THE EFFECT OF SUPPLY CHAIN INTEGRATION ON OPERATIONAL PERFORMANCE OF ETHIOPIAN PHARMACEUTICALS SUPPLY AGENCY (EPSA), JIMMA BRANCH.

A THESIS SUBMITTED TO DEPARTMENT OF LOGSTIC AND TRANSPORTATION MANAGEMENT (M.A) IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTERS DEGREE LOGISTICS AND TRANSPORTATION

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Declaration

I hereby declare that, this thesis entitled **"The effect of supply chain integration in the operational performance, a case of EPSA Jimma branch"**, has been carried out by me under the guidance and supervision of Dr. Zerihun Ayanew and Mrs. Tigist Waktole. The thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

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Certificate

This is to certify that the thesis entitled "**The effect of supply chain integration in the operational performance, a case of EPSA Jimma branch**" submitted to Jimma University, College of Business and Economics for the award of Degree of Master of Logistics and Transport Management (LTM) is a record of genuine research work carried out by Mohamedsani Kelil, under our guidance and supervision. Therefore, we hereby declare that no part of this thesis has been submitted to any other university or institution for the award of any degree or diploma.

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Abstract

Supply chain integrationmechanisms may enhance interaction andcollaboration in the firm supply chain, especiallyin the buyer-supplier interface. Internal integrationbetween purchasing and manufacturing groupsalso played a significant role in suppliercollaboration at the problem solving process. The objective of this study is to assess the effect of supply chain integration on operational performance of Ethiopian Pharmaceutical Agency (EPSA) Jimma branch. The study qualitative and quantitative approach has employed.The design of the study was descriptive and explanatory research methods. The sample size for this study was 112 employees from EPSA Jimma branch. The target respondents who were included on this study are employees who worked on the supply chain operation of the agency. Census sampling technique was employed for this study. Therefore, all the target population, 112 were planned and the researcher could able to collect 103 (91.96%) questionnaires.Both primary and secondary data collection approaches were used to conduct this study.. Based on this the data were analyzed using descriptive and inferential statistical analysis techniques. The results from the regression model indicate that supplier integration, information integration, customer integration and internal integration The finding of this study showed that there was a positive and significant relationship between the integration of internal, information, customer and suppliers and the operational performance of EPSA Jimma branch. Currently the internal integration identified in the study area is good however to made it either better or best the agency should have to give a critical emphasis on alignment among departments through better data integration & creating continuous interdepartmental contact among internal functions. Besides, the agency should have to equip itself with modern technologies like enterprise resource planning systems which benefits the company through better integration.

Key Terms: Supply chain Integration, Operational Performance, Supply integration, Customer integration, Information integration, Internal Integration.

ACKNOWLEDGEMENT

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BECO: Business & Economics College

CI: Customer Integration

EI: External Integration

II: Information Integration

II: Internal Integration

JU: Jimma University

OP: Operational Performance

SCI: Supply Chain Integration

SCM: Supply Chain Management

SI: Supplier Integration

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CHAPTER ONE

INTRODUCTION

This chapter deals with the back ground of the study, statement of the problem, objectives of the study, significance of the study, delimitation and limitation of the study, ethical consideration, organization of the paper

1.1. Background of the study

Supply chain management (SCM) seeks to enhance competitive performance by closely integrating the internal functions within a company and effectively linking them with the external operations of suppliers, customers, and other channel members. Achieving SCI is a complex task. The benefit of such SCI can be attained through efficient linkage among various supply chain activities, and the linkage should be subject to the effective construction and utilization of various supply chain practices for integrated supply chain. This means that a firm that is pursuing the effective construction of SCM practices needs to pay attention to SCI (Fawcett et al, 2008).

Vijay et al (2010)Says that the Firms with a broad span of integration have a greater focus on alignment with suppliers and customers, and have more of a supply chain focus than those with a narrow span. They also demonstrate higher levels of performance attributable to supply chain relationships. They highlight the importance to supply chain professionals of taking a broad view of the supply chain rather than focusing only on first tier suppliers and customers. They also suggest the importance of exploring opportunities to facilitate broader participation in supply chain integration efforts.

As stated by Marcos et al (2010) supply chain integrationmechanisms may enhance interaction andcollaboration in the firm supply chain, especiallyin the buyer-supplier interface. Internal integrationbetween purchasing and manufacturing groupsalso played a significant role in supplier collaboration at the problem solving process. Customer integration seemed more important to address supply problems for Original Equipment Manufacturing (OEM) firms.Theadvancement in technology, specifically in information technology, together with

globalization, the complexity of business processes and shrinking of time horizons are oscillating order-of-magnitude changes in the competitive demands on strategic business management and on the management of supply chains. The competitive pressures have a strong direct effect on supply chain strategy and integration of the organization which forces companies to look foreffective ways to manage their supply chain. In the past decade, the main focus in the supply chain management (SCM) research was the contribution of integration as a key variable to achieve improvements in their business practice (Tan, 2003).

There is a growing body of evidence indicating that SCI has a positive effect on operational performance (OP), which includes cost, quality, flexibility, and delivery outcomes (Flynn et al, 2010)(Yuen et al, 2016b). A meta-analysis conducted by (Leuschner et al R. &., 2013) revealed that the relationship between SCI and OP is positive. However, in their study, the authors also cautioned that negative or non-significant results reported by individual studies are not uncommon, and called for additional research to explain for this phenomenon. In line with their observation, Zhao et al (2011) acknowledged that the sign and magnitude of the linkages between SCI dimensions and OP differ considerably across studies.

As of studies of, Flynn et al (2010) operational performance and business performance are the two widely used measures of firm performance. Following these studies, this research considered operational performance as key aspect for measuring performance. According to this idea, one of the most important factors for improving business operations is implementation of supply chain management practices that will translate into improved organizational performance. The significance of Integrating supply chain is "to look beyond tactical order fulfillment and gain a better understanding of customer wishes for customized products and services which can help the company differentiate its offerings and increase profits. Therefore, this study wouldattempt to assess the effect of supply chain integration in the operational performance, a case of EPSA Jimma branch.

1.2. Background of the organization

The study will be conducted on EPSA Jimma branch, which found in Jimma town. EPSA Jimma Hubs is located in Jimma town to south western direction of Ethiopia, which is located 330 Km away from the capital, Addis Ababa. It is the key governmental organization for the implementation of IPLS and distribution of essential health commodities (RDF and Program) for public and private health facilities found in found in 9 zones ,2 Special woredas and 1 Town Administration. It also provides supervisory, material support and Capacity building to health facilities for strengthening and enforces the implementation of IPLS and pharmacy service. Currently the hub has been serving a total of 334 public health facilities.

In order to carry out its duties and responsibilities in an effective and efficient manner, PFSA is organized into four sub-processes (i.e. forecasting and capacity building, procurement, storage & distribution and medical equipment utilization and follow-up) and four supporting processes (fund management, human resource & general service, planning M &E, and MIS directorate) at head office level. And nineteen branches in the different regions of the country. The demand of the customer is considered to be sole drive for every function of the pharmaceutical supply management system. This implies that the data/information regularly obtained from public health facilities, which are the major stakeholders and customers of PFSA, is the basis for subsequent forecasting, procurement, storage, distribution and even capacity building activities (PFSA, 2017).

1.3. Statement of the problem

Various researchers have engaged on different levels for integration For instance, (Grzybowska, 2014)examined the Poland's influencing factors on integration and found that resource sharing; organizational compatibility, information sharing, and SCI are hindered and influenced by various interlinked activities. (Hudnukar et al, 2014) On the review of various researched literatures through collaborated SC relationships found that supply chain information sharing was important for effective supply chain collaboration.

There are constraints in the whole supply chain which critically affects operational performance of an organization such as longer lead times, supply disruptions caused by global customs,

foreign regulations and port congestion, political and/or economic instability in a source country, and changes in economics such as exchange rates which in turn leads to increasing cost of product, reduces speed of delivery of product and flexibility of the company. Globally the operational problems of wholesale businesses is expressed through: Lack of guidelines for creating alliances with supply chain partners; Failure to develop measures for monitoring alliances; Inability to broaden the supply chain vision beyond procurement or product distribution to encompass larger business processes; Inability to integrate the company's internal procedures; Lack of trust inside and outside a company; Organizational resistance to the concept; Lack of integrated information systems and electronic commerce linking firms (Fernie, 2014).

Accordingly, based on the pre assessment conducted at EPSA Jimma branch some of the problems related to operational performance include, lack of alignment among store operation, poor material handling which warehouse aiding machines, poor distribution and warehouse inventory management integration, problem of keeping steady supply of pharmaceuticals, role confusion among some departments and units, the existence of vital items stock out by problem of demand forecasting and backlog delay. As a result inconsistence observed on the operational performance of the agency. Therefore, this study is to explore and determine the effect of supply chain integration on Operational performance.

1.4. Research Questions

The main research questions are:

1. What is the effect of supply chain integration on the operation performance of business?

Sub-Questions:

1. What is the influence of internal integration in the operational performance of the agency?

2. How does the effect of information integration on operational performance of the agency reflected?

3. How the integration of customer does affect the operational performance of the agency?

4. How does the supplier integration of the agency affect operational performance of the agency?

1.5. Objective of the study

1.5.1. General objective:

The objective of this study is to assess the effect of supply chain integration on operational performance of Ethiopian Pharmaceutical Agency (EPSA) Jimma branch.

1.5.2. Specific Objectives

Specific objectives of this study are:

- ✎ To examine the influences of **internal integration** on the operation performance of Ethiopian Pharmaceutical Agency (EPSA) Jimma branch
- ✎ To verify the effect of **information** on operation performance of the agency.
- ✎ To identify the influence of **customer integration**on operational performance of the agency.
- ✎ To investigate the influence of **supplier integration** on operational performance.

1.6. Hypothesis

Based on the assumed causal relationship given in the conceptual model the following hypotheses were developed for testing.

H1. Internal integration has a significant influence on the operational performance of the agency.

H2. Information integration has a significant influence on the operational performance of the agency.

H3. Customer integration has a significant influence on the operational performance of the agency.

H4.supplier integration has a significant influence on the operational performance of the agency.

1.7. Significance of the study

This study is important because it would help the government to enact appropriate legislation in order to enhance proper supply chain management of the pharmaceuticals supply agency; this will increase the supply system efficiency which had an impact on modernizing businesses.

Stakeholders require the information in order to determine the viability of the supply chain in the Pharmaceuticals distributions and its profitability in the long run. The study would also help students and other scholars to gain knowledge in terms of information that would be attained during this study .The study is an enhancement to the academic body of knowledge for researchers, while to other scholars, it would be a source of reference material on the subject, useful for further study.

Finally, beneficiaries from the study would be the business people in the pharmaceuticals supply agency, they will use the findings to know how to enhance their work and deal with the common challenges systematically.

