

# **Data Analytics For DHL Logistics Facilities**

**Team Id: PNT2022TMID01215**

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# 1. INTRODUCTION:

DHL is an international Umbrella brand and trademark for the courier, package delivery, and express mail service which is a division of the German logistics firm Deutsche Post. The company group delivers over 1.6 billion parcels per year.

The company DHL itself was founded in San Francisco, USA, in 1969 and expanded its service throughout the world by the late 1970s. In 1979, under the name of DHL Air Cargo, the company entered the Hawaiian Islands with an inter-island cargo service using two DC-3 and four DC-6 aircraft. Adrian Dalsey and Larry Hillblom personally oversaw the daily operations until its eventual bankruptcy closed the doors in 1983. At its peak, DHL Air Cargo employed just over 100 workers, management, and pilots.

The goal of the project is to provide Analytics to improve New Marks and grow the business.

## 1.1 Project Overview:

DHL Logistics Facilities is concerned with getting the products and services where they are needed and when they are desired with the help of Data Analytics. It is difficult to accomplish any marketing or manufacturing without logistical support. It involves the integration of information, transportation, inventory, warehousing, material handling, and packaging. The operating responsibility of logistics is the geographical repositioning of raw materials, work in process, and finished inventories where required at the lowest cost possible. Logistics has been practised for ages since organised activity began. Without logistics support no activity can be performed to meet defined goals. The current challenge is to perform logistics scientifically in order to optimise benefits to the organisation. Logistics is a planning function of management. Logistics function is concerned with taking products and services where they are needed and when they are needed. Logistics is being transformed through the power of data-driven insights.

Real-time process optimization and simulation are becoming increasingly important tools for supply chain management. As worldwide complexity grows, the ability to run global supply chains at peak efficiency becomes more and more challenging. Warehouse operators and supply chain managers can make better decisions with granular visibility of processes like order management, and inventory levels and resource utilisation become transparent in live

dashboards. We understand that dynamic technology markets demand dynamic solutions. So we seek strong partnerships with every customer, envisaging and creating the connections to achieve business success. You can rely on our unrivalled global reach, experience and engagement. We'll help you to imagine and enable new approaches and solutions. Together we will push the pace of change. And always we will enrich your experience with our industry-leading logistics services.

## **1.2 Purpose**

The purpose of this study is identifying the services marketing mix (7 Psproduct/service, place, promotion, price, people, processes and physical evidence) decisions of a logistics company. The significance of services marketing mix on creating a logistics services brand has received little attention in the literature. In this paper, the case of a global brand, DHL Logistics is presented. Case study was conducted by using secondary data obtained from DHL. Logistics' reports and by conducting semi constructed interviews with DHL Logistics' executives and employees. Due to the reputation and operations of the company, this framework will act as a guideline for the other companies. The marketing mix decisions made by DHL Logistics affect both B2B and B2C customers' brand perceptions and enhance the brand equity of DHL Logistics.

## **2. LITERATURE SURVEY:**

### **DATA ANALYTICS FOR DHL LOGISTICS FACILITIES**

#### **ABSTRACT**

DHL Logistics Facilities using Data Analytics provides customers in many industry sectors with logistics services along the entire supply chain from planning, sourcing, production, storage and delivery to return logistics and value-added services. Since its arrival in the first edition of the DHL Logistics Trend Radar in 2013, Big Data Analytics has developed and today is increasingly becoming part of the de-facto operating model for the logistics industry. Surging demand for personalized and context-based services has driven development of artificial intelligence (AI) and machine learning applications which, in turn, have upped the need for larger datasets in the industry for better results. Additionally, the rapid migration of enterprise data storage from traditional datacentres to the cloud has provided more flexibility in effectively scaling storage and processing power for all collected data. The need for visibility and prediction is ever-more pressing. COVID-19 has caused unprecedented uncertainty in supply chains globally, affecting how goods are moved and altering consumer demand and behaviour. Big data analytics holds the key to uncovering hidden issues across entire supply chains and surfacing trends that are not so obvious. As companies around the world recover, demand is growing for promising features of data analytics, such as mitigating disaster risks, simulating operations, and improving customer service.

