# HX8001 - PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND ENTREPRENEURSHIP

## Data Analytics for DHL Logistics Facilities

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# Data Analytics For DHL Logistics Facilities

## ABSTRACT

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.

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# CHAPTER 1

# INTRODUCTION

Logistics facilities is being transformed through the power of data-driven insights. Thanks to the vast degree of digital transformation and the Data Analytics, 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. The term logistics commonly refers to the planning, management and control of tangible as well as intangible flows of goods. These move between several companies, within a company or between suppliers and end consumers. Logistics thus includes flows of goods and information, but also flows of people.

## 1.1 PROJECT OVERVIEW :

Logistics is the process of planning and executing the efficient transportation and storage of goods from the point of origin to the point of consumption. The goal of logistics is to meet customer requirements in a timely, cost-effective manner. Originally, logistics played the vital role of moving military personnel, equipment and goods. While logistics is as important as ever in the military, the term today is more commonly used in the context of moving commercial goods within the supply chain. Many companies specialize in logistics, providing the service to manufacturers, retailers and other industries with a large need to transport goods. Some own the full gamut of infrastructure, from jet planes to trucks, warehouses and software, while others specialize in one or two parts. FedEx, UPS and DHL are well-known logistics providers

## 1.2 Purpose:

1. Solve complex problems in a way that fits the state of your customers.
2. Sharpen your communication and marketing strategy with the right triggersand messaging.
3. Increase touch-points with your company by finding the rightproblem-behavior fit andbuilding trust by solving frequent annoyances, or urgent or costly problems.
4. Understand the existing situation in order to improve it for your target group

# CHAPTER 2

# LITERATURE SURVEY

## 2.1 Existing problem

Dhl logistics are hard to manage due to the lack of transparency in the supply chain. While technology has progressed in recent years, many companies still only receive data about the transport of their goods days or even weeks after their goods were delivered at the final destination.

Just consolidating all this data after the fact is a cumbersome task and resolving any issues within the supply chain and logistics industry is nearly impossible as it's hard to pinpoint exactly where and when something went wrong.

Below are the top 5 dhl logistics companies face.

**1. Counterfeiting**

Counterfeiting can take on different forms. Counterfeiters misappropriate someone else's brand, falsely label products, or use fake or inferior components to make a product. Lack of consumer confidence in the provenance of goods can really hurt a manufacturer's ability to sell their products. This is particularly a concern for companies selling their products in Asia, where counterfeiting is widespread and consumer confidence is low.

Counterfeiting is also an issue that is becoming worse each year as ordering goods on the internet is increasingly becoming the new norm. This encourages a lot of counterfeiters to enter the arena and sell fake products, which in turn leads to further decreased consumer confidence.

**2. Theft of goodsglobal logistics**

There are many people handling goods in transit and only one of them needs to have ulterior motives for theft to become a big issue. In the current supply chain, it's very easy for someone to sign a form saying they've handed over 100 boxes, whereas the real amount was only 99 as they kept one themselves.

For manufacturers it is very difficult to figure out where theft may have occurred as information about the shipment of their goods is usually only available days or weeks after (most of) their products have already arrived at their end destination.

**3. Lack of accurate data on shipping conditions**

Many products need to be transported within pre-set environmental conditions, such as within certain temperature parameters. As there is no way for manufacturers to see shipping conditions in real-time, some logistics companies, local or global, falsify the information on how they've shipped certain goods.

A shipping company may turn off the fridge or freezer straight after leaving a port to save costs and turn them back on closer to the end destination. When the conditions are checked at that endpoint, the temperature may well be within the right parameters again but the quality of the products will have been affected already as the temperature parameters were not met throughout the entire journey.

**4. Manual processes**

A lot of manual processes take place at each handover. Paperwork needs to be filled out and signed or barcodes scanned manually. This information then needs to be fed back to the original manufacturer. Very often this information often doesn't make its way back to the manufacturer for days or weeks which leads to significant delays and extra hours spent consolidating this data.

**5. Lack of shipment updates for end customers**

E-commerce is becoming more popular each year due to the increased use of the internet. A lot of the products bought online come from overseas and it can take days if not weeks to arrive. The end customer wants to be updated or be able to track the shipment of their goods themselves, but accurate data is simply not available.

