

Report on

Optimizing the delivery Process by implementing Fleet Management with IoT at Berger Paints Bangladesh Ltd.

By

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An internship report submitted to the Brac Business School in partial fulfilment
of the requirements for the degree of
Bachelor of Business Administration

BRAC Business School

BRAC University

January 2023

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Declaration

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

Student's Full Name & Signature:

Mohammad Muhtashim Fuad

ID-19204053

Supervisor's Full Name & Signature:

MD Hasan Maksud Chowdhury

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Brac University

Letter of Transmittal

MD. Hasan Maksud Chowdhury
Assistant Professor
BRAC Business School, BRAC University
66 Mohakhali, Dhaka-1212

Subject: Submission of the Internship Report on “Optimizing the delivery Process by implementing Fleet Management with IoT at BPBL.”

Dear Sir,

This is to inform you that I have completed the internship report Optimizing the delivery Process by implementing Fleet Management with IoT at Berger Paints Bangladesh Ltd., which has been prepared as a requirement for the completion of the BBA Program of BRAC University. I am fortunate enough that I have got an experience and efficient professional team in the organization. I have got an opportunity to work with them at different Departments to learn their process effectively.

I tried my level best to cover everything I have learned here. Finally, I would like to assure that I will remain standby for any clarification and explanation when required. Thank you in advance for your kind assistance. I enjoyed working on the report and hope you will consider all my mistakes generously.

Sincerely Yours,

Mohammad Muhtashim Fuad

ID- 19204053

BRAC Business
School

BRAC University

Date: January, 2023

Non-Disclosure Agreement

This agreement is made and entered into by and between Berger Paints Bangladesh Ltd and the undersigned student at BRAC University Mohammad Muhtashim Fuad, to eliminate the unlawful exposure of the organization's confidentiality.

Acknowledgement

First and foremost, I'd like to thank my supervisor, Hasan Maksud Chowdhury (Assistant Professor, BRAC Business School, BRAC University), for giving me with assistance and recommendations for writing this Final Internship Report, as well as for being helpful and informed about the Internship report. I'd want to thank him for his wonderful assistance, which gave me great confidence in the conclusion of my internship assignment.

I would want to express my heartfelt appreciation to the whole Department of Berger Paints Bangladesh Limited for providing me with a wealth of information, enough data, and lastly cooperating with me to successfully complete the report. I am extremely thankful to Mr. S.M Kamruzzaman (Distribution Manager) and my colleagues for their essential assistance and guidance in completing my internship report successfully.

I am really grateful to Berger Paints Bangladesh Limited and its Supply Chain Management Department, particularly the personnel of the whole Department, for your kind assistance in preparing this tough research including vital facts and data. Without them, I would be unable to perform this challenging duty. They provided me with all of the essential guidance, collaboration, and advice to help me achieve this difficult assignment.

Executive Summary

Berger Paints Bangladesh Limited is known for offering personalized service to its clients in a modern environment, and has set new financial standards in various industries including trade and foreign exchange since it was founded. The company has gained a strong reputation for these efforts.

The study's primary goal is to examine and assess Berger Paints Bangladesh Limited's Supply Chain Management practices and results by implementing Fleet management. In the paint sector, BPBL is the top brand and has the biggest market share. Modern technical tools are used by BPBL to manage every department. Data in BPBL are analyzed using SAP software. This program accomplishes the necessary task of expediting cash transactions and payments as well as providing more accountability, allowing the top management to make effective judgments regarding the degree of customer satisfaction.

Every department of the BPBL has a standard operating procedure (SOP). BPBL adheres to SOP with great rigor.

The supply management of BPBL and the Fleet management will be the main topics of this report. Three main units make up the supply management. the units responsible for the demand and supply plans, procurement, customer service, and distribution. The demand and supply plan unit focuses on maintaining customer satisfaction, identifying and addressing gaps in demand, developing trade and customer activity, and achieving consensus on demand planning. This unit works with valued dealers to achieve these goals.

The procurement section deals with choosing suppliers, buying raw materials, planning production, and carrying out production. The distribution channel and customer service are the main areas of attention for customer service and distribution. Distribution planning is based on the volume of production. One of the key factors taken into account while creating a new distribution and supply plan is the level of client satisfaction. Berger Paint Bangladesh Limited effectively manages all aspect of its business; as a result, it is at the forefront of Bangladesh's paint industry and looks forward to more successes and innovations.

Keywords: BPBL, SOP, Supply Chain

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List of Acronyms

BPBL- Berger Paints Bangladesh Ltd.

DCS- Dhaka Central Sales

CSD – Customer Service Department.

SCM – Supply Chain Management

EZ – Experience Zone

Chapter 1



Overview of the Internship

Chapter 1: Overview of Internship

1.1 Student Information

Name: Mohammad Muhtashim Fuad

ID: 19204053

Program: Bachelor of Business Administration

Major/Specialization: Operations and Supply Chain Management

Minor/Secondary Specialization: Human resource Management

1.2 Internship Information

1.2.1 Period, Name, Department, Address

Period: 01/09/2022 till 30/11/2022

Company Name: Berger Paints Bangladesh Limited.

Department/Function: Supply Chain Management

Address: 273-276, Tejgaon, Dhaka-1208

1.2.2 Line Manager

Name of Supervisor: Mr. S.M Kamruzzaman

Designation: Manager Distribution.

1.2.3 Job Description

The Supply Chain Management of Berger Paints Bangladesh Ltd. deals logistics management, warehouse, sourcing & modeling, demand planning & forecasting and asset Life cycle management which involves suppliers, warehouse, transportation, installers and chain stores. Additionally, BPBL is now focusing on lean Six Sigma project. To elaborate, now it concentrating on the efficiency through the minimization of waste errors and delays to accelerate the quality and the consistency by using this method improvement and variation reduction. This process involves prioritizing the customer, understanding the work being done, identifying and addressing the underlying causes of problems, streamlining processes by removing unnecessary steps, working effectively with team members, and using data to drive change while remaining adaptable. However, Berger creates some ways to manage these processes. For example, they try to evaluate the whole procedure from taking an order to customer satisfaction.

1.3 Internship Outcome

1.3.1 Contribution of Student

In the internship period at Berger paints Bangladesh Ltd, I accountable for observing the project name “Lean Six Sigma” for enhancing the delivery process of Berger Paints Bangladesh Ltd. First of all, the commitment of delivering the products in four hours was also an objective of the project and by ensuring the working is being done properly along with sorted the data in time was also my part. Moreover, the order placing system was also one of the problems at Berger paints Bangladesh Ltd. Dhaka central sales. So, by suggestion them an end-to-end mobile application also solved their problem dramatically. Finally, reducing the lead time was also one of my responsibilities.

1.3.2 Benefits to the Student

The most advantageous component of my internship was the opportunity to work in a professional setting with a team of specialists. As an extra benefit, I've learned a lot about the intricacies of the daily duties that must be completed to keep things operating properly, as well as the business culture. Not only did my time at Berger Paints Bangladesh Ltd. help me become a more self-disciplined and goal-oriented person, but it also helped me become a more competent decision-maker as a result of the invaluable experiences I gained there. For example, because of the continual push to start “Lean Six Sigma” project on time, I've grown better at dealing with pressure. Furthermore, I have improved my communication abilities. These benefits are in addition to the fact that I was able to contact with people from all around the world and develop new relationships. Finally, everything I've learnt has been practical to my profession in the garment industry; I've also met interesting people, managed difficult situations, and increased my own feeling of self-reliance. My involvement in this internship, I feel, will help me develop my résumé in preparation for future career prospects.

1.3.3 Limitations

- The study's main problem is a data shortage because the majority of the material was gathered from a departmental official who wasn't always available.
- The report mostly relies on secondary sources of information gathered from the business. Due to their commercial tactics, they did not want to give too much information. Most of the numbers provided here are estimates, which may somewhat deviate from reality.
- Another drawback of the study is that it had a limited amount of time.
- An issue might arise if a lot of items are delivered to dealer points since there won't be enough room for them to keep them.

1.3.4 Recommendations

- The company should consider increase the number of holidays than before to ensure employees mental health.
- Berger should hire expert employees in their concern departments so that they will get less errors.
- They should increase their technological involvement.

Chapter 2



Organizational Overview

Chapter 2: Organizational Overview

2. Introduction

An estimated BDT 30 billion is spent on paint in Bangladesh. Berger commands a market share of more than 56% in terms of sales volume, with net sales of BDT 17 billion (Uddin,2022). Some of Berger Paints' primary rivals in the local market are Asian Paints, Roxy Paints, Nippon, and Elite Paints. Bangladesh's industry is divided into three distinct categories-

- Decorative
- Marine
- Industrial

Decorative paints account for 84% of overall sales, followed by marine paints (approximately 12%). Most of the company's focus is on decorative paints (Alim, 2016). Due to the climate, the paint business tends to be slower in the July-September period, which is considered the "off season," but it is the third quarter for the company's accounting cycle (Zaman, 2020).

Since its humble beginnings in 1760, the corporation has gone a long way. Berger has also increased its presence in Nepal by establishing a second unit. Berger's sister firm in Bangladesh is now the market leader, with a sizable market share. Berger is the second largest paint business in India, despite its foreign expansion. Berger is the only provider of protective coatings to nuclear power plants. The corporation has operations throughout the Caribbean, the Middle East, South Asia, South East Asia, Africa, and the South Pacific. It has 30 paint manufacturing sites globally, serving clients from over 50 countries (Nasrin, 2019).

2.1 History of Berger paints

The Berger or Lewis Berger brand is now synonymous with color worldwide, although its history can be traced back to 1760 in England, when a young color scientist named Lewis Berger started producing "Prussian blue" using a proprietary process that was highly sought after by designers and homeowners. Berger improved the blue color technique and art, which was the color of many military uniforms at the time. He later changed the company's status by involving his family, and the company was renamed Berger & Sons Limited (Mukharjee, 2014). The company quickly gained a reputation for excellence in innovation and entrepreneurship, and grew rapidly by opening branches around the world and acquiring other prominent paint and coating production companies through mergers and acquisitions. The company continues to evolve and expand, driven by Lewis Berger's vision for innovation in the field of color and paints.

2.2 Berger Paints in Bangladesh

Berger Paints has been painting in Bangladesh since the country's independence. The firm serviced its clients to the best of its ability and attempted to satisfy their requests and expectations, transforming itself into the country's top paint solution supplier with a diverse product line that caters to all of your painting needs (Alim, 2016). Berger has touched practically every region of Bangladesh thanks to its extensive distribution network. The Nationwide Dealer Network, which is supported by 13 Sales Depots strategically located in Dhaka Central & North, Dhaka South, Fani, Brahmanbaria, Chittagong, Rajshahi, Khulna, Bogra, Sylhet, Comilla, Mymensingh, Barisal, and Rangpur, has an unrivaled capability to meet paint needs almost anywhere in Bangladesh (Nasrin, 2019).

