DISSERTATION REPORT
ON

The Impact of Supply Chain Management Practices on the Overall Performance of the RAK Ceramics Bangladesh Limited.

Submitted by:

Md. Jobair Hossan

ID: MSCM2102023005

Semester: Summer 2022

Program: MBA

Major: Supply Chain Management

Supervised By

Amir Husen
Assistant Professor
Department of Business Administration

Sonargaon University (SU)

Submitted to:

Department of Business Administration

Submitted for the partial fulfillment of the degree of
Master of Business Administration



Sonargaon University (SU)

Dhaka- 1215

Date of Submission: 04/08/2022

Letter of Transmittal

August 04, 2022

Amir Husen

Assistant Professor

Department of Business Administration

Sonargaon University

Subject: Submission of Dissertation Report.

Dear Sir,

With humble honor and respect, I am submitting my dissertation report on "The Impact of Supply Chain Management Practices on the Overall Performance of the RAK Ceramics Bangladesh Limited" as per partial accomplishment of requirements for the MBA degree. This dissertation has been carried out under the supervisor of you.

This report is an integral part of our academic courses in completion of the MBA program which has given me the opportunity to have an insight into The Impact of Supply Chain Management Practices on the Overall Performance of the RAK Ceramics Bangladesh Limited, real scenario impacts of supply chain management.

In completing the report, I tried my best to blend all my knowledge and implied every available details and also attempted to avoid unnecessary amplification of the report.

I humbly respect you to accept this report for your kind evaluation.

Sincerely,

_____

Md. Jobair Hossan
ID: MSCM2102023005
Program: MBA
Major: Supply Chain Management
Department of Business Administration
Sonargaon University (SU)

Letter of Authorization

Certified that this dissertation report titled "The Impact of Supply Chain Management Practices on the Overall Performance of the RAK Ceramics Bangladesh Limited" is the bona fide work of Md Jobair Hossan, who carried out the research under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degreeor award was conferred on an earlier occasion on this or any other candidate.

_____

Amir Hussen

Assistant Professor

Department of Business Administrntion

Sonargaon University (SU)

Acknowledgement

First I would like to thank Almighty Allah for making it possible for us to complete our work properly within the given time. Most importantly I would like to thank my dissertation supervisor Amir Husen, who was always ready to guide me and solved all the difficulties that I faced during preparing my report.

I would like to mention some people with due respect and honor who assisted me, without any hesitation to complete our dissertation report within the due time. Therefore, I would like to thank them all from the bottom of my heart.

Sincerely,

Md. Jobair Hossan
ID: MSCM2102023005
Program: MBA
Major: Supply Chain Management
Department of Business Administration
Sonargaon University (SU)

Abstract

RAK Ceramics is one of the largest ceramics' brands in the world. Specializing in ceramic and gres porcelain wall and floor tiles, tableware, sanitary ware and faucets, the Company has the capacity to produce 118 million square meters of tiles, 5 million pieces of sanitary ware, 24 million pieces of porcelain tableware and 1 million pieces of faucets per year at our 21 state-of-the-art plants across the United Arab Emirates, India and Bangladesh. Headquartered in the United Arab Emirates, we serve clients in more than 150 countries through our network of operational hubs in Europe, Middle East and North Africa, Asia, North and South America and Australia. Across our global operations we employ approximately 12,000 staff from more than 40 nationalities. We are a publically listed company on the Abu Dhabi Securities Exchange in the United Arab Emirates and on the Dhaka Stock Exchange in Bangladesh and as a group have an annual turnover of approximately US$1 billion.

RAK Ceramics Bangladesh is a proactive and resilient organization working in collaboration with all its stakeholders in a focused, constructive and mutually beneficial manner. It is well positioned to benefit from some of the structural long-term growth drivers that include urbanization, housing under-penetration, accessibility to financing solutions and a growing aspirational middle-class.

The Company's wide range of branded products are made available to all potential and emerging markets of the country through a unified customer sales team and integrated supply chain network that leverages the Company's scale. We target highest profitability, underpinned by a cost conscious culture, as well as environmental, social and governance (ESG) principles to drive shared value creation.
The Company has a primary listing on the Dhaka Stock Exchange, and its operations date back to the year 2000, with incorporation in 1998. The structure of the business in its current state is representative of a UAE-Bangladesh joint venture project.

This report is intended to explain the whole Supply Chain Process of RAK Ceramics Bangladesh Limited. Here we firstly tried to find the current practices of supply chain on the first part of the report. This analysis emphasizes on the major aspects of supply chain within a country which are Supply Chain Strategy, Sourcing and Procurement, Material Management, Manufacturing and Quality Control, Logistics and transportation. We have arranged them as per information could be gathered from both inside and outside of the company.
After the analysis this report focuses on the findings of the analysis. A SWOT analysis is there to guide through the findings of the analysis. At the end few steps of recommendations are suggested in order to indicate a greater future for the company.

Table of Contents

DISSERTATION REPORT. 1

Letter of Transmittal 2

Letter of Authorizations 3

Acknowledgement 4

Abstract ---------- **5**

Chapter: 01 Introductions 8

1.1 Introduction of the Study 8

1.2 Objectives of the Study 8

1.2.1 Broad Objective 8

1.2.2 The Specific Objectives 8

1.3 Scope of the Study 9

1.4 Methodology of the Study 9

Data Collection Method 9

1.4.1 The Primary Sources 9

1.4.2 The Secondary Sources 9

1.5 Time Schedule of the Study 10

1.6 Limitations of the Study 11

Chapter: 02 Profile of RAK Ceramics Bangladesh Limited 12

2.1 : Overview of the Company 12

2.2 : Vision, Mission and Quality Chapter: 02 Profile of RAK Ceramics Bangladesh Limited 12,13

2.3 : Organizational Structure 14

2.4 : Factory Concern Department and Branches 15

2.5 : Organogram of RAK Ceramics Bangladesh Limite 15

2.6 : Products Produced by RAK Ceramics Bangladesh Limited 16

2.7 : CSR Policy of RAK Ceramics Bangladesh Limited 17

Chapter: 03 Conceptual Frameworks 18

3.1 Supply Chain Management (SCM) 18

3.2 Strategic Management 18

3.3 Reasons for Forming Supply Chain Management 19

3.4 The Four Phases of Supply Management 19

3.5 Supply Management Systems 20

3.6 Strategic Supply Management Activities 20

3.7 Sourcing Analysis in Procurement ---------- 22
3.8 Material Management ---------- **22**
3.9 Manufacturing Process ---------- **22**
3.10 Logistics Management ---------- **22**
3.11 Logistic Drivers of Supply Chain Management ---------- **23**
3.12 Roles of Inventory ---------- **25**
3.13 Overview of Inventory Control Model ---------- **25**
3.14 Inventory Management in the Supply Chain ---------- **26**
3.15 Pitfalls in Inventory Management ---------- **26**

Chapter: 04 Analysis of the Study 27
4.1 Strategic Management ---------- **27**
4.2 Sourcing Analysis and Procurement methods ---------- **27**
4.3 Sourcing Process & Supplier List 28
4.4 Procurement Steps 28
4.5 Procurement Process 28
4.6 Purchase Order Process 29
4.7 Purchasing Process 29
4.8 Material Management 30
4.9 Functions of Material Management 30
4.10 Raw Material Purchasing 31
4.11 Production Planning 31
4.12 Manufacturing Process of Ceramics Products 31
4.13 Logistics Management 36
4.14 Material Handling Equipment of the Organization 36

Chapter : 05 Findings 37
5.1 Key Findings 37
Chapter : 06 Recommendations And Conclusion ---------- 37
6.1 Recommendations 37
6.2 Conclusion 38
References 39

Chapter: 01 Introduction

1.1 Introduction of the Study

The market- based economy of Bangladesh is the 39th largest in the world in nominal terms, and 29th largest by purchasing power parity; it is classified among the Next Eleven market economies and a frontier market. According to the IMF, Bangladesh was the world's seventh fastest growing economy with a rate of 7.3% real GDP annual growth. Dhaka are the principal financial centers of the country, being home to the Exchange. The financial sector of Bangladesh is the seventh largest in the subcontinent. It has also developed self-sufficient industries in pharmaceuticals, steel and food processing. Bangladesh telecommunication industry has witnessed rapid growth over the years, receiving high investment from foreign companies. Bangladesh also has substantial reserves of natural gas and is Asia's seventh largest gas producer. Offshore exploration activities are increasing in its maritime territory in the Bay of Bengal.
It also has large deposits of limestone.

1.2 Objectives of the Study

1.2.1 Broad Objective

The broad objective of the study is to know about the Supply Chain Management Practices of RAK Ceramics Bangladesh Limited.

