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**DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT
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***THE EFFECT OF INTEGRATED SUPPLY CHAIN QUALITY MANAGEMENT ON
OPERATIONAL PERFORMANCE IN THE CASE OF BGI ETHIOPIA PLC***

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DECLARATION

I hereby declare that this thesis entitled “The effect of integrated supply chain quality management on operational performance in the case of BGI Ethiopia plc.” is composed by myself, with the guidance of my advisor MATIWOS ENSERMU (Ph.D.), that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted, in whole or in part, for any other degree or professional qualification.

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Abstract

The study has been conducted with the aim of investigating the effect of Integrated supply chain quality management on operational performance. Supply chain quality management indicators utilized in the study were customer focus, quality leadership, supplier focus, employee involvement, quality process control and IT enable organization. The study employed an explanatory research design and both quantitative and qualitative research approaches were utilized. Primary sources; questionnaires and interview were used as a survey instrument. structured questionnaires were distributed to 41 employees of BGI Ethiopia plc working under the supply chain department, those employees were selected using purposive sampling techniques. The interview was conducted with the supply chain director. The data was analyzed using SPSS version 26. Pearson's correlation matrix was used to show the relationship between the dependent and the independent variables. The researcher also used multiple regression tools to analyze the effect of the independent variables on operational performance. As the multiple regression results show all supply chain quality management indicators; customer focus, quality leadership, supplier focus, employee involvement, quality process control, and IT-enable organization have a significant and positive effect on operational performance.

Key Words: Supply chain quality management, customer focus, quality leadership, supplier focus, employee involvement, quality process control, IT enable organization and operational performance

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List of Abbreviation and Acronyms

SCQM: Supply Chain Quality Management

TQM: Total Quality Management

GST: General System Theory

HR: Human Resource

QCC: Quality Control Circle

CFA: Carrying and Forwarding Agent

CHAPTER ONE

1. Introduction

1.1. Background of the study

Acquiring clients' trust and confidence while understanding their changing tastes are some of the major challenges organizations confront today. Using subpar materials is not an option. Delivering high-quality goods does not, however, guarantee competitiveness in the market, mostly because customers have extra expectations. They require that the products be delivered at the right time and place, which necessitates sustainable actions built on effective automated logistics systems for production, distribution, and inventory management. Marian & Soare, (2020)

Businesses that put a high priority on supply chain and quality goals get a competitive advantage, claim Flynn and Flynn (2005). Raising the quality of all supply chain activities results in cost savings, greater resource utilization, and increased process effectiveness. Organizing, carrying out, and controlling the effective movement and storage of raw materials, finished goods, and semi-finished goods, as well as related data, between the point of origin and the point of consumption in order to meet customer demands, is what the Council of Supply Chain Management Professionals defines as logistics. As a result, it's critical to satisfy consumer wants at the exact moment and in the exact quantity required, with the right goods and benefits that are suited for their needs. Sampaio, Carvalho, and Fernandos (2014)

The supply chain serves as an "umbrella" under which goods are created and distributed to clients, according to Robinson and Kalatoka (2000). In other words, all organizations contained in the contract are introduced to the idea of helping an organization by the supply chain organization. TQM has been mentioned by numerous researchers as a method for enhancing the usefulness, adaptability, and competitiveness of business in order to better serve customers' needs Oakland (1993), as a source of workable competitive advantage for trade organizations Terziovski, (2006), as a method for adopting a right-first-time mentality, for securing fruitful business assertions, for luring clients and providers, etc Mohanty and Behera, (1996). Utilizing TQM and SCM synergies will be essential if you want to improve customer satisfaction, boost staff inspiration, and improve organizational performance. Fernandos, Sampaio, and Carvalho (2014)

According to Cultivate (2008), SCQM is a system-based approach to advancing execution

leveraging openings presented by downstream and upstream with providers and customers. The author also touched on the following seven subjects: (1) Client-Centeredness; (2) quality enhancements; (3) provider contacts; (4) authority; (5) human resource management; (6) trade; and (7) security.

Since historically the focus of the supply chain was on specific aspects like purchasing, manufacturing, and shipping in order to strengthen coordination operations, it is safe to say that the integration between SCM and QM could be a common method. However, due to the competitive environment, it is necessary to advance the execution by controlling action, increasing proficiency and high benefit levels, quick reaction, Lin et al., (2005). Hence, this study is centered on the evaluation of the effect of integrated supply chain quality administration on operational performance within the case of BGI Ethiopia PLC.

1.2. Statement of the problem

As a result of the growing importance placed on quality in business, it is crucial to develop sustainable resource management. As a result, logistics is emerging as a function that offers both short- and long-term competitive advantage Sampaio, Carvalho, and Fernandos (2014). Supply chain management is a key area of concentration in the current climate of a fiercely competitive global market. In this market, only the company or organization with a high-quality supply chain will succeed Agarwal and Garg (2012).

In order for businesses to better comprehend quality practices all through the supply chain and the relationship between these practices and a system's overall performance, a number of authors offer specific areas for further research. These topics could be very beneficial for businesses. Zhang and Cao (2011). According to Robinson and Malhotra (2005), for example, to enable quality initiatives to interact and sync across the whole network of enterprises in the supply chain, classical quality management initiatives should indeed be turned into a supply chain viewpoint.. Terziovski and Hermel (2011), who presented an exploratory study on the impact of quality management practices on the performance of integrated supply chains, reached a similar conclusion.

Terziovsky and Hermel suggested in their study that future research should focus on why quality practices are reliable indicators of a coordinated supply chain, and that future models of coordinated quality and supply chain management should actively look at the aforementioned research questions using different approaches like overview and case study

approaches. The presentation of the quality administration concept was inspired by the integration of the two concepts of quality administration and supply chain administration that were put out by many scholars. The possibility of negotiating with upcoming supply chain difficulties is provided by supply chain quality management (SCQM). Cultivate (2008)

Concepts of supply chain management have received a lot of attention recently. But the connection between supply chain management and quality management is sometimes thin and indirect Robinson and Malhotra (2005). Numerous studies have shown that further study is needed in the fields of quality management and supply chain management integration.

As many of the researchers indicated there is a research gap concerning the integration of quality management and supply chain management worldwide. This makes it rarer at our country's level. Moreover, as per the researcher's knowledge, there is no recent study on the area and also based on the model to be utilized. This study, therefore, assesses the effect of integrated supply chain quality management on operational performance in the case of BGI Ethiopia PLC so as to contribute to filling the research gap that existed.

1.3. Research Questions

1.3.1. Main research question

To what extent does integrated Supply chain quality management affects operational performance?

1.3.2. Sub research questions

In this study the researcher address the following research questions.

- To what extent does customer focus affect operational performance?
- To what extent does quality Leadership affect operational performance?
- To what extent does suppliers Focus affects operational performance?
- To what extent does Employee involvement affect operational performance?
- To what extent does Quality process control affect operational performance?
- To what extent does IT-Enable Organization affect operational performance?

1.4. Objectives of the study

1.4.1. General objective of the study

The general objective of the study is to assess the effect of Integrated Supply chain quality management on operational performance in the case of BGI Ethiopia PLC.

1.4.2. Specific objectives of the study

- To analyze the effect of Customers Focus on operational performance
- To examine the effect of Quality Leadership on operational performance
- To examine the effect of Suppliers Focus on operational performance
- To analyze the effect of Employee involvement on operational performance
- To analyze the effect of Quality process control on operational performance
- To analyze the effect of IT-Enable Organization on operational performance

1.5. Research hypothesis

- **H1:** Customers Focus has a significant and positive effect on operational Performance
- **H2:** Quality Leadership has a significant and positive effect on operational Performance
- **H3:** Suppliers Focus has a significant and positive effect on operational Performance
- **H4:** Employee involvement has a significant and positive effect on operational Performance
- **H5:** Quality process control has a significant and positive effect on operational Performance
- **H6:** IT-Enable Organization has a significant and positive effect on operational Performance

1.6. Significance of the study

The study's findings will be beneficial for managers of the company to make decisions. Since, the company is recently pursuing a project regarding the integration of supply chain and quality management, this paper will have a great contribution. In addition, the study will provide information for policy developers in the area of integrated supply chain quality management effects on organizational performance. Furthermore, it will be used as a reference for future researchers.

1.7. Scope of the study

This study is delimited to;

Geographically this study is limited to BGI Ethiopia PLC head office in Addis Ababa and methodologically this study used cross sectional data collection and the data was collected from Employees and managers. Conceptually the study focused on the effect of integrated supply chain quality management variables (Customer focus, Quality Leadership, Suppliers Focus, Employee involvement, Quality process control and IT-Enable Organization) on operational performance. Finally, since it is a case study in one company, the result of the study may not be generalized for all brewery companies.

