The Effect of Supply Chain Integration on project performance in Healthcare Projects: The Case of Ethiopian Pharmaceuticals Supply Agency on Operating Room Establishment project

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Statement of Declaration

I, the undersigned, hereby certify that the study titled ‘’The Effect of Supply Chain Integration on project performance in Healthcare Projects: The Case of Ethiopian Pharmaceuticals Supply Agency on Operating Room Establishment project" is my original work, has not been submitted to be reviewed for any other academic program, and has properly cited all sources of information used.

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Acronyms

SC	Supply Chain
SCI	Supply Chain Integration
SCM	Supply Chain Management
GPO	Group Purchasing Organizations
EPSA	Ethiopian Pharmaceuticals Supply Agent
PMBOK	Project Management Body of Knowledge
SPSS	Statistical Package for Social Science
PMI	Project Management Institute
P-P plot	Probability-Probability plot
RBV	Resource Based View
RV	Relational View
IT	Information Technology
OC	Organizational Culture
PPP	Portfolios, Programs, and Projects
PBO	Project Based Organization
PSC	Project Steering Committee
OR	Operating Room

Abstract

Project management is a crucial skill in a lot of different healthcare industries, therefore it is very important to understand projects and their management (PMI, 2017). Project supply chains are those that deliver goods for a specific client and need to be customized or even created from scratch. Supply chain comprises of all the components, exercises and forms required to convey an item from raw material to a last client, such exercises incorporate request determining, resource allocation, production planning, planning, stock administration and client delivery. For many years, the essential center of the health sector has been to supply patients with the best quality of care recently, with the rising cost of supplies and the severe competition among healthcare suppliers the weight on material managers to operate more cost-efficiently without compromising high patient care measures has essentially expanded, due to that supply chain is getting to be backbone for the trade scenario. As a result of the company's value delivery network's integration of all supply chain participants, no one can work more successfully alone. Delivering value to clients and accomplishing the specified level of client happiness and dependability for the company is the extreme objective of this cooperative relationship, in order to do this, the Supply chain's inside and outside partners must be integrated at different levels (Schneller and Smeltzer, 2006).

Mixed research method utilizing both questionnaires and interview were applied to collect data from respondents of the project stakeholders. Explanatory and descriptive research design have been applied to describe the cause and effect relationship between the research variables. The census survey with forty eight respondents were taken based on four sources including; EPSA staff, supplier, Distributor and healthcare service providers. The goal of the research paper is to examine how supply chain integration affects project performance in healthcare projects. The four components that make up the supply chain integration concept are organizational relationship linking, coordination of resource sharing, information integration, and barriers to supply chain integration. Every industry has some integration obstacles that have an impact on the link between integration and organizational project performance. While other sectors have experienced significant progress through the deployment of supply chain management practices, healthcare sector in Ethiopia has not seen major improvements in this area. However, in spite of the uniqueness and complexity of the healthcare supply chain, opportunities for improvements are plentiful.

Key word: Supply chain (SC), Integration, project Performance, Barriers to integration

Chapter One
Introduction
1.1. Background of the study

Project management is a critical skill in many healthcare industries these days since most of the work is being done as a project, therefore understanding projects and their management is crucial. The term project refers to a temporary endeavor with a beginning and an end that results in a unique deliverable. Projects are primarily distinguished by their uniqueness and temporarily nature. Time, cost, scope, quality, resources, and risks are just a few of the constraints listed in the Project Management Body of Knowledge.

Project managers can reduce risks and become more resilient with the aid of supply chain mana gement skills. A supply chain consists of all the elements, activities and processes required to deliver a product from raw material to a final customer. Such activities include, demand forecasting, resource allocation, production planning, scheduling, inventory management and customer delivery. The success of a strong supply chain can be attributed to the effective implementation of supply chain management (SCM) practices, which include communication within the organization, support for supply chain management efforts and processes, information systems for data collection, analysis and sharing and measurement systems to assess total supply chain costs and performance. Furthermore, collaboration and cooperation, along with information sharing, among upstream and downstream supply chain members have been cited as important SCI practices, which have recently become very attractive for many companies because of their power to improve efficiencies by reducing operating costs and providing higher service level.