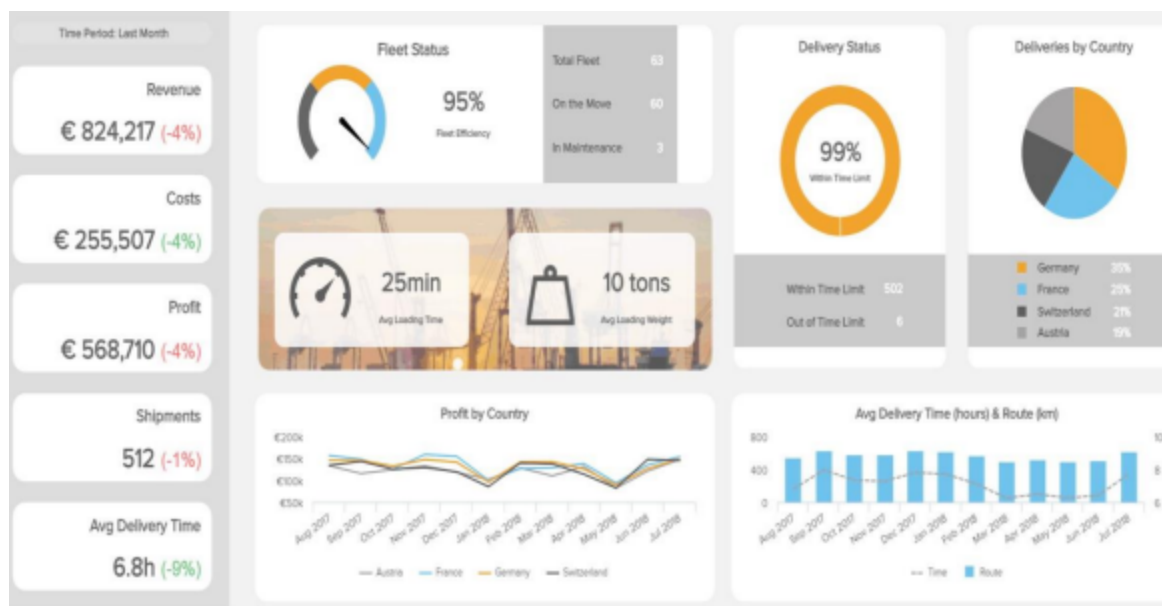
#### **INTRODUCTION :**

DHL Logistics Facilities is concerned with getting the products and services where they are needed and when they are desired with the help of Data Analytics. It is difficult to accomplish any marketing or manufacturing without logistical support. It involves the integration of information, transportation, inventory, warehousing, material handling, and packaging. The operating responsibility of logistics is the geographical repositioning of raw materials, work in process, and finished inventories where required at the lowest cost possible. Logistics is practiced for ages since organized activity began. Without logistics support no activity can be performed to meet defined goal. The current challenge is to perform logistics scientifically in order to optimize benefits to the organization. Logistics is a planning function of management. Logistics function is concerned with taking products and services where they are needed and when they are needed. Logistics is being transformed through the power of data-driven insights. Thanks to the vast degree of digital transformation and the Internet of Things, unprecedented amounts of data can be captured from various supply chain sources. Capitalizing on its value offers massive potential to increase operational efficiency, improve customer experience, reduce risk, and create new business models. Real-time process optimization and simulation are becoming increasingly important tools for supply chain management. As worldwide complexity grows, the ability to run global supply chains at peak efficiency becomes more and more challenging. Warehouse operators and supply chain managers can make better decisions

with granular visibility of processes like order management, and inventory levels and resource utilization become transparent in live dashboards. we understand that dynamic technology markets demand dynamic solutions. So we seek strong partnerships with every customer, envisaging and creating the connections to achieve business success. You can rely on our unrivalled global reach, experience and engagement. We'll help you to imagine and enable new approaches and solutions. Together we will push the pace of change. And always we will enrich your experience with our industry-leading logistics services.

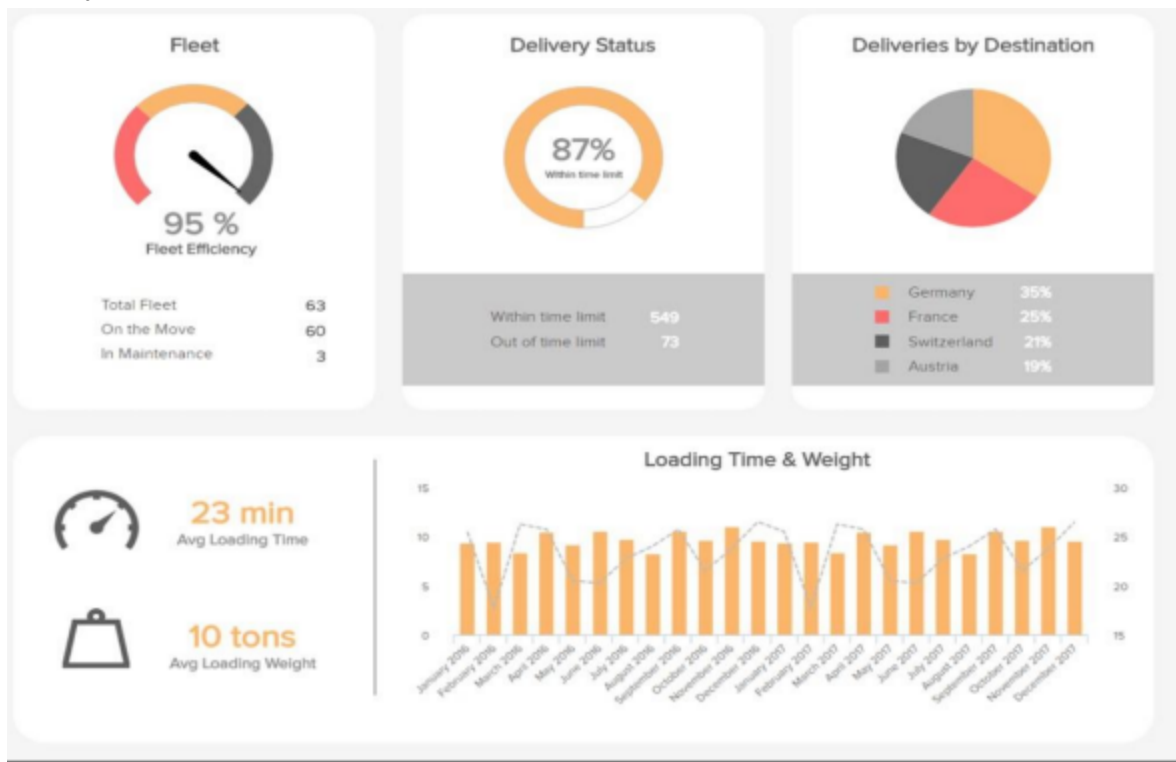
## 2.1 EXISTING Problem:

DHL is a global expertise in express, air and ocean freight, overland transport and logistics solutions; DHL combines worldwide coverage with an indepth understanding of local markets. pre-clearance of shipments through Customs Five international gateways proving direct-to-air networks and faster sorting of inbound and outbound shipments. DHL India is a proven facilitator of trade, across the globe. His strength lies in our global network and the know-how of our people. Backed by strategic alliances with world-class partners and the innovative use of technology, they strive to continuously improve the quality of our service. Our services range from fast, responsive and cost-effective express deliveries toe-commerce fulfilment and intelligent logistics solutions. DHL Core Services consist of door-to-door air express delivery of documents and parcels of all sizes (and weight), both into and out of the country.



Other value-added services are a. Kitting/Pre-Assembling Kitting is the addition of items such as accessories and batteries to the product pack. Pre-assembling is completion of a finished product from component parts or pre-programming of products. b. Re-Working/Re-Packing Repacking for a specific customer can include repalletization. Reworking is the modification of products to suit a local market. c. Packaging/Bundling

Packaging includes packing of products into suitable media for transportation and retail display. Bundling is the assembly of a number of prepackaged products to make up an integrated product offering d. QA Control Quality control ensures that product is received into and dispatched from the warehouse in a suitable condition, free from faults and defects. e. Labelling/Merchandising The application of labels either to the product or to the packaging Merchandising can include the addition of price stickers or promotional items ready for retail display.