1.8. Organization of the paper

This paper is organized into five chapters. The first chapter presents the introduction part which contains background of the study, statement of the problem, research questions,

objectives of the study, hypothesis of the study, significance of the study, scope of the study, the second chapter insights literature review which is about a conceptual, theoretical and empirical aspect of the study. The third chapter contains research methodology which includes research design and approach, sample design, population, sampling instrument and data collection techniques, methods of data analysis and interpretation of different tests and ethical consideration. In chapter four, correlation and regression analysis are included. Finally, chapter five contains summary of the study, conclusion and recommendation

CHAPTER TWO

2. Literature Review

2.1. Introduction

This chapter contains concepts about total quality management, supply chain management organizational performance, theoretical and empirical review on the integrated variables of supplychain quality management and conceptual framework

2.2. Theoretical Framework

2.2.1. Quality and total quality management

According to Joseph Juran's definition of quality, "Quality is the fitness of use," the supplier, manufacturer, and customer's perceptions of the products and services define their worth. It is also taken into consideration to what extent products and services satisfy requirements, specifications, and standards while keeping within a fair price range. "Quality system" refers to an established, plant- and company-wide operating work structure that is documented in effective, integrated, technical, and managerial procedures for coordinating the actions of people, machines, or company information in the best and most useful ways to assume customer quality satisfaction and reasonable costs of quality. Garg and Agarwal (2012).

Quality is the fundamental factor that keeps firms afloat in a competitive market. This is a fundamental principle of organizations' quality policies, especially those in the industrial sector. As a result, quality significantly contributes to an organization's ability to succeed, helping businesses thrive despite fiercer market competition. Raising quality is one of the pillars that supports businesses' capacity to achieve a competitive edge in the market. Quality is the source of distinction from a strategic perspective. Marian & Soare (2020)

2.2.2. Supply chain management

SCM originally stood for supply chain warehouse management. Later, the management of all supply chain functions was included in the scope of this idea. Supply chain management, as defined by Chopra and Meindl (2001), entails controlling the flow between supply chain phases in order to maximize total profitability. According to this definition, SCM includes managing the goods, data, and financial flows upstream and downstream of the supply chain. The SCM also involves choices on the location of the manufacturing facility, the goods to be produced, the production processes, and eventually, the distribution of those goods. Sila et al. (2006)

Reviews of Its Key Manufacturing and SCM Practices Collaboration with suppliers and customers has been crucial in recent years as the supply chain's participants have worked together to forge a competitive edge. Kushwaha and Barman (2010). SCM is becoming more widely acknowledged as a crucial source of competitive advantage Carter (2011). The fields of procurement and supply management, as well as logistics and transportation management, contributed to the development of the SCM concept. Li et al. (2006). All activities along the entire supply chain were integrated as a result of the integration of these distinct viewpoints into the integrated concept of SCM Li et al. (2006).

The terms including supply chain management, on-time production, total quality management, six Sigma, material planning, as well as supply chain quality management are the concepts extracted from supply chain networks in order to create an effective supply chain (Chue, 2006; Robinson, 2005; Kannan & Tan, 2005; Takahashi, 2005; Madu & Kuei, 2004; Tari, 2004; Kuei & Madu, 2003; Muei, 2002; Muei and Madu 2001). Kuei and Madu (2001) provided an appropriate definition for supply chain quality management, in which the words of the whole term are defined in form of the parts of an equation, in order to define the total term supply chain quality management by their combination.

Total quality management and supply chain management play a very effective role to increase in organizational power and competitiveness (Sila, 2006), and they both act for meeting one main objective, which is customer satisfaction. They only differ in terms of their approach and models used to meet this purpose. For example, total quality management focuses on quality, and supply chain management on the delivery as the basis for the cost price of

products. However, it must be noted that higher quality and more appropriate deliver will lead to customer satisfaction and improves competitive power of the organization (Gunasekaran & Ngai, 2004; Milles, 2004; Lamy 1996; Kannan & Tan, 2005; Wanichichai 2009). In general, it can be claimed that total quality management emphasizes mostly on quality, while supply chain management on the provision of on-time services. Total quality management focuses mainly on internal participation, and supply chain management on external participation.

2.2.3. Operational performance

Operational performance is a company's ability to reduce management costs, order times, lead times, and the effectiveness of raw materials and distribution functions. Achievement indicates the achievement of an organization's goals. The performance of an organization is defined as the result of the operation of the company or the achievement of the company's goals. Venkatraman and Ramanujam, (1986) Achievements are divided into three dimensions. These are operational, financial, and organizational effectiveness. Operational or non-financial performance includes product quality, market share, market effectiveness, and new product launches. Financial performance includes profitability and sales growth. The effectiveness of an organization is the extent to which it achieves its effectiveness.

Various authors have identified performance indicators such as cost and non-cost De Toni and Tonchia, (2001); Gunasekaran, (2001), quality, cost, delivery time, and flexibility. Cost, quality, resource utilization, flexibility, visibility, reliability, ability to innovate Chan (2003). Resources, Outcomes, Flexibility Beamon, (1999); Input, output, and compound measures. Cost, time, quality, and flexibility are frequently mentioned in the literature as key operational performance indicators eg Beamon, (1999); Neely et al., (1995); Shepard and Günter, (2006).

2.2.4. Agency Theory

The TQM-SCM partnership concerns effective collaboration between manufacturers and suppliers to address sanctions, quality contract inspection and negotiation, associated compensation, and collaborative arrangement issues in design, manufacturing and operation. Therefore, Stephen et al. (2014) and Wilhelm et al. (2016) confirm that agency theory can be used primarily to identify supply chain relationship attributes using TQM and SCM management mechanisms. In this study, agency theory assumptions are consistent with TQM

and SCM concerns, and companies may face problems, especially in relation to partnerships with suppliers. In reality, companies assume that suppliers provide the products and services they need in high quality, especially if they find that they are enjoying all their benefits. Therefore, from a theoretical point of view, this study extends the theory of knowledge by examining the practice of integration between TQM and SCM Robinson & Malhotra (2005).

2.2.5. General Systems Theory

Systems theory (GST) emphasizes the added value that results from the relationships and inter-dependencies of system objects and their properties Skyttner, (2006). The authors write that in any system, each element modifies the entire system, there are interdependencies between the components, the system components affect the system, and the subcategories of independently formed parts affect the entire system. Claims not.

The relationship between SCQM, CFA, competitive advantage, and benefits is associated with the order, pattern, and purpose characteristics of the system with lasting uniqueness and purpose. SCQM practices are supported by the conditions of a particular organization and are inter-organizational and intra-organizational interactions that ensure a reversible and seamless flow of materials, information, and money for the benefit of all stakeholders. Promotes Chang, (2009). Therefore, the interconnected components work together to create the competitive advantage that is essential for good business performance Sharma & Modgil, (2015). GST is based on an axiom that cannot be proved realistically and cannot maintain judgment. Conflicting demands from parties to the supply system are confusing because they can cause system changes by adding, replacing, or suppressing components Fernandes et al., (2017).

Therefore, it is difficult to realize the universality of the characteristics and purposes of a company. Skyttner (2006) explained that GST prioritizes understanding relationships between variables rather than establishing relationships. The author points out that qualitative and descriptive requirements limit parameterize, measurement, and prediction. But it addresses problems that go beyond the limits of typical reductionism. GST is probably abstract and common, but it can reveal the relative correspondence between different systems and hierarchy levels. This study is fixed to the GST because of its ability to provide an interdisciplinary overview for conducting critical and normative studies of the correlations between all system elements at the same time.

2.3. Empirical Review

Customer focus and operational performance

Customer focus is the customer's involvement in the design of a product or service, which can be achieved by using customer satisfaction surveys. It also focuses on achieving higher customer satisfaction. Therefore, end-customers are the only source of revenue for the entire SC, requiring effort at both the organizational and SC levels Chopra et al., (2006).

Therefore, all SC members need to pay attention to customer requirements, respond to changing customer requirements, and measure and improve customer satisfaction. In market situations where product diversity and customization are increasing, the ability to respond to customer orders in a timely manner can provide a competitive advantage over other companies Zhangetal, (2006). In general, achieving customer satisfaction shows a good reputation and image, resulting in increased market share. Ouetal, (2010).

➤ **H1:** Customers Focus has a significant and positive effect on operational Performance

Quality Leadership and operational performance

The definition of quality leadership is the top management's acceptance of accountability for quality assessment and involvement in quality improvement. J. V. Saraph, G. P. Benson, and R. G. Schroeder (1989). According to a study by Rodgers and Hunter (1991), companies experienced an average productivity increase of up to 56% when management's commitment to a particular performance goal was high. Powell (1995) reported that top management efforts for quality had a significant impact on quality performance. Similarly, Ahire and O'Shaughnessy (1998) have shown that a high level of management commitment results in higher quality products. In another study, The use of QM practices was not a comparable predictor of operational performance, according to Samson and Terziovski (1999). Only one substantial positive relationship between leadership, customer focus, and company success as measured by several QM practices was discovered by their research. As a result, they contend, leadership should have a big impact on high-caliber performance.

➤ **H2:** Quality Leadership has a significant and positive effect on operational Performance.