1.8. Scope of the Study

The topic was covers the issues of internal integration, customer integration, supplier integration and information integration on operational performance and doesn't include other performance measurements like profitability. The other delimitation was made on the subject of the study. The study addresses only employees who work under different departments (Warehouse and inventory management, Distribution & fleet management, General service, Forecasting & capacity building, Fund administration) and it doesn't consider the view of customers and other departments that are found in the agency. The geographical scope of the study was covers the city of Jimma because the departments covered under the study are found in Jimma town.

1.9.   Organization of the Study

The study was organized in to five chapters. Chapter-one presented the introductory part of the study that comprises, among others, the background of the study, statement of the problem along with the objectives and basic research questions & Hypothesis of the proposed study. Chapter-two would deal with the review of the existent literature related to the topic of inquiry; whereas chapter-three would give detail account of the design and methodological aspects Chapter four presented the data analysis, presentation and interpretation. Eventually, chapter four would incorporate the summary, conclusion and recommendations.

CHAPTER TWO
REVIEW OF RELATED LITERATURE

This chapter covers theoretical and empirical literature review related to the study. In order to provide suitable theories and empirical evidence on the topic under investigation, the researchers has reviewed a number of existing literatures; these are helps to explain some key terms, which are relevant to the study. And the researcher has also reviewed other researchers discussion related to the study area.

2.1. Theoretical Literature/ General Overview

Only a few studies used the resource-based view to the field in focus in order to get the sources of competitive advantage through SCM or to analyze the structure of chains and industrial clusters. The RBV concerns with competitive advantages obtained through the possession of heterogeneous resources (financial, physical, human, technological, organizational, and reputational) and capabilities (combination of two or more resources) by an organization. These resources and capabilities hold the core competence of an organization and serves as source of competitive advantage. The static stream of research focuses on attributes that contribute to the heterogeneity of resources and capabilities. The main barriers that may prevent competitors from imitating a firm's resources and capabilities include: durability, transparency, transferability and replicability. The more dynamic aspects of the RBV consider a firm's core competence to be its ability to react quickly to situational changes and build further competencies (Milner et al, 2003).

Hence, a firm's competitiveness is associated with the configuration of resources and capabilities as the markets evolve. However, inter-organizational relationships may also facilitate and advance the learning processes of individual firms. As such, relationships are not only output-oriented but also learning oriented. Efficiency may not only be explained in terms of productivity or operational measures, but also in terms of the opportunity to access another firm's core competencies through cooperative arrangements as an alternative to building such competencies in-house (Ensermu, 2015).

The practical field of supply chain management (SCM) is constantly changing, as the competitiveness of international companies is more and more dependent on their capability to produce and deliver customized products and services fast and efficiently all over the world. At the same time, an increasing percentage of the value creation takes place outside the boundaries of the individual firm (see, for example, (Bruce et al, 2004). This induces higher complexity and diversity into management decisions regarding the structure of the operations, the positioning of activities and processes, the role and power of the participants, and the most efficient forms of collaboration between all members in a transformation chain between production and consumption, which we call a supply chain. These issues also impact on research in the field of operations management. In order to understand and to explain decision-making and practices in a complex network of collaborating firms (see also (Rudberg, 2003).

2.1.1. The theoretical foundations of SCM

The supply chain encompasses organizations and flows of goods and information between organizations from raw materials to end-users (Handfield, 2002). The supply chain is a meta-organization built up by independent organizations that have established inter-organizational relationships and integrated business processes across the borderlines of the individual firms. A supply chain can also be characterized as a borderless organization example, (Picot, 2001), a value net (Bovert, 2000), a virtual supply chain (Chandra, 1999) an interactive firm (Johansen, 2005), a multi-organization/single-siteCoordinated operations network(Rudberg, 2003), or an extended enterprise (Davis and Spekman, 2004; Boardman and Clegg, 2001).

Several authors have traced the theoretical foundations of SCM. Thus, Stevenson (2002) found that the theoretical foundation of SCM and Alderson's functionalist theory (Alderson, 1957) have many similarities. (Mentzer et al, 2004)Presented a unified theory of logistics based upon logistics capabilities as a source of competitive advantage.

2.2. Supply Chain Integration

Ru-Jen (2009)says that Supplier integration is touted as an imperative strategy to improve firm performance and enhance a firm's competitive advantage in the marketplace. He says that several supplier integration activities, including supplier involvement, design integration, supplier base reduction, supplier commitment, and information sharing practices are examined regarding their effect on time-based competition, measured as delivery speed, new product development time, delivery reliability, and manufacturing cycle time. The statistical findings indicate while supplier integration contributes to the performance of a firm's time-based competition.

According to Kim (2009) supply chain integration have a role as an infrastructural mechanism driving higher level of linkage between supply chain management practices and competitive capability, which brings direct effect of both variables on supply chain performance.

Kim (2009)says that coordination between market related diversification strategies and SCM strategies will lead to better performance than when the two strategies are pursued independently. He suggest that in small firms in which the direct effect of diversification on firm performance is absent relatively, the level of SC integration may be a critical intervening variable that could lead to successful diversification, while in case of large firms, SCI may play an important infrastructural role for direct effects of diversification level on firm performance. This is helpful in developing a framework for linking a firm's SCI strategy to its market/productdiversification strategy, and also in identifying how SCM function can play a role in developingand supporting corporate competitive strategy to improve organizational performance.

Van der Vaart (2008) says that Supply chain integration is considered one of the major factors in improving performance. Based upon some concerns regarding the constructs, measurements and itemsused this paper analyses survey-based researchwith respect to the relationship between Supply chain integration and performance. The review shows that there are significant differences in the factors and constructs used to measure Supply chain integration.

Lee et al (2007) also argue that internal integration is the most important contributor to cost-containment while integration with the supplier is the best strategy to achieve supply chain reliable performance. Availability of electronic ordering systems for customers is an important strategy in cost-containment. Fast and easy ordering is the best strategy for customer in performance reliability. Reliable delivery with supplier collaboration in managing a broad supply chain operation is the best way to link with suppliers. Access to the inventory information creates the most favorable environment in internal integration.

Kim (2009)says that in small firms, efficient supply chain integration may play a more critical role for sustainable performance improvement, while, in large firms, the close interrelationship between the level of SCM practices and competition capability may have more significant effect on performance improvement. It is concluded that, in early stage, the emphasis on systemic SC integration may be more crucial. Once SC integration has been implemented, it may be advisable to focus on SCM practice and competition capability.

Eric et al (2006)suggest that information technology enabledintegration should be an integral part ofmanufacturing firm's supply-chain managementefforts, especially for supplier development andinvolvement, while responsive suppliers arecritical for both manufacturing flexibility and costadvantage under uncertain environments.

Prabir et al (2005) suggest that supply chain integration ismore a rhetoric than reality in most industries.While performance has been shown to haveimproved as a result of collaboration withsuppliers and customers alike in areas such assupply chain design, inventory management andcustomer relationship management.

A tight relationship among the members of supply chain create a conducive environment for the free flow of information and better performance, proper functioning with employees, having better infrastructure and systems can have a climate of innovation and free flow of ideas. Thus having such type of organization creates capability for delivering high quality of goods and services which in turn have best satisfied customers and, a desire to be part of a win-win relationship. Consequently, a variety of opportunities will be created in order to sustain long lasting supply chain profitability and market share but needs to be managed effectively (Andrew, 2013).

Above all, supply chain integration emphasizes about collaboration between different companies within the supply chain or supply chain members. There are various key processes that can be

integrated across the supply chain and some of them are: customers relationship management, customer service management, and demand management, order fulfillment, manufacturing flow management, procurement and product development (Sillanpaa, 2010).The extent of Supply chain integration depends on the extent in which a supply chain create a strategic alliance between the supply chain members and managers both across and inside organizational processes ,so that they can attain efficient and effective flows of products, services, money, information, and decisions. Highly integrated supply chain results in high product quality(lower defect rate), high visibility, short lead time , small amount of inventory and high capacity utilization, as a result managing supply chain integration becomes the best approach for the challenges of rapid market change, change in technology and globalization (Dawei,2011).

2.2.1. Internal Integration

Organizations must have willingness to integrate capabilities through data, system and process internally before they engage in meaningful external integration. Flynn et al (2010)Explained internal integration, as a systematic way of creating inter-functional interaction, collaboration, coordination, communication and cooperation that takes functional areas together to create a cohesive organization.

The great problem here is that, firms still practice the traditional information exchanges between the different functions such as telephone, letter, and verbal instructions. Data collection, storage, and handling mechanisms were highly manual and paper based. However, firms have started to collect data in the form of soft copy with help of computer. Some of the firms have started also to use information management system for the same purpose. This practice was just at infant and pilot stage. The inventory management policy was governed by high stock level for long period of time to control supply and demand uncertainty. In particular for imported items some firms kept up to maximum of one-year stock level. This practice has created financial constraints and storage problems. These challenges were true also for seasonal agricultural products such food, wood, textile, and leather manufacturers also (Fasika et al, 2014).

2.2.2. External Integration

External integration composed of supplier and customer integration. Supplier integration includes a strategic collaboration among a focal firm and its suppliers to properly undertake cross-firm business processes, such as information sharing, strategic partnership, and collaboration for effective planning and joint product development. Customer integration, also called "forward" integration Frohlich (2001) refers to the systematic way of creating interaction and collaboration between an organization and its customers to ensure the effective flow of products and/or services to the intended customers (Zhao et al, 2011).

As the competitive environment is becoming increasingly challenging, firms are undertaking efforts to compete along multiple fronts. However, in today's business world many organizations find it difficult to compete in the market by their internal resources and competencies alone rather they preferred to integrate and collaborate with their suppliers and customers to get information and complementary resources, which helps them in order to build and strengthen their competitive advantage. Stank et al (2001) Described that the integration of customer is a critical competency that affects the overall performance of an enterprise. Stank et al T. K. (2001)also further illustrated that external collaboration had a positive impact on logistics performance.

2.2.3. Supplier integration

Signifies the systematic process of linkage and interaction between company and suppliers to strengthen the effective flow of resources. The integration of Suppliers leads to significant improvements in terms of cost and quality while delivering products to customers. Through the management of suppliers strategically it is possible to increase the company's competitive power in terms of flexibility, reliability, cost and quality improvements (Otchere et al, 2013). A supply chain includes different stages involved, directly or indirectly, to satisfy customer requirements. The reflection of integration depends on the quality of collaboration among departments that is required to acquire unity of efforts by the interest of the environment. The touch point of supplier integration are many where a buyer'sprocess integrates with their seller's process and provides solutions for each of those touch points and increases the value of both organizations when implemented. In the integration of supplier, a number of studies have found

that, there is a positive association between supplier integration and operational performance (Peterson, 2007); (Handfield, 2002)(Devaraj et al, 2007).

