



St. Mary's University

School of Graduate Studies

Institute of Quality and Productivity

Management

**EFFECT OF SUPPLY CHAIN
MANAGEMENT ON PRODUCT QUALITY
IN BEVERAGE INDUSTRY; THE CASE OF
AWASH WINE SC;**

By

Weinharege Bekele

June, 2021

Addis Ababa, Ethiopia

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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, declare that this work entitled “Effect of Supply Chain Management on Product Quality in Beverage Industry the Case of Awash Wine SC.” is outcome of my own effort and study and that all sources of materials used for the study have been duly acknowledged. I have produced it independently except for the guidance and suggestion of my Research Advisor. Moreover, this study has not been submitted for any degree in this University or any other University.

Weinharege Bekele

Signature _____

Date _____

ENDORSEMENT

This is to certify that this study work, “Effect of supply chain management on product quality in beverage industry the case of Awash Wine SC.” Undertaken by Weinhareg Bekele for the partial fulfilment of Master of Science (MSC) in Quality and Productivity Management in St. Mary University, is an original work and not submitted earlier for any degree either at this University or any other University.

Research Advisor

Matias Taye _____

DEDICATION

I dedicate this research to my father Bekele Negassa, to my mother Sintayehu G/wold and to my sisters who has supported me through everything.

ACKNOWLEDGEMENT

At the beginning, I would like to thank GOD for giving me endurance to start and finish what I dared as one of educational carrier. This study has come to succeed with the help God and a collective effort of different people whom I am owed to ac Knowledge.

I am grateful to my advisor, Mr. Matias Taye for his professional guidance and supervision. He also persistently encouraged me throughout the course of this study. Without his immediate assistance, corrections and valuable comments, I would not have met the deadlines for this study. Thankyou!!

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ABBREVIATIONS AND ACRONYMS

SCM = Supply Chain Management

SCMP= Supply Chain Management Practice

WIP=Work In Process

COVID 19= Coronavirus Disease of 2019

FM= Facility Management

IT=Information Technology

SPSS= Scientific Package for Social Science

CRM= Customer Relationship Management

COA= Certificate of Analysis

QMS= Quality Management System

STD= Standard Deviation

ERP= Enterprise Resource Planning

ANOVA= Analysis of Variance

HRD= Human Resource Department

JIT= Just In Time

EDI= Electronic Data Interchange

B2B= Business To Business

BGI= Brasseries Glaciers International

TPS= Toyota Production System

BPR= Business Process Re-engineering

ABSTRACT

The purpose of this research is to study the effect of supply chain management practices on product quality in Awash wine SC. In supply chain management practice six relevant drivers were studied. These are Facility, Inventory, Transportation, Information sharing and its quality, Sourcing and supplier partnership and Customer relationship. From product quality perspective three dimensions were selected in which the researcher believed can be affected by supply chain management practices; these dimensions are consistency, fitness for use and variety. A survey questioner and interview is used to collect data. The study is explanatory in addition purposive and stratified sampling is used. Descriptive statistics is used to evaluate the level of success on supply chain management practices in the company and to examine product quality. Correlation and regression model is used to evaluate the overall association between supply chain management practices and product quality. The result from the study shows that the success of supply chain management practices in the company is varied mainly between poor, good and very good. Inventory, Transportation and Customer relation in the company is good; the analysis result on institutional facility is neutral. Information sharing and its quality of the company is good; whereas sourcing and supplier partnership practice of the company is poor. The correlation analysis shows supply chain management practice has strong and significant association with product quality. The regression analysis shows five supply chain management practices has significant and positive influence on product quality. These practices are inventory, transportation, information sharing and its quality, sourcing and supplier partnership and customer relationship. However facility has negative insignificant influence. This study has provided insight about the nexus between supply chain management practices and product quality and the effect of supply chain management practices on product quality.

Key words: supply chain management, product quality

CHAPTER ONE

INTRODUCTION

This chapter deals with the background of the study, statement of the problem, objective of the study, significance of the study, scope of the study, limitation of the study, definition of the basic terms and organization of the study.

1.1 Back ground of the study

Optimal production planning and scheduling is essential for manufacturing companies. It ensures efficient production, reliable delivery, and lower costs. Companies often find themselves trying to deal with large fluctuations in demand on one hand and a strong desire for balanced production on the other. Rigid production plans often make flexible reactions impossible. Stochastic methods of optimizing sequencing are often non-existent. As a result, lead times are long, processes are inefficient and in-process inventories are high. Chopra and Meindl (2010)

Juran and Montgomery defined “Quality” as “fitness for use” Montgomery D.C. (2007) and Juran, J. M., & Defoe, J.(2010). Defoe has settled on a new definition “quality means fitness for purpose” In statistical terms, quality is largely determined by the amount of variability in what is being measured and also product quality refers to a fitness of product to meet customers’ needs and satisfaction. Feigen Baum (1994) defines product quality as “the composite of product characteristics of engineering and manufacture that determine the degree to which the product in use will meet the expectations of the customer”. Fujimoto (1999) presents that the concept of product quality, in his framework, is related to fitness of information content or accuracy of information processing along a chain of productive resources that link customer needs, product concepts, product plan (basic design), product design, process design, process, product structure and product function. He divides total quality into two categories: design quality and conformance quality that design quality include ,customer needs, product concept and product plan (basic design)and also conformance quality consists product design, process design, process, product structure and product function.

According to Chopra and Meindl, (2010, p. 25) and Simchi-Levi et al. (2003, p. 2), it is important to facilitate efficiency on all levels in a supply chain in order to achieve high

overall efficiency. Hence, quality improvements should be addressed at problems in processes and flows as well as in networking; from production planning and control in machines, to cooperation between firms in the supply chain network.

Design quality can be noted as the inherent value of a product in the marketplace or how to measure the characteristics of a product designed to meet the requirements of a given group of customers. It measures how well the customer expectations are represented in the product concepts and then into detailed product designs.

Clark (2000) and Fujimoto (1999) state that conformance quality refers to how well products delivered to customers conform to the product design or specifications, including reliability, defects in the field, fit and finish and durability. Schniederjans and Cao (2002) state that conformance quality refers to the extent of achieving product design specifications. Based on Fujimoto conformance quality determines how closely the information embodied in the actual products represents that of the product design. As the chain of quality indicates, a high design quality and a high conformance quality are required in order to achieve a high level of total product quality.

American Society for Quality (2004), defines quality as "A subjective term for which each person or sector has its own definition. In technical usage, quality can have two meanings:

1. The characteristics of a product or service that bear on its ability to satisfy stated or implied needs;
2. A product or service free of deficiencies.

Supply chain management is an approach to integrating suppliers, manufacturers, distributors and retailers, such that products are produced and distributed at the right quantities, to the right location, at the right time, with the mutual goals of minimizing system wide costs and satisfying customer service requirements Simchi-Levi et al., (2008). In other words, supply chain management synchronizes a firm's processes with its suppliers and customers with the goal of matching the materials, services and information with customer demand Krajewski et al.,(2010). Critical supply chain processes include product design, production and delivery, support, and supplier-customer relationships.

Quality is one of the most important factors for companies in their relationship between suppliers and customers. In fact, quality is so critical that today's executives question whether

their companies should be participating in global sourcing as many global suppliers are not able to meet quality requirements Brockwell, (2011).

1.2 Back ground of the organization

The report on the Ethiopian beverages industry investigates the local beverages market, recent developments and factors influencing the success of the formal industry. The report profiles 16 companies including Moha, which with market share of approximately 52%, dominates Ethiopia's multi-million dollar carbonated soft drinks market. Also profiled are BGI Ethiopia, the leading player in the beer brewing segment with annual production capacity of 3 million hectoliters and the country's largest wine producer, Awash Winery Share Company. (<http://www.reportlinker.com/p04411879-summary/view-report.html>)

The case company, which is Awash Wine S.C, is a leading wine manufacturer in the Ethiopia. According to the company website, currently Awash Wine SC leads the Ethiopian wine market, 8 bottles out of 10 consumed are from Awash. Though it has been unchallenged since it was established in 1944, competition for Awash is now coming from the Castel Winery, which prides itself as the third-largest wine producer in the world and the second-largest beer and soft drinks business in Africa, has started producing wine in Ethiopia since March 2014. Castel has seven different types of products, two white wines and five red wines: Acacia Dry Red, Acacia Medium Sweet Red, Acacia Medium Sweet White and Rift Valley Merlot, Rift Valley Cabernet Sauvignon, Rift Valley Syrah and Rift Valley Chardonnay. The Company puts its production amount at 900,000 liters. Therefore, there are many things remaining to be done to achievement and fulfill the company's products sale goal Muluken k, (2011).

1.3 Statement of the Problem

Due to the number of rival companies expanding both locally and globally, companies not only have to reestablish themselves to produce higher-quality products and services, decrease waste and are able to respond to the market but also to handle their supply chain management efficiently. Organizations are facing different kinds of challenges in their effort of competing in today's dynamic global markets. To remain competitive, organizations must recognize the importance of supply chain practices that improve not only their own organizational performance, but also coordinate with their supply chain partners to improve their joint performance. Yet, despite the significant advances in research and practices, many organizations continue to struggle to understand the complex issues associated with the

coordinated planning and supply activities amongst the members of their supply networks Makena, (2014).

However, most of the researches related to the supply chain managements were carried out in developed countries which have different economic, political, technology, social, legal and cultural status. As a result, it may be difficult to directly apply and generalize that the same practices and collaboration as well as problems of SCM exists in Ethiopia. This is because of Ethiopia has different Economic, political, social, legal and cultural status than other countries. In Ethiopia the practice of integration, collaboration, and having willingness and the trend of managing the SC from supplier to the customer is traditional i.e., not more than just buy sale/ transactional relationship. Even if there is SC by default it is not well managed, and implemented for getting the benefits resulted from effective SCM. So that, each partners with in the SC are using their own individual efforts to improve their own competitiveness (quality, cost, delivery lead-time, etc.) but it is not as such effective Assefa, (2011).

Awash Wine S.c, Ethiopia is one out of these companies. As far as the knowledge of the researcher is concerned, there is no empirical study that is conducted on the effect of Supply Chain Management practices on organizational performance in the Wine industry in Ethiopia(i.e. from perspectives of strategic supplier partnership, customer relationship, level and quality of information sharing, and Internal Lean Practices) which incorporate upper and down streams sides of a supply chain, information flow across a supply chain and internal supply chain process on Wine manufacturers in Ethiopia particularly on Awash Wine S.c. Therefore, since the effort to achieve generalization of the causal relationship between SCM practices and performance calls for empirical confirmation in diverse environments, especially emerging economies like Ethiopia, this paper is to contribute to the debate by testing the relationship between SCM practices and organizational performance in the subject company. This study therefore sought to fill this gap and by establishing the effect of supply chain practices on organizational performance of Awash Wine S.c, Ethiopia.

The problem I intend to study is what is the effect successful supply chain management for manufacturer's product quality? For product quality improvement particular opportunities are identified in; variability, performance, demand planning, multistage inventory, transportation planning and supply chain management. Since quality is satisfying customer's requirement supply chain management plays great roll in fulfilling their demand.

1.4 Basic Research Questions

- ✓ Which supply chain management practices are impacting product quality in the company?
- ✓ What are the effects of supply chain management practices on product quality?

1.5 Objective of the Study

1.5.1 General Objective

The general objective of this research is to investigate the effect of supply chain to achieve product quality in beverage industries in the case of awash wine S.C

1.5.2 Specific Objectives

- ✓ To examine drivers for successful management of supply chain impacting product quality.
- ✓ To investigate the nexus between supply chain and product quality particular to wine production sector.
- ✓ To identify the main challenges of in achieving product quality in the company.
- ✓ To identify the different challenges of supply chain practice in the company.

1.6 Significance of the Study

This research is important to the manufacturing companies to know their gap and to understand what they have to do in the future. Previously different research has been conducted on importance of supply chain in relation to customer values. Supply Chain Management is the active management of supply chain activities and relationships in order to maximize customer value and achieve a sustainable competitive advantage. Bozarth and Handfield (2008)

Supply Chain Management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantity, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements. Simchi Levi, Kaminsky and Simchi-Levi (2008)

Supply chain management is the integration of trading partners' key business processes from initial raw material extraction to the final or end customer, including all intermediate

processing, transportation and storage activities and final sale to the end product customer. Wisner, Tan and Leong, (2012)

In the case of Ethiopia, there is a lack of previous studies concerning SCM practices implementation and how it affects product quality. The researcher had hardly found such studies in the literature. Only few authors such as Birhanemeskel (2018) and Dinberu (2016) conducted such studies. Birhanemeskel (2018) investigated supply chain practice its relation with organizational performance of Awash wine SC This research conceptualizes and develops five dimensions of SCM practice (strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing, and internal lean practices) and tests the relationships between SCM practices, organizational performance. From the result of the analysis it is concluded that there is strong relationship between SCM practices, operational performance and organizational performance.

The finding confirmed that, among supply chain management practices; strategic supplier partnership, customer relationship management have statistically significant contribution to the competitiveness of the enterprise. If this research would not be conducted and shows the existing gaps, the problem in the area would be left unanswered for a while and they could not be able to identify the root cause of the ineffectiveness of supply chain to improve product quality. The findings of this study are also expected to guide and show proper direction for the challenges which is quality and safety risk due to improper grape transportation from farm to manufacturing companies. The findings of the study could also provide some new strategies and show directions for policy maker to help them in reviewing and formulating related policies

The study's findings will provide a room to other researchers to use it as reference point to their future studies related to this subject matter. It will enable them to see the gap of what is unknown, what needs further research, elaboration and improvement.

1.7 Delimitation/Scope of the Study

The scope of the study is delimited to the effect of SCM practices on product quality of Awash Wine S.C. The subject scope of this study is also delimited to the company's point of reference towards facility of the company, inventory, transportation system, sourcing and supplier partnership, customer relationship and information sharing and its quality. This

study focuses on dimensions of wine quality which are fitness for use, Consistency and variety.

1.8 Limitation

Limitation is willingness of respondents to cooperate and different challenges caused by COVID 19 to approach respondents directly for interview.

Supply chain management encompasses vast areas of managerial practices. However, it is difficult and unmanageable to conduct the study in all areas that summarizes SCM in terms of time, finance, and research manageability. The research also integrated SCM practices with few product quality dimensions affordability and flavor are hardly linked with SCM practices

1.9 Definition of Terms

- ✚ **Effect:** relationship between dependent and independent variables and the degree to which independent variable reflected on the dependent variable.
- ✚ **Supply chain:** is an entire system of producing and delivering product.
- ✚ **Supply chain management:** Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements. Sunil Chopra and Peter Meindl, (2016)
- ✚ **Product quality:** Feigen Baum, (1994) defines product quality as “the composite of product characteristics of engineering and manufacture that determine the degree to which the product in use will meet the expectations of the customer”.

