Global Sales Data Analytics

A PROJECT REPORT

Submitted by

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TEAM ID:PNT2022TMID16725

S.NO	TITLE

1.INTRODUCTION

If you want to achieve your sales goals month after month, then guesswork and intuition aren't your best friends. You need to perform a strategic sales analysis and get cold, hard data. You will gain an understanding of the data ecosystem and the fundamentals of data analysis, such as data gathering or data mining.

1.1 Project Overview:

The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support

1.2PURPOSE:

Regular sales data analysis provides an understanding of the products that your customers are buying and helps you dissect why they are behaving in a certain way. You can also find patterns in your lead conversions and drop offs.

Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions

Thousands of data points at your fingertips. Build, refine and analyse your audience in our intuitive platform. Monitor trends. Granular Global Analysis. 46 Countries. 17 Million Panelists. 40,000 Data Points. Create Bespoke Segments.

Sales analytics refers to the technology and processes used to gather sales data and gauge sales performance. Sales leaders use these metrics to set goals, improve internal processes, and forecast future sales and revenue more accurately**.**

2.LITERATURE SURVEY

2.1 Existing Problem:

1. Global sales process is way too long and don't have enough leads.
2. Leads are unqualified and wasting your effort on bad fit prospects.

3. Spending too much time on low-value task
4. The statement may include workflow bottlenecks,resources challenges or fundamental difficulties such as understanding a customer base
5. Identify the key sales metrics you need, such as win rate and average deal size
6. Use a tool (such as Pipe drive's CRM) to track this data as leads travel through your pipeline. Record this data in visual dashboards

2.2 REFERANCES:

1. Han Jiawei, Micheline Kamber and Jian Pei, "Data Mining Concepts and Techniques" in , MK Publications, 2009.

https://scholar.google.com/scholar?as_q=Data+Mining+Concepts+and+Techniques

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.

https://scholar.google.com/scholar?as_q=Top-down+Data+Analysis+with+TreemapsHYPERLINK "https://scholar.google.com/scholar?as_q=Top-down+Data+Analysis+with+Treemaps&as_occt=title&hl=en&as_sdt=0%2C3 1" HYPERLINK

3. P. Hoek, "Parallel Arc Diagrams: Visualizing Temporal Interactions", Journal of Social Structure, vol. 12, 2011.

https://scholar.google.com/scholar?as_q=Parallel+Arc+Diagrams%3A+Visualizing+Temporal+InteractionsHYPERLINK "https://scholar.google.com/scholar?as_q=Parallel+Arc+Diagrams%3A+Visu

alizing+Temporal+Interactions&as_occt=title&hl=en&as_sdt=0%2C31" HYPERLINK

2.3 Problem Statement definition:

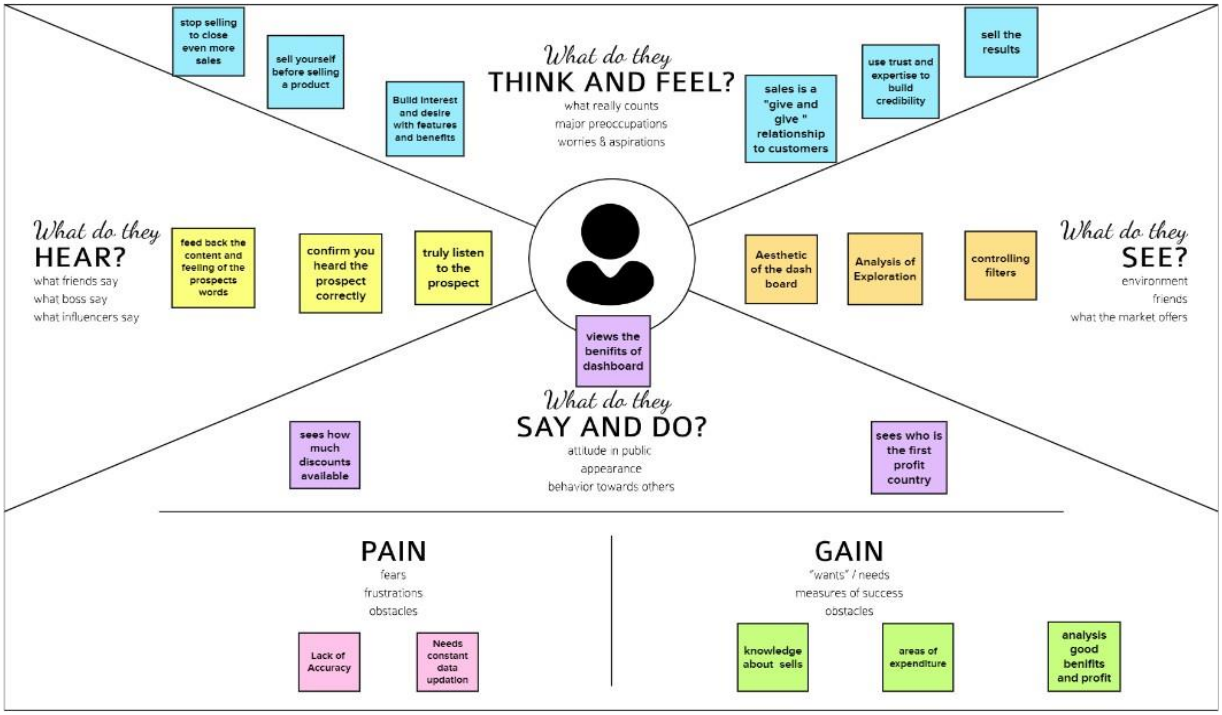
Problem statements are important to businesses, individuals and other entities to develop projects that states the challenges faced by your client.