1.2.2 The Specific Objectives

The specific objective of the study are as follows:

- General Objective: to showing the procurement process and supply chain and how it is applied in RAK Ceramics Bangladesh Limited;
- The Specific Objectives: The study which are predictable to followings:
- To analysis the procurement process and supply chain management activities and its development at RAK Ceramics Bangladesh Limited.; and to share the experience of research.
- To give suggestions to overcome those problems and to express an impression of RAK Ceramics Bangladesh Limited to share the experience of research.

1.3 Scope of the Study

The scope of the report is aim to the descriptions and analysis of application of transportations process and logistics management in supply chain management in RAK Ceramics Bangladesh Limited. This company's supply chain and the overall condition of Procurement, Transportations, International Shipment processes a big scope. The customer satisfaction availability, future possibility etc. Have been discussed. Some suggestions to improve the existing customs satisfaction have also been made.

1.4 Methodology of the Study Data Collection Method

A certain methodology used in order to fulfill the objectives of the report, making maximum utilization of the scopes and to avoid the limitations as much as possible to prepare the outcome of this study. To prepare this report I mostly depend on the experience and secondaryinfom1ation because it was difficult for me to collect primary information.

1.4.1 The Primary Sources

The sources as follows

I. Face-to-face conversation with the Executives and officers of RAK Ceramics Bangladesh Limited.
II. Informal conversation with the client.
III. Practical work exposures from the different desks of the various departments of the Branch covered.

1.4.2 The Secondary Sources

The secondary sources data and information are:

a) Annual Report of RAK Ceramics Bangladesh Limited.
b) Periodicals published by RAK Ceramics Bangladesh Limited.
c) Various books, articles, compilations etc. regarding general.

1.5 Time Schedule of the Study

SL.NO	Particulars	Time Duration
1	Data Collection	**10**
2	Data Analysis	**30**
3	Report Rearrangement	**15**
4	Report Editing	**20**
5	Report Evaluating & Binding	**15**
	Total	**90**

1.6 Limitations of the Study

Since our study is based on both primary and secondary data, there is a possibility of getting fake information. If the surveyed personnel provide us with any information about their opinion of their organization, then the report findings may be erroneous. Above all, this study is weak in some points. The notable ones are as under:

i. The survey was conducted in a very sho1t time so we were not able to collect more information. ii. This survey made on the crisis of Bangladesh, so it was difficult to collect more samples.

iii. Only the big and the reputed RAK Ceramics Bangladesh Limited consider here as samples lack of experience in this field.

iv. Another limitation of this study is the person's private information were being disclosing some, data and information for obvious reasons, which could be very much useful.

v. Lake of proper authority to conduct the interview program.

Chapter: 02 Profile of RAK Ceramics Bangladesh Limited

2.1 : Overview of the Company

RAK Ceramics (Bangladesh) Limited is the country's largest and most respected tiles and sanitary ware brand. The Company was incorporated in Bangladesh on 26 November, 1998 as a private limited company under the Companies Act, 1994 as a UAE-Bangladesh joint venture project. It has started its commercial production on 12 November 2000. It has converted into public limit ted company on 10 June 2008 and listed in the stock exchanges of Bangladesh on 13 June 2010. The Company has anchored this position on the basis of its market-leading capacities, world class manufacturing assets, high production utilization, optimized cost structures, vibrant sales and distribution network and robust customer engagement programs. The core business of RAK Ceramics (Bangladesh) Limited is to manufacture and sell of ceramics and gres porcellanato (Porcelain/ fully vitrified) tiles, bathroom sets and all types of sanitary ware. The Company has over 2,500 models active in the ceramic and porcelain tile business and regularly adds several new designs to the product portfolio. The Company manufactures tiles in a very wide range of tiles in the sizes from 20 cm X 30 cm up to 60 cm X 60 cm in Bangladesh location. The Company has over 30 models an exclusive range of sanitary ware to offer with a very wide choice. In sanitary ware various models are produced in wash basins (mounted as well as pedestal), water closets, accessories and marble sets. Besides, the product mix is geared to produce mostly value added products. This paired with the other advantages will ensure a shrunken payback cycle. Production is mostly consumed in local.

Reporting entity

RAK Ceramics (Bangladesh) Limited (the Company), formerly RAK Ceramics (Bangladesh) Pvt Limited, a UAE-Bangladesh joint venture company, was incorporated in Bangladesh on 26 November 1998 as a private company limited by shares under the Companies Act 1994. The Company was later converted from a private limited into a public limited on 10 June 2008 after observance of required formalities as per laws. The name of the Company was thereafter changed to RAK Ceramics (Bangladesh) Ltd. as per certificate issued by the Registrar of Joint Stock Companies dated 11 February 2009. The address of the Company's registered office is RAK Tower, Plot # 1/A, Jasimuddin Avenue, Sector # 3, Uttara, Dhaka 1230. The company got listed with Dhaka Stock Exchange (DSE) and Chittagong Stock Exchange (CSE) on 13 June 2010.

2.2 : Vision, Mission and Quality Policy of RAK Ceramics (Bangladesh) Ltd.

The vision of RAK Ceramics (Bangladesh) Ltd. Is to achieve long term sustainable quality level through continuous improvement. And the mission is to satisfy buyer expectation by providing better quality products.

Policy of RAK Ceramics (Bangladesh) Ltd.:

RAK Ceramics (Bangladesh) Ltd. has committed themselves to the following policies-

Vission:

Our vision is to be the world's leading ceramics lifestyle solutions provider.

Mission:

Our mission is to foster an internal culture that we are committed to our vision of becoming the world's leading ceramics lifestyle solutions provider and we will achieve this by utilizing our experience, our wide product range, our innovative approach and continuing to deliver quality. We want to build a world class organization. We have applied our expertise in some of the most iconic and innovative projects around the world and we aim to continue to push the boundaries in new and exciting projects as we move forwards.

Nature of business

The Company is engaged in manufacturing and marketing of ceramics tiles, wash room sets and all types of sanitary ware. It has started its commercial production on 12 November 2000. The commercial production of its new sanitary ware plant. expansion unit of ceramics facilities, tiles and sanitary plant was started on 10 January 2004, 1 July 2004.1 September 2007, 1 April 2015 and 17th May 2016 respectively.

Basis of preparation
Statement of compliance

These financial statements have been prepared in accordance with International Financial Reporting Standards (IFRSs), the Companies Act 1994 and the Securities and Exchange Rules 1987.

The title and format of these financial statements follow the requirements of I FRSs which are to some extent different from the requirement of the Companies Act 1994. However, such differences are not material and in the view of management I FRSs titles and format give better presentation to the shareholders.

Authorization for issue

These financial statements have been authorized for issue by the Board of Directors of the Company on

02 February 2022

Basis of measurement

These financial statements have been prepared on historical cost basis except for inventories which are measured at lower of cost and net realizable value.

Functional and presentational currency

These financial statements are presented in Bangladesh Taka (Taka/Tk/BDT), which is the functional currency and presentation currency of the Company. The figures of financial statements have been rounded off to the nearest Taka.