Supplier focus and operational performance

Forker, Mendez, and Hershauer (1997) reported that the relative efficiency of suppliers eased the relationship between quality management practices and quality performance. Due to its close connection to process management and product/service design, Kaynak (2003) illustrated the significance of supplier quality management for successful QM implementation. Despite the fact that all QM practices are interconnected, supplier QM, process management, quality data, and reporting help meet operational performance goals, according to Baird, Hu, and Reeve (2011).

- **H3:** Suppliers Focus has a significant and positive effect on operational Performance

Employee involvement and operation performance

For quality control to actually have an impact, all employees must apply their enthusiasm and inventiveness. To inspire the excitement and innovation of all members' employees in a supply chain situation, we need to establish an ambitious Excelsior work environment. All employees need to understand their role and responsibilities in the supply chain system, solve problems as a master, and learn the principles, skills and technologies of TQM and ISO9000. In addition, by involving all employees in supply chain quality control and establishing a QC team that transcends departments and companies, we can pursue user satisfaction together. Chang (2009)

The involvement and commitment of people at all levels of an organization is the very important, so their complete involvement allows their capacities to be used for the benefit of the organization. Also for the whole supply chain the involvement and commitment shall be very positive in organizational performance. Fernandes ,Sampaio & Carvalho (2014)

- **H4:** Employee involvement has a significant and positive effect on operational Performance.

Quality process control and operation performance

The term "quality control" will be used here to mean use of control materials to monitor the accuracy and precision of all the processes associated with the examination (analytic) phase of testing. Achievement of performance can be better if the implementation of integrated quality management is supported by the company. Quality Control Circles (QCC) have been found to be a simple and productive technique of Total Quality Management (TQM) Priyadharsan & Raja, (2020)

- **H4:** Quality Process Control has a significant and positive effect on Operational Performance

IT-Enable Organization and operational performance

This aspect examines communication and information exchange through the use of IT as a necessity for enhancing the quality performance of multi-echelon supply chain networks. If IT can be effectively managed and maintained, operational effectiveness and competitive advantage for all supply chain network participants can be maintained. Xu (2011). On the other side, IT makes it possible for the information to be integrated, which is the sharing of vital data throughout the network of the supply chain. Realizing the real-time transmission and information processing required for supply chain decision-making is one of the key goals of information integration. Olhager & Prajogo (2012).

- **H6:** IT-Enable Organization has a significant and positive and effect on Operational Performance

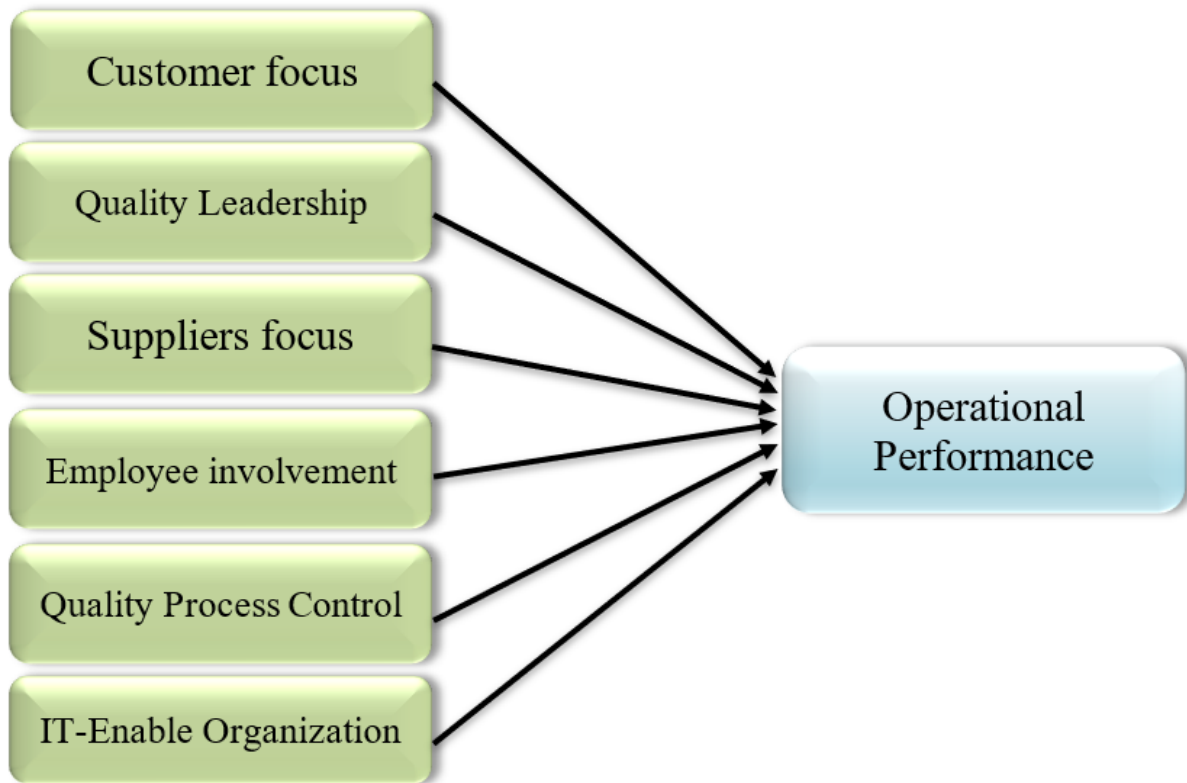
Samson and Terziovski's (1999) research showed that among the SCQM practices used in their study, customer focus and leadership have a significant impact on performance measurements, which in turn have the greatest impact on an organization's operational performance metrics. These results are supported by the finding that the practice of supply chain integration, customer focus, and supplier focus must start with leadership and senior management commitment in order to consistently enhance firm performance through these metrics. Through operational performance indicators, for example, it enhances quality performance, which in turn fosters enhanced organizational performance.

Additionally, the advancement of a quality-based culture is greatly aided by SCQM, sometimes referred to as SC quality management techniques, which emphasize customer attention, leadership, and supplier management. Even though there is no direct correlation between operational results and customer satisfaction, financial performance, market performance, human resource results, supplier and partner performance, as well as operational or quality performance, can all be improved through performance quality. Operational results are elements that assess company performance and improvement. These results include customer satisfaction, financial and market performance, supplier and partner performance, as well as operational or quality performance. Additionally, multi-echelon supply chain

networks' quality performance can be optimized by the process of information provision through the usage of IT. All supply chain network participants can achieve operational efficiency and competitive advantage if IT is controlled and maintained properly. Xu (2011). The Six SCQM techniques included in this study have an impact on the achievement of an organization's operational performance, according to some of the aforementioned explanations.

2.4. Conceptual framework

Based on the six dimensions of supply chain quality management; Customer focus, Quality Leadership, Suppliers Focus, Employee involvement, Quality process Control and IT-Enable Organization with their effect on operational performance, the following conceptual framework is developed.



Source; Researcher, 2022

Figure 2-1 Conceptual framework

CHAPTER THREE

3. Research Methodology

3.1. Introduction

This chapter contains research methodology which includes research design and approach, sample design, population, sample size and sampling instrument and data collection techniques, methods of data analysis and interpretation.

3.2. Research design

In this study, the explanatory research design was used to analyze the data collected from employees and managers. This design helps the researcher to explain understand and predict the cause and effect relationship between variables and test the hypothesis formulated.

3.3. Research approaches

Both quantitative and qualitative method of data collection were utilized. This study employed quantitative survey method in the form of a cross sectional study in which data was collected once across the population using sample. According to Creswell (2003) the quantitative survey research design is vital to create quantifiable causes and affect relationship between the variables of the study. As cited in Abraham, Assegid, Assefa, (2014) noted that quantitative survey is the most appropriate one to use if the purpose of an investigation is to describe the degree of relationship which exists between the variables. And qualitative method were used to analyze the interview question.

3.4. Sampling Design

3.4.1. Target population

According to Sekeran (2001), a population is described as “The entire group of people, events, or thing of interest that the researcher wishes to investigate”. The target populations of this study were employees and managers of BGI Ethiopia PLC.

3.4.2. Sampling technique and procedure

The researcher picked employees working under the supply chain department using purposive sampling techniques because the researcher believes that those staffs are too familiar with the terms and have the required knowledge on the subject area. In addition, those corporate roles within the supply chain departments represents all sites located in Addis Ababa, Kombolcha, Hawassa, Zebidar, Raya and Castel Winery, which makes it very promising to get the necessary information needed to fulfill the research objectives.

There are six departments within the supply chain department. These are corporate warehouse department, corporate transport department, corporate raw material procurement department, International procurement department, Local/Non industrial procurement department and corporate planning and Export department. Total number of these upper level management staffs within this departments are 41. Furthermore, the interview was conducted with the supply chain director.

3.5. Data Source and Collection Method

The data were collected from primary sources using questionnaire and Interview. To collect primary data structured questionnaire was employed in the survey that measures the effect of integrated SCQM on operational performance. The variables were measured using Likert scale with five response categories (strongly disagrees, disagree, neutral, agree, and strongly agree). A total of 89 items was prepared and distributed for this survey including 3 demographic characteristics questions which completed by the employees of BGI Ethiopia under the supply chain department. Also, the Interview was conducted with the supply chain director. Permission for the survey was granted by BGI Ethiopia HR Manager and supply chain director. After permission granted, the questionnaires were distributed to the respondents

3.5.1. Data collection Instrument

3.5.1.1. Questionnaire Design

The questionnaire has three parts. These are:- Background Information, Supply chain quality management Questionnaire, and operations performance questionnaire Self-administered questions were used to obtain background information of respondents relevant

to the study. Participants were asked to furnish information with regard to their gender, experience and department.