You need to **analyze** the right kind of **sales** data for generating meaningful insights that positively affect your bottom line.

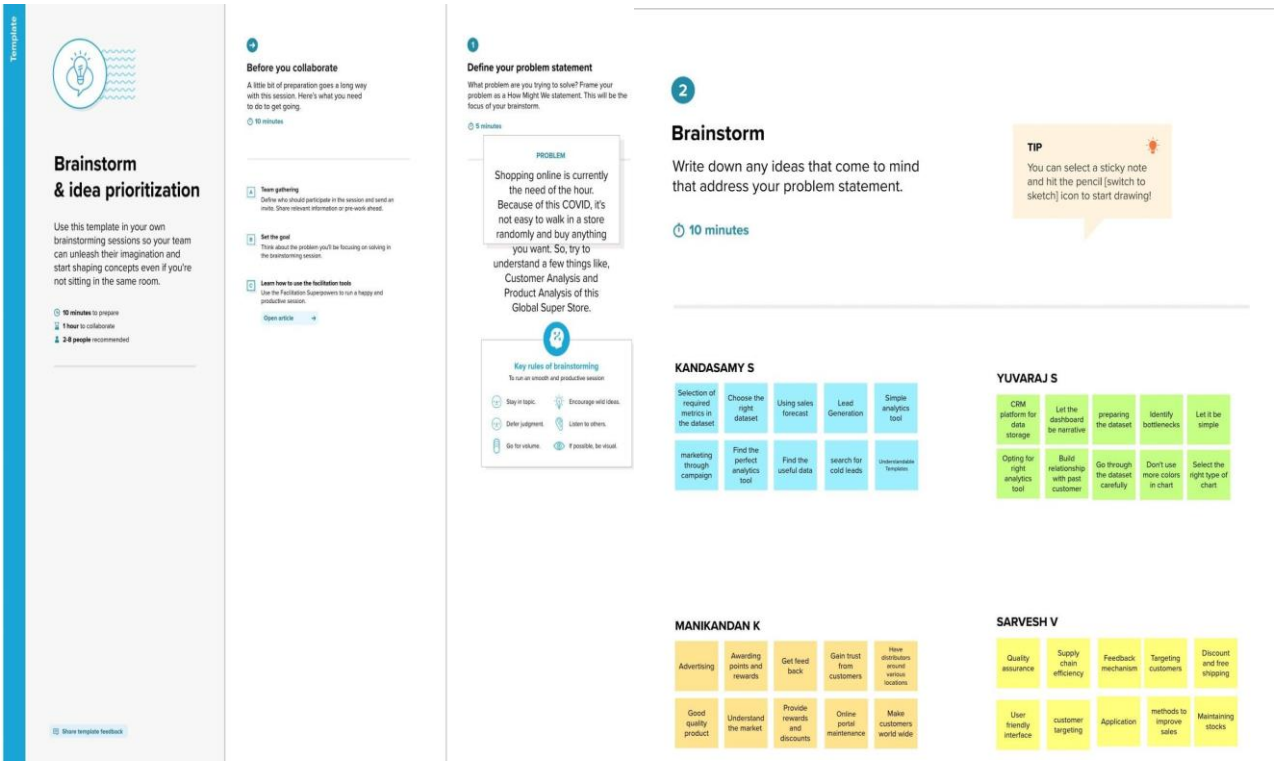
Sales analysis is vital for finding **weak spots and bottlenecks** in sales processes to collect and use sales data to achieve more sales goals.

3.IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas



3.2 Ideation & Brainstorming



3.3 Proposed Solution:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Sales include all the actions involved in the product sale, consumer service and business service. For the sales and marketing team to review their performance data visualization techniques called sales analytics is used. In sales analytics, technology is used to collect and use the sales data to produce productive results and they are in turn used to identify and optimize the sales. Various attributes are used to plan an efficient sales model which will benefit both customer and business.
2.	Idea / Solution description	The sales data is studied which will give knowledge about the trends in sales. Based on the understanding, the processed data is Analysed.
3.	Novelty / Uniqueness	During the analysis, extraction of new features will be done. With that, more understanding can be made and we can come up with better decisions which will increase the salesperson's profit.
4.	Social Impact / Customer Satisfaction	An insight about the sales in different location and time is gained. insight about the profit of the product is gained.
5.	Business Model (Revenue Model)	The dashboard is created in which trends of sales can be viewed and so that better decisions can be made by the company.
6.	Scalability of the Solution	Thus, the final model can be used by the small stores as well as the MNC's. Also, this solution is easily accessible and acquires lessmemory.

3.4 Problem solution fit:

1. CUSTOMER SEGMENTS	6. CUSTOMER CONSTRAINTS	5. AVAILABLE SOLUTIONS
Who prefers shopping on festival seasons.	Budget and Quality is a major constraint.	Providing a user-friendly interface make customer analyze the products to make better decisions.

2. JOBS-TO-BE-DONE / PROBLEMS	9. PROBLEM ROOT CAUSE	7. BEHAVIOUR
Advertising the policies, discounts, offers and the products helps the customer to decide for purchasing.	Massive growth of internet provides various data and it make analyzing a bit harder and supplying the goods have more taxes.	Reviews matter a lot in selling the products.