1.10 Organization of the Study

This study is structured into five chapters. The first chapter, which is the introductory part, deals with the background of the study, overview of the study area, statement of the problem, objectives and significance of the study, scope of the study and definition of the key terms used in the study. Chapter two presents the review of the related literature; the literature review describes theoretical issues regarding effects of supply chain management on quality improvement. The research design and methodology will be presented in the chapter three of the research document. Chapter four is dedicated to discuss the results and the findings

obtained from the study. Finally, the summary of major findings, conclusions and recommendations will be explained in chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter of the study focuses on review of relevant conceptual issues, theoretical framework related to the topic of the study. This chapter also covers topics related to supply chain management, constructs on supply chain management practices and product quality by focusing on previous research in this area and present reviewed literature relevant to this study.

2.1 Supply Chain Management and Product Quality

The concept of “supply chain” is well established in the literature and is generally referred to as the alignment of firms that bring products or services to market Lambert, Stock and Ellram, (1998). The supply chain includes manufacturer, suppliers, transporters, warehouses, wholesalers, retailers, other intermediaries and even customers themselves. Any product traded on the consumer goods market, in its evolution from raw material to finished products, undergoes a series of successive transactions on the business to business market.

For example, when a final consumer purchases a bottle of Coca Cola, he/she does not buy directly from Coca Cola, but from an intermediary (for example the hypermarket or neighborhood store) and the product goes through several transactions on the business to business market on the circuit Coca-Cola – wholesaler – retailer – final consumer Căescu and Dumitru, (2011). This is a supply chain.

Chopra and Meindl (2007) believes that “a supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request. Within each organization, such as a manufacturer, the supply chain includes all functions involved in receiving and filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, finance, and customer service”.

SCM is the process of planning, implementing, and controlling the operations of the supply chain with the purpose to satisfy customer requirements as efficiently as possible. Supply chain management spans all movement and storage of raw materials, work-in-process inventory, and finished goods from point-of-origin to point-of-consumption. Supply chain management practices in an organization done to fulfill customer’s requirement. Oliver and Webber (1982)

A supply chain can be described as a series of organizations that may be involved in different processes and activities to produce products and services for ultimate customers, both upstream and downstream. A supply chain, therefore, is made up of a number of companies including suppliers, distributions and the end-customers. There are certain objectives to achieve in a supply chain management. Improving customer satisfaction and service and increasing competitiveness are a number of these objectives. A supply chain management also aims to lower the costs and resources involved in the creation of products as well as improve efficiency and effectiveness. SCM also focuses on reducing inventory levels and respective costs, increasing profits and improving cooperation. Stadtler H., (2008)

2.2 Important Practices of Supply Chain Management to Achieve Product Quality

Supply chain management encompasses materials/supply management from the supply of basic raw materials to final product (and possible recycling and re-use).

Supply chain management focuses on how firms utilize their suppliers' processes, technology and capability to enhance competitive advantage. Tan, Kannan and Handfield (1998)

Supply chain (sometimes called the value chain or demand chain) management consists of firms collaborating to leverage strategic positioning and to improve operating efficiency. For each firm involved, the supply chain relationship reflects strategic choice. A supply chain strategy is a channel arrangement based on acknowledged dependency and relationship management. Supply chain operations require managerial processes that span across functional areas within individual firms and link trading partners and customers across organizational boundaries. Bowersox, Closs and Cooper (2002). Supply Chain Management is the active management of supply chain activities and relationships in order to maximize customer value and achieve a sustainable competitive advantage. Bozarth and Handfield, (2008)

Supply Chain Management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantity, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements. Simchi Levi, Kaminsky and Simchi-Levi (2008). Supply chain management is the integration of trading partners' key business processes from initial raw material extraction to the final or end customer, including all

intermediate processing, transportation and storage activities and final sale to the end product customer. Wisner, Tan and Leong, (2012)

The above literature review can be summarized as SCM consist in planning organizing, implementing, motivating and controlling efficiently of all the activities involved in movement of goods and services from the first supplier to the ultimate customer; SCM includes transportation, processing and storage of raw materials, working process inventory and finished goods from initial extraction stage to the final customer. SCM include a number of value added processes designed to satisfy customer requirements, to establish a long term relationships, to build the trust among the supply chain partners and to achieve a sustainable competitive advantage. SCM encompasses suppliers, manufacturers, warehouses, stores and other intermediaries that are involved in the movement of products and services from point of origin to point of consumption.

From the above analysis this study has 6 independent variables this are facility, inventory, transportation, information sharing and its quality, sourcing and supplier partnership and customer relationship.

Drivers of supply chain performance

To achieve product quality improving supply chain performance in terms of responsiveness and efficiency, the researcher should examine the logistical and cross-functional drivers of supply chain performance: facilities, inventory, transportation, information, sourcing and pricing.

2.2.1 Facilities

Facilities are 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 storage sites. Decisions regarding the role, location, capacity, and flexibility of facilities have a significant impact on the supply chain's performance. Facility planning is concerned with the design, layout, and accommodation of people, machines and activities of a system or enterprise within a physical spatial environment Garcia, A.D., Smith, McG, (2008.). Furthermore, Huang, H. 2003 states that facility layout design determines how to arrange, locate, and distribute the equipment and support services in a manufacturing facility to

achieve minimization of overall production time, maximization of operational and arrangement flexibility, maximization of turnover of WIP and maximization of factor you put in conformance with production schedules. According to Chopra and Meindl, (2007). Deciding where a company will locate its facilities constitutes a large part of the design of a supply chain this includes These include macroeconomic factors, quality of workers, cost of workers, cost of facility, availability of infrastructure, proximity to customers, the location of that firm's other facilities, tax effects, and other strategic factors. Companies must also determine a facility's capacity to perform its intended function or functions.

Oladejo (2009) opines that facilities management can be summarized as creating an environment that is conducive for carrying out the organization's primary operations, taking an integrated view of the services infrastructure, and using this to deliver customer's satisfaction and value for money through support for and enhancement of the core business. Facilities management is important to the growth and survival of organization, particularly in the dynamic society as ours Dell, (2008). The effectiveness and the survival of organization are largely enhanced by the ability of management to ensure that there is functional equipment, lands and building, infrastructure, fixtures etc. Overtime, organizations have become conscious of the need to concentrate on their core business activities and the expediency of reducing the rising cost of occupying buildings, providing services to support business operations and improving working conditions so as to sustain productivity in their activities, which has led to the development of FM. Alexander, (2003). FM involves the development, coordination and management of all the non-core specialist services of an organization together with the building and their systems, plant, IT equipment, and fittings with the overall aim of assisting any giving organization in achieving its strategic objectives. Moore & Finch, (2004).

2.2.2 Inventory

Encompasses all raw materials, work in process, and finished goods within a supply chain. The inventory belonging to a firm is reported under assets. Changing inventory policies can dramatically alter the supply chain's efficiency and responsiveness.

Inventory management systems are designed to monitor product availability, determine purchasing schedules and cycle out obsolete or unsold product. The availability of product is just one way in which an inventory management system attempts to create customer

satisfaction. A comprehensive understanding of the impact of inventory control on customer satisfaction helps you to create an effective inventory management system. Levinson, M., (2005).

Inventories are materials stored, waiting for processing or experiencing processing. They are ubiquitous throughout all sectors of the economy. Observation of almost any company balance sheet, for example, reveals that significant portion of its assets comprises inventories of raw materials, components and subassemblies within the production process, and finished goods. Most managers don't like inventories because they are like money placed in a drawer, assets tied up in investments that are not producing any return and , in fact, incurring a borrowing cost. They also incur costs for the care of the stored material and are subject to spoilage and obsolescence. In the last two decades there have been a spate of programs developed by industry, all aimed at reducing inventory levels and increasing efficiency on the shop floor. Some of the most popular are just-in-time manufacturing, lean manufacturing and flexible manufacturing. Nevertheless, in spite of the bad features associated with inventories, they do have positive purposes. Raw material inventories provide a stable source of input required for production. A large inventory requires fewer replenishments and may reduce ordering costs because of economies of scale. In- process inventories reduce the impacts of the variability of the production rates in a plant and protect against failures in the processes. Final goods inventories provide for better customer service. The variety and easy availability of the product is an important marketing consideration. There are other kinds of inventories, including spare parts inventories for maintenance and excess capacity built into facilities to take advantage of the economies of scale of construction. Because of their practical and economic importance, the subject of inventory control is a major consideration in many situations. Questions must be constantly answered as to when and how much raw material should be ordered, when a production order should be released to the plant, what level of safety stock should be maintained at a retail outlet, or how in-process inventory is to be maintained in a production process. Padmanava Samanta, (2017.)

2.2.3 Transportation

Entails moving inventory from point to point in the supply chain. Transportation can take the form of many combinations of modes and routes, each with its own performance characteristics. Hill (2000) argues that a company wins orders through its ability to deliver more quickly than competitors or to meet the required delivery date when few or none of the competition can do so.

Without well-developed transportation systems, logistics could not bring its advantages into full play. Besides, a good transport system in logistics activities could provide better logistics efficiency, reduce operation cost, and promote service quality. The improvement of transportation systems needs the effort from both public and private sectors. A well-operated logistics system could increase both the competitiveness of the government and enterprises. Transport system is the most important economic activity among the components of business logistics systems. Around one third to two thirds of the expenses of enterprises' logistics costs are spent on transportation. Transport system makes goods and products movable and provides timely and regional efficacy to promote value-added under the least cost principle. Transport affects the results of logistics activities and, of course, it influences production and sale. In the logistics system, transportation cost could be regarded as a restriction of the objective market. Value of transportation varies with different industries. For those products with small volume, low weight and high value, transportation cost simply occupies a very small part of sale and is less regarded; for those big, heavy and low-valued products, transportation occupies a very big part of sale and affects profits more, and therefore it is more regarded. Eastern Asia Society for Transportation Studies, (Vol. 5, pp. 1657 - 1672, 2005)

Transportation plays a connective role among the several steps that result in the conversion of resources into useful goods in the name of the ultimate consumer. It is the planning of all these functions and sub-functions into a system of goods movement in order to minimize cost maximize service to the customers that constitutes the concept of business logistics. The system, once put in place, must be effectively managed. Fair et al., (1981)

Traditionally these steps involved separate companies for production, storage, transportation, wholesaling, and retail sale, however basically, production/manufacturing plants,

warehousing services, merchandising establishments are all about doing transportation. Production or manufacturing plants required the assembly of materials, components, and supplies, with or without storage, processing and material handling within the plant and plant inventory. Warehousing services between plants and marketing outlets involved separate transport. Merchandising establishments completed the chain with delivery to the consumers. The manufacturers limited themselves to the production of goods, leaving marketing and distribution to other firms. Warehousing and storage can be considered in terms of services for the production process and for product distribution. There have been major changes in the number and location of facilities with the closure of many single-user warehouses and an expansion of consolidation facilities and distribution centers. These developments reflect factors such as better transport services and pressures to improve logistics performance. Eastern Asia Society for Transportation Studies, (Vol. 5, pp. 1657 - 1672, 2005)

The role that transportation plays in logistics system is more complex than carrying goods for the proprietors. Its complexity can take effect only through highly quality management. By means of well-handled transport system, goods could be sent to the right place at right time in order to satisfy customers' demands. It brings efficacy, and also it builds a bridge between producers and consumers. Therefore, transportation is the base of efficiency and economy in business logistics and expands other functions of logistics system. In addition, a good transport system performing in logistics activities brings benefits not only to service quality but also to company competitiveness. Eastern Asia Society for Transportation Studies, (Vol. 5, pp. 1657 - 1672, 2005)

2.2.4 Information sharing and its quality

Information sharing within a supply chain has numerous benefits among supply chain members, it reduce different types of uncertainties related to demand, product and technology that add costs to supply chain processes. The information sharing facilitate enhancing the efficiency and effectiveness of supply chain as it obtains certain advantages. Several advantages revealed by Khuranaet al., (2011) as including better coordination between different departments and between supply chain members and improved control of the supply chain processes, also that may reduce product design time, make the production lead-time shorter and stable the outputs along with reliable quality. Sharing information is stated by Khuranaet al., (2011) as a key component for any successful SCM system as they

discussed the need to implement a good structure of information sharing. It has been identified as being critical to effective innovation and development of supply chain management at an industry and enterprise level.

The true value of sharing information within a supply chain can be defined by the fact that benefits achieved outweigh the costs involved. These costs may include information systems investment and charges by customers or suppliers for providing the information. The coordination costs may include communication and administration costs. These costs can be dramatically reduced with recent developments in information technologies, such as ERP and Web technologies. Information sharing in a supply chain may bring a number of benefits to enterprises. For example, the products match the consumer's demand more closely and changes in the marketplace may be anticipated. The broad use of advanced information technologies in supply chains, such as EDI and Web technologies demonstrate that organizations have come to substantiate the importance of integrating information. Actually, many supply-chain related issues arise due to lack of sharing information within the members in a supply chain. This study attempts to make an overview of supply chain management, information sharing, types of shared information and, benefits and barriers of shared information in a supply chain. Li J., Shaw M.J., Sikora R.T., Tan G.W., (2001)

Information sharing means distributing useful information for systems, people or organizational units. To enhance the results of information sharing, organizations should answer four main questions: First we ask what to share, then whom to share it with, then how to share, and finally when to share. The quality of answers will help to avoid redundancy, reduce sharing costs and improve responses Sun S., Yen J., (2005).

The term 'Information Sharing' can also be referred to as 'Knowledge Sharing' or 'Information Integration'. There exists a myriad of information in a supply chain, such as, logistic, business, strategic, tactical and many more. The impact of information sharing on supply chains has become more significant with recent advances in IT. Furthermore, some investigations have been conducted to focus on the impact of information sharing on product quality. However, there is still room for further studies to clarify exactly how and what information should be shared and the beneficial effects on quality improvement Sun S., Yen J., (2008)

2.2.5 Sourcing and partnership with the supplier

Sourcing is the choice of who will perform a particular supply chain activity, such as production, storage, transportation, or the management of information. At the strategic level, these decisions determine what functions a firm performs and what functions the firm outsources. Sourcing decisions affect both the responsiveness and efficiency of a supply chain.

Relationships between an organization and its suppliers have traditionally been characterized by adversarial activities such as the low-bid process, in which at least one and often both parties lose. Rather than working together to find ways for both to win, buyers use their leverage to force suppliers to absorb costs to win the low bid, and suppliers look for ways to minimize their losses by barely meeting the buyer's specifications. Such relationships will not help either party succeed in the long run in a competitive marketplace. To understand the rationale for partnering with suppliers, one must first understand the goal. The goal is to create and maintain a loyal, trusting, reliable relationship that will allow both partners to win, while promoting the continuous improvement of quality, productivity, and competitiveness. David L. Goetsch Stanley Davis, (2014)

The growing market competitions are forcing the organizations to enhance the product quality as well as to reduce the cost of the product. The firms are using different methods of product quality development to mark their position in the market. Supplier Relationship Management is one of the practices to achieve better quality products in more efficient way. Moreover, supplier's participation has somehow become important for the organizations to gain innovative technical advancements for product development. Songand Benedetto, (2008).

The early involvement of the suppliers in product development phase will lead to reduction in development time, will also help in avoiding production problems from both sides, the suppliers and the customers and will eventually lead to enhanced product quality. The involvement of the suppliers at an early stage also helps in determining their manufacturing limits during the product designing process and this helps in avoiding many problems which may be faced at a later stage. Moreover, the suppliers may also contribute in the product

design giving rise to many possibilities of reducing cost and enhancing product quality. Hartley et al., (1997a).

