



بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Internship Report on

Supply Chain Management Practices of FMCG:

In Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL)



Submitted to,

Islamic University of Technology (IUT)

In partial fulfillment of the requirements for the degree of
BBA in Technology Management (BTM)

Submitted by,

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Internship Department: **Supply Chain Management (Procurement), AFBL, Akij Venture Ltd.**

Internship Period: **03 Months**

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Date of Submission: 25th April, 2022



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Letter of Transmittal

25th April 2022

Dr. Mohammad Shamsu Uddin,
Assistant Professor,
Department of Business and Technology Management,
Islamic University of Technology (IUT), OIC.

Subject: Submission of Internship Report on Supply Chain Management Practices of FMCG in Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL).

Dear Sir,

With due respect, I'd like to notify you that it gives me great pleasure and honor to submit the internship report names as **Supply Chain Management Practices of FMCG in Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL)**. This was assigned to me as a practical requirement for the 8th Academic Semester of the BBA in Technology Management Program. Throughout the investigation, I attempted to integrate as many material and pertinent concerns as feasible while adhering to the department's recommendations. I made every effort to make my report as thorough as possible, and I honestly feel that it will fulfill and meet requirements, as well as serve the objective of my entire internship program.

Working in this new enterprise has been a really educational experience for me, and I truly enjoyed my internship at Akij Food and Beverage Ltd. When necessary, the authority of AFBL has also extended their assistance. As a result, I hope you will be so kind as to accept my report as fulfilling the criterion for this BBA in Technology Management Program.

Sincerely,

Md. Rafsan Khan Eusuf Zai

ID: 170061067

Session: 2017-18, Academic Year: 2020-21

Department of Business & Technology Management, 8th semester.

Islamic University of Technology (IUT), OIC



Acknowledgement

First and foremost, I would want to thank Almighty Allah for blessing me and allowing me to complete this Internship Report. I'd like to thank my honored internship supervisor, **Dr. Mohammad Shamsu Uddin**, Assistant Professor Department of Business & Technology Management (BTM) Islamic University of Technology (IUT), OIC, for his constant guidance, keen attention, and encouragement. **Mohammed Shafiqul Islam**, Manager, Supply Chain Management Akij Food & Beverage Ltd. (AFBL), Akij Venture Ltd. (AFBL), has been really helpful. It would be tough for me to create this report without their guidance and suggestions. I'd also want to thank all of the other officers of AFBL that took the time out of their busy schedules to assist me make my report more useful by supplying important information. Aside from that, I'd want to point out that no writing is perfectly alright except the verses of Allah from the Holy Quran. So, with all due respect, I will request that everyone read this internship report while disregarding the errors.



Executive Summary

Supply chain management, particularly Procurement (Proactive Purchasing), is a significant challenge in many sectors, as organizations such as Akij Food and Beverage Ltd. recognize the value of developing integrated relationships with their suppliers and consumers. Managing the supply chain as an FMCG (Fast Moving Consumer Goods) firm has become a technique of boosting competitiveness by minimizing unpredictability and improving service. One aspect of successfully managing the supply chain is understanding a company's logistical strategies and practices. The food and beverage industry has a significant impact on our economy because people consume the items on a regular basis; this consumption is not impulsive; it is a primary purchase. Directly or indirectly, the FMCG industry is dependent on client responsiveness. As a result, food and beverage goods, as well as supply chain management processes, should be updated and systemized to smooth this expanding market. As part of my internship, I chose supply chain management practices in the FMCG industry: a case study of Akij Food & Beverage, Akij Venture Ltd. This industry has 20 prominent brands such as Fuitika, Aafi, Mojo, Cleamon, Twing, SPEED, Houston, Farm Fresh, Shake, SPA Drinking Water, and others, and has created numerous job opportunities to support the overall economy. I intern in this firm for three months and examined overall organizational behavior, manufacturing procedures, and supply chain management. Based on this observation, I must recognize not only production but also a good strategic fit for supply chain management in order to meet the goals of the organization. To prepare this report, I spoke with officials and workers about production and supply chain management practices. Primary and secondary data assist me in compiling actual facts. Part difficulties were encountered due to the fact that some of the data is very secret for the firm. I tried to keep the data as close to the real spectrum as possible. I have provided a brief theoretical foundation for understanding supply chain management using a centrally stored data source known as ERP (Enterprise Resource Planning) and the relevance of this business in our country's competitive marketplaces. This report reflects the major roles of AFBL's supply chain management procedures. To improve supply chain management practices, I have provided recommendations that will be effective for this industry.

Keywords: *Procurement, FMCG Industry, Supply Chain Management, Integrated Supply Chain, Impulse Purchasing, Strategic Fit, ERP.*



Student's Declaration

I am Md. Rafsan Khan Eusuf Zai, a student of Business and Technology Management (Degree: BBA in Technology Management), Islamic University of Technology (IUT), Organization of Islamic Cooperation (OIC), and I am pleased to announce that the work presented in this report **Supply Chain Management Practices of FMCG in Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL)** was completed by me and has never been sent to any other organization for The work I provided does not infringe on any existing rights, and the translations are based on my personal collections.

.....

Md. Rafsan Khan Eusuf Zai

ID: 170061067

Session: 2017-18, Academic Year: 2020-21

Department of Business & Technology Management (BTM), 8th semester.

Islamic University of Technology (IUT), OIC



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Chapter 01: Introduction



Chapter 01

1 Introduction

In today's global trade scenario, many raw material buyers (Procurement) are generating better Supply Chain Management to acquire an edge over its competitors over others by offering superior value for money and uniqueness within the pricing compared to others for their buyers. This strategic perspective has created the challenge of more effectiveness and efficiency for coordinating the entire supply chain, from upstream to downstream activities of FMCG. While supply networks have existed since businesses were founded to deliver goods and services to end clients, supplier management (Logistics management) is a relatively new discipline of management. SCM has grown more important in managing the risk, dynamism, and complexity of local and global sourcing. For the firm to reap the most benefits, a fully integrated supply chain is essential. To design the most efficient procurement system, the supply chain objectives and performance measures must be understood. Benchmark analysis measures are a method for determining the success and potential of supply management systems. One important part of SCM is identifying the best sources of supply (raw material sourcing) in the global business environment to support the corporate strategy. In contrast to traditional antagonistic connections, effective SCM in the competitive rivalry involves seeking long-term meaningful connections with a fewer number of loyal partners. Despite the frequently shifting market conditions and customers' taste of need for the utmost importance, long-term vendor partnerships have become fundamental in the FMCG sector. As a result, food and beverage items producers are seeking for cost efficient & targeted vendors that can deliver items to the end user in the shortest amount of time (within lead time). This type of interaction is considered a partnership since it includes activities such as information exchange, cooperative product design, and shared storage facilities. The goal of this research is to highlight the significance of the vendor-selection challenge and its relationship to supply-chain strategy through proper strategic fit.

1.2 Origin of the Study

I completed my internship at Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL) as a mandatory part of my final semester to graduate from Islamic University of Technology (IUT), which is required as a student of Business & Technology Management (BTM) to conduct a practical orientation in any leading institution. This report is based on my work experience at the aforementioned business. It was a fantastic learning experience at AFBL; in accordance to the guidelines, I completed the 90-day (03-month) internship program in procurement, but I was able to have a very detailed look at the whole supply chain department. As a culmination, this report represents the result of my whole working experience at AFBL as part of my graduation from IUT.



1.3 Rationale of the Study

Bangladesh, as a developing economy, has more to be desired, and there are numerous potentials for enormous development in the food and beverage business. In comparison to the other comparators, the food business is the strongest source of income generation. Because of their geographical location and socioeconomic background, people in Bangladesh are extremely dependent on fast-moving food and beverage items, which may play an essential part in earning income through consumer satisfaction. Supply chain management includes the planning and management of all activities involved in sourcing and procurement, conversion, and all operations logistics management. However, minor and new-born food and beverage companies in Bangladesh lack a systems integrator to follow supply chain management effectively or scientifically, and as a result, those industries do not last long or generate business gaps. As a result, non-scientific strategies to procurement for raw materials are developed. However, by implementing supply chain management, a sector may generate ample business space. I picked this topic for my internship report because I recognize the relevance of supply chain management strategies in the food and beverage business. I feel that this study will assist in learning about supply chain management and the significance of supply chain management methods, particularly procurement segmentation in Bangladesh.

1.4 Objective of the Study

This research will be divided into two different segmentations of objectives. The objectives are as follows:

1.4.1 Primary Objectives

The general goal of this report is to complete the requirements of the BTM 8th semester internship course by compiling and submitting a report on " **Supply Chain Management Practices of FMCG in Akij Food & Beverage Ltd. (AFBL), Akij Venture Limited (AVL).**" Further from that, the goal of this study is to provide an overview of the company's procurement and supply chain functions based on my work experience. In particular, the study will explore, audit, and analyze supply chain management processes and practices, as well as identify important difficulties and how to overcome them.



1.4.2 Secondary Objectives

- i. Evaluating the relevance of good decision making in Supply Chain Management from the perspective of strategic practices from the perspective of the organization.
- ii. Analyzing procurement department performance and creating a benchmark to compare AFBL's procurement department to the threshold one.
- iii. The Importance of E-Procurement and Its Importance in AFBL
- iv. Gaining practical understanding of the Food & Beverage manufacturing unit and its surroundings via corporate culture.
- v. Assessing the likelihood of meeting strategic fit in the company.
- vi. Identifying some recommendations to address SCM-related issues.

1.5 Significance of the Study

This analysis considers the importance of supply chain management using certain theories from the literature that are taught in BTM courses. The definition and practice of supply chain management are changing. The report focuses on the significance of supply chain management in industrial development. One of the most heavily debated subjects right now is supply chain management. The study's goal is to offer a thorough knowledge of the benefits of supply chain management, accountability, and the efforts taken by the firm to remain competitive in a global business environment. The study was conducted to examine several supply chain management areas of other FMCG firms in Bangladesh and their contributions. This study revealed supply chain management in the fast-consumed sector of AKIJ FOOD & BEVERAGE and others in Bangladesh. According to the findings of the study, Bangladesh's food and beverage firms are attempting to increase their contribution in accordance with their performance.

The report's relevance is to:

- i. Gain an overview of the efficacy of their supply chain function.
- ii. Learn about the corporate procurement procedure at Akij Food & Beverage (AFBL), Akij Venture ltd (AVL).
- iii. To provide proposals to enhance the overall supply chain operation of AFBL, AVL.



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Chapter 02: Methodology



Chapter 02: Methodology

2.1 Data Collection

Because this research has been experimental in purpose, the document was compiled using both primary and secondary sources of information. The following sources are highlighted in detail-

2.1.1 Primary Data

Primary data were acquired directly from authorities. Some of the data are very much confidential. So, I tried to carry the numbers close to the real one to obtain non-disclosable agreement with AFBL. I addressed the relevant supply chain operations with the relevant executive official and utilized their comments as primary data. In addition, I am doing a three-month internship in the Procurement department of that organization. This department oversees all supply chain activities. My professional experience also provided a source of original data for this paper.

2.1.2 Secondary Data

This type of data source is being included the firm's yearly business review report, marketing report, annual budget, in-house training material, corporate handbook, internal meeting minutes, text book, and internet information, among others.