The second part of the questionnaire was to measure the Supply chain quality management impact by using a five – point Likert response scale developed by (Lokesh, 2014, Lise and Gilbert, 2003, Knebel - 2008) that includes strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5).

The Third part of the questionnaire was to measure operational performance by using a five - point Likert response scale developed by Rahaib, et al, (2012) includes strongly disagree(1), disagree(2), neutral(3), agree (4) and strongly agree (5)

3.5.1.2. The Interview design

The interview also designed by including 11 questions which related with the effect of supply chain quality variables on operational performance which was asked for the manager of supply chain department.

3.6. Reliability Test

Cronbach's alpha is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examines. Several authors such as Alwadaei (2010) and Kothari (2004), state that an instrument that provides a reliability coefficient of 0.70 is usually considered as a reliable instrument. Hence, in this study the internal consistency for all items of the instrument was tested using Cronbach's alpha method. Therefore the researcher used the above mentioned literature into consideration and tested the reliability of the items which were developed for respondents.

Figure 3-1 Reliability Statistics

Variable	Cronbach's Alpha	N of Items
Customer Focus	.881	16
Quality leadership	.759	5
Supplier Focus	.884	9
Employee Involvement	.907	10

Quality control process	.900	9
IT enable organization	.849	16
Operation Performance	.853	24

Own Survey, 2022

Reliability is the measure of internal consistency of the constructs on the study. A construct is reliability if the Alpha (α) value is greater than .70 (Hair et al., 2013). The reliability test has been conducted using Cronbach's Alpha. The results revealed that the customer focus scale with 16 items ($\alpha=.881$), the Quality Leadership with 5 items ($\alpha=.759$), the Supplier Focus with 9 items ($\alpha=.884$), the Employee involvement with 10 items ($\alpha= .907$), the Quality control process with 9 items ($\alpha=.900$), the IT enable organization with 16 items ($\alpha = .849$), and the operation performance with 24 items ($\alpha =.853$). This results proves the reliability of all questions used to asses the study since the alpha of all the variables turned out to be more than .70.

3.7. Data Processing and Analysis

3.7.1. Data Processing

There are two sequential parts to this data processing procedure: The first data cleansing was editing the raw data that had been gathered to look for mistakes and omissions in the responses and to cross-check the procedure to see if the questions were correctly and consistently answered. The process of assigning numerical or other symbols was carried out in the next phase. In order to classify responses into a finite number of classes and categories, answers are coded by being given numbers or other symbols. This made it easier to divide the response into a small number of categories or classes before applying the classification or grouping procedure to a substantial amount of raw data.

3.7.2. Data Analysis

Statistical Package for Social Science (SPSS) software version 26 was employed to analyze and present the data through the statistical tools used for this study, namely reliability test, frequency analysis for background information, correlation, normality, linearity, multi-collinearity tests multiple regression analysis. The results were presented using tables.

3.5.1.1. Descriptive analysis

Descriptive analysis techniques were used to analyze the results of descriptive statistics to describe the Demographic and general results which is presented by tables frequency distributions and percentages.

3.5.1.2. Inferential Analysis:

Inferential statistics allow researchers to infer from the data through analysis the relationship between two variables; differences in a variable among different subgroups; and how several independent variables might explain the variance in a dependent variable. Sekaran, (2000) Therefore, the inferential statistical methods utilized for the study are explained as follows:-.

The Pearson Correlation analysis

As stated on Alwadaei (2010) Correlation Analysis: is to show the strength of the association between the variables involved. Inter-correlations coefficients (r) were calculated by using the Pearson's Product Moment. Field (2006) also state that the output of correlation matrix can be the correlation coefficient that lies between -1 and +1 within this framework, a correlation coefficient of +1 indicates a perfect positive relationship, and a correlation coefficient of -1 indicates a perfect negative relationship; whereas a coefficient of 0 indicates no liner relationship. While, for correlations purpose the descriptors developed by Davis (1971) was used.

Interpretation of strength of correlation coefficient

Value of coefficient Relation between variables 0.70-1.00 Very strong association, 0.50-0.69 Substantial association, 0.30-0.49 Moderate association, 0.10- 0.29 Low association, and 0.01-0.09 negligible association. Alwadael, (2010)

Multiple Regression Analysis

The inter-correlations between all of the variables are taken into consideration in multiple regression analysis. The correlations between the predictor scores are also taken into account by this methodology. Multiple predictors are concurrently regressed against the criteria variable in multiple regression analysis. Swerdlik & Cohen (2002). The impact of integrated supply chain quality management factors (customer focus, quality leadership, suppliers focus, employee involvement, quality process control, and IT-enable organization) on operational performance is studied using this methodology.

Regression functions

Typically, this study's equation for multiple regressions is constructed using two sets of data: dependent variables (operational performance) and independent variables (Customer focus, Quality Leadership, Suppliers Focus, Employee involvement, Quality process control, and IT-Enable Organization). Regression analysis is being used in this study primarily to improve the researcher's ability to describe, comprehend, predict, and regulate the indicated variables.

Figure 3-2 Variables of the study

Independent variables	Dependent variables
Customer focus,	Operational performance
Quality Leadership,	
Suppliers Focus,	
Employee involvement,	
Quality process control and	
IT-Enable Organization	

The Multiple regression models will be applicable as follows:

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6 + \epsilon \text{ Where:}$$

Y=Dependent Variable (Operational performance)

β_0 = constant term; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = Beta coefficients

X1= Customer focus,

X2= Quality Leadership

X3= Suppliers Focus

X4= Employee Involvement

X5= Quality process Control

X6= IT-Enable Organization

ϵ =the residual value/error term.

Where Y is the dependent variable- employee performance X_1, X_2, X_3, X_4, X_5 , and X_6 are the independent variables β_0 is the intercept term- it gives the mean or average effect on Y of

all the variables excluded from the equation, although its mechanical interpretation is the average value of Y when the stated independent variables are set equal to zero. β_1 , β_2 , β_3 , β_4 , β_5 , and β_6 refer to the coefficient of their respective independent variable which measures the change in the mean value of Y, per unit change in their respective independent variables.

3.8. Ethical Consideration

According to Leedy and Ormrod (2010), most ethical issues fall into one of the following four categories; informed consent, confidentiality, security and honesty. Taking in to account this point in concerning ethical consideration firstly, Permission for the survey was granted by BGI Ethiopia HR Manager and supply chain director. the questionnaires were distributed to the respondents After permission was granted, secondly, all the information and data from the respondents was kept confidential no information's was recorded to link respondents with their responses. The researcher also informed respondents about the aim of the research clearly which was enabling them to join with full consent. The responses for questionnaires are not exposed to third party but the researcher used them only for academic research purpose. And finally, the researcher reported the findings in complete honesty.

CHAPTER FOUR

4. Data Analysis and Interpretation

4.1. Introduction

The statistical program used to analyze and display the data in this study is Social Science Statistics Package (SPSS) version 26. Inferential analysis of the study are presented respectively.

Forty-one questionnaires were distributed to the respondents and out of 41 questionnaires, 40 of them were collected that accounts 97.56% response rate. Accordingly, the analysis of this study is based on the number of questionnaires collected.

4.2. Regression Assumption tests

4.2.1. Normality Test

Table 4-1 Normality test

	Tests of Normality					
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Operation Performance	.122	40	.136	.972	40	.414

a. Lilliefors Significance Correction

The data was reviewed to ensure that the assumptions of normality were upheld since, it is a benchmark distribution for many statistical assumptions. Normality is a term used to indicate that the data are normally distributed. Normal distributions take the form of a bell-shaped curve. To check the normality of the data the normality test was conducted using SPSS and the result shows that in a Shapiro-Wilk test the p value is .414 and kolmogorov-Smirnov test p value is .136 which both tests p value is > 0.05 which indicates that the data are normally distributed as inferred by Shapiro and Wilk, (1965) and the visual inspection of their Histogram, normal Q-Q plots showed that the operation performance scores were approximately normally distributed. Also the Skewness is -0.088 and kurtosis is -0.891, which is a very good range that indicated a normal distribution as mentioned by Lewis-Beck, Bryman

& Liao (2004). Skewness and kurtosis should be between should be within the +2 to -2 range and Skewness and kurtosis z Should by somewhere in the span of -1.96 to + 1.96 when the data are normally distributed. You can see the entire result from the table from appendix II

4.2.2. Multicollinearity test

Table 4-2 Multicollinearity test

Model	VIF Mean
Customer Focus	4.009
Quality Leadership	7.689
Supplier Focus	3.076
Employee Involvement	6.280
Quality Process Control	7.810
IT enable organization	3.070

Source own survey 2022

As stated in table 4.2 to assess whether multicollinearity was a problem, the data set was reviewed. When numerous independent variables exhibit strong correlations with one another or when one independent variable is a nearly linear combination of other independent variables, this phenomenon is known as multi-collinearity. Hayduk (1987).