As for business performance, similar to customer integration, the few existing studies focusing on this aspect have not found a direct positive association between supplier integration and business performance or between integration intensity and business performance (Rosenzweig et al, 2013) have a different view on this aspect and illustrates, supplier integration and performance are positively and significantly related and it is an indication that enhancing supplier integration will lead to increased performance. Likewise ignoring supplier integration aspects can significantly affect the productivity of the industry.

2.2.4. Customer integration

Customers Integration emphasizes with cooperation and interaction between a given company and its customers, to ensure the effective flow of products or services to customers. Customers Integration involves sharing of customer's demand information, aiding producers to understand customer's demand in a better manner and expecting customer's demand as well as collaborating and cooperating with customers to design, to reach products with better quality, lower costs and greater flexibility in response to customer's demand. Customer Integration is directly related to operational performance (Otchere et al, 2013).

From the customer side of integration, different researches indicate that this dimension is directly and indirectly (Devaraj et al, 2007) associated with improved operational performance. However, other studies contradict the customer-facing to operational performance association (Swink et al, 2007). Customer integration and performance of wholesale industry are positively related. This means that improving the extent to which the industry ensures customer integration has a great potential to improve the industry's performance. Elements of customer integration dealt with in this study such as computerization for ease of customer ordering and establishment of quick ordering system should be ensured for improved performance (Evans, 2013).

Effective customer integration plays a paramount role for continuous growth and competitiveness in the market in terms of value creation (Storey et al, 2005); (Reichhart, 2007).

Strategies of value-creation for instance, establishing a strong close relationship with customers results for building a working operational capability for the firm. One of the critical plots is that, relationship between organizations with its esteemed customer is a basic mechanism to achieve competitive advantage and better business performance. Different studies conducted in the area illustrated that customer relationship management is tightly linked to operational capability in terms of cooperation.

2.2.5. Information integration

Information integration refers to the free sharing of accurate and timely sharing of information across the members of the supply chain which is a key success factor for an organization. According to Lisa Harrington (1999), Supply chain management emphasizes on the flow of information and products along the members of supply chain in an organization and also encompasses; suppliers, customers, producers, and service providers that integrates together the acquisition, purchase, manufacture, assemble and distribute products from suppliers to the ultimate users. Proper information utilization will lead to greater coordination in the chain and a better coordination in the flow of information between partner's results to growing impacts on the timely delivery (speed), accuracy, quality of products. A critical emphasis on information technology without the interest of sharing information will not contribute to associate organizations together. Effective utilization of information technology has the potential to develop supply chain partners in order to perform together for better delivery of products to consumers.

2.3. Empirical Review

Stank et al (2001) Studied the 306 firms have been integrated in North America for logistical and performance benchmarking. The study identified and used six aspects of integration and six different measures of performance. Relationships influence internal, operational and customer; technology & planning integration vs information systems support and advanced shipment notification support; measurement integration with customer satisfaction; finally relationship integration vs financial performance, specifically return on assets.

On an empirical investigation of supply chain management practices in large private manufacturing firms in Kenya, The researcher noted there was no significant relationship. A limitation of this studyis that it used regression analysis on ordinal (Likert) scale measures. Also other factors that could influence the relationship such as firm size and age were not considered. (Awino et al, 2009)Conducted a study on supply chain best practices in private manufacturing firms formed an empirical investigation. He noted that critical factors form linkages that enable benchmark performance, strategic alliances and supplier evaluation hence the cost of production to consumers with strategic emphasis made on the fitness of the manufacturing methods. Large firms focus on efficiency and core competencies that enable the local firms benchmark with global best practices.

Awasthi (2014) researched on challenges of supply chain integration process using barriers affecting entities in businesses among 17 were identified with methodological tests such as Decision Making Trial and Evaluation Laboratory (DEMATEL). Further research is recommended to allow planning and information sharing. Hudnukar et al (2014)Sought to determine the research papers published and journalized on specific countries based on reviewed papers on collaboration of supply chain in affected supply chain collaborations.

Research as conducted by on commercial banks and their influence on performance identify technology as a key component in achievement of processes and procedures.. Hence Integration is a major role for service delivery. Results were determined as mores strongly related in terms of performance as linked with supplier integration. The study did not consider firm characteristics and only looked at SCI on banks. Kanda (2015)on the Public Health facilities in 47 Counties of Kenya. The researcher sought to establish influence of: procurement processes, competency of medical staff in supply chain, ICT infrastructure, distribution channels and, as factors affecting efficiency in Health Centers in Kenya.. The results showed that indeed these factors influenced supply chain efficiency.

Ralston et al. (2015) studied the firm's performance, a firm's strategy, its supply chain integration efforts using a sample size of 220 of USA firms. Structural equation modeling approach was used. Corporate strategy was hypothesized to influence both customer and supplier integration and these two variables in turn affect demand. Demand on the other hand will

influence performance as well as operations. Hypothesis showed that operational performance will influence financial performance. It was found that corporate integration had both customers and suppliers having positive relationship which were also found to influence demand as predicted.. This study utilized firm characteristics such variables as market share and control industry size.

There is a growing body of evidence indicating that SCI has a positive effect on operationalperformance (OP), which includes cost, quality, flexibility, and delivery outcomes (Flynn et al, 2010)(Yuen et al, 2016b). A meta-analysis conducted by Leuschner et al R. R. (2013) revealed that the relationship between SCI and OP is positive. However, in their study, the authors also cautioned that negative or non-significant results reported by individual studies are not uncommon, and called for additional research to explain for this phenomenon. In line with their observation,Zhao et al (2011) acknowledged that the sign and magnitude of the linkages between SCI dimensions and OP differ considerably across studies.

According to the study of Kocogluipe et al (2011) sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of inventory costs, increases the satisfaction of customer through reliable and fast delivery of products, improve performance and increase operational effectiveness. While the technological aspect of information integration is significant, it is the frequency, the quantity and the quality of information that is shared that really matters.

There are scholarly opinions in the evaluation of business performance. Nwokah (2006) suggests that, business performance is related to the fulfillment of financial and operational business goals which helps to determine the status of an organization when compared to its competitors. There are many indicators used to understand the performance status of a firm. Business achievements or attributes are considered as strong financial result, satisfied customers and motivated employees, high levels of individual initiative, high level of productivity and the degree of innovation, aligned performance measurement and reward systems.

Based on the research of Harland et al (2007), on barriers to supply chain information integration identified that adoption of Electronic business into supply chain function is below expectation

due to various barriers. These barriers are poor strategic alignment of information strategies, lack of awareness on the adoption of potential benefits of Information Technology, lack of leadership from the management and thrift in this regard in different organizational context.

Different organizations use financial performance as a key output measure of firm performance, but many studies conducted on supply chain described that, relying only on financial performance measures results for various limitations (Eccles&Pyburn, 1998). This study, focus on operational performance to measure the benefits of Supply Chain Integration. Internal integration can help functions to leverage each other's resources and capabilities to jointly design products, ensure product quality and reduce duplicated tasks which allow speeding up product delivery processes, improving distribution process and reducing the obsolescence of inventory through accurate information about the demands and preferences of the customer (Schoenherr&Swink, 2012).

Many studies conducted on the relationship between SCI and operational performance reflects that an effective integration along the supply chain have an impact on the financial performance of an organization. For example, according to Frohlich (2001), manufacturers that have higher degrees of supplier and customer integration obtain the highest performance improvements in terms of market share and profitability. We can indicate that operational performance plays a vital role in the relationship between Supply Chain Integration and financial performance.

A broader conceptualization and more effective business performance should include indicators of operational performance. This is mainly because non-financial measures can overcome the limitations of just using financial performance measures (Eccles&Pyburn, 1992, Medori, 1995, Neely, 1998, Beamon, 1999, (Medori, 2000). There are many advantages of using non-financial measures, including the facts that nonfinancial measures are more timely than financial ones (Chen and Lee,1995), they are more measurable and precise, they are consistent with company goals and strategies, and non-financial measures change and vary over time as market needs change and thus tend to be flexible (Medori, 2000).

While financial performance measures are more likely to reflect the assessment of a firm by factors outside of the firm's boundaries, operational measures reflect more directly to the

efficiency and effectiveness of the operations within the firm. These categories of performance reflect competencies in specific areas of supply chain including cost, quality, and flexibility. They also mirror the two arguably most important dimensions of supply chain performance: efficiency, the ability to provide a service at a lowest possible cost, and customer service, the ability to accommodate customers" special requests (Fawcett et al, 2008). Operational performance measures provide a relatively direct indication of the efforts of the various supply chain constructs.

Information processing theory suggests that information processing capability, which is an aspect of II, is critical for firms operating in a complex environment. According to Zhao et al (2011), some external information may be overlapping or redundant. The task of processing the external information and transforming them into economically useful information by using data management systems and learning mechanisms depends on how internally integrated a firm is. The ability to absorb and assimilate information to render an optimal decision is certainly more crucial in service supply chains since each service is unique and there is lesser lag time for service firms to respond to customers' orders.

Literature reveals that before 1980s there was a concept of vertical integration as being 100 percent owned operations by a firm that are physically interconnected to supply 100 percent of a firm's need. After 1980s various researchers and the practitioners argues that this practice outmoded and stated that it does not necessarily correspond to ownership of the whole chain. One of the early contributions acknowledging the phenomenon is Harrigan's (1984) study. He introduces the concept of "tapered integration". According to her study, an organization does not own 100 percent of the adjacent business units in the supply chain, but relies on other organizations to provide some portion of its input and output. After that several studies point out various levels of supply chain integration in practice (Frohlich, 2001); (Rosenzweig et al, 2013). Most empirical studies have focused on either upstream integration (Peterson, 2007) or downstream integration (Rosenzweig et al, 2013); however, an empirical study by (Frohlich, 2001) has shown that companies with the widest degree of integration with both suppliers and customers have the strongest association with performance improvement.

I found a number of rationales from researchers and practitioners on the contribution of SCI in operational performance of an organization. For example Stanley et al (2008) state that SCI can cause inventory reduction, improved delivery service, and shorter product development cycles. Further Kim (2009) argued that Supply chain management (SCM) seeks to improve competitive performance by closely assimilating the internal functions within a company and effectively linking them with the external operations of suppliers, customers, and other channel members. Narasimhan (1998) Suggest that efficient SCM and purchasing practices have a significant effect on firm performance. Their study disclosed that sales, market share, and market position are influenced by not only advertising, competition level, product pricing and positioning, and degree of innovation in product lines. This means that the purpose and performance of a firm to improve the efficiency of a firm itself can be different depending on the application focus of supply chain practice. Lambert (1993) Also stresses that supply chain integration is needed for satisfying customer demands.

2.4. Conceptual framework

Supply chain integration (SCI) helps firms to reconfigure their resources and capabilities internally and externally to consolidate their supply chain as a whole in an effort to improve long-term performance (Horvath, 2001).