## DISADVANTAGES OF EXISTING SYSTEM

- Logistics industry requires huge investment to set up operations and grows. DHL also require heavy investment to grow its business and to generate return on investment.
- DHL is expected to act in compliance with regulatory guidelines and local authorities. Regulations can be different in the source and destination locations, and so it can be impossible to obey different rules.
- Logistic Market is filled with many local and international players and the market growth is distributed among all the players and due to high pricing strategy DHL market share is restricted in developed and developing economies.
- Due to a very large market and a large network of delivery partners are required. DHL also depends on small and local entities for delivery. And this has a direct influence on DHL efficacy, and so teamwork becomes very necessary.
- DHL has less marketing cost as compared to FedEx or UPS and does not spend much on advertisement and branding practices. This impacts the success and recognition of brands.

## **2.2 References:**

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## **2.3 Problem Statement:**

In today's world, the difficulty arose in the industry of Logistics from the fragmentation and inconsistency. We can't create a centralised control over the Logistics industry due to many departments/sectors involved such as managers, manufacturers, service providers and end users.



### 3 Ideation Phase & Proposed solution:

#### 3.1 Empathy Map Canvas:



## 3.2 Ideation & Brainstroming:


Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

Reference: <https://www.mural.co/templates/empathy-map-canvas>

### Step-1: Team Gathering, Collaboration and Select the Problem Statement

Template




## Brainstorm & idea prioritization

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

- 10 minutes to prepare
- 1 hour to collaborate
- 2-5 people recommended

[Share template feedback](#)



### Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

10 minutes

A

Team gathering

Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

B

Set the goal


Think about the problem you'll be focusing on solving in the brainstorming session.

C

Learn how to use this facilitation tool

Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#)




### Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

5 minutes


PROBLEM


To Provide Analytics to Improve New Marks and Grow the Business





### Key rules of brainstorming


To run an smooth and productive session


 Stay in topic.

 Encourage wild ideas.

 Defier judgment.

 Listen to others.

 Go for volume.

 If possible, be visual.

## Step-2: Brainstorm, Idea Listing and Grouping

### Brainstorm

Write down any ideas that come to mind that address your problem statement.

15 minutes

**Yuvan Bala B**

Improve Resource Management	Increase the service Quality
Decrement in Cost	No damage Delivery

**Selva Ganesh R**

Relationship of supplier & customer	Delivery Confirmation from customer
Bandwidth of DHL services	Tracking of Product Details

**Vishnu Varshan S**

A good distribution network Design	Customer flexibility
Long Distance Delivery process	Time Management

**Vigneshwar v**

Improve supply chain process	Payment Management of customer
Consumer Feedback	Alternative Changes of customer in product

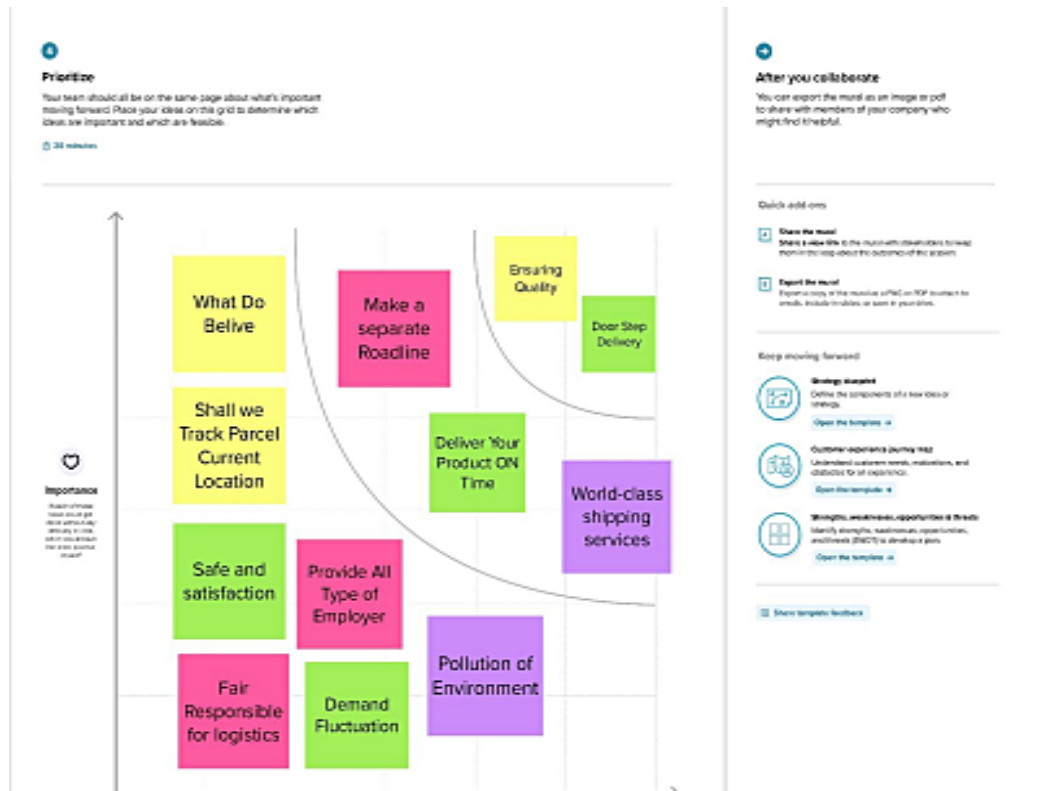
### Group ideas

Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been proposed, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you can break it up into smaller sub-groups.