## 2.2 References


1. Christopher, M. (2011) Logistics & Supply Chain Management, 4th Edition, Pearson,Great Britain.

2. Ballou, R.H (2004) Business Logistics / Supply Chain Management, 5th Edition, Pearson, New Jersey.

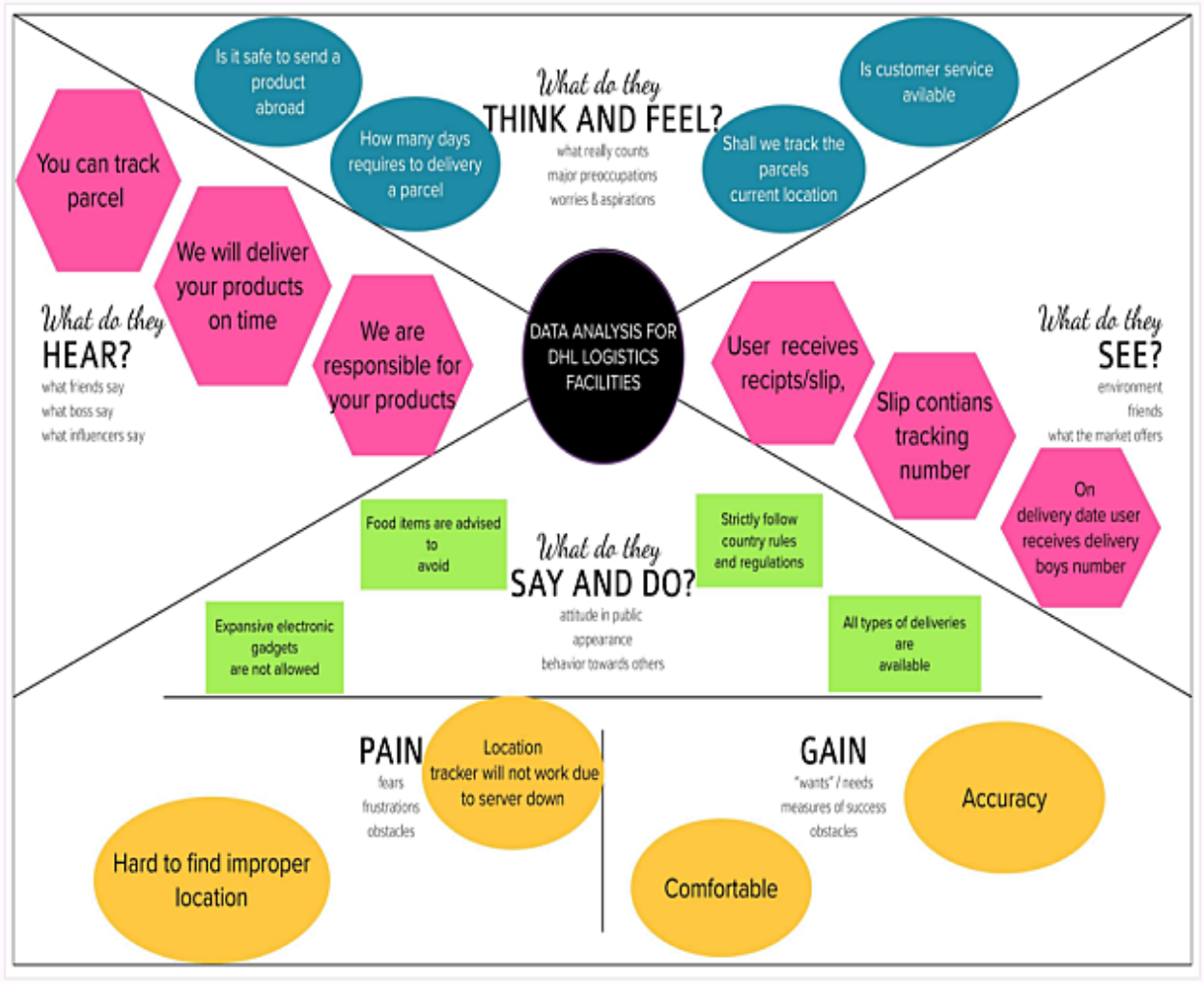
## 2.3 Problem Statement Definition

| S.No. | Problem Statement | Solution |
|---|---|---|
| 1. | Muthukumaran owns a professional DHL logistics company who wants deliver neat products to his customer who orderor sends package via his company ? | Optimize your inbound domestic groundtransport by leveraging dhl planning and execution capabilities including improved materials collection from suppliers and synchronized delivery at your manufacturing sites or warehouse. |
| 2. | M a r i a j a r s o n owns another company which deliverproduct at correct timebut damages the product ? | Remain focused on your core business byleveraging dhl unrivalled experience and expertise in the design, development, construction and management of logistics facilitie. |
| 3. | Iyyappan owns a company whodeliver product atirrelvent time which makes the customer disappointments and issue coming ? | But, there are some challenges of BigData encountered by companies.<br>These include dataquality, storage,lack of data science professionals, validating data, and accumulating data from different sources. |
| 4. | Ajith who orders product frequently for logistics andsuffers by package damageand searching for better logistics company for neat delivery ? | Increase the agility of your domestic ground distributionby leveraging dhl to plan and execute the delivery of your goods to point of storage, use or sale, usingfixed, dynamic or pre-scheduled routes. |

