IBM NALAIYA THIRAN 2022-2023 PROJECT REPORT
PROJECT NAME: DATA ANALYTICS FOR DHL LOGISTICS FACILITIES
TEAM MEMBERS: A VARSHAN, M DHILIPAN, S D RAJESH, B UDHAYA KUMAR

PROJECT REPORT

1.   **INTRODUCTION**

1.1 Project Overview

DHL is an international Umbrella brand and trademark for the courier, package

delivery, andexpress mail service which is a division of the German logistics firm Deutsche Post.

The company group deliversover 1.6billionparcels per year. The company DHL itself was founded

in San Francisco, USA, in 1969and 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 andfour DC-6 aircraft. Adrian Dalsey and Larry Hillblom

personally oversaw the daily operations until its eventualbankruptcy closed the doors in 1983. At

its peak, DHL Air Cargo employed just over 100 workers, management,andpilots.

1.2 Purpose

To provide Analytics to improve New Marks and grow the business.

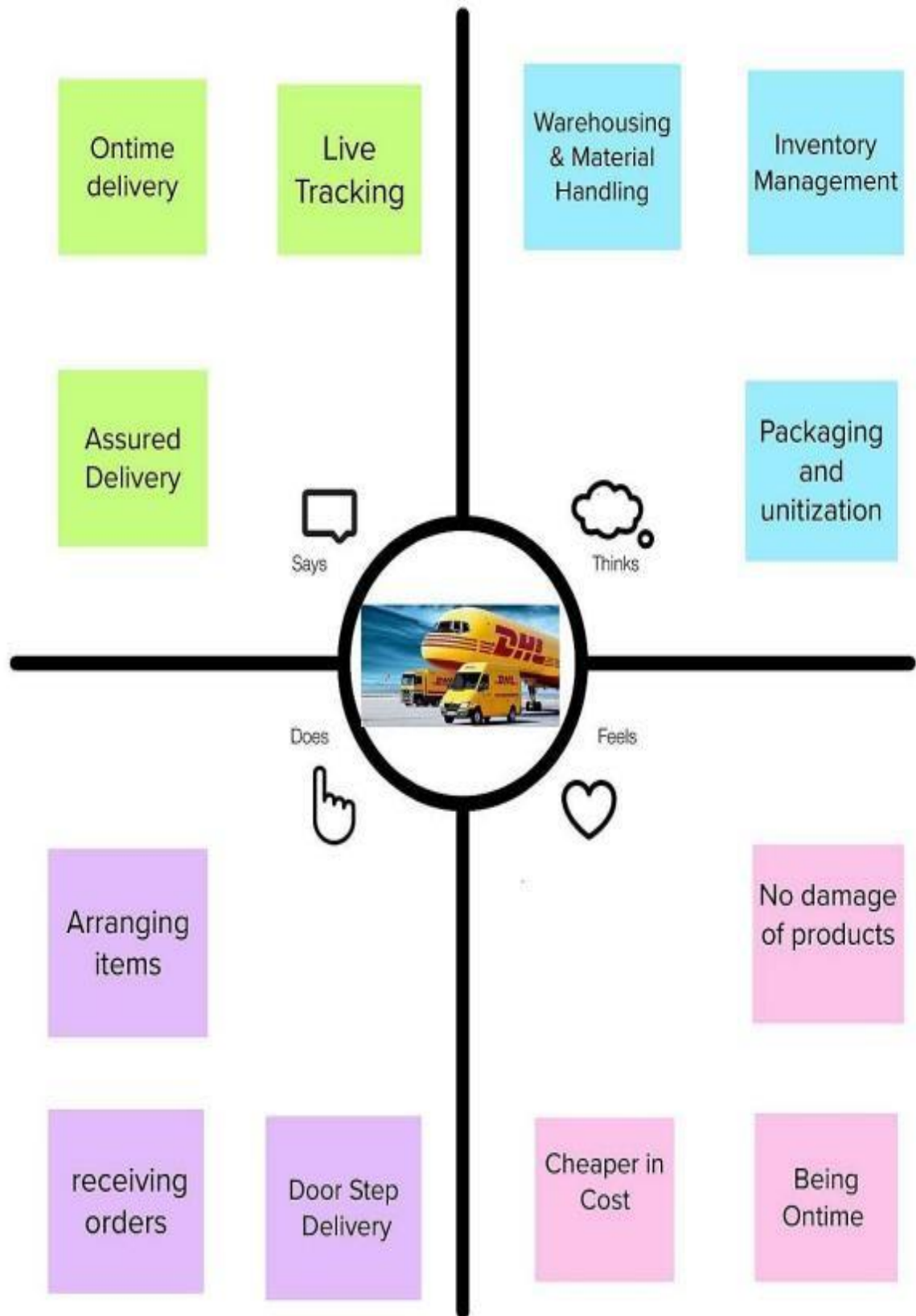**2.LITERATURE SURVEY**

2.1 Existing problem

This data needs to be analyzed to enhance decision making. But, there are some

challenges of Big Data encountered by companies. These include data quality, storage, lack of data

science professionals, validating data, and accumulating data from different sources.

2.2 References

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3. IDEATION & PROPOSED SOLUTION

3.1 Empathy Map Canvas

Ontime delivery

Live Tracking

Warehousing & Material Handling

Inventory Management

Assured Delivery

Packaging and unitization

Says

Thinks

Does

Feels

Arranging items

No damage of products

receiving orders

Door Step Delivery

Cheaper in Cost

Being Ontime

3.2 Ideation & Brainstorming

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.

3.3 Proposed Solution

| S. No	Parameter	Description
1	ProblemStatement (problemtobe solved)	The biggest problems inthe logisticsindustry come from its inconsistency and fragmentation. Since there are many parties involved (manufacturers, storekeepers,drivers, managers, and end users) it's impossible to have centralised control over everystepofthe way.
2	Idea / Solution description	Idea management software structures the process of gathering and developing ideas aroundbusiness focus areas, including product development,day-to-day processes, customer feedback, market trends, and competitive insights, with the goal of organizing and managing thoseideas for improvement or development.