30 minutes

Security and Safe	Environment Issues	needs quick service	Customer Service is available
Demand Fluctuation	High Customs cost	Make Work Together	Make a Separate road line
Proper Documentation with Shipping	You can track parcel	We are responsible	Customer can Receive a Receipt
Door Step Delivery	Regular updates of the services	Economic Growth of Country	Negotiation with client and customer

### Step-3: Idea Prioritization



### 3.3 Proposed solution:

S.no	Parameter	Description
1	Problem Statement (Problem to be solved)	A company's profitability may be severely impacted by continually shifting dynamics brought about by the global nature of the supply chain. The enormous burden that the COVID pandemic placed on logistics made this clear. As a result, manufacturers,

		<p>shippers, and retailers are using data analytics to better understand their processes and optimise them in order to be more prepared for unforeseen events. Data-driven businesses are growing their profit margins and customer satisfaction levels as a result.</p>
<b>2</b>	Idea / Solution description	<p>New technology plays a vital part in improving operations, removing costs and improving customer service. With DHL you like technology advances and investments as we constantly review, evaluate and adopt new technological solutions. Augmented Reality , for instance, is already getting used to optimize warehouse processes, while a spread of automated guided vehicles and robots are being tested and assessed for future deployment.</p>
<b>3</b>	Novelty / Uniqueness	<p>The specialist knowledge of your team has been the foundation for your company's success. By entrusting DHL with your logistics, you can concentrate on your core business rather than being side tracked by the requirements and complications of the global supply chain. DHL offers a wide range of ready-to-use solutions, technologies, and</p>

		<p>assets that would otherwise take a lot of time and money to implement, freeing up your cash to expand your business in other ways. Furthermore, outsourcing your logistics allows you the freedom to quickly scale up and down in response to new opportunities or issues with the least amount of risk.</p>
<b>4</b>	Social Impact / Customer Satisfaction	<p>Customers want to understand when their items are delivered and whether a package's expected arrival date are later than expected. Customers are often happier as they get more knowledgeable. Real-time or nearly real-time status updates are now possible, and businesses that make it simple for purchasers to urge these logistics updates will enjoy higher customer satisfaction. Additionally, data can improve customer satisfaction in ways aside from just shipping monitoring.</p>
<b>5</b>	Scalability of the Solution	<p>As market growth requires an expansion of your distribution network, you ideally desire a partner that incorporates a presence within the markets where you wish help. the choice to tapping into a scalable logistics infrastructure is either working with a replacement</p>

		<p>provider (new relationships to manage, new systems to integrate) or pushing an existing provider to enter new, unfamiliar markets. Look for partners who can walk the talk when it involves exchanging data between your two systems. The provider's size doesn't necessarily correlate with a classy IT capability. Vet providers carefully during this area or it can return to bite you. The largest 3PL providers will have virtually unlimited scale – a hugely attractive benefit. But their interest is also limited to serving only the most important companies out there. If that's not you, you'll find yourself being the proverbial small fish within the big pond.</p>
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### 3.4 Problem Solution Fit:

The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why

#### **Purpose:**

- ☒ Solve complex problems in a way that fits the state of your customers.
- ☒ Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- ☒ Sharpen your communication and marketing strategy with the right triggers and messaging.
- ☒ Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- ☒ Understand the existing situation in order to improve it for your target group.

## References:

1. <https://www.idealhackers.network/problem-solution-fit-canvas/>
2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4fe>

Define CS, fit into CC	<b>1. CUSTOMER SEGMENT(S)</b> <span>CS</span>  Our customers are mostly middle-class parents and people living in different environment.	<b>6. CUSTOMER CONSTRAINTS</b> <span>CC</span>  The main constraint is MONEY. We need of a huge investment to process logistics.  Another constraint is the customer changes.	<b>5. AVAILABLE SOLUTIONS</b> <span>AS</span>  1. Transport - When consumer is at long distance our transport solution may be of use.  2. Warehouse - Storing of products is main problem. So, our warehousing solution solves that problem.	Explore AS, differentiate
	<b>2. JOBS-TO-BE-DONE / PROBLEMS</b> <span>J&amp;P</span>  1. Frequent changing of their changes 2. A proper feedback.	<b>9. PROBLEM ROOT CAUSE</b> <span>RC</span>  Many customers alter their changes in their decisions due to their wishes in different products.	<b>7. BEHAVIOUR</b> <span>BE</span>  They need to be constant at their decisions before giving the final drastic measure.	
Focus on J&P, explore BE	<b>3. TRIGGERS</b> <span>TR</span>  Due to the various changes made in the environment it triggers the customers to act.  <b>4. EMOTIONS: BEFORE / AFTER</b> <span>EM</span>  Definitely customers will feel a lack of confidence and trust before acting upon their will. But after they see it with their own eyes they will start to trust and their confidence level will get increased.	<b>10. YOUR SOLUTION</b> <span>SL</span>  The main and foremost solution in a DHL logistics is to build the customer trust about their product, process and infrastructure. Because a good atmosphere will definitely develop a good and trustworthy relationships between customer and supplier.	<b>8. CHANNELS of BEHAVIOUR</b> <span>CH</span>  <b>8.1 ONLINE</b> Customers mostly verify their dealers before making a final change. They visit some websites about their dealers.  <b>8.2 OFFLINE</b> To verify about their dealers, they will see if their neighbors has done the same action and they will know what is their confident level.	Focus on AS, explore BE

## 4 Requirement Analysis:

### 4.1 Functional Requirements:

FR NO.	Functional Requirement ( Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through any google account or social media accounts.
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Dataset	The DHL_Facilities.csv record are collected as a dataset and upload to Cognos analytics
FR-4	Prepare/Analyse	The dataset is moved around to prepare and analyse using Cognos



FR-5	Exploration	The data are explored using logistics dataset by Cognos
FR-6	Dashboard	The Prepared and Explored data are Visualize and created in different type of dashboards. i.e., charts, graphs, tree, reports, summary, etc..