The product quality was always treated as the unobserved factor or uncorrelated with the included variables in the demand function. In many cases this assumption is incorrect, in result the conventional cost function estimated does not provide accurate representations of the structure of production. One of the reason product quality is included, since quality characteristics are the strategic variables which the firm can use to pursue profit maximization. Paul J. Gertler and Donald M. Waldman, (1990). With multiplier supplier procurement strategy there is always a competition between the suppliers which curbs suppliers' opportunism. Paul J. Gertler and Donald M. Waldman, (1990). Buyer will have an opportunity to receive lower prices and shipping costs. Supplier will be responsible to maintain the necessary technology, expertise and forecasting abilities, cost, quality and delivery competencies. Render, B, J.Heizer, (1997).

However dealing with multiple suppliers is likely to require longer time in negotiation which in turn may delays or disturb production schedules. Cruz, I.S, (1997). Long term partnership is the strategy taken by many winning companies with suppliers to achieve the same benefits provided through the multiple sourcing strategy, in turn reducing the supplier base. Xerox reduces its supplier base from five thousand in 1981 to several hundred by 1985. Reducing with huge numbers helps them to form effective partnerships with those who are willing to produce high quality, low cost components. International Journal of Business and Management Invention, (2015). Reducing the supplier list has become the priority for many firms; some have even considered single sourcing would be a choice. The concept of single sourcing has evolved with growing popularity of JIT concept International Journal of Business and Management Invention, (2015).

There was a survey study which indicates the benefits of single sourcing. It includes higher quality at lower total cost to the buyer and higher supplier-buyer cooperation. International Journal of Business and Management Invention, (2015). Other benefits such as monitoring cost will be less and more consistency of product can be achieved. Greater reliability, increased machine throughput and reduced number of failures and repairs are further more benefits provided by the single source stated by the Engineers of Machine design. Cruz, I.S, (1997). In Multiple sourcing strategy, concept of splitting orders in a context of cost minimization or economics. Researchers have assessed the benefits of order splitting in

economic context, total cost for ordering, purchasing prices and inventory holding and stock out penalties are minimized. In this case using numerical search technique researchers claim that dual sourcing is often better than single sourcing. Analyst from Industry suggested firms to adopt multi sourcing supplier strategy, pointing out advantages of major cost savings and operational and strategic risk reduction. Multi-sourcing supplier strategy allows firms to tap into unique resources of diverse supplier relationships and gaining complementary competitive advantages. *International Journal of Business and Management Invention*, (2015).

2.2.6 Customer relationship

According to David L. Goetsch Stanley Davis, (2014) involving customers early in the product development cycle, a manufacturer can make changes inexpensively and with relative ease. The further along a product is in the development cycle, the more costly such changes become. If modifications are needed after the product is being used by customers, such as in the case of product recalls, the cost cannot be measured in just dollars and cents. Additional costs accrue in the form of lost consumer confidence, diminished trust, and a tarnished corporate image. Product defects can be corrected much more easily than consumer confidence or trust can be restored.

Building the firm relationships with the users is a prerequisite for creating the competitive advantage of the organization. Stojkovic, Djordje-vicandSajfert, (2012). In other words, customer relationship can be defined as an interactive process achieving the optimum balance between corporate investments and the satisfaction of customer needs to generate the maximum profit. Customer value is the value that a customer can bring to a company from the company's perspective. One direct value is the profit contributed to the company by the customer. Customer value is a customer's perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving the customer's goals and purposes in use situations. Conceptually, the subjective understanding of the products is the manufacturer of 'something' that could be offered as an attempt to achieve the objectives of the organization through the fulfillment of the needs and desires of consumers, in accordance with the competence and capacity of the organization as well as the purchasing power of the market. In addition the product can also be defined as the perception of consumers who elaborated by producers through the production results. Sri Harryani, (2017)

According to Roberts-Phelps, (2001) three things can be highlighted concerning customer relationship conscious business: retention, customer potentiality and de-selection of customers. Too many businesses concentrate on getting new customers instead of keeping their old ones and developing deeper relationships with them. Secondly, businesses should focus on customers as individuals and find a way to make them more frequent customers. Third thing is to identify the most potential customers who are worth keeping. Not every customer is profitable in long-term due to differencing customer groups. Robert-Phelps, (2001)

Research findings indicates that effective supply chain management leads to increased customer satisfaction and improved organizational performance. However, according to Alabama Technology Network, (1998.), empirical based evidences on these contentions are still scarce. Having a competitive advantage generally implies that an organization can have lower prices, higher quality, higher dependability and shorter delivery time when compared to its competitors Mentzer, J.T., (2001). Tan, K. C., Kannan, (2008) studied the relationship between SCM practices, competitive advantage and organizational performance and found that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. Customer relationship has an impact on the effectiveness of SCM strategy which led to financial and market performance. Companies with broader supply chain integration with customers and suppliers - showed largest performance improvement. According to Vickery, S. K. et al, (2003) the relationship between chain integration with financial performance was indirect and fully mediated by customer service performance.

Customer relationship has been defined in various ways. According to Kincaid, J. W., (2003.), Customer relationship is “the strategic use of information, processes, technology, and people to manage the customer’s relationship with your company across the whole customer life cycle.” Tan, K.C., (2001.) Defined customer relationship management as a set of firms’ activities in managing its relationships with customers to improve customer satisfaction. Parvatiyar, A. and Sheth, S. N., (2000). Describe CRM as “a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer. It involves the integration of marketing, sales, customer service, and the supply-chain functions of the organization to achieve greater efficiencies and effectiveness in delivering customer value”. Swift, R. S., (2001) explain

CRM as an “enterprise approach to understanding and influencing customer behavior through meaningful communications in order to improve customer acquisition, customer retention, customer loyalty, and customer profitability”. Specifically, CRM measures in this study was operationalized based upon five different kinds of activities that manufacturers commonly used to integrate their operations with customers namely ‘evaluates relationships with customers continuously’, ‘facilitates and helps immediate customers’, ‘measures and evaluates customer satisfaction and expectation’, ‘provide follow up and after sale services to customers’ and ‘involve customers in product and process designs’.

2.3 Product Quality

Garvin, (1987) developed a system of thinking about the quality of products by describing the basic elements of product quality in eight dimensions. Garvin, (1987): Foster, (2001): pointed out that quality is multidimensional and that each of its dimensions can be used strategically to gain competitive advantage. Based on Garvin’s product quality dimensions this research focuses on the dimensions that are impacted by supply chain practices.

The following is a summary of Garvin’s eight dimensions of Product Quality:

- **Performance** refers to a product's primary operating characteristics.
- **Features** are additional characteristics that enhance the appeal of the product to the customer. These are the secondary aspects of performance.
- **Reliability** is the likelihood that a product will not fail within a specific time period when put in use. Reliability refers to the dependability of customers on specific service. It is all about what is promised and what is delivered.
- **Conformance** is the precision with which the product or service meets the specified standards.
- **Durability** measures the length of a product’s operating life.
- **Serviceability** is the speed, ease and costs with which the product can be put back into service when it breaks down.

- **Aesthetics** refers to how the product looks, feels, sounds etc. It is a matter of personal judgement and a reflection of individual preference. This is all about visual appeal of the product, often taking into account factors, such as style, color, shape, packaging, tactile characteristics, and other sensory features.
- **Perceived quality** is the quality attributed by the customer, noting that perception is not always reality. The customers' judgement on the consumption value after comparing the received benefits from products and services with its cost Zeithmal, (1988)

According to Crosby, (1979) Quality is conformance to requirements. "Quality in customers' perception is the only thing that matters" (Deming, 1986) "Quality is those features of products which meet customer needs and thereby provide customer satisfaction", "Quality is freedom from deficiencies", and "Quality is fitness for use", Juran, (1988).

Juran, (2003) and Montgomery (2007) defined "Quality" as "fitness for use" and Defoe, (2010) has settled on a new definition "quality means fitness for purpose" In statistical terms, quality is largely determined by the amount of variability in what is being measured and also product quality refers to a fitness of product to meet customers' needs and satisfaction Ryan T.P, (2011). Quality is a complex and multifaceted concept. In its broadest sense, product quality is the ability of a product to meet or exceed customer's expectations Waters & Waters, (2008). The most common operational definition posits quality as the customer's perception of product and service excellence.

Feigen Baum (1994) defines product quality as "the composite of product characteristics of engineering and manufacture that determine the degree to which the product in use will meet the expectations of the customer". Fujimoto (1999) presents that the concept of product quality, in his framework, is related to fitness of information content or accuracy of information processing along a chain of productive resources that link customer needs, product concepts, product plan (basic design), product design, process design, process, product structure and product function. He divides total quality into two categories: design quality and conformance quality that design quality include ,customer needs, product concept and product plan (basic design)and also conformance quality consists product design, process design, process, product structure and product function.

2.2.1 Design quality

Design quality can be noted as the inherent value of a product in the market place or how to measure the characteristics of a product designed to meet the requirements of a given group of customers. It measures how well the customer expectations are represented in the product concepts and then into detailed product designs.

According to Widrick S.M, (2002) quality of design is determined by three factors: deep understanding of customer requirements, translation of these requirements into a product and continuous improvement of the design process. Such an improvement is based on close cooperation among marketing, research and development, and engineering. Quality of design is influenced by many factors, such as product type, cost, profit policy, demand of the product, availability and materials, and product reliability. A general definition of design quality as a match between product characteristics and customer needs can be specified by invoking the concept of a zone of tolerance in customer expectations Zeithaml, and Bitner, (2003)

2.2.2 Conformance Quality

Clark and Fujimoto, (1991) state that conformance quality refers to how well products delivered to customers conforms to the product design or specifications, including reliability, defects in the field, fit and finish and durability. Schniederjans and Cao, (2002) state that conformance quality refers to the extent of achieving product design specifications. Based on Fujimoto, (1999.), conformance quality determines how closely the information embodied in the actual products represents that of the product design. As the chain of quality indicates, a high design quality and a high conformance quality are required in order to achieve a high level of total product quality.

Quality of conformance is basically meeting the standards defined in the design phase after the product is manufactured or while the service is delivered. This phase is also concerned about quality is control starting from raw material to the finished product.

2.2.3 Customer satisfaction

Customers today have different needs and increasingly demand for higher quality of products and services. However, in majority of case customer priorities often differ significantly from what organizations think they are. Quinn & Humble, (1993).

Customer satisfaction goes beyond service experience that a customer went through. It incorporates value judgment and comparison to initial expectation of what the service quality should be; oftentimes based it is an overall comparison between the value that customers perceive and the price that they pays. Rust & Zahorik, (1993).

Effective strategic supply chain decisions have a profound impact on competitive position, profitability, market share, as well as impact on the specific needs of the consumer. Song, Dong and Xu, (2014). Examples of these needs are consumer trends, type of products, services, quantities, qualities and time. Hugo, Babenhorst-weiss and Van Rooyen, (2002). As observed by Saura *et al.* (2008), SCM is the connection between production and consumption, a cost-reduction technique and a product differentiation strategy that brings greater customer satisfaction.

2.3 Dimensions of Wine Quality

Wine quality dimensions are of two categories. One category comprises the extrinsic dimensions of quality, relating to factors beyond the wine in the glass. Most typically these were production methods (including both grape quality and wine making methods), but they also included marketing-related issues. The other larger category relates solely to what is in the glass, that which is experienced when the wine is consumed, i.e., the intrinsic quality dimensions. These broad categories of quality dimensions can then be broken down further to individual dimensions and in some cases to sub-dimensions. Extrinsic qualities are grapes, production, marketing, fitness for purpose, faultlessness and consistency. Intrinsic qualities are pleasure, appearance, gustatory, variety and potential. From the above wine quality dimensions research the research selected four dimensions this are fitness for purpose, consistency, appearance and variety. Steve Charters, (2003)

➤ **Fitness for purpose** M. Pamela Neely, (1995) Juran developed a short list of inputs that companies, organizations, and individuals alike can use in determining a product or service's fitness for use. The questions or inputs for consideration are:

- The users of the product or service
- How the users will actually put the product or service to use
- The possibility and probability of any dangers to human safety
- The economic resources of both the producer and the user

- The user's specific determinants of a product or service that is fit for their use
 - **Consistency** One specific area in which quality and wine production were linked was in consistency, although the overall perspective on this was ambivalent. For a number of consumers it was important that wine is consistent – that it tastes the same from one bottle to the next. This focus very much reflects the current quality management approach to production. Steve Charters, (2003)
 - **Variety** Products are designed and manufactured to fulfil perceived needs. However, such needs vary because of differences among users, usage scenarios, constraints, social values and others. In order to address these differences, variety of products is created to meet diversified requirements. Variety or assortment is defined as a number or collection of different things of a particular class of the same general kind. Variant is an instance of a class that exhibits usually slight differences from the common type or norm. H. EMaraghy, (2013)

2.4 Lean Supply Chain

Lean Thinking is a philosophy of management and/or business strategy that objective of streamlining the flow of production. Womack & Jones, (2003). While seeking to reduce costs through a system of identification and elimination of waste, making the customer receive exactly what he need, at the requested time and in the quantity requested. Ferreira, Francescki, Melo, Silva, & Reichert, (2017). The analysis of the concepts and principles of the lean mentality should always precede the choice of management tools since the concepts dictate the behavior of the system. Concepts knowledge are relevant in decision making and determination of appropriate tools. Operating with smaller stocks, greater flexibility and better customer service all at the same time requires a very coherent logic, and often surprising for its simplicity.

Unlike the traditional SCM, which has excessive inventory and tolerates many inefficiencies, the lean culture is to maximize flow value, to reduce waste and loss Guimarães & Rodriguez, (2018). Simplicity is a fundamental part of Lean Logistics, but in many cases, it would not be possible to apply it. In other cases, to simplify it, it is necessary to adopt a different way of thinking which may represent a break with the dominant paradigms Bañolas, (2006)

2.5 Conceptual Framework

A conceptual framework based on literature review with 6 independent variables (facility, inventory, transportation, sourcing and partnership with the supplier, customer relationship, information sharing and its quality) and 3 dependent variables (consistency, fitness for purpose and variety).