2.2 Report Design & Philosophy

The study is structured in such a way that the reader can quickly grasp the overall theme of the report. The data required to complete the research are gathered here from both primary and secondary sources. Because of the nature of the issue, only qualitative data is needed to ascend the stairwell of decision-making. The research philosophy used in this case is pragmatism philosophy. Pragmatism opposes the notion that thought's job is to describe, depict, or mimic reality. Instead, pragmatists base their philosophy on the notion that cognition serves as an instrument or tool for prediction, action, and problem resolution. Most philosophical subjects, according to pragmatists. The nature of knowledge, language, concepts, meaning, belief, and science, for example, are all better assessed in terms of their practical applications and accomplishments rather than representational correctness.



2.3 Limitations of the Reports

It is critical to emphasize the limitations of the research approach adopted in this study:

- i. Due to time and resource constraints, it was unable to conduct in-depth study into all areas of all supply chain operations of all consumer products industry organizations in Bangladesh. Rather, I had to make do with focusing on the AFBL's supply chain operations.
- ii. The lack of sufficient sources prohibited information from being verified. Nonetheless, several of the officials assisted me in correctly gathering the material.
- iii. The organization may deem some portions of the report to be secret.
- iv. Due to lack of experience, there may have been faults in the report though maximum labors have been given to avoid any kind of slip-up.



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Chapter 03: Biography of Sheikh Akijuddin

Chapter 03: Biography of Sheikh Akijuddin

3 Story of Sheikh Akijuddin



Picture: S.K Akijuddin (1929-2006)

Sheikh Akijuddin began his business journey in the 1940s and planned to establish a group of industries to produce various categories of consumer goods in the 1970s. S.K Akijuddin was not well-known to the younger generation as a unique and inventive thinker, yet he was a notable and inspiring pioneer business leader who implemented many new and innovative designs for the Bangladeshi business industry.

3.2 Sheikh Akijuddin's Early Life

He was born in the Fultola Upozilla of the Khulna district in 1929. He was Sheikh Mafij Uddin's only son. Sheikh Mafijuddin was a Fultola village local merchant. When Sheikh Akijuddin was old enough to attend school, his father enrolled him in a local institution. However, because to his windy demeanor, he was unable to concentrate on his academics and dropped out. His father was quite disappointed in him as a result of this his father ordered Sheikh Akijuddin to work for his father's local business because their family's financial situation was not steady enough. His entrepreneurial career began in the Bejedanga Railway Station, where he sold Snacks (Chana Chur), Chocolate, and other items. Without it, he helped his father's business whenever he was asked. At his age, Sheikh Akijuddin was committing mistakes so many times, which led to his father prattling to him. He could not accept those tolerance and left home at the age of 11 after carrying so much raze in his mind for the family, he traveled so far by rail. The train's last stop was at Kolkata, India. He only had 17 Taka (BDT 17.00/USD 0.20 in 1940) when he left home.

Sheikh Akijuddin had several unexpected challenges after moving to Kolkata. He had no family or known persons in the area, so he settled in a nearby rail station known as 'Shiyaldaha Railway Station.' At the time, he was attempting to locate a part-time work that would allow him to meet his daily food needs.



He couldn't discover a single one after looking for days. But he couldn't give up hope and keep fighting in this difficult position. He was so frugal in dealing with the matter on his own that he slept on the platform over the unfinished newspaper. He ate grain to save the last money he had before fleeing his house. Despite his best efforts, the money he had stashed in his pocket had run out.

3.3 Sheikh Akijuddin's Tangerine business

During this situation, Sheikh Akijuddin saw the good possibility of Tangerine's purchasing rate in Kolkata Market and purchased four bags of Tangerine. Which he promptly sold for 10 Poyscha (BDT 0.1/USD 0.0012 in the 1940s). Seeing this consistent revenue and understanding his miserable life, a local restaurant owner from Zakaria Hotel in Kolkata (Near Railway Station) offered him a job with a daily salary of 1.0 Anna and the provision of food and shelter. Sheikh Akijuddin was able to deposit the capital of 300 Indian rupees in a short period of time. This gross capital made him to consider starting a new firm where he could operate it on his own and earn more money.

3.4 Sheikh Akijuddin's first dream to do big

The 4-wheeler van business was popular at the time. This technique, in which salespeople offer their wares by repeating different rhymes in Hindi, has resulted in a positive response from small business owners. As a result of observing the revenue generation machine, Sheikh Akijuddin decided to purchase a secondhand 4-wheeler van. He was not fluent in Hindi, so he recruited an assistant who could summon people with different rhymes to entice them. He operated this company for over a year. Better quality at a lower price resulted in consumer distinction from other sellers. This "Better quality at a lower price" proposition brought Sheikh Akijuddin to the attention of local consumers.

3.5 His decision to come back to home country Bangladesh

Other sellers around him were not happy with his success. Because of Sheikh Akijuddin's exceptional financial acumen, they were unable to create sufficient revenue. As a result, they told the police about his unlawful abode in Kolkata, which resulted in a three-day prison sentence and a Rs 5.0 fine. It demotivated Sheikh Akijuddin so greatly that he sold everything. He intended to relocate far away from there. During the moving process, one of the previous known Peshwari businessmen requested that Sheikh Akijuddin move Peshawar with him by seeing his honesty in business. He moved to Peshawar and made Rs. 4000 of earnings in two years. He opted to come to Bangladesh after two years of business experience. Prior to that, he intended to obtain some



commercial experience back in Kolkata, but the situation in Kolkata was unfavorable for doing so owing to World War II. He returned to his homeland in Bangladesh in 1948.

3.6 His decision to never leave Bangladesh again

When he returned home, His parents were taken aback after seeing him. They were traumatized all these year after losing him unexpectedly as a toddler. When he returned to his hometown with Rs. 8000 in money, World War II had not ended, and no business could be conducted. So, he waited a while before convincing his parents to do business in Kolkata again. After the situation got normal, he went back to Kolkata and Sheikh Akijuddin heard of his father's death after arriving there. This news devastated his heart so badly that he returned to Bangladesh and vowed never to leave again. Finally, after returning to his native country, Sheikh Akijuddin used his prior earnings to run a modest company in his hamlet.

3.7 His Biri Business & era of success

During this time, Sheikh Akijuddin met one of his boyhood pals, Nituchanda. Nituchandra's father was a well-known Biri (Cigarette) trader in Bangladesh's Khulna District. Seeing the promising future of this market, they began to concentrate on improving the quality, taste, and fragrance of cigarettes. Sheikh Akijuddin quickly grasped the in-depth tobacco leaf selection and manufacturing process, propelling him to become one of the greatest Biri (AKIJ Biri) manufacturers in Bangladesh. Sheikh Akijuddin never looked back after developing the Biri Industry and seeing incredible success. He expanded his business all the way to India. Akij Group was in charge of the world's largest tobacco factory, 'Dhaka Tobacco.' Philip Moris's Marlboro's official manufacturer was Akij Tobacco in Bangladesh, the world's largest tobacco manufacturing and cigarette making company. He invested his earnings in 24 various businesses, including Akij Cement, Akij Plastic, Akij Jute Ltd, Akij Food and Beverage, and others. In 2018, Akij Group's Tobacco sector was sold to Japan Tobacco due to ethical standards.



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Chapter 04: Industry Analysis



Chapter 04: Industry Analysis



AKIJ FOOD & BEVERAGE LTD.

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“Quality first”- Sheikh Akijuddin

Akij Food and Beverage Ltd. (AFBL) came into operation in 2006. AFBL produces a variety of Snacks and beverages in the domestic and international markets. The main business company Akij Group has established AFBL, a \$250 million program.

AFBL is part of the Akij Group, founded by Sheikh Akij Uddin. This sector of the industry is constantly growing, with the latest number of units reaching 26. These units employ more than 50,000 people. To date, they have 25 significant national achievements. Sk. Nasir Uddin serves as party chairman, while Sk. Bashir Uddin serves as Executive Director. The director of AFBL is Sk. Shamim Uddin. AFBL is one of the world's largest Food and Beverage companies, producing a wide variety of food and beverages such as carbonated beverages, fruit drinks, and other food products on the domestic and foreign markets. It has a strong global presence, with items shipped to 26 countries.

AFBL aspires to be a sustainable firm by always delivering good goods through empowered and motivated employees using state-of-the-art technology for the benefit of the community. AFBL offers a portfolio of a variety of products including cold drinks, fruit drinks, energy drinks, processed beverages, drinking water, milk and dairy-based products, chips, mango slices, and cucumbers. With milk production on a contract from Pabna and Rajshahi, as well as Rajshahi and Chapainawabganj mangoes, AFBL assists local and medium-sized local farmers.

AFBL has received numerous awards and certificates over the years. He has won the Best Brand Award four times. National and international certificates such as BSTI, HALAL, ISO, and HACCP reflect the quality of the company.



AFBL produces high-quality food products using locally sourced and imported ingredients, as well as modern technologies from world-renowned companies such as Tetra Pak, Kronos, Alfa Laval, and Spa. The principles of the AFBL include innovation, cooperation, integrity, customer focus, trust and respect, which guides the company to its goal of "becoming the most respected food and beverage company in Bangladesh with quality commitment." AFBL has a reputation for being busy with various Corporate Social Responsibility (CSR) activities, which it maintains in banks, other financial institutions, and government agencies.

4.2 Product Comparison of AFBL

Product	SKU	Pack size
Mojo	250 ml Can(light)	24
	250 ml Can (Zero)	24
	250 ml Can (Naga)	24
	250 ml Can	24
	250 ml Pet	24
	500 ml Pet	24
Clemon	250 ml Can	24
	250 ml Pet	24
	500 ml Pet	24
Twing	250 ml Pet	24
	500 ml Pet	24
Houston	250 ml Pet	24
Rivera	500 ml Pet (24)	24
	1000 ml Pet	12
	1500ml Pet	6
	2250ml Pet	6
Aafi Jira Pani	250 ml Pet	24
SPEED	250 ml Can	24
Frutika	200ml (Mango) Pet	
	250 ml (Mango) Pet	24
	500 ml (Mango) Pet	24
	1000 ml(Mango) Pet	12
	250ml (Grape) Pet	24
	250ml (Green) Pet	24
	250ml (Pulpy Orange) Pet	24
Farm Fresh	500ml UHT	16
Ghee	100ml	1



	200ml	1
	400ml	1
	450ml	1
	900ml	1
Chips	Cheese Puffs(20g)	48
Sipit	Sipit Orange 250g	48
	Sipit Orange 125g	48
	Sipit Orange 25g	320
	Sipit Mango 25g	320
	Sipit Mango 125g	48
	Sipit Mango 250g	48
Mustared Oil	Home Maker Mustared oil 500ml	24
	Home Maker Mustared oil 1000ml	12
Flavoured Milk	Farm Fresh Chocolate 250 ml Pet	24
	Farm Fresh Elachi 250 ml Pet	24
	Farm Fresh Mango 250 ml Pet	24
Powder Milk	Farm Fresh Powder Milk-100 gm-Pack	30
	Farm Fresh Powder Milk-200 gm-Pack	24
	Farm Fresh Powder Milk-500 gm-Pack	12
Aafi Puff Rice	Aafi Puffed Rice-250gm	30
	Aafi Puffed Rice-500gm	16
Aafi Chanachur	Aafi Chanachur Classic-35 gm	72
	Aafi Chanachur Classic-150 gm	24
	Aafi Chanachur Classic-300 gm	12
	Aafi Chanachur Jhal-35gm	72
	Aafi Chanachur Jhal-150gm	24
	Aafi Chanachur Jhal-300gm	12
Mojo	1000 ml Pet	12
	2000 ml Pet	6
Lemu	250 ml Can	24
	250 ml Pet	24
Clemon	1000 ml Pet	12
	2000 ml Pet	6
Clear up	250 ml Pet	24
	500ml Pet	24
SPEED	250 ml Pet	24
Houston	250ml Can	24