2.3 The major milestones of Berger Paints in Bangladesh

Berger Paint began operations in Bangladesh in 1950 by importing paint from the United Kingdom. Berger Paint Bangladesh Limited was established in 1980 after the Chittagong factory was built in 1970. In 1999, the double tight can manufacturing process was established. Berger Paint Bangladesh established its own cooperative building in Dhaka in 2002, and a power coating plant in Bangladesh in 2004.

2.4 Business Principles

Berger Bangladesh has a very clear, comprehensible vision. Their fundamental guiding principle is to bring about change via innovation, and they are quite stringent when it comes to ethical behavior. They always strive to provide clients with services that are more valuable.

2.4.1 Vision

“To be the most preferred brand in the industry ensuring consumer delight.”

2.4.2 Mission

“We shall increase our turnover by 100% in every five years. We shall remain socially committed ethical company.”

2.4.3 Goals

Of the Paint: Profit Maximization and Sustained Growth.

Of the Customer: Maximum Benefit and Satisfaction.

Of the Society: Maximization of Welfare.

2.4.4 Tag-line

The tagline for Berger paint, which is used globally, is "**Trusted worldwide**". It conveys the message that buyers have confidence in Berger paint's promised quality.

2.5 Organization Structure

A Managing Director leads Berger, much like any other firm. Two general managers (General Manager of Operations and General Manager of Finance) and two Managers provide direct assistance to him or her (Manager- HR a Liaison Manager). MD is successfully managing the organization with the help of these four functional heads-

Fig. 2.5.1.1 Executive Management Team

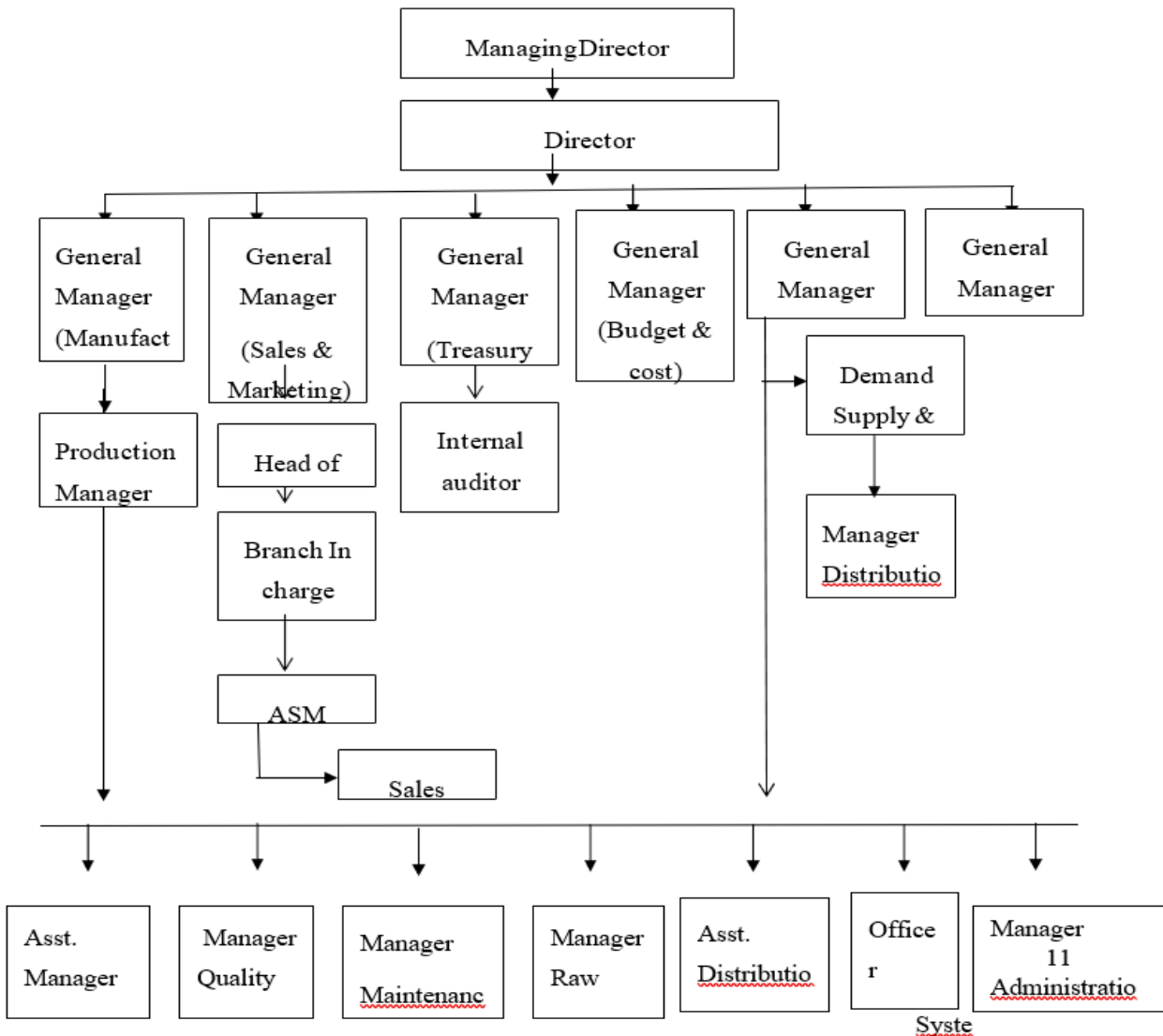


Figure 1- Executive Management team

2.6 Quality Policy

Berger's goal is to achieve excellent business excellence by understanding, accepting, meeting, and surpassing client expectations. Berger adheres to worldwide quality management standards to provide continuous product and service quality and customer satisfaction.

2.7 Product Description

The company's product line includes weather-resistant outdoor paints, Color-Bank, marine paints, textured coatings, heat-resistant paints, roofing compounds, epoxies, and powder coatings, all of which were pioneered by Berger Paints in the country. The company also offers illusions, Bangladesh's first designer paint solution (Zaman, 2020). To meet increasing customer demand, the company has developed Power Bond adhesive, Innova Wood Coating in partnership with Sherwin-Williams, Vehicle Refinish in collaboration with PPG-USA, and Tex-bond binder. Berger Color Paint places a high emphasis on product quality and invests heavily in product development through various research projects and technical engagement. It sources raw materials from leading companies such as Mitsui, Mobil, Dupont, Hoechst, and Basf. The company's modern factories and strict quality standards have allowed it to maintain high-quality products. The new Berger Paints Bangladesh Limited factory in Savar demonstrates the company's investment in technology and plant capacity, and the Double Tight Can manufacturing plant in Chittagong will further increase the company's ability to be a dominant player in the paint industry in Bangladesh. All of these efforts demonstrate Berger's commitment to the industry and its goal of establishing itself as a reputable center for basic and applied research in paint and resin technology.

2.7.1 Product Classification

Berger sells paints in our nation that are both solvent- and water-based. In addition to these, Berger sells emulsion and building chemicals. Berger also sells a limited number of 25 different varieties of powder coating paint. By taking into account numerous factors, paint can be categorized into distinct categories.

Painting is mostly of three types,

- Decorative
- Marine
- Industrial

In Decorative subdivision, the two main classifications are,

- Interior
- Exterior

From the application sequence, paints can be categorized as,

- Primer
- Under coat
- Finish coat

Paints can be alienated into two groups according to thinner/ solvent usage,

- Water-based
- Solvent-based

2.8. Practices of Supply Chain Management at BPBL

Industry 4.0 is transforming how businesses produce, improve, and distribute their products by incorporating advanced technologies such as the Internet of Things (IoT), cloud computing, analytics, artificial intelligence (AI), and machine learning into their manufacturing processes. Smart factories, which use sensors, software, and robots to gather and analyze data to aid in decision-making, are a key component of this transformation. When data from manufacturing processes is combined with data from corporate systems such as ERP, supply chain, and customer service, even greater value can be derived from previously separate information. A well-planned logistics 4.0 strategy is essential for linking manufacturing operations with a transparent and efficient supply chain, as industrial operations rely on it. This can change the way manufacturers acquire raw materials and deliver finished goods. For example, by giving suppliers access to some production data, manufacturing companies can better plan deliveries and redirect or delay them if necessary to save time and money. Predictive shipping, which involves evaluating data such as weather, transportation partners, and store data to determine the optimal moment to dispatch finished items to meet consumer demand, is another way businesses are using these technologies to improve their operations.

Blockchain is quickly becoming a crucial piece of technology for enabling supply chain transparency. However, BPBL has faced problem while they were implementing the logistics 4.0 and those are-

1. Successful IoT Adoption
2. Legacy Systems/Low Visibility
3. Client IT Integration
4. Defining KPIs
5. Increasing Globalization

2.8.1 Order taking Process

The order taking process of Berger paints Bangladesh Ltd. at Dhaka central Sales works in a smooth way with the help of customer service department. First of all, the customer service department takes the order from the dealers by phone call or by email. To elaborate, the customer service department has 7-8 team members who receives call from the authorized dealers and wrote down the orders. Secondly, they begin the order by writing date with customer code and then they write the product code alongside the quantity. Thirdly, they forward the papers to the customer service officer who turns those paper work as invoices with the delivery date and address confirmation

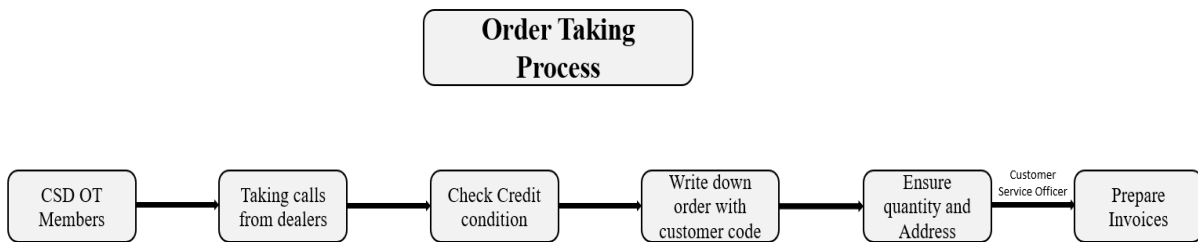


Figure 2- Order taking process

To complete this process BPBL needs collaboration of three departments and those are- Sales Department, Customer Service department, Accounts department.

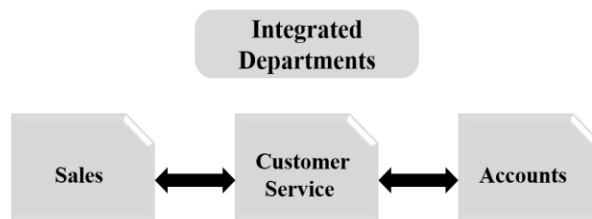


Figure 3- Integrated Departments

As the order comes by the sales team. Then the customer service department attend those. Finally, with accounts department confirmation the customer service team forward invoices.

BPBL Dhaka central sales face challenges while conduction the whole process are low visibility and lack of client IT integration. For example, the CSD team has 7-8 members who are taking calls and very few of the orders are coming from emails. So, that’s why the customers and CSD are receiving less interaction. Moreover, this scenario creates a condition where many of the customers face delay in placing the orders and they then blame the CSD for this. However, the reality is that the CSD cannot take too many phone calls in a single time. Which sometimes results lower order rate in that particular day. Additionally, there are no client IT integration. Although, this thing is completely depending on BPBL. So, to match up with Industry 4.0 standards and implementing logistics 4.0, they are trying to launch E2E app for the customers where they can easily place order and track the order condition over the app. BPBL has already taken few steps about this condition. Furthermore, they have assigned “Brain Station” for developing this app. According to the Supply Chain department of BPBL, this app will increase their productivity rapidly.