The independent variable is the antecedent while the dependent variable is the consequent. If the independent variable is an active variable then we manipulate the values of the variable to study its effect on another variable. Dependent variable is the variable that is affected by the independent variable. Earl Babbie (1983)

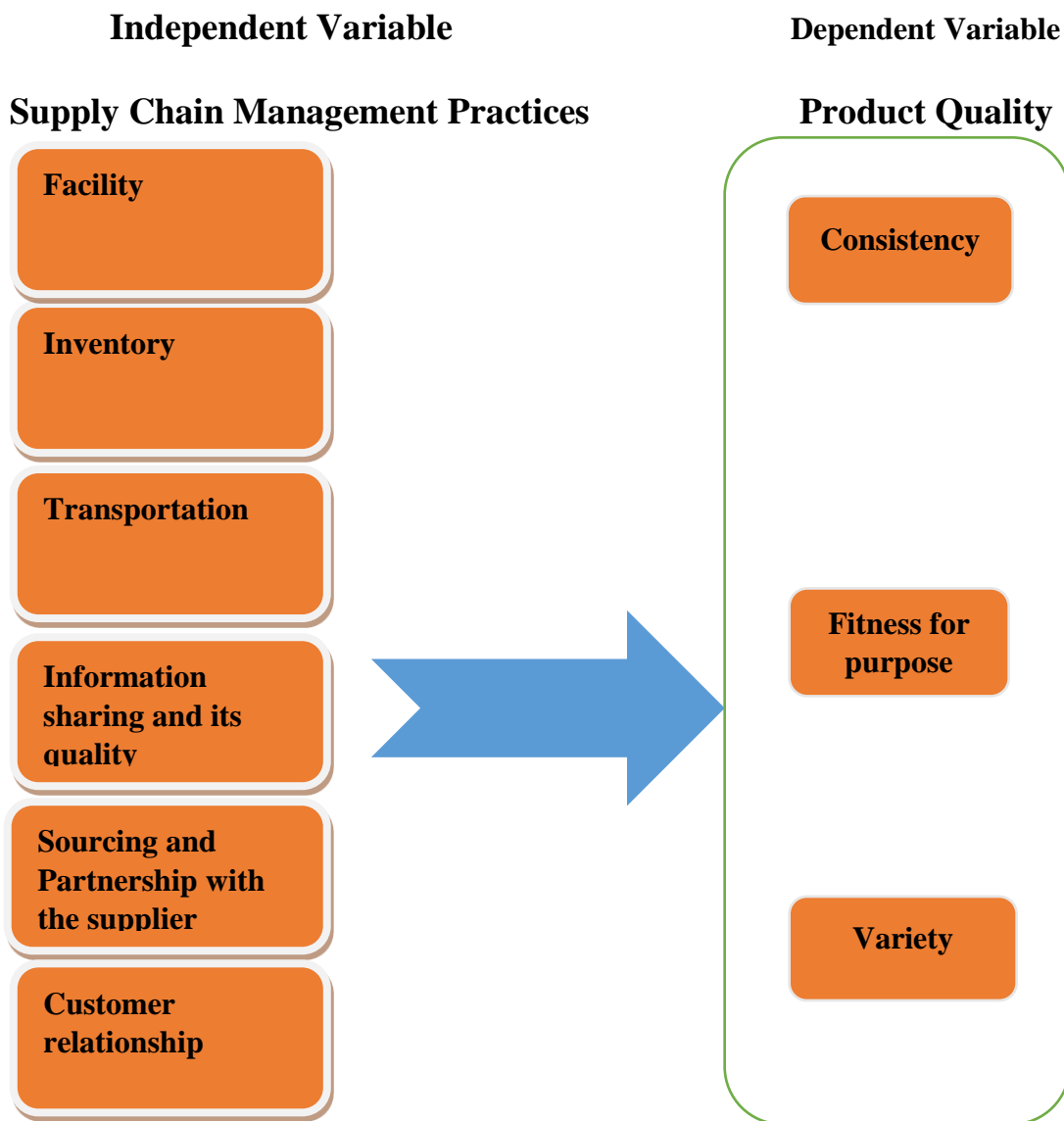


Figure 1. Conceptual frame work

Source: own survey, 2021

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

This chapter deals with the research design, the research method, sources of data, description of the study area, samples and sampling techniques, instruments and procedures of data gathering together with its validity and reliability tests, methods of data analysis as well as ethical consideration in the study.

3.1 Research Approach

Quantitative approach is one in which the investigator primarily uses postpositive claims for developing knowledge. Creswell, (2009). Therefore, the researcher chooses quantitative and qualitative research to measure the effect of independent variables (SCMP) on the dependent variable (product quality) by collecting quantitative data using questioner and qualitative data using interview from Awash Wine S.C employees.

3.2 Research Design

Designing a study helps the researcher to plan and implement the study in a way that will help the researcher to obtain intended results, thus increasing the chances of obtaining information that could be associated with the real situation Burns & Grove, (2001). Causal research also called explanatory research is the investigation of cause and effect relationships in order to determine causality; to observe variation in the variable that is assumed to cause the change in the other variable and then measure the changes in the other variable using statistical methods. It enables us to understand the very nature of what we are actually looking at it. Binyam, (2016). The study was intended to analyze the casual relations between the dependent variable (product quality) and the independent variables (SCMP) using correlation and regression, which makes the research explanatory. Therefore this study explanatory type.

3.3 Target Population

Population is defined as the entire set of individuals or other entities to which study findings are to be generalized. Schutt, (2011). The target population for this study comprised of employees of Awash Wine Sc. at Lideta plant who are engaged in supply chain related activities and product quality practices.

3.4 Sampling and Sampling Techniques

3.4.1 Sampling techniques

A sample is the number of items selected to represent the whole population Kothari, (2004). For the purpose of this study probability sampling particularly stratified sampling technique was adopted. According to Kothari, (2004), a stratified sample is a probability sampling technique in which the researcher divides the entire target population into different sub-groups, or strata, and then randomly selects the final subjects proportionally from the different strata. This type of sampling is appropriate when the researcher wants to highlight specific subgroups within the population.

The target population for the study was classified into six strata based on the sectional division of the company. Then the researcher takes samples from each stratum according to their proportion to the total population. Since the information required for the study needs different people who have knowledge and awareness about different supply chain management practices/dimensions, and product quality, stratified sampling technique was adopted to have the right proportion of people from every concerned department or section. The departments considered as strata from which data will be collected are:

- a. **Commercial** includes distribution, store, marketing and sales work units.
- b. **Finance** includes ICT work unit.
- c. **HRD** includes facility management work unit
- d. **Technique**
- e. **procurement and warehouse**
- f. **Quality**

3.4.2 Sample size

The total number of Awash Wine SC Lideta plant employees are 211 because the study is using purposive sampling and Lideta plant is the main manufacturing plant than the new plants resides on Addis Ababa. Out of total number employees about 106 employees eligible to be considered as a target because they were directly engaged in supply chain related activities. A sample size of 70 employees was selected since the entire population of interest could not be selected. To arrive at the desired sample, Fisher's model will be used as solution as it used by Linet, (2015).

In order to determine the sample size Yamane's, (1967) sampling size determination formula is used. This formula is used at 95% of confidence level, and at 0.05, level of

significance.

Where n= Sample size

N= Population Size

e= Level of precision considered as (5%)

$$n = \frac{106}{1+106(0.05^2)} = 70$$

Proportion = n/N= 70/106 = 66%

Table 1. Sample size

Strata (Departments)	Total Population of each	Sample size of each Stratum
Commercial	20	13
HRD	40	27
Finance	20	13
Technique	10	6
Procurement	11	8
Quality	5	3
Total	106	70

Source: the case company

3.5 Data Collection Tools

The researcher attempted adequate and relevant information with concerning topic by using quantitative and qualitative data. Quantitative assume the meaning and refers to measure of it the how much and qualitative refers to the meaning the definitions analogy or model characterizing something Cooper Schindler, (2014). By using primary and secondary data source.

Primary data collected by using Likert questionnaires and interviews. The researcher conducted an interview with procurement department head, quality department technician and logistics officer. A Secondary data gathered from case Institute relevant documents, previous reports.

3.6 Validity and Reliability

3.6.1 Reliability

Reliability is measures of internal consistency that concerned with items responses consistent across constructs and indicates scores are stable over time when the instrument is administered Creswell, (2009). The researcher used SPSS to test reliability of the questioner. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The closer the coefficient is to 1.0, the greater is the internal consistency of the items (variables) in the scale. Cronbach's alpha coefficient increases either as the number of items (variables) increases, or as the average inter-item correlations increase

In order to measure the reliability of the instrument, a 0.70 Cronbach's coefficient alpha was done. George and Mallery, (2003) provide the following rules of thumb: " $\geq .9$ = Excellent, $\geq .8$ = Good, $\geq .7$ = Acceptable, $\geq .6$ = Questionable, $\geq .5$ = Poor, and $\leq .5$ = Unacceptable". As it indicated in the table, the test result is between 0.88 and 0.91. Therefore, based on the test, the results for the items are reliable and acceptable.

Table 2. Reliability test

Item	Number of item	Cronbach's Alpha	Result
Facility	8	0.90	Excellent
Inventory	6	0.91	Excellent
Transportation	6	0.90	Excellent
Information sharing and its quality	8	0.89	Good
Sourcing and Partnership with the supplier	9	0.90	Excellent
Customer relationship	6	0.90	Excellent
Product quality	7	0.88	Good
Overall reliability	50	0.91	Excellent

Source: own survey, 2021

3.6.2 Validity

Validity of an instrument is how accurate the instrument is in obtaining the data it intends to collect Mugenda & Mugenda, (2003). Validity indicates the degree to which the instrument measures what it is supposed to measure. Kothari, (2004). To ensure precision, relevance and content validity of the instrument, the questionnaire was subject to critical evaluation by the researcher and the supervisor. The questionnaire tested test in order to check its content, construct and face validity. The questionnaire was standardized and adopted from Li et al (2006) with few additions. Therefore, the instrument is already valid and tested.

3.7 Data Analysis Techniques

The researcher analyzed the quantitative data using scientific package for social science (SPSS) for the purpose of significance study; To know the basic needed facts that the technique uses to reduce large numbers of error data gathering from primary sources

analyzed and interpreting by using statistical methods that can be percentage, Mean, standard deviation compare and contrast of data and theoretical aspects. Narrative analysis is used to analyze the interview. The research used Regression to identify the magnitude of the effect of practices of supply chain management on product quality; Correlation used to see the magnitude of association between supply chain practices and product quality.

Descriptive statistics were used for demographic factors and SCM Practices. Also the study used Correlation analysis, specifically Pearson correlation to measure the degree of association between different variables under consideration used. Regression analysis was also used to test the effect of independent variable on dependent variable

3.8 Ethical Consideration

For the purpose of to facilitate the data gathering processes of the research it needs a letter of cooperation written from the student support office of St. Mary University. This letter supported to provide each of the data collection and help or shown to the case company that are random and purposively sample to collect the relevant data and documents from its.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

As discussed in chapter three, this study attempted to examine the effect of supply chain management practices on product quality in case of Awash Wine Sc. To analyze the collected data in line with the overall objective of the research undertaking, statistical procedures were carried using SPSS (version 27).

4.1 Respondent's Profile

This descriptive analysis is used to look at the data collected and to describe that information. It is used to describe the demographic factors for more clarification. It is mainly important to make some general observations about the data gathered for general or demographics questions. The demographics factors used in this research are Educational Qualification, Job Title/Position, and length of service in the organization and Departmental distribution. On the other hand assessing the work experience and education level of the respondent's is that, when the respondents are more experienced and educated they have better opportunity to understand the case and give better response than else. From the researchers data on the respondents educational back ground 48% of them are first degree holders and 10.8% are second degree and above this shows the respondents has good knowledge on the subject. The respondent's job titles included Managers, Team leaders, Experts, technicians, HR officers and marketing representatives this shows the researcher included professionals that are able to respond on the subject. Work experience of the respondents is included on this research to examine the knowledge of the employees on the company's reputation regarding SCM and product quality; the rate shows 87.7% of the respondents stayed in the company more than 1 year. The departmental representation shows the researcher selected respondents that are involved in SCM and product quality activities.

Table 3. Respondents' profile

Respondents' Background	Demographic Characteristic	Frequency	Percentage
Educational background	College diploma	10	15.4%
	First degree	48	73.8%
	Second degree and above	7	10.8%
Job title	Manager	6	9.2%
	Team leader	6	9.2%
	Expert	20	30.8%
	Other(technicians, HR officers and marketing representatives)	33	50.8%
Work experience	Under 1year	8	12.3%
	1-5 years	28	43.1%
	6-10 years	20	30.8%
	Over 10 years	9	13.8%
Departmental representation	Commercial	12	18.5%
	Finance and ICT	12	18.5%
	HR and facility management	24	36.9%
	Technique	6	9.2%
	Procurement and ware house	8	12.3%
	Quality	3	4.6%

Source: own survey, 2021

4.2 Response Rate

During the survey a total of 70 questionnaires were distributed to employees of Awash Wine S.C. 65(93%) of distributed questionnaires were returned. So the analysis was made based on 65 responses

4.3 Descriptive Analysis

The research questionnaire designed using 5 point Likert scale to collect appropriate responses, in relation to this the respondents indicated the extent they agree with the statements by choosing: 5-Strongly Agree, 3-Neutral, 2-Disagree and 1-Strongly Disagree. Based on the response of the respondents ; the mean and group mean statistical values approaching to 3.00 and less indicates the poor perception, above 3.00 indicates good perception of respondents on that particular item or variable and 3.00 shows neutral.

Table 4. Descriptive statistics of SCMP and product quality.

	N	Mean	Std. Deviation
Facilities	65	3.0577	0.82110
Inventory	65	4.0154	0.70136
Transportation system	65	4.2641	0.59672
Information sharing and its quality	65	3.1538	0.83261
Sourcing and Partnership with the supplier	65	2.8821	0.80903
Customer relationship	65	4.0103	0.61930
Product quality	65	3.5868	0.59996

Source: own survey, 2021

N= 65 and the group means of Facilities of the company shows that 3.05 mean value and the standard deviation is 0.82. The group mean value indicates that the overall perception of the respondents on this particular dimension is neutral. Standard deviation shows that how diverse are the responses of respondents for a given construct. N=65 and the group mean of inventories is 4.0 and 0.70 standard deviation. The overall mean shows perception of respondents about inventory of the company is good. The group mean of transportation system of the company shows that 4.26 and STD 0.59. The overall mean shows perception

of respondents about transportation system of the company is good. The group mean of information sharing and its quality dimensions shows that 3.15 and STD 0.83. The mean value indicates that the overall perception of the respondents on this particular dimension is good. The mean of sourcing and partnership with the supplier is 2.88 and STD is 0.80. The overall mean shows perception of respondents about sourcing and partnership with the supplier is poor. Customer relationship dimensions have scored 4.01 group mean and 0.61 standard deviation. The overall mean shows perception of respondents about Customer relationship dimensions is good. Product quality dimensions have scored 3.58 grand mean and 0.59 standard deviation. The overall mean shows perception of respondents about Product quality dimensions is good.

