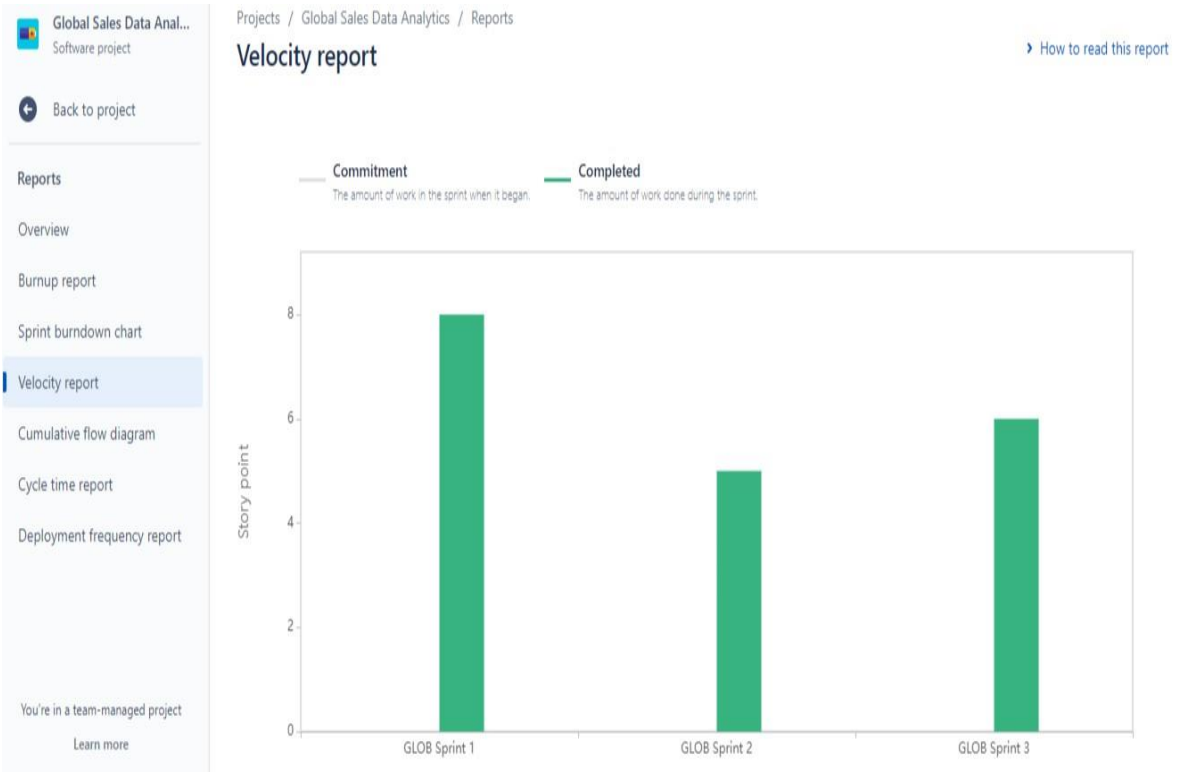
Nov 13
Nov 14
Nov 15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Software project
Back to project
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Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
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Projects / Global Sales Data Analytics / Reports
Velocity report
How to read this report
Commitment
The amount of work in the sprint when it began.
Completed
The amount of work done during the sprint.
Story point
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2
4
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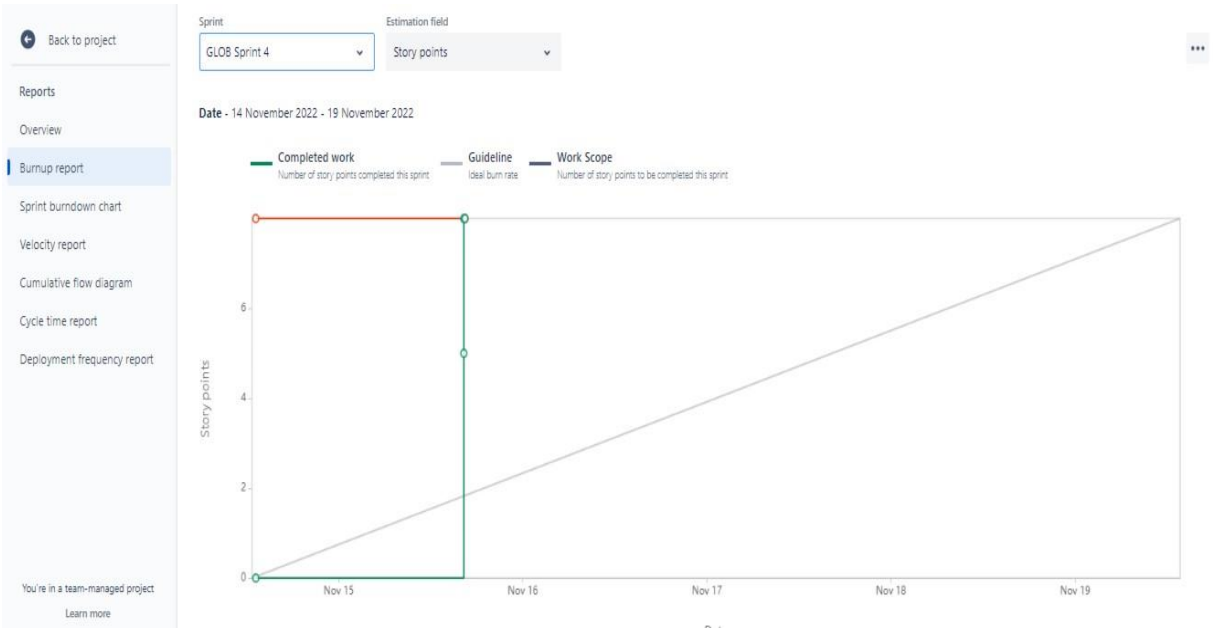
8
GLOB Sprint 1
GLOB Sprint 2
GLOB Sprint 3