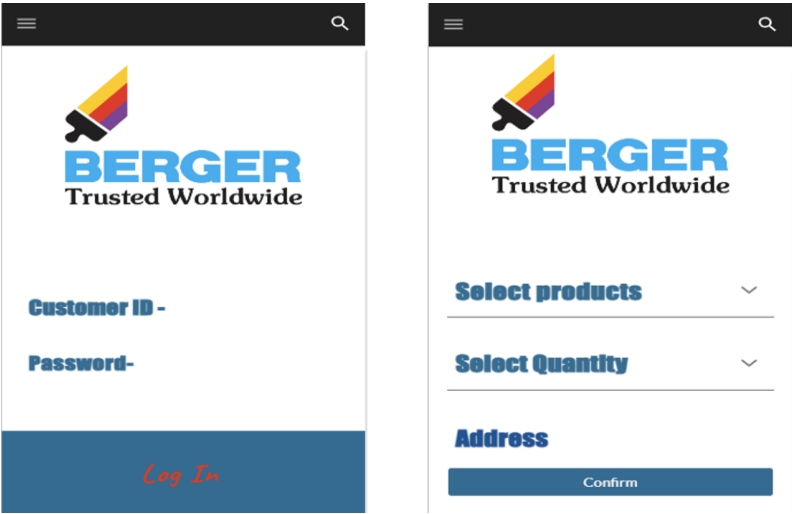


Figure 4- Application

After receiving the orders over the phone and emails the Customer Service department forward those to the supply chain department (Distribution) of BPBL Dhaka central sales. After that, the distribution team determines that either the product is directly available to the inventory or it is a special product. To elaborate, Berger has some special products named “Tinting” products which is being made by the mixture of some raw colors. For example, some colors like BUBBLE, LITTLE FLOWER, APPLE WHITE, BABY’S BREATH, HUSH BLUSH etc. If they receive this kind of products request then they forward it to Tinting depot and they proceed. Moreover, if the product is not special item, then they just forward the invoice to the supervisors of the picking team. The work flow looks like this-

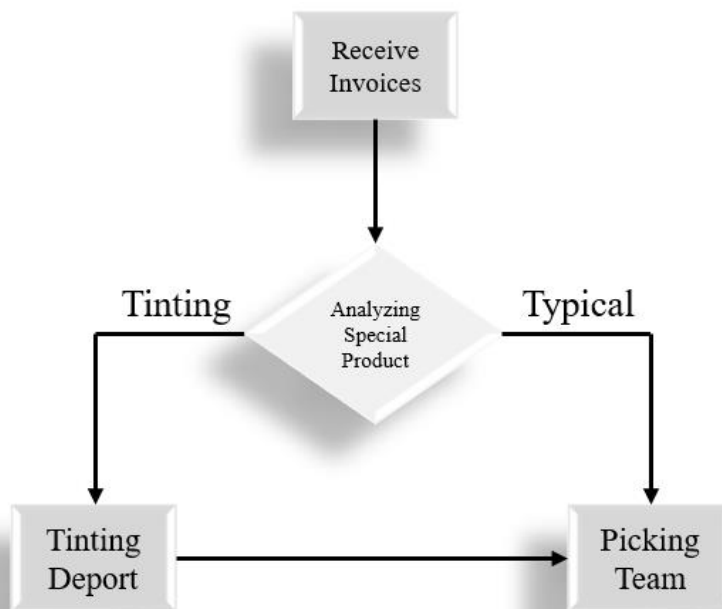


Figure 5- Analysis diagram

After receiving the invoices in the tinting depart, they took the product code and then they put the quantity and color code as an input in the software. Then, the bucket of raw color mixes with the assigned colors and converts into the expected color. Furthermore, the Tinting depart SSO then mail to the distribution team that the product is ready and the concern department assign the invoice to the picking team supervisor.

Frequently, organizations struggle to implement smart digital functionality in their transport logistics for human factors that are at least somewhat unrelated to technology. For instance, without first defining what success would look like, it is difficult to properly implement a Logistics 4.0 workflow. To enhance your ability to respond to disruptions, are you attempting to establish a more decentralized decision-making structure? Are you attempting to provide your clientele with digital capabilities with more value? Perhaps your goal is to develop an agile or lean supply chain. Whatever your objective, it must be specific and quantifiable. In order to make sure that your goals are still on track, it should really be accompanied by particular KPIs that you can measure and monitor over time.

2.8.2 Route Planning

Then Process of Route planning happens under the distribution department and the person who is concern at Dhaka Central Sales is the SSO route planner. The route of distribution DSC is almost all over the Dhaka city. However, Dhaka South and Dhaka North has some of the portions of Dhaka. To elaborate, Areas like Uttara, Demra are out of Dhaka central Sales area.

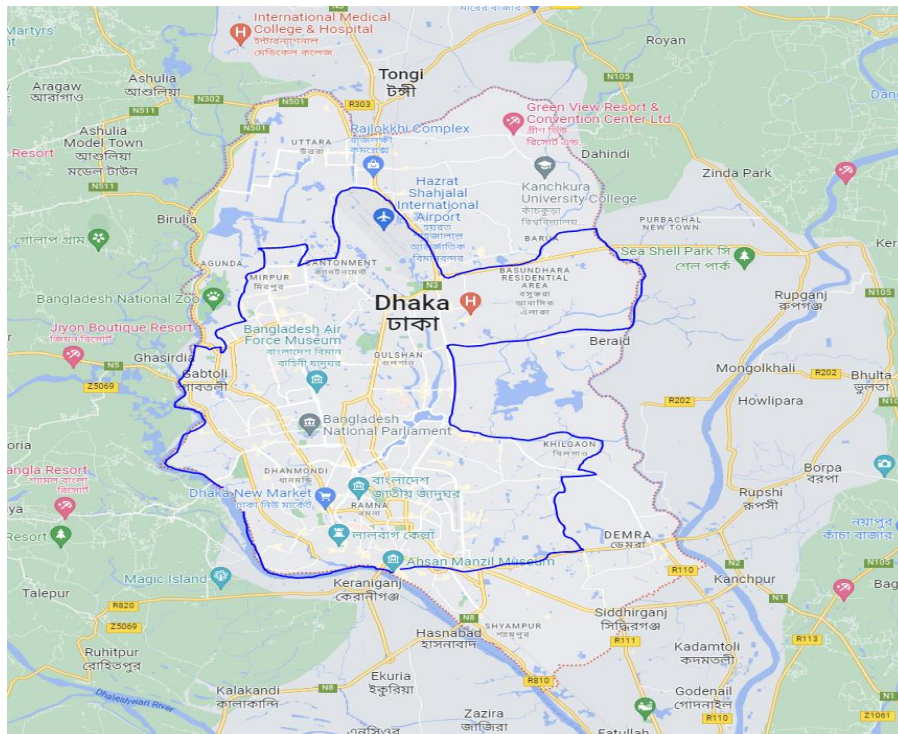


Figure 6-Route

The dealers of DSC are almost speared all over Dhaka so the route of product distribution depends of the invoice address. For example, after receiving the invoices the route planner decides which vehicle will carry the products and deliver to which particular area. The process is maintained by

an Excel file where they daily manage the serial of the vehicles and appropriate destinations of those. Moreover, there are few third-party vendors with 31 vehicles. The vendors are- Sufe Transport, Mahin Enterprise and Truck Lagbe. The Route of the vehicles can be change according to the demand of the products. The Vehicle serial Excel looks like this-

Sl	Vendor	Vehicle no	Size	Serial time	Area
1	Mahin		100		
2	Emu		250		
3	T.L		350		
4	Mahiu		550		
5	Emu		100		

Figure 7- Vendor Serial

The cost of delivering products is fixed. However, there is no separate payment for drivers, deliveryman. Everything includes in one payment. The rate of delivering products is 138 taka per kilometers. Delivery vendors place their bills after completing trips and they have to this. After assigning the routes the route planner put vehicle number on the token slips and forward the token to the picking team.

However, BPBP faces huge problem when they Imply logistics 4.0 as this process has any legacy system. Moreover, the main objective of supply chain face huge problem when it wanted to implement. To elaborate, this process has a mild capability of minimizes cost. So this process needs to enhance its capability and optimizing networks is one of the solutions here.

2.8.3 Picking

The picking team starts their work right after the route planning is done by the team. The supervisors of picking team of every gate receive invoices and then ask the team to collect the products according to the quantity. There are usually 8-9 gates in picking team. Additionally, there are 4 supervisors for those gates and 8 SSO for the helping them. The whole process is monitored by a token slip. Th slips looks like this-

Carrying Bill:	Date	Time	Responsible's Sign	Remarks
Route Planning Completed	01.09.22			RP
Picking Start Time				UD
Picking Completion Time		16:31		Picking
Truck Reported at Loading Point				Loading
Checking Start Time				
Checking Completion Time				
Loading Start Time				Checking
Loading Complete Time				
Truck Exit Date & Time				Truck Exit

Figure 8- Token Slip

First of all, the route planner put carrying bill number with date and time and assign specific fate according to the route. Secondly, when the token slips arrive at the gate then they started putting the release for delivery time. Thirdly, the gate supervisor asks the SSO to start the picking alongside write down the piking start time. Fourthly, after completing picking they fill up and also write down when the delivery truck report at the picking point. Finally, they started checking the products according the invoice and started loading the products in the truck. After that, they write down the loading start and end time and then before leaving BPBL the truck drivers left the token slips at the gate. There is standard time for completing each task. For example, the picking team should not take more than 30 minutes for completing the picking and checking start delay should

not exceed 5 minutes. Moreover, the loading start and finish time should be done within 10 minutes. Furthermore, the trucks are instructed to leave the picking point right after finish the loading process and within half n hour.

However, the picking team is doing good but not matching according to the standards of Industry 4.0 as logistics 4.0 asks for more reliability. For example, the token slips may seem like efficient but this is a manual process. It means there's less successful IoT adaption. It results less efficiency with time consuming matter for BPBL. Moreover, when the token slips process is being monitored manually then It requires more time and the chances of getting errors increase.

2.8.4 Unloading

Plenty of products are received by BPBL Dhaka central sales every day. The unloading process is also similar like the picking process. However, there are some minor differences. For example, unloading process has only 2 points or gates for the vehicles to unload products and there unloading time limitations varies as the larger vehicles requires more time to unload. There is an excel sheet which conduct the process.