Internal Integration

- ✓ Data integration for internal function
- ✓ Enterprise application integration
- ✓ Integrative inventory management
- ✓ Real time searching
- ✓ Interdepartmental meeting

Information Integration

- ✓ Sharing accurate information
- ✓ Timely sharing of information
- ✓ Coordination of flow of information
- ✓ Utilization of information

Customer Integration

- ✓ Information network
- ✓ System based customer ordering
- ✓ Effective communication
- ✓ Quick ordering
- ✓ Customer Feedback
- ✓ Period of contact

Supplier Integration

- ✓ Data exchange for products
- ✓ Quick ordering
- ✓ Strategic partnership
- ✓ Stable procurement

OPERATIONAL PERFORMANCE

- ✓ Cost
- ✓ Quality
- ✓ Flexibility

Fig 1: Conceptual modelfor supply chain integration.

Source: adapted from (Hussein et al, 2014)

The figure determines a brief introduction of the variables of the present study. Independent variable consists of Supply Chain Integration, which cover integration with customer, integration

with supplier, integration with information and internal integration with in organization. Dependent variable is Operational Performance which include Cost, Quality and Flexibility. Furthermore, the model states that there is a positive relationship between supply chain integration and operational performance of a firm. The model depicts the direct effect of supply chain integration on operational performance.

CHAPTER THREE

RESEARCH METHODOLOGY

Research methodology being used in the study discusses research design , source and data type, sampling design, and data collection method, data collection instruments, data analysis and presentation method, finally validity and reliability and ethical consideration are included.

3.1. Research Design

The study has used both descriptive and explanatory research design. Accordingly, in descriptive method the study has focuses on the determination of the frequency with which an event occurs and how variables are related in a particular context. And in explanatory approach the study was concerned with determining the impact and cause and effect relationships among variables. Hence, this research is undertaken with descriptive and explanatory research design in order to give an adequate description of the variables and reveal the extent to which the factors of supply chain integration on operational performance of EPSA Jimma branch.

3.1.1. Research Approach

And also the study used qualitative approach for descriptive findings with word impression and texts. Accordingly, the collected data was presented in to two parts; in the first part the study described the relationship between the dependent and independent variables using frequency and percentage. And in the second part the study has triangulated the interdependence between the dependent and independent variables using quantitative/numerical value approaches such as, usingmultiple regression and correlation.

3.2. Source and Type of Data

Both primary and secondary data collection approaches were used to conduct this study. Primary data was collected by interviewing the staff's from selected samples and questionnaires were distributed for selected sample of each of the agency staffs. Secondary data was collected through books, journals and desk research to clarify most of the issues.

3.3. Sampling Design

A sample design is a definite plan for obtaining a sample from a given population. It refers to the technique or the procedure the researcher would adopt in selecting items for the sample (Kothari, 2014).

3.3.1. Target Population

The targetpopulations of the study were employees who work at the different departments of the EPSA Jimma branch along with the line of supply chains. Those employees were 112 in number.

3.3.2. Sample Size

The sample size for this study was 112 employees from EPSA Jimma branch. The employees those were included on this study are employees who worked on the supply chain operation of the agency.Census sampling technique was employed for this study. Therefore, all the target population, 112 were included in this study. The sampling technique was chosen for the advantages of it can be presumed that in such an inquiry, when all items are covered, no element of chance is left and highest accuracy is obtained. The research has chosen the design since there was a limited number of target population on the study area. Thus, it is logical to be used a complete enumeration of all items for this study.

3.4. Methods of Data Collection, Design and Administration

3.4.1. Methods of Data Collection/ Instrument

For the data that was collected using self-monitored questionnaires, first the respondents were communicated to get their consent. After getting their consent, the prepared questionnaires were distributed to each participant. The questionnaires were collected by checking the completeness of the data and by appreciating their participation and devoting their precious time for the research.

3.4.2. Questionnaire Design

The Likert-type scale method was used to from the range of responses: strongly disagree, disagree, Neutral, Agree, and strongly agree, with a numeric value of 1-5, respectively. The usage of this particular scaling method ensured that the research study illustrated the ability to assess the responses and measure the responses quantifiably. So that a pattern or trend may be produced in order to answer the research questions. As Neuman (2003) explained, it is a

process of asking many people the same questions and examining their answers research questions.

Secondary Data Collection:

The secondary data which the study was focused on published secondary data. These data were collected through the review analysis of the published secondary data sources which were journals, articles, books and electronics media. The data were collected with regard to the subject matter which this study was focused on.

3.4.2.1. Interview Guide

According to Drew, Hardman and Hart (1996), the advantage of the interview technique is that it enables the participants to enlighten the researcher about unfamiliar aspects of the setting and situation. It is also important to obtain information with regard to issues that require clarification and vital information that is not expected to access using questionnaires, and it was used concurrently with the design of the questionnaire. On doing so, in addition to the questionnaire, interview guide has been used and conducted with 4 key officials of EPSA's Jimma hub and with the head of the head of EPSA Jimma branch. Hence, the researcher has made the interview in accordance with the objectives of the study and the basic questions rose in the statement of the problem so as to identify particular supply chain integration and its effect on the operational performance of the agency.

3.4.3. Methods of Administration/ Quality Criteria

Self-administration/ A personal delivery and pickup methods wasused to improve the return of the questionnaires from study participants. Moreover covering letter was attached to each questionnaire to introduce the research objectivity and confidentiality to the study participants.

3.4.3.1 Validity test

The validity test of the data collection instruments was done with the help of an expert to edit the questionnaire and the interview guide. The researcher was forward the questionnaire and the interview guide to supervisor who is an expert in the area covered by the research for editing and reviewing.

3.4.3.1 Reliability test

The reliability was ensured by testing the instruments for the reliability of values (Alpha values) as recommended by Cronbatch, (1946). Cronbatch recommends analysis for Alpha values for each variable under study. According to Sekaran 2001 Alpha values for each variable under study should not be less than 0.6 for the statements in the instruments to be deemed reliable. Consequently, all the statements under each variable will be subjected to this test and prove to be above 0.6. A measure is reliable when it is error free and consistent across time and across various items in the instrument.

Table 3.1:Reliablity test				
	No of items	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha
Supplier integration (SI)	4	19.052	.894	.951
Information integration (II)	4	18.860	.869	.956
Customer integration (CI)	6	19.022	.882	.954
Internal integration	6	19.808	.910	.950
Operational performance (OP)	4	19.536	.906	.950

The results of data analysis showed that the survey indicators, which were adopted from mature measurement scales, have good content validity. The Cronbach's α used in this study for the dimensions of each construct is higher than the critical value of 0.7, as proposed by (Nunnally, 1978), indicating that the internal consistency of the scale used in this research is good.Since the Sig. (2-tailed) value < 0.05, then the item is valid and if Sig. > 0.05alpha, the item is invalid. (Note that the Sig. (2-tailed) value also known as the*p-value, is in most valid circumstances take the "*0.000" value)

3.5. Methods of Data Analysis

The data was obtained through questionnaire was first edited for their completeness, categorized, registered. Based on this the data was analyzed using descriptive and inferential statistical analysis techniques. With regards to the descriptive analysis the study analyzed using mean and standard deviation. On the other hand, inferential statistics techniques, specifically multiple correlation and multiple linear regression analyseswas applied to tests whether the combined effect, of all the variables in the model, is different from zero. If, for example, < 0.05 then the model have some relevant explanatory power, which does not mean it is well specified or at all correct. The study was used SPSS version 20.0 software package in the entire analysis part.

3.6. Model Specification, Description & Coding of Study Variables

3.6.1. Multiple regression models

The effect of independent variables over dependent variable in the study area is explained using the following multiple regression model or equation. It was used to predict the value of certain variable based on the other variable. This study used cross sectional data. The intended impact on operational performance by factors of internal integration, customer integration, information integration, and supplier integration was considered using the following model:

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + ... \beta_k x_k + e$$

Where; x is independent variable (Factors)

Y is dependent variable (Operational performance)

$\alpha$is constant value

β is coefficient of independent variable to be estimated.

$Y (OP) = \alpha + \beta_1 IntI + \beta_2 CI + \beta_3 InfI + \beta_4 SI + e$

Where:-

OP=Operational performance

IntI= Internal Integration

CI= Customer Integration

SI=Supplier Integration

InfI= Information Integration

e = model error term

3.7. Ethical Consideration

For this study permission letter was forwarded from JU, BECO to EPSA Jimma branch. Then principal investigator had communicated the objective of the study with the supply chain, department head and pharmaceuticals distribution and fleet management and warehouse and inventory management teams. After getting consent from the management data collection was started. And has informed to each respondent that the information that was collected will be kept confidential.

CHAPTER FOUR

FINDINGS AND DISCUSSIONS

This chapter contains the presentation, analysis and interpretations of data. The statistical techniques that were outlined in chapter three were applied to the data, and the results obtained are presented in this chapter. The first part describes the demographic characteristics of respondents in terms of sex, age group, and education level and service years.

In the second part the analysis and interpretation of data gathered through questionnaire were discussed descriptions of the variables with different assumption tests, result of goodness of fit test and result of independent variables effect tests.

4.1. Findings of Demographic Analysis

The study sought to collect data from 112 staff's of EPSA Jimma branch but the researcher managed to collect 103 questionnaires. This represents a response rate of 91.96 percent which is very good for analysis. According to Babbie (2004) a response rate of 60 percent is good and that of 91.96 percent is very good.

Figure 4.1: Sex proportion of respondents
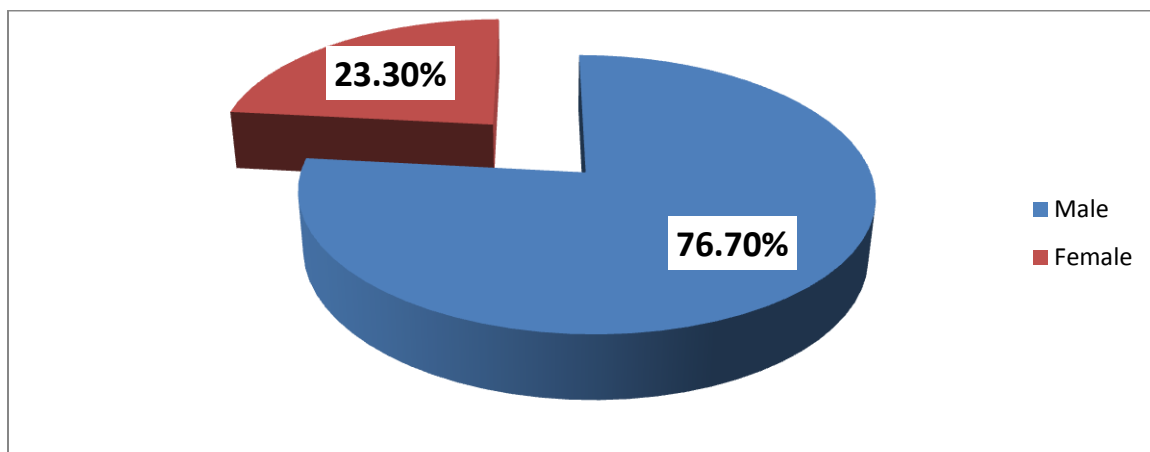
Source: Own survey,2020

According to the information observed above on figure 4.1, regarding gender of the respondents, majority (76.7%) of the respondents were male while23.3 percent of the respondents were

female (figure 4.1). This suggests a good representation of gender thereby the study collected views from both gender. This implies that the proportions of male were high in the supply chain operations of EPSA Jimma branch.