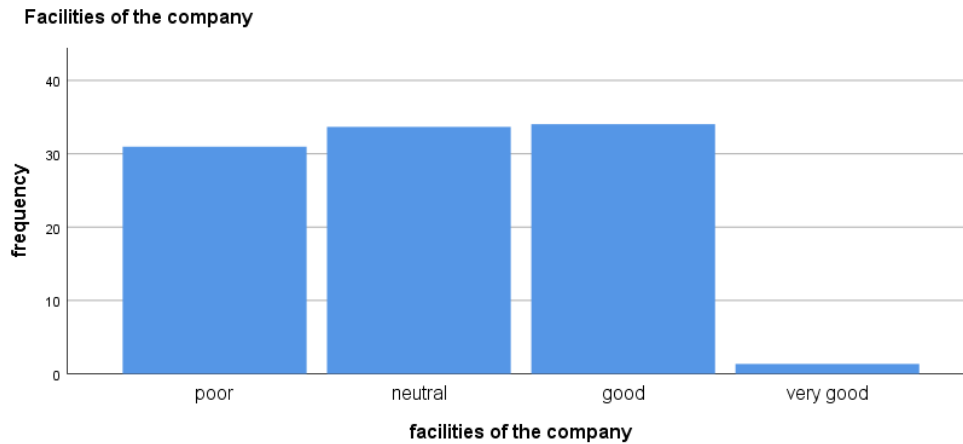
4.3.1 Facility

Table 5. Descriptive statistics of facility

	N	Minimum	Maximum	Mean	Std. Deviation
Company's Plant Size is sufficient to fulfill the demand	65	2.00	4.00	2.9692	.78996
Company has productive Labor	65	2.00	5.00	3.1385	.82683
Location the Production site of the company is convenient for transportation	65	2.00	4.00	3.2154	.80024
The company consider the storages located near the customers	65	2.00	4.00	3.0923	.74421
The company's warehouse located near the production site	65	2.00	4.00	2.8308	.78201
The companies machineries' are capable of producing the required amount of product	65	2.00	5.00	3.1538	.90538
Manufacturing process of the company is productive	65	2.00	5.00	3.3231	.88579
Time has been reduced for inspection of the incoming Materials/components/Products	65	2.00	4.00	2.7385	.83436
	65				

From table 5. The facility of the company has insufficient plant size, location of ware house is not near the production site and much time is spent on inspection and time spent on inspection. The respondent's response on location of storage is neutral; good perception on productivity of labor, location of production site, machineries and production process. Over all analysis of facility of the company is shown on fig2, 31% of their response were poor, 33.7% neutral, 34% good and 1.3% very good. Most of respondents are neutral about facility of the company

Figure 2. Descriptive analysis of facilities



Source: own survey, 2021

4.3.2 Inventory

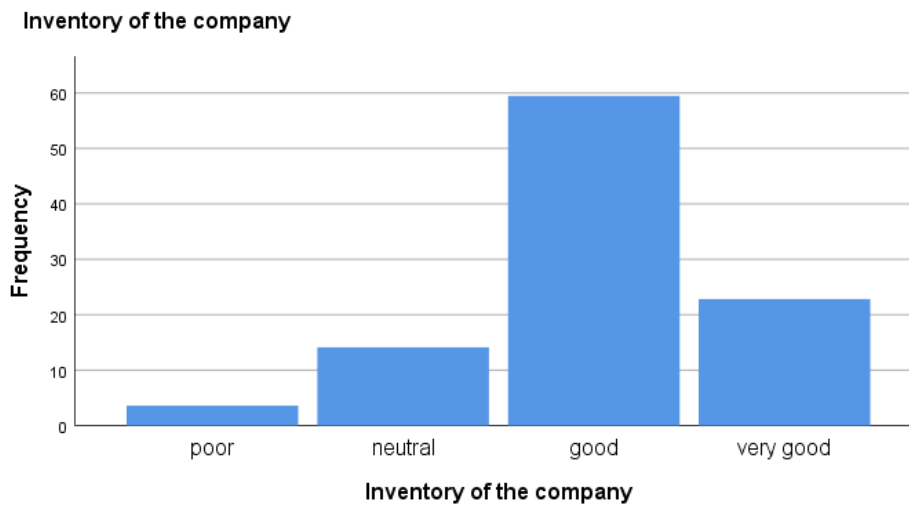
Table 6. Descriptive statistics of inventory

	N	Minimum	Maximum	Mean	Std. Deviation
The company use cyclic inventory system	65	3.00	5.00	4.1231	.67332
The company has Safe product in the inventory in case demand exceeds expectation	65	3.00	5.00	4.1692	.54684
The company uses seasonal inventory in periods of high and low demand	65	2.00	5.00	3.9846	.83838
The company has enough products in the stock.	65	2.00	5.00	3.9692	.70643
Our company buys products in smaller batches only when they are needed at the place where they are needed and exactly in the quantity required (Just in Time) 31Pull“ production system	65	2.00	5.00	3.7385	.75575
Our company policy looking for reducing set-up time	65	2.00	5.00	4.1077	.68746
	65				

According to the respondents response inventory of the company is good.

The respondents were asked to reflect their opinion on inventory of the company as shown on fig3, 3.6% of their response were poor, 14.1% neutral 59.5% good and 22.8% were very good. The respondents has good perception on the inventory system of the company.

Figure 3. Descriptive analysis of inventory



As the researcher investigated using interview question there is distribution risk by Poor standard of destination warehouses; long truck turning around time/truck residence time; poor layout of distribution offices; inefficient invoicing process; manual handling of all distribution activities. The intended solutions are provide storage standards and continuous follow up on agents, stockiest storage practices; give storage consultation and create awareness on wine storage to outlets during visit; Provide standard storage materials to big volume outlets; modernize the loading/unloading system using standard loading/unloading machineries like Forklift and modernize the loading and unloading process using simple manual machineries. Another risk is storage risks some of storage risks are Poor raw material storage practice and Poor storage practice of full goods. The intended solutions are building standard raw material stores in or renting satellite stores for stock and rebuilding and standardize the full and empty bottles stores.

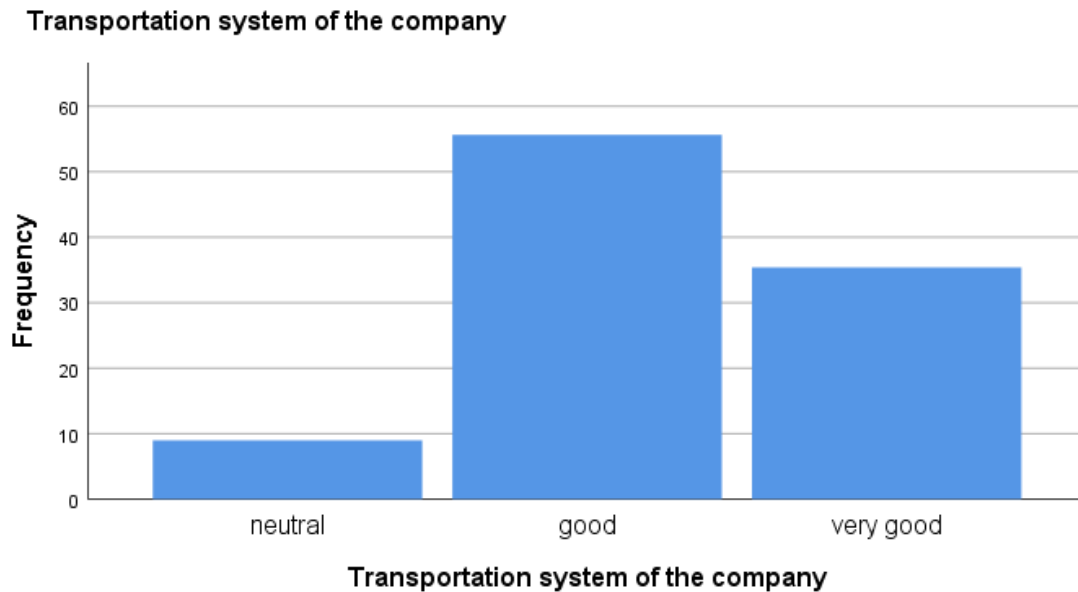
4.3.3 Transportation

Table 7. Descriptive statistics of transportation

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
In transportation multiple supply or demand points will be included in a single run	65	3.00	5.00	4.0462	.59767
The company uses the fastest mode of transportation	65	3.00	5.00	4.2308	.63169
The transportation decision logic of the company is to satisfy customer requirement	65	3.00	5.00	4.4000	.63246
Products and raw material are transported safely	65	3.00	5.00	4.4308	.68395
The company uses standard trucks to raw material transportation.	65	3.00	5.00	4.3385	.53843
The company has implemented on site quality inspection before and after transportation.	65	3.00	5.00	4.1385	.49614
Valid N (list wise)	65				

From table 7 the respondent's response on each constraints of transportation of the company is good. The respondents were asked to reflect their opinion on transportation system of the company as shown on fig4, 9% of their response were neutral 55.6% good and 35.4% were very good. From this respondents has good perception on transportation system of the company.

Figure 4. Descriptive analysis of transportation



From the interview there is transportation risk on quality of raw material emerged because of transportation system; quality and safety risk due to improper grape transportation from farm; Transportation of raw materials from distant warehouses to production sites and Supplier viability & reliability. The solutions are improving the transportation of grape from farm using tracks with standard cooler system; Installing crushing and de-stemmer machineries at Farm to change the grape to semi-finished product and increase the quality of grape and decrease transportation cost; Standardize the raw materials transportation practice using raw material transportation procedure; Implement on site quality inspection before and after transportation; Using standard trucks to raw material transportation and conducting supplier assessment.

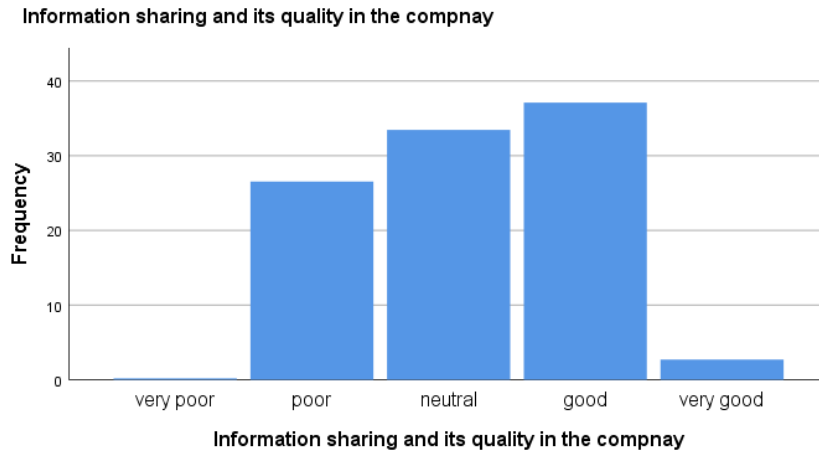
4.3.4 Information sharing and its quality

Table 8. Descriptive statistics of information sharing and its quality

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
The company share demand and production information with the supplier	65	2.00	5.00	3.4000	.91515
In the company sales and marketing shares demand information with supply chain management	65	2.00	5.00	3.1846	1.04421
Supply chain management information sharing of the company is assisted by technology	65	1.00	4.00	3.3692	.69752
Information exchange between our trading partners and us is timely	65	2.00	4.00	3.1538	.77522
Information exchange between our trading partners and us is accurate	65	2.00	4.00	3.1077	.77304
Information exchange between our trading partners and us is complete	65	2.00	4.00	3.1077	.81246
Information exchange between our trading partners and us is adequate	65	2.00	4.00	2.7538	.81069
	65				

The respondent's response on questionnaires of information sharing and its quality in the company is good. But they responded poor on adequacy of information exchange between awash wine sc. and its partner. The respondents were asked to reflect their opinion on information sharing and its quality dimensions of the company as shown on fig 5, 0.2% of their response were very poor, 26.5% poor, 33.5% neutral and 37.1% good and 2.7% were very good. This shows most of the respondent's response on information sharing and its quality dimensions is good.

Figure 5. Descriptive analysis of information sharing and its quality



4.3.5 Sourcing and partnership with the supplier

Table 9. Descriptive statistics of sourcing and partnership with the supplier

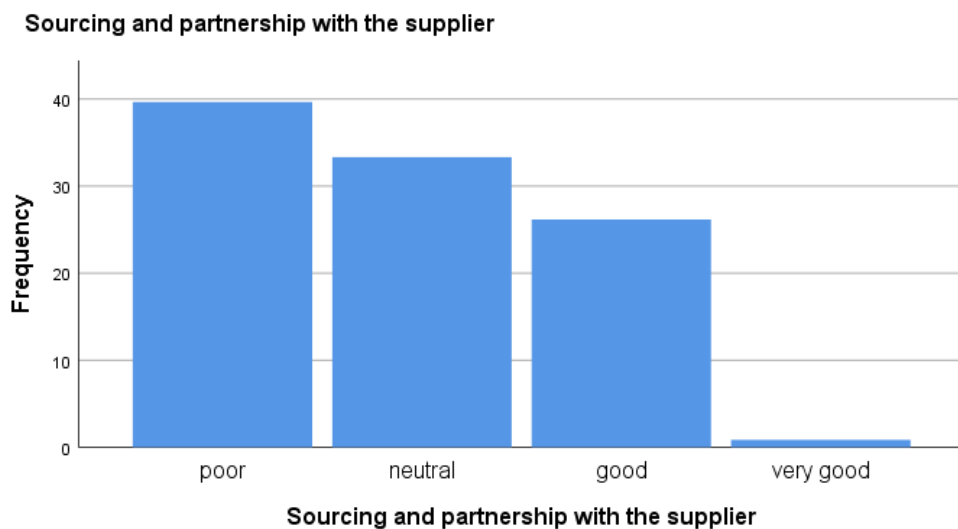
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
In choosing supplier company's criterion is quality	65	2.00	5.00	2.9692	.91804
The company helps the suppliers to improve their product	65	2.00	4.00	3.1077	.77304
The company's continuous improvement program includes the key suppliers	65	2.00	4.00	2.9846	.81953
The company involves the key suppliers in developing new product	65	2.00	4.00	2.9538	.81836
The company has a systematic supplier rating system	65	2.00	4.00	2.8462	.79512
The company believes in long-term relationships with suppliers and takes effort for the same	65	2.00	4.00	2.8154	.78844
The company trusts on a small number of high-quality suppliers	65	2.00	4.00	2.4769	.68711
Our company pushes suppliers for shorter lead-times	65	2.00	4.00	2.7692	.82480
Our company streamlines ordering, receiving, and other works from suppliers	65	2.00	5.00	3.0154	.85682

Respondents has poor perception on criterion on choosing suppliers, the company's continuous improvement program includes the key suppliers, the company involves the key suppliers in developing new product, the company has a systematic supplier rating system ,the company believes in long-term relationships with suppliers and takes effort for the same, the company trusts on a small number of high-quality suppliers and company pushes suppliers for shorter lead-times. And they are neutral regarding company streamlines ordering, receiving, and other works from suppliers. Good perception on company helps the suppliers to improve their product.

The respondents were asked to reflect their opinion on sourcing and partnership with the supplier of the company as shown on fig 6, 39.7% of their response were poor, 33.3% neutral and 26.2% good and 0.9% were very good. From this analysis most of respondents responded poor on sourcing and partnership with the supplier of the company.

Figure 6. Descriptive analysis of sourcing and Partnership with the Supplier



Source: own survey, 2021

Interview question regarding supplier expectations and how the company is respond the respondent said that the supplier's expectations are information on national regulatory requirements (certificate of analysis and health certificate); continuous business to business relationship and planned order. The company tries to respond accordingly and provides description of raw material technical specification and timely payment.