While SCI practices have been widely adopted in many sectors, the healthcare industry has not seen major improvements in the implementation of these practices. The health care sector, which is experiencing a dramatic increase in the cost of practically all of its goods and services. The nature of the very high pace of upward movement of cost is making the products of the industry beyond the reach of the mass. Supply chain in this industry being a significant driver of cost is therefore grabbing all the attention from stakeholders in the sector. Supply chain in the healthcare can be defined as a complex system that requires the flow of products and services in order to satisfy the needs of those who serve patients (Schneller and Smeltzer, 2006).

In hospitals, the department responsible for the efficient management of supplies is often known as material management. Material management functions comprise procurement, distribution, and purchasing and inventory control of supplies with the intention of providing high quality of care at reduced cost.

In the past, healthcare providers were generally focused on providing high quality of care regardless of cost. However, with the skyrocketing cost of materials especially for under developed countries like Ethiopia and the intense competition among healthcare providers, the role of material management has gained great importance for hospitals and healthcare providers. Furthermore, lack of success in this area can be attributed for the most part to the existence of strong implementation barriers that have hindered the adoption of SCM practices. Thus, there is a strong need to study the challenges embedded in the healthcare sector in order to provide material managers with potential solutions to reduce inefficiencies and achieve supply chain success. Empirical data will be collected through an interview and survey consisting of healthcare providers, group purchasing organizations (GPO or EPSA), suppliers and distributors, to help identify barriers to implementing SCM practices and analyze material management best practices. Results of this study will help to inform project and material managers of the improvements made in the healthcare sector, provide them with a list of areas where efforts are still needed, and recommend potential solutions to become more cost-efficient and give quality service.

This research focuses on assessing the nature and components of supply chain of health care projects giving attention on future scopes with present trends Supply chain in healthcare project is inherently complex therefore it is difficult to recognize and actualize any magic button which can offer assistance remove the inefficiencies to minimize the cost. In this research paper broad literatures have been examined to pick up an understanding on complexity of healthcare project supply chain integration management. After conducting in-depth writing audits as portion of the consideration for this work in an effort to better understand the complexity of the healthcare supply chain management (SCM). The current pattern illustrates that the segment has trouble delivering products on time. The supply chain's essential imperfection proceeds to be that each component works independently, driving to mismatched operations that ruin the framework from working as a whole.

This research report describes SCI and its challenges taking the case of Ethiopian Pharmaceuticals supply agent. Interviews, examiner, observations and analyzing reports & records have been utilized as a strategy of information collection amid the method of data gathering. Mixed research approach is used in the research project to look at the major areas of barriers for implementing supply chain Integration /SCI/ practice. Finally healthcare material management best practice is identified and analyzed after finishing the research project.

Background of the organization

Ethiopian Pharmaceutical Supply Agency (EPSA) is a government organization under Ministry of Health and plays an important role in providing pharmaceuticals, laboratory reagents, medical equipment and supplies to healthcare administrations in Ethiopia. In spite of the various changes in classification all through a long time, providing pharmaceuticals from distinctive distributors and providers has continuously been the core action taking after with standard offering handle. The Standard Bid Document (SBD) could be a comprehensive record that covers each angle of the offering handle. It incorporates a detailed introduction of the offering methods, the articulation of prerequisites, and the contract, as well as shapes, assessment strategy, legitimate contemplations, certification, end conditions, and other things (EPSA, 2020). It was established for the following objectives:

i. To enable public health institutions to supply quality assured essential pharmaceutical and medical equipment supply at affordable prices in a sustainable manner to the public;
ii. To play a complementary role in developmental efforts for health service expansion and strengthening by ensuring enhanced and sustainable supply of medical equipment supply and pharmaceuticals;
iii. To create enabling conditions for enhancing the accumulation of funds in its revolving and cost recovery process and thereby ensure the realization of the objectives.