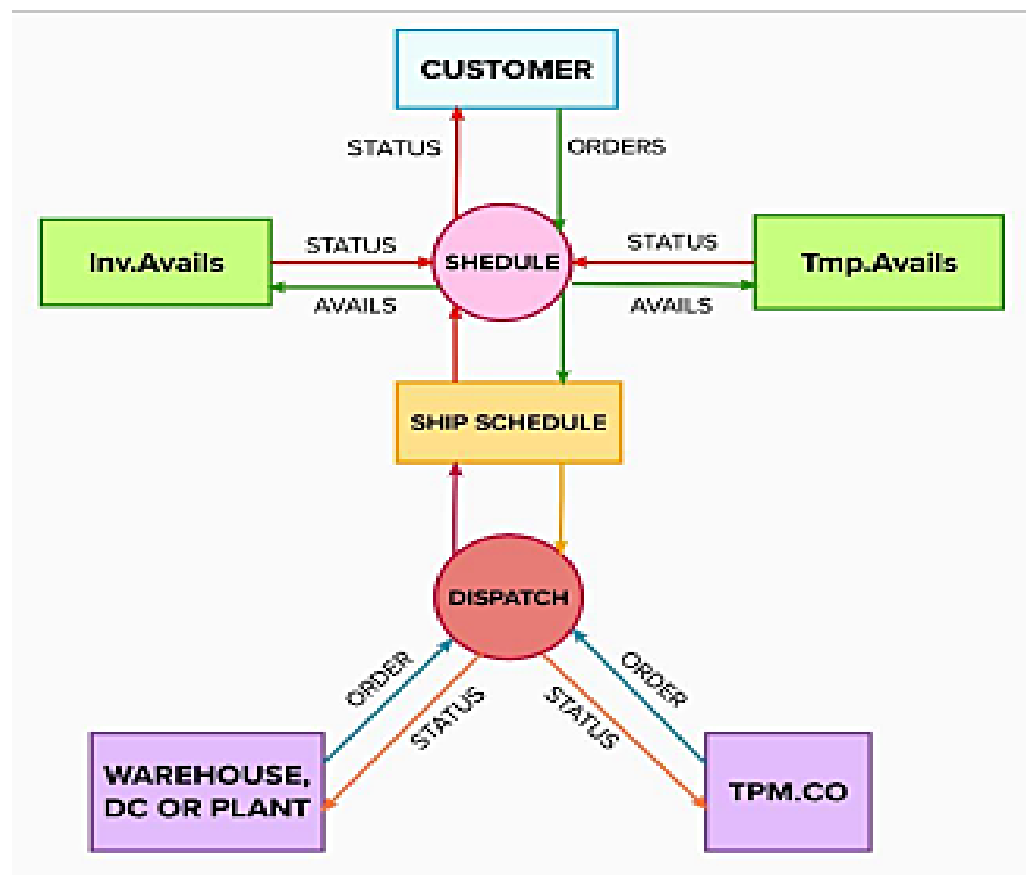
## 4.2 Non Functional Requirements:

NFR NO.	Non Functional Requirements	Description
NFR-1	Usability	No prior experience required to use the dashboard. People with basic understanding can use the system
NFR-2	Security	Only registered user can use this application
NFR-3	Reliability	The Analytics system ensures the reliability.
NFR-4	Performance	Gets updated regularly to improve the performance of the application.
NFR-5	Availability	The availability of dataset must be constrained for accurate data.
NFR-6	Scalability	Any kind of data can be explored and the system is quite expandable.

## 5 Project Design:

### 5.1 Data Flow Diagram:

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.



### 5.3 User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer	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-
		USN-4	As a user, I can register for the application through Gmail	I can register & access the dashboard with Gmail Login	Medium	Sprint-1

	Login	USN-5	As a user, I can log into the application by entering email & password	I can login into the application with Gmail login	High	Sprint-1
	Dashboard	USN-6	As a user I can use the methods provided in the Dashboard.	I can access the dashboard with various methods	High	Sprint-2
Customer Care Executive	Login	USN-7	As a Customer Care Executive, I can log into the application by entering my Executive email Id & password	I can login with my credentials	Medium	Sprint-1
	Service	USN-8	As a Customer Care Executive, I can answer user's queries	I can give the solutions to the user's queries	High	Sprint-3
Administrator	Login	USN-9	As an Administration, I can log into the application by entering my Administer email Id & password	I can login with my credentials	High	Sprint-1
	Access	USN-10	As an admin, I can make changes to the interface according the needs	I have a full access to the application	High	Sprint-3
Customer tools	Tools	USN-11	I can perform analysis by tools	I have an ease of	High	Sprint 1

			(Cognos and with ML	Accessing tools		
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## 6 Project Planning and Scheduling:

### 6.1 Sprint Planning and Estimation:

Milestones	Tasks	Submission Date
Milestone-1	Collection of data from Kaggle	17 Sept 2022
Milestone-2	Uploading the dataset on the IBM Cognos Tool	17 Sept 2022
Milestone-3	Exploration and Visualization of data	21 Oct 2022
Milestone-4	Creating Interactive dashboards	27 Oct 2022
Milestone-5	Display the insights in the dashboard	27 Oct 2022
Milestone-6	Prepare a standardised dataset and using the data required with the help of python program	4 Nov 2022
Milestone-7	Usage of various algorithms to obtain the desired result with more accuracy using Google COLAB	9 Nov 2022
Milestone-8	Display them in the required format	16 Nov 2022
Milestone-9	Deploying in the Github	16 Nov 2022