Table 4.1: Age of respondents					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<25years	7	6.8	6.8	6.8
	25-30Years	18	17.5	17.5	24.3
	31-35years	46	44.7	44.7	68.9
	36-40years	26	25.2	25.2	94.2
	>40years	6	5.8	5.8	100.0
	Total	103	100.0	100.0	

Source: Own survey,2020

Concerning the respondents age wise percentage distribution the study foundthat majority (44.7%)of the EPSA Jimma branch staff's in the study area were aged between 31 and 35 years followed by 25.2 percent of the staff's aged between 36 and 40, 17.5 percent were in between 25-30years. The remaining least proportions of 6.8 percent& 5.8% of the respondents indicated that they were<25 years and > 40years old respectively. Therefore,72.96 percent of the respondentswere aged 30 years and above (Table 4.1). This suggests that therespondents have wide experience in the work place consequentlythey are in a position to understand most of the logistics concepts. The above finding implies that most of the employees at EPSA Jimma branch were found at their productive and maturity age. Thus, they were involved on the supply operations of the agency, as a result they could able to evaluate the factors affecting the operational performance of the supply chain activities.

Table 4.2: Work experience in the agency (in years)		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<3years	14	13.6	13.6	13.6
	3-5years	31	30.1	30.1	43.7
	6-10years	43	41.7	41.7	85.4
	>10years	15	14.6	14.6	100.0
	Total	103	100.0	100.0	

Source: Own survey, 2020

As indicated above on table4.2, respondents work experience which revealed this study showed that, larger proportion 41.7% of the participants were served for 6-10 years followed by, 30.1% were serve for 3-5 years and 14.6 % were include respondents those serve > 10 years and the remaining 13.6 % were served for less than 3. This could show that as the participants experienced enough to provide information for this study. Since most of the participants stayed long on their work they had a good potential to evaluate the supply chain integration effect on the operational performance of EPSA Jimma branch.

Figure 4.2: Educational Level of Respondents
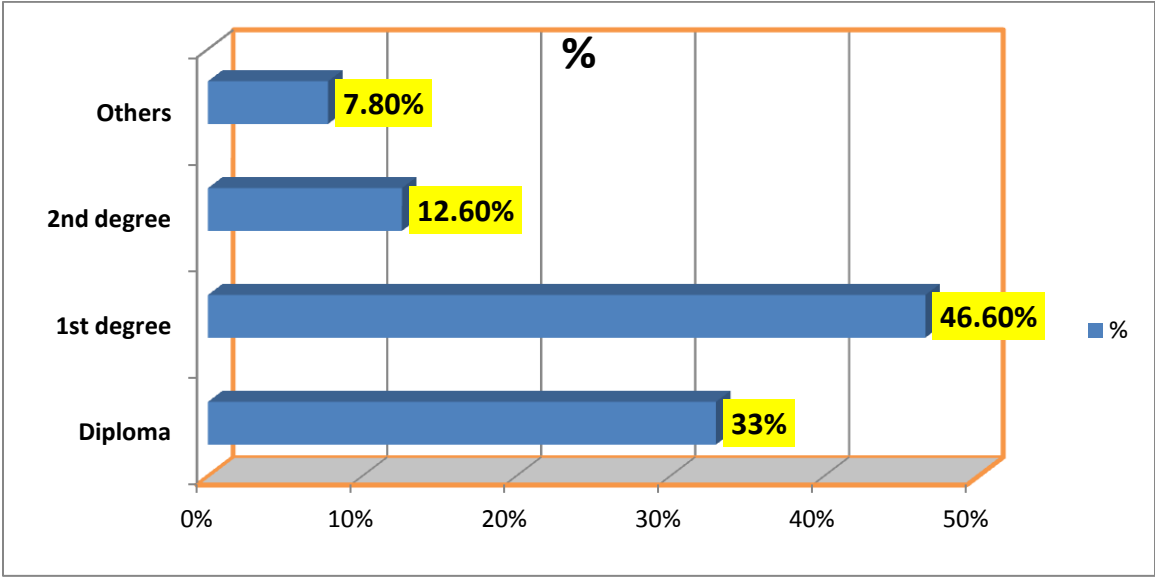
Source: Own survey,2020

According to the information observed above on figure 4.2, regarding respondents educational level the study showed that, larger proportion 46.6% of respondents were hold their first degree followed by, 33% diploma holder, 12.6% were found at the second degree level and the remaining 7.8% were found at other educational level. From this we can conclude that most of the employees at EPSA Jimma branch were found at their degree level. Thus, they could understand the subject matter of the study very well.

Figure 4.3: Respondents Position in the agency
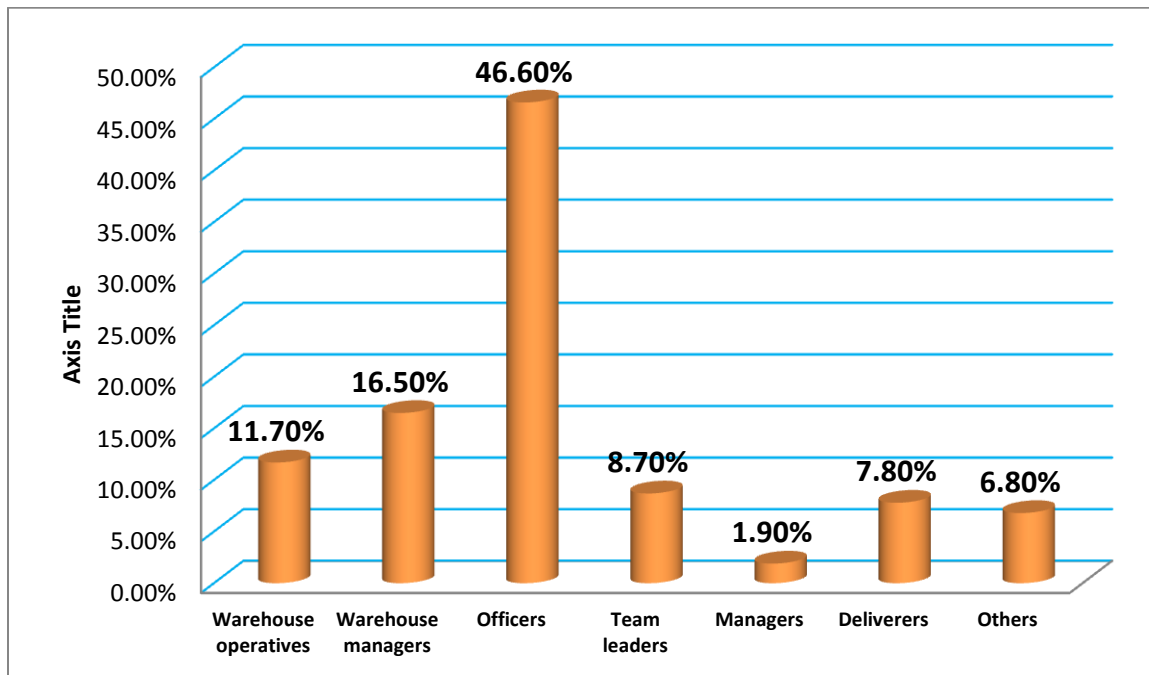
Source: Own survey,2020

The study sought to find the EPSA Jimma staff's position and responsibilities. The results indicated that larger proportion of respondents 46.6 % of them were officers at different team of the agency followed by 16.6 % & 11.7 % of warehouse managers & warehouse operatives respectively. The least proportion 1.90 % of them were at the manager position (Manager & his Vice manager) (see figure 4.3 above). Thus, the study involved the staff at a different position of the agency which to measure the issues in a varied views of the staffs at a different position.

4.2. Descriptive Analysis

The descriptive statistics utilized are based on frequency tables to provide information on the demographic variables. Through tables, summary statistics such as means, standard deviations,

minimum and maximum are computed for each supply chain integration and operational performance in this study. The findings which identified on this study presented as follows;

Table 4.3: Descriptive Statistics			
	Mean	Std. Deviation	N
Supplier integration (SI)	3.84	1.161	103
Information integration (II)	3.76	1.256	103
Customer integration (CI)	3.87	1.210	103
Internal integration	3.91	1.112	103
Operational performance (OP)	3.83	1.150	103

Source: Own survey,2020

Table 4.3; represents the calculated means and standard deviations for the dependent variable (operational performance) and independent variables (supplier integration, information integration, customer integration and internal integration). The mean of supplier integration is 3.84 which showed that average employees on the study areas were agree for the effect of supplier integration on the operational performance on the study area. This could imply supplier integration of EPSA's at Jimma branch could able to support the operational performance of the agency. The fact supported by the literature the integration of Suppliers leads to significant improvements in terms of cost and quality while delivering products to customers. Through the management of suppliers strategically it is possible to increase the company's competitive power in terms of flexibility, reliability, cost and quality improvements (Otchere et al, 2013)

Similarly the means of information integration shows that (3.76) this figure was revealed almost an agreement on average employees on the study area for the effect of information integration on the operation performance on the agency. This could suggest the effect of supplier integration slightly higher than information integration on the operational performance. According to the study of (Kocogluipe et al, 2011)sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of inventory costs, increases the satisfaction of customer through reliable and fast delivery of products, improve performance and increase operational effectiveness.

Whereas the mean value of customer integration and internal integration were 3.87, and 3.91 respectively the findings showed that almost agreement of employees to the effects of customer integration and internal integration respectively on the operational performance of the agency at study areas. This could assure as customer integration and internal integration had been rated as more efficiently operated than supplier integration and information integration on the agency. As suggested by the literature Customer integration and performance of wholesale industry are positively related. This means that improving the extent to which the industry ensures customer integration has a great potential to improve the industry's performance. Elements of customer integration dealt with in this study such as computerization for ease of customer ordering and establishment of quick ordering system should be ensured for improved performance (Evans, 2013).Organizations must have willingness to integrate capabilities through data, system and process internally before they engage in meaningful external integration. (Flynn et al, 2010). The above facts supported as customer integration and internal integration had positive effects towards the organization operational performance. Thus, EPSA Jimma branch had a practice of customer and internal integration to enhance the operational performance of the agency.