1.2. Problem Statement

"The healthcare supply chain is frequently described as highly fragmented and relatively inefficient" (Schneller and Smeltzer, 2006, p.27). A major problem with the traditional healthcare supply chain is that each stage of the supply chain operates independently, leading to misaligned incentives and conflicting goals that prevent the supply chain from operating as a system. Healthcare is not based on supply and demand, it can't be stocked like any other product, it's very different from businesses supply chain hence there is an issue with expiry date and highly regulated nature of healthcare. Lacking a general understanding of supply chain performance and the associated causal factors limits organizations ability to identify the best opportunities for improving supply chain performance which in turn affect the project performance as a whole. Supply chain activities like sourcing, producing, inventory, distribution and the associated factors that affect the ability of supply chain performance and meet the maximum service level provided by the company (Flynn et al., 2010).

There are many healthcare service providers located in rural areas of Ethiopia, some of those health care service providers was originally included in this specific healthcare project, the initial objective was to establish Operation room by delivering machines, equipment's and materials supplies so that the healthcare service providers be able to do some minor operating procedures in their health facility and minimize the refers to the higher hospital and minimize patients from suffering in the process.

There is also a high need of medical supplies and drugs to make the project proceed delivering what was intended to deliver. Almost all local manufacturing of medicine in Ethiopia are limited to secondary manufacturing that involves combining various active ingredients and processing bulk medicines into dosage forms. In addition most of the supplies or reagents to make the equipment's function and all medical equipment's are imported from abroad which exposes the firms to a high level of foreign exchange risk and long lead-times for part, accessories, supplies and raw materials of medicines (Harsoor.et al, 2022). This leads to low patient care and high inefficiency in healthcare projects. Therefore, it is critical to identify barriers for implementing supply chain integration so as to provide insight information about material management practices in the healthcare sector in regard with supply chain integration.

1.3. Research Questions

General research question

- How does the integration of information impact the performance of OR establishment project?
- How does coordinating and sharing resources impact the healthcare projects?
- How does the linkage of organizational resources impact the healthcare projects?
- How does supply chain integration barriers affect the project performance?

1.4. Objective

General Objective

- To provide insight information about Supply chain integration in Healthcare projects of the Ethiopia pharmaceutical supply agency (EPSA)

Specific Objective

- To identify barriers to implementing SCI practices.
- To recommend potential solutions for effective project performance.
- To analyze SCI best practices.
- To provide Project managers with a list of areas where efforts are still needed.

1.5. Significance of the study

The objective of the study is to recognize the impact of supply chain integration on healthcare project execution, evaluate the challenges and suggest major areas of enhancement of health division supply chain administration in Ethiopia and EPSA in particular. The successful execution of the SCI by government offices like EPSA produces core competencies to move forward the existing issue of bringing in companies and upgrade the excussion of healthcare projects and provide quality service to patients. In this manner, the think about has commonsense significance to survey the practice of the SCI, challenges and highlighted major areas of enhancement.

1.6. Scope of the study

The scope of the research project is to analyze the cause and effect relationship of SCI facilitators, to recognize challenges and suggesting major areas of advancement of healthcare project supply chain integration in Ethiopia through the Ethiopian pharmaceutical Supply Office /EPSA/. The project is possessed by EPSA, having primary EPSA center in Addis Ababa and distinctive regional center points in in regional city from where the machines, equipment and supplies are distributed to distinctive adjacent healthcare service providing government institutions. Distinctive suppliers or providers and wholesalers besides work with EPSA to deliver particular machines, equipment and supplies after formally and legitimately being chosen with the institute's working procedure to convey quality guaranteed fundamental pharmaceutical and medical equipment at reasonable costs in a sustainable manner to the public.

1.7. Limitation of the study

The study examined the effects of the four SCI practices— linkage of organizational relationships, coordinating and sharing resources, integration of information, and SCI barriers—on the effectiveness of healthcare project of Ethiopian pharmaceuticals supply Agency. The researcher suggests conducting additional studies to examine the impact of other SCI attributes on Project performance. Further research should emphasize the other project performance dimensions, such as consistent supply procurement to make the project deliverable met the project final goal consistently without discontinuity and shortage, as the researcher was also focused on the time and quality aspects of project performance.