Researchers are less able to distinguish between the impacts of factors the more variables correlate. Keith (2006). According to Myers (1990), collinearity VIFs of 10 or less are thought to indicate that the model does not have multicollinearity. As the results demonstrate, the data's mean VIF scores all fell inside the permitted range. The researcher can determine that the data set is in good shape on the basis of this information.

4.2.3. Linearity test

A linear function of the predictor (independent) variables is what is meant when something is said to be linear. Only linearly related dependent and independent variables can be estimated with sufficient accuracy by standard multiple regression. Regression analysis results will underestimate the real relationship if the relationship between the independent factors and the dependent variable is not linear. When an independent variable is under-estimated, there are two risks associated with it: an increased likelihood of a Type II error for that independent

variable and, in the case of multiple regression, an increased likelihood of a Type I error (over-estimation) for other independent variables that share the same variance as that independent variable. All regression estimates, including regression coefficients, standard errors, and statistical significance tests, may be distorted if linearity is violated. Keith (2006). In light of this knowledge, the researcher ran a linearity test and discovered that all independent factors significantly correlated with the dependent variable. look at Appendix II.

4.3. Descriptive analysis

4.3.1. Background information analysis

Table 4-3 Background information of Respondent

No	Item	Frequency	Percent	Valid percent	Cumulative percent	
1	Gender of Respondents	Male	19	38.0	47.5	47.5
		Female	21	42.0	52.5	100.0
		Total	40	80.0	100.0	
2	Year of Experience	< 6 months	3	6.0	7.5	7.5
		6 months-1 year	6	12.0	15.0	22.5
		1-5 years	19	38.0	47.5	70.0
		6-10 years	10	20.0	25.0	95.0
		11 and above	2	4.0	5.0	100.0
		Total	40	80.0	100.0	
3	Department	Corporate transport department	5	10.0	12.5	12.5
		Corporate warehouse department	6	12.0	15.0	27.5
		Corporate raw material procurement department	7	14.0	17.5	45.0
		International procurement department	11	22.0	27.5	72.5
		Local/Non industrial procurement department	5	10.0	12.5	85.0

	Corporate planning and Export department	6	12.0	15.0	100.0
	Total	40	80.0	100.0	

Own survey: 2022

As represented in the Item 1 of the above table, Gender distribution of respondents. Accordingly 47.5% of them are male and the remaining 52.5% are females. Therefore, from the employees BGI working under supply chain department there are a greater proportion of female respondents than the male.

The experience of respondents as it is shown on item 2, respondents in the range of less than 6 months of experience are 3 (7.5%), respondents in the range of 6 months-1 year are 6 (15%), in the range of 1-5 years are 19 (47.5%), respondents in the range of 6-10 years are 10 (25%), and 2 (5%) are 11 and above years. This indicates that the majority of the employees are within the range of 1-5 years years of experience while consisting all of the other ranges.

The last item indicates the category of employees on departments bases. From the table, 5 (12.5%) of the respondents are under Corporate transport department, 6 (15%) of the respondents are under Corporate warehouse department, 7 (17.5%) of the staffs are working under Corporate raw material procurement department, 11 (27.5%) of the respondents are under International procurement department, 5 (12.5%) of the respondents are under Local/Non industrial procurement department, 6 (15%) of the staffs are working under Corporate planning and Export department. This shows that from staffs of Supply chain department most of them are working under International procurement department.

4.4. Results of Inferential Statistics

In this section Pearson's Product Moment Correlation Coefficient, single regression and multiple regression analysis was computed. With the help of these statistical tools, conclusions are drawn with regard to the respondents and decisions are made with respect to the research questions.

4.4.1. Pearson's Product Moment Correlation Coefficient

Pearson's Product Moment Correlation Coefficient was used to determine the relationship the following relationships.

- The relationship between Customers Focus and operational performance
- The relationship between Quality Leadership and operational performance
- The relationship between Supplier Focus and operational performance
- The relationship between Employee involvement and operational performance
- The relationship between Quality process control and operational performance
- The relationship between IT-Enable Organization and operational performance

Table 4-4 The relationship between Supply chain quality management dimensions and operational performance

		Operation Performance	Customer Focus	Quality Leadershi p	Supplier Focus	Employee Involvement	Quality Control Process	IT enable organization
Operation Performance	Pearson Correlation	1	.875**	.934**	.848**	.934**	.938**	.823**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000
	N	40	40	40	40	40	40	40
Customer Focus	Pearson Correlation	.875**	1	.824**	.684**	.829**	.827**	.715**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000
	N	40	40	40	40	40	40	40
Quality Leadership	Pearson Correlation	.934**	.824**	1	.776**	.842**	.903**	.813**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000
	N	40	40	40	40	40	40	40
Supplier Focus	Pearson Correlation	.848**	.684**	.776**	1	.794**	.745**	.665**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000
	N	40	40	40	40	40	40	40
Employee Involvement	Pearson Correlation	.934**	.829**	.842**	.794**	1	.882**	.715**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000
	N	40	40	40	40	40	40	40

Quality Control Process	Pearson Correlation	.938**	.827**	.903**	.745**	.882**	1	.774**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000
	N	40	40	40	40	40	40	40
IT enable organization	Pearson Correlation	.823**	.715**	.813**	.665**	.715**	.774**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	
	N	40	40	40	40	40	40	40

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

Therefore, from the results, there is a positive, significant and a very strong correlation between Customer focus and operation performance implied by ($r = .875, p < 0.01$). moreover, Quality leadership has a positive, significant and a very strong correlation with operational performance which implied by ($r = .934, P < 0.01$). the Supplier Focus also positively, significantly and in a very strong association correlated with operational performance implied by ($r=.848, p<0.01$). beside this, Employee involvement positively, significantly and in a very strong association correlated with operational performance at ($r=.934, p<0.01$). likewise Quality process control positively, significantly and in a very strong association correlated with resistance to change($r=.938, p<0.01$). finally IT enable organization positively, significantly and in a very strong association correlated with operational performance at ($r=.823, p<0.01$).

Generally, the above result indicates that the relationship between all supply chain quality management indicators customer focus, quality leadership, supplier focus, employee involvement, quality process control and IT enable organization is a positive, significant and with a very strong association correlated with operational performance.

4.4.2. Regression analysis

To answer the objective of the study multiple regression model was employed. The model helped to measure the effect of integrated supply chain quality management on operational performance

Multiple Regression between independent and dependent variables

Table 4-5 Regression result for Operational performance (Customer Focus, Quality leadership, supplier focus, employee involvement, quality process control and IT enable

organization)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.986 ^a	.972	.967	.06604

a. Predictors: (Constant), IT enable organization, Supplier Focus, Customer Focus, Quality Control Process, Employee Involvement, Quality Leadership

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.060	6	.843	193.360	.000 ^b
	Residual	.144	33	.004		
	Total	5.204	39			

a. Dependent Variable: Operation Performance

b. Predictors: (Constant), IT enable organization, Supplier Focus, Customer Focus, Quality Control Process, Employee Involvement, Quality Leadership

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.192	.136		-1.407	.169		
	Customer Focus	.113	.055	.120	2.062	.047	.249	4.009
	Quality Leadership	.191	.076	.200	2.497	.018	.130	7.689
	Supplier Focus	.154	.047	.166	3.277	.002	.325	3.076
	Employee Involvement	.281	.075	.272	3.747	.001	.159	6.280
	Quality Control Process	.207	.079	.213	2.635	.013	.128	7.810
	IT enable organization	.101	.049	.104	2.053	.048	.326	3.070

a. Dependent Variable: Operation Performance

This study was conducted to measure the effect of integrated supply chain quality management on operational performance. It was hypothesized that customer focus, quality leadership, supplier focus, employee involvement, quality process control and IT enable organization will positively predict operational performance. To test this hypothesis multiple regression analysis was used. The result shows that all the independent variables significantly predict operational performance: $F(6, 33) = 193.360$, $p < .05$ as shown by ANOVA table. The R^2 for the overall model was .972 and the adjusted R^2 was 0.967(96.7%) this implies that 96.7% of the variance in operational performance is explained by integrated supply chain quality management indicators.

The coefficient table represent the unique contribution of the each independent variable which can be explained with each hypothesis developed.

➤ **H1:** Customers Focus has a significant and positive effect on operational Performance

The first predictor; customer focus is a statistically significant indicator as the result shows ($\beta=0.113$ $t=2.062$ $p=0.047$). This means keeping other independent variables constant, as the beta value of 0.113 indicates that if there is a one-unit increase in customer focus there will be a 11.3% increase in operational performance. Hence, H1 was supported.

This result is further explained as the organization increases its focus on customers by engaging them with important company decisions and by treating customer complaints with the top priority we can enhance the operational performance of the company. This result is supported by Noor, Nuryakin, and Pribadi, (2020). Customers focus also becomes a core SCQM measurement, according to the authors, in order to realize operational execution within a company. By entering the untapped characteristics that these customers need and seek, an organization can learn about the fundamental quality capacities that already exist in its customers.