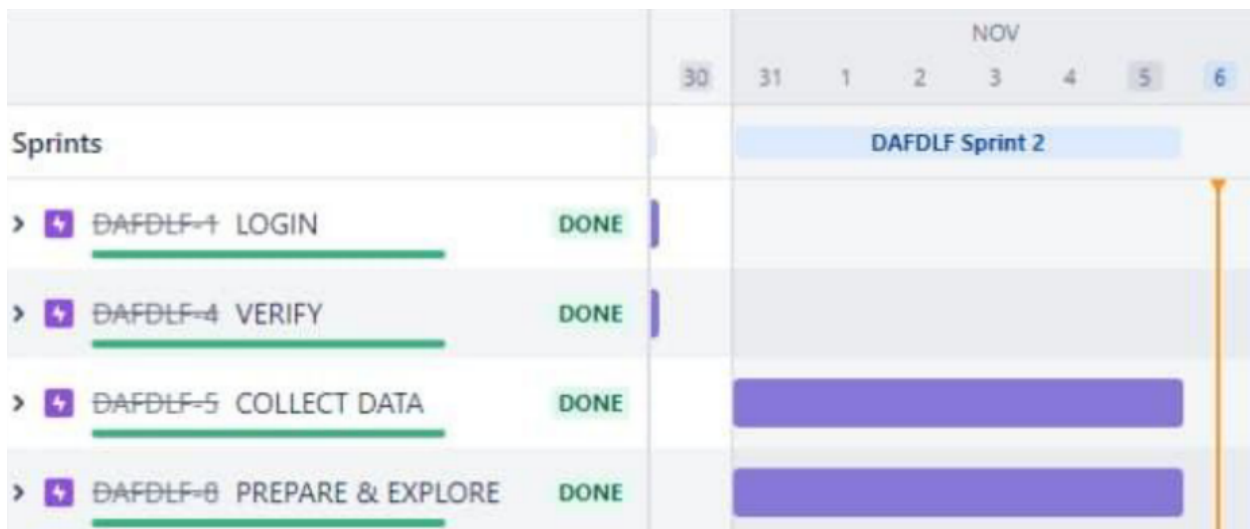
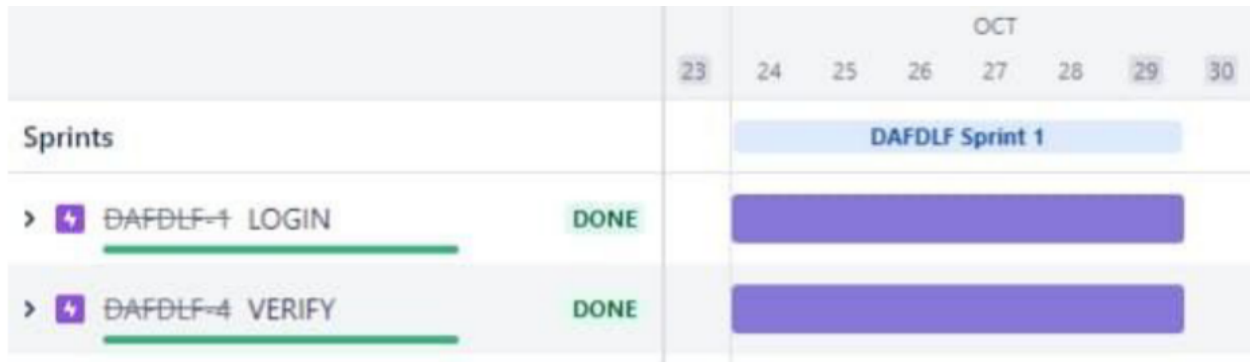
### 6.2 Sprint Delivery Plan:

Sprint	Functional Requirements	User Story Number	User Story/Tasks	Story Points	Priority	Team Members
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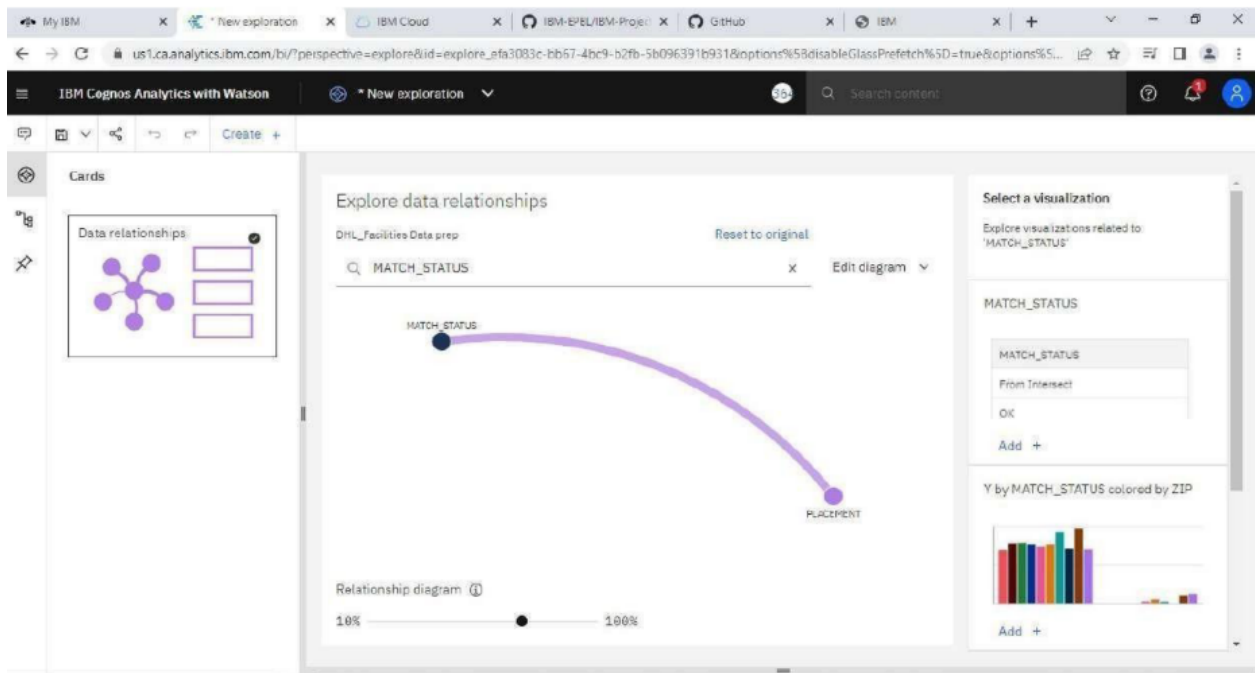
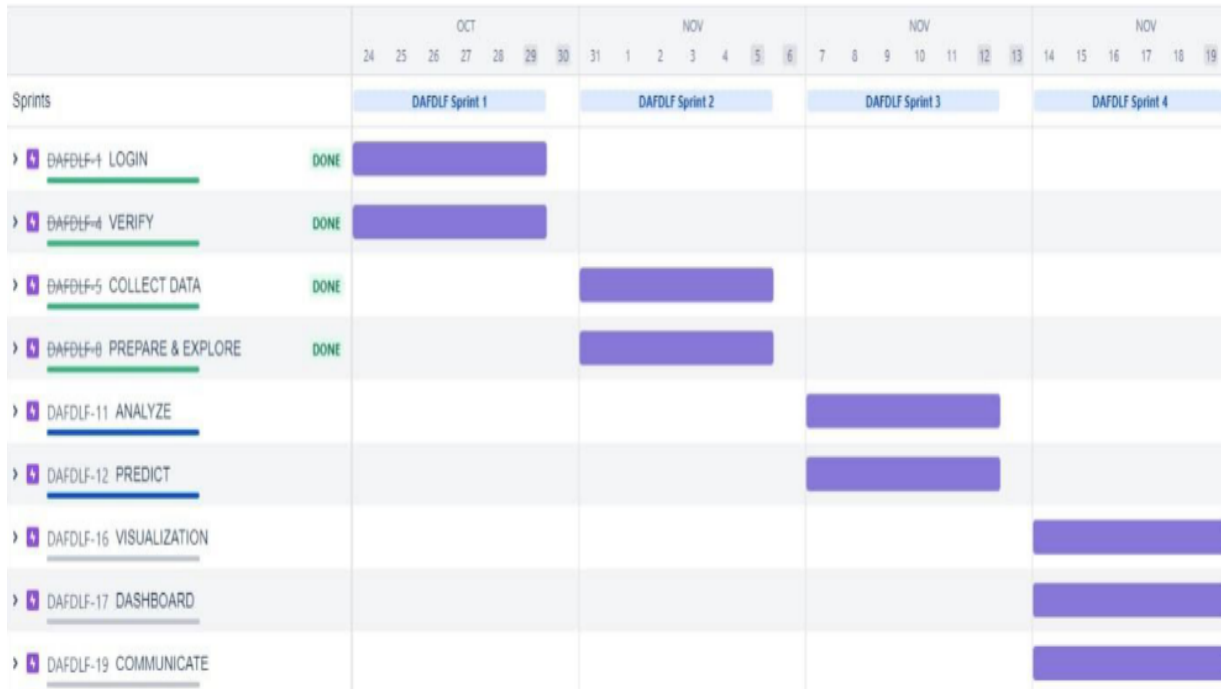
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password.	8	high	Yuvan Bala B Vishnu Varshan S
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	8	high	Selva Ganesh R Vigneshwar V
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	low	Yuvan Bala B Vishnu Varshan S
Sprint-1		USN-4	As a user, I can register for the application through Gmail	10	high	Selva Ganesh R Vigneshwar V
Sprint-2	Login	USN-5	As a user, I can log into the application by entering email &	8	high	Selva Ganesh R Vigneshwar V