Sprint 4 :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Reports
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Sprint burndown chart
Velocity report
Cumulative flow diagram
Cycle time report
Deployment frequency report
You're in a team-managed project
Learn more
Sprint
GLOB Sprint 4
Estimation field
Story points
Date - 14 November 2022 - 19 November 2022
Completed work
Number of story points completed this sprint
Guideline
Ideal burn rate
Work Scope
Number of story points to be completed this sprint
Story points
0
2
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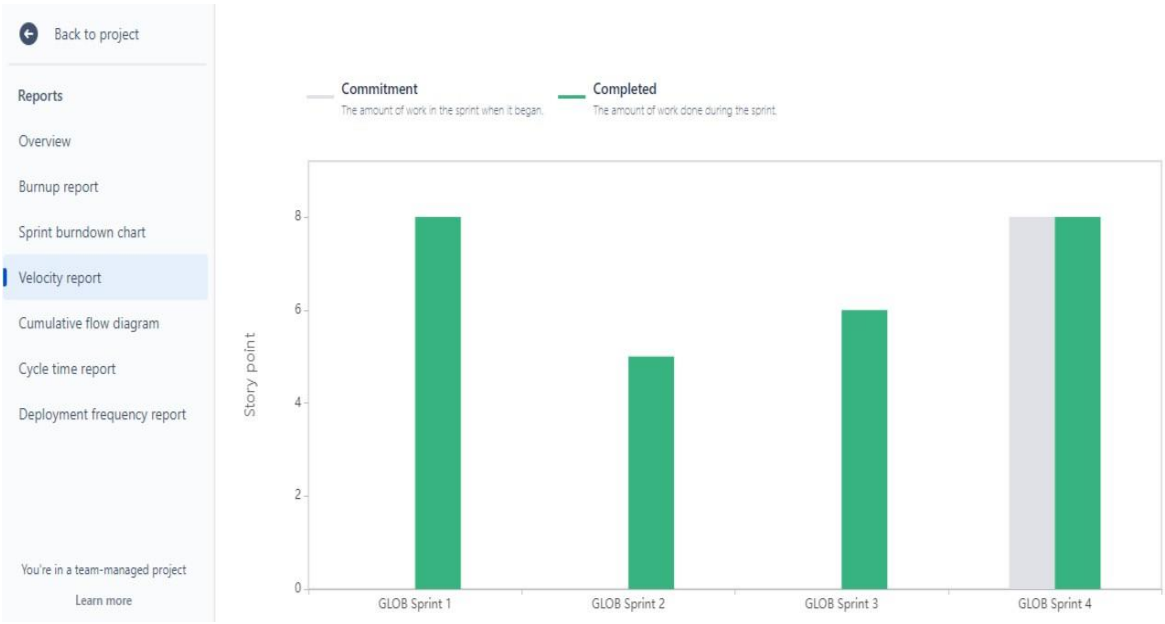
Nov 15
Nov 16
Nov 17
Nov 18
Nov 19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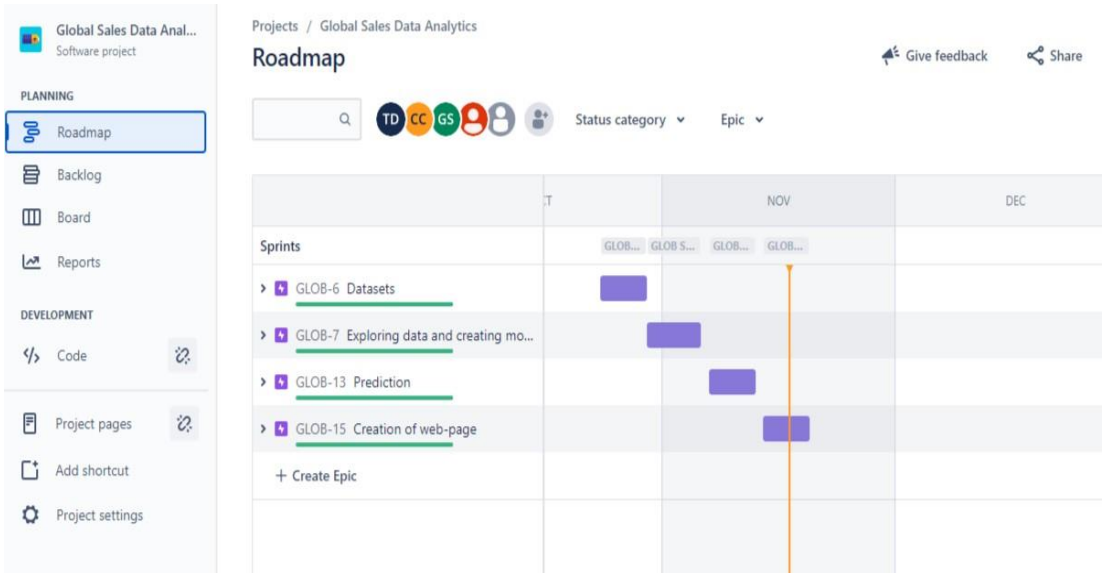
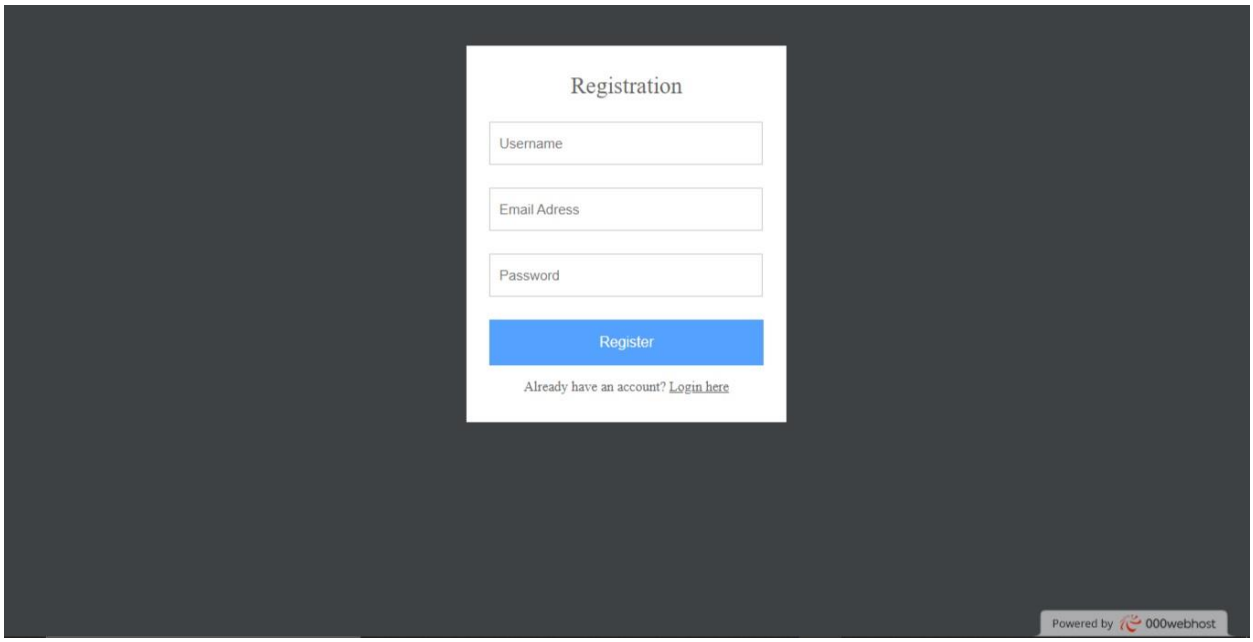
Learn more
Commitment
The amount of work in the sprint when it began.
Completed
The amount of work done during the sprint.
Story point
0
2
4
6
8
GLOB Sprint 1
GLOB Sprint 2
GLOB Sprint 3
GLOB Sprint 4