H2: Quality Leadership has a significant and positive effect on operational Performance

The second predictor; quality leadership ($\beta=0.191$ $t=2.497$ $p=0.018$) is statistically significant to predict the dependent variable. The beta value of 0.191 indicates that keeping others independent variables constant, if there is a one unit increase in quality leadership their will be 19.10% increase in operational performance. Hence, H₂ was supported.

This result further explained that as the organization top management strongly encourage, empower employee and suppliers the operational performance of the company will be improved

This study is in line with study conducted by Noor, Nuryakin and Pribadi, (2020) and Soares et. al., (2017). The success of operational performance can be influenced by the quality leadership component, where top management must be able to offer further assistance in managing quality across the supply chain network. The supply chain's downstream and upstream operations will be closely monitored by top management, who will also make sure

everything runs smoothly to further improve operational performance efficiency and effectiveness.

H3: Suppliers Focus has a significant and positive effect on operational Performance

The third predictor; supplier focus is statistically significant as the result shows ($\beta=0.154$ $t= 3.277$ $p= 0.002$). As the beta value of 0.154 indicates that keeping other independent variables constant if there is a one-unit increase in supplier focus there will be a 15.4% increase in operational performance. Hence, **H3** was supported.

This result further explained that as the organization focuses on the supplier by engaging in a long-term relationship with the supplier, evaluating the performance, and giving feedback to the supplier the operational performance will increase.

The results of this study have similarities with studies conducted by Noor, Nuryakin, and Pribadi, (2020), Soares et. al., (2017). and Soares, A., Soltani, E., & Liao, Y, Y., (2017) indicate as By concentrating on their suppliers, businesses may find it easier to satisfy customer demands, cut down on the amount of defective goods they get, and adhere to production requirements.

H4: Employee involvement has a significant and positive effect on operational Performance

The fourth predictor; employee involvement is statistically significant as the result shows ($\beta=0.281$ $t= 3.747$ $p= 0.001$). As the beta value of 0.281 indicates that keeping other independent variables constant if there is a one-unit increase in Employee involvement there will be a 28.1% increase in operational performance. Hence, **H4** was supported.

This result further explained as if the organization engage employee, delegate and hear employees the operation performance will increase.

The result is in line with the research output of Fernandes, Sampaio & Carvalho (2014). According to the authors, the involvement and commitment of employees at all levels of an organization is very important, so their capacities are used to the organizations benefit. As well as through out the entire supply chain, the involvement and commitment of all individual are necessary to ensure success.

➤ **H5:** Quality Process Control has a significant and positive effect on Operational

Performance

The fifth predictor; quality process control is statistically significant as the result shows ($\beta=0.207$ $t= 2.635$ $p= 0.013$). As the beta value of 0.207 indicates that keeping other independent variables constant if there is a one-unit increase in Quality process control there will be a 20.7% increase in operational performance. Hence, H5 was supported.

This outcome further demonstrated how having a precise and standardized description of the job and processes, as well as audit quality, improves operation performance.

➤ **H6:** IT-Enable Organization has a significant and positive and effect on Operational Performance

The sixth predictor; IT enable organization is statistically significant as the result shows ($\beta=0.101$ $t= 2.053$ $p= 0.048$). As the beta value of 0.101 indicates that keeping other independent variables constant, if there is a one-unit increase in IT-Enable Organization there will be a 10.1% increase in operational performance. Hence, H6 was supported.

This result further explained that having a smooth information flow, IT alignment within the organization contributes to the rise of operational performance. This result is supported by Noor, Nuryakin,, and Pribadi, (2020) by saying among the SCQM dimensions is an IT-enabled organization, which makes it simple for an organization to obtain information that satisfies its requirements.

In general, as the multiple regression results show, all independent variables predict operational performance, especially employee involvement followed by quality process control that has a high effect on organizational performance.

4.5. Interview Questions Analysis

An interview was conducted with the supply chain director to further analyze the effect of

SCQM on the operational performance of the BGI breweries. The discussion conducted with the director will be summarized as follows.

Management is highly committed to improving quality the way to show this is we have developed an application specifically for this purpose. This software application is used to record quality discrepancies, and follow up quality issues. Every direct product input passes through the application on every site. Therefore, when there is any discrepancy all nonconformity will be filled. Regarding nonconformity issues there are three categories, for minor issues (we can use it without changing the process and the supplier needs to take action for improvement) the production manager will check and approve, for major issues (we can use it but we need to adjust the process) goes to technical director industry director and if it is critical issues (Impossible to use automatically segregated and kept on returning to the supplier) goes directly to the CEO for approval. All the suppliers should submit certificates of analysis and technical experts take a sample and check it in the laboratory to check their conformity with the standard. Therefore, using this advanced software we are able to improve and meet quality objectives. A standard format has been developed for each department. The castle winery has been already certified with this certification and others to be followed.

In case of any crises, the management discusses the issues and gives corrective action as quickly as possible and for any deviation, management approval is required to proceed. Procurement emergency procedures are in the process of being developed as part of the normal procedure. The supply situation is monthly reviewed and plans are developed and updated with the management team. There is an alignment in developing plans and reviewing quality issues among departments. Everyone is responsible for the quality and as supply chain quality is the major criteria of selection and in terms of control quality, the department will come into the picture to verify that all received products are as per the standard.

The organization structure has recently changed and becomes stronger in controlling and improving quality issues. Before quality was controlled at the lower management level but in the new structure quality is monitored and controlled by the higher level at a country level this gives a big emphasis on quality issues and contributes a lot to the improvement. The system is managed jointly by the supply chain department and quality department this justifies the integration among the two major departments.

Quality issues are followed closely and any quality parameter defects are screened and

reported. On top of that, the supply chain management has a monthly meeting to discuss the major suppliers' performance and communicate with them if any issues are on board. In addition to the software, the team has a media to post if they encounter any quality issues; these further enhance the attention and make it easy to discover it on the spot and take corrective action immediately. Nowadays, any quality issues are treated consciously by the company compared to the early days. This justifies the company's commitment to improving and managing quality on continuous bases.

Moreover, there is a project undergoing to get QFS (Quality Food Safety) certification, this project is considered as a major process improvement opportunity, the project has its own manager, the project team has been organized from each department and started the project, for this SWOT analysis has been identified, action plans are already developed and there is an application developed for this purpose. The quality module system is not yet developed but is on the way to managing it with the projects on the table. In addition, the system is used as a way of information flow at the department level.

The supplier and department key performance measures are conducted on a monthly basis as per the indicators developed and the appraisal will be communicated accordingly. There are parameters in terms of on-time performance, quality of work, and customer satisfaction that will be measured and reviewed.

Daily meetings are conducted among the supply chain, production department, and sales department teams to plan the production of raw material transport based on the sales forecast, etc.. This is the best example to show the integration of departments within the company. All reports are shared using the application. These habits can be taken as the best practice and be an example for other companies engaged in production.

The application is used as an engagement mechanism since every report passes through it by engaging different functional departments.

Moreover, the integration between the supply chain and quality department is a must since the technical expertise will be fulfilled by the quality department as quality is the major or a basic thing in the supply chain aspect. Further while selecting the supplier the technical qualification will be identified by technical experts from the quality department along with the supply chain. Two aspects from the supply point of view and from the financial point of view evaluated by

the supply chain in terms of delivering the required quality product will be reviewed by the quality department. Therefore, without the integration of these two departments, the supply chain department alone will not be successful. The same is true for the quality department alone; it will miss important aspects. For this reason, their integration is crucial to fulfill the ultimate goal of the company not only in BGI but in all other companies.

CHAPTER FIVE

5. Summery, Conclusion and Recommendations

5.1. Summary of Results

Depending on the discussion that has been made in the analysis part the following summery was drawn

Among the staff of BGI breweries working under the supply chain department, there is a greater proportion of female (52.5%) respondents than male.

The experience of respondents indicates that the majority of the employees are within the range of 1 to 5 years of experience while consisting of all of the other ranges. And most of the respondents are staff working in the International procurement department.

As the correlation test of the study indicated the relationship between all supply chain quality management indicators; customer focus ($r = .875$, $p < 0.01$), quality leadership ($r = .934$, $P < 0.01$), supplier focus ($r=.848$, $p<0.01$), employee involvement ($r=.934$, $p<0.01$), quality process control ($r=.938$, $p<0.01$) and IT- enabled organization ($r=.823$, $p<0.01$) have a positive, significant and with a very strong association correlated with operational performance.

In addition to this, as indicated in multiple regression analysis all the independent variables significantly predict operational performance $F(6, 33) = 193.360$, $p<.05$ as shown by the ANOVA table. The R^2 for the overall model was .972 and the adjusted R^2 was 0.967 (96.7%) this implies that 96.7% of the variance in operational performance is explained by integrated supply chain quality management indicators.