The mean value of the operational performance is 3.83 which was indicate that average number of the respondents were agree on the operational performance of the agency. According to the above findings the existing effect of the operational performance mainly affected by supplier integration, information integration, customer integration and internal integration.Many studies conducted on the relationship between SCI and operational performance reflects that an effective integration along the supply chain have an impact on the financial performance of an organization. For example, according to (Frohlich, 2001), manufacturers that have higher degrees of supplier and customer integration obtain the highest performance improvements in terms of market share and profitability. We can indicate that operational performance plays a vital role in the relationship between Supply Chain Integration and financial performance.

4.3. Result of Goodness of fit test

We want to run a regression of operational performance (Y) on SCI (X) determinants, supplier integration (X**1**), information integration (X**2)**, customer integration (X3) and internal integration (X**4**) for EPSA Jimma branch. Operational performance (Y) = function of supplier

integration(**X1**),information integration (**X2**), customer integration (X3) and internal integration (**X4**) or, as relevant text book will have it,

$$Y=\alpha+\beta1x1+\beta2x2+\beta kxk+e$$

The real question here is that "does this model works? How can we know that?

Three ways to answer this question. Always we have to look at the model fit ("ANOVA") first. We do not have to make the mistake of looking at the R-square before checking the goodness of fit.

Table 4.4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119.142	4	29.786	185.782	.000[b]
	Residual	15.712	98	.160		
	Total	134.854	102			
a. Dependent Variable: Operational performance (OP)						
b. Predictors: (Constant), Internal integration, Information integration (II), Customer integration (CI), Supplier integration (SI)						

Source: Own survey,2020

Significance of the model *("Did the model explain the deviations in the dependent variable")*

The last column in the above table (ANOVA-table) shows the goodness of fit of the model. It is p-value or observed significance of the F. *The lower this number, the better the fit*. Typically, if "Sig" is greater than 0.05, we conclude that our model could not fit the data.

The F is comparing the two models below:

1. ***OP= β0 + β1*SI+ β2*InfI+ β3*CI+ β4*IntI+et ,***

2. ***OP = β0***

(In formal terms, the F is testing the hypothesis: $\beta0=\beta1=\beta2=\beta3=\beta4=\beta5=0$)

If the F is not significant, then we cannot say that model 1 is any better than model

2. The implication is obvious-the use of the independent variables has not assisted in predicting the dependent variable. If Sig < .01, then the model is significant at 99%, if Sig < .05, then the model is significant at 95%, and if Sig <.1, the model is significant at 90%. Significance implies that we can accept the model. If Sig >.1 then the model was not significant (a relationship could not be found) or "R-square is not significantly different from zero", the model does not work at all. Note that p-value is the Sig. column value.

Test of the goodness of fit of the model in this research showed negative results. From the result of F-test, it is known that the F-statistic 185.782 is higher than the critical value 4.141 (from t-table) and the probability (p-value or the Sig. value) 0.000 is smaller than alpha (0.05). Therefore, the model is fit. The third confirmatory test is looking at the R^2 value of the model summary which is .883 > 0. As this value gets approach to +1, the better the model will be.

Table 4.5: Model Summary[b]

Mo del	R	R Squa re	Adjuste d R Square	Std. Error of the Estimat e	Change Statistics				
					R Square Change	F Change	df 1	df2	Sig. F Chan ge
1	.940[a]	.883	.879	.400	.883	185.782	4	98	.000
a. Predictors: (Constant), Internal integration, Information integration (II), Customer integration (CI), Supplier integration (SI)									
b. Dependent Variable: Operational performance (OP)									

Source: Own survey,2020

If we had to compute it by hand the F value, it would be…　　　　　$F= \dfrac{R^2/_{k-1}}{1-R^2/_{(N-k)}}$

Where:

F=F-value that is resulted from the calculation;

R2 =coefficient of determination;

k=number of variables (# of dependent and independent variables);

N=number of observations (# of sample respondents).

(K-1) = degree of freedom

Given

R^2=0.883................from regression summary table

K-1 = 5 – 1 = 4, 1 - R^2= 1-0.883 = 0.117 and N-k = 103- 5 = 98=df2

Therefore, F= 0. 883/4 ÷0.117/98

＝ 0. 883/4 * 98/0.117 = .22075*98 ÷ .0.117 　 = 21.6335/.117 = 184.902

＝ 0.22075*837.6068＝ 184.902

The value is similar, 185.782=184.902; the difference could be the effect of rounding.

The results from the regression model summary and analysis of variance above indicate that supplier integration, information integration, customer integration and internal integration could significantly contribute towards the R^2 value, which is a statistical measure of how close the data are to the fitted regression line Based on the R^2value of 0.883, these four variables could explained 88.3 % variation in the operational performance of the agency.

Sample characteristics of Multi co linearity

Table 4.6: Co linearity statistics

Variables	Tolerance	VIF
Supplier integration (SI)	.170	5.884
Information integration (II)	.222	4.154
Customer integration (CI)	.221	4.531
Internal integration	.192	5.210

Dependent variable: Operational Performance

According to the information observed above on table 4.3.1 Output of variance inflation factor (VIF) column in the coefficients table of the regression output shows that VIF for SI (5.884), InfI (4.154), CI (4.531), and IntI (5.210), all are smaller than 10. It means that there is no problem of multi co linearity between independent variables and dependent variable. This can be further ascertained from the Tolerance column of the same table in which the tolerance for the four

independent variables & 1 moderate variable is 0.170, 0.222, 0.221 and 0.192 respectively all > 0.1 indicating that there is no multi co linearity.

Table 4.7: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.321	.147		2.184	.023
	Supplier integration (SI)	.197	.083	.199	2.377	.019
	Information integration (II)	.135	.067	.139	2.015	.028
	Customer integration (CI)	.175	.070	.184	2.504	.014
	Internal integration	.583	.081	.564	7.163	.000

Source: Own survey, 2020

The regression coefficients are shown in the above table. The intercept, 0.321, is representing the estimated average value of operational performance when supplier integration; information integration, customer integration and internal integration are zero. Thus an organization with no supplier integration; information integration, customer integration and internal integration have severe impact on the operational performance. The slop of independent variables also exhibits useful predictive information about the implication. The slop of supplier integration; information integration, customer integration and internal integration are 0.199, 0.139, 0.184 and 0.564 means that organization operational performance increased by 0.199, 0.139, 0.184 and 0.564 when supplier integration; information integration, customer integration and internal integration respectively increase by 1.

An examination of these four independent variables indicated that internal integration represented the strongest positive interference on the operational performance with the standard beta of 0.564 followed by supplier integration with beta of 0.199, customer integration with β of 0.184 and information integration with β of 0,139. Thus the statistical results prove that supplier

integration; information integration, customer integration and internal integration had a positive and linear relationship with operational performance of the agency.

Table 4.8: Summary of the Regression output

Variables	F-test and T-test						R^2	K	N	Conclusion
	F-statistic	Critical value	Regression coefficient	t	Critical value	p-value				
Goodness of fit testing	185.782	4.141				0.000				Significant
(Constant)			0.321	2.184	4.141	.023				Significant
Supplier integration (SI)			.199	2.377	4.141	.019	0.833	5	103	Significant
Information integration (II)			.139	2.015	4.141	.028	0.833	5	103	Significant
Customer integration (CI)			.184	2.504	4.141	.014	0.833	5	103	Significant
Internal integration			.564	7.163	4.141	.000	0.833	5	103	Significant

Source: 2020 survey

Based on the above tables, the regression model will be filled in as follows:

$$Y = 0.321 + 0.199X1 + 0.139X2 + 0.184X3 + 0.564x_4 + \varepsilon$$

4.4. Result of hypotheses test

"Hypothesis is a formal statement that presents the expected relationship between an independent and dependent variable."(Creswell, 1994).**The hypothesis** provides a simple statement of association between Y and X. Nothing is indicated about the association that would allow the researcher to determine which variable, Y or X, would tend to cause the other variable to change in value. Based the hypothesis drawn for this study the findings which were revealed presented as shown below.

Table 4.9. Hypothesis test Summary

S/No	Hypothesis	p-value	r-coefficients	tested value
1	Ho1: *Internal integration has no a significant influence on the operational performance of the agency..*	.000 (p<0.05)	.564	**rejected**
2	Ho2: *Information integration has no a significant influence on the operational performance of the agency.*	.028 (p<0.05)	.139	**Rejected**
3	Ho3: *Customer integration has no a significant influence on the operational performance of the agency.*	.014 (p<0.05)	.184	**rejected**
4	Ho4: *supplier integration has no a significant influence on the operational performance of the agency*	.019 (p<0.05)	.199	**rejected**

Source: 2020 survey

4.4.1 Result of first hypothesis testing (Internal Integration)

Internal integration was defined as the level of collaboration among functional groups in a firm, and is measured by the degree to which a firm can structure its organizational strategies, practices, procedures and behaviors into collaborative, synchronized, and manageable processes to fulfill its customers' requirements (Zhao *et al.*, 2011).In a summary, multiple regression analysis indicated that, internal integration positively predicted operational performance of EPSA Jimma branch. This could suggested as internal integration had a strong positive relationship with significant effect of with operational performance on the organization which (r = 0.564, N =103, p < 0.01)

Thus, the null hypothesis **Ho1:** *Internal integration has no a significant influence on the operational performance of the agency* was rejected and HA1: *Internal integration has a significant influence on the operational performance of the agency* was accepted. The result of

this study fits with researches done previously, have found a positive relationship among internal integration and operational performance. For instance, Stank, Daugherty, and Ellinger (1999) found a positive association between frequent collaborative integration along marketing, logistics and firm performance. Further, Stank, Keller, and Daugherty (2001) found that internal collaboration had a positive impact on logistics performance which in turn associated with overall performance improvement. Therefore, the agency should have to pay a great concern on advancing and maintaining its internal integration effort to enhance the operational performance of the organization.

4.4.2 Result of second hypothesis testing (Information Integration)

Proper information utilization will lead to greater coordination in the chain and a better coordination in the flow of information between partner's results to growing impacts on the timely delivery (speed), accuracy, quality of products. In a summary, multiple regression analysis indicated that, information integration positively predicted operational performance of EPSA Jimma branch. This could suggested as information integration had a positive relationship with significant effect of with operational performance on the organization (r=0.139, N=103, p<0.05).Thus, the null hypothesis **Ho$_1$:** *information integration has no a significant influence on the operational performance of the agency* was rejected and HA1: *information integration has a significant influence on the operational performance of the agency* was accepted.According to the study of Koçogluipek , SalihZekiimamoglu, Hüseyinince, HalitKeskin (2011),sharing of information across the chain is a key and critical component in achieving an integrated supply chain because it is believed that SCI increases collaboration, minimizes uncertainty, increases the speed of material flow, accelerate order fulfillment, reduction of inventory costs, increases the satisfaction of customer through reliable and fast delivery of products, improve performance and increase operational effectiveness. Thus, EPSA Jimma branch should have to improve to more extent its trends of information sharing habit in order to increase the rate of information integration through its supply chain as a means of improving the agency operational performance.