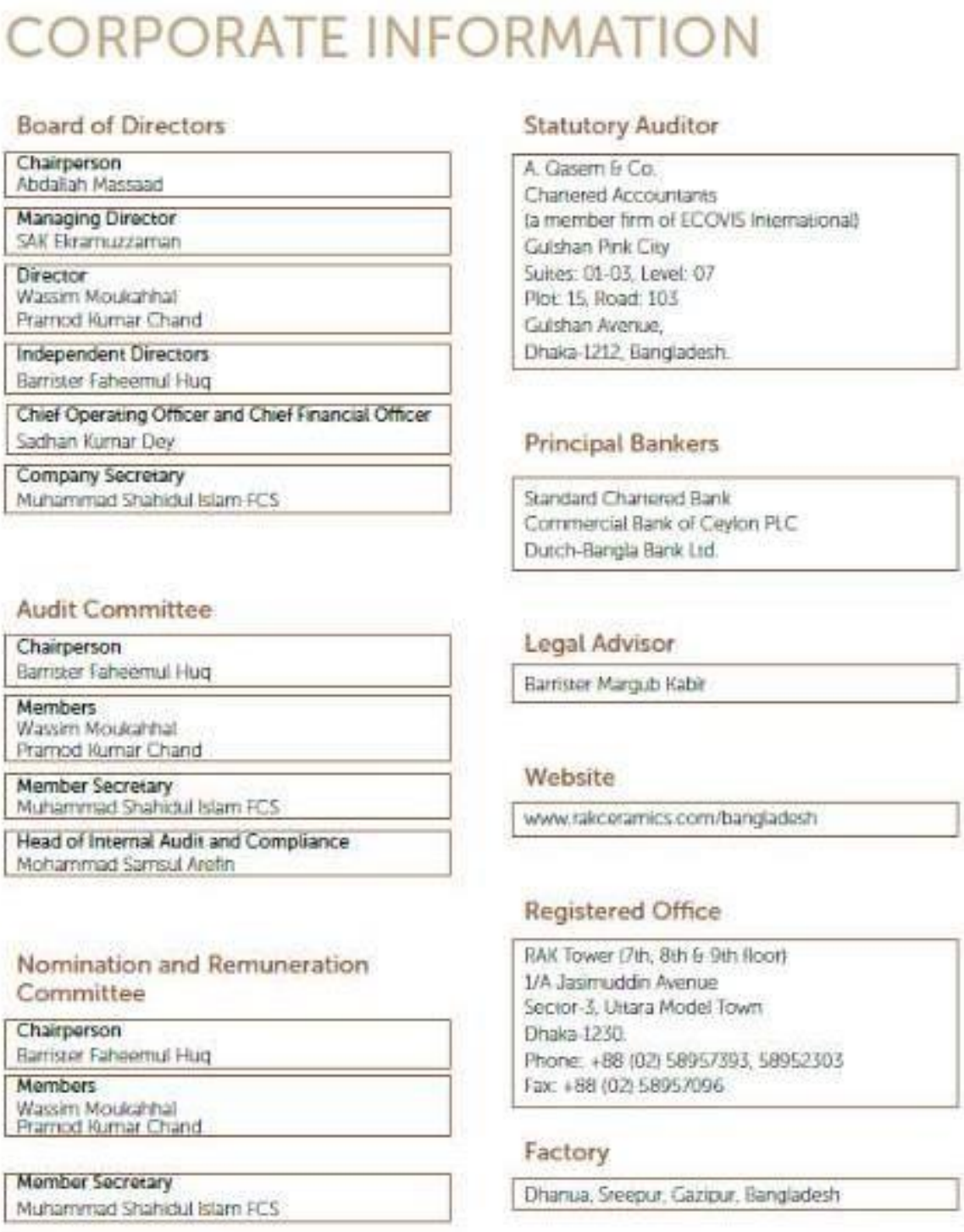
Use of estimates and judgements

The preparation of these financial statements in conformity with I FRS req u ir es management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates. Estimates and underlying assumptions are reviewed on an ongoing basis

2.3 : Organizational Structure

The Chairman of the RAK Ceramics (Bangladesh) Ltd is the business owner and follow up all the companies by himself. The Vice Chairman along with the other directors is responsible for the Ceramics manufacturing companies.

The Board of Director of RAK Ceramics (Bangladesh) Ltd are following-



CORPORATE INFORMATION

Board of Directors

Chairperson
Abdallah Massaad

Managing Director
SAK Ekramuzzaman

Director
Wassim Moukahhal
Pramod Kumar Chand

Independent Directors
Barrister Faheemul Huq

Chief Operating Officer and Chief Financial Officer
Sadhan Kumar Dey

Company Secretary
Muhammad Shahidul Islam FCS

Audit Committee

Chairperson
Barrister Faheemul Huq

Members
Wassim Moukahhal
Pramod Kumar Chand

Member Secretary
Muhammad Shahidul Islam FCS

Head of Internal Audit and Compliance
Mohammad Samsul Arefin

Nomination and Remuneration Committee

Chairperson
Barrister Faheemul Huq

Members
Wassim Moukahhal
Pramod Kumar Chand

Member Secretary
Muhammad Shahidul Islam FCS

Statutory Auditor

A. Qasem & Co.
Chartered Accountants
(a member firm of ECOVIS International)
Gulshan Pink City
Suites: 01-03, Level: 07
Plot: 15, Road: 103
Gulshan Avenue,
Dhaka-1212, Bangladesh.

Principal Bankers

Standard Chartered Bank
Commercial Bank of Ceylon PLC
Dutch-Bangla Bank Ltd.

Legal Advisor

Barrister Margub Kabir

Website

www.rakceramics.com/bangladesh

Registered Office

RAK Tower (7th, 8th & 9th floor)
1/A Jasimuddin Avenue
Sector-3, Uttara Model Town
Dhaka-1230.
Phone: +88 (02) 58957393, 58952303
Fax: +88 (02) 58957096

Factory

Dhanua, Sreepur, Gazipur, Bangladesh

The manufacturing companies that are included with RAK Ceramics (Bangladesh) ltd are following-

2.3.1 RAK Ceramics (Bangladesh) Limited

2.3.2 RAK Power PVT Limited

2.3.3 RAK Security and Services Pvt Ltd

2.4: Factory Concern Department and Branches

I am working in RAK Ceramics (Bangladesh) Ltd. This company has following department with some branches-

Industrial Engineering (IE) Department, Planning Department, Quality Department, R&D Department, Security Department, Supply Chain Department. Admin Department, Human Resource and Development, Sales and marketing, Maintenance Section- Electrical & Mechanical

2.5 : Organogram of RAK Power Pvt Limited

Rak power pvt ltd. Has been incorporated in bangladesh under the companies act 1994 on 30 june 2005 as a private company limited by shares with an authorized capital of taka 1,000,000,000 divided into 10,000,000 ordinary shares of taka 100 each. The paid up capital stands at taka 205,000,000 at the end of reporting period. The company has gone into operation from 1 may 2009. The registered office of the company is at rak tower (8TH floor), jashimuddin avenue, plot # 1/a, sector # 03, uttara model town, dhaka - 1230. The power plant is located at village: dhanua, ps: sreepur, district: gazipur. 57% shares of rak power pvt ltd. Is held by rak ceramics (bangladesh) limited.

The board of directors of rak ceramics (bangladesh) limited in its meeting held on july 26, 2015 have decided to further increase the shareholding in rak power pvt ltd. From 57% to 99.99% through purchase of 881495 number of ordinary shares of bot 100 each in consideration of bot 255 per share totaling to bdt 224,781,225 only from all the other shareholders of rak power pvt ltd. Subject to approval by the shareholders and concerned authorities for the interest of the business of the company. The shareholders of rak ceramics (bangladesh) limited have approved the same in the egm dated september 20, 2015.the effect of acquisition has been taken place as approved in board of directors meeting of rak power (pvt) ltd on 20 october 2015.

2.5:1. RAK Security and Services Pvt Ltd.

RAK Security and Services (Pvt) Ltd. has been incorporated in Bangladesh under the Companies Act 1994 on 21 December 2006 as a private companylimited by shares with an authorized capital of Taka 100,000,000 divided into 1,000,000 ordinary shares of Taka 100 each. The paid up capital stands at Taka 1,000,000 at the end of reporting period. The Company has gone into operation from 1 May 2007. The registered office of the Company is at RAK Tower (8th floor), Plot # 1/A. Jasimuddin Avenue, Sector # 03, Uttara Model Town, Dhaka-1230. 35% shares of RAK Security and Services (Pvt) Ltd is held by RAK Ceramics (Bangladesh) Limited.

The Board of Directors of RAK Ceramics (Bangladesh) Limited in its meeting held on July 26, 2015 have decided to further increase the shareholding in RAK Security & Services (Pvt) Ltd. from 35% to 99 00% through purchase of 6,500 number of ordinary shares of BOT 100 each in consideration of BDT 2,875 per share totaling to BDT 18,687,500 only from all the other shareholders of RAK Security & Services (Pvt) Ltd. subject to approval by the shareholders and concerned authorities for the interest of the business of the Company. The shareholders of RAK Ceramics (Bangladesh) Limited have approved the same in the EGM dated September 20, 2015. The effect of acquisition has been taken place as approved in Board of Directors meeting of RAK Security and Services (Pvt) Ltd on 20 October 2015.

2.6: Products Produced by RAK Ceramics (Bangladesh) Limited

In tiles RAK Ceramics offers one of the largest collections of ceramic wall and floor tiles, gres porcelain and super-sized slabs in the industry. Offering more than 6,000 production models, tiles are manufactured in a variety of sizes, from the smallest 10x10cm up to the largest in the region at 135x305cm, the widest range offered in the ceramics field. RAK Porcelain offers porcelain tableware for the hotel, restaurant and hospitality segment. Its products are now supplied to over 40,000 star-rated hotels across more than 165 countries with customers including J W Marriott, Hilton, Hyatt, and Sheraton amongst others-

Various Sizes of Tiles:

Floor Tiles

a. Gress Porcelain
b. Salt & Pepper
c. Glaze Rustic
d. High Tech Porcelain
e. Glaze Polish
f. Double Charge

Wall Tiles

a. Ceramics Red Body
b. Ceramics White Body
c. Hard Rock

Various Types of Sanitary ware:

a. Washbasin
b. Toilet Seat
c. Water Closet
d. Wall Hung Toilet
e. Pedestal Washbasin

2.7: CSR Policy of RAK Ceramics Bangladesh Limited.

RAK Ceramics Bangladesh Ltd. has integrated corporate social responsibility into their operations and choose to develop their personnel holistically. Planting 1000+ trees every year, providing safe drinking water and on-site medical facilities for all employees and their families, and providing daycare centers with qualified childcare providers for working mothers are just a few of their activities. They also hold regular wellness training workshops for their employees, focusing on financial literacy and nutrition. They are committed to investing in their employees. They have developed a salary management method called the Fair Wage Method with the help of the International Labor Organization (ILO) to address wage discrepancy issues in the worldwide Ceramics manufacturing sector. RAK Ceramics Bangladesh Ltd. consider these projects as more than just corporate social responsibility and a way to develop the community and the larger global sector.