Wild Brew	250ml Can	24
Aafi	250ml	24
	500ml	24
	1000ml	12
Frutika	125ml(Little Frutika)TPK	48
	125ml Little Frutika-SIG	48
	250ml (Prizma Mango) TPK	24
Farm Fresh	200ml TPk	30
SPA	250ml	24
	330ml Pet	24
	500ml Pet (24)	24
	500ml Pet (24)	24
	1000ml Pet	12
	1500ml Pet	6
	2250ml Pet	6
	5000ml Pet	2
Chips	Coconut puffs(25g)	48
Chips	Mozzarella Chees puffs(25g)	48
	Mozzarella Chees puffs(20g)	48
Bar	Mango bar(15gm)	300
	Mango bar small(10gm)	300
	Mango bar jar(15gm)	300
	Mango bar jar small(10gm)	300
Aafi Fruit Bar	Mango bar(15gm)	300
	Mango bar jar(20gm)	300
Aafi orange	Aafi Orange Drink-250 ml-Pet	24
Mustared Oil	Home Maker Mustared oil 50ml	
	Home Maker Mustared oil 100ml	
	Home Maker Mustared oil 200ml	24
Shake	Shake Chocolate 250ml Pet	24
	Shake Kheer 250ml Pet	24
	Shake Venilla 250ml Pet	24
Powder Milk	Farm Fresh Powder Milk-50 gm-Pack	60
	Farm Fresh Powder Milk-400 Gm	12
	Farm Fresh Powder Milk-1000 gm	6
Aafi Chanachur	Aafi Chanachur Jhal-80 gm	48
	Aafi Chanachur Classic-80 gm	48
Farm Fresh Laban	Farm Fresh Laban 250ml	24



Farm Fresh Lassi	Farm Fresh Lassi 250ml	24
	Farm Fresh Lassi 200ml	
	Farm Fresh Lassi 180	
Flavour Milk	Farm Fresh Chocolate Milk UHT (200ml)	30
	Farm Fresh Mango Milk UHT (200ml)	30
Aafi Toast	Aafi Sweet Toast-200gm	12
	Aafi Sweet Toast-350 gm	6
	Aafi Plain Toast-350 gm	6
Aafi Dry Cake	Aafi Dry Cake-40 gm	48
	Aafi Dry Cake-160 gm	12
	Aafi Dry Cake-350 gm	6
Yummy Lassi	Yummy Lassi 180ml	
	Yummy Lassi 200ml	
Aafi Chanachur	Aafi Chanachur Jhal-65 gm	

4.3 AFBL's Mission to be Unique

In comparison to other MNC Food and Beverage Companies such as Coca-Cola, Pepsi, Thumps Up, and others, Akij Food and Beverage sustains its operation with undetermined earnings. This is remarkable since competing with the flavor of these well-known firms is akin to arriving to the glory of Comet and releasing a spark of Candles in the local and international market. In summary, these contestants did not progress. However, AFBL is the only firm that pushes the Fit approach with these world-renowned beverage companies while maintaining the best degree of customer satisfaction. This is due to good quality management, which attempts to meet the complete business organization's vision, goal, and AFBL standards.

4.3.1 Vision

“To be the Most Respected Food & Beverage Company in Bangladesh by Commitment to Quality”

This dedication to quality, along with an incredible management team, results in the greatest items at an accessible price. For example, of all fruit juices, 'Frutika' is the most extensively used fruit juice, marketed every day in three distinct types in Bangladesh. AFBL employs aseptic technology, making this the first time in Bangladesh that fruit juice has no bacteria. In addition, unlike other fruit drinks in Bangladesh, Frutika is not reported to employ Pumpkins or advertise itself in the same way as Mango Fruit Juice does.



Frutika has shown its potential customers about the "Ektu Beshi-E Pure" brand with an amazing TVC, which implies they display all of the possible quality of each fruit drink.

Aside from fruit juices, AFBL also sells the most commercially accessible strong beverages in Bangladesh, particularly 'SPEED.' There are other popular beverages including Mojo, Clemon, Houston, Rivera, and a large range of variants under the sub-brand 'Farm Fresh.'

4.3.2 Mission

“We will strive to be sustainable Business: Growth, Profitability, Organizational Capability, innovation”

In terms of Consumer Items, the AFBL aim is market stability with prospective profitability and the capacity to balance the stated goals; and, the successive advancement in research and development of the provision of unique-diverse products. The Supply Chain Management team is working hard to implement new cutting-edge technology across the production chain. Given the prior expansion of the beverage list, Akij Food and Beverage provides some cookies and biscuits for a new product featured on "Bakeman's." Which is why you're concerned about frequent customers.

4.3.3 Values

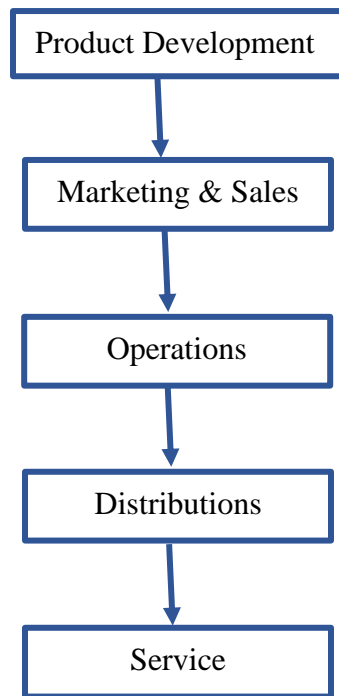


"Values" are responses to the question of what Akij Food and Beverage intends to accomplish in terms of equipment in order to achieve the desired vision. Innovation, teamwork, integrity, customer focus, and trust and respect are valued. Here's a quick rundown of the AFBL 'values' -

Integrity Employees are devoted when they are honest, transparent, and obedient to whichever company they work for. The organization values ownership, honesty, process focus, and resilience, as well as trust and respect and mutual trust, with the potential to establish trust and respect for each other's vision. **Customer-Oriented Customer Service** We live to delight our clients, and we go above and above to provide the Best Customer Experience possible. **Teamwork** AFBL One, One Team To fulfill our Vision and Mission, we operate as one Team.



4.3.4 Value Chain of AFBL



The competitive strategy of Akij Food and Beverage will be designed based on consumer priority. Competitive strategy focuses on one or more consumer segments and strives to produce appealing products and services that meet the demands of the modern era.



Brings Quality in Life.®

Chapter 05: Main Duties of Supply Chain Management in AFBL



Chapter 05: Main Duties of Supply Chain Management in AFBL

5 Some theoreticals to operate SCM in AFBL

Master Production Scheduling (MPS): A master production schedule (MPS) is a plan for each time period's various commodities to be produced, such as production, personnel, inventories, and so on. Employees may be processing orders from projections or needs from client orders, resulting in separate demand with production schedules. DRP stands for Distribution Requirements Planning. To satisfy demand, DRP focuses on moving goods through the supply chain.

MRP & BOM: MRP (Material Requirements Planning) is a common supply planning technique that assists organizations, mainly product-based manufacturers, in understanding inventory requirements while balancing supply and demand. It's a computer-based inventory management system that aims to boost corporate productivity. Material needs planning systems are used by businesses to predict raw material amounts and schedule delivery.

A bill of materials (BOM) lists all the parts that go into making a product. Raw materials, semi-finished goods, and ingredients are examples of components. Services can be mentioned in a BOM in some instances. It's a list of all the raw materials, resources, components, assemblies, and pieces needed to make a product, as well as the amounts of each. A bill of materials, in a nutshell, is an industrial formula for producing a finished product.

Line Balancing: Line balancing is a production approach that includes matching the production rate to the takt time by balancing operator and machine time. To put it another way, the number of personnel and machines allocated to each task in the line should be rebalanced to achieve the highest possible production rate. The primary goals of line balancing are to reduce the number of workstations and reduce cycle time.

Production Planning & Capacity Planning: The planning of production and manufacturing modules in a firm or industry is known as production planning. It makes use of resource distribution of personnel activities, materials, and manufacturing capacity to satisfy various clients. Its goal is to ensure that all essential preparations are done prior to the start of a production cycle, allowing it to function smoothly. This entails properly allocating resources so that everything is in place before each step of production can begin. The production floor should be well organized.

Capacity planning is the management of the company's resources' limits and workloads that contribute to total supply capacity. It's utilized to figure out what sort of equipment and manpower is needed, as well as when they're needed. Simply said, it is the ability to create, store, and attain, as well as the process of determining the greatest resource use.

COGS: The direct expenses of manufacturing the commodities sold by a corporation are referred to as the cost of goods sold (COGS). This figure covers the cost of the materials and labor that went into making the item. Retailers only have to worry about one type of inventory: product. In



order to generate a profit, a corporation must sell inventories in all circumstances. It functions as an asset for the firm before it is sold. After the goods is sold, however, the cost becomes an expense known as Cost of Goods Sold (COGS).

Fast Moving, Slow Moving, Non-Moving Inventory: Fast-moving items are objects that have a high turnover rate and are sold in a short amount of time.

Slow-moving items are goods or products that have a low turnover rate and are kept in the warehouse for an extended length of time. Slow-moving objects are stored or take up space for a lengthy time due to the slowness with which they are sold.

Non-moving inventory are monetary investments that have lost their selling value and have gone to waste. They are blemishes on the marketing landscape, since they are not only obvious failures of promotional methods, but also hurdles to the introduction of new goods.

OTIF & DRP: The On-Time in Full (OTIF) Delivery KPI is a well-known metric for assessing the supply chain process. The OTIF may be calculated for a whole order, which means that all goods from a single sales order are delivered on time and in full.

The supply chain industry hasn't agreed on a precise formula for the OTIF, but it's roughly: the number of on-time and complete deliveries divided by the total number of deliveries.

DRP stands for Distribution Resource Planning, and it is a planning process that allows you to specify inventory level management factors like security and safety stock, as well as compute inventory requirements over time based on sales predictions and orders.

DRP is a time-phased, backward scheduling approach that combines distribution inventory planning with production planning to ensure that the correct supplies are available at the right time and in the right place.

Work Study- Time & Motion study: Work study is the analysis of work done in an organization using a consistent method in order to achieve the greatest possible use of resources, such as materials, machines, men, and money. Productivity is linked to all technology and management systems.

In Production Management, there is a motion study. Motion study is a type of method study in which the motion of an operator or a piece of work is examined using the defined procedures.

Calculation of Error & Accuracy: The difference between actual and predicted demand is known as forecast accuracy. You may factor the amount of inaccuracy in your prior demand predictions into future ones and make the necessary modifications to your planning if you can assess the level of error in your previous demand forecasts.

Companies employ a variety of standard and non-standard formulas to assess prediction accuracy and/or inaccuracy. The following are some examples of regularly used metrics: ABS (Actual –



Forecast) = Mean Absolute Deviation (MAD) $100 * (\text{ABS (Actual - Forecast)/Actual}) = \text{Mean Absolute Percent Error (MAPE)}$.

Forecasting Techniques: In supply chain management, there are four forecasting approaches. Forecasting with a moving average. Smoothing on an exponential scale. The auto-regressive integrated moving average is a type of auto-regressive integrated moving average. Algorithm for multiple aggregation prediction.

Standard Deviation: The term 'Standard Deviation' refers to how far a value deviates from the expected or threshold value. The easiest technique to calculate safety stock when dealing with uncertainties and various factors is to utilize standard deviation to determine supply and demand changes. The term "standard deviation" refers to a number that is calculated to show the level of departure for a group.