3	Novelty / Uniqueness	As a Thought leader inthe logisticsindustry,DHL structurally invests in trend research and solution development.The nature of the workplace, work culture, and workforce are evolving.

3.4 Problem Solution fit

1. CUSTOMER SEGMENT(S) [CS]	6. CUSTOMER [CC]	5. AVAILABLE SOLUTIONS [AS]
Client analytics is the act of gathering information from various sources and combining it to form a comprehensive picture of the customer. This data may contain details about client demographics, past purchases, and website usage.	Teams that are not aligned, lack commitment and show little patience complexity and prejudice	Usage of Big Data Analytics
2. JOBS-TO-BE-DONE / PROBLEMS [J&P]	9. PROBLEM ROOT CAUSE [RC]	7. BEHAVIOUR [BE]
Within a company, there is a lack of coordination between various teams or departments, which is not beneficial in the near term.	There are several issues facing the logistics sector today, particularly with the integration of e-commerce and new data sources like cell phones and sensors. GPS and other gadgets	An analysis of the most recent big data analytics applications in the logistics and transportation industries.
3. TRIGGERS [TR]	10. YOUR SOLUTION [SL]	8. CHANNELS OF BEHAVIOUR [C]
Monitoring 24/7 , User friendly interface	Regarding the way in which organizations now use their analytics Now, businesses may predict sluggish and busy times as well as anticipated supply shortages in the future.	Along with a growth in data volume, data processing technologies will also become more powerful.
4. EMOTIONS: BEFORE / AFTER [EM]		
Before: Keeping track of records for commodities is difficult. **After**: Now, businesses may predict busy and sluggish times. future supply shortages that may occur and take appropriate action		

(side labels) Define CS, fit into CC | Focus on J&P, tap into GC, understand RC | Explore AS, differentiate | Focus on J&P, tap into BE, understand RC

4. PROJECT DESIGN

4.1 Data Flow Diagrams

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 entersand leaves the system, what changes the information, andwhere data is stored.