# CHAPTER 3

# IDEATION & PROPOSED SOLUTION

## 3.1 Empathy Map Canvas



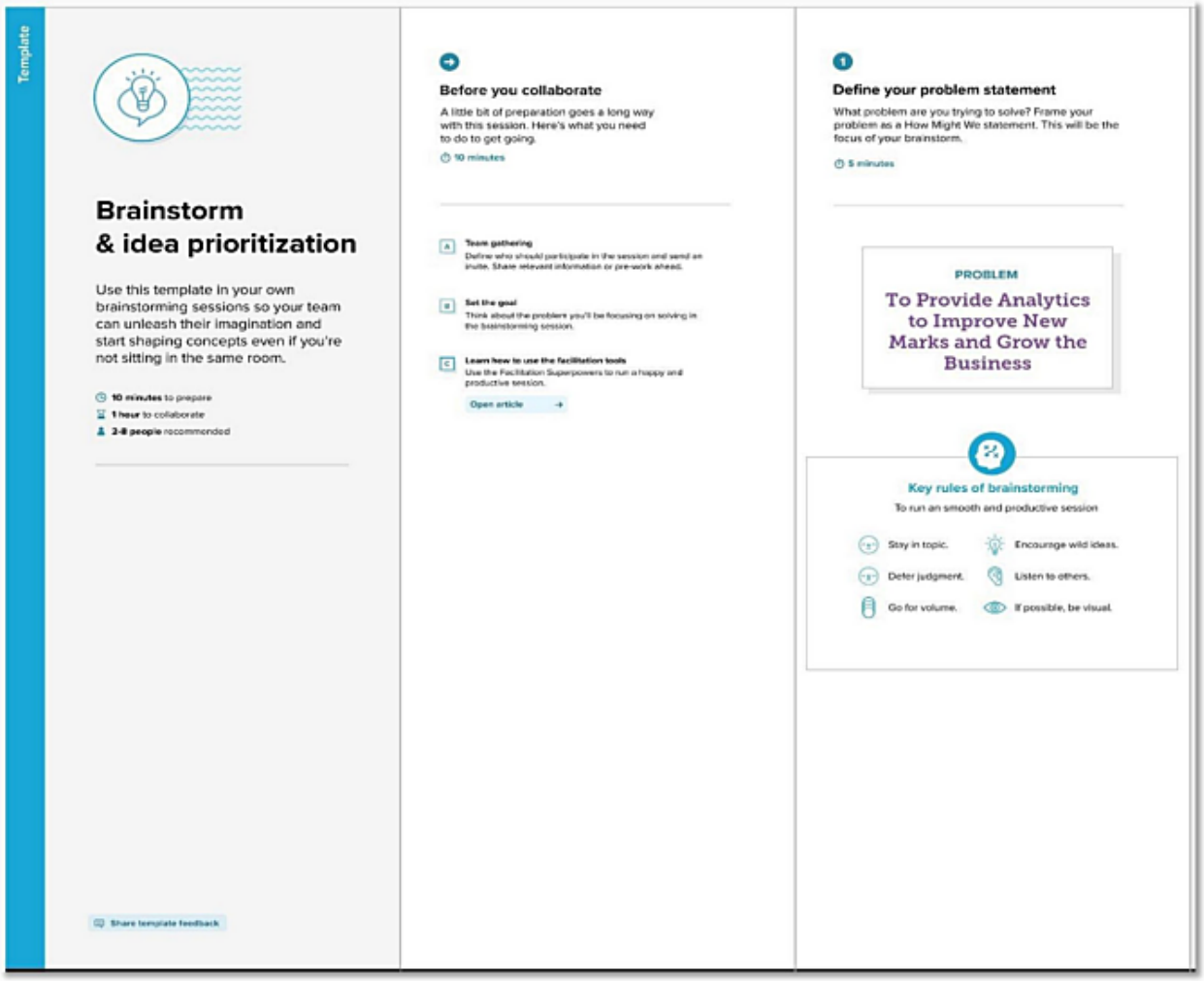
## 3.2 Ideation & Brainstorming

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.

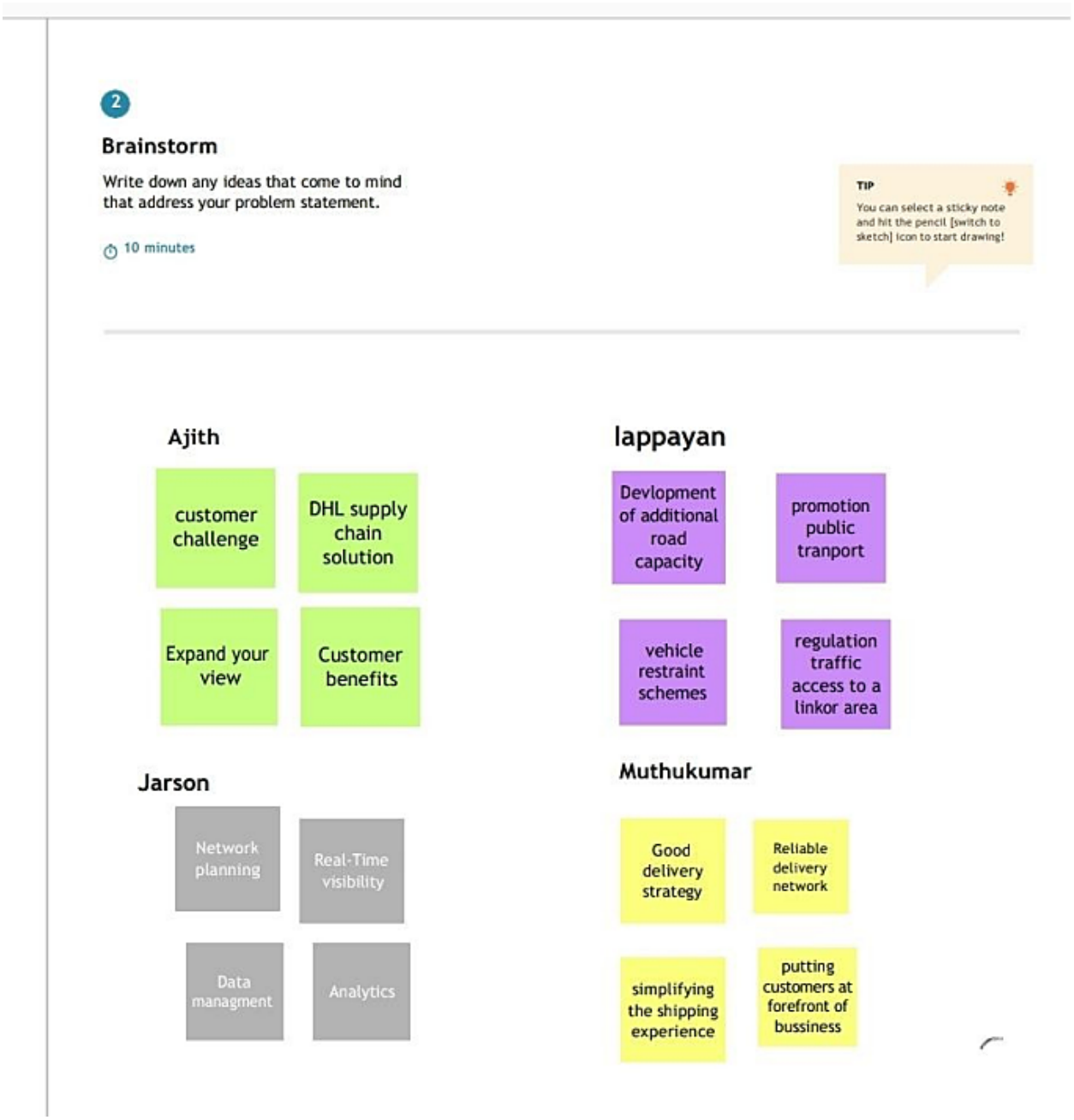
Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