4.3.6 Customer relationship

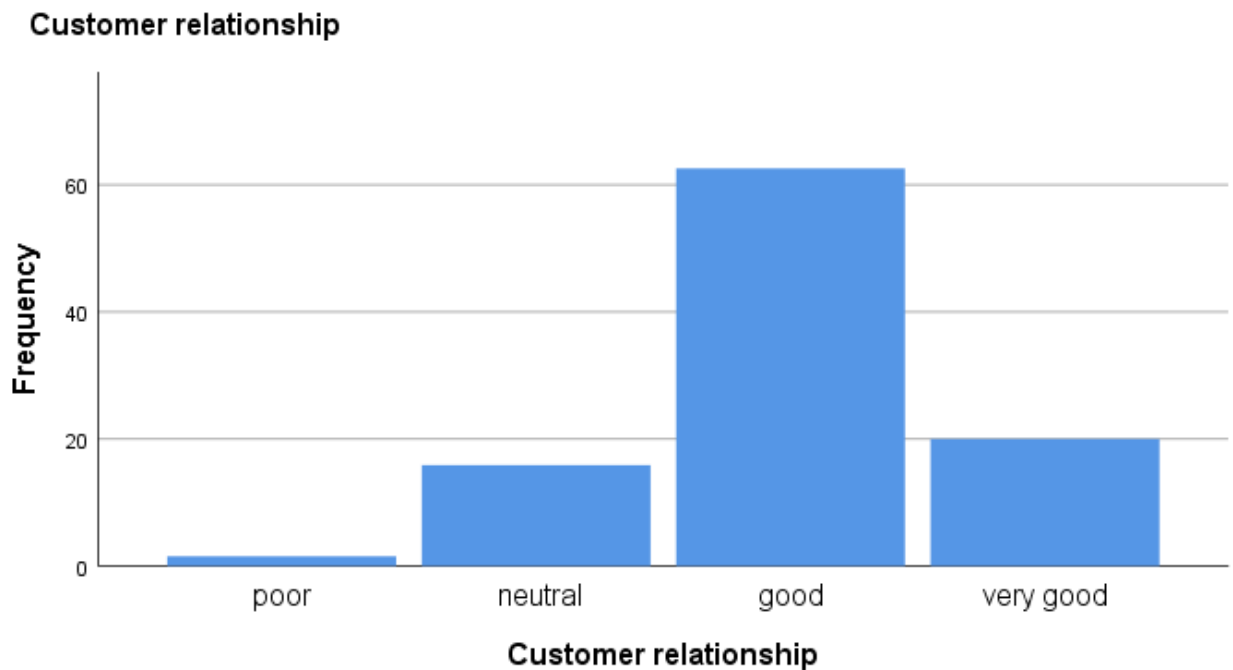
Table 10. Descriptive statistics of customer relationship.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
The customers and their needs shape our organization and its work	65	3.00	5.00	4.1846	.55600
The company periodically evaluate the importance of our relationship with our customers	65	3.00	5.00	4.1231	.64970
The company frequently interacts with customers to set reliability and responsiveness.	65	3.00	5.00	4.1077	.64039
The company frequently measure and evaluate customer satisfaction	65	3.00	5.00	4.1077	.58957
The company frequently determine future customer expectations	65	2.00	5.00	3.9385	.55557
The company facilitate a way for customers' to seek assistance from us	65	2.00	5.00	3.6000	.72457
Valid N (list wise)	65				

From table 8. The respondent's response on customer relationship of the company is good.

The respondents were asked to reflect their opinion on Customer relationship of the company as shown on fig 7, 1.5% of their response were poor, 15.9% neutral and 62.6% good and 20% were very good. Therefore most of respondents responded positive about relationship between customers and Awash wine Sc.

Figure 7. Descriptive analysis of customer Relationship



Source: own survey, 2021

On the interview question on expectation of customers the customer's expectations are good company image; awareness on product and storage practice; timely response on defective products; clean material delivery (filled bottles and crats); good Business to Business (B2B) relationship with the company; Credit facility and updated information on route to market. The company's response to customer's requirement is to deliver safe and quality products with proper labeling with affordable price and timely delivery of products(product availability). The overall aim is to exceed customers' needs and expectation.

4.3.7 Product quality

Based on the response of the respondents ; the mean and group mean statistical values approaching to 3.00 and less indicates the poor product quality perception, above 3.00 indicates better product quality perception of respondents on that particular item or variable and 3.00 product quality is similar with others.

Table 11. Descriptive statics of product quality

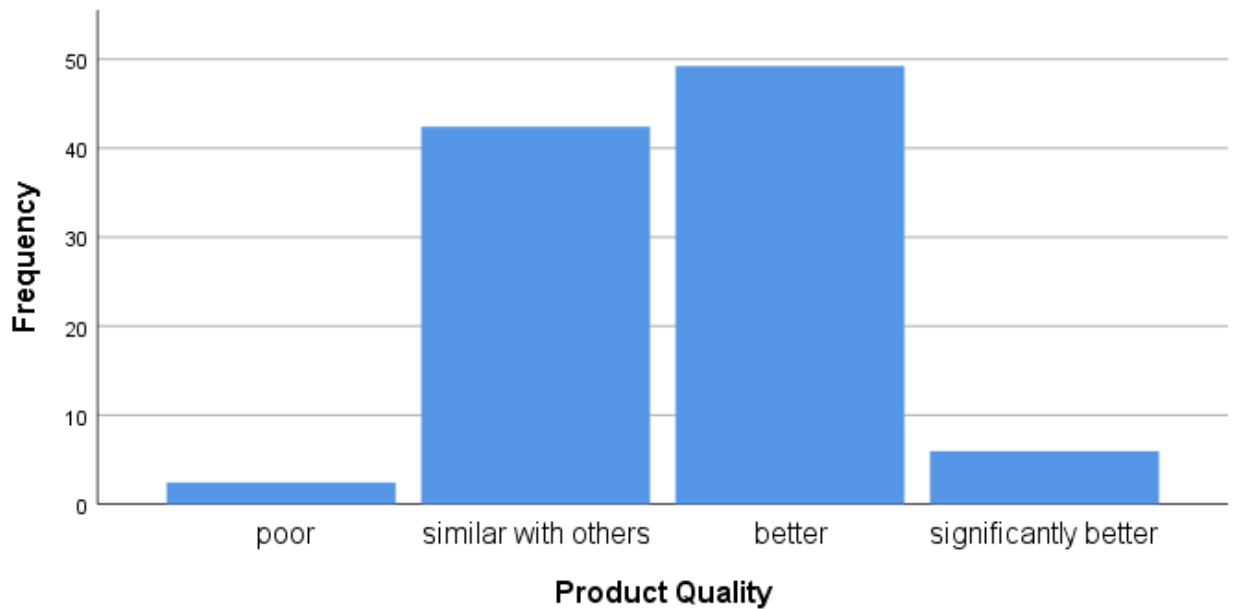
Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Consistency	65	3.00	5.00	3.4615	.58835
Flavor	65	3.00	5.00	3.8000	.56458
Appearance	65	3.00	5.00	3.6923	.63549
Varity	65	2.00	5.00	3.1077	.70982
Packaging	65	3.00	5.00	3.7846	.48387
Affordability	65	3.00	5.00	3.6923	.55686
Delivery	65	3.00	5.00	3.5692	.66071
Valid N (list wise)	65				

According to the respondent's response product quality of awash wine better than others.

The respondents were asked to reflect their opinion on Product quality dimensions as shown on fig8, 2.4% of their response were poor, 42.4% similar with others and 49.2% better and 5.9% were significantly better. From the percentage of respondent's' response product quality of the case company is better than others this shows most of the respondent's believe Awash Wine factory's product is better than other producers.

Figure 8. Descriptive analysis product Quality

Product Quality



From the interview questions the respondent responded regarding product quality program Awash wine S.C has implemented QMS and other relevant management systems; the company has also worked on its products to meet national compulsory standards. In the case of raw material direct raw materials supported by documents such as COA and Health Certificate. In production using registered recipe at registered site; Timely notification of any change including packaging conditions and Renewal of certificate of competence. The goal of the company is to achieve safe and quality product at affordable price

4.4 Correlation Analysis.

Correlation is a statistical measure that indicates the extent to which two or more variables fluctuate together. A positive correlation indicates the extent to which those variables increase or decrease in parallel; a negative correlation indicates the extent to which one variable increases as the other decreases. Thorndike, Robert Ladd (1947)

Table 12. Correlation Analysis

		Correlations						
		Facility of the company	Inventory of the company	Transportation system of the company	Information sharing and its quality	Sourcing and partnership with the supplier	Customer relationship	Product quality
Facilities of the company	Pearson Correlation	1	.662**	.559**	.746**	.523**	.618**	.699**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	65	65	65	65	65	65	65
Inventory of the company	Pearson Correlation	.662**	1	.461**	.565**	.636**	.510**	.701**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	65	65	65	65	65	65	65
Transportation system of the company	Pearson Correlation	.559**	.461**	1	.591**	.535**	.600**	.739**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	65	65	65	65	65	65	65
Information sharing and its quality	Pearson Correlation	.746**	.565**	.591**	1	.607**	.662**	.765**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	65	65	65	65	65	65	65
Sourcing and partnership with the supplier	Pearson Correlation	.523**	.636**	.535**	.607**	1	.443**	.660**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	65	65	65	65	65	65	65
Customer relationship	Pearson Correlation	.618**	.510**	.600**	.662**	.443**	1	.778**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	65	65	65	65	65	65	65
Product quality	Pearson Correlation	.699**	.701**	.739**	.765**	.660**	.778**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	65	65	65	65	65	65	65

** . Correlation is significant at the 0.01 level (2-tailed).

Source: own survey, 2021

A coefficient of +1 indicates that the two variables are perfectly positively correlated, so as one variable increases, the other increases by a proportionate amount. Conversely, a coefficient of -1 indicates a perfect negative relationship: if one variable increases, the other decreases by a proportionate amount. Thorndike, Robert Ladd (1947)

A coefficient of zero indicates no linear relationship at all and so if one variable changes, the other stays the same. Because the correlation coefficient is a standardized measure of an observed effect, Cohen's (1998) guideline it is a commonly used measure of the size of an effect and that values of +0.1 represent a small effect, +0.3 is a medium effect and +0.5 is a large effect (Andy Field 2009).

To investigate if there was a statistically significant association between facility of the company and inventory of the company correlation was computed. Pearson moment product correlation was calculated, $r(65) = 0.66$, $p=0.000$. The direction of the association was positive, which means better facility will positively the inventory of the company. Using Cohen's (1998) guideline, the magnitude of association is strong. Same correlation was calculated between facility of the company and transportation system of the company $r(65) = 0.55$. This association is strong. Pearson Correlation was calculated between facility of the company and information sharing and its quality $r(65) = 0.74$. The magnitude of this association is strong. Same correlation was calculated between facility of the company and sourcing and partnership with the supplier of the company $r(65) = 0.52$. This association is strong. Another correlation was calculated between facility of the company and customer relationship $r(65) = 0.61$. This association is strong.

The correlation between facility of the company and product quality is $r(65) = 0.69$. This association is strong. Facility includes the companies Plant Size is sufficiency to fulfill the customer's requirement; productivity of labor to achieve customers demand; location the Production site; storage of the company that is convenient for delivery and capable machines for better packaging. From the correlation result facilities and product quality has strong association this shows better plant size; productive labor; convenient location of storage; capability of machines and productive manufacturing process helps to achieve better delivery; consistent production and good packaging.

Pearson Correlation was calculated between inventory of the company and transportation system of the company $r(65) = 0.46$. The magnitude of this association is medium. Whereas Pearson Correlation was calculated between inventory of the company information sharing and its quality in the company $r(65) = 0.56$. The magnitude of this association is strong. And Pearson Correlation was calculated between inventory of the company and sourcing and partnership with the supplier $r(65) = 0.63$. The magnitude of this association is strong. And Pearson Correlation was calculated between inventory of the company and customer relationship $r(65) = 0.51$. The magnitude of this association is strong.

Whereas Pearson Correlation was calculated between inventory of the company and product quality $r(65) = 0.70$. The magnitude of this association is strong. Inventory includes the company's cyclic inventory system and amount of product to achieve accurate number of product to fulfill customers need. Seasonal inventory also helps to achieve customers demand and by reducing set up time enables JIT replenishments while raising productivity, lowering inventory, slashing lead time, and improving quality by achieving availability of product. From the correlation result inventory and product quality has strong association this shows seasonal inventory; cyclic inventory and reduced set up time helps to achieve better delivery and consistent availability.

Pearson Correlation was calculated between transportation system of the company and information sharing and its quality in the company $r(65) = 0.59$. The magnitude of this association is strong. Same correlation was calculated between transportation system of the company and sourcing and partnership with the supplier of the company $r(65) = 0.53$. This association is strong. Another correlation was calculated between transportation system of the company and customer relationship $r(65) = 0.60$. This association is strong.

The correlation between transportation system of the company and product quality is $r(65) = 0.73$. This association is strong. Transportation of the includes the track's single run to include multiple supply or demand to achieve better delivery; safety of products and raw material to deliver consistent valid flavors of product and raw material; standard trucks to raw material transportation to protect the flavor and appearance of the product and implementation of on site quality inspection before and after transportation.

Pearson correlation was calculated between information sharing and its quality in the company and sourcing and partnership with the supplier of the company $r(65) = 0.60$. This

association is strong. Another correlation was calculated between information sharing and its quality in the company and customer relationship $r(65) = 0.66$. This association is strong. The correlation between information sharing and its quality in the company and product quality is $r(65) = 0.76$. This association is strong. Information sharing includes information sharing between the company and the supplier on demand and production information; information sharing on sales and marketing with supply chain management and availability of information sharing technologies in the company. Quality of information includes information's timing, accuracy, complicity, adequacy and reliability this helps to achieve better delivery and consistency.

Pearson correlation was calculated between sourcing and partnership with the supplier and customer relationship $r(65) = 0.44$. This association is medium. The correlation between sourcing and partnership with the supplier and product quality is $r(65) = 0.66$. This association is strong. Sourcing and partnership with the suppliers includes companies criterion on choosing supplier the criterion is quality this helps to achieve product's quality. Helping the suppliers to improve their product; including key suppliers in continuous improvement program and involving the key suppliers in developing new product this helps to deliver better quality regarding its appearance, Variety and affordability. Systematic supplier rating system; having long-term relationships with suppliers; trusting on a small number of high-quality suppliers; pushing suppliers for shorter lead-times and streamlining ordering, receiving, and other works from suppliers this helps to achieve better delivery, consistency and affordability.

The correlation between customer relationship and product quality is $r(65) = 0.77$. This association is strong. Customer relationship includes customers and their needs shapes the organization and its work; periodically evaluating the importance of relationship with customers; frequently interacting with customers to set reliability and responsiveness; frequently measuring and evaluating customer satisfaction; frequently determining future customer expectations and facilitating a way for customers to seek assistance from the company this helps to achieve product consistency, flavor, appearance, variety, packaging, affordability and delivery.

Technical correctness in the production of wine did allow some resolution of the objective/subjective dichotomy around the nature of quality. Grape quality, faultlessness, or fitness for purpose, are externally verifiable dimensions, giving a sense of objectivity, but beyond that quality becomes a matter of personal taste. (Steve Charters, 2003)

Quality of wine depends heavily on support of agricultural partners. For example, agricultural operations such as pruning, cropping, harvesting and tillage pest control are needed to prepare raw material for wine production. Throughout the back end of wine supply chain, sourcing and supplier partnership is needed for activities such as stemming, crushing, fermenting and storage. Without the coordination of agricultural partners, it becomes very difficult for wine producers to source proper supply for wine production.