4.2 Solution & Technical Architecture
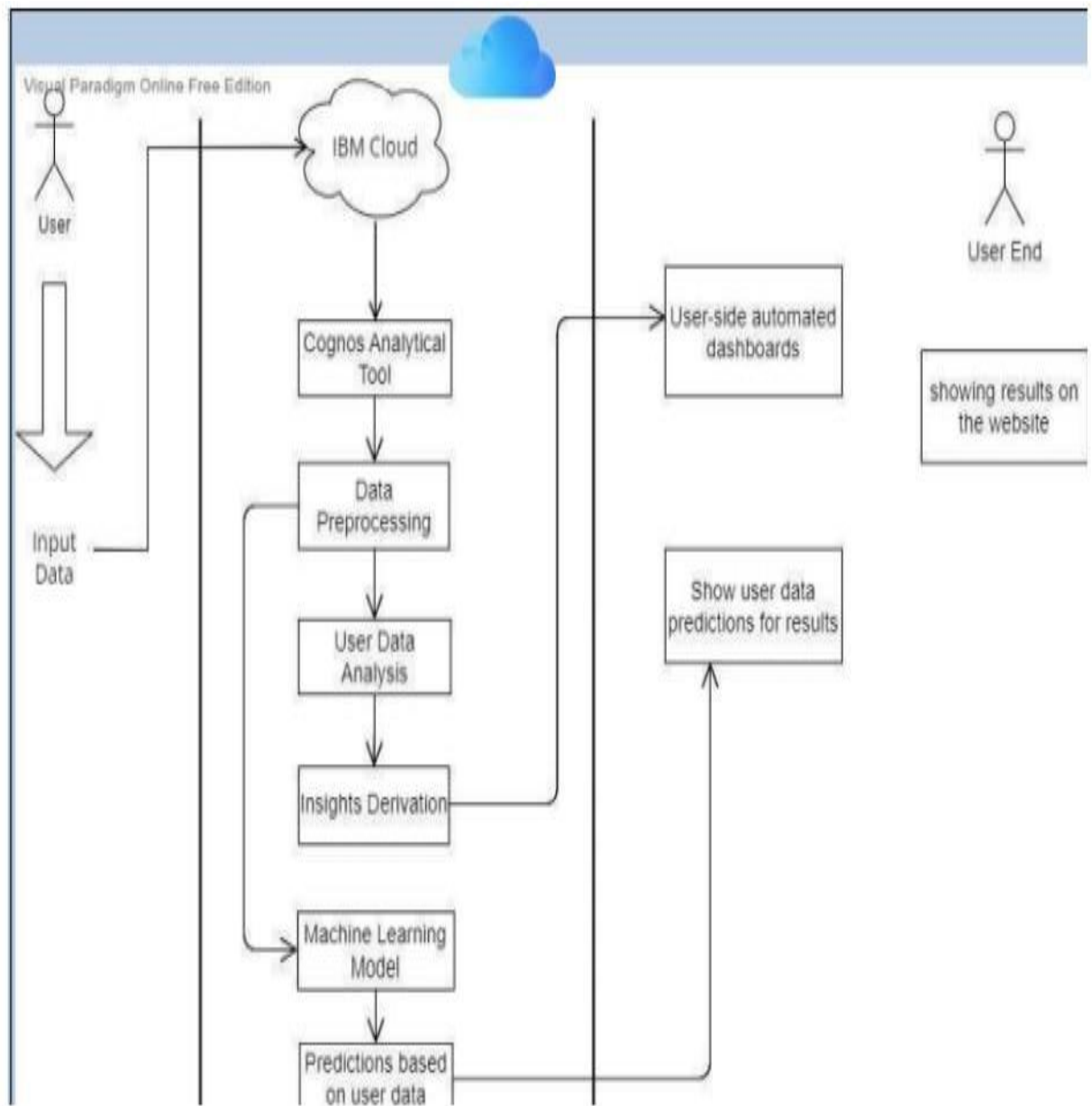
Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	User uploads the csv or excel formatfiles into the webpages	HTML, CSS, JavaScript
2.	Application Logic-1	The user datawill pass into the IBM cloudfor storing and acts as a datasource	IBM cloud
3.	Application Logic-2	In cloud, datawill be fetched by the Cognosanalyticaltool fordata analysis	IBM Cognos analytical tool
4.	Application Logic-3	The pre-trained Dashboards will be present to performanalysis on the incoming data	IBM Cognos analytical tool
5.	Database	Data will be retrieved from cloud	MySQL
6.	Cloud Database	Database Service on cloud	IBM DB2, IBM Cloud
7.	File Storage	Customer sales datais uploaded in cloud throughinterface	IBM Block Storageor Other Storage Service or Local Filesystem
8.	External API-1	To perform data analysis on the userdata	IBM Cognos Tool