Lean & Six Sigma Management: The Lean Six Sigma approach may assist supply chain managers in ensuring that every step of their process is not only defect-free, but also customer-focused. Lean Six Sigma is a valued, high-impact skill set because of its simultaneous focus on the customer and the process. Six Sigma is a systematic knowledge management strategy that focuses on decreasing variation, quantifying faults, and improving product, process, and service quality. Raw materials to manufacture, distribution, transportation, warehousing, and product sales are all part of the supply chain.

RoFo: A rolling forecast is a report that constantly predicts future numbers using previous data over a period. Financial reporting, supply chain management, planning, and budgeting are all areas where rolling projections are often employed. Continuous planning with a fixed number of periods is possible with rolling predictions. If your forecast period is 12 months, for example, when each month finishes, another month will be added. You can always anticipate 12 months ahead of time this way.

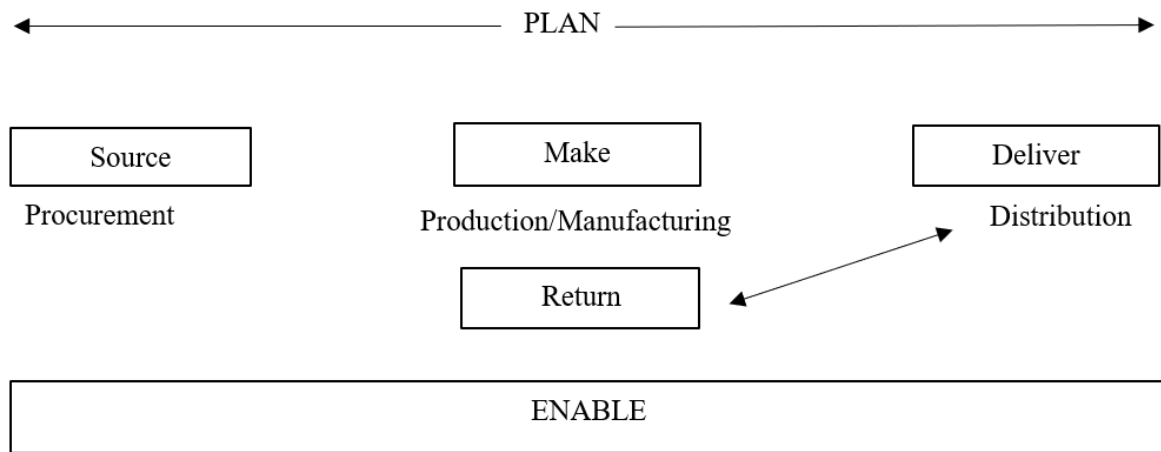
Planning Horizon: The duration of time (in weeks or months) during which plans are prepared is referred to as the planning horizon. A good strategy should consider all important knowledge about future occurrences. As a result, an optimal or suitable planning horizon is both desired and essential for better plans. Operational, tactical, and strategic planning are the three primary categories of planning.

Safety Stock: A safety stock item is an additional amount of a product that is kept in the warehouse to avoid running out of stock. It acts as a buffer against demand changes. It's an extra amount of an item kept in inventory to lessen the chances of it becoming out of stock. It serves as a reserve in case sales exceed expectations and/or the supplier is unable to deliver the additional units on time.



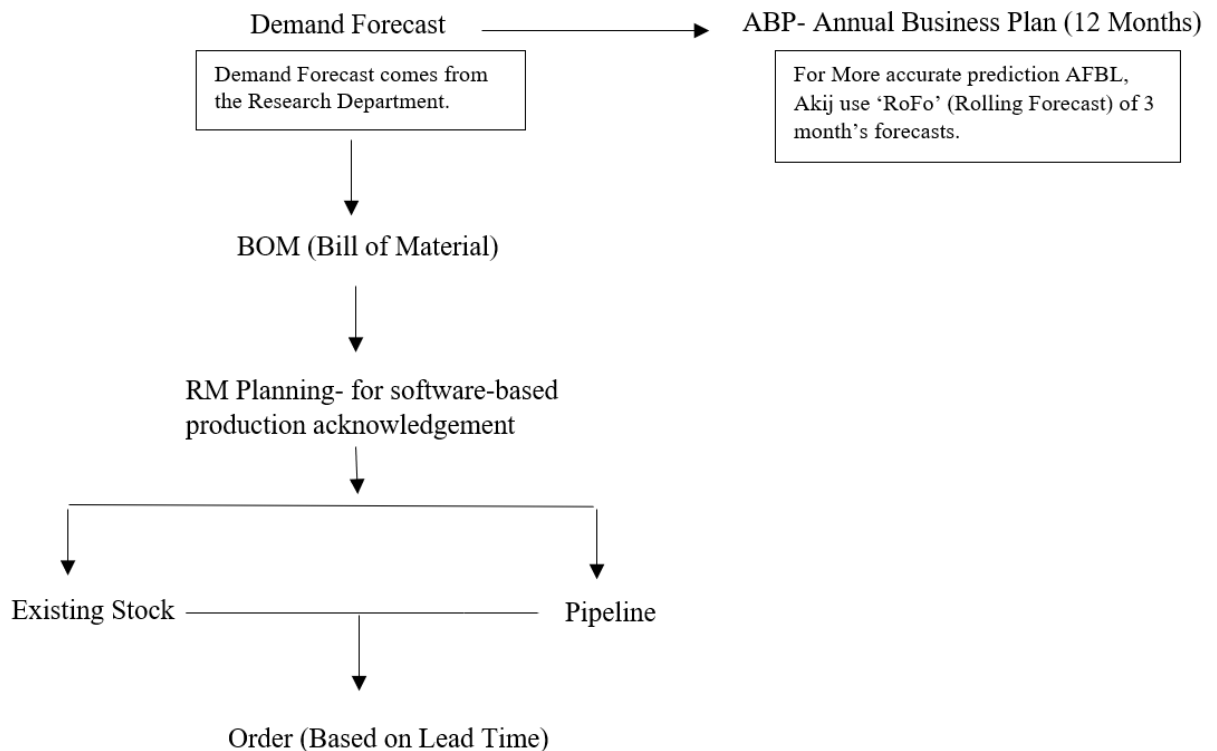
5.2 My Duties Related to AFBL's Supply Chain Management Model

Akij AFBL uses the 'SCOR Model' supply chain model given by APICS, which is one of the world's largest non-profit organizations for Associating Supply Chain Management. The model consists of six steps: Plan, Source, Make, Deliver, Return, and Enable the System. I will be working for the Planning Department of the AFBL, Akij Group's SCOR Model. The model is as follows:



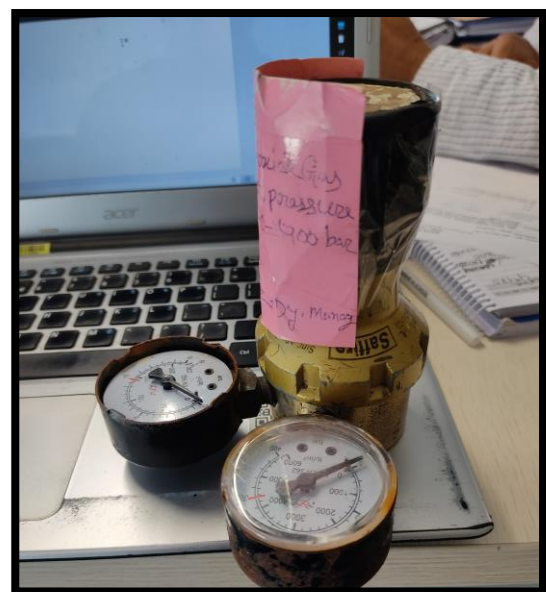
5.2.1 Plan

There are numerous duties to keep under the Planning division, such as Raw Material (Sourcing, Make, Deliver), Packaging Material Maintenance, Chemical, Capacity Planning, Line Balancing, Safety Stock Management, Minimum Order Quantity, and lastly Production Planning (which takes place in factory). The model is as follows:



AFBL's Sourcing (Procurement) refers to all the work that goes into finding and proactive purchasing the materials that a company needs to run smoothly. This involves finding supplies, signing contracts, managing vendors, and paying supplier invoices on time. There are twelve steps of Procurement process in AFBL- These are

- i. **Indent According to the requirement:** If a specific amount of raw material is required, the AFBL Factory in Dhamrai will decide how much and when it should be ordered. They will provide an indent number along with data for this (what raw materials should be purchased in which quantity). This identifying number is given to the Procurement department of Akij House. Different staff members oversee different product categories. Items such as civil things, electrical items, chemical items, machine items, and so on. The indent data are put into an e-procurement system, which is an ERP system, without the use of email.
- ii. **Search for Possible Suppliers:** Following the acceptance of an order from the factory or office, the procurement department anticipates locating prospective suppliers for a certain item. If the product is not new, the supplier will be included in the ERP list (Enlisted Supplier). Following that, the procedure becomes less complicated; the procurement department will place an order with them at market price. If, on the other hand, the item is new and the supplier is unclear where to get it, the procurement team will need to physically search the market for the best price and configuration.
- iii. **Sample Collection:** The collecting of samples is an essential part of verifying every order for new and selective items. During this process, the sample will be submitted to the procurement department in a certain quantity to be compared to the required threshold. It may be required to compare different samples with different vendors' merchandise at times.



Picture: Spare Parts Sample Collection for Electrical Item

- iv. **Sample Checking by R&D:** If an item is largely chosen, the Research and Development team will be looking forward to reviewing QC (Quality Clearance) and other benchmark control measures. It will appropriately confirm whether the item is ready to use.
- v. **Quotation with Terms and Conditions:** After R&D approval, if one supplier's item is chosen for the next step, the procurement department will request a quotation from that supplier, along with terms and conditions that take into account their own and AFBL's procurement policies. Payment policies are occasionally referenced.

Quotation No.

Date. 23.01.2022

To

Akij Food & Beverage Ltd

Sub:

Dear Sir,

This letter contains our products and price details as below.

Sl.	Description	Size	Qty	Model	Unit price	Made
01	Gas 134a					
02	Gas 410a					
03	Gas 407c					
04	Gas R22 (
05	A/c Compresso					

Terms & Conditions

Delivery

Payment

Warranty

Vat & Tax

Transport

We hope you will find our offer reasonable & acceptable to you.

Thanking You

For

Picture: Quotation for Civil Items with T&C


- vi. **Comparative Statement for Multiple Quotation:** If the procurement department requests quotations with terms and conditions from different suppliers, the procurement department will generate a CS (Comparative Statement) to provide an overview of specifications for any item while accounting for Tax and AIT. Following this comparison statement, just one supplier's item will be chosen as the outcome of this entire procedure.