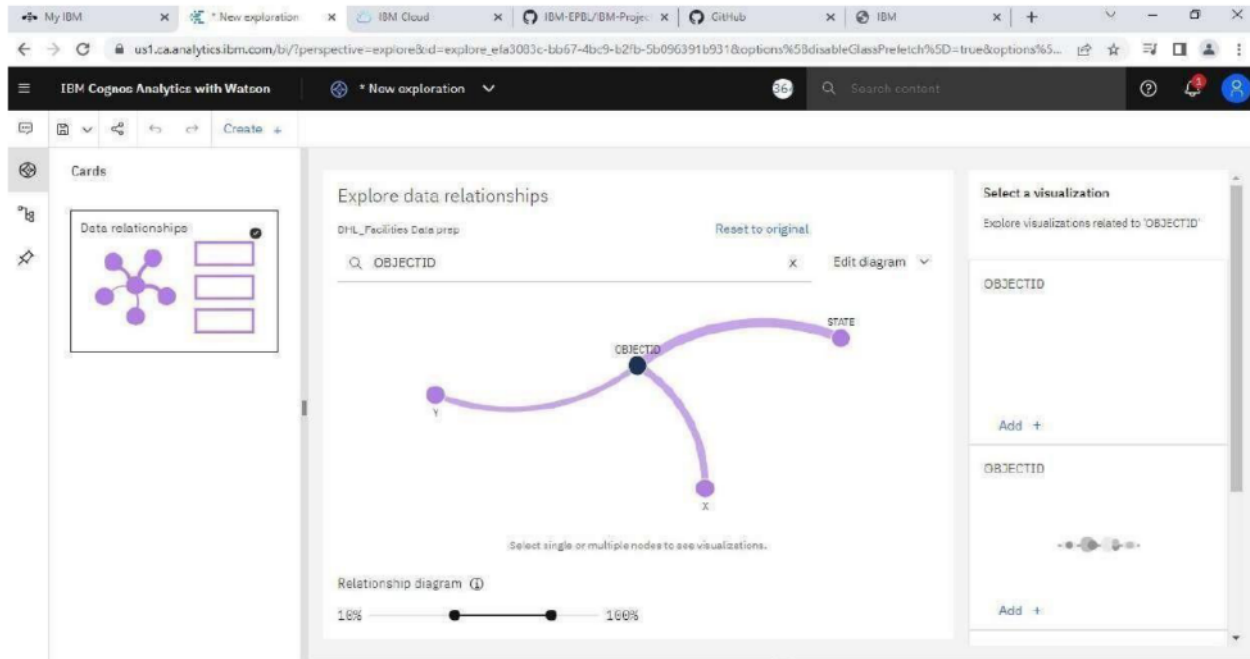
			password			
Sprint-2		USN-6	As a user, I can view City Wise DHL Deliveries of the given dataset	9	high	Yuvan Bala B Vishnu Varshan S
Sprint-3		USN-7	As a user, I can view Top N Deliveries State and City of the given dataset	10	high	Vishnu Varshan S
Sprint-3		USN-8	As a user, I can view Top 3 State Deliveries of the given dataset	10	high	Selva Ganesh R
Sprint-4		USN-9	As a user, I can view Summary and Bar Chart of Deliveries using the given datase	10	high	Vigneshw ar V

### 6.3 JIRA Report:









## 7 . ADVANTAGES & DISADVANTAGES:

### Advantages:

#### 1. Unlocking key values

First of all, Data Visualization ensures that key values can be unlocked from massive sets of data. Large amounts of data in particular can be overwhelming and difficult to wrap our head around. Data Visualization helps with this by making the key values of the data clear and easily visible. This makes it easy to understand and interpret for everyone in the company.

#### 2. Identify patterns

Second, Data Visualization unlocks other previously invisible patterns. These other emergent properties in the data can formulate new valuable insights, which could not have been discovered before. Visualization allows business users to recognize relationships and patterns between the data, and also gives it greater meaning. By exploring these patterns, users can focus on specific areas that need attention in the data, to determine the importance of these areas to move their business forward.