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g., SHA-256, Encryptions, IAM Controls, OWASPetc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g., use of loadbalancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, useof Cache, use of CDN's) etc.	Technology used

5. PROJECT PLANNING & SCHEDULING

5.1 Sprint Planning & Estimation

| Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
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	Naveen S Praba M
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	8	High	Rhoger Praba E
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	Sanjay G Praba M
Sprint-1		USN-4	As a user, I can register for the application through Gmail	4	Medium	Rhoger Sanjay G
Sprint-2	Login	USN-5	As a user, I can log into the application by entering email & password	10	High	Naveen S Praba E
Sprint-2	Dashboard	USN-6	As a user, I can view City Wise DHL Deliveries of the given dataset	8	Medium	Sanjay G
Sprint-3		USN-7	As a user, I can view Top N Deliveries State and City of the given dataset	10	Medium	Rhoger
Sprint-3		USN-8	As a user, I can view Top 3 State Deliveries of the given dataset	10	High	Praba M
Sprint-4		USN-9	As a user, I can view Summary and Bar Chart of Deliveries using the given dataset	10	High	Sanjay G
Sprint-4		USN-10	As a user, I can view Dashboard of Delivery stats using the given dataset	10	High	Naveen S Sanjay G

5.2 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

6. TESTING

6.1 Test Cases
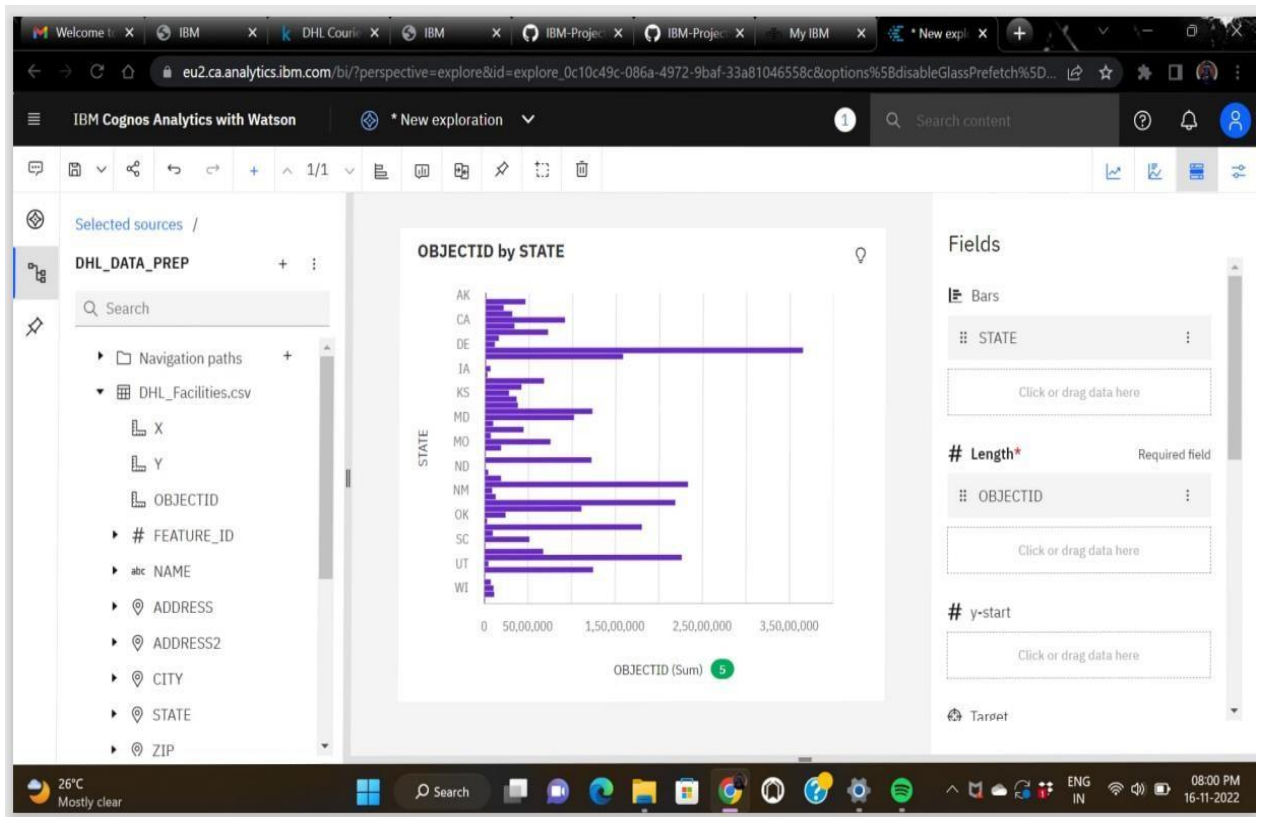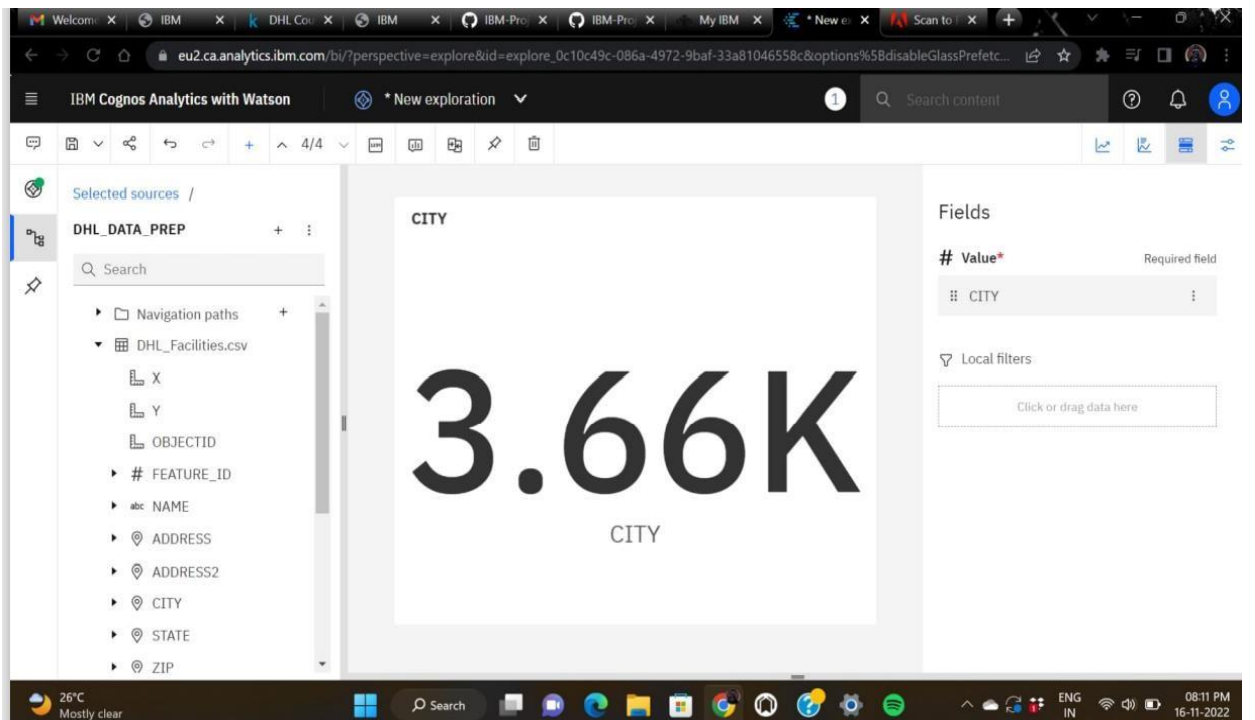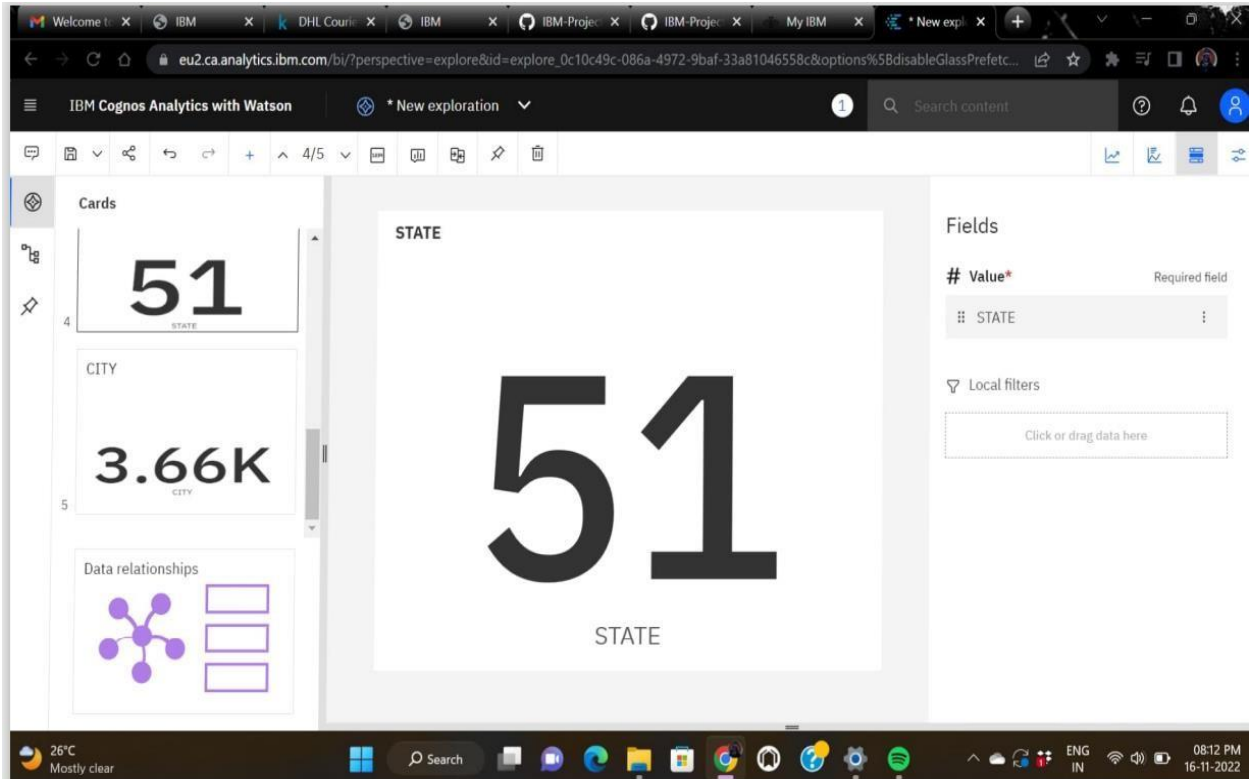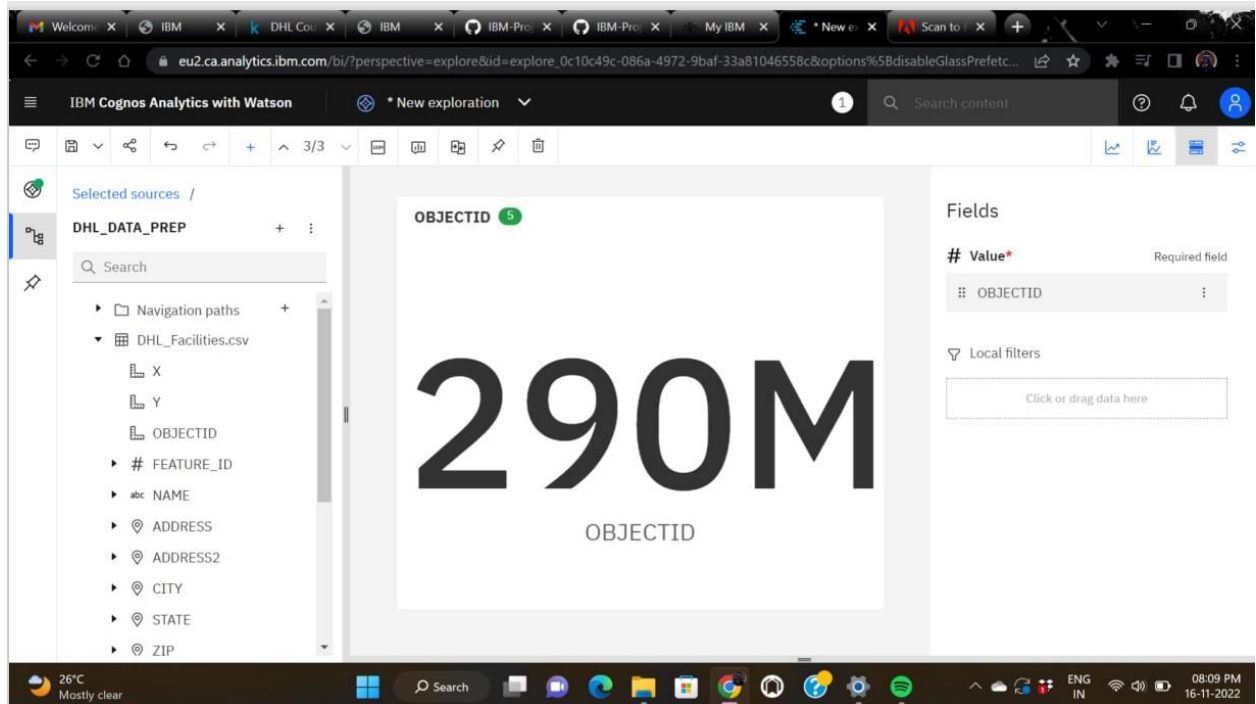
7. ADVANTAGES & DISADVANTAGES