4.4.3 Result of third hypothesis testing (Customer Integration)

Effective customer integration plays a paramount role for continuous growth andcompetitiveness in the market in terms of value creation (Storey*et al*., 2005; Reichhart andHolweg, 2007).In a summary, multiple regression analysis indicated that, customer integration positively predicted operational performance of EPSA Jimma branch. This could suggested as customer integration had a positive relationship with significant effect of with operational performance on the organization which (r=0.184, N=103 p< 0.05).Thus, the null hypothesis **Ho$_1$:** *customer integration has no a significant influence on the operational performance of the agency* was rejected and HA1: *customer integration has a significant influence on the operational performance of the agency* was accepted. From the customer side of integration, different researches indicate that this dimension is directly and indirectly (Devaraj*et al*. 2007) associated with improved operational performance. However, other studies contradict the customer-facing to operational performance association (Swink, M., Narasimhan, R., & Wang, C.2007). Customer integration and performance of wholesale industry are positively related. This means that improving the extent to which the agency ensures customer integration has a great potential to improve the agency's performance. Therefore, the agency should have to work hard on the tasks of customer integration on its supply chain operations.

4.4.4 Result of fourth hypothesis testing (Supplier Integration)

The integration of Suppliers leads to significant improvements in terms of cost and quality while delivering products to customers. Through the management of suppliers strategically it is possible to increase the company's competitive power in terms of flexibility, reliability, cost and quality improvements (OtchereA.F. Jonathan Annan and Emanuel KwabenaAnin, 2013).In a summary, multiple regression analysis indicated that, supplier integration positively predicted operational performance of EPSA Jimma branch. This could suggested as supplier integration had a positive relationship with significant effect of with operational performance on the organization (r= 0.199, N=103 P< 0.05) .Thus, the null hypothesis **Ho$_1$:** *supplier integration has no a significant influence on the operational performance of the agency* was rejected and HA1: *supplier integration has a significant influence on the operational performance of the agency* was accepted. The finding of the study which similar the study conducted by Evans Mose (2013),have a different view on this aspect and illustrates, supplier integration and performance

arepositively and significantly related and it is an indication that enhancing supplier integration will lead to increased performance. Thus, supplier integration is the other variable which needs a great concern from the agency to improve the operational performance of the agency.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter provides the summary of major findings, conclusions and recommendationof the study.

5.1 Summary

In this study, the researcher looked for the effect of supply chain integration onoperational performance in case of Ethiopian Pharmaceuticals Supply Agency Jimma branch. The study also illustrated therelationship that exists between the operational performance and supply chain integrationdimensions and also along the dimensions of supply chain integration with the intent ofknowing the strength of the relationship of the dimensions in this particular case. Based the collected data the researcher could able to summarize the following major findings.

The study sought to collect data from 112 staff's of EPSA Jimma branch but the researcher managed to collect 103 questionnaires. This represents a response rate of 91.96 percent which is very good for analysis. The Demographic analysis shows that the number of male respondents higher than female, the age category between 31 to 35 years was the age group for larger proportion of respondents, most of the respondents were served for 6-10years and most of the study participants were hold their first degree and most of them were officers at their working position

According to the mean value of the descriptive findings of the study shows that most of the respondents were tends to agree on the overall practices of supplier integration, customer integration, internal integration, information integration and operational performance of the agency, which their mean value found in the ranges of 3.42-4.2 that indicates the cut point for average number of respondents assured their agreement.

According to the results from the regression model summary and analysis of variance above indicate that supplier integration, information integration, customer integration and internal integration could significantly contribute towards the R^2 value, which is a statistical measure of how close the data are to the fitted regression line Based on the R^2value of 0.883, these four variables could explained 88.3 % variation in the operational performance of the agency.

The slop of independent variables also exhibits useful predictive information about the implication. The slop of supplier integration; information integration, customer integration and internal integration are 0.199, 0.139, 0.184 and 0.564 means that organization operational performance increased by 0.199, 0.139, 0.184 and 0.564 when supplier integration; information integration, customer integration and internal integration respectively increase by 1.

5.2 Conclusions

In this study, the major determining factors of operational performance identified were integrating variables of supply chain based on the response of employees which composed of four dimensions; supplier integration, information integration, customer integration and internal integration. Four research hypotheses were developed and addressed in this research and fortunately all the dimensions were rated above the average mean value of 3.4. In other words, it shows the good existence of supply chain integration in the agency.

The results from the regression model summary and analysis of variance above indicate that supplier integration, information integration, customer integration and internal integration could significantly contribute towards the variation in the operational performance of the agency. The

contribution these four variables are very high. Thus, the agency should have to pay a great concern towards monitoring the indicated variable as a positive indicator for operational performance of the agency.

An examination of these four independent variables indicated that internal integration represented the strongest positive interference on the operational performance, followed by supplier and customer integration. Thus the statistical results prove that supplier integration; information integration, customer integration and internal integration had a positive and linear relationship with operational performance of the agency.The results given on the conclusion entails us that the four hypotheses developed in this study were considerably tested with the regression coefficient and t-test which actually indicates that all four hypothesis rejected their null hypothesis and accepted the alternative hypothesis to confirm that the independent variables having a significant relationship with the dependent variable.

5.3 Recommendation

Based on the identified result, the findings which summarized & the conclusion had been drawn, the study could able to forward the following recommendations as a possible solution for the identified gaps to the concerned bodies for intervention.

❖ In order to improve the supplier integration, the agency needs to create a long-term strategic supplier relationship for strategic items. So the organization should first classify effectively the pharmaceuticals being procured based on strategic significance, then it should create long supplier relationship for items which have high value and high importance in the organization with the right suppliers.

❖ Linking the customer (Public health facilities) through information network with the agency to get feedback from the customer and creating an access of computerization for customer ordering is crucial factors while considering the integration of customer.

❖ Currently the internal integration identified in the study area is good however to made it either better or best the agency should have to give a critical emphasis on alignment among departments through better data integration & creating continuous interdepartmental contact among internal functions. Besides, the agency should have to equip itself with modern technologies like enterprise resource planning systems which benefits the company through better integration.

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Annex I-

SPSS-Statistical Output

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.321	.147		2.184	.023		
	Supplier integration (SI)	.197	.083	.199	2.377	.019	.170	5.884

	Information integration (II)	.135	.067	.139	2.015	.028	.222	4.514
	Customer integration (CI)	.175	.070	.184	2.504	.014	.221	4.531
	Internal integration	.583	.081	.564	7.163	.000	.192	5.210

a. Dependent Variable: Operational performance (OP)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	119.142	4	29.786	185.782	.000[b]
	Residual	15.712	98	.160		
	Total	134.854	102			

a. Dependent Variable: Operational performance (OP)

b. Predictors: (Constant), Internal integration, Information integration (II), Customer integration (CI), Supplier integration (SI)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.940[a]	.883	.879	.400	.883	185.782	4	98	.000

a. Predictors: (Constant), Internal integration, Information integration (II), Customer integration (CI), Supplier integration (SI)

b. Dependent Variable: Operational performance (OP)

Correlations

		Supplier integration (SI)	Information integration (II)	Customer integration (CI)	Internal integration	Operational performance (OP)
Supplier integration (SI)	Pearson Correlation	1	.856[**]	.818[**]	.836[**]	.834[**]
	Sig. (2-tailed)		.000	.000	.000	.000
	N	103	103	103	103	103
Information integration (II)	Pearson Correlation	.856[**]	1	.802[**]	.808[**]	.804[**]
	Sig. (2-tailed)	.000		.000	.000	.000

	N	103	103	103	103	103
Customer integration (CI)	Pearson Correlation	.818**	.802**	1	.851**	.844**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	103	103	103	103	103
Internal integration	Pearson Correlation	.836**	.808**	.851**	1	.907**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	103	103	103	103	103
Operational performance (OP)	Pearson Correlation	.834**	.804**	.844**	.907**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	103	103	103	103	103

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

Histogram
Dependent Variable: Operational performance (OP)

Mean = -6.77E-16
Std. Dev. = 0.980
N = 103

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Operational performance (OP)

Scatterplot

Dependent Variable: Operational performance (OP)

Partial Regression Plot
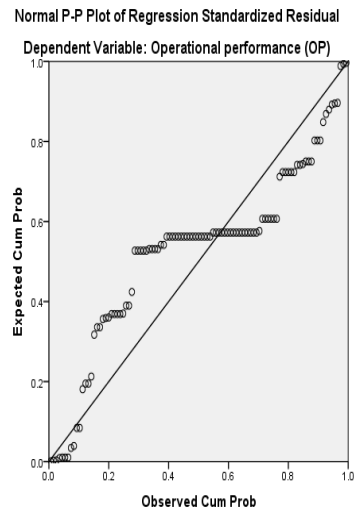
Dependent Variable: Operational performance (OP)

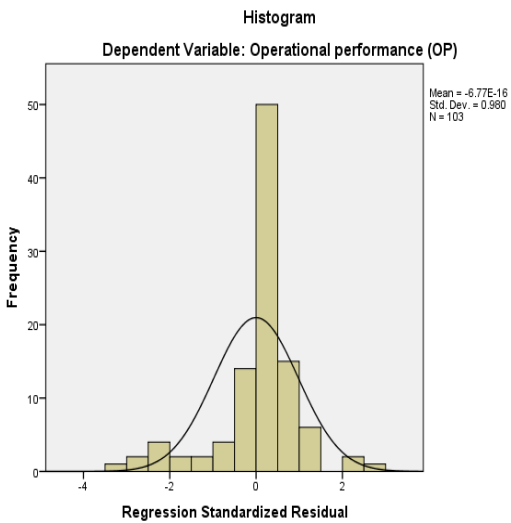Partial Regression Plot

Dependent Variable: Operational performance (OP)

Partial Regression Plot

Dependent Variable: Operational performance (OP)

Partial Regression Plot
Dependent Variable: Operational performance (OP)