The unique contribution of each independent variable explains as follows, customer focus is a statistically significant indicator as the result shows ($\beta=.113$ $t= 2.062$ $p= 0.047$). This means keeping other independent variables constant, as the beta value of 0.113 indicates that if there is a one-unit increase in customer focus there will be a 11.3% increase in operational performance, and quality leadership ($\beta=.191$ $t= 2.497$ $p= 0.018$) is statistically significant to predict the dependent variable. The beta value of 0.191 indicates that keeping other independent variables constant if there is a one-unit increase in quality leadership there will

be a 19.1% increase in operational performance. supplier focus is statistically significant as the result shows ($\beta=.154$ $t= 3.277$ $p= 0.002$). As the beta value of 0.154 indicates that keeping other independent variables constant if there is a one-unit increase in supplier focus there will be a 15.4% increase in operational performance.

Employee involvement is statistically significant as the result shows ($\beta=.281$ $t= 3.747$ $p= 0.001$). As the beta value of 0.281 indicates that keeping other independent variables constant, if there is a one-unit increase in employee involvement there will be a 28.1% increase in operational performance. quality process control is statistically significant as the result shows ($\beta=.207$ $t= 2.635$ $p= 0.013$). As the beta value of 0.207 indicates that keeping other independent variables constant if there is a one-unit increase in quality process control there will be a 20.7% increase in operational performance. IT enabled organization is statistically significant as the result shows ($\beta=.101$ $t= 2.053$ $p= 0.048$). As the beta value of 0.101 indicates that keeping other independent variables constant, if there is a one-unit increase in an IT-enabled organization there will be a 10.1% increase in operational performance. Most of the study results are supported by the study conducted by Noor, Nuryakin, and Pribadi, (2020)

In general, as the multiple regression results show, all independent variables predict the operational performance especially employee involvement followed by quality process control have a high effect on organizational performance.

The management of BGI is highly committed to improving quality the way to show this is we have developed an application specifically for this purpose. This software application is used to record quality discrepancies, and follow quality. Every direct product input passes through the application on every site. Therefore, using this advanced software we are able to improve and meet quality objectives.

Moreover, the management of BGI believes in the importance of the integration of supply chain and quality departments for this reason the company is undertaking a project to get QFS (Quality Food Safety) certification. This project is considered a major process improvement opportunity and can be used as an integration mechanism for both supply chain and quality departments.

5.2. Conclusion

This study was aimed at investigating the effect of integrated supply chain quality management on operational performance in BGI Ethiopia. Based on the objectives and findings of the study, the following conclusions are drawn:

- The Pearson correlation result shows that all supply chain quality management indicators (customer focus, quality leadership, supplier focus, employee involvement, quality process control and IT enable organization) have a positive, significant, and very strong correlation with operational performance.
- The result of multiple regression assures the model fitness to the study with a high value of R^2 and all independent predictors, together significantly and positively affect the operational performance. Which means
 - Operation performance is significantly and positively affected by customer focus
 - Quality leadership also has a significant and positive effect on operational performance
 - Operation performance is significantly and positively affected by supplier focus
 - Employee involvement has a significant and positive effect on operational performance
 - Operation performance is significantly and positively affected by quality control process
 - IT enable organization has a significant and positive effect on operational performance, This enables the researcher to accept all hypothesis formulated as per the regression result.
- The company has developed a software application used to record quality discrepancies, and follow quality. Every direct product input passes through the application on every site. Therefore, whenever there is any discrepancy all non-conformity will be filled and passed through the consecutive approval stages.
- Moreover, the management believes in the importance of the integration of supply chain and quality departments for this reason the company is undertaking a project to get QFS (Quality Food Safety) certification. This project is considered a major process improvement opportunity and can be used as an integration mechanism for both supply chain and quality departments.

5.3. Recommendations

Based on the findings and conclusions of the study, the researcher would like to give the following recommendations to the management of BGI

- The finding from the correlation analysis indicates that all indicators of Supply chain quality management have a significant and positive relationship with operational performance. Therefore, in order to enhance the operation performance, it is recommendable for the company to consider all important variables. To get the best out of the supply chain quality management integration the company should Focus on customers, use quality leadership, focus on suppliers, involve employees, enhance quality process control and create IT-enable organization because as the model of regression proves the SCQM best described by the selected variables.
- Among the predictors' employee involvement highly affects operational performance followed by process quality control. Therefore, the company is advised to involve its employees in quality-related activities, in decision making, conduct performance appraisals objectively, and treat them respectfully to improve operational performance.
- It is recommended for the company to give more attention to enhancing quality process control by making the work instruction clear, developing standard procedures, and using quality control tools so as to improve performance.
- The company is recommended to have a quality module system to further support the quality and supply chain department so as to reduce their daily administrative workload significantly.

5.4. Limitation of the study

Because of the wideness of supply chain quality management issues, it is difficult to cover the whole content; this research is constrained by the six indicators identified. It would be good for the researcher to include other variables. Methodologically the study is conducted by only one company and It would be good for the researcher to incorporate other companies in the industry. However, the finding of the study will contribute to a better understanding of the effect of integrated supply chain quality management on operational performance.

5.5. Direction for future research

This study was undertaken by picking one company among the brewery companies. Hence, it will be good for future researchers to conduct the topic at the industrial level by using other methods

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APPENDIX

APPENDIX I

QUESTIONNAIRE

Introduction

This questionnaire has been designed for the sole purpose of collecting data to know to what extent the integrated Supply chain quality management affects organizational performance. The data collected will be treated with a very high degree of confidentiality and it is meant for academic purpose only. In order to ensure confidentiality do not put down your name on the questionnaire but please answer the questions as honestly and objectively as possible.

Section A. (Personal Information)

Tick the following questions where it's appropriate

1. Gender

Male

Female

2. Number of years worked in the organization

Less than 6 months []

6 months to 1 year []

1 year – 5 years []

6-10 years []

11 and Over []

3. Kindly indicate the department you are work in in the organization (tick the appropriate box)

Corporate transport department	[]
Corporate warehouse department	[]
Corporate raw material procurement department	[]
International procurement department	[]
Local/Non industrial procurement department	[]
Corporate planning and Export department.	[]
Other (Specify) _____	

Section B

Measuring operational performance of Supply chain quality management as per the following variables. Indicate to what extent each of the following statements are in relation to organizational performance on a five point Likert scale 1=Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree

Customer Focus (Regarding your company's attitudes towards customers and information sharing, Determination of key factors for building and maintaining customer relationships.)					
	1	2	3	4	5
The customer requirements are considered as the basis for quality and innovation					
Determination of future customer expectations.					
Most employees realize that the real purpose of their existence is “service to customers					
The service of your organization is reliable, responsive and empathetic to customers					
Our company collects extensive complaints information from customers					
Our company always conducts market research for collecting suggestions for improving our products					
Evaluation of formal and informal complaints.					
Our company has develop a program to maintain good customer communications					
We reset our standards whenever customer needs and expectations change					
Follow-up with customers for quality/service feedback.					
Measurement and evaluation of customer satisfaction factors.					
Interaction with customers to set reliability, responsiveness, and other standards.					
Communicating customers’ future strategic needs throughout the supply chain.					
We have introduced and maintained the “customer focus” philosophy for a long time					
Customers requirement are communicated to employees					
Quality-related customers complaints are treated with top priority					
Quality Leadership (Regarding your company's top management positions)					
Top management strongly encourages employee involvement in quality management and improvement activities.					
Top management actively participates in quality management and improvement process.					
Top management empowers employees to solve quality problems.					
Top management empowers suppliers to solve quality problems.					

Top management strongly encourages supplier involvement in quality management and improvement activities.					
Supplier Focus (Regarding your company's attitudes towards suppliers)					
Our company regularly conducts supplier quality audit.					
Our company has detailed information about supplier performance.					
Our company always gives feedback on the performance of suppliers' products.					
Our company always participates in supplier activities related to quality.					
Our company has a formal programme for evaluating and recognizing suppliers.					
Our company regards product quality as the most important factor for selecting suppliers.					
Our company enters into special agreements with suppliers who have improved performance.					
Our company has established long-term co-operative relations with suppliers.					
Our company is more interested in developing a long-term relationship with these suppliers than reducing prices					
Employee involvement					
Our company has cross-functional teams or quality circles.					
Employees are actively involved in quality-related activities.					
Our company implements suggestion activities extensively.					
Employees are very committed to the success of our company.					
Employees within the organization are usually involved in decision making					
Employees are valued and are treated respectfully by the management within the organization Employee suggestions are usually invited during feedback sessions within the organization					
The organization conducts performance appraisal objectively within the firm					
The organization usually delegates duty within the organization					
The personnel within the organization are allowed to attend consultative meetings with the firm					
Employees are always given an opportunity to express their views within the organization					
Process Management (Quality process control)					
Our service specification are clear					
Every attempt has been made to ensure that our process design is fail-safe so that the possibility of employee errors is reduced					
We give clear, standardized work or process instructions to employees					
We continually use internal or external audits to make sure we deliver quality services					
We emphasize the continuous improvement of quality in all work processes					