- Medical room with available full-time doctors and nurses Day-care center staffed with certified child caregivers.
- Dining hall and canteen wherein employees can have their lunch and snacks.
- Separated prayer rooms for men and women.
- Safe drinking water dispensers available throughout the factory premises.
- Female welfare officers providing consultancy and employee awareness.
- Workers Participatory Committee for worker counseling and grievance handling



Figure 1 Social policy of ApHoldings Ltd.

Chapter: 03 Conceptual Frameworks

3.1 Supply Chain Management (SCM)

Supply chain management (SCM) is the centralized management of the flow of goods and services and include all process at transform raw materials into final production. By managing the supply chain companies are able to cut and deliver products to the consumer faster.

Supply chain management is the integrated process-oriented planning and control of the flow of goods, information and money across the entire value and supply chain from the customer to the raw material supplier. In essence, supply chain management integrates supply and demand management within and across companies. A process for designing, developing, optimizing, and managing the internal and external components of the supply system, including material supply transforming, materials and distributing finished products or se1vices to customers, that is consistent with overall objectives and strategies.

The integration of business processes from end user through 01iginal suppliers that provides products, services and information that add value for customers. A supply chain is a network of facilities that procure raw materials, transform them into inte1mediate goods and then final products, and deliver the products to customers through a distribution system. A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. The supply chain includes not only the manufacturers and suppliers, but also transporters, warehouses, retailers, and even customer themselves. Each stage in a supply chain is connected through the flow of products, information and fund. These flows often occur in both directions and may be managed by one of the stages or an intermediary. Here we can see raw mate1ials supplier supply industrial product to the manufacturer, and make the product sale to distributor, distributor sale this product to the retailer by small lot, and final consumer get the product from the retailer.

Supply chain stages:

- Raw material supplier
- Manufacturer
- Wholesaler/distributor
- Retailer
- Customer

3.2 Strategic Management

Strategies are plans for achieving organizational goals. It has a great impact on what the organization does and how it does it. Strategies can be long term, intermediate term and long term. To be effective, strategies must be designed to support the organization's mission and its organizational goals.

Strategic management is the process of setting goals, procedures, and objectives in order to make a company or organization more competitive. Often, strategic management includes strategy evaluation, internal organization analysis, and strategy execution throughout the company.

3.3 Reasons for Forming Supply Chain Management

Practices experienced in the traditional management of the supply chain raised the need for conversion to a new paradigm of supply chain management (SCM). The traditional supply chain and manufacturing processes relied on experience and intuition of managers and were designed with long supply cycle times, large batch sizes, capacity based on annual volumes, volume-driven technology, and numerous suppliers for the same parts on the short-te1mbase contracts. With traditional management processes, the goal of business activities was to maximize the efficiency of an individual functional unit by achieving competitive edges based on cost reduction. Under the traditional supply chain, efforts of manufacturers to meet the increased changing of customer requirements caused decreased margins, poor service perfo1mance, increased overhead costs, poor production process reliability, increased downtime due to changeovers, and high inventory levels of raw materials and finished product. None of these conditions are viable in a competitive market. Most product supply systems are out of balance with customer requirements.

3.4 The Four Phases of Supply Management

The four phases of supply management all require many perspectives & inputs best obtained through a cross-functional approach. These four phases of supply management are as follows:

1. **Generation of Requirements:** The generation of requirements is a critical activity that results in the identification of the optimal materials & services to purchase, together with the development of specifications & statements of work describing these requirements. Approximately 85 percent of the cost of purchased material, se1vices & equipment is "designed in" during this phase. Thus supply management should be involved up-front during the generation of requirements to ensure that all commercial issues such as cost, availability, substitutes & so on, receive appropriate consideration.
2. **Sourcing:** The objective of sourcing is the identification & selection of the supplier whose costs, qualities, technologies, timeliness, dependability & service best meet the firm' s needs. The development of supply alliances is a sourcing activity.
3. **Pricing:** The objective of pricing is the development of prices that appropriately reward the supplier for its effo11s & which result in the lowest total costs of ownership for the customer film. While negotiations occur throughout the supply management process, their most significant role normally is during the pricing phase.
4. **Post-Award Activities:** This impo1tant activity ensures that the firm receives what was ordered on time & at the price & quality specified. Post-award activities include supplier development, technical assistance, troubleshooting & the management of the contract & the resulting relationships.

3.5 Supply Management Systems

Virtually all firms have supply management system even though many do not appear to be aware of this truth. A cross-functional approach to supply management allows each functional areas affected by the procurement of materials, equipment & services to be involved at a poiI1t where it may contribute to the lowest total cost. For example, Ceramics manufacturing has expertise in technical & design; operations have it in the productivity implications of different materials; quality addresses the ability of prospective suppliers to meet quality requirement; & supply management addresses the commercial issues involved. Functions that should be included up-front (but seldom are under traditional approaches) are more likely to be involved so that they may contribute their insight. Customer service & maintenance are examples of functions with valuable information that should be considered early in the product's development. Unfortunately, such activities n01mally do not participate early enough to voice their concerns & needs. This may result in the purchase of equipment that is difficult to maintain, which may result in unavoidable downtime. Early in the development stage for new products or services (n01mally, after the objectives have been established & agreed to), one or more carefully selected suppliers is invited to join the in-house cross-functional team. Such action reduces the development & operation cycle & total cost.

3.6 Strategic Supply Management Activities

Supply management must focus on ten strategic activities:

1. **Environment Monitoring:** Supply management must understand supply markets & monitor the supply environment to identify threats & opportunities. These threats & opportunities include material shortages that affect one or more industries that supply the film. Sh01tage will affect both the price & availability of purchased materials & supplies. The film should take actions to minimize the impact of such shortages by monitoring changes in the supply environment.

2. **Integrated Supply Strategy:** Supply management must develop & manage the firm's supply strategy as an integrated whole instead of a series of unrelated strategies. The corporation's strategy is the key driver of the supply strategy. The technology, marketing & production strategies are all inputs to the supply strategy. Conversely, the supply strategy is an input to the technology, marketing & production strategies.

3. **Commodity Strategies:** Supply management must develop & update sound commodity supply strategies. The following activities must be performed in order to ensure the effectiveness of the firm's commodity strategies:

    □ Strategy updating.

    □ Technology access & control.

    □ Supply management organization.

    □ Risk management

4. **Data Management:** Supply management, accounting & information technology must cooperate in the collection & application of supply data with the objective of facilitating strategic supply planning. Strategic supply planning requires data that provides information for processes that span over functional & company boundaries. The responsibility for planning, collection & compilation of supply data should not be placed on supply management alone. Rather, it should be an inter functional activity where the leaders are supply management & information technology personnel. Suppliers should also be included in the planning of data collection & application after careful internal consideration & analysis of each supplier relationship.

5. **Corporate Strategic Plans:** Supply management must join marketing & operations as the key players in the development of each of the firm's corporate strategic plans. Supply management provides input to the strategic planning process on threats & opportunities in the supply world. Threats may be potential key material shortages or price increases. Opportunities may in the form of likely new technologies, materials & equipment that may lower the firm' s cost of operations. Production & marketing am vitally involved.

Supply management provides input on constraints that may affect strategic initiatives.

Supply management's knowledge of the firm's supply world may be a source of vital input during the strategic planning process.

6. **Strategic Sourcing:** The firm must design & manage its supply base in line with the firm' s strategic objectives. Several actions must be taken in the area of supply base management or strategic sourcing:

- □ Periodically review the firm's base of active suppliers.
- □ Identify the appropriate type of relationship.
- □ Optimize the supply base.

7. **Strategic Supply Alliances:** The development & management of supply alliances frequently are two of the most critical & most strategic activities undertaken by any firm. Institutional trust is a prerequisite to supply alliances.

8. **Supply Chain/Supply Networks:** The development & management of a firm's supply chain or supply network parallels the development & management of supply alliances, but is infinitely more complex. Information technology & relationship skills are essential prerequisites for personnel assigned to this task.

9. **Social Responsibilities:** Supply management must develop & implement programs which protect the environment, which facilitate the inclusion of minority-owned, women owned & small business in our economy & which promote values in the workplace.

10. **Understand Key Supply industries:** Supply management's impact is directly proportional to its knowledge of the industries in which it buys. Supply professionals study & understand the industries which provide key materials, equipment & services, their cost structure, technologies, competitive nature & culture. We see that supply management has both strategic & tactical responsibilities. When both are executed efficiently & effectively, supply management becomes a key to the organization's survival & success.