AKIJ FOOD & BEVARAGE LTD		
CS for Electric Vehicle		
Specification	Henan Robeta Import & Export Trade Company Ltd	Shandong Gaia New Energy Tech. Co. Ltd
Model	RBT-VAN	GAIA-PICK VAN
Dimension	2860mm x 1210mm x 1565mm	4000mm x 1400mm x 1800 mm
Ground Distance	135mm	170 mm
Passenger	2	2
Mass Weight	520 kg	600 kg
Max Loading Capacity	250 KGs	1200-2000 KGs
Motor Type	Brushless DC Motor	AC Motor
RPM	3400r/min	
Mileage	100-120 km	300 km
Breaking System	Disc Brake	Drum Break [R] & Disc Brake [F]
Maximum Speed	38-45 km/h	72 km/h
Charging Time	8-10 hours
Charging Voltage	220V	
Climbing Capacity	15%	≥30%
Power Consumption	10.2KWh/100 km	6KWH/100 km
Battery System	60V/120AH Lead Acid Battery	12V/250AH Ternary Lithium Battery
Driving Mode		FWD (BWD ?)
Body Materials		Alluminium Alloy
Rated Power		7.5 KW
Input Voltage		72V

Picture: Example of Comparative Statement between two distribution Vehicle Model

- vii. **Select One Supplier's item:** Comparative Statement (CS) give an overview of different specification, price which resulted to a final decision-making process. It means- 'one supplier' will be selected for procuring any item. After selection of single supplier, it is time to ask for some informal price negotiation.
- viii. **Price Negotiation:** Informally price negotiation can be an option from the procurement department. Because some of the items can be less priced from other suppliers. So, procurement department convinced the supplier to contain a considerable price offer comparing to the standard market. After Price negotiation supplier is asked to provide a purchase order against the Indent number which is provided before or mailed to the suppliers.

- ix. **Purchase Order (PO) against Indent Number:** Purchase order is formal approach to the procurement department containing Price, Discount, Tax, AIT, Delivery date etc. Also, it contains some information of the Supplier and someone who placed the order to the ERP system. After getting the PO from Procurement Department, it is time to wait for the limited period which holds the time frame of delivery schedule for getting the ordered product.



Akij Food & Beverage Ltd.

Purchase Requisition

Indent No: Indent Type: Indent Date:

SL	Item ID	Item Name	UoM	Quantity	Current Stock	Last Price	Remarks
<input type="text"/>	<input type="text"/>	Refined White Sugar <input type="text"/>	TON	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Indent By:

Approved By:

Accounts Approved By:

Picture: Example of- Purchase Order in AFBL

- x. **MRR Clearance:** MRR is Material Received Report. After getting the product in AFBL Factory or the corporate office procurement department has to provide a report containing material received status. This report indicated to the next step which will be Pill Clearance.
- xi. **MRR Number with Updated ERP:** ERP automatically detect if the report is not uploaded to the Centralized system. So, it will be the next step to upload MRR Clearance with specific number to the system. After that supplier can be paid for his provided item.
- xii. **Payment will be done through Bill Section:** After MRR Clearance the bill mentioning MRR Status will be sent to the bill Section. ‘Mentioning the MRR Status’ means it is ready to bill section for the payment, here one thing needs to be mentioned, if the advance payment is required for certain materials, it is important for this step before. It will be called as ‘Advance Payment’.



5.2.1 Bill Clearance Through Bill Section

Bill Clearance: When there is a vacancy for a certain item, the Akij Food & Beverage SCM Department contacts potential suppliers through the segmentation of each category (for example Raw materials, Spare parts etc.). Following that, the SCM Department requests a feasible price quotation in order to assess the whole cost and predict/compared to the probable fund. Among the several vendors, AFBL selects the greatest quality to maintain QC (Quality Clearance). After obtaining a lower price from the supplier, the corporation purchases the item and receives it in the factory on time. The factory labels the goods with MRR numbers and updates the Akij Food and Beverage ERP maintenance software. The bill section of AFBL checks-

- i. MRR with unique indent Number.
- ii. If the MRR is presented in the ERP, the bill will be sent to the following section, 'Payment and Bill Clearance Section of Akij Group'.
- iii. In addition, certain indexes must be verified before submitting invoices to the bill section.
- iv. What is a 'Challan' or a tax clearance report; there are various Challans that will be studied more below.
- v. Those invoices that do not have an MRR number in the ERP software will be kept for rechecking, and I will have to contact them by phone or letter to reissue the MRR number.
- vi. There may also be some additional difficulties, such as a discrepancy in the amount that I purchased and what I received, a bill difference, or a lack of supplier goods, which will be kept in the office for further processing to ensure that I receive the exact number that I wanted.

Challan:

A challan is an official form or other type of document, such as a piece of documentation, a citation, and so on. It is a method of crediting money to one's bank account via a form, which is commonly used in Bangladesh as a receipt for payment or delivery. There are several Challan available which AFBL uses for-

Treasury Challan: It is a Tax system which is a mandatory financial charge or other sort of levy imposed by a governmental body on a taxpayer in order to finance government expenditures.

VAT Challan: It is a sort of tax that is charged progressively and is known as a goods and services tax (GST) in some countries. It is applied to the price of a product or service at each stage of manufacture, distribution, or sale to the final customer.



গণপ্রজাতন্ত্রী বাংলাদেশ সরকার জাতীয় রাজস্ব বোর্ড
কর চালানপত্র
[বিধি ৪০ এর উপ-বিধি (১) এর দফা (গ) ও (ঙ) দ্রষ্টব্য]
নিবন্ধিত ব্যক্তির নাম :
নিবন্ধিত ব্যক্তির বিআইএন :
চালানপত্র ইস্যুর ঠিকানা :
প্রথম কপি
মূসক-৬.৩

ফ্রেতার নাম :
ফ্রেতার বিআইএন :
ফ্রেতার ঠিকানা :
সরবরাহের পত্তব্যস্থল :
যানবাহনের প্রকৃতি ও নম্বর :

চালানপত্র নম্বর :
ইস্যুর তারিখ :
ইস্যুর সময় :

ক্রমিক	পণ্য বা সেবার বর্ণনা (প্রযোজ্য ক্ষেত্রে ব্র্যান্ড নাম সহ)	সরবরাহের একক	পরিমাণ	একক মূল্য (টাকায়)	মোট মূল্য (টাকায়)	সম্পূর্ণ বছর ধরে বহু	সম্পূর্ণ বছর পরিমাণ (টাকায়)	বহু মাসের মধ্যে/সুনির্দিষ্ট ক্র	মূল্য সংযোজন কর / সুনির্দিষ্ট কর এর পরিমাণ (টাকায়)	সকল প্রকার কর ও করসহ মূল্য
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১
সর্বমোট										

(১) সকল প্রকার কর ব্যতীত মূল্য।

প্রতিষ্ঠান কর্তৃপক্ষের দায়িত্বপ্রাপ্ত ব্যক্তির
নাম :
পদবী :
স্বাক্ষর :
সীল :

Picture: VAT Challan Paper; Because this information is confidential, it has been obscured.

Delivery Challan: It is a good systematic approach to include which files are delivering in a particular order for every purchase.

5.2.3 Make

My Sight Visiting Experience

AFBL Factory at Dhamrai, Dhaka: Akij Venture Ltd. has the largest high-tech Food & Beverage Factory in Dhamrai, Savar, Dhaka. Without that AFBL also has an operational unit in Panthapath, Dhaka. But the Dhamrai Factory has the largest manufacturing unit to fulfill all the required market needs. This manufacturing unit works as ‘Make’ segmentation of SCOR Model. There is some significant item that is unique that AFBL Holds as a unique food and beverage producer in Bangladesh.

Aseptic Filling Machine: The aseptic filling machine is a high-innovative electromechanical machine used to fill and pack sterile powders and liquids in carpooler, vials, disposable syringes, and bottles. The aseptic filling machine operates with a high degree of process reliability, accuracy, safety, and protection for the entire application. AFBL uses this machine to complete the manufacturing process of Frutika, Clear up, Mojo etc. and Powder Milk line ups. The machine is very expensive, the estimated price of this machine is BDT 600 crore (BDT 6 billion). The main objective of this machine is to finish goods without any touch of human contacts and anti-germ environment.



Picture: AFBL Aseptic Filling Machine

Modula Storage System (MSS): For storing spare parts, the modular Storage system is a computer program composed of components that work together to form a bigger overall application. It is very much effective component of AFBL Factory, Dhamrai. Developing modular applications is analogous to piecing together a jigsaw puzzle. The Modula vertical lift system is the best option for storing any industrial product, component, or spare part in any industrial setting, industry, or department. Because of its versatility, large choice of models, overall design, and ease of use, very few factories in Bangladeshi businesses have selected a Modula storage system to reorganize and optimize productivity. Software can be used in conjunction with a Modula vertical storage system, as a stand-alone system that runs all warehouse activities, or as a mix of the two. We provide a variety of accessories to help the company to get the most out of its Modula and boost productivity.



Picture: Modula Storage System

Refrigerator container: Refrigerator containers are a type of container that transports imported flavors from one country to another without compromising quality. It is critical because the flavors must be transported and stored at a specific temperature. This ensures that the quality of the Speed, Clemon, and Mojo manufacturing lines remains consistent over the course of the year.

Conveyor Belt: A modular Storage system is a computer program composed of components that work together to form a bigger overall application. A mouse is a common component of a home computer system. Developing modular applications is analogous to piecing together a jigsaw puzzle. The Modula vertical lift system is the best option for storing any industrial product, component, or spare part in any industrial setting, industry, or department. Because of its versatility, large choice of models, overall design, and ease of use, many businesses have selected a Modula storage system to reorganize and optimize productivity. Conveyor belts are crucial tools in the material handling industry. They are the continuous moving strips that are used for carrying different materials from one place to another. Mostly used for conveying a large volume of materials in a short span of time. A conveyor belt is also known as a belt conveyor. Conveyor, to save space, the carrier of goods and raw materials is being built across the factory's pedestrian and vehicle carrying areas. Products, including rejected ones, are transported down this path for recycling and reuse.



Picture: Conveyor Belt of AFBL to carry Finished Goods Faster

Health & Hygiene: Finally, when I visited Dhamrai, I saw a really clean and hygienic atmosphere from the entrance of Akij Food and Beverage Ltd facility in Dhamrai to preserve the product quality at a highest level. In addition, because to the Corona virus epidemic, security enforces the use of masks, a small health check, and hand sanitization throughout the vehicle. Every worker

and employee in the plant is concerned about their personal safety in order to satisfy the quality standards.

5.2.4 Enable

ERP & Supply Chain Management: The information base of a FMCG company like Akij Food & Beverage must be consolidated from many sources. Data integration is a big issue for FMCG firms since their activities are spread out across a wide territory. When it comes to Supply Chain Management businesses must work with a variety of vendors and partners to obtain the raw materials and resources needed to put finished products on the market. The process of maintaining everything in order involves meticulous planning, execution, management, and continual supply chain monitoring.

Alike many organizations, AFBL using ERP systems to track and regulate expenses, productivity, supply, and inventories. Bringing distant supply chain participants together is now possible because of cloud technologies. AFBL can now bring all participants together in one system for shared information and resources via remote access from any internet-connected device. Other companies in the FMCG industry will discover that an ERP system designed with the supply chain in mind is more than capable of storing, distributing, and controlling demand for produced goods. The integration of material, information, and financial information flow cements ERP as a vital instrument for effective supply chain management, from procurement to product delivery.