1.8. Organization of the study

Based on the fundamental research composing standards, the project work is organized in to five chapters. The primary chapter deals with the study's setting, SCI practice definition, SCI practice within the health segment, investigate issue, concerns, think about basis and centrality, and arranged managerial and hypothetical contributions. This chapter gives setting for the researches key concepts and addresses the current state of past investigate on the subject. The study objectives, and scope are characterized. The second chapter analyzes the literature on SCI, linkage of organizational connections, extend execution, planning and sharing assets, integration of data and obstructions to supply chain integration. The third chapter examines the inquire about plan and methodology, talking about on the overall structure and inquire about plan in this research proposition, as well as a description of the connected methodological approaches. The fourth chapter presents, information examination and comes about and dialog of results. At long last, the fifth chapter presents conclusion and suggestions, counting the hypothetical and viable suggestions of this investigate, limitations, and recommendation for future research.

Chapter Two
Literature review
Introduction

The earlier research on SCI and project performance is reviewed in this chapter. The chapter also makes an effort to explain the current circumstances surrounding the Ethiopian Pharmaceuticals supply Agent.

Theoretical Review
2.1. Supply chain integration

As the implementation of SCM requires the integration of forms from sourcing, to fabricating, and to dissemination over the supply chain, integration is presently broadly acknowledged as the key concept of effective supply chain administration (SCM) (Cooper et al., 1997; Ellram and Cooper, 1990; Mentzer et al.,2001). The scope of supply chain integration is wide and comprehensive, including both the essential thought of inner integration as well as provider and client integration. All through the value chain supply chain administration centers on integration, participation and coordination. The concepts of supply chain integration are participation, shared choice making, open communication, a common vision for the longer, term shared innovation and a high degree of shared believe between the producer and their clients (Flynn et al., 2010).
The goal of SCI is to accomplish accurate, timely, and smooth flow of information, goods and services, funds and procedures in order to provide customers with the most value possible for the least amount of money and time possible. A supply chain is a network of organizations that are strongly connected in all processes and activities from upstream to downstream in such a way that it adds value for the firm and the end user (Bowersox et al., 1999; Frohlich and Westbrook, 2001; Naylor et al., 1999).

2.2. Resource Based View & Relational View Approach

The RBV approach and its expansions serve as the philosophical establishment for the favorable association between SCM & execution that can be found in writing. According to the beginning RBV approach, a company's inside assets are interesting, rare, unreplicable, and firms' source of competitive advantage. (Barney, 1991; Dierickx & Cool, 1989; Peteraf, 1993).

Concurring to Relational View (RV) hypothesis, connections are the essential source of moved forward project execution and diminished costs, which is the center of supply chain integration. It also integrates both inner and external supply chain partners on different levels.

2.3. Supply Chain Integration in Literature

It refers to the degree to which a producer deliberately interacts with its supply chain partners to attain effective and productive streams of merchandise and administrations that maximize client value.

The reason of supply chain integration is to extend proficiency and precision in a company's whole operations and to rearrange the stream of products, information, and cash from providers to end clients.

(Alfalla-Luque and others, 2012), stated that there are three levels or facilitators for supply chain integration:

- Integration of information
- Coordinating and sharing resources
- Linkage of organizational relationships

2.3.1. Integration of information

For efficient operations in any corporate organization data integration is a crucial part of supply chain integration. Taking into consideration the intervening impact of inter organization data system integration, (Raja Master and Matanda, 2013) considered the impacts of associate organizational compatibility on supply chain capabilities. They tended to the value of data framework integration among SC partners in terms of reducing inventory costs and threat of performance-improving impediments.

Data innovation encompasses a critical effect on the firm's supply chain agility in terms of better responding to market variances through a timely, adequate, and precise stream of essential data among supply chain partners. This incorporates a positive effect on the firm's deals, market share, benefit, execution of facilitated plans, and in general client satisfaction.

Agreeing to the inquire about on the drivers and results of innovation supply chains that work on internet-based associate and intra organizational frameworks: high technology supply chains give organizations with the convenient, exact, and vital data for shared decision-making, these advances empower organizations to make strides commerce forms (Soderoa, Rabinovich, Sinha, 2013).

2.3.2. Coordinating and sharing resources

Supply chain integration, according to (Mangan et al.,2008, p. 250), "is the arrangement and interlinking of trade forms, whereas collaboration could be a relationship between supply chain partners built up over time."