9/25/2022		9:00		Unloading Kg/ManHrs (Today)			0		Total Man/Hrs Passed			128				
Gate No.	Headcount	Total G.Wt. Unloaded	Total Delay (Min)	Total Delay (Min)	Unloading Kg/Min	Description	Date & Time	Time (HR)	Description	Total G.Wt.	Total Volume (Gln)					
1	7	-	-	-	-	Unload Start Time	9/25/2022 9:00	8.53	Total G. Wt.	-	-					
2	8	-	-	-	-	Current Time	9/25/2022 17:31		Complete	-	-					
3		-	-	-	-	Predicted Completion	9/25/2022 17:31		Pending/ Ongoing	-	-					
4		-	-	-	-											
Total	15	-	-	-	-											
SL	Reporting SI No.	Date	Vehicle Number	Delivery Document Number	Split	Total Gross Weight	Count of Line Item	Status	Unloading Gate No.	Report at Unloading Point Time	Unloading Start Time	Unloading End Time	Unloading Start Delay	Time to Unload	Unloading Kg/Min	Delay Reason
1																
2																
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Figure 9- Unloading

This excel sheet shows how many peoples were needed to unload a vehicle and many more things. First of all, we can detect a vehicle according to its reporting number and it will show all the details. Secondly, how many gallons were unloaded we can also see that. Thirdly, what were the total unloading start time and end time we can have idea from that. Finally, we can also find out what were the reasons for delaying the process.

2.9 Fleet Management Tracking Dashboard

Fleet management is the online process to conduct the delivering process. Though the process is maintained by live excel sheet but the delay time always remain half n hour to one hour.

Check	Carrying bill No.	Route Planning Date	Route Planning Time	Release for Delivery Date	Release for Delivery Time	Gate No	SSO Name	Supervisor Name	Picking Start Date	Picking Start Time	Picking complete Date	Picking complete Time	Truck reach at gate Date	Truck reach at gate Time	Checking Start Time	Checking Completion Time	Loading Start Time	Truck Loading End Date	Truck Loading End Time	Truck gate Exit Date	Truck gate Exit Time
OK	242553	10/20/2022	9:38	10/20/2022	9:46	6	LIKHON	LOKMAN	10/20/2022	9:48	10/20/2022	9:56	10/20/2022	9:50	9:58	10:00	10:00	10/20/2022	10:04	10/20/2022	10:20
OK	242590	10/20/2022	12:22	10/20/2022	13:55	2	MOSTOFA	HRIDOY	10/20/2022	14:03	10/20/2022	14:24	10/20/2022	14:30	14:43	14:49	14:49	10/20/2022	14:51	10/20/2022	15:10
OK	242589	10/20/2022	12:40	10/20/2022	14:10	7	SALEK	KHOKON	10/20/2022	14:15	10/20/2022	14:25	10/20/2022	14:20	14:28	14:32	14:29	10/20/2022	14:37	10/20/2022	14:55
OK	242588	10/20/2022	12:28	10/20/2022	13:55	1	MOSTOFA	KHALIL	10/20/2022	14:05	10/20/2022	14:26	10/20/2022	14:25	14:28	14:30	14:28	10/20/2022	14:33	10/20/2022	14:45
OK	242587	10/20/2022	12:25	10/20/2022	13:30	5	SALEK	PAPPU	10/20/2022	13:33	10/20/2022	13:57	10/20/2022	13:40	14:04	14:10	14:05	10/20/2022	14:13	10/20/2022	14:35
OK	242544	10/19/2022	17:40	10/19/2022	17:42	3	MAMUN	KORIM	10/19/2022	17:45	10/19/2022	17:50	10/19/2022	17:50	17:53	17:55	17:54	10/19/2022	18:05	10/19/2022	18:05
OK	242763	10/23/2022	12:10	10/23/2022	13:58	2	MOSTOFA	HRIDOY	10/23/2022	14:05	10/23/2022	14:15	10/23/2022	14:19	14:20	14:22	14:21	10/23/2022	14:25	10/23/2022	14:40
OK	242762	10/23/2022	13:00	10/23/2022	13:45	5	MAMUN	PAPPU	10/23/2022	13:47	10/23/2022	13:53	10/23/2022	13:53	13:55	13:58	13:55	10/23/2022	13:59	10/23/2022	14:40
OK	242759	10/23/2022	12:00	10/23/2022	12:22	7	LIKHON	KHOKON	10/23/2022	12:27	10/23/2022	12:55	10/23/2022	13:10	13:03	13:08	13:13	10/23/2022	13:20	10/23/2022	13:40
OK	242760	10/23/2022	12:05	10/23/2022	12:30	1	MAMUN	KHALIL	10/23/2022	12:35	10/23/2022	12:57	10/23/2022	13:30	13:34	13:37	13:34	10/23/2022	13:40	10/23/2022	14:03
OK	242754	10/23/2022	11:38	10/23/2022	12:06	4	MAMUN	LITON	10/23/2022	12:06	10/23/2022	12:30	10/23/2022	12:36	12:36	12:37	12:36	10/23/2022	12:41	10/23/2022	13:20
OK	242758	10/23/2022	12:22	10/23/2022	12:40	5	MAMUN	PAPPU	10/23/2022	12:45	10/23/2022	13:00	10/23/2022	13:00	13:01	13:03	13:01	10/23/2022	13:07	10/23/2022	13:20
OK	242757	10/23/2022	11:20	10/23/2022	11:37	6	SALEK	LOKMAN	10/23/2022	11:40	10/23/2022	12:20	10/23/2022	12:50	12:35	12:41	12:36	10/23/2022	12:36	10/23/2022	13:10
OK	242756	10/23/2022	11:50	10/23/2022	12:10	3	MAMUN	RASHED	10/23/2022	12:14	10/23/2022	12:43	10/23/2022	12:30	12:44	12:48	12:44	10/23/2022	12:52	10/23/2022	13:06
OK	242755	10/23/2022	11:00	10/23/2022	11:38	2	MOSTOFA	HRIDOY	10/23/2022	11:43	10/23/2022	12:20	10/23/2022	12:35	12:39	12:45	12:40	10/23/2022	12:45	10/23/2022	13:05
OK	242752	10/23/2022	10:47	10/23/2022	11:05	1	MOSTOFA	KHALIL	10/23/2022	11:37	10/23/2022	11:58	10/23/2022	11:58	12:15	12:23	12:15	10/23/2022	12:24	10/23/2022	13:00
OK	242747	10/23/2022	10:55	10/23/2022	11:18	4	MAMUN	LITON	10/23/2022	11:20	10/23/2022	11:30	10/23/2022	11:30	11:43	11:44	11:43	10/23/2022	11:47	10/23/2022	12:35
OK	242751	10/23/2022	11:20	10/23/2022	11:37	7	SALEK	KHOKON	10/23/2022	11:42	10/23/2022	12:03	10/23/2022	12:00	12:06	12:10	12:07	10/23/2022	12:15	10/23/2022	12:30
OK	242750	10/23/2022	10:45	10/23/2022	11:00	3	MAMUN	RASHED	10/23/2022	11:16	10/23/2022	11:45	10/23/2022	11:49	11:49	11:52	11:49	10/23/2022	11:57	10/23/2022	12:15
OK	242749	10/23/2022	10:58	10/23/2022	11:15	5	LIKHON	PAPPU	10/23/2022	11:35	10/23/2022	11:35	10/23/2022	11:48	11:37	11:39	11:50	10/23/2022	11:53	10/23/2022	12:15
OK	242745	10/23/2022	10:42	10/23/2022	10:46	7	SALEK	KHOKON	10/23/2022	10:52	10/23/2022	11:20	10/23/2022	11:10	11:22	11:24	11:23	10/23/2022	11:26	10/23/2022	12:00
OK	242742	10/23/2022	10:10	10/23/2022	10:15	1	MOSTOFA	KHALIL	10/23/2022	10:20	10/23/2022	10:48	10/23/2022	10:48	10:51	10:55	10:52	10/23/2022	11:00	10/23/2022	11:15
OK	242743	10/23/2022	10:12	10/23/2022	10:30	4	MAMUN	LITON	10/23/2022	10:30	10/23/2022	10:44	10/23/2022	10:48	10:48	10:50	10:48	10/23/2022	10:55	10/23/2022	11:15
OK	242741	10/23/2022	10:30	10/23/2022	10:30	5	LIKHON	PAPPU	10/23/2022	10:35	10/23/2022	10:50	10/23/2022	10:40	10:52	10:54	10:53	10/23/2022	10:57	10/23/2022	11:15
OK	242739	10/23/2022	9:00	10/23/2022	9:05	1	MAMUN	KHALIL	10/23/2022	9:10	10/23/2022	9:20	10/23/2022	9:23	9:25	9:27	9:26	10/23/2022	9:30	10/23/2022	9:35
OK	242764	10/23/2022	12:15	10/23/2022	13:42	4	SALEK	LITON	10/23/2022	13:42	10/23/2022	13:58	10/23/2022	13:55	14:05	14:10	14:06	10/23/2022	14:13	10/23/2022	14:50
OK	242731	10/22/2022	16:29	10/22/2022	16:55	4	MAMUN	LITON	10/22/2022	17:15	10/22/2022	17:30	10/22/2022	17:30	17:30	17:33	17:31	10/22/2022	17:37	10/23/2022	8:35

Figure 10- Fleet

His excel sheet contains the same value as the token slips has. However, this thing shows us status about every order. For example, if we search an order by it carrying bill number the we can see when and how the order was delivered. To elaborate, according to the carrying bill number we can find out when the order was placed, how much time it required to complete the picking and when the truck left station. Moreover, we can see which supervisor and SSO were engaging with the product picking process which will help BPBL to find out any uncertainty at any time and will also help to discover what was the reason for any incident. Additionally, only by watching the

numbers it's difficult to understand what's going on so this excel also leads to a graph sheet where we can see results graphically. It looks like this-



Figure 11- Graph tracking

First of all, we can have idea about picking, checking and delivery status. For example, the red line in the picking start delay is the actual output of picking start delay and the blue line is the standard time for picking start delay. So, the X axis is for gate numbers and the Y axis is for time and easily we can see the variations among the gates. This results in, we can easily find out which gate is working well and which one is not working well. Same thing goes for the Vehicle Status. As we can see that it shows which vendors are doing good and which are not doing well. Finally, we can also conduct the output count and find out which gates are giving us maximum and minimum output.

2.10 Inventory Management

Dhaka Central Sales of BPBL is known as the national inventory of Bangladesh as many products are delivered from here. Additionally, the capacity of the wire house five lac gallons. The inventory has some separate parts for the products. After unloading the products, the works sort the products and rearrange those according to their desired places. To elaborate, there important category for sorting the inventory is traditional products, Berger Marine and Berger fosrock. All the products are placed on racks and pallets. If the products are in small size then the products are sorted 6 high in the pallets. On the other hand, if the products are big in size, then they sort the product 3 high. For example, all the product which are 18 L or more than 5 gallons are sorted in 3 high pallets. The marine products are arranged in a different side of the inventory. Additionally, Berger Fosrock products are also stored in a separate area but they are always kept inside of a box and has better packaging. The most selling item in BPBL is Berger wall putty so that product acquires the most of the area of inventory. In the peak time Dhaka Central sales inventory remains fully loaded and sometimes they have to arrange products outside of the inventory. However, managing products in the inventory is also played an important role. So, they manage the inventory by a software called SAP. Here they can update and manage their inventory. For example, after delivering the products according to the invoices the products got deducted from the inventory by the software and by doing PO (pay orders) they can add products in the inventory. Moreover, they can also see which inventory has what quantity of products. Furthermore, they also run a physical count of each product in every two weeks for extra safety.