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

**Step1: Team Gathering, Collaboration and Select the Problem Statement**



**Step 2: Brainstorm, Idea Listing and Grouping**



3

**Group ideas**

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

20 minutes

## Step-3: Idea Prioritization

## 3.3 Proposed Solution

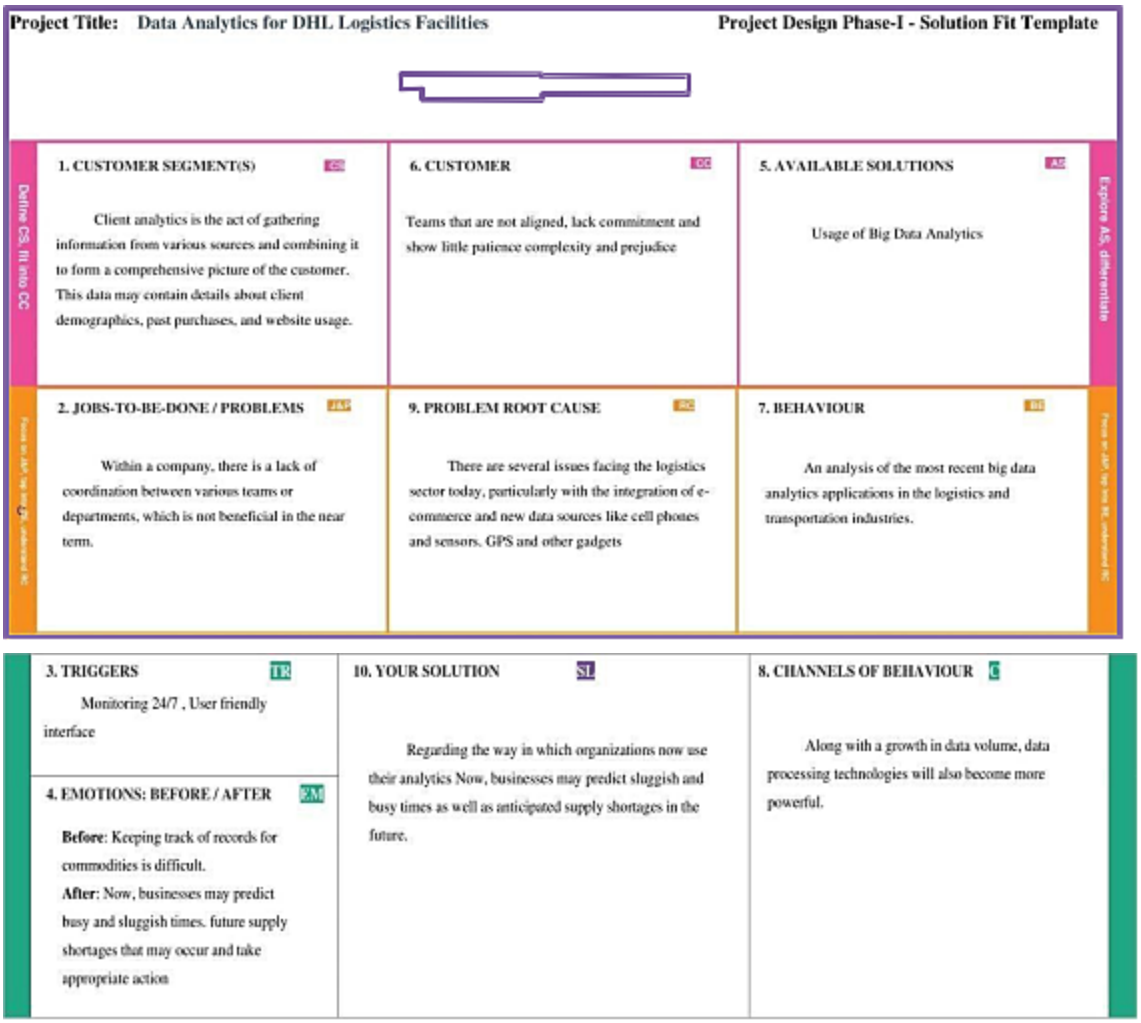
Project team shall fill the following information in proposed solution templates.

| S.No. | Parameter | Description |
|---|---|---|
| 1. | Problem Statement (Problem to be solved) | The biggest problems in the 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 everystep of the way. |
| 2. | Idea / Solution description | Perform the coding & solutioning, acceptance testing, performance testing based as per the Timelimit. |
| 3. | Novelty / Uniqueness | As a Thought leader in the logisticsindustry, DHL structurally invests in trend research and solution development.The nature of the workplace, work culture,and workforce are evolving. |
| 4. | Social Impact / Customer Satisfaction | Optimized way for Domestic and internationalparcel delivery to Target Location. |
| 5. | Scalability of the Solution | A Scalable solution allowing for changing demands&servicerequirements.Whatever your company's shape size,you will gain. |
| 6. | Business Model (Revenue Model) | Sales revenue model that makes money by mailservice, product delivery. |

## 3.4 Problem Solution fit

The Problem-Solution Fit simply means that you have found a problem withyour customer and thatthe 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.




## References:


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

# CHAPTER 4

# REQUIREMENT ANALYSIS

## 4.1 Functional requirement

Following are the functional requirements of the proposed solution.

| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
|---|---|---|
| FR-1 | User Registration | Registration through any google account or socialmedia accounts. |
| FR-2 | User Confirmation | Confirmation via EmailConfirmation via OTP |
| FR-3 | Dataset | The DHL_Facilities.csv record are collected as adataset and upload to Cognos analytics |
| FR-4 | Prepare/Analyse | The dataset is moved around to prepare andanalyse using Cognos |
| FR-5 | Exploration | The data are explored using logistics dataset byCognos |
| 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

Following are the non-functional requirements of the proposed solution.