Supply chain integration refers to a set of company exercises that are pointed particularly toward cultivating connections with providers and clients. These exercises are aiming to harmonize supply chain exercises with providers on the upstream side and increment client fulfillment on the downstream side through the delivery of superior products (Petrovic-Lazarevic et al., 2007).

The supply chain integration is a basic component made up of specialized framework, high levels of coordination, shared information, shared vision, and joint collaboration between makers and wholesalers (Flynna et al., 2010). According to investigate on agreeable connections between buyers and dealers within the dairy industry, a successful coordination's framework, the use of process innovation, and data exchange are the keys to the competitiveness of the milk supply chain (Moori, Lima, and Menezes., 2012).

There are different instruments for integrating transport into supply chain frameworks based on their cost and advantage analyses, all they require is close participation between clients and providers. Fabricating is getting to be progressively dependent on transportation, and bringing down costs and moving forward quality is the trademark of victory for each commerce (Bricklayer and Lalwani's,2007).

The difficult choices that the supply chain must make when there's a possibility of disturbance, Within the occasion of characteristic disasters or disturbance concerns, coordinates choices with respect to the choice of suppliers and the timing of client orders require near collaboration within the long run, this will upgrade execution in hazardous disturbance scenarios (Sawik, 2013).

A company ought to outsource supplies or those capacities to other parties who have skill, according to Mazlan and Ali's (2006) research on the relationship between supply chain management and outsourcing. Within the long run, this will progress supply chain integration as the company will concentrate more on its core business operations.

The administration hypothesis for superior SCM was given by Junqueria (2010) in his proposition on coordinations and SCM; it was talked about that SCM practices have a critical impact on the integration of dairy providers with companies which they cultivate a high level of believe and participation between the dairy farmers and teach.

Australian drain processors are realigning themselves within the supply chain with their inner and outside partners due to HSE concerns and deregulation arrangements in developed countries like Australia, agreeing to investigate that was displayed at the worldwide farm administration congress (Wagener, Issar, and Cowan., 2003).

2.3.3. Linkage of organizational relationships

In Arcs of Supply Chain Integration, Mei, C., and Zhang, Q. (2011). Claim that SCI starts with inside cohesiveness at its center and advances through upstream and downstream outside integration. In their intensive examination of supply chain integration within the Chinese fabricating industry, Flynn, Huo, and Zhao (2010) demonstrated based on both inner and outside integration. Inside integration refers to how closely divisions and organizational capacities are consolidated into one another, while outside organization advances near strategic connections with clients and providers.

To realize commerce excellence, supply chain technique must be consolidated into all aspects of corporate procedure (Harrison, R., 2013). Within the setting of his inquire about on supply chain integration, Van Hoek (1998) looked into the variables of inner and outside integration. It got to be clear that one significant step toward coming to the organization of SCI and harvesting its benefits within the frame of moved forward organizational performance is inner integration among all useful zones. Fast communication channels between supply chain members help within the definition of commerce approaches, objective arrangement, and convenient completion of assignments (Matanda. M. j., 2011). A more profound understanding and persistent enhancement in inside and outside trade forms is vital for accomplishing trade goals as well as for accomplishing the specified level of client fulfillment, concurring to Chan et al.'s (2012) work on SCI and execution estimation.

Within the modern era of globalization, it is fundamental to adjust and coordinated supply chain relationships and practices with business strategy in order to attain the extreme objectives of client fulfillment and esteem expansion to the company's esteem conveyance organize. Operational excellence, inter-organizational collaboration, and intraorganizational process integration were examined as the three primary sorts of SC integration. The primary shape refers to a high degree of coordination between the organization's different functional divisions and its forms; in the event that the primary shape is present, it is conceivable to integrate the SC capacities of the organization with providers and clients; and at long last, operational excellence makes a difference the organization maintain a competitive position in terms of cost and service effectiveness (Morash and Clinton., 1998).

2.4. Supply Chain Performance

Concurring to the research on supply chain practices and their impacts on buyer satisfaction within the pharmaceutical division of developing countries, supply chain practices are supported by three pillars: collaboration and information sharing, coordination design and IT infrastructure, and organizational culture (OC), all of which have an enormous effect on buyer fulfillment. (Huang, Y., Hung, J. and Ho, J. 2017).