### **3. Easy to understand**

The aim is to tell a good story by translating the data into a form that would be easy to understand for everyone. Eventually useful information would be highlighted and the noise would thus be eliminated from the data.

### **4. More attractive and user-engaged**

This attractiveness is achieved by using visually appealing ways of presenting data and adhering to design best practices. Next-level visualizations present data in a very sensible way by using the most appropriate chart and formatting options. In addition, elegant transitions facilitate an attractive and smooth way of moving between different points in the storyline of a visualization. This will increase a user's engagement with the visualization, thus facilitating easy and quick interpretation and understanding. As a result, the message resonates strongly with the audience. <sup>18</sup> However, it is not as simple as taking the data and placing them in a graph and making it look better. It's an act of balance between the form and a function. A plain graph can be boring to catch the attention or make a point; the most impressive visualization could take away from the data or it could speak volumes. It is important to realize that visuals and data have to work together to convey a message.

### **5. Display complex relationships**

Standard visuals, such as bar charts or line graphs, are often not sufficient when presenting complex relationships. A dataset with over a million distinct data points, for example, can hardly ever be presented in a standard manner. In that case, a visual that allows for interactive hierarchies and exploration is a much better option. The interactivity of an Data Visualization can facilitate next-level data exploration that matches a user's specific needs.

## **DISADVANTAGES:**

### **1. It gives assessment not exactness**

While the information is exact in foreseeing the circumstances, the perception of similar just gives the assessment. It without a doubt is anything but difficult to change over the robust and protracted information into simple pictorial configuration yet such a portrayal of data may prompt theoretical ends now and then.

### **2. One-sided**

The essential arrangement of information representation occurs with the human interface, which means the information that turns out to be the base of perception can be one-sided. The individual bringing the information for the equivalent may just think about the significant part of the information or the information that requirements center and may reject the remainder of the information which may prompt one-sided results.

### **3. Absence of help**

One of the downsides of information perception is that it can't help, which means an alternate gathering of the crowd may decipher it in an unexpected way.

### **4. Inappropriate plan issue**

On the off chance that information perception is viewed as such a correspondence. At that point, it must be certifiable in clarifying the reason. In 19 the event that the plan isn't legitimate, at that point, this can prompt disarray in correspondence.

### **5. Wrong engaged individuals can skip center messages**

One of the issues with information perception is however it could be logical its clearness in clarification is totally subject to the focal point of its crowd.

## **8. CONCLUSION**

The services marketing mix has an incontrovertible importance for creating a mental picture of intangible products, in other words services. In a similar vein, when logistics sector's disadvantageous position in Porter's Five Forces of Competition Model is considered, it is ought to emphasize the importance of positioning decisions and marketing mix efforts for logistics service providers. Due to the reputation and global operations of Deutsche Post DHL, the developed framework in this paper will act as a guideline for the other alike companies. For further research, customer side can also be considered and customer satisfaction can be measured via surveys.

## **9.Future Scope**

The following trends in data visualization reflect the general move toward use-case optimized visual experiences and the accessibility of data visualization across both devices and industries.

### **1. Emergence Of High-Fidelity Digital Twins**

Digital twins are virtual models of physical objects/systems created by pulling in data streams related to the physical asset in question (e.g., telemetry from onboard sensors monitoring temperature, vibration level, etc.). This enables the remote monitoring of performance and health/condition parameters, allowing for physical assets to be analyzed and assessed from afar. In the past, these digital models were presented to users in the form of interactive

dashboards and continuously updated metrics. Newer offerings such as Oracle's IoT Asset Monitoring Platform and Microsoft Azure Digital Twins integrate data streams with 3D asset models for truly high-fidelity digital twins – the ultimate in data visualization.

## **2. More Powerful JavaScript Visualizations**

With software as a service ( SaaS) being today's preferred way to consume software, web front ends are the primary interfaces between applications and users. In this space, technologies like Flash and Java have all but died out, while JavaScript continues to reign supreme. These days, popular JavaScript frameworks such as Vue.js, React.js, and Angular.js are used to streamline the development of complex front-end visualizations, while specialized frameworks like Three.js and Babylon.js add 3D and immersive reality to JavaScript-based data visualization.

## **3. Verticalized Data Visualization Offerings**

As traditional industries undergo digitization, data visualization will become more specialized to the needs of specific industry audiences. For example, data visualization in shipping and maritime is enabling ship owner/operators to improve vessel performance and monitor safety and operational conditions. Similarly, the automotive industry is using data visualization to optimize vehicle product development workflows.

## **4. Data Visualization Optimized For Mobile**

With over half of total page views in 2020 occurring on phones and handheld devices, site operators have been well-advised to focus on mobile in their user experience optimization and improvement efforts. Enterprise SaaS offerings and business software platforms are following suit by taking a mobile-first approach to data visualization. That is, they are prioritizing their data visualization and widget designs for optimal viewing on the small screen. For example, the mobile version of 22 Salesforce offers a feed-first design, mobile-enhanced dashboards/reports, and a flexible "Component Visibility Rules" feature for defining which data visualization components are displayed on mobile devices.

## **5. AI-Powered Data Visualizations**

Data analysis and management systems were some of the first applications to incorporate artificial intelligence ( AI)/machine learning ( ML) for automating information collection, analysis, and dissemination. Similar trends can now be observed in the data visualization space, with automated systems leveraging ML models trained on common user patterns and task execution to construct UI dashboards. These components are automatically fine-tuned for delivering relevant, unique visualizations and insights per user. In the future, software solutions will increasingly rely on AI/ML for optimizing data visualizations used in human-computer interactions (HCI) .

## **10 . APPENDIX**

Github Repository Link:

<https://github.com/IBM-EPBL/IBM-Project-3619-1658584411>

## **11. PROJECT DEMO VIDEO LINK**

[https://drive.google.com/file/d/10Tug2yKKOEUnU2yp1\\_hj0JFmEoe-3pJq/view?usp=share\\_link](https://drive.google.com/file/d/10Tug2yKKOEUnU2yp1_hj0JFmEoe-3pJq/view?usp=share_link)