<table>
<tr><td>3.TRIGGERS
Discount and offers for short period of quality products.</td><td rowspan="2">10. YOUR SOLUTIONS
Gathering a better dataset with choosing. a best analytics tool for analyzing and reaching out people in a correct time with a user-friendly interface shows a drastic improvement</td><td>8.CHANNELS OF BEHAVIOUR
8.1: ONLINE
Datasets were generated and analyzed for improvement in sales.</td></tr>
<tr><td>4.EMOTIONS: BEFORE / AFTER
Interested, joyous, trustful, Frustrating, doubtful, satisfaction</td><td>8.2: OFFLINE
Data were gathered from suppliers and then analyzed for betterment.</td></tr>
</table>

4.Requirement analysis:

4.1 Functional requirement :

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 with usernameLogin with password
FR-4	Centralized Record of all product	Product name, Stock keep unit, brand, retail price, product category, lot number , expire date, vendor details, wholesale cost, minimum reorder amount, case quantity amount, reorder lead time
FR-5	User uploading data(administrative)	To store the data set through the cloud
FR-6	Periodical stock checking	Physical counting and Cycle counting

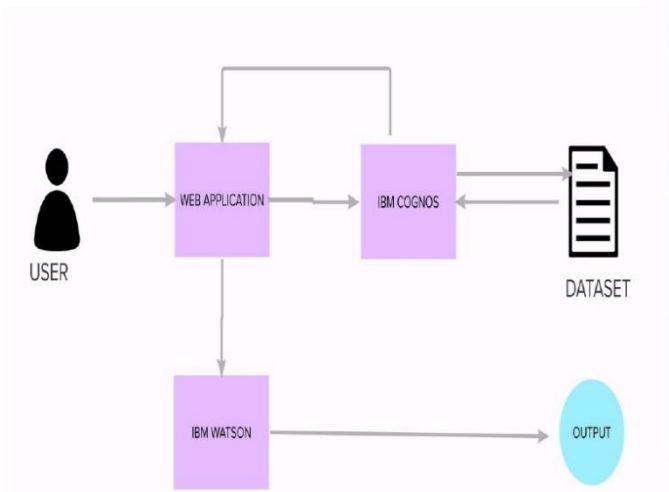
4.2 Non Functional requirement:

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Optimized resources and it can be used by Everyone.
NFR-2	Security	It has securable because it has end to end Encryption.
NFR-3	Reliability	It has high reliability based on development
NFR-4	Performance	It has high state of performance and efficiency
NFR-5	Availability	It has available in all platforms and websites.
NFR-6	Scalability	The ability of a hardware and software parallel system to exploit increasing computing resources efficiency in the analysis of the large datasets.
NFR 3	Reliability	The web application must have a 99.9%uptime
NFR4	Performance	The home page should load within 1.5 seconds
NFR 5	Availability	The web application must have a 99.9% uptime
NFR 6	Scalability	The web application will be compatible for both windows&mac machines

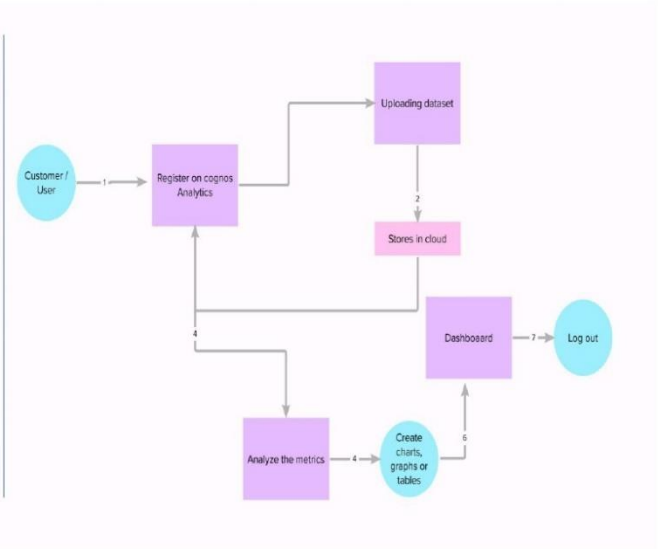
5.Project Design:

5.1.Data Flow Diagram:

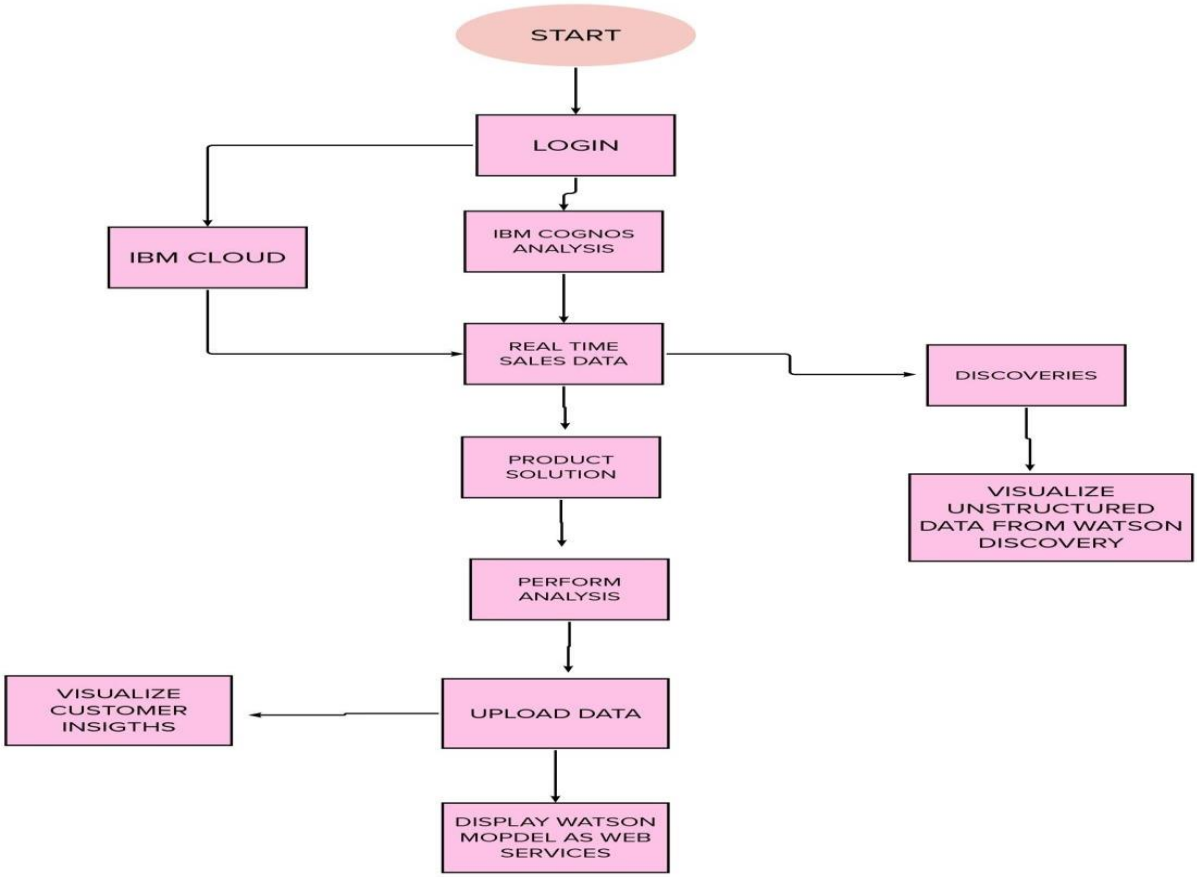
Data Flow Diagrams:



Structural flow diagram:



5.2 Solution and Technical Architecture:



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	Registration	1	Customers can register by entering the basic personal details through website	2	High	Sarvesh V, Yuvaraj S
	Login	2	As an authenticated user using their login credentials user can view the entire website and various options	2	High	Sarvesh V, Yuvaraj S
	Working with the Dataset	3	Initially Data Preprocessing like filtering, formatting and data cleansing have to be done.	2	High	Yuvaraj S, Kandasamy S, Manikandan K
		4	Load the dataset in the cloud platform and analyze the data points by Visualization techniques.	10	High	Yuvaraj S

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-2	Creating the dashboard	10	To create a web oriented dash board with various options including sales, profit and report generation	20	High	Sarvesh V
Sprint-3	Data Visualization Chart	11	Using the Sales production in Global superstore dataset, create various graphs and charts to highlight the insights and variation in the sales.	4	Medium	Yuvaraj S, Sarvesh V
		12	Using the heat map sales, profit and quantity can be clearly viewed.	4	Medium	Manikandan K
		13	Using bar graph we can analyze sales by sub category and sales by region	4	Medium	Kandasamy S,
		14	Using pie-chart we can analyze the country wise sales using map points	4	Medium	Kandasamy S,
		15	Using Scatter plot to represent the Sales against Seasonal sales Production using a Text representation.	4	Medium	Manikandan K
Sprint-4	Customized visualization can be done	16	Export the created Dashboard	20		Sarvesh V, Yuvaraj S, Kandasamy S, Manikandan K

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	20	6 Days	24 Oct 2022	29 Oct 2022	20	29 Oct 2022
Sprint-2	20	6 Days	31 Oct 2022	05 Nov 2022	20	05 Nov 2022
Sprint-3	20	6 Days	07 Nov 2022	12 Nov 2022	20	12 Nov 2022
Sprint-4	20	6 Days	14 Nov 2022	19 Nov 2022	20	19 Nov 2022

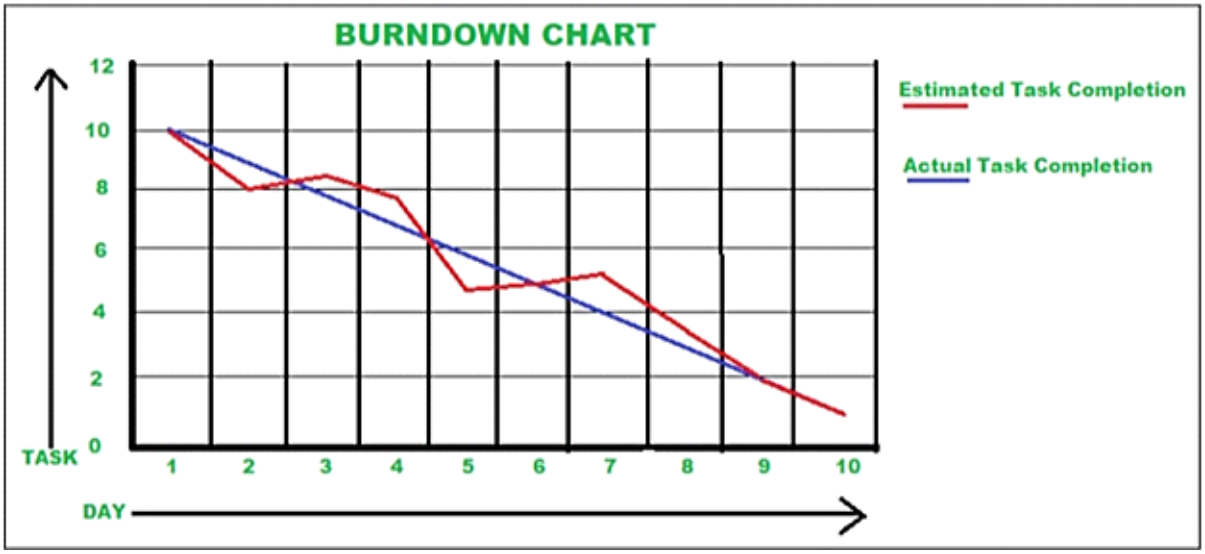
Velocity:

We have a 24-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

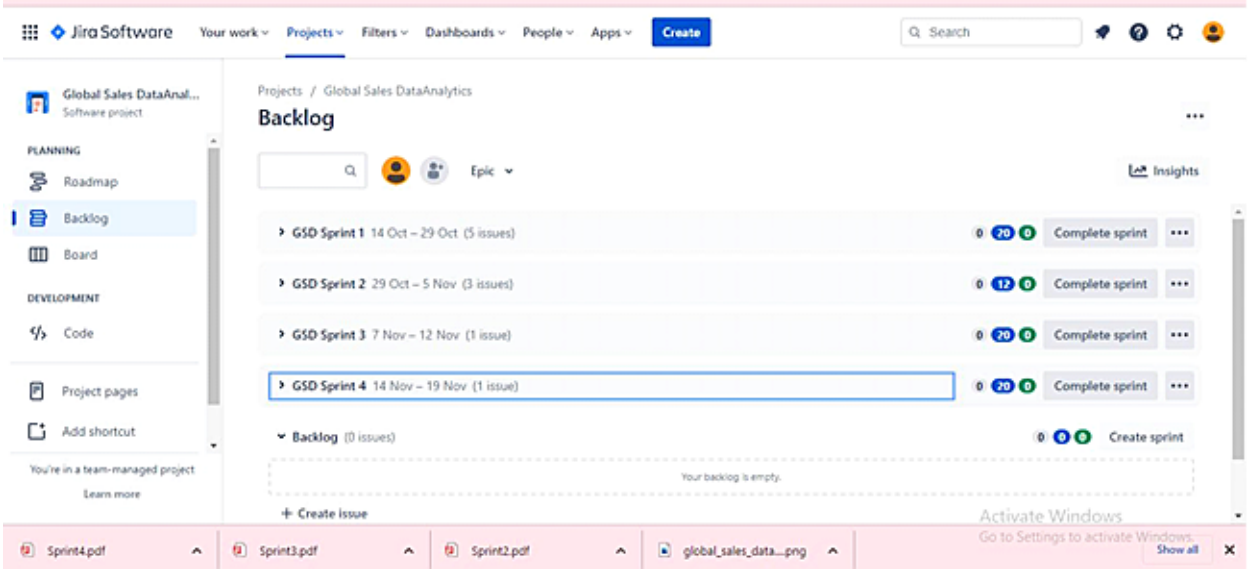
$$AV = \text{Sprint Duration} / \text{Velocity} = 24 / 20 = 1.2$$

Burndown Chart :

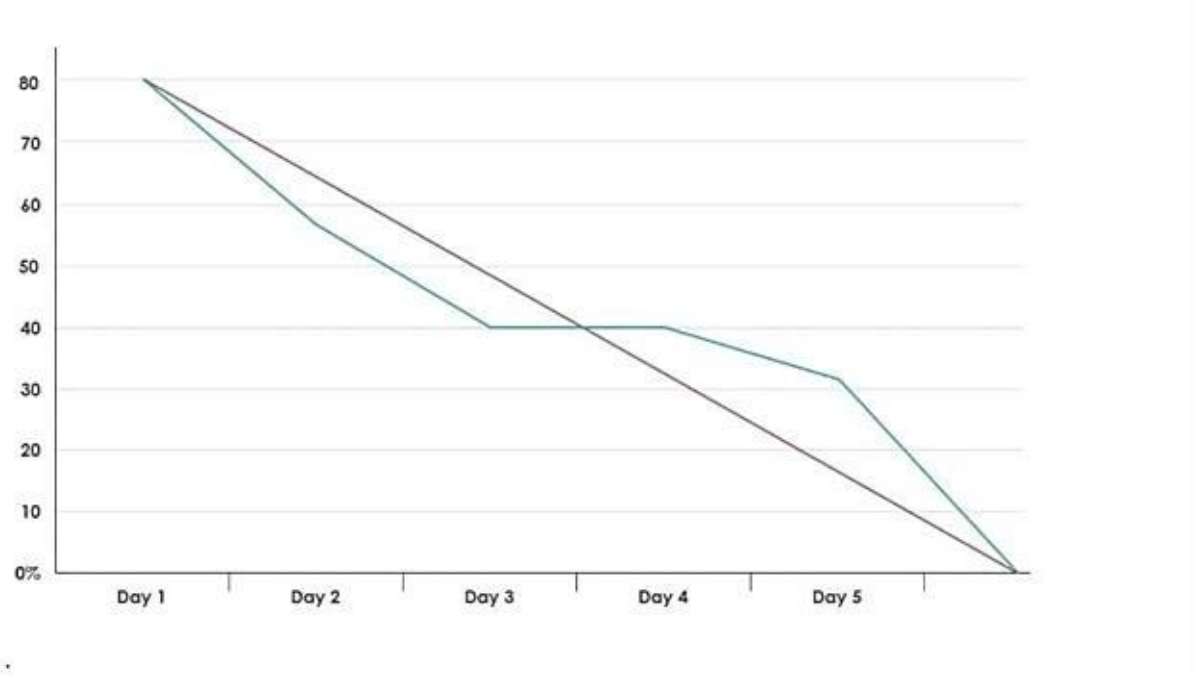
A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum. However, burn down charts can be applied to any project containing measurable progress over time.