3.7 Sourcing Analysis in Procurement

Strategic sourcing analysis is a collaborative and organized approach to leveraging suppliers and organizational strategy to yield long-term cost-saving benefits Itisimp01iant to assess whether the benefits of strategic sourcing are light for your organization. Sourcing, also known as procurement, is the practice of locating and selecting businesses or individuals based on set criteria. Sourcing is carried out in business in many different areas and for different reasons. One of the most common uses of sourcing is in supply chain management.

3.8 Material Management

Materials Management, Procurement, and Logistics ensures that all of our products are at the right place at the right time. They are in charge of inventory management, managing and planning materials, the logistical procurement of goods and services, and delivering K+S products to customers. Mate1ial Management is responsible for purchasing the highest quality equipment and products at the lowest possible cost for the organization.

Production Control, Purchasing, Master Scheduling (Demand Planning) and Warehousing. Controlling costs of Purchases with PPV also is key. Material management is a scientific technique, concerned with Planning, Organizing &Control of flow of materials, from their initial purchase to destination.

3.9 Manufacturing Process

Direct procurement is sourcing the goods, mate1ials or services that serve as the input for the organization's manufacturing process. Direct procurement is a vital process that directly impacts the company's own output of goods or services. Manufacturing, procurement is the connection process of purchasing and arranging in bound movement of all items, supplies, materials, finished inventory and general supply services from the suppliers into manufacturing process or assembly plants or warehouses

3.10 Logistics Management

Logistics management is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information flows) through the organization and its marketing channels in such a way that current and future profitability are maximized through the cost. The roles of logistics feature transpo1tation/delivery, storage, packaging, cargo handling, distribution processing, and information processing, and many systems have been put in place to deliver products from the production location or factory to the consumer quickly and on time.

3.11 Logistic Drivers of Supply Chain Management

The forces that are reshaping the way businesses are being conducted in the contemporary hyper competitive environment world -wide and the concepts underlying the philosophy of supply chain management. There are three logistical drivers:

1. Facilities
2. Inventory &
3. Transportation

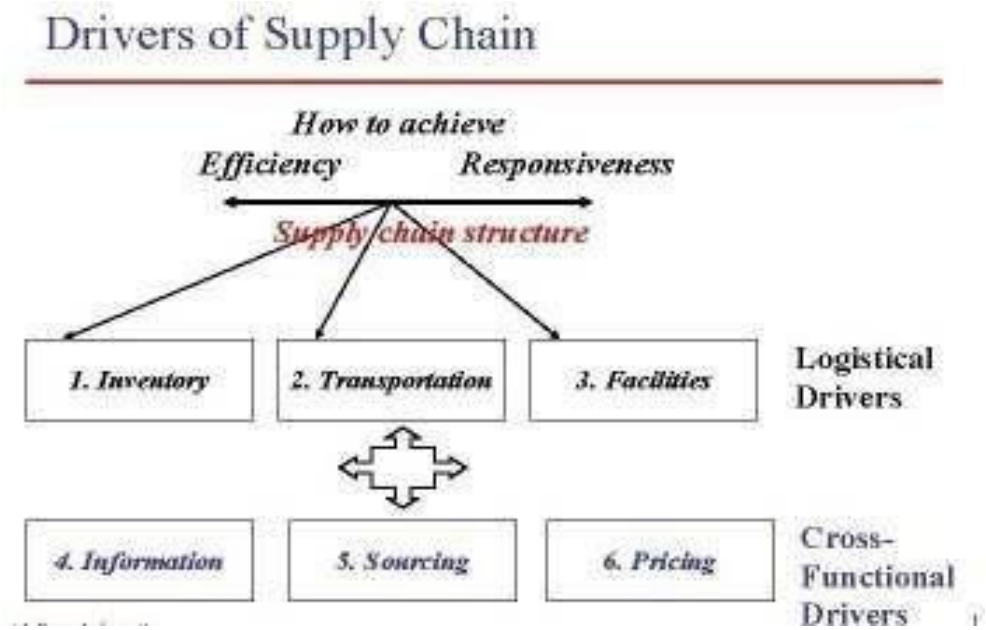


Figure 2 Logistics drivers

Facilities: The actual physical locations in the supply chain network where product is stored, assembled, or fabricated. The two major types of facilities are:

• Production sites and (Plant)

• Storage sites.

• Decisions regarding the role, location, capacity, and flexibility of facilities have a significant impact on the supply chain's pe1formance.

• For example, in 2013, Amazon increased the number of warehousing facilities (and, as a result, experienced an increase in Prope1ty, Plant and Equipment (PP&E) located close to customers to improve its responsiveness. In contrast, Best Buy tried to improve its efficiency in 2013 by shutting down retail facilities even though it reduced responsiveness.

• Facility costs show up under Property, Plant and Equipment (PP&E) PP&E if facilities are owned by the firm or under selling, general, and administrative if they are leased.

Inventory: Inventory management is the supervision of non-capitalized assets, or inventory, and stock items. As a component of supply chain management, inventory management supervises the flow of goods from manufacturers to warehouses and from these facilities to point of sale.

The four types of inventory most commonly used are Raw Materials, Work-In-Progress (WIP), Finished Goods, and Maintenance, Repair, and Overhaul (MRO). When you know the type of inventory you have, you can make better financial decisions for your supply chain. That includes choosing the best inventory management software to keep track of all that inventory.

1. Raw Materials

Materials that are needed to tum your inventory into a finished product are raw materials. For example, leather to make belts for your company would fall under this category. Or if you sell artificial flowers for your interior design business, the cotton used would be considered raw materials.

2. Work-In-Progress

Inventory that is being worked on is Work-In-Progress (WIP), just like the name sounds. From a cost perspective, WIP includes raw materials, labor, and overhead costs. Think of the inventory under this category as being a part of the bigger end-product picture. If you sell medical equipment, the packaging would be considered WIP. That' s because the medicine cannot be sold to the consumer until it is stored in proper packaging. It' s literally a work-in- progress.

3. Finished Goods

Maybe the most straight-forward of all inventory types is finished goods inventory. That inventory you have listed for sale on your website? Those are finished goods. Any product that is ready to be sold to your customers falls under this category.

4. Overhaul / MRO

Also known as Maintenance, Repair, and Operating Supplies, MRO inventory is all about the small details. It is inventory that is required to assemble and sell the finished product but is not built into the product itself. For example, gloves to handle the packaging of a product would be considered MRO. Basic office supplies such as pens, highlighters, and paper would also be in this category.

C. Transportation: Transportation provides the flow of inventory from points of origin in the supply chain to destinations, or points of use and consumption. Most businesses manage both inbound and outbound logistics. Inbound logistics involves the procurement of materials and goods from supplier locations. A transportation strategy, to be effective in supply chain management, is fitting the movement of goods to the corporate supply chain. It is not playing one carrier off against another. Rather it is a way to respond to the dynamics of the business, its customers, suppliers' and operation.

3.12 Roles of Inventory

Traditionally, a relatively high level of inventory has been kept in a company. The reasons for building inventory can be found in inventory's five functional roles: economies of scale, balance of supply and demand, specialization in manufacturing, protection from uncertainties, and inventory as buffer.

1. Purchasing or producing a bulk of items (i.e., economies of scale) enables a company to cut costs by allowing setup cost reduction, po1ice discounts, and spreading the factory overhead expenses.

2. Inventory provides balance between supply and demand. Supply and demand do not always match at any given time for reasons such as seasonal demand pattern or seasonal supply pattern. To maintain a stable workforce and production scheduling, and to avoid problems due to capacity limits, production can be used to build invento1y. Peak demand can be anticipated by building inventories in excess of current demand.

3. Inventory enables a manufacturer to specialize in the item by obtaining focused factory and learning-curve effects. Focused factory is a small factory dedicated to a specific product with a single product line to maximize productivity and quality. According to learning curve effect, a worker can gain skill and efficiency from their own experience from the repetitious practice with the long product runs.

4. Inventory serves to protect uncertainties in demand and supply. Inventory is necessary in case demand for finished goods fluctuates or if the suppliers' ability to meet the buyers' demand is not reliable. Raw material inventory is required in case of supply shortage and price increases. WIP inventory is needed to avoid a shutdown and stabilize workflow. Finished goods inventory improves customer service levels by avoiding stock outs due to variability in demand and manufacturing lead-time.

5. lnventory is used as buffer in the supply chain. It takes time to transit inventory from one operation to another within a company or one node to another in the supply chain (i.e., supplier to manufacturer, manufacturer to distributor, and distributor to customer). A certain amount of inventory throughout the chain ensures the independence of each operation team or channel member. Raw materials inventory isolates the supplier from the user, in-process inventory isolates production departments from each other, and finished goods inventory isolates the customer from the manufacturer.

3.13 Overview of Inventory Control Model

To help solve the problems of inventory, mathematical models which describe the inventory situation have been developed and applied in many industries. Inventory control models can be used to desc1ibe either replenishment from an outside vendor or internal production. Therefore, inventory control and production planning are often synonymous.