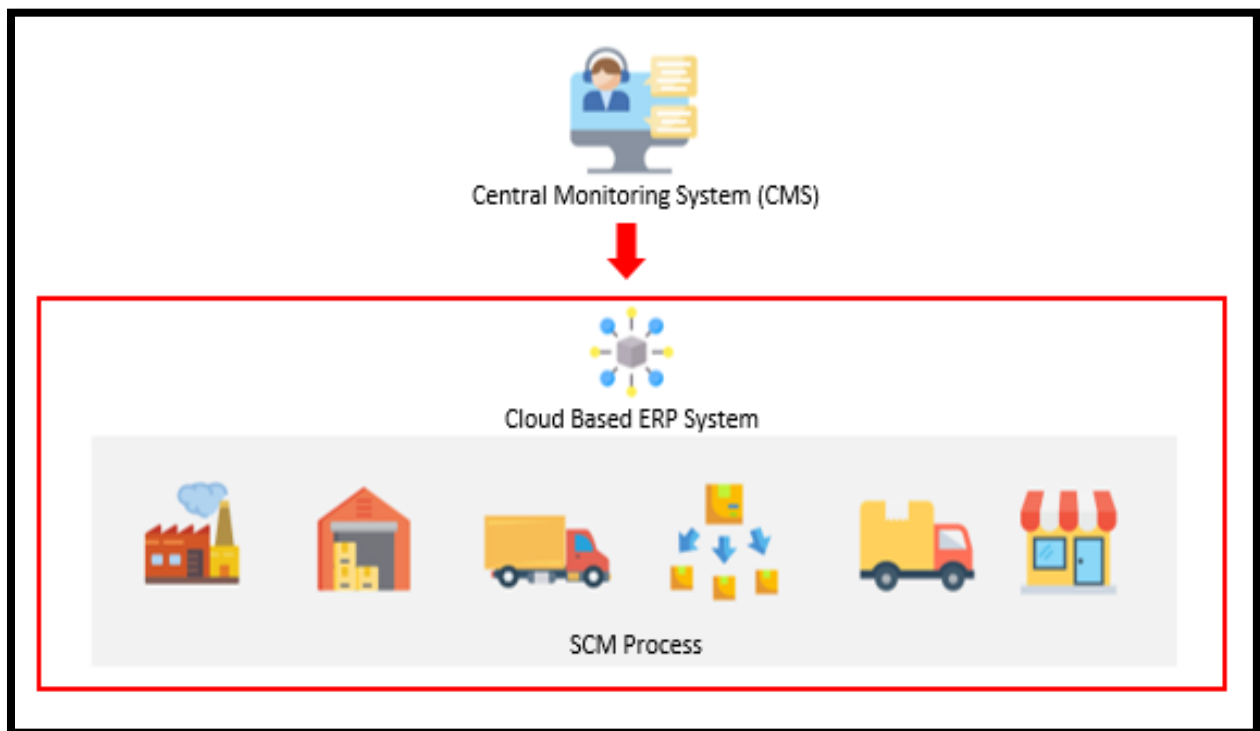
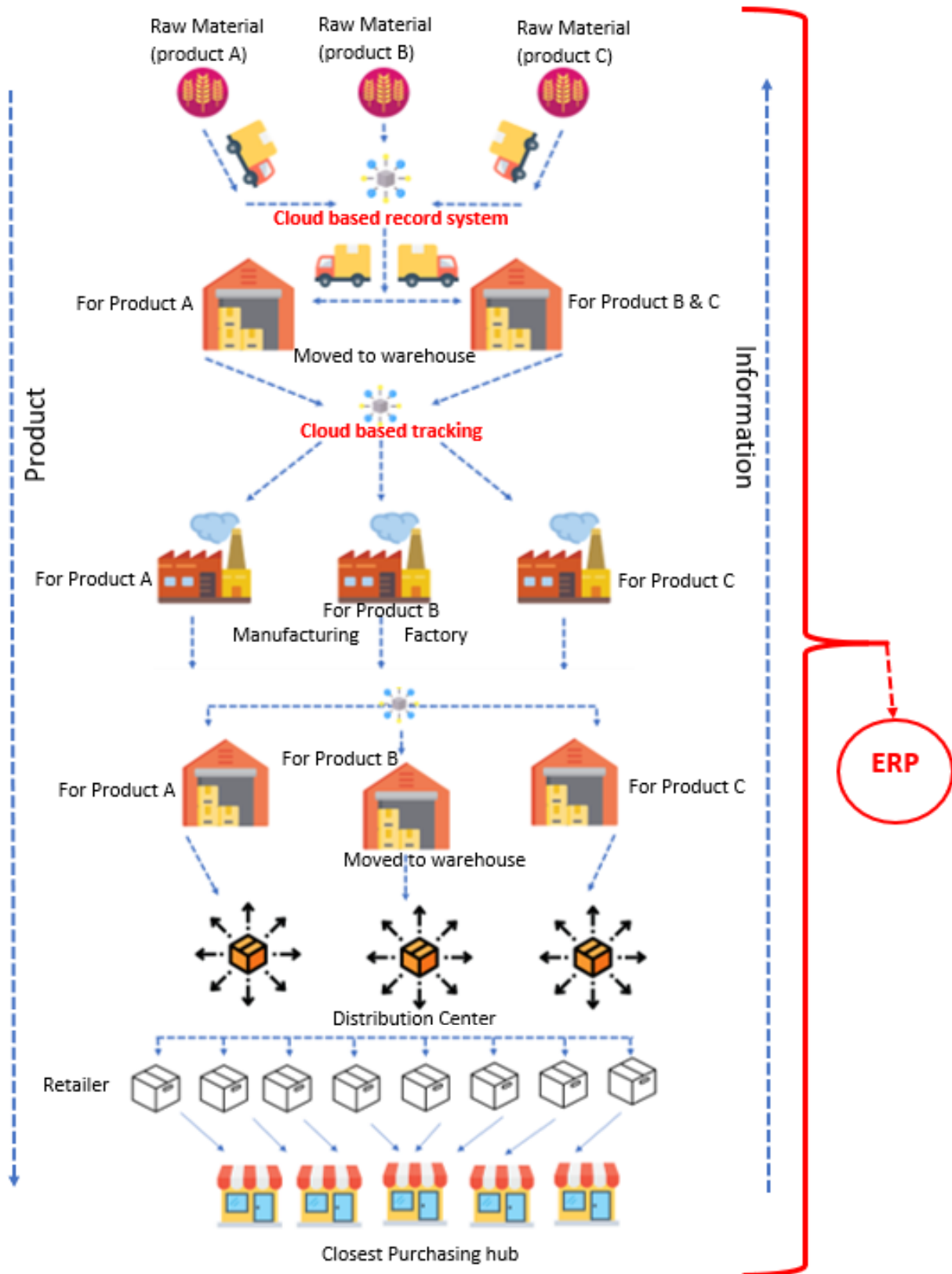


Figure: Graphical Framework of AFBL's CMS ERP

Graphical Implementation & Framework:



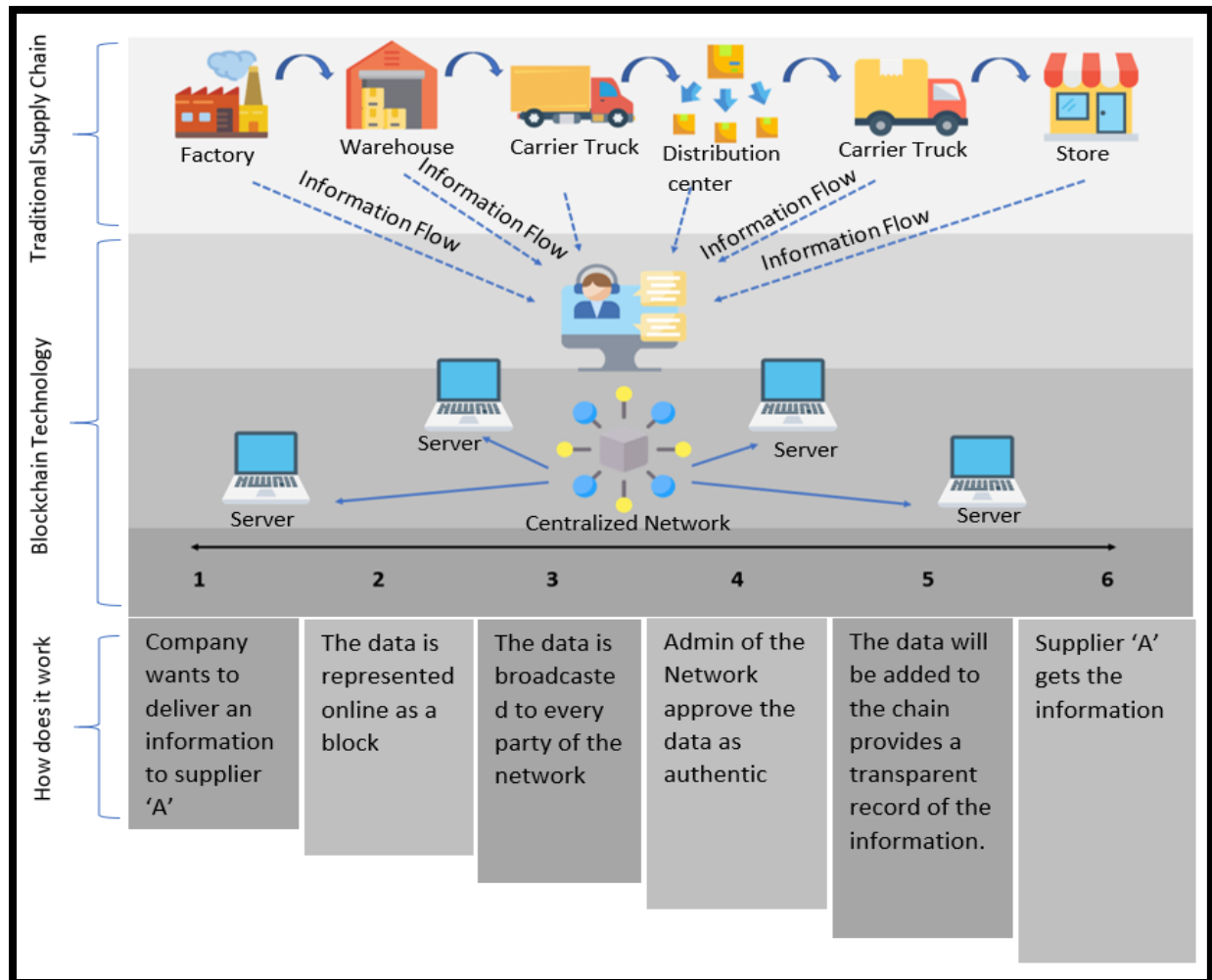
Proposed Blockchain Technology in ERP: Blockchain Technology is an information collection method which makes changing of data set, hacking or cheating the system difficult or impossible. When supplier data, vendor's data are saved into different parties, always there is minimal possibility of data manipulation and ducking any given job in whole system, financial reports, workflows. Blockchain Technology mitigates miscommunications and interruption of assignments to validate the data authenticity.

AFBL does every action as a combination of Enterprise Resource Planning and Blockchain in the FMCG supply chain which helps to achieve 4th industrial evolution.

Feasibility:

- i. Reduce paperwork expenditures.
- ii. Lower losses in trading falsification.
- iii. Enhance visibility and compliance with the contract production outsourced.
- iv. It will increase traceability of the FMCG supply chain to ensure company requirements.

Proposed Implementation:



Picture: AFBL's Proposed Graphical Blockchain Technology Framework



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Chapter 06: Benchmarking AFBL's Procurement



Chapter 06: Benchmarking AFBL's Procurement

6 Comparing with Threshold

This article discusses the issues that arise while designing a Supply Chain (SC) performance metric in practice. Management's pressures on AFBL rationalization constitute a substantial issue for Supply Chain Management (SCM). The SC must be simplified, lead times reduced, unnecessary processes removed, and the organization as a whole evolved in such a way that new, more efficient processes may be formed. A review of the existing status and assessing the efficacy of the current SC in AFBL serve as the foundation for development activities. This work offers a solution to the issues associated with measuring the SC. This part of analysis the existing frameworks and points of view for the development of supply chain performance measurement in the manufacturing sectors will be conducted. Nonetheless, there will be a conclusion to the performance measurement framework as a broad framework.