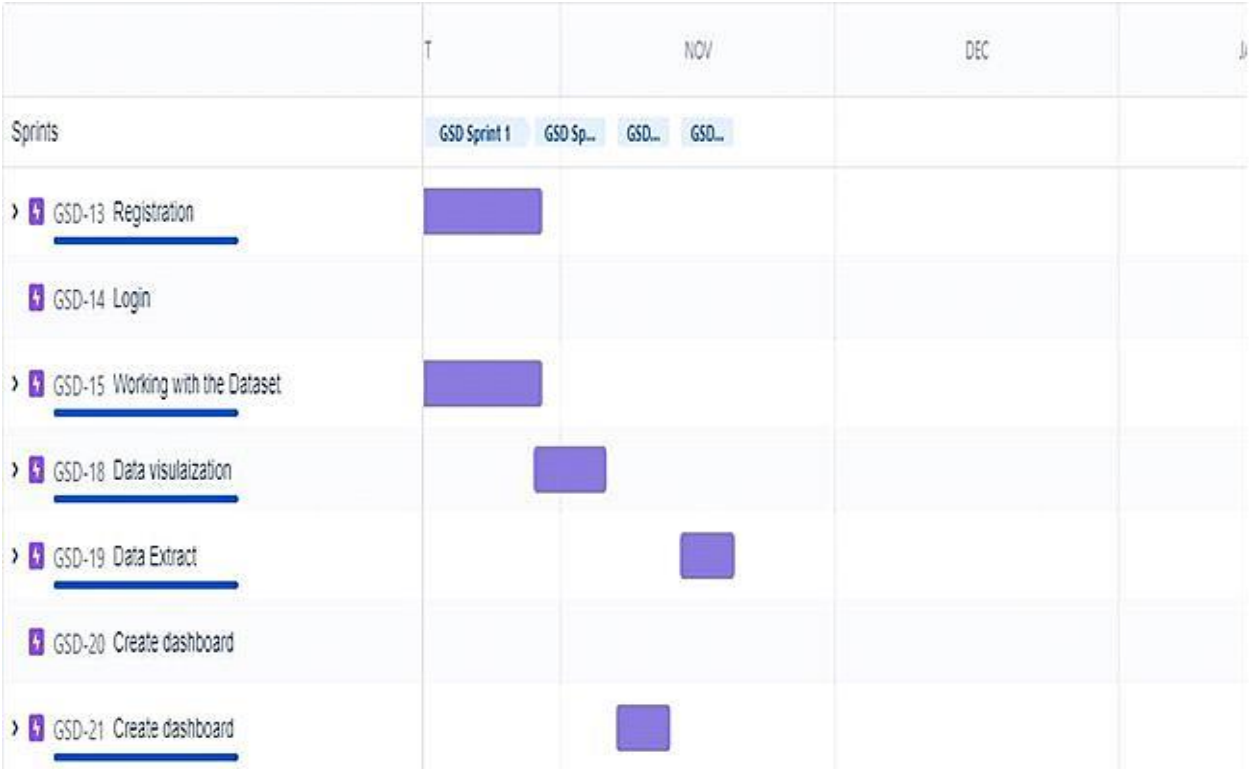
6.3 Reports from JIRA :



Burndown chart :



Road Map:



7.Coding & Solution:

7.1 Feature 1

Sales – Analysis:

This is an analysis of the sales data with particular focus given to how promotions and advertising translate into sales, in terms of both units sold and sales dollars.

Different types of Sales Analysis

- Furniture company sales analysis HTML file
- Cereal Company Sales Analysis HTML file
- Financial Statement Analysis PDF file

Analysis using R Shiny Dashboard

- Furniture company sales Dashboard R Shiny app

Steps for Cereal Company Sales Analysis

1. Download the Raw Data
2. Analysis code R file
3. Final Analysis R file

Steps for Furniture company sales analysis

1. Download the Raw Data
2. Analysis code R file
3. Dashboard Code HTML file
4. Final Dashboard PDF file
5. Final Analysis HTML file

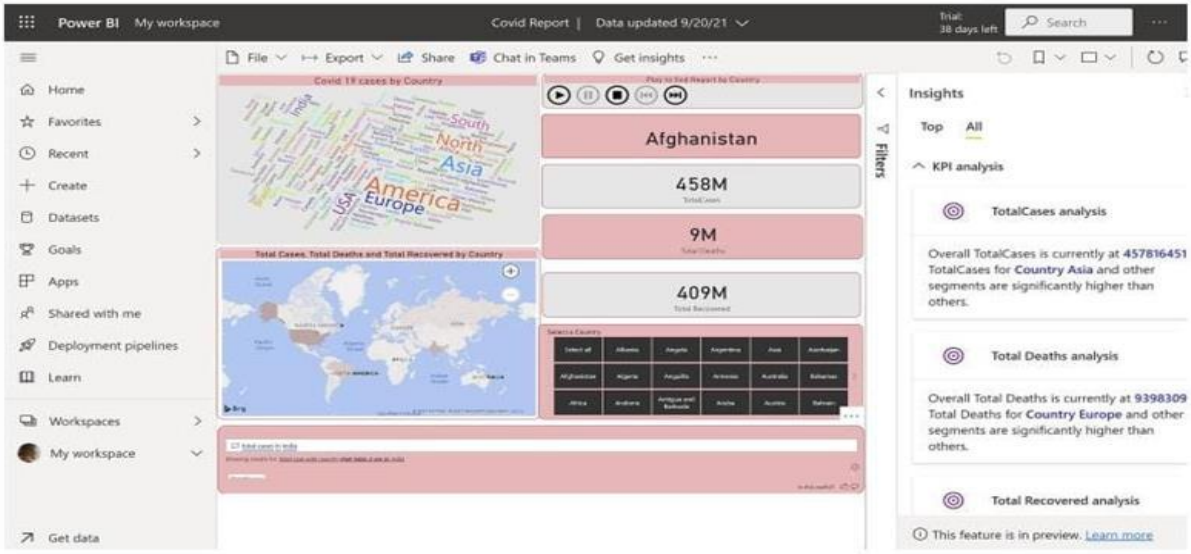
fearture-1:

Step 1: Understand the Business

Step 2: Get Your Data

Step 3: Explore and Clean Your Data

Step 4: Enrich Your Datasets



8. Testing :
8.1 Test cases:

Feature Type	Component	Test Scenario	Pre-Requisite	Steps To Execute
Functional	Home Page	Verify user is able to see the Login/ Signup popup when user clicked on My account button	Nil	1.Enter URL and click go 2.Click on My Account dropdow 3.Verify login/Singup popup dis or not
UI	Home Page	Verify the UI elements in Login/Signup popup	Nil	1.Enter URL and click go 2.Click on My Account dropdow 3.Verify login/Singup popup wit UI elements: a.email text box b.password text box c.Login button d.New customer? Create accou e.Last password? Recovery pas link
Functional	Home page	Verify user is able to log into application with Valid credentials	Nil	1.Enter URL(https://shopenzer.c and click go 2.Click on My Account dropdow 3.Enter Valid username/email i text box 4.Enter valid password in passv box 5.Click on login button
Functional	Login page	Verify user is able to log into application with InValid credentials	Nil	1.Enter URL(https://shopenzer.c and click go 2.Click on My Account dropdow 3.Enter InValid username/email text box 4.Enter valid password in passv box 5.Click on login button

8.2 USER ACCEPTANCE TESTING

Copying and pasting screenshots of test results into Word or Excel is very time-consuming and prone to human error. Optimize your UAT testing with automated documentation, workflow and defect management. The right tool will help you with exploratory testing and be able to document tests using a recorder for playback as needed, accelerating the process and reducing the back-and-forth between the software development and testing teams.

9. RESULTS

9.1 PERFORMANCE Metrics:

The analysis covered the period from 2012 to 2015, with conversion to the Brazilian currency Real BRL (R$). Some results:

• The US was the country with the highest profit.

• The country that presented the biggest loss in sales was Turkey.

• There was greater demand for Superstore products to be shipped via the standard mode.

• The Technology Category presented better results in Profit and Sales.

• The Retail segment performed better for all the years evaluated.

10. ADVANTAGES

1. Cost efficiency
2. Receive full-scale services
3. Maximize presentation
4. Save time

DISADVANTAGES

1. Risk of choosing the wrong provider
2. Lack of on-site support
3. Less control
4. Data security

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 analyze 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 10reports 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

SOURCE CODE :

HOME:

```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1">
<title> Global Sales Data Analytics </title>
<style> Body {
font-family: Calibri, Helvetica, sans-serif; background-color:white;
}
button {
background-color:#c3e3dc; width: 100%;
color: purple;

padding: 15px; margin: 10px 0px; border: none; cursor: pointer;
}
form {
border: 3px solid #f156189;

}
input[type=text], input[type=password] { width: 100%;
margin: 8px 0; padding: 12px 20px; display: inline-block; border: 2px white;
box-sizing: border-box;

}
button:hover {
opacity: 0.7;

}
.cancelbtn {
width: auto; padding: 10px 18px; margin: 20px;

background-color: skyblue; border-radius: 5px;
font-weight: bold; color: black;
}


.content {
margin: 0px 20%; color: white;
```

```
}
.container {
padding: 25px;

}
.loginbtn {
background-color: skyblue; text-decoration: none; color: black;
margin-left: 20%; padding: 10px 20px; font-weight: bold; border-radius: 5px;
margin-right: 20px;
}

.forgotbtn {
background-color: skyblue; text-decoration: none; color: black;
padding: 10px 20px; font-weight: bold; border-radius: 5px;
}
.aboutbtn {
background-color: skyblue; text-decoration: none; color: black;
padding: 10px 20px; font-weight: bold; border-radius: 5px; margin-right: 20px;
}
.dashboardbtn {
background-color: skyblue; text-decoration: none; color: black;
padding: 10px 20px; font-weight: bold;border-radius: 5px;margin-right: 20px;
}

.Datasetbtn{
background-color:skyblue; color:black;
padding:10px 20px; font-weight:bold; border-radius:5px;
}
</style>
</head>
<body>
<center> <h1 style="background-color:white">Global Sales Data Analytics</h1>
</center>
<form>
<div class="container content">

<a href="https://www.ibm.com/account/reg/in-en/login?formid=urx-34710"
class="loginbtn">Login</a>
<a href="about.html" class="aboutbtn">About</a>
<a
href="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&id=i3392C25F2
```

```
D8A482CA409EF8EF45D1F68&objRef=i3392C25F2D8A482CA409EF8EF45D1F
68&options%5BdisableGlassPrefetch%5D=true&options%5Bcollections%5D%5Bc
anvasExtension%5D%5Bid%5D=com.ibm.bi.dashboard.canvasExtension&options
%5Bcollections%5D%5BfeatureExtension%5D%5Bid%5D=com.ibm.bi.dashboard.
core-
features&options%5Bcollections%5D%5Bbuttons%5D%5Bid%5D=com.ibm.bi.das
hboard.buttons&options%5Bcollections%5D%5Bwidget%5D%5Bid%5D=com.ibm
.bi.dashboard.widgets&options%5Bcollections%5D%5BcontentFeatureExtension%
5D%5Bid%5D=com.ibm.bi.dashboard.content-
features&options%5Bcollections%5D%5BsaveServices%5D%5Bid%5D=com.ibm.
bi.dashboard.saveServices&options%5Bcollections%5D%5Btemplates%5D%5Bid
%5D=com.ibm.bi.dashboard.templates&options%5Bcollections%5D%5Bvisualizati
onExtension%5D%5Bid%5D=com.ibm.bi.dashboard.visualizationExtensionCA&op
tions%5Bcollections%5D%5BboardModel%5D%5Bid%5D=com.ibm.bi.dashboard.
boardModelExtension&options%5Bcollections%5D%5BcontentTypes%5D%5Bid
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assetTags%5D%5B%5D=dashboard&options%5Bconfig%5D%5BfilterDock%5D=
true&options%5Bconfig%5D%5BshowMembers%5D=true&options%5Bconfig%5
D%5Bupgrades%5D=dashboard-
core%2Fjs%2Fdashboard%2Fupgrades&options%5Bconfig%5D%5BassetType%5
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fig%5D%5BsmartTitle%5D=true&options%5Bconfig%5D%5BnavigationGroupAc
tion%5D=true&options%5Bconfig%5D%5BenableDataQuality%5D=false&options
%5Bconfig%5D%5BmemberCalculation%5D=false&isAuthoringMode=false&boar
dId=i3392C25F2D8A482CA409EF8EF45D1F68"
class="dashboardbtn">Dashboard</a>
<a href="https://www.kaggle.com/datasets/apoorvaappz/global-super-store-dataset"
class="Datasetbtn">Dataset</a><br><br><br>




</div>
</form>
</body>
```

```
</html>
```