Examples of these models are Simple Economic Order Quantity (EOQ) model, EOQ with quantity discounts, Mate1ial Requirements Planning (MRP), Newsboy model, Lot size - Reorder point (Q, R) model, and Periodic-Review system. Which model to apply is determined by several factors: order repetitiveness (i.e., single order vs. repeat order), order quantity (i.e., fixed quantity vs. variable quantity), knowledge of demand (i.e., constant demand vs. variable demand, independent demand vs. dependent demand), and inventory review frequency (i.e., periodic vs. continuous review), and knowledge of lead time (i.e., constant lead time vs. variable lead time)

3.14 Inventory Management in the Supply Chain

Inventory management is one aspect of SCM. The main goal of SCM is to better manage inventory throughout the chain via improved information flow aimed at improved customer service, higher product variety, and lower costs and used the te1m "Networked

Inventory Management" (p.16) for the inventory aspect of SCM. The efficiency of SCM can be measured by inventory performance such as the speed of inventory passing through the chain and the load of inventory throughout the chain. Inventory of various forms from raw materials through WIP to finished goods is fed into the chain from suppliers, production, and subsequently distribution centers to customers. This flow of inventory requires responsibilities of channel members for the planning, acquisition, storage, movement, and control of materials and final products. High levels of inventory are found when the chain members less communicate due to lack of information sharing between chain members and inefficiency of SCM.

3.15 Pitfalls in Inventory Management:

Based on knowledge and expe1ience from supply chain management in Ceramics industry are found relevant to this project: □ No Supply Chain Metrics: In a supply chain with multiple sites, each site will often have its fairly autonomous management team. The objectives of the va1ious teams may differ, and even be conflicting. Inventory may for example be reduced at a Site A of a supply chain, and thereby, seen from a local perspective, the performance is enhanced. But the inventory decrease may also decrease Site A's flexibility. Because Site A now responds more slowly to changes,

Site B, which is Site A's customer will have to increase its inventory (of Site A pairs) in order to maintain its flexibility and level of customer service. The lack of supply chain metrics has prevented managers at Site A to see that their local improvements has not lead to improved overall performance of the supply chain. The objective of supply chain metrics is to give the basis for evaluations of the performance of the whole supply chain as one system.

□ Inadequate Definition of Customer Service: Too few and in-concise metrics for customer service. The evaluation of performance becomes difficult, and certain aspects of customer service may be overlooked. □ Inaccurate Delivery Status Data: Customers are not correctly informed of delivery dates of orders and of late deliveries. Companies can often not readily retrieve the information needed to do so.

□ Inefficient Information Systems: Databases at different operation sites that describe system environment, inventories, backlog, future production plans, and so on are often not linked. Inf01mation must be retrieved manually, and this can be a long process. Planning cycles may therefore be long, using highly uncertain demand forecasts. The wrong products are made, and inventories arid backlogs grow.

□ Ignoring the Impact of Uncertainties: Too often supply chains do not track uncertainties such as suppliers' delivery times, the quality of incoming materials, manufacturing process time, transit times, and so on. This leads to non-optimal stocking levels. In some cases, uncertainties are properly tracked, but there is no follow-up.

□ Simplistic Inventory Stocking Policies: Stocking policies are often not linked to knowledge of the unce1iainties mentioned above. Stocking policies are often based on the quantity usage of the items stocked. This says nothing about the uncertainty associated with the usage. Analysis show that stocking levels could be greatly reduced by hai1sferring stocking policies from being quantity based to being uncertainty based.

□ Organizational Barriers: Entities in a supply chain may belong to different organizations within the same company. The organizations will independently measure the performance of the entities. While each entity is occupied with achieving local goals (much like in pitfall 1), important synergies may be lost.

□ Incomplete Supply Chain: Supply chain managers are often focused only on the internal supply chain. Going beyond the internal supply chain by including external suppliers and customers often exposes new oppo1tunities for improving internal operations.

Chapter: 04 Analysis of the Study

4.1 Strategic Management

Supply Chain Management includes planning and management of all stages that are involved directly or indirectly in fulfilling customer request. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.

As a Ceramics Tiles manufacturing company RAK Ceramics Bangladesh Ltd. does not use any forecasting method or SOP meetings. They impose strategies based on the situation for example, once they produced Ceramics worth 800 core but they sold only few (worth 500) and remained some Ceramics which worth 300 core. Then they made a strategy by setting a target toward their sales executives that, if they meet the target to sale remained Ceramics they will be rewarded.

4.2 Sourcing Analysis and Procurement methods

Supplier Evaluation Process

- Approved Suppliers will be evaluated based on the year performance. Performance will be recorded through supplier performance report.
- Material Store Process
- After approving from the Q/C Department All the purchase Items are stored in Factory by the store keeper for the production purpose
- The Finished Goods are stored in the warehouse
- The Safety Stock of Finished Goods is maintained by the store department both manually & computerized way on monthly basis

4.3 Sourcing Process & Supplier List:

RAK Ceramics Bangladesh Ltd. maintained both local & foreign suppliers. The suppliers are carefully selected on the basis of the quality of the raw materials, lead time, and efficiency and on time delivery of the materials needed. With the increasing demand local supplier list is increasing day by day. RAK have 43 local regular suppliers. RAK Ceramics procures 95% of raw materials from foreign suppliers of China, Japan, Thailand, Taiwan, Indonesia, South Korea, Malaysia.

Vietnam & India and 5% of raw materials are procured locally. Approved supplier list is strictly followed at all times of the whole procurement process.

4.3 Procurement Steps:

Each & every Company has unique models for their organization. RAK Ceramics Bangladesh Ltd.

are following a procurement steps which are given below-

1. Prepare Specification & Check Budget
2. Prepare Purchase Requisition
3. Check & Authorize Requisition
4. Obtain Quotations
5. Select Supplier (Purchasing Panel)
6. Issue Purchase Order
7. Receive Goods
8. Receive & Check Invoice
9. Prepare & Authorize Payment Voucher
10. Pay Supplier Invoice

4.5 Procurement Process:

Store keeper generates the requisition for the items.

1. Requirements are approved by GM (Plant)/ Plant Manager/QC officer
2. Indent will be prepared based on Requisition form.
3. After receiving the purchase requisition document from the factory GM will ensure that only specified items have been purchased from approved suppliers.
4. Specifications/Quality/Quantity/Model/Other Info1mation's shall be desc1ibed in the Purchase Order/Work Oder after receiving requisition of material.
5. After reviewing, Managing Director/Director will approve the pm-chase order / work order.

4.6 Purchase Order Process:

RAK Ceramics Bangladesh Limited maintain a unique pm-chase order number. They use pm-chase order date, Vendor's Name & Address, The Quantity, Unit Price, Item details, Quality /Model. It also follows some terms and conditions for the suppliers, where they focus the delive1y date, VAT & AIT rules.

1. Unique Purchase Order Number
2. Purchase Order Date
3. Vendor Name & Address
4. Quantity
5. Item & Specification
6. Quality/Model
7. Price
8. Delivery Date

Two types of pm-chase order are prepared as the company is not using SNOP Software. One type of purchase order is prepared manually and other type of purchase order is prepared systematically. But RAK have some limitations, because a sophisticated ERP is not use here.

4.7 Purchasing Process:

1. All Purchased Products will be recorded into the Pm-chaser sister File.
2. Vendor Shall Maintain delivery date, specified quality standard as mentioned in the PO strictly
3. For the Items like spare parts, bearing, belts, scale, paraffin wax, chemicals etc. are purchased by the purchase officer from the open market after ve1ifying the required specification, quality & price.
4. Purchase Materials supplied to the factory shall only be accepted if the quality parameters meet the requirements.
5. Upon receipt of procured materials store keeper informs concerned department for quality check.
6. Concerned departmental in charge or his nominee checks the quality, quantity and condition of the procured items and gives verification report.

7. If the Items are accepted, store keeper prepares a Goods Receive Note (GRN) and sends copy to the Head Office for reference of the accounts & procurement department.

8. Store Keeper also updates his stock ledger and stored the item is a designated place with proper identification.

9. All International purchase will be done through approved vendors either through Letter of Credit (L/C) or through registration of LCA (Letter of Credit Authorization)

4.8 Material Management:

Material management involves Planning Programming, organizing directing, controlling and coordination the various activities concerning the material. Materials management is the branch of logistics that deals with the tangible components of a supply chain. Specifically, this covers the acquisition of spare parts and replacements, quality control of purchasing and ordering such pa1ts, and the standards involved in ordering, shipping, and warehousing of the pa1ts. Material Management is concerned with control of materials in such a manner which ensures maximum return on working control material management is concerned with the location and purchase of needed their storage and movement. It also arranges to keep on account for them it is also responsible for planning their movement through manufacturing processes, store rooms and distribution channels.