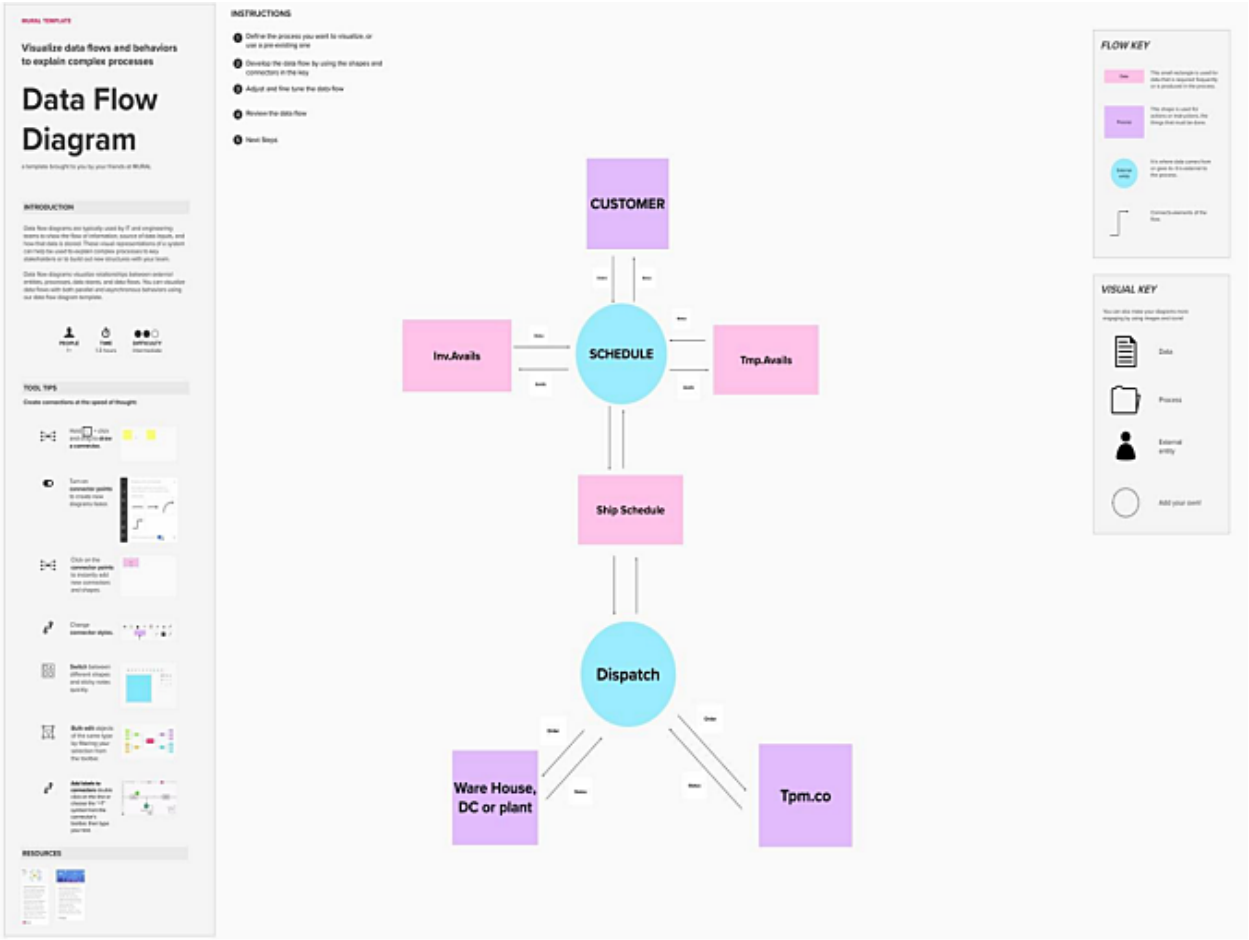
| FR No. | Non-Functional Requirement | Description |
|---|---|---|
| NFR-1 | Usability | No prior experience required to use the dashboard. People with basic understandingcan use the system. |
| NFR-2 | Security | Only registered user can use this application. |
| NFR-3 | Reliability | The Analytics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

# CHAPTER 5

# PROJECT DESIGN

## 5.1 Data Flow Diagrams

A Data Flow Diagram (DFD) is a traditional visual representation ofthe information flows within a system. A neat and clear DFD can depictthe 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.