However, BPBL has to face some problems regarding managing the inventory because the IT integration is not that well as only 3 people can join SAP at a time which sometime lead them to problem.

2.10. Undelivered & Returned Products

Undelivered products are those products which are not delivered for some reason. To elaborate, when a customer places an order and if something error happens then sometimes the products get undelivered. For example, after placing an order if a customer changes the order or cancels the order the products remain undelivered. Additionally, there could be some unavoidable incidents which leads to UD. For instance, when a worker is loading the truck with products and all of sudden if a product got damaged then that product remains undelivered for some time. On the other hand, some returned products are also known as UD. They are considered as UD because sometimes our delivery van went to the customer but customer sometimes don't accept the product with claiming some reason. Furthermore, if a product is expired or got damage while delivering then they also consider as return item and undelivered products.

According to the industry 4.0 standards the main reason for UD is low visibility. Moreover, All the cutting-edge technology in the world won't enable you to enhance your logistics operations if you don't have a high level of visibility. Every touchpoint throughout the value chain needs to be connected to every other touchpoint via digital infrastructure in order to reach the kind of visibility we're talking about. When efforts to increase visibility fail, legacy systems and data silos that refuse to interact with modern technology are frequently important contributing reasons. Because of this, businesses aiming to implement a Logistics 4.0 framework should examine every aspect of their IT infrastructure to make sure that each part fosters connection and visibility throughout the whole network. If not, you'll be forced to make judgments in the future on the basis of crucial (but unavailable) operational data.

2.11 Forecasting

Picking team and unloading team always face a problem of how many workers should they hire every day. But most of the time they fail to predict that for good sales or bad sales. For example, if they hire 10 workers and the sales go up then there will delay in delivering the products and unloading. Same scenario goes for the bad sales situation. This scenario results some problems like extra costing as sometimes they hire more workers for that particular day. To solve this problem by forecasting-

Date	workers	sales	
1-Oct-22	11	15	
2-Oct-22	14	21	
3-Oct-22	9	11	
4-Oct-22	5	9	
5-Oct-22	15	25	
6-Oct-22	11	14	
7-Oct-22	11	16	
8-Oct-22	15	19	
9-Oct-22	17	29	
10-Oct-22	17	26	
11-Oct-22	11	16	
12-Oct-22	11	15	
13-Oct-22	17	24	
14-Oct-22	12	15	
15-Oct-22	13	18	
16-Oct-22	17	19	
17-Oct-22	17	28	
18-Oct-22	17	26	
19-Oct-22	16	21	
20-Oct-22	16	21	
21-Oct-22	16	22	
22-Oct-22	17	25	
23-Oct-22	15	21	
24-Oct-22	19	28	
25-Oct-22	19	33	
26-Oct-22	20	35	
27-Oct-22	21	39	
28-Oct-22	22	34	
29-Oct-22	23	42	
30-Oct-22	24	49	
31-Oct-22	25	51	For workers
1-Nov-22			23
2-Nov-22			23
3-Nov-22			23
4-Nov-22			24
5-Nov-22			24
6-Nov-22			25
7-Nov-22			25
8-Nov-22			26
9-Nov-22			26
10-Nov-22			26
11-Nov-22			27
12-Nov-22			27
13-Nov-22			28
14-Nov-22			28
15-Nov-22			28
16-Nov-22			29
17-Nov-22			29
18-Nov-22			30
19-Nov-22			30
20-Nov-22			31
21-Nov-22			31
22-Nov-22			31
23-Nov-22			32
24-Nov-22			32
25-Nov-22			33
26-Nov-22			33
27-Nov-22			33
28-Nov-22			34
29-Nov-22			34
30-Nov-22			35

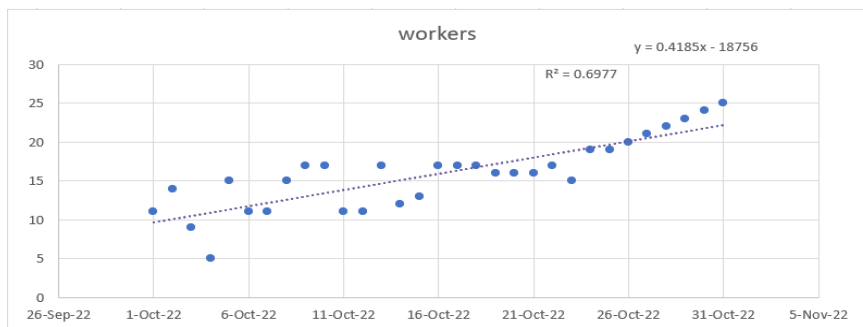


Figure 12- forecasted Graph

2.12 Developed Fleet Management Dashboard

While working in BPBL I observed some issues which later I tried to solve with my own knowledge. To extravagant, the whole delivery system was conducted but how many vehicles and what was their daily costings were never discussed. Moreover, after discussing with the worker they shared their experience how the vendors got the whole money in the trips. So, I made a fleet management tool which can identify every details. The developed fleet management looks like this -



Figure 13- Advanced fleet

This sheet can help Berger in many ways. First of all, it can be defined vendors and months according to their need. Secondly, it can show us what was the total expense in a particular month and how many trips were made by that vendor. Thirdly, we can define drivers and buddies

(delivery man) wages separately. Finally, this can give update about how many trips were made according to the truck size.

However, this sheet could solve some problems but to cope up with the logistics 4.0 they need to enhance more to remain themselves compatible by their KPIs. The reasons why companies fail to implement smart digital capabilities in their transport logistics are, at least in part, not technological but human-related. For instance, without first defining what success would look like, it is difficult to properly implement a Logistics 4.0 workflow. To enhance your ability to respond to disruptions, are you attempting to establish a more decentralized decision-making structure? Are you attempting to provide your clientele with digital capabilities with more value? Perhaps your goal is to develop an agile or lean supply chain. Whatever your objective, it must be specific and quantifiable. In order to make sure that your goals are still on track, it should really be accompanied by particular KPIs that you can measure and monitor over time.

2.13 Industry and Competitive Analysis

2.13.1 Porter's Five Forces Analysis

Understanding the type and amount of competition, as well as how Berger Paints can handle it, will be made easier with the aid of Porter's five forces analysis.

New competitors' Threats > **Low**:

The risk of new entrants is minimal in the paint sector since there are several obstacles that one must overcome when starting a new company. Also, to build a new factory with a functional paint production facility, a sizable amount of cash is needed. According to one supplier of machinery from China, a set of such plants with a capacity of 100,000 tons per year can create paint for about \$50,000. After generating the basic product paint, additional machinery is also needed for things like container production, labeling, weighing, etc.

Suppliers' Purchasing Power > **Low**: Numerous providers are available worldwide in the age of globalization. It is just not possible for a supplier to set his own prices. Since multiple departments often handle supply chain management and procurement, the organization will likely identify alternatives. The supplier therefore has little negotiating leverage.

Buyers' Purchasing Power > **High**: In the market, there are several paint brands. Brands vary in the advantages they provide. The buyer is entirely free to select any brand from those offered on the market that best suits his or her demands. Since there is no changing fee, a client may easily transfer brands if they feel that the brand, they were previously using was unsatisfactory. Pricing is subject to the same rules. Customers are more inclined to choose the cheaper option if a brand is much less expensive while still offering high quality. Because of this, the paint business has very strong consumer negotiating power.

Alternative Product Threat>**Low**: As was already said, buyers must use paint in order to meet their coloring requirements. Therefore, paints cannot be substituted. As a result, the industry that manufactures paint faces little danger from replacement goods.

Intensity of Competition>**High**: In the paint production sector, there is intense competition among competing companies. The characteristics and advantages that each brand offers to customers vary. One business chooses a wide range of colors, another provides higher durability, and still another offers a cheaper price. Each business battles with the rival for market share.

2.13.2 SWOT analysis

Strength

Having a reputation as a pioneer in the paint business, Berger Paints Bangladesh is regarded as one of the top paint manufacturers worldwide. In the paint industry, Berger is a well-known name brand that has been in operation for more than 300 years. Although most clients are unaware of this fact, it nevertheless serves as free advertising. One of Berger's primary advantages is that people embrace the brand without much reluctance thanks to the perception that it is the industry pioneer. Moreover, Berger has established a vast supply chain with 7 sales offices and more than 1000 dealers due to Bangladesh's extremely weak rural communication infrastructure. According to a study, Berger's extensive distribution network touches 63.2% of the population of the nation (Distribution Coverage Study of the big corporations). As a result, BPBL's sales channel administration must be considered a strength. Besides, Berger is one of the oldest companies and a leader in the paint business. Berger has a significant presence in every market area, both from a paint category and customer perspective. It has a robust and stable financial foundation, giving the business the freedom to take greater risks and flexibility when making financial decisions.

Weakness

The leading brand of paint is Berger. Nearly 50% of the market for the entire sector belongs to Berger. The corporation has become overconfident in its market position as a result of its enormous market share and the dearth of suitable competitors in the industry, which is shown in their reluctance to appear on foreign satellite channels. Basically, the company's issue is that they are overconfident. Also, Worldwide, Berger has long been regarded as a high-end brand. Dealing with a high-priced product in a third-world nation like Bangladesh and maintaining the top market share is a big problem. Customers in metropolitan areas are aware of and capable of evaluating the correlation between premium pricing and premium quality. The only thing a consumer in a semi-urban or rural region knows is pricing. People in semi-urban and rural areas steer clear of the brand due to lack of understanding and lesser money. If the justification for the extra price could be explained to them with clarity, a sizable market share may be attained. The dealers are mostly responsible for Berger's dissemination. A single dealer may represent two or even more brands. Because paint is a commodity that is not frequently discussed, customer understanding and usage are somewhat reliant on dealer advertising. The dealer can advertise the brand that has become more beneficial for him to sell.

Opportunity

Bangladesh's paint industry is expanding. because the real estate industry has been promoted and industrialized. After a certain period of time, paint must be reapplied. For example, ornamental interior paints need to be replaced every three years. Customers are consistently kept in business by the paint's short lifespan. Products from Berger are thought to be expensive. This attitude of semi-urban and rural clients has already been mentioned as a factor in Berger losing a significant portion of the market. A sizable market may be attracted if the idea could be conveyed towards semi-urban and rural clients that Berger products are expensive primarily due to the high quality of their products.

Threats

Berger's business is becoming a bit more challenging as new global corporations enter in the sector and provide their goods at a very low price. Due to their inexperience, the new businesses have not yet posed a significant challenge to Berger, but if they get sufficient expertise, they will. The paint industry is mostly a credit-driven industry. Berger is opposed to the notion of financing its operations using debt. The majority of Berger's merchants only accept cash. Dealers, on the contrary hand, like to provide the item on credit wherever possible. The new businesses are already taking advantage of this chance and providing the dealers with enormous quantities of items on credit. The effect is that the brand that the dealers may purchase on credit is being promoted. The new brands don't pose a significant threat because they aren't yet particularly well-known.