Partners within the supply chain work together toward long-term objectives and pool their assets (resources, information, and capabilities) to create predominant comes about and pick up an advantage over their competitors. Utilizing a writing review to create a system for supply chain integration, Luque, Lopez, and Dey (2012) recognized the three key columns of SCI as information integration, coordination and resource sharing, and organizational relationship linkage. It isn't fair a strategy or method; organizational culture also has to embrace it. Therefore, in order to perform way better in terms of operations and commerce development, project organizations ought to cultivate a culture of healthy inner and outside collaboration with supply chain partners.

According to Lee (2000), SCI, which incorporates information integration, operational integration and relationship integration, contains a positive relationship with firm's venture execution. In today's world of furious competition, supply chain integration is the key to success. Kaynak and Hartley (2008) in their consider on quality management as a part of supply chain administration proposed that Supplier Quality and consumer center are the two key zones of Quality administration practices inside the space of SCM. Discoveries appear that way better quality administration practices inside and remotely inside supply chain leads to improved stock administration execution, expanded quality, budgetary, and extend success.

The three areas of just in time, quality management, and SCM were worked on to improve the project operations performance of a company. The findings indicated that higher project operation excellence is a result of a commitment to quality and consideration of supply chain integration. Technical elements (IT competencies) and coordination resource sharing (information sharing, teamwork, trust, etc.) are precursors to SC flexibility, which in turn leads to cost effectiveness, which mediates the relationship with improved project performance. (Yang, 2014) Li, Nathan, and Rao, (2006) Studied to understand how supply chain collaboration affects firm's project performance, and found that firm size plays a moderating role in the relationship within SC collaboration and firm performance. As a result, small firms benefit from this collaborative advantage much more than medium-sized and large firms.

Modern SCM practices have a significant positive impact on not only firm project performance but also on gaining competitive advantage among the firms, as competition in this era is not only between firms but also among various supply chains. This was discovered through research on the impact of SCM practices on firm performance and an organization's competitive advantage. Huo, B., (2012) Worked to connect the firm's supply chain integration strategy with the competitive strategy of the firm. The relationship between SCM practices and firm performance was discovered to be mediated by Supply chain integration. Additionally, SCM practices and SCI interact with one another and ultimately mediate the relationship with firm's project performance.

Flynn, Huo and Zhao (2010) examined the advantages of internal and external integration in terms of lower inventory costs, shorter lead times, more precise demand forecasting and effective movement of materials and goods among supply chain partners in their study on the impact of SCI on performance in the Chinese manufacturing sector.

2.5. Barriers to Supply Chain Integration

The supply chain literature provides the following barriers (Sammuel & Kashif, 2013):

- Lack of technology
- Lack of sharing of information
- Lack of trust
- Demand distortion-bullwhip
- Lack of system compatibility
- Knowledge gaps
- Integration costs

Obstacles to SCI, including lacking understanding of the other work, a need of communication, a weak working relationship, competing objectives, and a need of senior administration heading. Need of trust, a need of understanding, inner politics, misaligned objectives and targets, insufficient administration data frameworks, a short-term introduction to objectives, and other supply chain complex issues were recorded as obstructions to supply chain usage. (Ellinger et al. 2006)

There are a number of deterrents to SCI on all integration levels, and these obstacles can be found at the strategic, operational, and key levels of an organization. Finding the facilitators or arrangements to these boundaries to SCI is more pivotal than essentially understanding the boundary itself. Successful supply chain administration faces a number of challenges, such as misaligned data frameworks, a need of believe, and stock administration. (Handfield and Nichols, 1999).

The adoption of E-business into supply chain capacities is slower than expected, concurring to research on supply chain data integration obstructions (Meyer, Marc H., 2007). These deterrents incorporate a need of managerial leadership and thrift in this range in different organizational settings, a poor arrangement of data techniques, and ignorance of the potential benefits of receiving. SCI's objective is to realize operational excellence and scale economies through progressed collaboration between all stakeholders. The objective of SCI isn't accomplished essentially by utilizing modern instruments and advances; rather, it must set up organizational standards that advance cooperation and a shared vision. In this respect, SCM moreover incorporates inner and outside integration.