## 5.2 Solution & Technical Architecture

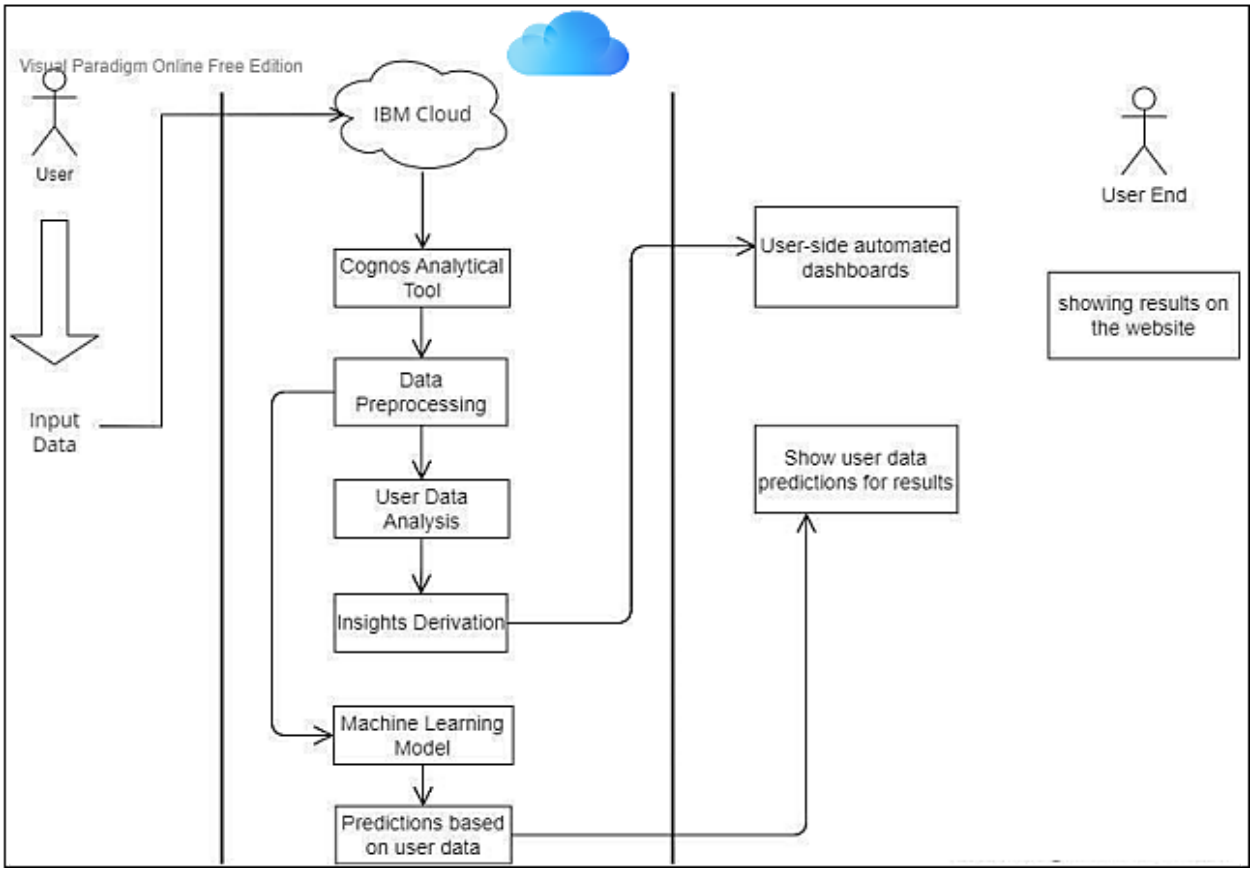


**Table-1: Components & Technologies:**

| S.No | Component | Description | Technology |
|---|---|---|---|
| 1. | User Interface | User uploads the csv or excel format files into the web pages | HTML, CSS, JavaScript |
| 2. | Application Logic-1 | The user data will pass into the IBM cloud for storing andacts as a data source | IBM cloud |
| 3. | Application Logic-2 | In cloud, data will be fetched by the Cognos analyticaltool for data analysis | IBM Cognos analytical tool |
| 4. | Application Logic-3 | The pre-trained Dashboards will be present to perform analysis 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 data is uploaded in cloud throughinterface | IBM Block Storage or Other StorageService or Local Filesystem |
| 8. | External API-1 | To perform data analysis on the user data | IBM Cognos Tool |
| 9. | External API-2 | To build the machine learning model for classification | Jupiter Notebook |
| 10. | Machine Learning Model | To do the predictive analysis on the input data | Predictive analysis model, etc. |
| 11. | Infrastructure (Server / Cloud) | Application Deployment on Local System / Cloud Local Server Configuration: Using the flask Cloud Server Configuration: IBM cloud | Local, Cloud Foundry |

**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, useof firewalls etc. | e.g., SHA-256, Encryptions, IAM Controls,OWASP etc. |
| 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 load balancers, distributed servers etc.) | Technology used |
| 5. | Performance | Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc. | Technology used |

## 5.3 User Stories

These are the user stories we generated using the traveler personas' needs and protections, and using the four information imperatives. (As the transportation system evolves, user stories may change, as might the degree to which user needs are satisfied. DOTs should continue to reevaluate these stories against the current technologies and the state of the system.)Using Similarweb's Sales Solution, DHL Express is able to identify prospects in a smarter way by quickly identifying eCommerce websites where the majority of traffic comes from their core market but a certain percentage comes from other geographical locations. If the prospect or customer is not yet shipping their products in a country where they are receiving significant traffic, the DHL Express Sales team reaches out to try to help these businesses expand to new markets. There is a clear value proposition that the prospect is missing out on sales from the country where they are generating significant interest. DHL Express can also show how competitor traffic may be increasing (from a specific overseas market) as a result of offering international shipping, as well as advising prospects on how to increase sales for their business, which is mutually beneficial.

Hundreds of reps across 60+ markets of the DHL Express sales teams are armed with the Similarweb insights they need in order to find, qualify, and win new e-commerce customers, by far the fastest growing area of DHL's business. Using Similarweb's Sales Solution, DHL Express has experienced a significant increase in new revenue, resulting in a 506% annual return on investment.

# CHAPTER 6
# PROJECT PLANNING & SCHEDULING

## 6.1 Sprint Planning & Estimation

| MILESTONES | TASKS |
|---|---|
| MILESTONE-1 | COLLECTION OF DATA KAGGLE |
| MILESTONE-2 | UPLOADING THE REQUIRED DATAON THE PLATFORM (IBM COGNOS) |
| MILESTONE-3 | EXPLORATION AND VISUALIZATIONOF DATA |
| MILESTONE-4 | CREATING THE INTERACTIVEDASHBOARD. |
| MILESTONE-5 | DISPLAY THE INSIGHTS IN THEDASHBOARD |
| MILESTONE-6 | PREPARE A STANDARDIZED DATASET AND USING THE DATA REQUIRED WITH THE HELP OF PYTHON PROGRAM |
| MILESTONE-7 | USAGE OF VARIOUS ALGORITHM TO OBTAIN THE DESIRED RESULT WITHMORE ACCURACY USING GOOGLE COLAB. |
| MILESTONE-8 | DISPLAY THEM IN THE REQUIREDFORMAT |
| MILESTONE-9 | DEPLOYED IN THE GITHUB |

### 6.2 Sprint Delivery Schedule

Use the below template to create product backlog and sprint schedule

| 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. | 10 | High | Ajith S<br>Muthu Kumaran |
| Sprint-1 | Login | USN-2 | As a user, I will receive confirmation emailonce I have registered for the application. | 8 | High | Iyyappan M<br>maria jarson R |
| Sprint-1 | Login | USN-3 | As a user, I can register for the applicationthrough Gmail and password in Cognos. | 8 | High | Maria jarson R<br>Ajith S |
| Sprint-2 | Analysing | USN-4 | As a user, I can use for uploading dataset, loadingthe dataset. | 10 | High | Iyyappan M<br>Muthu Kumaran S |
| Sprint-2 | Dashboard | USN-5 | As a user, I can prepare and explore the dataset. | 8 | High | Maria jarson M<br>Muthu Kumaran S |
| Sprint-3 | Working | USN-6 | As a user, I can view City Wise DHL Deliveriesof the given dataset | 8 | Medium | Ajith S Iyyappan M |
| Sprint-3 | Working | USN-7 | As a user, I can view Top N Deliveries State and City of the given dataset | 8 | Medium | Muthu kumaran S<br>Ajith S |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sprint-3 | Working | USN-8 | As a user, I can view Top 3 State Deliveries ofthe given dataset | 9 | High | Maria jarson RMuthu Kumaran S |
| Sprint-4 | Working | USN-9 | As a user, I can view Summary and Bar Chartof Deliveries using the given dataset | 10 | High | Ajith S Mut hu Kumaran S |
| Sprint-4 | Working | Sprint-4 | As a user, I can view Dashboard of Deliverystats using the given dataset | 10 | High | Iyyappan M |
| Sprint-4 | Viewing | Sprint-4 | As a user, I can view the steps and share thelink. | 10 | High | Ajith S Muthu M |