Process and Management based Metrics: SCM performance measurements may be presented in two ways: financial and non-financial. Top management need financial metrics for management level decisions, whilst lower management and employees require operational measures for day-to-day operations. The framework with SC performance metrics is as follows:

- i. Planning metrics include order input technique, order lead-time, and customer order route.
- ii. Supply chain evaluation, supplier evaluation, strategic level measures, tactical level measures, operational level measures.

Management and Production Engineering Review: Some management and product engineering reviews are shown below:

- i. Measures and KPIs at the production level include: product and service range, capacity utilization, and scheduling approach efficacy.
- ii. Delivery link evaluation, delivery performance evaluation metrics, and overall distribution cost.
- iii. Measuring customer service and satisfaction: flexibility, customer query time, and post-transaction customer service measurements.
- iv. SC and logistics costs include asset costs and return on investment, as well as information processing costs.

Performance metrics should include a variety of measurements, including a balanced approach, strategic, tactical, and operational levels, as well as financial and nonfinancial data. SCM might be monitored at several levels of management or operation. Strategic level metrics have an impact on top management choices and frequently indicate the investigation of broad-based policies and the amount of adherence to company goals.



The tactical level is concerned with resource allocation and performance measurement in relation to objectives that must be reached in order to accomplish the results set at the strategic level. Measurements and metrics at the operational level necessitate precise data, and decisions are made by lower-level management. Metrics are crucial for day-to-day business at the operational level; hence the major indicators are time-related and non-financial metrics. Non-financial measures such as order leadtime and delivery leadtime are examples of non-financial metrics. Many of these measures are not just time-related, but also cost-related. These measurements are used by senior management to make strategic decisions and long-term plans and strategies. SCM performance measures, according to Gunasekaran, may be defined as shown in the table.

6.2 SCM Performance Metrics

Strategic Level	Tactical Level	Operational Level
<p>i. non-financial measures, total SC cycle time.</p> <p>ii. Total cash flow time, as well as financial and non-financial measures.</p> <p>iii. Customer enquiry time, as well as financial and non-financial variables.</p> <p>iv. Level of consumer perceived product value, non-financial measures</p> <p>v. Financial measurements, net profit vs. productivity ratio Financial measures, such as the rate of return on investment</p> <p>vi. Product and service range, non-financial metrics</p> <p>vii. Budget deviations and financial metrics Non-financial measures, such as order lag time</p> <p>viii. Service system flexibility to satisfy specific client demands, financial metrics</p> <p>ix. Level of buyer-supplier collaboration, financial and non-financial measures</p> <p>x. Supplier lead-time in comparison to the industry average, non-financial measures</p> <p>xi. Defect-free delivery level of supplier, non-financial measures</p> <p>xii. Delivery lead-time and non-financial measures</p> <p>xiii. Metrics for delivery performance, including financial and non-financial</p>	<p>i. Forecasting approach accuracy, financial and non-financial metrics</p> <p>ii. Non-financial measures, such as product development cycle time.</p> <p>iii. Non-financial metrics and order entry techniques</p> <p>iv. Delivery invoice effectiveness, non-financial indicators</p> <p>v. Non-financial measures, such as purchase order cycle time</p> <p>vi. Process cycle time forecasted, non-financial indicators</p> <p>vii. Master production schedule effectiveness, non-financial metrics</p> <p>viii. Supplier support in resolving technical issues, as well as non-financial indicators</p> <p>ix. Non-financial measures, such as the supplier's capacity to respond to quality issues.</p> <p>x. Supplier cost-cutting strategies, as well as financial and non-financial metrics</p> <p>xi. Non-financial measures and supplier booking in processes.</p> <p>xii. Reliability of delivery, financial and non-financial measures</p> <p>xiii. Non-financial indicators, such as responsiveness to urgent deliveries.</p> <p>xiv. Distribution planning schedule effectiveness, non-financial metrics</p>	<p>i. Financial indicators, cost per operating hour</p> <p>ii. The cost of carrying information, including financial and non-financial measurements.</p> <p>iii. Non-financial measures for capacity utilization</p> <p>iv. Total inventory as a financial metric: incoming stock level, work in progress level, scrap level, and Finnish products in transit.</p> <p>v. The supplier rejection rate, as well as financial and non-financial data.</p> <p>vi. Delivery documentation quality, non-financial metrics</p> <p>vii. Purchase order cycle time efficiency, non-financial measures</p> <p>viii. Delivery frequency, non-financial indicators</p> <p>ix. Non-financial indicators for driver dependability.</p> <p>x. Non-financial measures for product quality.</p>



6.2.1 Measures for Supply Chain Actions

SC performance measurements are classified into five SC processes: plan, source, make, deliver, and return or customer happiness, cost, time, quality, flexibility, and innovativeness, and whether they are quantitative or qualitative measures. As previously indicated, the measures can be classified as strategic, operational, or tactical management levels.

The plan category metrics are mostly cost and time-based. Metrics are mostly numerical metrics. Sales, profit, rate of return on investment, cost of goods sold, and value-added productivity are all cost-based indicators. Total SC response time, order lead-time, order fulfillment lead-time, product development cycle time, and % decrease in time to build a product are examples of time-based measurements. There are other quality-based criteria in the plan category, such as forecasting technique accuracy, fill rate, perceived efficacy of departmental connections, order flexibility, and certain flexibility and innovativeness measures.

The source category comprises mostly of quality-based metrics such as the amount of buyer-supplier partnership, the level of defect-free deliveries by suppliers, the supplier rejection rate, and the extent of mutual planning collaboration leading to enhanced quality. These are mostly qualitative metrics. There are some cost and time-based criteria as well.

The make category focuses on cost-based metrics such as total cost of resources, manufacturing costs, inventory investment, inventory obsolescence, and work in process. The majority of the measurements in the make category are quantitative. There are other time-based measurements such as planned process cycle time, manufacturing lead-time, and the time necessary to create a specific item or collection of products, as well as flexibility measures such as production flexibility, capacity flexibility, and volume flexibility.

The delivery category techniques are mostly focused on cost, time, and quality metrics. These are mostly quantitative indicators. Total logistics cost, distribution cost, delivery expenses, and transport cost per unit of volume are all cost-based measurements. Time-based delivery metrics include, for example, delivery lead time, average order lateness, and percentage of on-time deliveries.

Quality metrics include delivery performance, dependability, and the quality of delivered items, whereas flexibility indicators include delivery flexibility and transportation flexibility. Customer contentment, degree of customer perceived value of product, customer complaints, and product quality are all included in the return-on-investment category.



6.2.2 Following the Reference Model

Supply chain operations reference model:

The Supply-Chain Council, a global group of enterprises interested in SCM, created the supply chain operations reference (SCOR) model in 1996, which AFBL already uses. The SCOR model is a business process reference model that offers a framework for SC business processes, KPIs, best practices, and technological elements. The SCOR model seeks to apply the ideas of BPR, benchmarking, process measurement, and best practice analysis to SCs. The SCOR model provides the following advantages to users:

- i. Standardized descriptions of the management procedures that comprise the SC.
- ii. A connection framework among the standard procedures.
- iii. Common metrics for measuring process performance.
- iv. Management techniques that yield best-in-class results.
- v. Adherence to software features and functionality that enable best practices.

The SCOR model is based on five core processes: deliver, make, plan, return and source. The SCOR model advocates hundreds of performance metrics used in conjunction with five performance attributes: reliability, responsiveness, flexibility, cost, and asset metrics.

Supply Chain Council presents five attributes of SC performance:

SC dependability: The SC's capacity to deliver the proper product to the correct location, at the correct time, in the correct condition and packaging, in the correct number, with the correct paperwork, to the correct client.

SC responsiveness: The rate at which a SC delivers things to a consumer. SC adaptability. The ability of a SC to adjust to market developments in order to obtain or sustain a competitive edge. SC fees. The expenses connected with running the SC.

Asset management in SC: The ability of an organization to manage assets in order to meet demand. This encompasses the management of both fixed and working capital assets.



6.3 Model Framework

The foundation for producing SCM performance measures known as the "map model." The framework is comprised of seven steps:

- i. Draw a map of the SC and highlight the major links.
- ii. Analyze each link using the customer relationship management and supplier relationship management procedures to discover where more value may be achieved.
- iii. Create customer and supplier profit and loss statements to measure the impact of the connection on the two companies' profitability and shareholder value.
- iv. Realign SC procedures and activities to meet performance goals.
- v. Develop non-financial performance indicators that link individual behavior to SC process objectives and financial targets.
- vi. Compare shareholder value and market capitalization among enterprises in relation to SC objectives, and update process and performance indicators as needed.

6.3.1 Inventory, timing, order fulfillment, quality, customer attention, and customer happiness are all important considerations

Inventory, time, order fulfillment, quality, customer attention, and customer happiness are the six techniques of assessing SC success. The following are the definitions of these approaches:

Inventory levels, inventory rotations, and inventory expenses are all examples of inventory. Time is defined as the time it takes to develop a product, the time it takes to market, and the time it takes to break even. Order fulfillment measures how much a SC partner influences order processing time and shipment accuracy. Quality is defined as the ongoing improvement achieved by SC partners. The amount to which a SC partner impacts contribution margin, value contributed, and customer value is captured by customer focus. Customer satisfaction implies that a SC partner has an impact on end-user satisfaction and account penetration.



6.4 Threshold Six Constructs Approach

Six constructs of SCM practices:

- i. strategic supplier collaboration,
- ii. customer relationship,
- iii. information sharing,
- iv. information quality,
- v. internal lean methods, and
- vi. Postponement

A strategic supplier partnership is a long-term relationship that exists between a company and its suppliers. It is intended to capitalize on the strategic and operational skills of each collaborating firm in order to create considerable long-term advantages. Client relationship management include dealing with customer complaints, developing long-term connections with customers, and increasing customer happiness. Close client relationships are one way to differentiate yourself from competition and provide value to consumers. The level to which sensitive and proprietary information is provided to one's SC partner is referred to as information sharing. In SCM research, information exchange is viewed as a critical element. The correctness, timeliness, appropriateness, and trustworthiness of information communicated are all examples of information quality. It is inextricably linked to knowledge exchange. Flexibility may be gained through sharing qualifying knowledge. Internal lean techniques are methods of reducing waste in a production system. Cost, tie, set-up periods, small batch sizes, and pull-production are all examples of waste. LT and lean principles have become critical for effective SCM. The technique of deferring one or more procedures or activities until a significantly later point in the SC is referred to as postponement. Making, sourcing, delivering, timing, and postponement are all examples of SCM operations in this environment. The performance outcomes of identification include delivery reliability and time to market. Delivery dependability refers to the ability to provide items to customers. Time to market refers to the time it takes to bring new items to market faster than rivals.

6.4.1 Internal & External Time Performance of AFBL

The time performance measurement approach is a new strategic performance measure that should be used to promote improvement. Time-based performance measurement has the limitation of over-emphasizing the role of time and not considering the impact of other operational performance measures with respect to time. In order to improve time performance, all operational performance measures should be measured, controlled and improved. They present the main time-based metrics that companies could use in different areas:

- i. New product development encompasses the time it takes from idea to market and the rate at which new products are introduced.
- ii. Decision making encompasses both decision cycle time and time spent while waiting for choices to be made.

- iii. Processing and production comprise the following: value contributed as a proportion of total elapsed time; uptime yield; inventory turnover; and cycle time.
- iv. Customer service consists of the following elements: response time; stated lead-time; % delivery of time; and time from customer recognition of need to delivery.