Road Map:

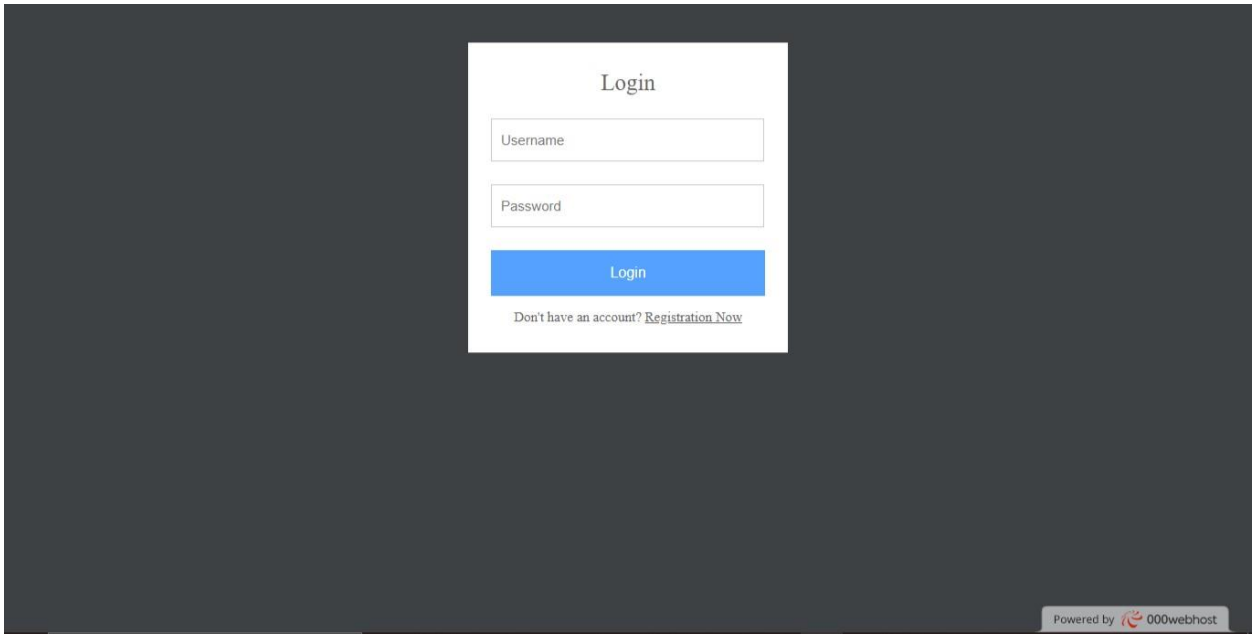


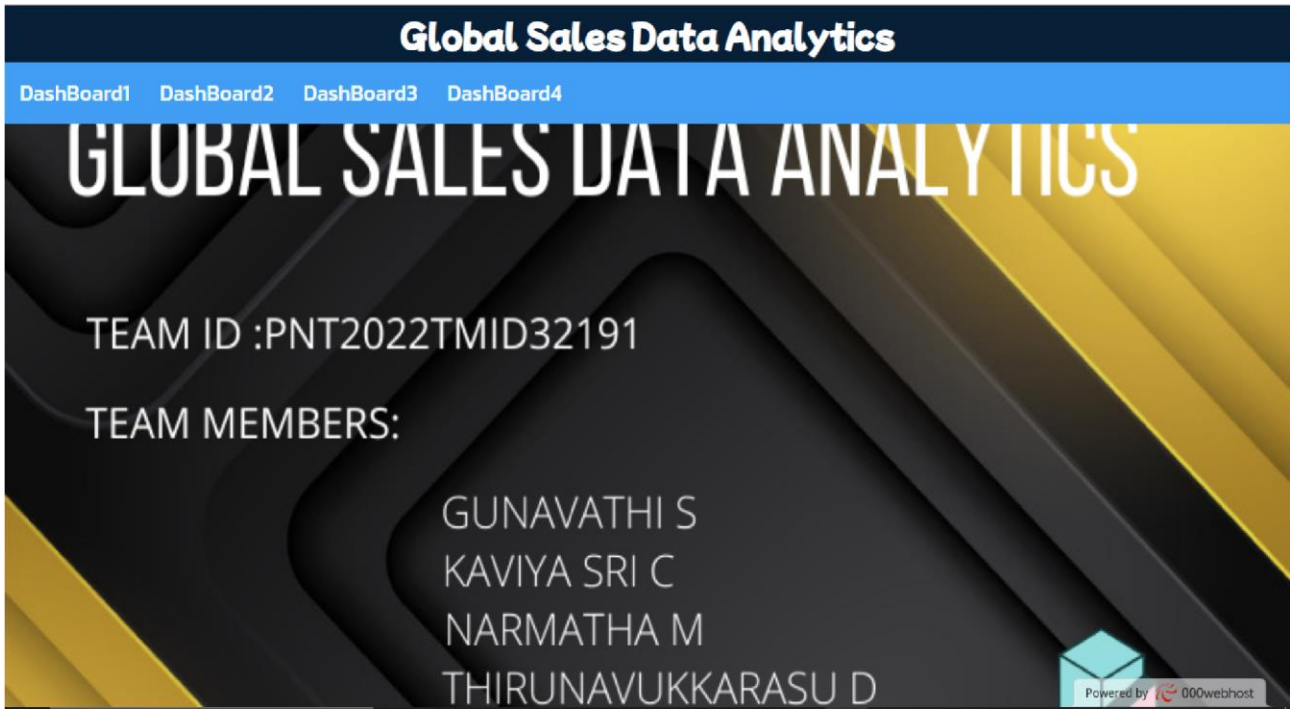
7.CODING & SOLUTIONING:

7.1 Feature 1:

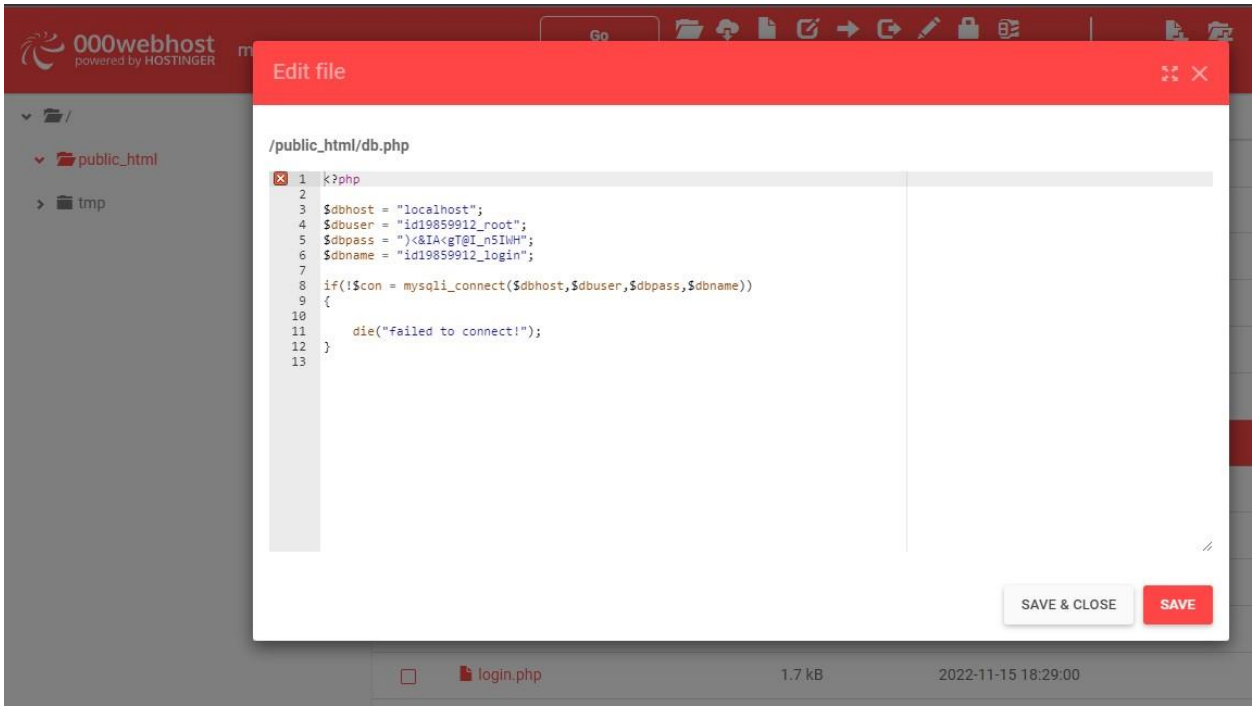


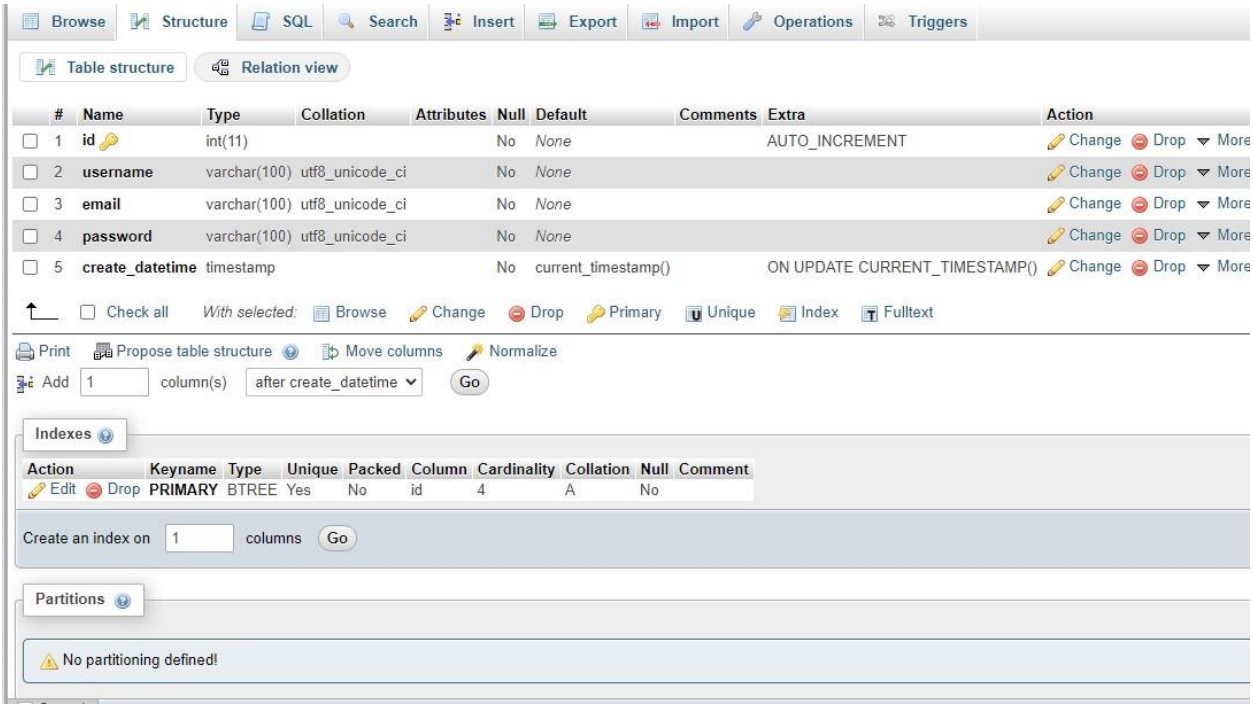
7.2 Feature 2:





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 Visulizations / 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 Filteration.