**Project Tracker, Velocity & Burndown Chart: (4 Marks)**

| **Sprint** | **Total Story Points** | **Durati on** | **Sprint Start Date** | **Sprint End Date (Planned)** | **Story Points Completed (as on Planned End Date)** | **Sprint Release Date (Actual)** |
|---|---|---|---|---|---|---|
| Sprint-1 | 20 | 4 Days | 24 Oct 2022 | 27 Oct 2022 | 20 | 07 November 2022 |
| Sprint-2 | 20 | 4 Days | 31 Oct 2022 | 03Nov 2022 | 20 | 09 November 2022 |
| Sprint-3 | 20 | 6 Days | 4 Nov 2022 | 9 Nov 2022 | 20 | 12 November 2022 |
| Sprint-4 | 20 | 5 Days | 11 Nov 2022 | 15 Nov 2022 | 20 | 17 November 2022 |

**Velocity:**

Imagine we have a 10-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 = Sprint duration/Velocity = 20/10 = 2**

# CHAPTER 7

# TESTING

## 7.1 Test Cases

In the role of Application Test Analyst, you will act as a validation and quality assurance professional across the different stages of the Testing lifecycle: you will develop, design and deploy test scripts and cases of complex modules, help set up the test environment and contribute to the requirements documentation and test design for different types of testing. The jobresponsibilitiesinclude testingall aspects of the application life cycle including but not limited to system, performance, regression and integrations.

- Work alongside project stakeholders to validate captured requirements and ensure business problems are correctly articulated, and proposed solutions are well understood and scoped

- Develop and implement both automated and manual testing procedures, including defining test plans to validate solution development

- Identify best practices for Software QA; partner with developers on ensure code quality and testability, and leverage resources inside (and when needed outside) the company to augment the QA work done within the department

- Conduct first line quality assurance activities, confirm products are ready for clients, and facilitate User Acceptance Testing (UAT)

- Support holistic testing efforts for multiple projects and software releases, including integration, system, regression, performance and user-acceptance testing.

- Develop, execute and maintain test plans, test scenarios, test cases and test scripts.

- Document and evaluate test results and defects, track and manage defects and work with Development team and business to troubleshoot issues.

- Provide testing estimates for assigned work.

- Establish and maintain traceability of requirements through test plans and cases.

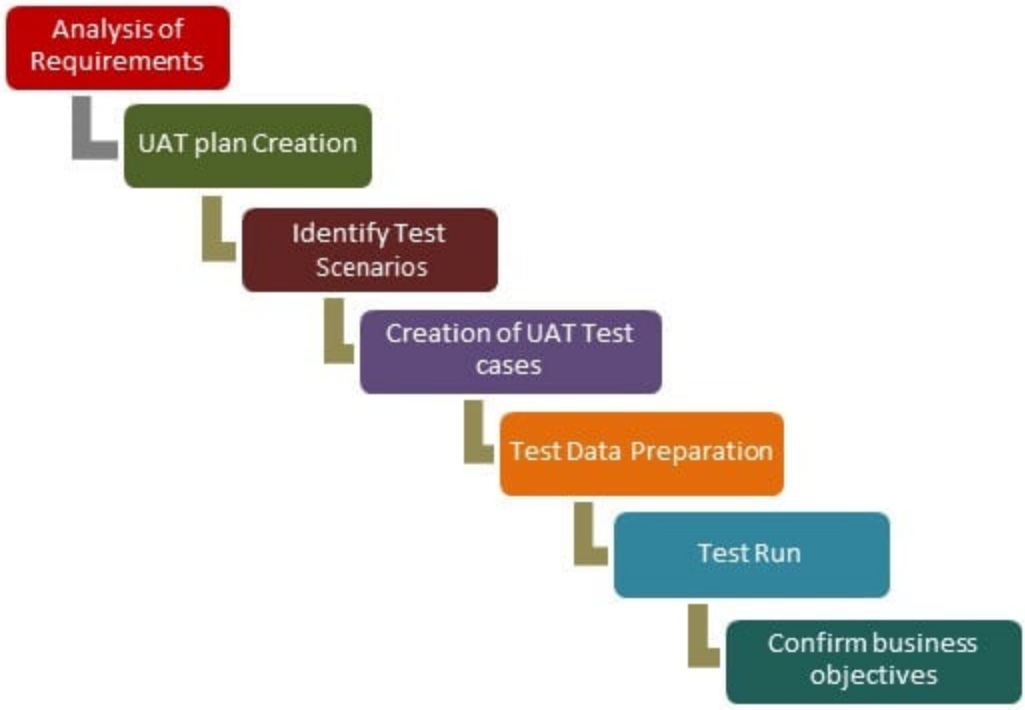
- Track and report on established metrics and KPIs for assigned projects.

- Assist the Software Development Engineer in Test in building and maintaining a stable and reliable automation infrastructure by providing functional and complete manual tests to be included in automated testing and in identifying candidates for automation tests.

- May be required to create basic script automation through point-and-click script recording and execution.