2.14 Summery and Conclusion

Berger Paints Bangladesh is one of the big players in the paint market of Bangladesh. Furthermore, they are enhancing their working capabilities and environment regularly for their own betterment. Additionally, they have more than 60% of the paint market share. Moreover, they are expanding their steps in every place in Bangladesh. However, they also need to look at their competitors also. As, the other big competitor has better market in India so that could be a threat fore them in future.

2.15 Recommendation

- Berger Paint should redesign its sales process. It may be reorganized by hiring more salespeople, expanding its distribution network, enhancing end-user activities, visiting markets often, and improving contact with circulation.
- Its fundamental sales processes, such as gathering orders, creating bills, indexing bills, making thrashing plans, and queuing up things for automobile loading, should be automated.
- Security stockpiles in the product should be handled to guarantee the prompt distribution in response to Customer requests for the items.
- The business should research new industries. They also need to lessen their reliance on specific brands for ornamental purposes. Additionally, they want to increase their business with building firms and broaden their sales depot nationwide.
- It must continually be mindful of the dealership development rate, use creativity to find bogus claims, and keep vigilance over their actions.

Chapter 3



**Optimizing the
delivery Process
by implementing
Fleet Management
with IoT at -
Berger Paints
Bangladesh Ltd.**

Chapter-3 Project Part

3.1 Optimizing the delivery Process By implementing Fleet Management with IoT

3.1.1 Background

Fleet firms rely on razor-thin profit margins because to rising fuel and vehicle maintenance expenses. IoT in fleet management may help lower and control total expenses by making better use of resources like as cars, gasoline, spare parts, and so on. Fuel economy, driver productivity, and reducing in-transit damage to carried items must all be improved in supply chains. Let us begin by discussing how to optimize fuel supply and transport loads. Sensors can assess load capacity to offer extra information about spare capacities in trucks traveling specified routes. The space capacity along a defined route may be determined using a dashboard. This will increase fleet efficiency, minimize deadhead miles, and enhance fuel economy. A connected fleet may also open the path for predictive asset lifecycle management (Donaldson, W. A. (1966).). Driver monitoring in real time is critical for optimizing fleet runtime. IoT can help drivers' health and safety by alerting them to weariness when driving long distances. By integrating sensors and IoT, fleet telematics can monitor the position, movement, status, and behavior of a vehicle within a fleet. It must be assured that drivers are not too weary to safely operate the vehicles. Furthermore, in order to confirm that the trucks are operational 24 hours a day, a smartphone app on the operator's phones can track the number of hours a driver has spent behind the wheel as well as fuel use. Connected logistics organizations may save a lot of money since crowded routes can be avoided entirely by tracking devices and sensors, resulting in lower fuel costs and lower prices for damaged products due to delivery delays.

3.2 Objective of the Report

Broad Objective

The key objective of this report is to optimize the delivery process of Berger Paints Bangladesh Ltd. by fleet management to reduce cost and time.

Specific Objective

- To enhance relationship with Customer end while placing the order by managing Fleet.
- To reduce cost of workers with forecasting by managing fleet for picking and unloading.
- To Ensure customer satisfaction after implementing fleet management in different situation.

3.2.1 Scope of the study

The economic growth of the nation has been significantly aided by Berger Paint Bangladesh Limited. This report includes a comprehensive review of Berger Paint Bangladesh Limited's most intricate and foolproof process of supply chain management align with fleet management as well as the areas that may be strengthened to help the company remain a leader in the fiercely competitive paint industry.

3.2.2 Literature Review

The effective operation of logistical operations depends on fleet management. It entails ensuring that the fleet's regulatory compliance, resource and fleet utilization, and total transportation expenses are all at their highest levels. A fleet may become more agile and experience higher customer satisfaction and revenue growth thanks to all of these strategies. The goal of the discipline (and profession) of fleet management is to run fleets more cost-effectively while maintaining performance and customer relationships (Warren and Huseyin, 2002). Basically, Procurement, maintenance, safety, budgeting, and monitoring of a collection of vehicles are all included in the definition of "fleet management." It goes without saying that each of these elements is crucial to a company's success as well as to the safety of its employees and fleet. You can monitor every part of your fleet with the use of a comprehensive fleet management system, which will also alert you when action is required. This will enable you to address issues before they become unaffordable (Nair and Millar, 2011).

Fleet management enables you to lower expenses, improve operational effectiveness for your company, and enforce compliance across your entire fleet. Also, Companies focus on fleet management so that they can have control over the fleet of assets & enhance fleet performance in order to maximize efficiency, reliability, accountability, security, and minimize costs. Besides, the goal of fleet management is to give the business a way to control its assets by keeping track of all the many process factors. A successful logistics company is unimaginable without effective fleet management. It entails a variety of duties, including maintaining cars, improving driver health and safety, and tracking vehicles. Its primary goals are to raise customer happiness while lowering costs and increasing production and efficiency (Lin et al, 2018).

The fact that fleet management increases productivity for your company is one of the key reasons it is so significant. It is simpler to keep track of everything that occurs inside your company when you have a productive system in place. By doing this, you can make sure that every step goes off

without a hitch. Besides, Fleet management is essential since it lowers operational expenses for businesses, which is another reason why it's so vital. Having a productive system in place makes it simpler to keep records of everything that occurs inside your company (Warren and Huseyin, 2002). In this manner, you'll be able to steer clear of any unneeded blunders or issues that can result in rising prices later on. Keeping track of your costs will be simpler as a result. This will enable you to control how much money your company spends on various expenses. Additionally, it offers real-time vehicle tracking and monitoring so that you can guarantee prompt client service and delivery of items (Rudyk, 2018). This increases customer loyalty, which lowers the rate of customer turnover or retention and lowers the cost per acquisition, or CPA, while also raising levels of client satisfaction and sales volumes (cost per acquisition).

besides Fleet management solutions have transformed how many firms operate from beginning to finish, considerably reducing operating costs while dramatically increasing efficiency. This creates potential to further cut operating costs while significantly increasing efficiency (Mauro and Silvio, 2012). Businesses may organize, monitor, & coordinate their fleets through fleet management operations to increase productivity and save expenses. Over the past two decades, fleet management has advanced, and more organizations are now adopting technology to oversee their fleets more effectively.

3.3 Methodology

The data for the study were collected following several ways

Primary Data: Primary Data were gathered mostly by -

In person conversation was conducted with Line manager, the further stuff of Berger Paint Bangladesh, retailers and its dealers.

Secondary Data: Secondary data sets were acquired from older research articles, several publications on Berger Paint Bangladesh Limited, various books to learn about various terms, and

the company's official websites. Berger Paints Bangladesh Limited's SOP (Standard Operating Procedure) book.

3.4 Finding and Analysis

Delivery Time variations by Fleet Management

Berger promised their customers that they will deliver within four hours inside Dhaka and after implementing the fleet we can see the changes-

Table 1- Avg. delivery time without fleet

Date	Without Fleet Management
10/26/2022	6
10/27/2022	7
10/28/2022	5.9
10/29/2022	6.2
10/30/2022	7.1
10/31/2022	8
11/1/2022	4.9
11/2/2022	5.9
11/3/2022	6.5
11/4/2022	6
11/5/2022	6.98
Average Time	6.41

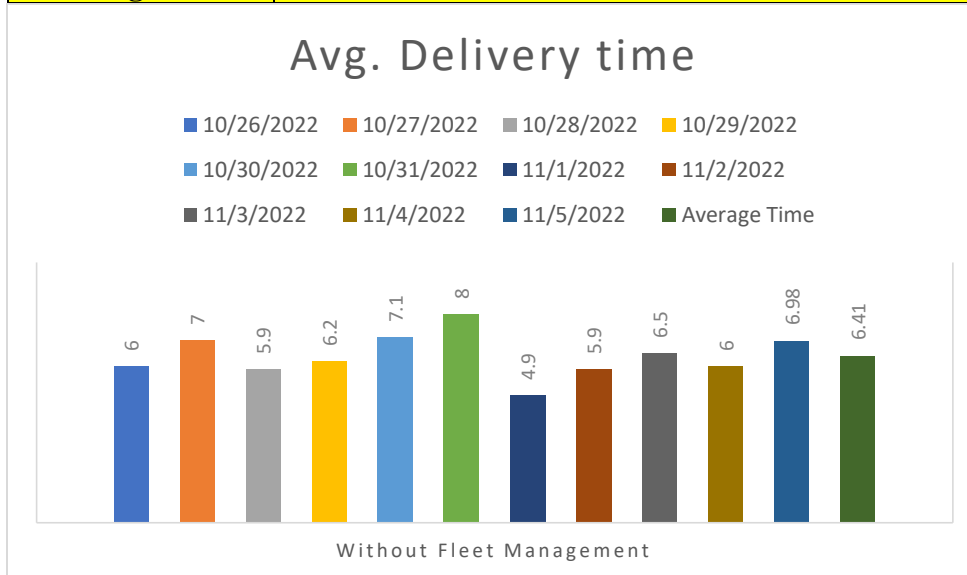


Figure 14- Avg Delivery time without fleet

Table 2- Avg. delivery time with fleet

Date	With Fleet Management
10/15/2022	4
10/16/2022	3.5
10/17/2022	3.5
10/18/2022	5
10/19/2022	4.5
10/20/2022	4
10/21/2022	3.9
10/22/2022	4.2
10/23/2022	4.8
10/24/2022	4
10/25/2022	3.78
Average Time	4.11

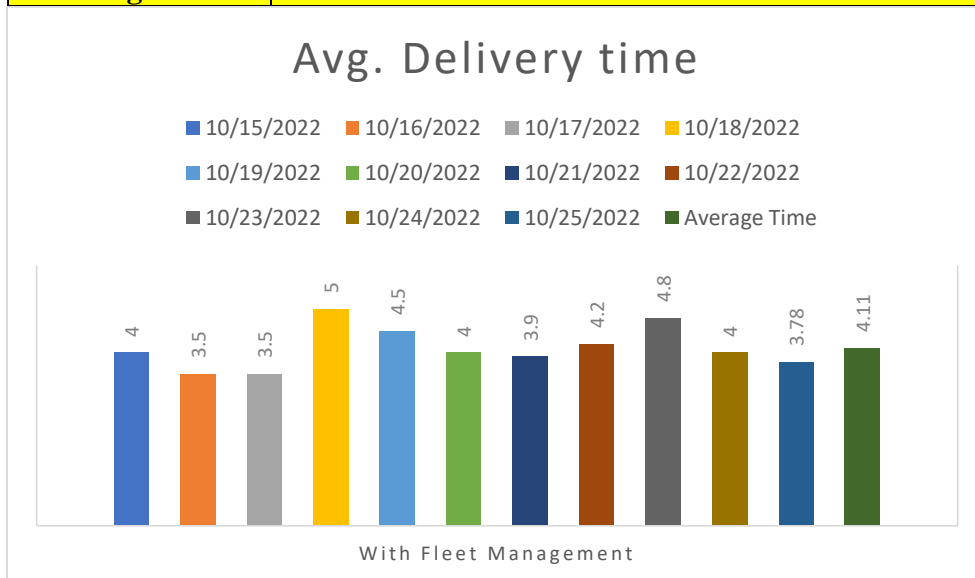


Figure 15- avg. delivery time with fleet

These graphs tell us how fleet management affect the delivery process of BPBL and the average delivery time without fleet is 6.41 but with fleet is 4.11 hours which is close to their expectations. However, these delivery process also includes order placing, picking-loading and loading.