Hurricane and Hu inspected the milk supply chain in China, which has developed as a worldwide pioneer within the export of high-quality merchandise at competitive costs over all financial divisions. To direct costs and quality benchmarks, huge milk providers must be streamlined and in close proximity to backward integration.

The preferences of data integration inside SCI are incompatible, but at the same time, it presents a number of challenges and impediments, counting the need for foundation improvement to empower businesses to utilize shared data successfully, the cost of data innovation, antitrust laws, the timelines and genuineness of the shared data, and the confidentiality of the data shared (Lotfi, Mukhtar, Sahran, and Zadeh, 2013).

2.6. Project performance

Bates & Holton (1995), proposed that the concept of performance includes a wide structure whose evaluation is diverse due to different variables, as it were based on the record of the results accomplished, we can make an assumption about performance. Execution is something that an individual causes out of oneself and is isolated from the objective (Kane, 1996).

Execution is characterized as the results of the work. Extraordinary companies once in a while utilize the projects to expand their capabilities and capacities. The project could be a short-term endeavor to convey particular products, administrations, and results. Subsequently, by assessing the execution of the projects, project-based organizations' execution is assessed. All activities taken to guarantee that Portfolios, Programs, and Projects (PPP) create in understanding with their plans and accomplish their goals are considered portion of the project-based organization's execution (Kane, 1996).

These exercises incorporate surveying how well they are performing, looking into ways to improve, and issuing orders to fix any failed capacities. The high level of PPP success within the PBOs is in this way the desired result of the project steering committee (PSC) for this area.

2.7. Hypothesis

According to Flynn et al. (2010), the supply chain integration is divided into three groups:

H1: The integration towards the suppliers or Linkage of organizational relationships features a positive impact on the performance of the project

H2: The integration towards the clients or Customer relationship features a positive impact on the project performance.

H3: Internal integration of an organization or Internal Operation Practices has a positive impact on project performance.

2.8. Conceptual framework

The conceptual model shows the effect of barriers on the link between the factors that influence supply chain integration and firm's project performance. Integration of information includes Information sharing, exchanging quality of information sharing and information technology. Information sharing is sharing delivery scheduling data with the most important suppliers, design and manufacturing data with most important suppliers, order, demand, and forecast information and inventory, production, sales information with the most important suppliers. Exchanging quality of information sharing; which is Information to Partners timely, exchange information to partners accurately, exchange completeinformation to partners and adequate information to partners. Information sharing include Sharing share delivery scheduling data with our most important suppliers, design and manufacturing data with most important suppliers, order, demand, and forecast information andinventory, production, sales information with our most important suppliers. Strategic supplier partnership Using quality as number one criterion in selection of suppliers; solving regularly problems jointly with its suppliers; continuous improvement programs that include its key suppliers and actively involve our key suppliers in new product development processes will be studied under Linkage of organizational relationships. Internal operation Shows regularly continuous and instantaneous product and service improvement; uses up- to- datedness of production; has flexibility of production system and uses automated production process automation. Customer relationship (Frequently determine future customer expectation, facilitate customers' ability to seek assistance, interact with customers to set reliability, responsiveness etc standards and measure and evaluate customer satisfaction) and internal operations practices will be studied under, Coordinating and sharing resources. Barriers to Supply Chain Integration include lack of technology, lack of sharing of information, lack of trust, demand distortion-bullwhip, lack of system compatibility and knowledge gaps integration costs. Project performance includes (The project objectives were met, the project was completed within budget, the project was completed within schedule, project stakeholder were satisfied with the project and the overall quality of the project outcome was high). There is a positive and high relation between information integration and coordination and resource sharing having a high impact on project performance.