## 7.2 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.Business Requirements must be available. Application Code should be fully developed Unit Testing, Integration Testing & System Testing should be completed No Showstoppers, High, Medium defects in System Integration Test Phase Only Cosmetic error is acceptable before UAT. Regression Testing should be completed with no major defects. All the reported defects should be fixed and tested before UAT Traceability matrix for all testing should be completed UAT Environment must be ready Sign off mail or communication from System Testing Team that the system is ready for UAT execution.



# CHAPTER 8

# RESULTS

## 8.1 Performance Metrics

A logistics metric is a performance measurement that is used by logistics managers to track, visualize and optimize all relevant logistic processes in an efficient way. Among others, these measurements refer to transportation, warehouse and supply chain aspects.

The logistics industry produces huge amounts of data on a daily basis coming from warehousing processes, orders transportation, picking and packing, among others. That said, companies who benefit from logistics analytics solutions to improve their performance are the ones that will thrive in the long run. To help you accomplish this type of success, we put together a list of professional logistics metrics that will not only ensure that your business operational processes are running smoothly, but will help you optimize costs while still maintaining a quality service. If you want to extract deeper insights from these metrics, put them together in a logistics dashboard with the help of a professional dashboard tool and take advantage of powerful data visualizations.After realizing a benchmark of the average time you need to ship a certain type of order, you can set a target shipping time relative to each product to achieve.

# CHAPTER 9

# ADVANTAGES & DISADVANTAGES

## Advantages of the Logistics Facilities

Understanding the aspects of the logistics facilitties and the advantages that it can bring can be extremely insightful to your organization. Logistics has a series of advantages, which include the following:

**Enhanced Distribution Network –** When having a good logistics system, with different logistics operators, you are able to optimize the times along with the distribution chain. There are a variety of companies out there that are available to take care of your logistics needs at a national and international level.

**Costs Reduction –** Due to automated facilities and other globalized distribution systems, transport cost and handling costs are able to be reduced. A more efficient logistics chain will improve both final customer satisfaction and the service.

**Delivery Fulfillment –** Delivery fulfillment is extremely important to modern-day customers. In an era of instant-gratification, consumers are looking for their product the second they push the "buy" button. Through adequate logistical processes, delivery times have been greatly reduced as compared to a few years ago.

## Disadvantages of the Logistics Facilities

In the logistics sector, there are different aspects to consider that have a great influence. This can be globalization, technology, consumer evolution, legal aspects, or government policies. These aspects directly influence the logistics sector and may hinder its ability to thrive. Here are a few of the disadvantages pertaining to the logistics sector:

**Multinational –** One of the most consistent disadvantages pertains to the sector being covered with substantially larger companies. This makes it very difficult for medium and small companies to have access to this, due to the costs associated with it.

Cost of Transport – A greater distance to travel will only make the cost greater as well. This will make it difficult to get a competitive price. Transportation is by far the greatest cost of the logistics sector.

**Legality -** Barriers pertaining to entry and exit can also be a hurdle to overcome, considering that each country and state can have its own say on logistical practices. This is definitely a major concern for some areas within the United States, especially on some issues such as marijuana legalization.

# CHAPTER 10

# CONCLUSION

DHL companies can be counted as No.1 ranking in freight forwarding services in the world through air,ocean,road and rail worldwide. It has helped their customer a lot by reducing the cost, time and risk. DHL developed various and numerous innovation remedies to resolve and improve supply chain problems which faced by their customer.Logistics is one the most important and integral part of any organisations strategy and function. When the logistical process is carried out accurately then not only the company reduces the production cost but also improves the efficiency and customer satisfaction. Overall logistics management is very important for today's highly competitiveand cut- throat corporate world.

DHL has the worlds largest express and logistics Network. Over the past decades it had turned delivering goods into a finely oiled process. Be it a book, pen, WIP material, drugs, hazardous chemicals, clothes, documents, wild animals and any other thing underthe sun DHL delivers it . With a network spanning 200 countries and with its private fleet of airplanes, mobile vans, cargo ship carriers & even rail way automotives in some countries DHL can handle any type of goods. Not only that with international network there comesthe hassle of documentation and paperwork, standard packaging and other formalities toadhere to. But DHL has its own department which looks into the international laws and other formalities. In the end what maters is delivering good in good condition at the doorstep of the customer. A happy and satisfied customer makes the business grow.Competitors have come and gone but DHL has been able to keep its No 1 position intact.This is because of its dynamic nature and attitude of maintaining good customer relations. Logistics management is important for every organisation but more so DHL. I have tried to incorporate all the facets of logistics which propel DHL to the best delivery and carriage-service around the world.

# CHAPTER 11

# FUTURE SCOPE

Shifting demographics, technology advancement, digitalization, and the COVID-19 pandemic are greatly transforming work in the logistics industry. Humans working collaboratively with robots, flexible work systems, and continuous learning and upskilling will help businesses future-proof, stay competitive, and attract and retain the workforce – in spite of the current skilled labor shortage.

Building on findings from the last Logistics Trend Radar, DHL issued a global workforce survey that generated over 7,000 responses from logistics professionals early to mature in their careers for on-the-ground insight into the preferences, tools, environments, and expectations shaping the next decade to produce part one of the latest Trend Report.

Now, in part two, you'll see how an automated and augmented future will shape the future, with technology reducing manual tasks and improving efficiencies along six segments of the supply chain. The report also outlines three levers of success for managing the large-scale change management influencing the digitalization of work, with key considerations and practical guidance for ensuring employees are drivers of change as they adopt newly created roles. Gain new insights and prepare for what's next.

# CHAPTER 12

# APPENDIX

### Source Code GitHub & Project Demo Link

### Cognos Link

https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FDHL_Facilities%2BProject%2BAjith&action=view&mode=dashboard&subView=model000001841285aa61_00000000

### Source Code GitHub Link

https://github.com/IBM-EPBL/IBM-Project-43977-1660720910/tree/main/Data%20Visualizations%20Chart/Team_Lead

### Project Demo Link

https://drive.google.com/file/d/1_z6QSCi6QhEpRTEGXRcsSo_oPjim_QEi/view?usp=sharing