3.4.1 Order placing time variance after fleet

Previously, the order taking process was slow and for this reason we proposed a better way of placing the orders by an end-to-end app service which. We collect some data after the test run of that app –

Table 3- Time comparison

Vendors	Before fleet required Avg. time	After fleet required Avg. time
Nishi Hardware	7	2
Delwar Paints	12	3
Mayer doa Ent.	9	2
Habib Hardware	17	3
Joti Hardware	15	2
Bhai Bhai Hardware	9	2
Sultan Ent	10	3
Rodela Hardware	9	2

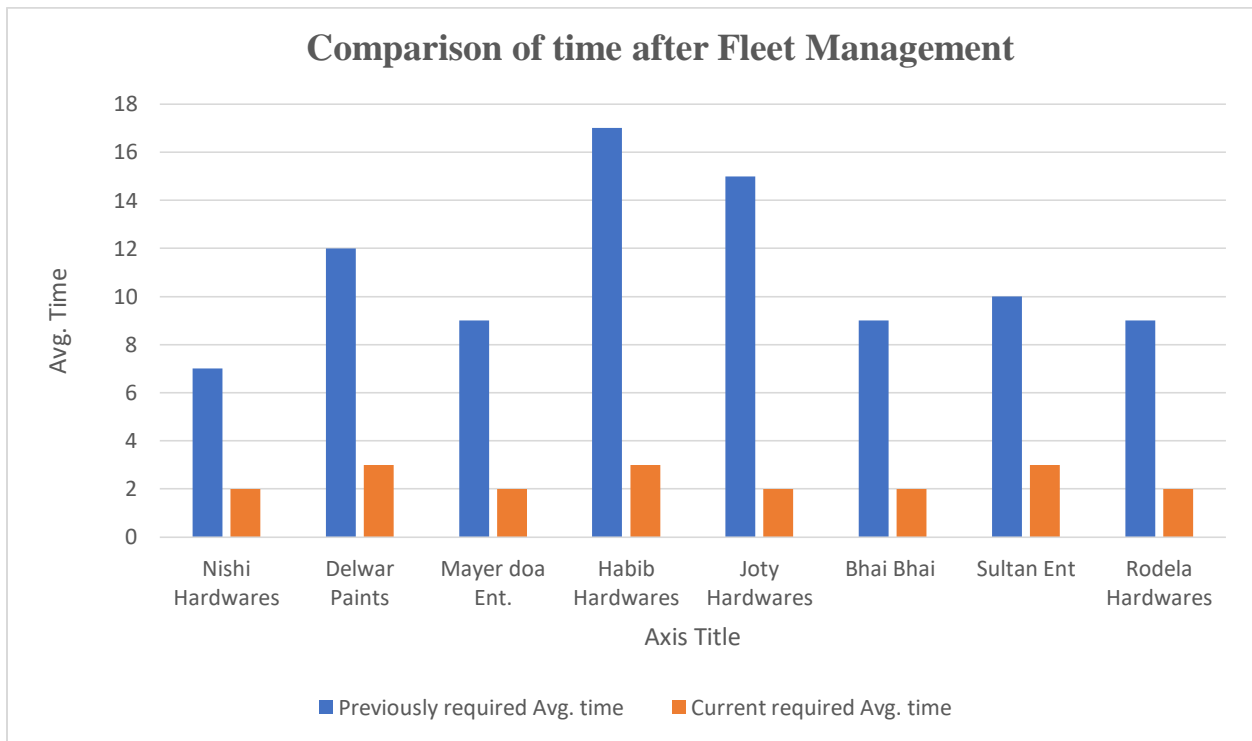


Figure 16- Time Comparison

3.4.2 Picking Checking and Loading after fleet

After getting the order the main problem was the workers spent many times on picking and arranging the orders so the token system and the fleet management of picking team monitors each and every action. As a result, it reduces the picking and arranging time. Here we can see the results-

Table 4- Order processing

Duty	Previously required Avg. time	Current required Avg. time
Avg. Picking time	31	12
Avg. Checking time	10	4
Avg. Loading time	14	5

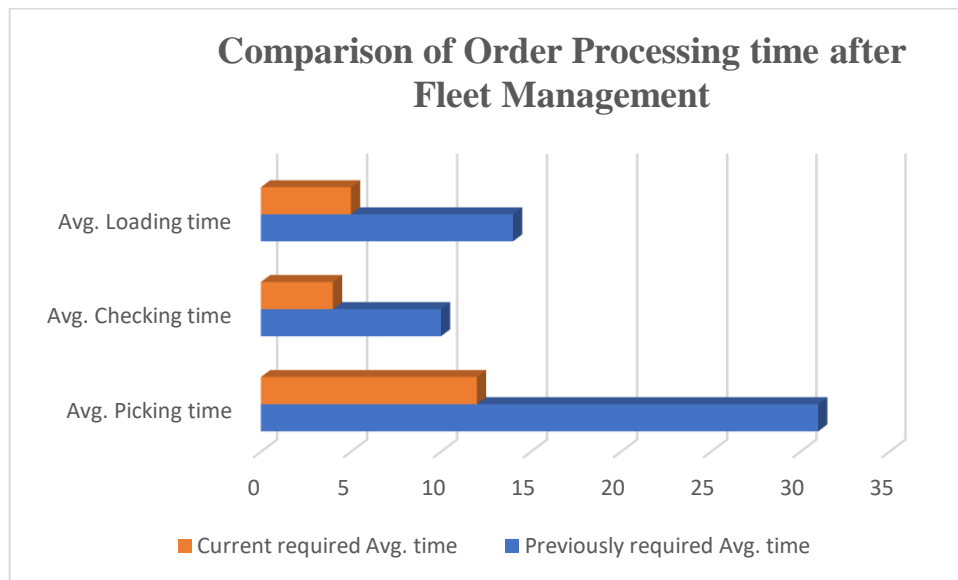


Figure 17- Order Processing time Comparison

3.4.3 Unloading

Unloading was one of the major problems in BPBL so we also managed a fleet management so that we can reduce the unloading time –

Table 5- Unloading Time

Truck Size	Previously required Avg. time	Current required Avg. time
1.5 Ton	59	38
3 Ton	80	55
4 Ton	101	67
5 Ton	132	90

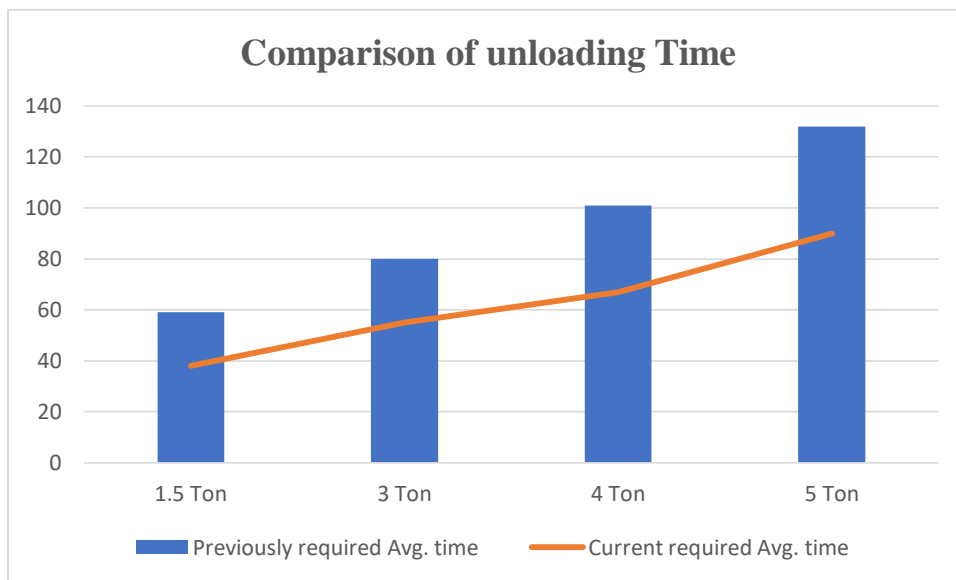


Figure 18- Unloading time comparison

3.5 Results of advanced fleet management

Previously it was hard for the BPBL to manage the delivery vendor with proper costing. So, we come up with a better fleet management process where they can easily track their spending and reduce their cost in proper way-

Table 6- Cost Comparison

Distribution cost of 30 days	Existing	Proposed
Drivers Salary	398,115	154,436
Helper and delivery man's Salary	120,257	94,315
DA of Driver	63,400	28,020
DA of Delivery Man	6,500	7,500
Maintenance cost	228,065	165,435
Fuel Cost	638,115	91,473
Total cost	1,454,450	541,043

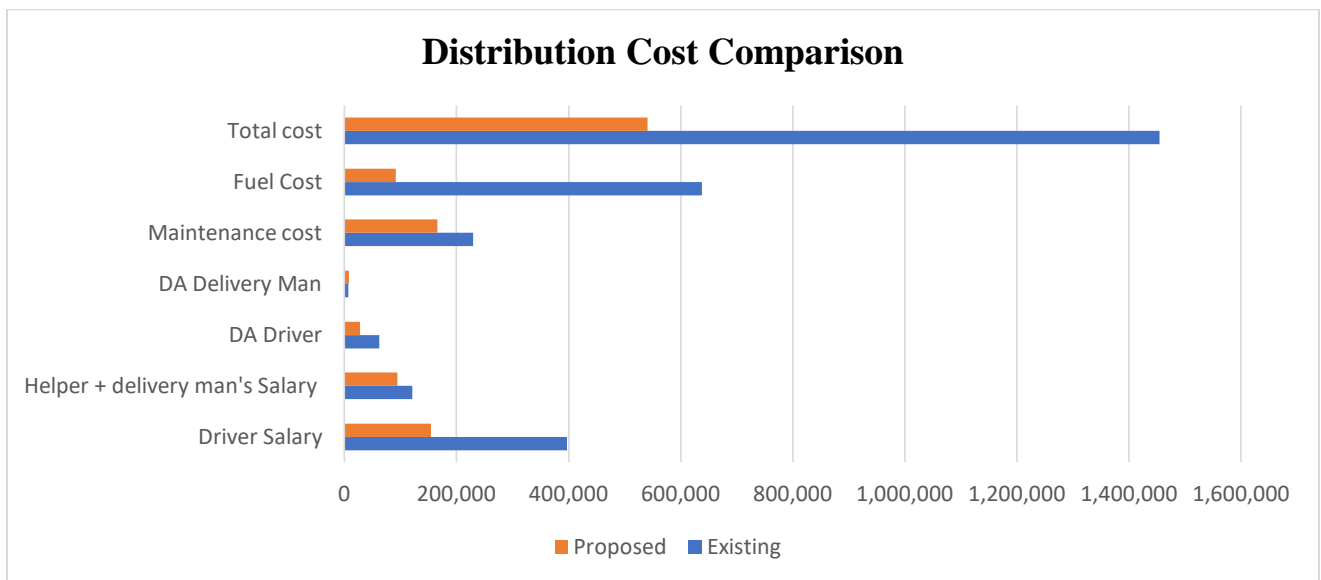


Figure 19- Cost Comparison

3.6 Effects of Fleet Forecasting

The forecasting process leads to decrease the extra costing of hiring workers in a particular day