The warehouse of RAK Ceramics located in Dhanua, Sreepur, Gazipur which is the central distribution center. 80 percent of the work in warehouse done manually.

4.9 Functions of Material Management

- Raw material purchasing
- Warehousing
- Quality management
- Logistics management
- Transportation of materials

These functions discussed further in the following page.

4.10 Raw Material Purchasing

Bangladesh's' Ceramics market is growing at 15-20 percent a year due to the expansion of zone as the government looks to provide incentive for all by 2022. RAK Ceramics Bangladesh Limited is dependent on raw material imports from China, Hong Kong, Thailand, Indonesia, and Germany, Italy, France, Spain, UK, etc. The demand for Ceramics is not only for the abroad, it also has a big market in the Bangladesh and industrial sectors.

Main raw materials of Soda, Potash, Chipis, Kaolin, Quartz Powder, Clay, Color, Glaze, Ink, Frit & chemical etc. Fire and flame retardants, compounding materials like calcium carbonate, stabilizers, and plasticizers may also be required. Finished goods are kept in warehouse and maintained though ERP system.

4.11 Production Planning

RAK Ceramics Bangladesh Limited is looking forward to managing expertise and obtaining technology to provide better enginee1ing solutions through supplying quality Ceramics Tiles and Sanitary ware and better Customer Service. Now at the eve of the 21st century globalization, RAK Ceramics has become an integral part for infrastructural development. RAK Ceramics has purchased all machineries in new conditions from Germany, Italy, India, China and local market. Now the company uses Germany to produce quality for the customers. The production and planning process of RAK Ceramics is very much confidential as it's managed by the factory production department. They use an ERP system to smoothen the production plan. From the entrance of raw mate1ials in the warehouse to become finished goods everything is recorded in ERP.

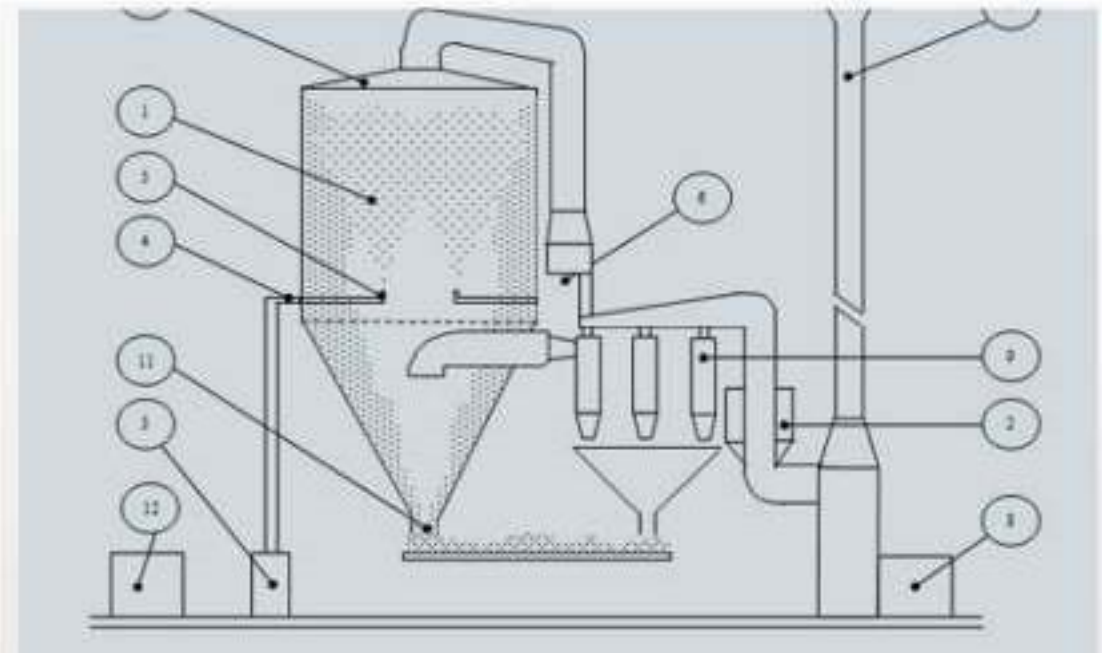
4.12 Manufacturing Process of Tiles Products

- The preparation of the body begins with proportioning or batching of the various raw materials in the correct amounts. The mixing of the body from individual components follows the coarse-crushing of the raw materials and is carried out according to the body formulation. Nowadays, coarse-crushing of the materials is often performed by the raw materials suppliers.
- The batching or proportioning may be done by volume or by mass. However, proportioning by mass is far more accurate than that by volume and is thus preferred. Automatic raw material weighing and feeding has enabled better control of the mixture of raw materials, reducing possible variations that could lead to a change in body properties.
- The grinding of solid raw materials involves a whole series of operations aimed at reducing the size of materials. The purpose of grinding is to obtain smaller particles out of coarser size ones. Besides that, it also increases reactivity of materials (especially feldspar) so that firing is efficient as well as to give a size distribution of materials such that they can pack to give a high packing density [4]. There are essentially two methods of grinding namely the wet and dry grinding method. In both cases, the fineness of the materials needs to be brought down to eliminate dangerous impurities that can cause spots or faults.

- For the wet grinding method, the different raw materials such as clay, flux (feldspar) and filler (normally sand) that make up the body composition are stored in separate bays. The raw materials are weighed proportionally according to the formulation and charged into ball mills (Figure 2) together with suitable amounts of water and deflocculated to ease dispersion. One of the purposes of milling is to obtain a high compaction in the body powder, by producing a range of course, medium and fine particles in the particle size distribution of the ball mill slip



- In the wet batch milling, the mill is charged, milled and then discharged followed by filling with a new charge for milling. Once the slip has achieved its desired particle size, it is discharged into the underground storage tank and aged for 24 hours. The second grinding method is dry grinding. There are several types of mills which grind raw materials with moisture contents of up to 8 or 10% down to 100% pass through a screen of <63µm. A version called "Novorotor" from Hazemag was applied in Central Europe. Hammers hanging on hammer bolts served as grinding tools. The milled material is discharged pneumatically or mechanically.
- From the technological point of view, the same degree fineness of grinding is not possible with dry grinding as can be achieved with wet grinding. The wet grinding method is at present the most commonly utilized method in the manufacture of porcelain stoneware tiles. By the wet grinding method, the granulated powder obtained from the spray drying process is more suitable for properly filling the presses due to its optimum shape and particle size distribution. Contaminants that may be present are eliminated with sieving the slip obtained by wet grinding.
- For ceramic tiles, spray drying is the process that converts the body slip obtained from the mill to a granulate with a size distribution and moisture content suitable for pressing. The body slip is atomized under high pressure, and water is evaporated from the fine droplets using a flow of heated air.
- Figure 3 shows the schematic construction of a spray drier. A volumetric pump sends the slip to a set of lances placed inside the dryer. At the lances' extremities, the slip is atomized into fine particles by nozzles and then is sprayed toward the top of the drying chamber against concurrent descending hot air that rapidly evaporates water from the slip. The spray-dried powder produced falls to the bottom of the dryer where it is unloaded by means of an extractor valve. Exhaust air goes through a set of cyclones to recycle the small quantity of fine powder it contains, then to a wet scrubber system for further cleansing before it is expelled as steam [4,6]. The two most important properties to be controlled are the moisture content and the size distribution of the granulate.



1	Drying Tower	7	Chimney
2	Drier	8	Extractor Fan
3	Slip Pump	9	Fines Removing Cyclones
4	Lance	10	Warm Air Diffusor
5	Atomizing Nozzle	11	Extractor Valve
6	Warm Air Heater	12	Control Panel

Figure 3. Diagram of Spray Dryer After Ryan [4] pg .122

- The purpose of the pressing stage is to shape the spray dried powder into a compacted piece of unfired tile. Pressing is the simultaneous compaction and shaping of a powder or granular material confined in a rigid die or flexible mould. Pressing of the spray dried granulate followed by drying determines the size and geometry of the product. The unfired strength is determined by the compaction achieved.
- There are two types of presses namely the hydraulic press and friction press. The most commonly used presses in the ceramic tile industry are the hydraulic presses (Figure 4). They offer the advantage of a consistently high pressure which may be controlled relatively easily. They are preferably used in the manufacture of single-fired products such as, of glazed and unglazed vitrified stoneware tiles and of large-size tiles where a constant pressure is imperative for dimensional accuracy.