Several time performance metrics, both internal and external. Time-to-market, distribution lead-times, delivery reliability, supplying lead-times, supplier delivery reliability, manufacturing lead-times, standard run times, actual run times, wait times, set-up times, move times, inventory turnover, order carrying-out times, and flexibility are the time performance indicators listed in ascending order of superiority. Time performances are classified as external and internal. Internal times may be divided into two categories: run and set-up times on the one hand, and wait and move periods on the other. Externally observed time performances are classified into three categories: System timelines (including supplying, manufacturing, and distribution lead times), delivery speed and dependability (both from suppliers and to consumers), and time-to-market are all factors to consider (or time required to develop a new product). These time metrics are referred to as time performance. This performance is reflected in four indicators:

- i. cost/productivity.
- ii. time;
- iii. flexibility; and
- iv. quality.

The first metric is cost-based, whereas the next three are non-cost performance indicators. Cost-based performance includes the following metrics: production cost affordability, productivity, and working capital control. Time is a performance metric that includes both internal and external times. Internal time refers to time that a company controls but that a client does not perceive. External time is defined as the time that the client perceives, such as delivery time and the frequency with which new items are introduced. In the quality approach, performance measurements include produced quality, perceived quality (customer satisfaction), in-bound quality (supplier quality), and cost quality (cost of maintaining a high standard of quality). Direct costs, labor productivity, inventory, and net process time are the most often assessed performance measures. Time-to-market, non-value-added timeframes, delivery, product quality, and customer happiness are not as frequently monitored.



6.4.2 System dynamics, operational research, logistics, marketing, organization and strategy

The threshold may be used to assess SCM capacity in six ways:

- i. System dynamics,
- ii. operational research,
- iii. logistics,
- iv. marketing,
- v. organization, and
- vi. strategy are the main categories.

How it compares to AFBL: The goal of system dynamics is to manage trade-offs throughout the whole SC. Capacity utilization, cumulative inventory level, stockouts, time delays, time to adjust, and phantom ordering are performance measures. The goal of operational research and information technology is to find the best solution within the constraints of a certain degree of freedom. Metrics include logistical expenses per unit, service level, and delivery time. The goal from a logistical standpoint is to combine generic processes sequentially, vertically, and horizontally. Integration, lead-times, order cycle time, inventory level, and flexibility are used to assess capabilities in this area. The marketing strategy aims to categorize clients and link them with the appropriate channel. Customer satisfaction, distribution cost per unit, and market share/channel costs are the metrics used. The organizational strategy is to manage SC connections based on transaction costs, time to network, flexibility, and relationship density. The strategic viewpoint seeks to connect capabilities with the capacity to profit. Time to network, time to market, and ROI of the focus organization are performance indicators.

6.4.3 Quantitative and qualitative measures

A performance measuring technique for SCM that includes both qualitative and quantitative indicators. Cost and resource utilization are quantitative metrics, whereas quality, adaptability, visibility, trust, and innovativeness are qualitative measures. One of the quantitative metrics is cost, which may be calculated using distribution cost, production cost, inventory cost, warehousing cost, incentive cost and subsidy, intangible cost, overhead cost, and sensitivity to long-term cost. Labor, machine, capacity, and energy resource usage are examples of resource utilization, and performance measurement probes the proportion of excess or deficiency of that specific resource during a certain time period. Optimization may save both time and money while also reducing the size of the organization and improving its performance.

Quality, adaptability, visibility, trust, and innovativeness are examples of qualitative measurements. Customer response time, lead-time, on-time delivery, fill rate, stock out likelihood, and correctness are all time-based qualitative measurements. Lead-time is a very significant metric since it represents the amount of time required from the moment the product is manufactured until it is entirely processed. Metrics for measuring flexibility are classified as input, process, output, and improvement. The labor and machine flexibility categories are used to measure input. Material handling flexibility, routing flexibility, and operating flexibility are all examples of process flexibility. Volume and mix flexibility are examples of output flexibility. Modification flexibility,



new product flexibility, and expansion flexibility are the three types of delivery flexibility and improvement. Time and precision are used to determine visibility. Trust is assessed by consistency, which is the proportion of late or incorrect deliveries to the next layer, resulting in inconsistency in supply. Innovativeness is demonstrated by the introduction of a new product and the application of new technologies.

SCM performance measurements are classified into two types: qualitative and quantitative, and include customer satisfaction and responsiveness, flexibility, supplier performance, and cost. He distinguishes three kinds of metrics: resources, output, and flexibility. There are two performance indicators: cost and the combination of cost and customer responsiveness. Inventory and operational costs are included in the cost. Lead-time, stock-out likelihood, and fill rate are all indices of customer responsiveness.

The new SCM performance framework includes three distinct types of performance measurements:

- i. resource measures,
- ii. output measures, and
- iii. flexibility measures.

The objective of the resource measures is efficient resource management, which is vital to profitability. The goal of the resource measures is a high degree of efficiency. The resources' overarching purpose is resource reduction. Total cost of resources utilized, total distribution cost, total cost of production, expenses associated with stored inventory, and return on investment are all resource performance indicators (ROI). The aim of output measure type is a high level of customer service, and the purpose of output measurement is that consumers will turn to other SCs if they do not receive appropriate output. Customer responsiveness, quality, and quantity of final product produced, such as number of items produced, time required to produce a specific item or set of items, number of on-time deliveries, proportion of orders filled immediately, profit, sales, back-order/stock out, customer response time, manufacturing lead-time, shipping errors, and customer complaints, are all output measures. The aim of flexibility is to be able to adjust to a changing environment, and the reason is that in an uncertain world, supply chains must be able to respond to issues that arise as a result of changes. Volume flexibility, delivery flexibility, mix flexibility, and new product flexibility are the four kinds of flexibility. A measure chosen from the performance measure type categories must align with the organization's strategic goals.



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Chapter 07: Recommendations to AFBL for Better Approach

Chapter 7: Recommendations to AFBL for Better Approach

7 Process based approach

Process-based measurement, when combined with timely information, may greatly aid in the integration and improvement of cross-organizational processes. The following are the primary benefits of using process-based performance monitoring in SCM:

- i. Providing the ability to identify operational problems and take remedial action before they worsen.
- ii. Facilitating linkage with operational strategies, identifying success, and measuring the effectiveness of strategies
- iii. Assistance in tracking progress.
- iv. Assisting in the focus of management attention and resource allocation.
- v. Improving communication of supply chain process objectives, hence boosting trust and shared understanding.

The following are the procedures and methods for assessing and deconstructing the process to be measured:

- i. Identifying and connecting all internal- and intra-organizational activities.
- ii. Defining and restricting the essential processes.
- iii. Determining the fundamental processes' missions, responsibilities, and roles.
- iv. Breaking down and identifying the sub-processes
- v. Determining the roles and functions of sub-processes.
- vi. Breaking down and identifying the fundamental actions of sub-processes.
 - i. Connecting goals to each hierarchy, from processes to basic action.

Cost, time, capacity, capability, productivity, utilization, and output are all factors in process-based methods. The cost is the cash outlay for carrying out a single event or activity. It is always one of the most important factors in evaluating the success of corporate operations and processes. In today's corporate world, time is a valuable resource. Capacity refers to a certain activity's capacity to complete a job or execute a specified function. Effectiveness, dependability, availability, and adaptability are examples of capability measurements. The pace at which resources are used to carry out a certain task is referred to as utilization. The outcome is the result or value contributed of a single action or event.

7.2 Balanced Scorecard Approach

In AFBL It assesses company performance using four approaches: It assesses company performance using four approaches:

- i. the financial,
- ii. the internal business process,
- iii. the customer, and
- iv. learning and growth.



The term "balanced scorecard" refers to a combination of elements that maintains a balance between short-term and long-term objectives, financial and non-financial metrics, lagging and leading indicators, and internal and external performance perspectives. There are two approaches: customer-centric and financial-centric. The shareholders' point of view is the customer's point of view, which is a value-added point of view, and the financial point of view. Customer views' approach objective is to realize vision by providing value to customers. It is also an internal perspective (a process-based view), with the goal of promoting efficiency and effectiveness in corporate operations. The mission of financial perspective is to succeed financially by providing value to shareholders and achieving the goal by sustaining innovation and change skills, continuous improvement, and preparing for future problems. In the future, this method has also learnt and grown. Financial measurements, consumer perspectives, internal company perspectives, and innovation and learning perspectives are all considered. The financial performance of a corporation is measured by its financial results. Profitability, sales turnover increase, and shareholder wealth maximization are all examples of threshold financial measures. The purpose of evaluating the customer viewpoint method is to discover how consumers see the firm. Measures can include lead time, product and service quality, corporate performance, and cost effectiveness. Internal business operations that have the greatest influence on customer satisfaction criteria are measured. In the future, viewpoints on innovation and learning can increase the efficiency of a firm's operational business. It does not include a system for ensuring that defined measurements remain relevant. SCOR takes a block-by-block approach and provides complete traceability.

- i. The threshold concept may fail to combine top-level, strategic score-card, and operational-level criteria, thereby making strategy implementation difficult. SCOR describes the process type (planning, execution, and enabling) and configures it to meet the SC criteria.
- ii. It is also possible to fail to describe a user-centered development methodology. A thorough SCOR exercise yields enough data to create a tailor-made software system.

The SCOR-threshold framework at Level 1 is connected to numerous decision areas of the SCOR model. Various SC planning techniques are explored for each SCOR decision area. An individual organization selects a Level 2 SCOR category and a suitable plan-source-make-deliver configuration. Level 3 decomposes the processes determined at Level 2 into sub-processes and summarizes process element description, inputs-outputs, process, and performance indicators. To create a viable implementation strategy, an analysis is carried out to obtain understanding of the difference between the current scope of performance assessment and the proposed scope of the SCOR-Threshold framework.



7.3 Managerial Approach

SC activity/process performance categories (plan, source, make/assemble, and deliver) and management approach to strategic, tactical, and operational management viewpoints as previously stated, measuring measures were selected based on research in which organizations were asked which indicators were most relevant to their business. They also show how SCM performance may be monitored at three different management levels. There are three levels: strategic, tactical, and operational. Strategic level performance is measured to meet the demands of high management. These are often corporate-level performance indicators. The tactical levels assess performance against goals and solicit input from mid-management. Data that is important to low-level management is required for operational level measurements.

7.4 Time Based Approach

The time-based measuring approach seems to be one of the most wide-known SCM capability measures among researchers. Time is also identified as the important source of competitive advantage. Therefore, it seems that even though time has been quite a common measure in SC performance it is still an accurate and useful measure. Lead-time, order cycle time, time-to-market and other time measures are actually relevant for every management level. Operational, tactical and strategic management are of interest for time measurement of SC performance. Time is the same for everyone and every company, every production line and all people and therefore it is easy to measure. When comparing cost or financial metrics and time, it is clear that time is a more stable measure than other financial metrics and cost. It is not possible to change the time currency like money.

7.5 Quantitative and qualitative measures

A performance measuring technique for SCM that includes both qualitative and quantitative indicators. Cost and resource utilization are quantitative metrics, whereas quality, adaptability, visibility, trust, and innovativeness are qualitative measures. SCM performance metrics are offered in two categories: qualitative and quantitative – where customer happiness and responsiveness, flexibility, supplier performance, costs, and other SC modeling measurements are presented. As previously indicated, two performance indicators are used: cost and the combination of cost and customer responsiveness. Inventory and operational costs are included in the cost. Lead-time, stock-out likelihood, and fill rate are all indices of customer responsiveness.



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