5.	Effective User Story	No of scene added - 14
6.	Descriptive Reports	No of Visulizations / 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

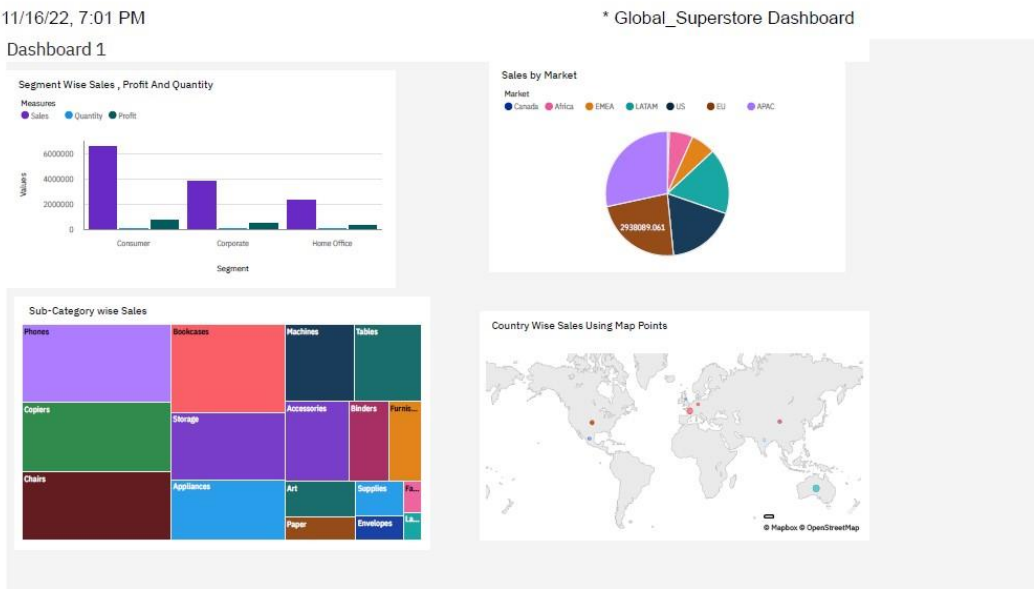
This report shows the number of test cases that have passed, failed, and untested