Figure 4. Typical Hydraulic Press used in a ceramic tile plant

- The pressing pressure differs for different types of tiles. In the case of white-body floor tiles, a pressure below 300MPa is used, while for vitrified tiles of the same size it is necessary to use pressures of 350-400MPa
- Drying of the ceramic tile is carried out between the pressing stage and the firing process. This is carried out to increase the strength of the unfired tile and also to reduce the risk of tile loss due to deformation as the tile rapidly shrinks or cracks as the steam is rapidly evolved in the kiln. The amount of water to be removed depends on the shaping method and it is about 3 to 6% for ceramic tiles. The drying of dust pressed tiles are safer than wares produced by the plastic shaping method with higher moisture contents because water that separates the particles in these latter wares are removed and causes a drying shrinkage. At present, tile body drying is performed automatically and continuously in vertical or horizontal fast dryers
- Firing is usually the final stage in the ceramic tile manufacturing, at which the weak, unfired, newly pressed piece of tile is transformed into a strong, durable product due to the effect of chemical and physical reactions within the green body during heating [9]. After firing, the ceramic tile body adopts the mechanical and aesthetic properties of the finished ceramic piece. Fast firing in a single layer ensures completely uniform temperature distribution and high quality of tiles as shown below.



Figure 5. Typical Fast Firing roller hearth kiln in a ceramic tile plant

- The goals of the firing process in rollers kilns (Figure 5) are mass vitrification and the dimensional stability in the firing temperature interval. A porcelain tile manufacturing plant ends with the sorting stage. In the selection line, planarity and quality of the pieces is of utmost priority [4].

Production Process of Ceramic Tiles

The production process of ceramic tiles is illustrated as in Figure 1

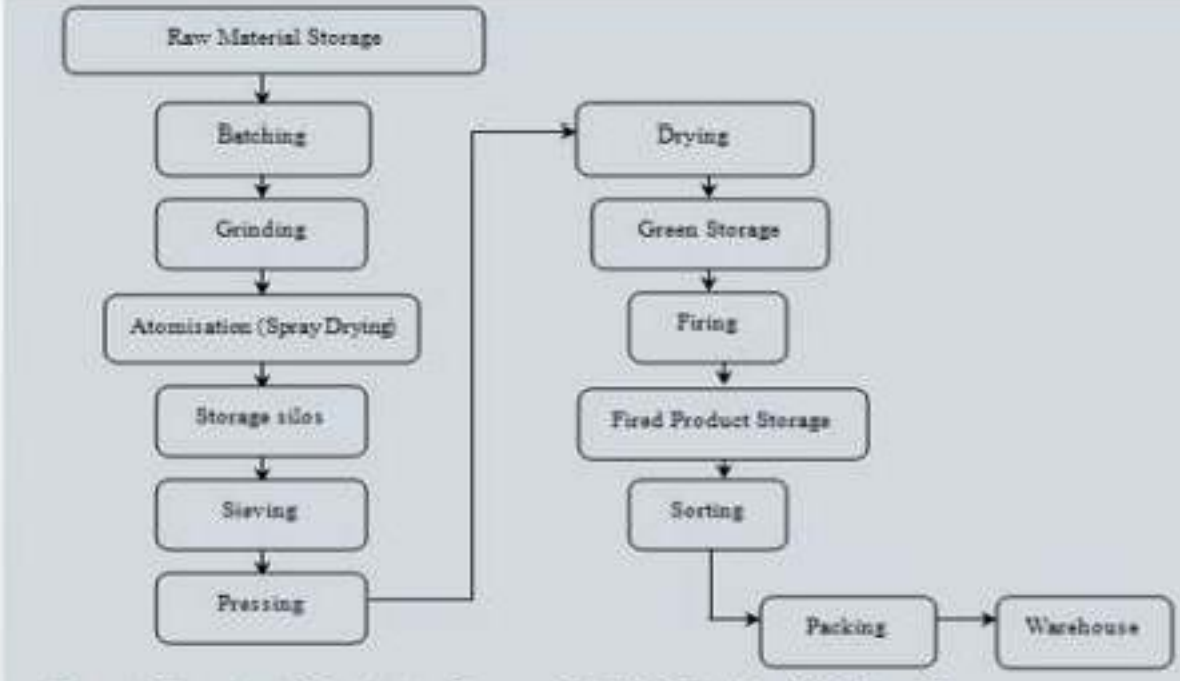


Figure 1: Flow chart of Production Process of Vitrified Tile. After [1] Biffi pg.28



4.13 Logistics Management

They maintained inbound and outbound logistics and there is no cross docking. The raw materials for Ceramics come through the inbound logistics of the company by road mostly. Their main advantage on logistics is that their main factory and warehouse are situated at the same place. So that, they can easily move the raw mate1ials to the production area without much cost. From there they distribute their finished goods throughout different regions by trucks and covered van.

As mentioned earlier the main distribution center of RAK Ceramics situated in Dhanua, Sreepur, Gazipur. From there all the finished goods are distributed in different locations. To distribute the finished product RAK Ceramics, use truck, pick up in a cost effective way.

4.14 Material Handling Equipment of the Organization

For material handling purpose our organization use many types of equipment. They are-

- Hand trucks
- Pallet Jacks
- Pallet bucks
- Platfo1m trucks
- Order picker

Chapter: 05 Findings

5.1 Key Findings

• Wastage management is not so effective that can cause raise in the price of the Ceramics.

• As a new company brand value is low. It will take time to create great brand value in market. And the department of Brand need to be strong and implements cost reducing idea.

• Need to developed Information Technology depa1tment for more operative and fast work.

• It has huge manpower in the industry. It is good for the business. However, they are unskilled that reduced the high productivity of manpower.

Chapter: 06 Recommendations and Conclusion

6.1 Recommendations

Some necessary steps are recommended below on the basis of collected data, observation, experience staff's opinion and my knowledge and judgments. For the probable solutions of the identified problems ensure better process of RAK Ceramics Bangladesh Ltd. in future.

• The entire department should be well informed regarding their goals and objectives. It is essential to execute company objective into individual target.

• The head office manager should ensure proper distribution of works responsibility personally and strictly monitor the activities of the officer. Also needs to be built up interpersonal relationship.

• RAK Ceramics Bangladesh Ltd. should provide an effective training program for the junior level officers as though they can perfo1m their task efficiently.

• A philosophy of working for customer and provide quality products & services instead of working for boss and compai1y's profit must be introduced.

• Job description should be classified and proper training facilities should ensure to improve the performance of bottom line management. Employees should be more expert & trained to use the ERP software.

• Modern technologies should be implementing to capture the growing demand of the customers and compete with other Ceramics industries.

• Salary structure should be revised for the satisfaction of the employees comparing with the other commercial p1ivate company.

- Advertisement is the key factor for the business organization upholds it for market and for making market share and goodwill in future. That's why should give priority on it.

- Company should be more involved in corporate social responsibilities, which in return will make their brand more affection towards the minds of the customers.

- Revenue is increasing every year and intense competition is arising soon as many new company also coming in the industry, so they need to increase their customer loyalty.

6.2 Conclusion

In this age of modem technology and inventions it is very hard to stay competitive for the organization. Though concept of organization is less than a hundred years old, it is ruling all over the world. Sometimes organization determines the nature of rules and regulation. This organization is a single entity but included many human beings into its arena. Thus organization is the combined effort a group of human being.

Organization really does not do anything man or woman dose it. As a result, organization becomes profitable. Share of the companies get higher price in the market. Behind everything there is human being.

So, people are the main assets. They are current which means the organization. Human Resource works with these assets, which is more valuable than other product like service, money or any other thing.

References

Books

1. Biffi, G. "Fine Porcelain Stoneware Tiles - technology, production and marketing" Gruppo Editorale Faenza Editrice
   S.p.A (1994)
2. Fugmann, K.G. "How to Produce Tiles-Preparation" Interbrick, Volume 5 No.3, pp.34-40(1989)
3. Biffi, G.; Cini, L.; Pozzi, D.; Poppi, M. "Technical and Process Innovations in the Ceramic Industry" Ceramica Informacion, pp. 2-26 (September 1993)
4. Ryan, W. "The Manufacture of Wall and Floor Tiles" Ceramic Research Company, Malaysia, pp. 52-75 pp. 99-147, pp. 185-200 (1999)
5. Fugmann, K.G. "Wet Way Continuous Milling in the Ceramic Tiles Industry" Interbrick, Volume 3 No.1, pp. 42-43 (1987)
6. Smith, G. "Operating the Spray Dryer" Ceramic Industry, pp.54-56 (June 1993)
7. Reed, J.S. "Introduction to the Principles of Ceramic Processing" John Wiley & Sons 1989
8. SITI "Drying, Pressing" Societa Impianti Termoelettici Industriali CRC Centro Ricerche ceramiche Volume 5 La Tecnogia Ceramica, pp. 9-24, pp. 61-63
9. Manfredini, T.; Pennisi, L. "Recent Innovations in Fast Firing process" Science of Whitewares, The American
   Ceramic Society.
10. https://www.ceramic-research.com/articles_03.html

Website

- www.google.com
- www.wikipedia.com
- Annual report of RAK Ceramics Bangladesh Ltd 2020-2021
- Website of RAK Ceramics Bangladesh Ltd.

https://www.rakceramics.com/bangladesh/en-bd/company/#section-rak-bangladesh