During the production of wine, information sharing between supply chain partners is needed to handle complex processes such as stemming, crushing, fermenting and storage. In case of lack information sharing by the wine producing companies, back end partner of supply chain (farmers, vendors who transport raw materials, packaging solution provider and others) fail to understand the exact requirements related to production process. Such lack of understanding negatively hampers the performance of supply chain partners. As one of the wine supply chain managers stated “without information sharing through coordination, you cannot expect clear understanding among supply chain partners about different requirements of production process. Due to such ambiguity, supply chain members fail to add proper value to the end product”.

Wine bottles are distributed through both local and international distribution channels. In the case of lack of coordination between distribution partners (members at satellite procurement department, freight carrier, and transporter of packaged wine bottles from international procurement centers), it becomes problematic for parent company to track the movement of shipment throughout the distribution channels. Retailers and luxury hotels work as distribution partners. These partners need to have a proper knowledge as well engagement level to promote the unique benefits of wine offered by the parent company. As a result, marketing success of wine companies depend heavily on performance of distribution partners. For example, distributing retailers need to clarify the customer confusion regarding refrigeration or non-refrigeration of wine. In case of communication gap with parent company, distributing partner faces difficulty in promoting the offered wine products.

4.5 Regression Analysis

Regression analysis was used to express the relationship between the independent and dependent variables. The dependent variable was Product quality while the independent variables were facility of the company; inventory of the company; transportation system; information sharing and its quality; sourcing and partnership and customer relationship. The ability of independent variables to explain the changes in dependent variables was measured by adjusted R-square as shown by table 6

Table 13. Regression Analysis

Model Summary^b				
Mode				Std. Error of the
1	R	R Square	Adjusted R Square	Estimate
1	.912 ^a	.832	.815	.83052

Source: own survey, 2021

a. Predictors: (Constant), customer relationship, sourcing and partnership with the supplier, transportation system of the company, inventory of the company, facility of the company, information sharing and its quality in the company.

b. Dependent Variable: product quality

From table 6 it is clear to see that the independent variables explained 81.1% of variations in the dependent variable as shown by the adjusted R-square (0.815). Therefore 19% of the variations in the dependent variable were due to other factors not considered by the model.

Table 14. ANOVA

		ANOVA^a				
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	198.240	6	33.040	47.900	.000 ^b
	Residual	40.007	58	.690		
	Total	238.246	64			

source: own survey, 2021

a. Dependent Variable: product quality

b. Predictors: (Constant), customer relationship, sourcing and partnership with the supplier, transportation system, inventory of the company, facility of the company, information sharing and its quality

The significance of the model was further established by carrying out ANOVA test as shown by table 4.9. Table 4.9, shows that the variables of regression are statistically significantly different, they therefore measure different attributes. The p-value=0.000 is less than 0.05 therefore we confirm the significance of the model under 95% confidence level.

The Anova shows that the (R=(33.04) F= (47.90). associated between the variables that indicated the effect of the independent variables and the dependent variables; which means percentage of the effect of the independent variables the dependent variables

4.5.1 Regression coefficients of SCMP

Table 15. Regression Coefficient

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
Model		B	Std. Error	Beta		
1	(Constant)	-.235	1.592		-.148	.883
	Facility	-.015	.072	-.019	-.211	.834
	Inventory	.174	.058	.242	2.972	.004
	Transportation	.250	.070	.264	3.551	.001
	Information sharing and its quality	.202	.091	.209	2.224	.030
	Sourcing and supplier partnership	.099	.074	.105	1.342	.185
	Customer relationship	.310	.075	.323	4.111	.000

a. Dependent Variable: product quality

Source: own survey, 2021

From table, the constant of the model was $-.235$, the highest statistically significant coefficient was 0.31 which customer relationship ($P\text{-value} = 0.000$). This was followed by transportation, information sharing and its quality, inventory, sourcing and supplier partnership and facility with coefficient of 0.25 ($p\text{-value} = 0.01$), 0.20 (0.30), 0.17 (0.004), 0.099 (0.18) and facility -0.15 (0.88) respectively.

The coefficient for Facility variable was -0.15 , however not statistically significant with the coefficient for supplier $p\text{-value} = 0.88$. We can conclude that from the sample results the SCMP constructs that has significant and positive influence on product quality were Customer relationship, transportation, information sharing and its quality, inventory and sourcing and supplier partnership. However, facility has negative influence but it's insignificant on product quality.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The main purpose of the study was to examine the effect of Supply chain management Practices on product quality in Awash Wine SC Awash Wine SC's Supply Chain was evaluated through six SCMP dimensions including Facilities, Inventory, Transportation, Information sharing and its quality, Sourcing and Supplier Partnership, Customer Relationship. Based on the results of the study the summary of major findings are as follows.

5.1 Summary of Major Findings

5.1.1 Summary of descriptive statistics of finding

As described on the literature review facilities are the actual physical locations in the supply chain network where product is stored, assembled, or fabricated. The questionnaires were focused on plant size, labor, production site, storage and machineries of the company. The respondent's response is neutral. Inventory is all raw materials, work in process, and finished goods within a supply chain. The questionnaires asked regarding inventory included safety of products, availability of products stock of the company and step up time. The response of the respondent on inventory of the company is good. Transportation Entails moving inventory from point to point in the supply chain. Transportation can take the form of many combinations of modes and routes, each with its own performance characteristics. The survey questionnaire regarding transportation included transportation decision, transportation mode and accuracy. The overall response of the respondents regarding transportation is good. Information sharing is a key component for any successful SCM system as they discussed the need to implement a good structure of information sharing. It has been identified as being critical to effective innovation and development of supply chain management at an industry and enterprise level. The survey questionnaire included information's accuracy, timing, adequacy and reliability. The descriptive analysis of information sharing and its quality in the company shows good. Sourcing is the choice of who will perform a particular supply chain activity, such as production, storage, transportation, or the management of information. Supplier Relationship Management is one of the practices to achieve better quality products in more efficient way. This relationship is to promote continuous improvement of quality, productivity, and competitiveness. The respondent's response on this regard shows poor perception. Customer relationship can be defined as an

interactive process achieving the optimum balance between corporate investments and the satisfaction of customer needs to generate the maximum profit. The overall response shows that the company has good relationship with the customers. Product quality is the ability of a product to meet or exceed customer's expectations. The research focused on Garvin's product quality dimensions such as consistency, flavor, appearance, packaging, variety, affordability and delivery. The survey shows the product quality of Awash wine Sc. is similar with others.

5.1.2 Summary of correlation

As the correlation data views facility and inventory, transportation, information sharing and its quality; sourcing and partnership with suppliers and customer relationship are associated positively and the magnitude of this association is strong. The correlation between facility of the company and product quality is $r(65) = 0.69$. This association is strong. Facility includes the companies Plant Size is sufficiency to fulfill the customer's requirement; productivity of labor to achieve customers demand; location the Production site; storage of the company that is convenient for delivery and capable machines for better packaging. From the correlation result facilities and product quality has strong association this shows better plant size; productive labor; convenient location of storage; capability of machines and productive manufacturing process helps to achieve better delivery; consistent production and good packaging.

From correlation's analysis inventory and transportation associated positively and the magnitude of the association is medium. Inventory and information sharing and its quality; sourcing and partnership with the supplier and customer relationship associated positively strong. Inventory of the company and product quality $r(65) = 0.70$. The magnitude of this association is strong. Inventory includes the company's cyclic inventory system and amount of product to achieve accurate number of product to fulfill customers need. Seasonal inventory also helps to achieve customers demand and by reducing set up time enables JIT replenishments while raising productivity, lowering inventory, slashing lead time, and improving quality by achieving availability of product. From the correlation result inventory and product quality has strong association this shows seasonal inventory; cyclic inventory and reduced set up time helps to achieve better delivery and consistent availability.

The correlation data between transportation and information sharing and its quality; sourcing and partnership with the supplier and customer relationship is associated positively strong. The correlation between transportation system of the company and product quality is $r(65) = 0.73$. This association is strong. Transportation of the includes the track's single run to include multiple supply or demand to achieve better delivery; safety of products and raw material to deliver consistent valid flavors of product and raw material; standard trucks to raw material transportation to protect the flavor and appearance of the product and implementation of onsite quality inspection before and after transportation.

Correlation analysis between information sharing and its quality and sourcing and partnership with the supplier and customer relationship positive and association is strong. The correlation between information sharing and its quality in the company and product quality is $r(65) = 0.76$. This association is strong. Information sharing includes information sharing between the company and the supplier on demand and production information; information sharing on sales and marketing with supply chain management and availability of information sharing technologies in the company. Quality of information includes information's timing, accuracy, complicity, adequacy and reliability this helps to achieve better delivery and consistency.

Pearson correlation was calculated between sourcing and partnership with the supplier and customer relationship $r(65) = 0.44$. This association is medium. The correlation between sourcing and partnership with the supplier and product quality is $r(65) = 0.66$. This association is strong. Sourcing and partnership with the suppliers includes companies criterion on choosing supplier the criterion is quality this helps to achieve product's quality. Helping the suppliers to improve their product; including key suppliers in continuous improvement program and involving the key suppliers in developing new product this helps to deliver better quality regarding its appearance, Variety and affordability. Systematic supplier rating system; having long-term relationships with suppliers; trusting on a small number of high-quality suppliers; pushing suppliers for shorter lead-times and streamlining ordering, receiving, and other works from suppliers this helps to achieve better delivery, consistency and affordability.

The correlation between customer relationship and product quality is $r(65) = 0.77$. This association is strong. Customer relationship includes customers and their needs shapes the organization and its work; periodically evaluating the importance of relationship with customers; frequently interacting with customers to set reliability and responsiveness; frequently measuring and evaluating customer satisfaction; frequently determining future customer expectations and facilitating a way for customers to seek assistance from the company this helps to achieve product consistency, flavor, appearance, variety, packaging, affordability and delivery.

5.1.3 Regression summary

Simple regression was conducted to express the relationship between the independent and dependent variables. The dependent variable was Product quality while the independent variables were facility of the company; inventory of the company; transportation system; information sharing and its quality; sourcing and partnership and customer relationship. The result shows the independent variables explained 81.1% of variations in the dependent variable as shown by the adjusted R-square (0.815). Therefore 19% of the variations in the dependent variable were due to other factors not considered by the model. The significance of the model was further established by carrying out ANOVA the test as shows that the variables of regression are statistically significantly different, they therefore measure different attributes. The p-value=0.000 is less than 0.05 therefore we confirm the significance of the model under 95% confidence level.

From Regression Coefficients of SCMP the sample results the SCMP constructs that has significant and positive influence on product quality were Customer relationship, transportation, information sharing and its quality, inventory and sourcing and supplier partnership. However, facility has negative influence but it's insignificant on product quality.

5.2 Conclusion

The research was based on supply chain management practices and product quality in awash wine sc. The researcher considered supply chain management practices as independent variable and product quality as dependent variable. In this research supply chain management has six constraints this are facilities, inventory, transportation, information sharing and its quality, sourcing and supplier partnership and customer relation. On this research product

quality has seven dimensions consistency, appearance, flavor, variety, packaging affordability and delivery.

The research focused on studying the effect of SCMP on product quality and the link between the two variable from the research result the researcher concluded:-

- ❖ From the percentage of the descriptive analysis the company's Facilities, Inventory, Transportation, Information sharing and its quality, Customer relationship and product quality are good; Sourcing and Supplier Partnership is poor and Product quality is similar with others.
- ❖ Facility of the company and product quality has significant relationship and strong positive association. Facility includes the companies Plant Size, productive labor, location the Production site and storage of the company, machines and manufacturing process this fulfills the customer's requirement; customers demand.
- ❖ Inventory of the company and product quality has significant relationship and the magnitude of this association is positive and strong. Inventory includes the company's cyclic inventory system and amount of product in the stock, Seasonal inventory to achieve accurate number of product to fulfill customers need and to achieve customers demand and by reducing set up time enables JIT replenishments while raising productivity, lowering inventory, slashing lead time, and improving quality by achieving availability of product.
- ❖ Transportation of the company and product quality has significant relationship and positive strong association. Transportation of the company including the track's single run to include multiple supply or demand; standard trucks to raw material transportation; implementation of onsite quality inspection before and after transportation this achieves better delivery; safety of products and raw material to deliver consistent valid flavors of product and raw material; to protect the flavor and appearance of the product.
- ❖ Information sharing and its quality in the company and product quality has significant relationship and strong association. Information sharing and its quality includes information sharing between the company and the supplier on demand and production information; information sharing on sales and marketing with supply chain management and availability of information sharing technologies in the company

- ❖ Sourcing and partnership with the supplier and product quality has significant relationship and positive strong association. Sourcing and partnership with the suppliers has different constraints this includes company's criterion on choosing supplier if the criterion is quality; Helping the suppliers to improve their product; including key suppliers in continuous improvement program and involving the key suppliers in developing new product; having long-term relationships with suppliers; trusting on a small number of high-quality suppliers; pushing suppliers for shorter lead-times and streamlining ordering, receiving, and other works from suppliers this achieves product's quality regarding its appearance, Variety and affordability. Systematic supplier rating system; this helps to achieve better delivery, consistency and affordability.
- ❖ Customer relationship and product quality has strong relationship and positive strong association. Customer relationship includes customers and their needs shapes the organization and its work; periodically evaluating the importance of relationship with customers; frequently interacting with customers to set reliability and responsiveness; frequently measuring and evaluating customer satisfaction; frequently determining future customer expectations and facilitating a way for customers' to seek assistance from the company this helps to achieve product consistency, flavor, appearance, variety, packaging, affordability and delivery.
- ❖ From the study Regression Coefficients of SCMP the sample results the SCMP constructs that has significant and positive influence on product quality were Customer relationship, transportation, information sharing and its quality, inventory and sourcing and supplier partnership. However, facility has negative influence but it's insignificant on product quality.

The research showed the company has implemented QMS and worked on its products to meet national compulsory standards. The goal of the company is to achieve safe and quality product at affordable price. The customers of the company expects regarding supply chain and product quality is awareness on product and storage practice; timely response on defective products; clean material delivery (filled bottles and crats); The company's response to customer's requirement is to deliver safe and quality products with proper labeling with affordable price and timely delivery of products (product availability). The overall aim is to exceed customers' needs and expectation.

This research shows different supply chain risks and different measures were taken some this risks are: distribution risks are Poor standard of destination warehouses; residence time; poor layout of distribution offices; inefficient invoicing process; Manual handling of all distribution activities. The intended solutions are provide storage standards and continuous follow up on agents, stockiest storage practices; give storage consultation and create awareness on wine storage to outlets during visit; Provide standard storage materials to big volume outlets. The other risk is Supplier risk the main supplier risk is raw materials unavailability at market. The intended solutions are diversifying the business through investing on some important locally produced raw materials; building standard stores or renting satellite stores for stock and searching for new suppliers for scares raw materials.