Table A3   The *t*-distribution
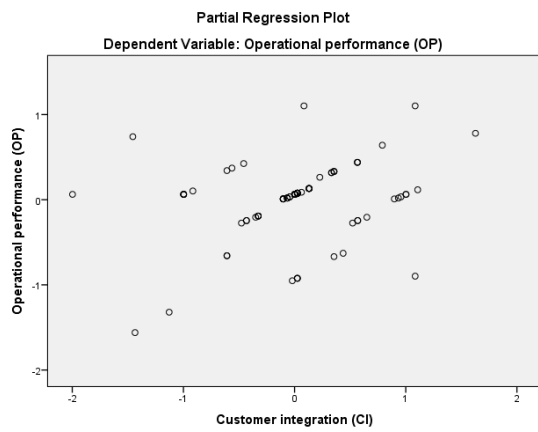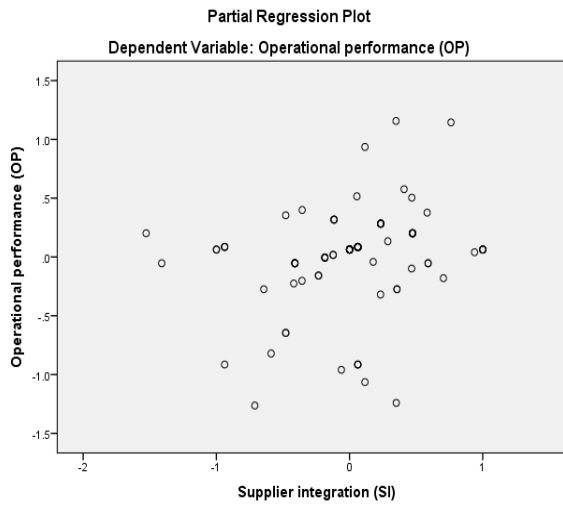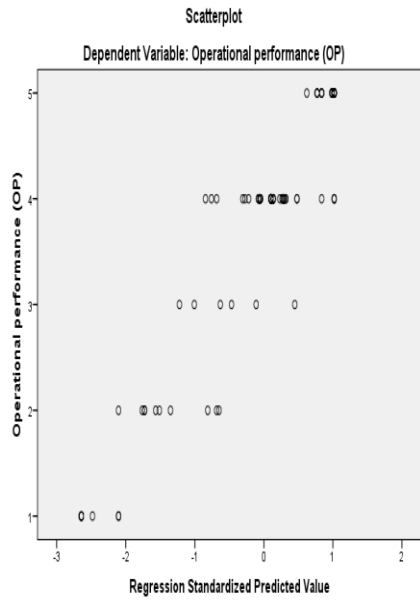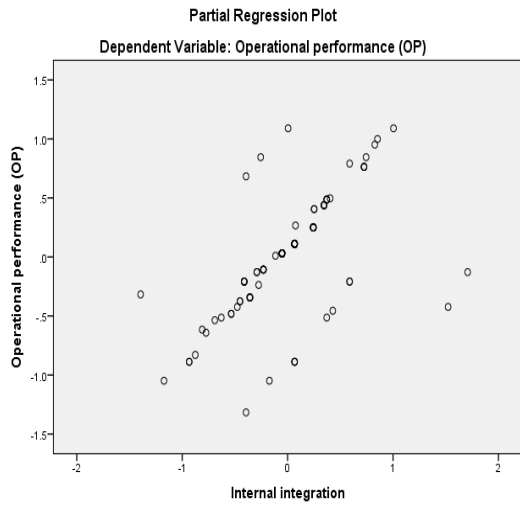
The table gives critical values of *t* for significance at various levels, in a two-tailed/non-directional or a one-tailed/directional test, for different numbers of degrees of freedom. These critical values are the values beyond which lies that proportion of the area under the curve which corresponds to the significance level.

Degrees of freedom	Significance level: two-tailed/non-directional				
	0.20	0.10	0.05	0.02	0.01
	Significance level: one-tailed/directional				
	0.10	0.05	0.025	0.01	0.005
1	3.078	6.314	12.71	31.82	63.66
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
40	1.303	1.684	2.021	2.423	2.704
60	1.296	1.671	2.000	2.390	2.660
120	1.289	1.658	1.980	2.358	2.617
∞	1.282	1.645	1.960	2.326	2.576

Table A9　The Pearson product–moment correlation coefficient

The table gives the critical values of the Pearson product–moment correlation coefficient, r, for different numbers of pairs of observations, N. For significance, the calculated value of r must be *greater than or equal to* the critical value.

| N | Significance level: two-tailed/non-directional | | | |
	0.20	0.10	0.05	0.01
	Significance level: one-tailed/directional			
N	0.10	0.05	0.025	0.005
3	0.951	0.988	0.997	1.000
4	0.800	0.900	0.950	0.990
5	0.687	0.805	0.878	0.959
6	0.608	0.729	0.811	0.917
7	0.551	0.669	0.754	0.875
8	0.507	0.621	0.707	0.834
9	0.472	0.582	0.666	0.798
10	0.443	0.549	0.632	0.765
11	0.419	0.521	0.602	0.735
12	0.398	0.497	0.576	0.708
13	0.380	0.476	0.553	0.684
14	0.365	0.458	0.532	0.661
15	0.351	0.441	0.514	0.641
16	0.338	0.426	0.497	0.623
17	0.327	0.412	0.482	0.606
18	0.317	0.400	0.468	0.590
19	0.308	0.389	0.456	0.575
20	0.299	0.378	0.444	0.561
21	0.291	0.369	0.433	0.549
22	0.284	0.360	0.423	0.537
23	0.277	0.352	0.413	0.526
24	0.271	0.344	0.404	0.515
25	0.265	0.337	0.396	0.505
26	0.260	0.330	0.388	0.496
27	0.255	0.323	0.381	0.487
28	0.250	0.317	0.374	0.479
29	0.245	0.311	0.367	0.471
30	0.241	0.306	0.361	0.463
40	0.207	0.264	0.312	0.403
50	0.184	0.235	0.279	0.361
60	0.168	0.214	0.254	0.330
70	0.155	0.198	0.235	0.306
80	0.145	0.185	0.220	0.286
90	0.136	0.174	0.207	0.270
100	0.129	0.165	0.197	0.256
200	0.091	0.117	0.139	0.182

Table A10 The Spearman rank correlation coefficient

The table gives the critical values of the Spearman rank correlation coefficient, ρ, for different numbers of pairs of observations, N.

	Significance level: two-tailed/non-directional			
	0.20	0.10	0.05	0.01
	Significance level: one-tailed/directional			
N	0.10	0.05	0.025	0.005
5	0.800	0.900	1.000	—
6	0.657	0.829	0.886	1.000
7	0.571	0.714	0.786	0.929
8	0.524	0.643	0.738	0.881
9	0.483	0.600	0.700	0.833
10	0.455	0.564	0.648	0.794
11	0.427	0.536	0.618	0.755
12	0.406	0.503	0.587	0.727
13	0.385	0.484	0.560	0.703
14	0.367	0.464	0.538	0.679
15	0.354	0.446	0.521	0.654
16	0.341	0.429	0.503	0.635
17	0.328	0.414	0.488	0.618
18	0.317	0.401	0.472	0.600
19	0.309	0.391	0.460	0.584
20	0.299	0.380	0.447	0.570
21	0.292	0.370	0.436	0.556
22	0.284	0.361	0.425	0.544
23	0.278	0.353	0.416	0.532
24	0.271	0.344	0.407	0.521
25	0.265	0.337	0.398	0.511
26	0.259	0.331	0.390	0.501
27	0.255	0.324	0.383	0.492
28	0.250	0.318	0.375	0.483
29	0.245	0.312	0.368	0.475
30	0.240	0.306	0.362	0.467
35	0.222	0.283	0.335	0.433
40	0.207	0.264	0.313	0.405
45	0.194	0.248	0.294	0.382
50	0.184	0.235	0.279	0.363
55	0.175	0.224	0.266	0.346
60	0.168	0.214	0.255	0.331

JIMMA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

DEPARTMENT OF MANAGEMENT

Dear respondents

My name is **MohamedsaniKelil** conducting a study on **the effect of Supply chain Integration on the Operational performance of EPSA Jimma branch** for the partial fulfillment of master's degree in logistics and transport management in Jimma University, college of business and economics department of management. I would like to extend my deep appreciation to your hub and you for the willingness and cooperation in undertaking this valuable research. Taking part in this study you will contribute towards alleviating the problem of pharmaceuticals delivery and order fulfillment on the supply chain of your hub. I request your cooperation to fill and respond truthfully for the asked Questions. If you have any question, you can contact me through **0935747777**. Finally, I would like to appreciate and thank you in advance for your dedication, time and genuine response to the questions.

PART I: GENERAL INFORMATION AND DEMOGRAPHIC BACKGROUND OF RESPONDENTS

Please tick (✓) or provide your own answers where applicable.

1. Sex: Male ☐   Female ☐

2. Age: _____

3. Work experience in the agency (in years)?

<3years ☐   3-5years ☐   6-10 years ☐   >10years ☐

4. Educational level

Diploma ☐   1st degree ☐   2nd degree ☐   Others,_____

5. Position in the agency? _____

Part II: THE EFFECT OF SUPPLY CHAIN INTEGRATION; (Supplier Integration, Customer integration, Information integration & Internal integration) ON OPERATIONAL PERFORMANCE IN ETHIOPIAN PHARMACEUTICALS SUPPLY AGENCY OF JIMMA BRANCH

This part of the questionnaire consists of twenty four (24) questions. The main purpose of this instrument is to examine "The effect of Supply chain Integration on operational performance". Judge how frequently each statement fits the situation of your organization. Use the following rating scale, and put "✓" mark for each rating.

Key: Strongly agree (5), Agree (4), Neutral (3), Disagree (2), and strongly disagree (1).

Statement	Rating				
	5	4	3	2	1
Supply Chain Integration (SCI)					
Supplier integration (SI)					
There is strong information exchange with major supplier through information network.					
There is quick ordering system with major supplier					
There is strong strategic partnership with major supplier					
There is stable procurement through network with major supplier					
Information integration (II)					
There is high level of free sharing of accurate information across members of supply chain					
Timely sharing of information across the members of supply chain					
Strong coordination in the flow of information among partners					
There is strong utilization of information among supply chain partners					
Customer integration (CI)					
There is linkage with customer through information network					
Computerized system for major customer ordering					
Use of effective communication with major customer					
Establishment of quick ordering system with major customer					
There is follow up with major customer for feedback					

High frequency of period contacts with major supplier					
Internal integration					
There is better Data integration among internal functions					
There is Enterprise application integration among internal functions					
There is strong Integrative inventory management					
Real time searching of the level of inventory					
Utilizing periodic interdepartmental meeting among internal functions					
Use of cross functional teams in process improvement					
Operational performance: please indicate the degree to which you agree to the following statements concerning your company's performance with respect to your customer. (1=Strongly disagree,2=Disagree,3=Neutral ,4=Agree,5=Strongly agree)	1	2	3	4	5
There is quick response by the suppliers to emergency request for stock out items					
On-time delivery record to customers by the agency during resupply period					
The agency provides cost effective service to customer					
The lead time for fulfilling customer's orders (the time which elapses between the receipt of customer's order and the delivery of goods) is short.					

Thank you for your time and Response!!!

Annex-III

Interview Guide

INTERVIEW QUESTIONS

FOR MANAGERIAL BODY/HIGHER OFFICIALS OF THE AGENCY

1. How do you evaluate the Supply chain integrationand operational performance of the agency on the practical aspects?

   ➢ Internal Integration_____
   ➢ Customer Integration _____
   ➢ Supplier Integration _____
   ➢ Information Integration_____
   ➢ Operational Performance---

2. What likes the supply chain integration of the agency on supporting the operational performance pharmaceuticals supply chain?

3. What the agency faced challenges/bottlenecks on its supply chain integration management?