Table 7- Forecasting

Day	Workers Cost Before Forecasting	Workers Cost After Forecasting
1	14415	8289
2	8835	8248
3	8835	8208
4	6975	8167
5	8835	8126
6	8370	8086
7	9765	8045
8	9765	8004
9	8835	7963
10	8370	7923
11	6975	7882
12	7440	7841
13	8835	7801
14	6975	7760
15	8835	7719
16	8835	7679
17	9765	7638
18	9300	7597
19	10695	7557
20	9765	7516
21	11625	7475
22	10230	7435
23	10230	7394
24	9765	7353
25	5115	7312
26	12090	7272
27	13485	7231
28	3255	7190
29	11160	7150
30	4185	7109
Total	271560	230971

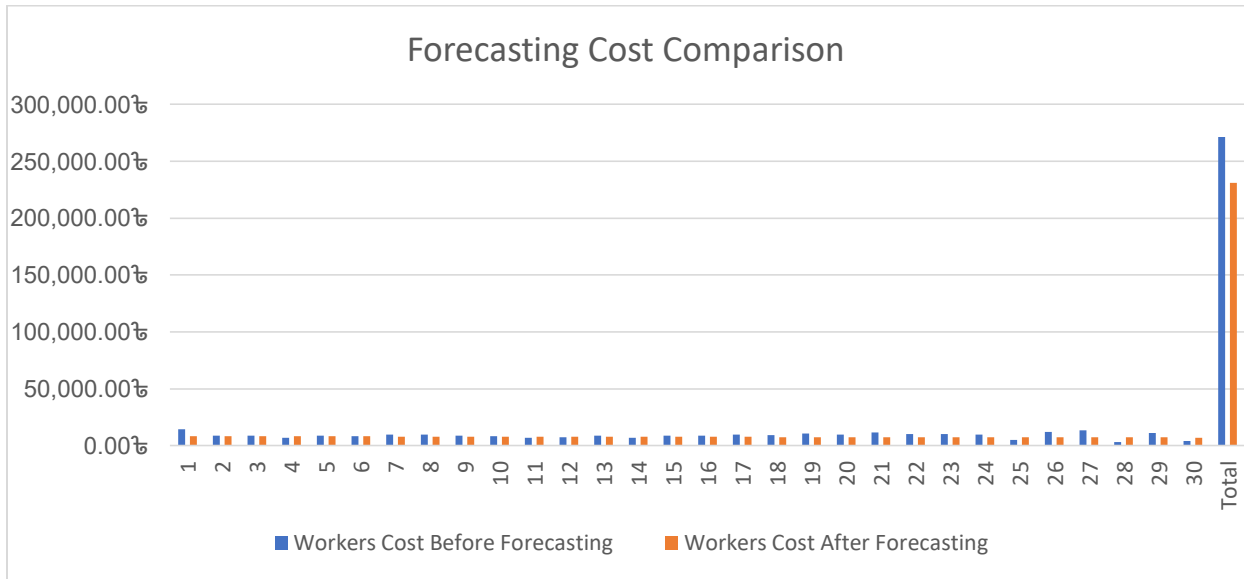


Figure 20- workers Cost comparison

Here we can clearly see the difference between before and after forecasting.

3.7 Customer Satisfaction after Fleet Management in different conditions

The internship tenure encourages me to find either the customers were satisfied with the product and service or not. So, I run some tests to find out the result. However, September to November was their off-season time and rain was a major effect on their sales along with the four-hour delivery promise they made to their customer. Moreover, I run three tests and those are ANOVA, F-test, and T-test.

ANOVA

Sales in delivery not in time	Sales in delivery in time	Sales in Rain
20	35	11
15	41	9
17	39	7
29	33	4.5
25	31	5
13	35.5	9

Anova: Single Factor						
SUMMARY						
	Groups	Count	Sum	Average	Variance	
	Sales in delivery not in time	6	119	19.83333	37.76667	
	Sales in delivery in time	6	214.5	35.75	13.775	
	Sales in Rain	6	45.5	7.583333	6.441667	

ANOVA							
	Source of Variation	SS	df	MS	F	P-value	F crit
	Between Groups	2393.527778	2	1196.764	61.91937	5.65E-08	3.68232
	Within Groups	289.9166667	15	19.32778			
	Total	2683.444444	17				

Figure 21- ANOVA

Null Hypothesis- There are no difference in sales delivery time and weather.

As we can see in this analysis that, $F > F_{crit}$, it means we reject the null hypothesis. This is the case, $61.91937 > 3.68232$

Therefore, it was decided to reject the null hypothesis.

The means of the three populations re not all equal. However, ANOVA does not tell us where the difference lies and that's why we will run T- test

T-Test

Sales in delivery in time	Sales in Rain	
35	11	
41	9	
39	7	
33	4.5	
31	5	
35.5	9	
t-Test: Two-Sample Assuming Unequal Variances		
	<i>Sales in delivery in time</i>	<i>Sales in Rain</i>
Mean	35.75	7.583333333
Variance	13.775	6.441666667
Observations	6	6
Hypothesized Mean Difference	0	
df	9	
t Stat	15.34462588	
P(T<=t) one-tail	4.62991E-08	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	9.25981E-08	
t Critical two-tail	2.262157163	

Figure 22- T- Test

Null Hypothesis- Sales are same in Delivery In time and in rain

As we can see that, t stat not equal to two critical two tail, that's why we are rejecting the null hypothesis. This is the case, **15.34462588 > 2.262157163**

Therefore, we have rejected the null hypothesis. The changes of mean & variance also tell us that Sales in delivery in time is better than Sales in rains

F- Test

Sales in delivery in time	Sales in delivery not in time	
35	20	
41	15	
39	17	
33	29	
31	25	
35.5	13	
F-Test Two-Sample for Variances		
	<i>Sales in delivery in time</i>	<i>Sales in delivery not in time</i>
Mean	35.75	19.83333333
Variance	13.775	37.76666667
Observations	6	6
df	5	5
F	0.364739629	
P(F<=f) one-tail	0.146262898	
F Critical one-tail	0.1980069	

Figure 23- F- Test

Null Hypothesis- Sales are same in Delivery In time and Delivery not in time

As we can see that, $F > F$ Critical one tail, we are rejecting the null hypothesis. This is the case, **0.364739629 > 0.198069**

Therefore, we have rejected the null hypothesis. The changes of mean & variance also tell us that Sales in delivery in time is better than Sales in Delivery not In time.

So, we can conclude that if BPBL deliver their products in time and if the weather is good then their order will increase.

Chapter 4- Recommendations

- I.** As a pioneer in the Bangladeshi paint business, BPBL has always worked to raise customer satisfaction by offering superior customer service. The SCM department of BPBL is operated extremely well. Working at Berger Paint Bangladesh's supply chain division, I've noticed that there are several complexities there, and BPBL is always attempting to decrease them, which may raise customer satisfaction levels. Regarding the matter, I have a few suggestions that, in my opinion, can aid BPBL in enhancing the general state of the SCM department.
- II.** Increase the number of depots with IoT in Bangladesh, there are 64 districts, however there are only 13 depots. With only 13 facilities throughout the country, the firm faces a significant barrier in reaching every consumer. Furthermore, product delivery costs are expensive due to transportation and carrying costs; however, if the number of depots is raised in conjunction with IoT adaption, it will be easier to supply the products to clients and reach the rustic market. This would not only minimize transportation costs but also delivery time because the goods will already be stocked at the nearest depot.
- III.** Increasing Customers involvement by establishing own Experience Zone as BPBL distributes its products to customers through dealers. They offer hefty commissions to dealers, which are indirectly tied to the increased price of the items. When a corporation has to pay for a dealer's error, such as when a dealer is unable to deliver the color that a client requested, the consumer will have an unfavorable image of the firm. Furthermore, because the corporation primarily deals with the dealer and not with the client, there is a gap that is one of the most significant impediments to developing successful customer relationships. Being independent of dealers, if BPBL opens its own EZ in specified regions, it will be easier to create solid client relationships via direct encounters with customers. Additionally, it will boost client trust in the product. Customers will order directly from the firm, therefore there will be less instances of mismatch. As an example, consider Samsung.

Samsung devices and gadgets are accessible at ordinary showrooms as well as its own showroom. The majority of Samsung items are sold from the company's own showroom since customers can rely on it and know they are not purchasing a copy. A showroom may

also be an excellent marketing tool because a place may be named after the showroom. Bata signal refers to a location near a signal point where a Bata outlet is located. So, I believe this is a highly successful approach that will aid in the right distribution of items and boost product availability, eventually leading to 100% customer happiness.

- IV.** Fleet management in both factories in BPBL has two factories, one in Chittagong and one in Dhaka. The issues are that certain items are made in Dhaka but not in Chittagong, while others are manufactured in Chittagong but not in Dhaka, and they are not sorted and delivered efficiently, although fleet management may help with that. If a product is required in Rajshahi that is made in Chittagong but not in Dhaka, the delivery time and cost would be increased. Due to the fact that Dhaka and Rajshahi are closer to one another than Chittagong and Rajshahi, it would not be the same if the goods were made in Dhaka. With the aid of fleet management along with Kaizen, this will increase a relative advantage in proper distribution and lower the cost of inventory.

4.1 Conclusion

In Conclusion, I am grateful for the opportunity to work for one of Bangladesh's top organizations and hope to continue in this position while working hard to improve my skills. I have been learning about how BPBL effectively manages its SCM division, one of the complex systems within the company, and have gained insight into the strategies that have helped the company become a market leader in the paint industry in Bangladesh. This has included learning about the use of SAP (System Applications and Products in Data Processing) in the SCM department, forecasting and settlement, managing the IoT and fleet calculation, and analyzing daily and monthly sales bills. Moreover, the fleet management engages the whole delivery system and cost management. If the organization can adopt more IoT then it could reduce the errors. Furthermore, weather and other unavoidable things also could play vital role is implementing the optimization of the whole delivery process. Additionally, the routes and fuel cost can also be track regularly with proper integration. Finally, the whole fleet management could lead the company towards more financial success.

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Appendix



Berger Customers Order Placing time

 muhtashimfuad999@gmail.com (not shared) [Switch account](#) 

How you place the order?

By App

Offline

By Mail

Do you place the order By Berger App?

Yes

No

If Yes the How Much time it required to place the order?

2-3 Minutes

5-7 Minutes

8-10 Minutes

How Much it required to place the order in offline?

5-10 Minutes

11-14 minutes

15-20 Minutes

Are you satisfied with Berger's App?

Yes

No!

Submit Clear form