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

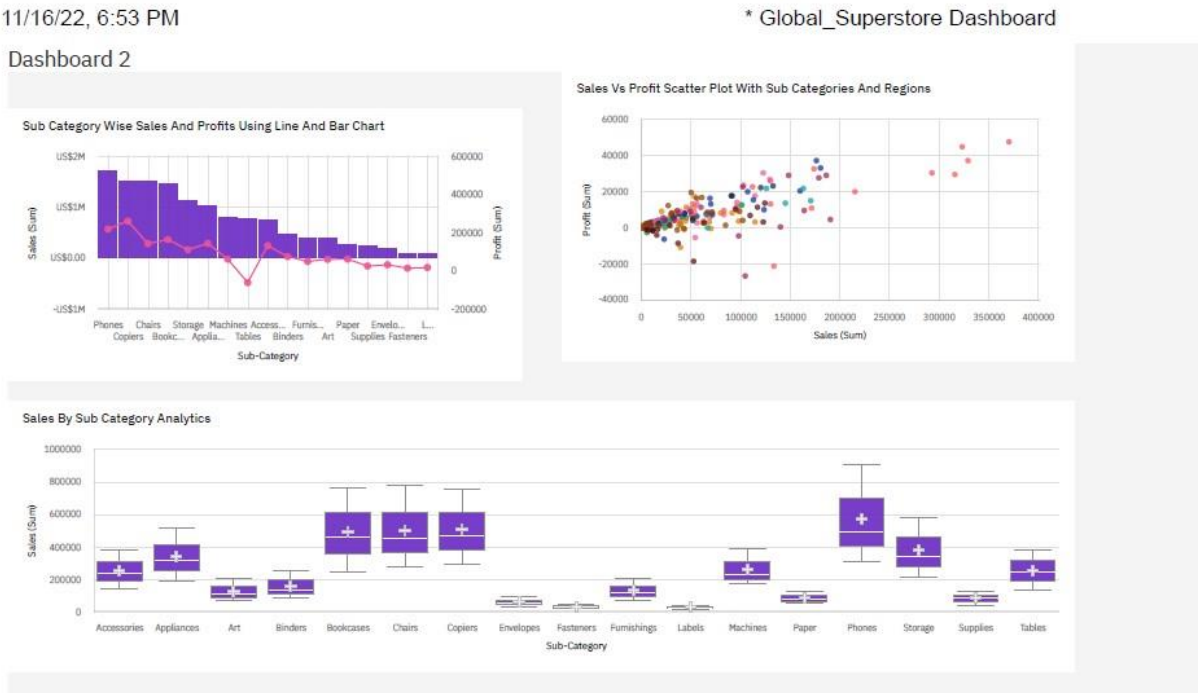
9.RESULTS:

9.1 Performance Metrics:

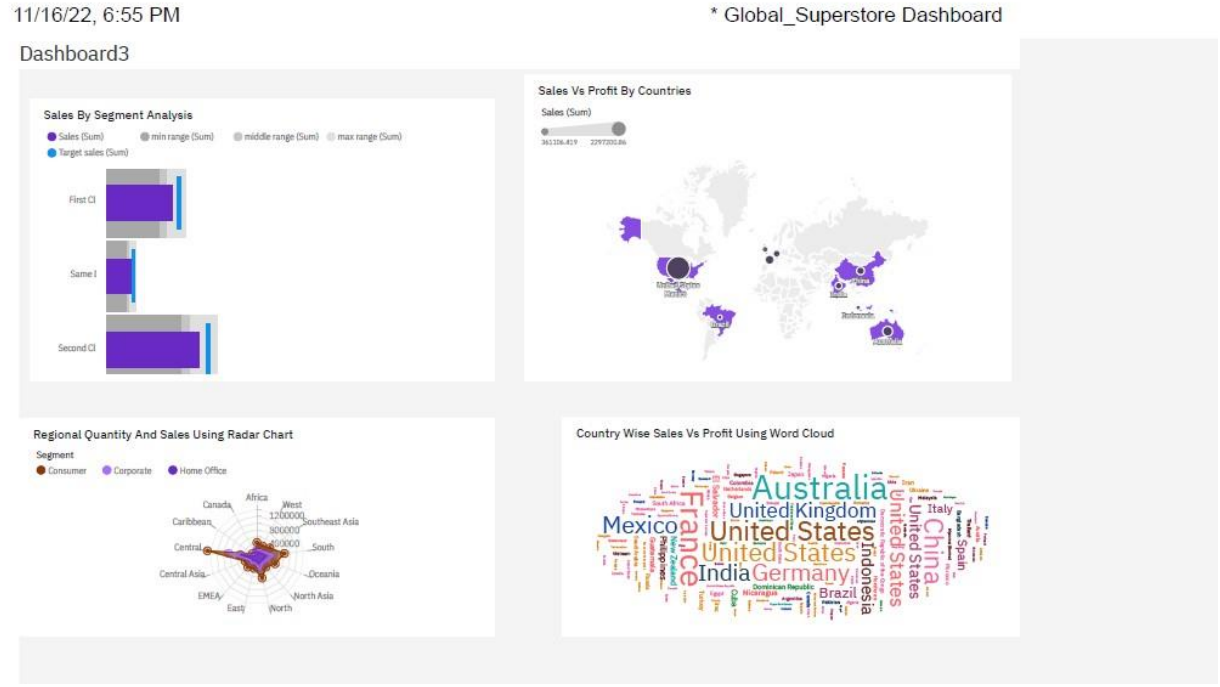
Dashboard 1



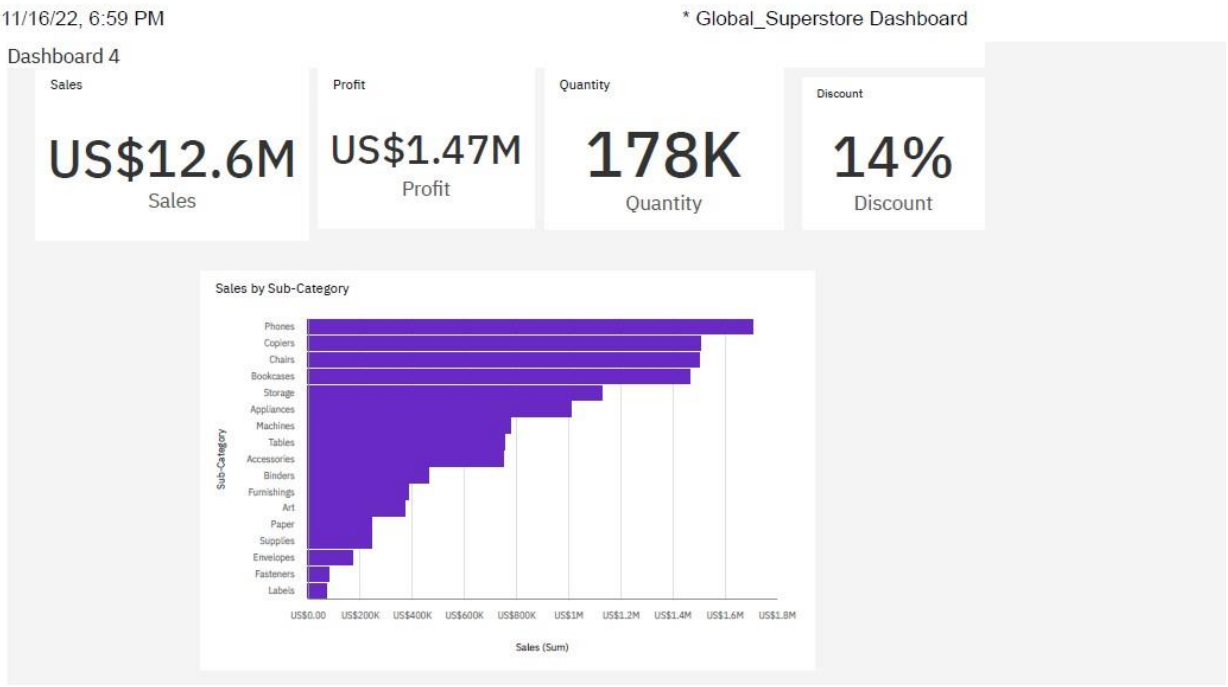
Dashboard 2



Dashboard 3



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:

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

2.Login.php

```php
    <!DOCTYPE html>
    <html>
    <head>
    <meta charset="utf-8"/>
    <title>Login</title>
  <link rel="stylesheet" href="style.css"/>
    </head>
    <body>
    <?php
    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); 16
        $password = stripslashes($_REQUEST['password']);
17                      $password = mysqli_real_escape_string($con,
                        $password);
18                      // Check user is exist in the database
19                      $query    = "SELECT * FROM `users` WHERE
                        username='$username'
20                      AND password='" . md5($password) . "'";
21                      $result = mysqli_query($con, $query) or
                        die(mysql_error());
22                      $rows = mysqli_num_rows($result);
23                      if ($rows == 1) {
24                      $_SESSION['username'] = $username;
25                      // Redirect to user dashboard page
26                      header("Location: dashboard.php");
27                      } else {
28                      echo "<div class='form'>
29                      <h3>Incorrect Username/password.</h3><br/>
30                      <p class='link'>Click here to <a
                        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"
                        name="username" placeholder="Username"
                        autofocus="true"/>
38                      <input type="password" class="login-input"
                        name="password" placeholder="Password"/>
39                      <input type="submit" value="Login"
                        name="submit" class="login-button"/>
```

```
40      <p class="link">Don't have an account? <a
        href="registration.php">Registration Now</a></p>
41      </form>
42      <?php
43      }
44      ?>
45      </body>
46      </html>
```

3.Logout.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
                    href='login.php'>Login</a></p>
29                  </div>";
30                  } else {
31                  echo "<div class='form'>
32                  <h3>Required fields are missing.</h3><br/>
33                  <p class='link'>Click here to <a
                    href='registration.php'>registration</a> again.</p>
34                  </div>";
35                  }
36                  } else {
37                  ?>
38                  <form class="form" action="" method="post">
39                  <h1 class="login-title">Registration</h1>
```

```
40                  <input type="text" class="login-input"
                    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></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