Our company has an accurate and efficient database that provides information on internal operation.					
The aim of employee performance evaluation is for improvement, not for criticism.					
Production equipment is maintained well according to maintenance plan.					
Our company uses QC tools extensively for process control and improvement.					
It enable organization on organizational performance (To what extent has your firm implemented Information and Communication Technologies in its work place directed towards organizational performance?)					
Use of IT has improved target monitoring and reporting significantly at The company.					
Use of IT has helped The company incorporate quantitative targets at planning stage.					
Use of IT has helped The company implement target schedules on time.					
Use of IT has helped The company improve employee’s productivity and increased flexibility.					
The company has a network of IT systems (ERP, CRM, SCM, Intranet, etc.) highly integrated with key suppliers					
The company shares information in real time through IT with key suppliers					
The company works to have a better alignment of IT with key suppliers					
The company shares information in real time through IT within the organization					
Effective Internet usage to manage Business-to-Business commerce					
The company shares information in real time through IT with key customers					
The company works to have a better alignment of IT with key customers					
The company has a high degree of feedback through IT					
The company shares demand forecasts and production planning with suppliers					
The company receives demand forecasts and production planning from its customers					
Supply chain optimization via Efficient Consumer Response (ECR)					
Use of information systems for intra-organizational coordination and integration of the supply chain Eliminate intermediaries					

Operation Performance

Flexibility:

The company is to amend the characteristics of the products according to customer's needs (without conflicting with the regulations and instructions)					
The company has the ability to respond to changes in production volumes					

The company possesses the ability to respond rapidly to changes in the workEnvironment (internal and external changes)					
The company chooses suppliers who are flexible in responding to requests of the company when needed					
The company is characterized by openness to new ideas at Work					
The company gives its customers pay facilities after checking their financial status					

Time (Speed):

The company is committed to provide fast service to its Customers					
The company is committed to deliver orders to customers within the agreed delivery times					
Suppliers are committed to supply orders by the agreed Timetables					
The company reserves the minimum limit of stock which could continue of work in the case of raw material delay					
The company bears the differences in transportation costs in order to meet the deadlines of supplying orders to customers					
The company is characterized by quick exchange of information with stakeholders.					

Quality:

The company is committed to provide the production according to local and international slandered like GPM (Global Product Management)					
The company produces various forms of the products to suits customers' needs (provide several forms of the medication)					
The company uses transportation means that maintain the products quality (such as refrigerated cars to keep the temperature)					
The company is committed to proper storage conditions according to the specifications					
The company has control tracking system to keep the inventory valid (Expiry date)					
The company chooses their suppliers on the basis of high-quality					

Cost:

The company is seeking to reduce the wasteful use or resources (electricity, water, raw materials)					
The company is working to reduce defective in output (the proportion of damaged products)					
The company arrange its internal processes in a manner to shorten performing activities (layout)					
The company is working to reduce the inventory to minimum level to the extent that does not hinder the continuation of Work					
The company uses the cheapest transportation means without compromising the quality of the products					
The company is working on economy of scale (large-scale production to reduce the cost per unit)					

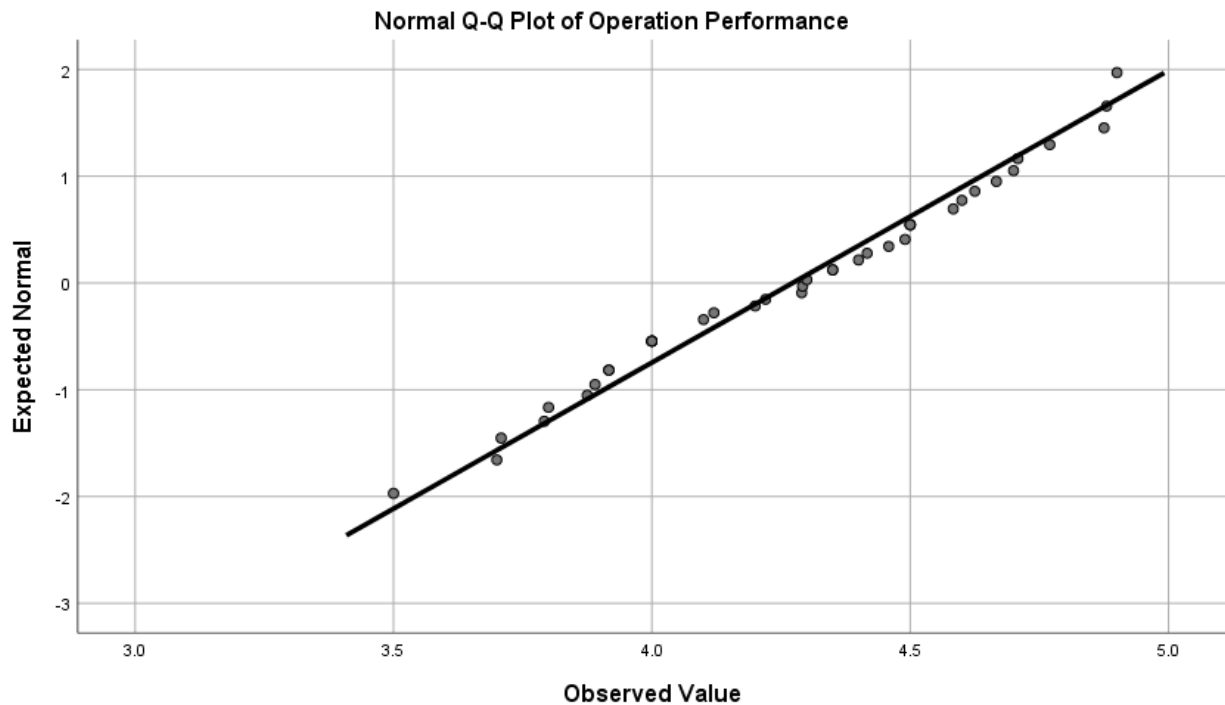
Interview Questions

1. Describe management commitments, attitudes and involvement towards quality objectives and improvement.
2. How are quality goals and objectives formalized throughout the facility? How are they measured? Is improvement managed continually? Or upon crisis? How?
3. Are internal plans created jointly among various functions?
4. Who is responsible for quality? Is there a reliance on the Quality Assurance Department?
5. What makes this organizational structure distinctive/advantageous in terms of managing and measuring quality? Ensuring customer satisfaction? Managing supply chain?
6. Are there tasks performed jointly by supply chain and quality management departments? Explain
7. Are you currently working in a project to improve the performance of actors in any part of the supply chain?
8. What integrative processes are in place internally and how integrated are these processes? Are the responsibilities shared? Are the performance measures shared? How is information/data shared?
9. How are employee duties/jobs/work practices tied to quality objectives/customer satisfaction?
10. Are the members of the supply chain working toward mutual goals (collaborating)? Are there alliances win-win situations? Are there any established “rules of engagement?”
11. What do you think is the advantage of supply chain and quality departments’ integration?

APPENDIX II

Descriptive

		Statistic	Std. Error	
Operation Performance	Mean	4.2723	.05776	
	95% Confidence Interval for Mean	Lower Bound	4.1555	
		Upper Bound	4.3892	
	5% Trimmed Mean	4.2754		
	Median	4.2958		
	Variance	.133		
	Std. Deviation	.36530		
	Minimum	3.50		
	Maximum	4.90		
	Range	1.40		
	Interquartile Range	.56		
	Skewness	-.088	.374	
	Kurtosis	-.891	.733	



ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * Customer Focus	Between Groups	(Combined)	4.821	27	.179	5.592	.002
		Linearity	3.982	1	3.982	124.728	.000
		Deviation from Linearity	.839	26	.032	1.010	.516
	Within Groups		.383	12	.032		
	Total		5.204	39			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * Quality Leadership	Between Groups	(Combined)	4.801	17	.282	15.408	.000
		Linearity	4.541	1	4.541	247.743	.000
		Deviation from Linearity	.260	16	.016	.887	.591
	Within Groups		.403	22	.018		
	Total		5.204	39			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * Supplier Focus	Between Groups	(Combined)	4.532	27	.168	2.996	.025
		Linearity	3.740	1	3.740	66.759	.000
		Deviation from Linearity	.792	26	.030	.544	.906
	Within Groups		.672	12	.056		
	Total		5.204	39			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * Employee Involvement	Between Groups	(Combined)	4.764	18	.265	12.630	.000
		Linearity	4.543	1	4.543	216.777	.000
		Deviation from Linearity	.221	17	.013	.621	.839
	Within Groups		.440	21	.021		
	Total		5.204	39			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * Quality Control Process	Between Groups	(Combined)	4.957	23	.216	13.956	.000
		Linearity	4.575	1	4.575	296.223	.000
		Deviation from Linearity	.382	22	.017	1.125	.411
	Within Groups		.247	16	.015		
	Total		5.204	39			

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Operation Performance * IT enable organization	Between Groups	(Combined)	4.542	26	.175	3.427	.012
		Linearity	3.523	1	3.523	69.123	.000
		Deviation from Linearity	1.019	25	.041	.799	.696
	Within Groups		.663	13	.051		
	Total		5.204	39			