5.3 Recommendation

Sourcing and Suppler partnership is a key way for companies to influence the sustainability of their product's quality. Where the company chooses to incorporate management of supplier into the purchasing function they face a complex set of issues. This research has revealed that efforts to improve or influence suppliers the company must involve the suppliers in continuous improvement programs. The researcher's recommendation is development of a model for approaching issues of supplier through lean supply. The lean supply relationship is characterized by open communication and a standardization of all things including the status of a supplier's relationship with company. Suppliers are made aware of their relationship status at all times and given the opportunity to improve.

From the study, it was established that Customer Relationship had been moderately exploited. Another important issue that is suggested to the case company's marketing department is improving the relationship with customers through a continuous information sharing, follow-up them and get feedback, monitoring customers' perceptions towards the product of the company, improving its compliant management through conducting market research for better responsiveness and to fulfill customers requirement.

Key best practice of good facilities management is having a streamlined workflow that can be modified as needed. An automated and streamlined workflow will help to increase visibility, maintain consistency, and improve facility efficiency. To make the facility efficient and responsive automating the management of operation by streamlining the company's facility and maintenance operations is through electronic work orders that can be submitted through software or other avenues. modernize the loading/unloading system using

standard loading/unloading machineries like Forklift and modernize the loading and unloading process using simple manual machineries Eliminating paper work orders enhances visibility when it comes to all facility and maintenance activities, helping to improve team productivity and efficiency.

From the study, it was established inventory had been exploited moderately to boost product quality. The case company can use lean management to lower their costs, and improve customer satisfaction. The success on any lean inventory management depends on how a company best implements the principles to achieve its needs. The greatest benefit of the principles comes in identify its key attributes and applying them across functional boundaries. Building and maintaining lean inventory it involves Demand management, cost and waste reduction and cultural change. The term 'lean' refers to a systematic approach to enhance value in an organization's inventory by eliminating excessive waste of materials, and performing tasks with minimum effort and time through continuous improvement. Lean production is carried out from the perspective of the client, or customer who will be purchasing the product or service. The Lean inventory management practice has been inspired by the Toyota Production System (TPS) synonymous with Just-In-Time inventory system and designed to improve overall customer value.

In integrating supply chain management and achieving product quality transportation has a role. Transportation is one of the key components in the entire product flow, and it is more of a glue that sticks every part of the operations together. Therefore, a robust logistics strategy can contribute to increased efficiency and ensure your supply chain survives a long run. From this research the researcher recommends the case company must use standard truck to transport raw material as well as finished goods

From the study, it was established that Information Sharing and its quality had been exploited moderately to boost product quality. The study therefore, recommended that the case company should improve and invest on IT facilities to enhance information sharing both internally and externally. This can be done through hiring IT specialists or outsourcing. More importantly, the case company is suggested to improve its relationship with suppliers from simply buy-sale relationship to a modern supply chain relationship through establishing strategic or long term relationship, contract, and continuous information sharing in order to minimize supply uncertainty which resulted in demand and supply unmatched and dissatisfaction of customers of the case company. Because, this could help the case company

to obtain the inputs at the right time and quantity from these suppliers and provide the required quantity by the customers when they need it. So that, this will minimize the dissatisfaction of customers due to shortage product.

Regarding Quality of Information Sharing the study recommended that the case company should improve information flow by leveraging information collected through Enterprise Resource Planning (ERP) and other transactional systems for optimized planning and improved information visibility. This is so because good supply chain involves management of the flow of goods and any related information as well. The study also recommended that the case company should employ IT in their operations for improved performance because information sharing improves visibility of supply chain by enabling effective decision making if the information is relevant, accurate, timely and reliable (Simutupang and Sridharan, 2005)

Generally, to be competitive enough, it is better for the case company to give due attention on SCM practices for more improvement of their product quality. In order to achieve advancement in achieving customer requirement and exceeding their expectation it is better for the organization to give due emphasis on SCM practices.

5.4 Areas for Further Study

This study directly focuses on Supply chain management practices and its effect on product quality Awash Wine S.C. This research can be further explored by adding more Supply chain management practice dimensions like BPR, Distribution Planning, and others which could influence product quality. The study also formed a basis for further research in determining the extent to which supply chain management could improve product design. This research also can be expand in relating SCMP for quality management standards. The findings also formed a basis in carrying out a study on the effects of supply chain management practices on employee satisfaction in wine industries or other sectors engaged in production of goods.

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APPENDIX A
St. Marry University
School of Graduate Studies Institution of Quality and
Productivity Management

Effect of supply chain management on product quality in beverage industries
the case of Awash wine SC

Questionnaire for employees

Dear Participants;

This questionnaire is developed for an academic effort planned for the collection of data to conduct a thesis paper on the title ‘**Effect of Supply Chain management on product quality in beverage industry the case of Awash Wine S.C. Ethiopia**’. in order to fulfill the University’s (St. Mary university) requirement set for awarding of a Master’s Degree in Quality and Productivity Management.

The study is purely for academic purpose and thus not affects you in any case. All responses will be kept confidential and will not traceable to individual respondent. So, your genuine, frank and timely response is vital for successfulness of the study. Therefore, I kindly request you to respond to each items of the question very carefully.

Thank you Very much!!

General instruction

- there is no need of writing your name
- Where answer options are available please tick () in the appropriate box for part

Part one. General Information

1. Educational Qualification

Grade 10 completed Grade 12 completed Certificate

College diploma First Degree Second Degree and above

2. Job Title

CEO/President Vice President/deputy manager

Director/manager Team leader Expert

Other _____

3. Length of Service in the organization

Under 1 year 1–5 years

6–10 years over 10 years

4. Your department/work unit _____

APPENDIX B

Part two: Supply Chain Management Practices of Awash Wine S.C

The following questions are about how your organization has been practicing supply chain management. Please circle the appropriate number to indicate the extent to which you agree or disagree with each the following statement based

on your experience working in this organization. The item scales are five-point Likert type scales with

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

1= strongly disagree 2= disagree 3= neutral 4= agree 5= strongly agree							
If you have additional ideas I suggest you use the remark space							
1	Facility of the company	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
1.1	Our companies Plant Size is sufficient to fulfill the demand	1	2	3	4	5	
1.2	Our company has productive Labor	1	2	3	4	5	
1.3	Location the Production site of the company is convenient for transportation	1	2	3	4	5	
1.4	The company consider the storages located near the customers	1	2	3	4	5	
1.5	The company's warehouse located near the production site	1	2	3	4	5	
1.6	The companies machineries' are capable of producing the required amount of product	1	2	3	4	5	

1.7	Manufacturing process of the company is productive	1	2	3	4	5	
1.8	Time has been reduced for inspection of the incoming Materials/components /Products	1	2	3	4	5	
2	Inventory of the company	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
2.1	The company use cyclic inventory system	1	2	3	4	5	
2.2	The company has Safe product in the inventory in case demand exceeds expectation	1	2	3	4	5	
2.3	The company uses seasonal inventory in periods of high and low demand	1	2	3	4	5	
2.4	The company has enough products in the stock.	1	2	3	4	5	

2.5	Our company buys products in smaller batches only when they are needed at the place where they are needed and exactly in the quantity required (Just in Time) 31Pull“ production system						
2.6	Our company policy looking for reducing set-up time	1	2	3	4	5	
3	Transportation system of the company	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
3.1	In transportation multiple supply or demand points will be included in a single run	1	2	3	4	5	
3.2	The company uses the fastest mode of transportation	1	2	3	4	5	
3.3	The transportation decision logic of the	1	2	3	4	5	

	company is to satisfy customer requirement						
3.4	Products and raw material are transported safely	1	2	3	4	5	
3.5	The company uses standard trucks to raw material transportation.	1	2	3	4	5	
3.6	The company has implemented on site quality inspection before and after transportation.	1	2	3	4	5	
4	Information sharing and its quality in the company	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
4.1	The company share demand and production information with the supplier	1	2	3	4	5	
4.2	In the company sales and marketing shares demand information with supply chain management	1	2	3	4	5	
4.3	Supply chain management information sharing of	1	2	3	4	5	

	the company is assisted by technology						
4.4	Information exchange between our trading partners and us is timely	1	2	3	4	5	
4.5	Information exchange between our trading partners and us is accurate	1	2	3	4	5	
4.6	Information exchange between our trading partners and us is complete	1	2	3	4	5	
4.7	Information exchange between our trading partners and us is adequate	1	2	3	4	5	
4.8	Information exchange between our trading partners and us is reliable	1	2	3	4	5	
5	Sourcing and Partnership with the supplier	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
5.1	In choosing supplier company's criterion is quality	1	2	3	4	5	

5.2	The company helps the suppliers to improve their product	1	2	3	4	5	
5.3	The company's continuous improvement program includes the key suppliers	1	2	3	4	5	
5.4	The company involves the key suppliers in developing new product	1	2	3	4	5	
5.5	The company has a systematic supplier rating system	1	2	3	4	5	
5.6	The company believes in long-term relationships with suppliers and takes effort for the same	1	2	3	4	5	
5.7	The company trusts on a small number of high-quality suppliers	1	2	3	4	5	
5.8	Our company pushes suppliers for shorter lead-times	1	2	3	4	5	
5.9	Our company streamlines	1	2	3	4	5	

	ordering, receiving, and other works from suppliers						
6	Customer relationship	Strongly disagree	disagree	neutral	agree	Strongly agree	Remark
6.1	The customers and their needs shape our organization and its work	1	2	3	4	5	
6.2	The company periodically evaluate the importance of our relationship with our customers	1	2	3	4	5	
6.3	The company frequently interacts with customers to set reliability and responsiveness.	1	2	3	4	5	
6.4	The company frequently measure and evaluate customer satisfaction	1	2	3	4	5	
6.5	The company frequently determine future customer expectations	1	2	3	4	5	

6.6	The company facilitate a way for customers' to seek assistance from us	1	2	3	4	5	
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Part three Product quality

Please circle the appropriate number to indicate the extent to which you agree or disagree with each the following statement based on your experience working in this organization. The item scales are five-point Likert type scales with

1= significantly poor 2= poor 3= similar with other 4= better 5= significantly better

1	Product quality	Significantly poor	poor	Similar with other	better	Significantly better	Remark
1.1	Consistency	1	2	3	4	5	
1.2	Flavor	1	2	3	4	5	
1.3	Appearance	1	2	3	4	5	
1.4	Varity	1	2	3	4	5	
1.5	Packaging	1	2	3	4	5	
1.6	Affordability	1	2	3	4	5	
1.7	Delivery	1	2	3	4	5	

APPENDIX C

Part four Interview questionnaire for procurement, quality and commercial departments

1. Does the company have product quality improvement activities?

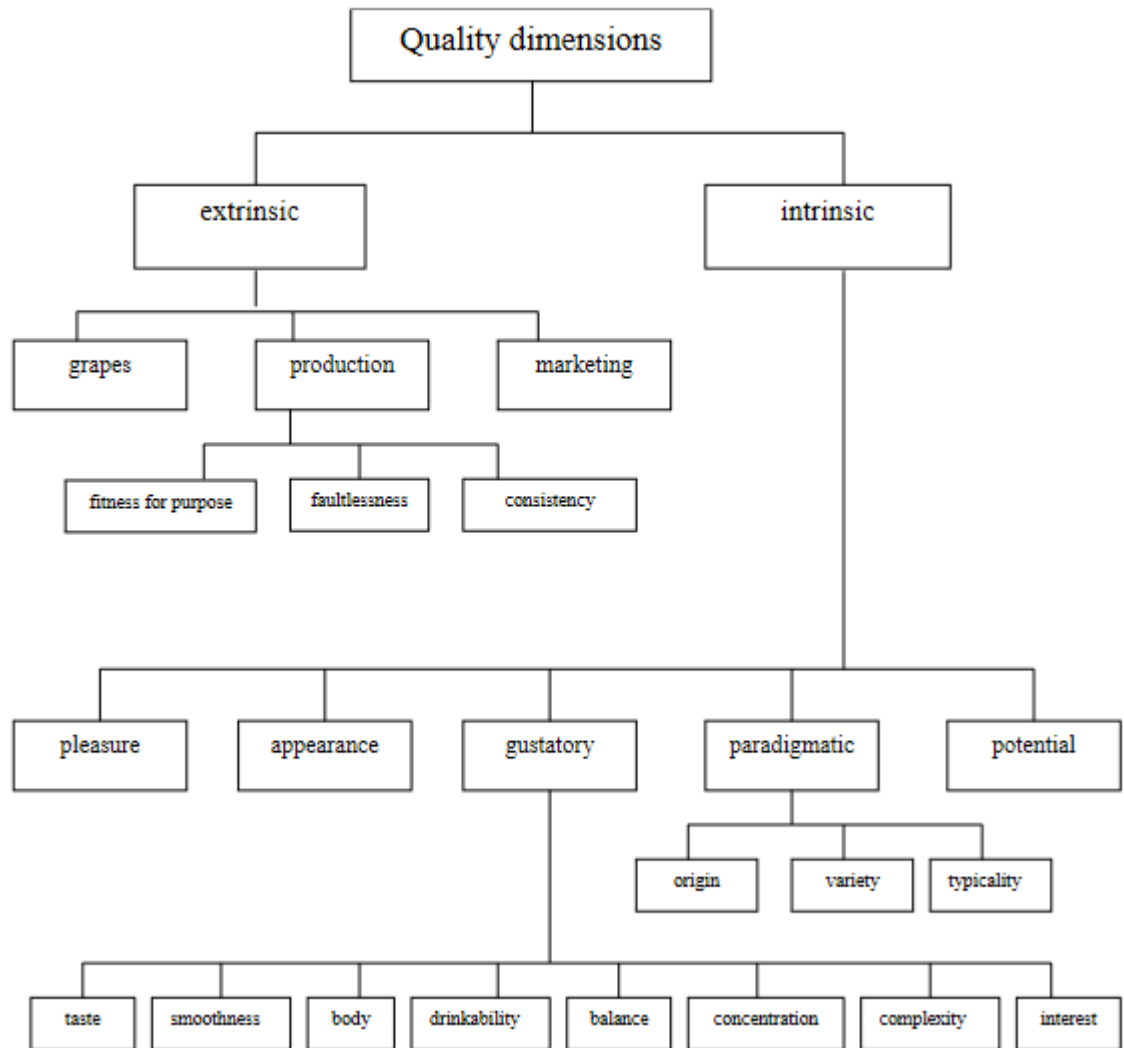
2. What is the customer's expectation and how your company is responding to their need?
3. What is the suppliers' expectation and how your company is responding to their need?
4. What are supply chain risks in the company?

APPENDIX D

Part five: Interview guiding question for supply chain management practices and product quality

1. What was the improvement activity? How does it affect the company's product quality?
2. How was the process of implementation and how did you evaluate the quality improvement progress?
3. How was the top management commitment towards customer requirement?
4. What is the customer's response on your product and service quality?
5. How do you see the contribution of effective supply chain on product quality?
6. How do you measure the level of coordination between different supply chain management practices?
7. How do you measure the nature of your relationship with your supplier?
8. What is the feedback of your supplier for the responses that your company delivered?
9. How your company do solved the supply chain risks?

APPENDIX E



Source: Steve Charters, MA (Oxon) 2003, perception of wine quality School of Marketing