Pro #1: Improvement in Demand Forecasting

Using artificial intelligence systems provides significant insight into forecasts, which is extremely valuable with supply chains. The technology will learn from 14 past data and then analyze that data to find predictable patterns. These key indicators are often what trigger demand, so they help suppliers stock products that customers want.

Pro #2: More Efficient Sourcing of Products

Data analytics uses past performance in combination with market pricing to approach the sourcing of products. In awards contracts based on predetermined metrics. Some supply chains look at price alone, while others have a broader criterion for sourcing.

Pro #3: Boost in Product Efficiency

Reducing overhead costs is an area where most businesses put most of their focus and for a good reason. When using supply chain analytics,data is gathered and analyzed to provide easily digestible assessments. Therefore, decision-makers can make slight modifications that reduce costs,improve the quality of products,and enhance the efficiency of all business processes.

Pro #4: Better Warehouse Management

It looks into the behavior of customers to ensure that products are being delivered in the most timely and profitable manner possible. In the past, supply chains relied on trial and error to maintain quality,but not analytics has taken away the guesswork. Reports can be produced automatically that show 15 leader any potential delays so they can make decisions accordingly.

Pro #5: Improved Logistics

Distribution and logistics are made much more efficient through the use of data processing because it enables businesses to share data in real-time. In addition to demand forecasting,this will help supply chains develop more efficient systems and uncover new delivery opportunities. Additionally,businesses can improve their asset uptime and better optimize resources.

Con 1: Deficiency in Future Predictions

While data is usually streamlined through the use of analytics, we have no way to predict the way humans will react on a given day. However,it's believed that data science can be adopted by HR departments to improve this accuracy,but the fact is that we'll never have a way to completely predict human behavior.

Con 2: Numbers can Create Uncertainty

One of the main problems with being data reliant is that there is still some uncertainty. While getting these decisions right will boost profits, secondguessing decisions can have a disastrous effect. Another cause of this can be poor data quality so developing proper data management practices is essential.

Con 3: Data Bias

Different departments within a company are going to be focused on specific metrics,which can cause them to be biased. Furthermore,data biases can also happen when people collecting the data already have a preconceived notion. Being biased is a natural human tendency,but it can be disastrous in business. It's avoided by making sure to ask the right questions. Let every department provide input before you decide on the questions to ask.

8. CONCLUSION

- 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 defacto 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 datacenters 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 17 uncertainty in supply chains globally,affecting how goods are moved and altering consumer demand and behavior.

- 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.

9. FUTURE SCOPE

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.

10. APPENDIX

GitHub: https://github.com/IBM-EPBL/IBM-Project-45803-1660732392