ABOUT:

```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta http-equiv="X-UA-Compatible" content="IE=edge">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/css/bootstrap.min.css">

<script
src="https://cdn.jsdelivr.net/npm/jquery@3.6.0/dist/jquery.slim.min.js"></script>
<script
src="https://cdn.jsdelivr.net/npm/popper.js@1.16.1/dist/umd/popper.min.js"></scri
pt>
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.1/dist/js/bootstrap.bundle.min.js">
</script>
<title>About</title>
<style>
*{
margin:0px;
box-sizing: border-box;

}
body{
font-family: Arial, Helvetica, sans-serif; margin: 0;
background: #8e9eab; /* fallback for old browsers */
background: -webkit-linear-gradient(to right, #eef2f3, #8e9eab); /* Chrome 10-25,
Safari 5.1-6 */
background: linear-gradient(to right, #eef2f3, #8e9eab); /* W3C, IE 10+/ Edge,
Firefox 16+, Chrome 26+, Opera 12+, Safari 7+ */



}
#about{
margin-top: 50px;
```

```
}
h1{
font-size: 60px;

}
p{
font-size: 20px;

}
#cards{ padding: 30px
}
.column{ padding: 30px;
}
.card{
border: none;
box-shadow: rgba(0, 0, 0, 0.24) 0px 3px 8px;

}
button{
margin-left: 100px; margin-top: 50px;
}
#home-btn{ margin-top: 50px;

margin-left: 100px; padding:10px 30px; font-size: 30px;
}

</style>
</head>
<body>



<a href="Global Sales.html" class="btn btn-dark stretched-link" id="home-
btn">Home</a>
<div class="container-fluid" id="about">
<h1>ABOUT US </h1>
<p>Who are we and what we do.</p>
<p>Resize the browser window to see that this page is responsive by the way.</p>
</div>
```

```
<h2 style="text-align:left">Our Team</h2>
<div class="container-fluid" id="cards">
<div class="row">
<div class="column">
<div class="card" style="width:400px;">
<div class="card-body">
<h4 class="card-title">SARVESH V</h4>
<h5 class="title">Team Leader</h5><br>
<p class="card-text">B.Tech IT<br>S.A ENGINEERING
COLLEGE.<br></p><br>
<p>sarveshv285@gmail.com</p><br>

</div>
</div>
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<div class="card-body">
<h4 class="card-title">YUVARAJ S</h4>
<h5 class="title">Team Member 1</h5><br>
<p class="card-text">B.Tech IT<br>S.A ENGINEERING
COLLEGE<br></p><br>
<p>syuvaraj287@gmail.com</p><br>

</div>
</div>
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<div class="column">
<div class="card" style="width:400px">
<div class="card-body">
<h4 class="card-title">MANIKANDAN K</h4>
<h5 class="title">Team Member 2</h5><br>
<p class="card-text">B.Tech IT<br>S.A ENGINEERING COLLEGE</p><br>
<p>venkatmani2511@gmail.com</p><br>
</div>
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<div class="column">
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<div class="card-body">
<h4 class="card-title">KANDASAMY S</h4>
<h5 class="title">Team Member 3</h5><br>

<p class="card-text">B.Tech IT<br>S.A ENGINEERING COLLEGE</p><br>
<p>sks011017@gmail.com</p><br>

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</div>
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GITHUB : https://github.com/IBM-EPBL/IBM-Project-15736-1659603794

PROJECT DEMO LINK:

https://drive.google.com/file/d/1Hl6Z3hFj_JvnTFnKvydAjGjqZIMTw3xk/view?usp=share_link**