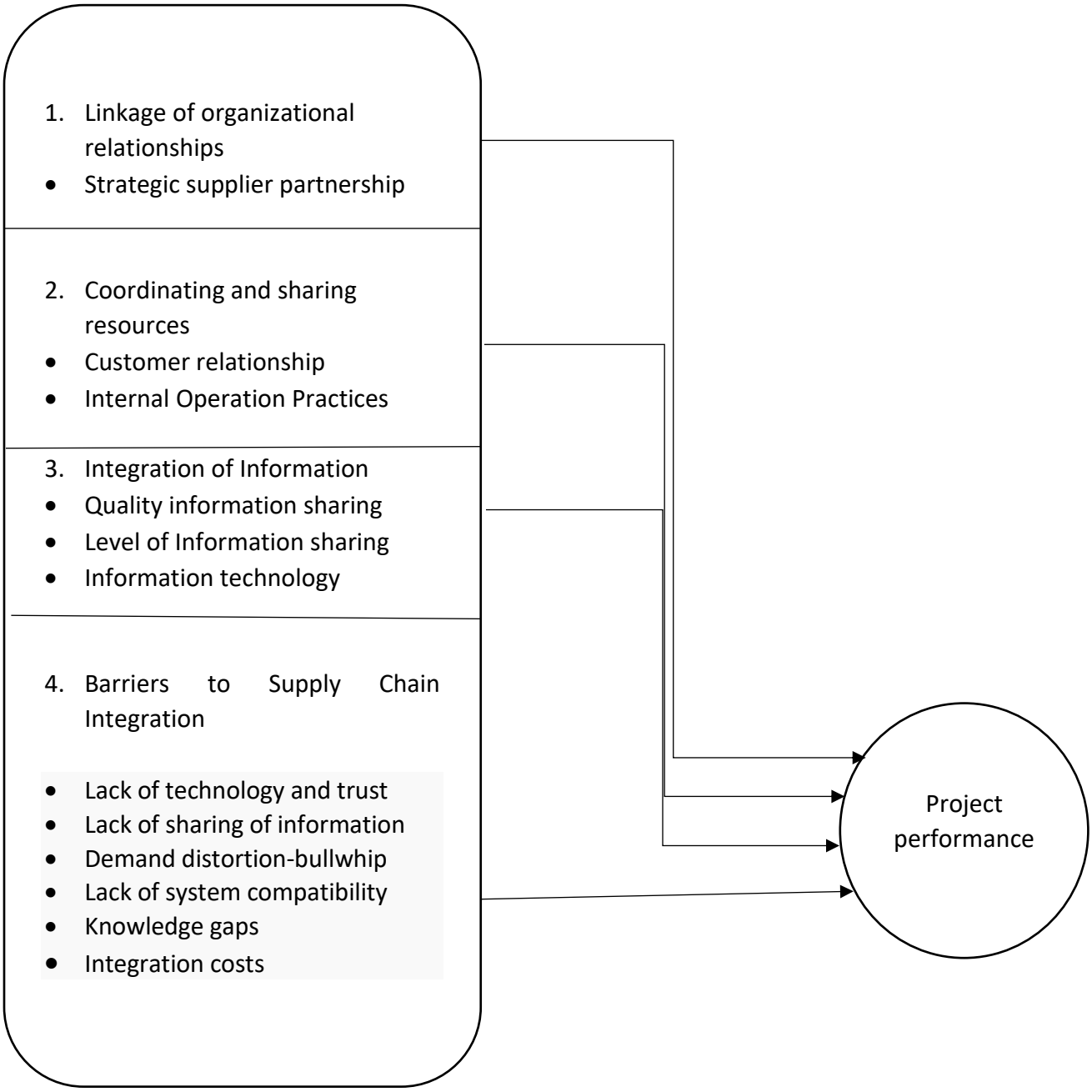

Figure 1. Conceptual Framework

Source; (Richey Jr. et al., 2009 and Flynn, B. B. et.al, 2010)

Chapter Three
Research Methodology
Introduction

This chapter responds to the research questions raised and accomplishes the main goal of the research on project work, the research design, research methodology, and data analysis are presented. There are explanations of data collection, processing, research design, and methodologies, including ethical considerations. It covers sample selection, questionnaire design, data collection methods, data processing, analysis, and evaluation, as well as the accuracy and dependability of the methods used.

3.1. Description of study area

The study was conducted in Operating Room (OR) establishment project of Ethiopian Pharmaceutical Supply Agency. Despite the numerous changes in nomenclature throughout the years, supplying pharmaceuticals has always been the core activity. As a healthcare provider for establishing OR; well trained professional, electric power distribution, OR room construction and readiness, continues delivery of supply (oxygen, gauze, cotton, drugs, anesthetic agent, glove, syringe etc.) should first get established. Ideally operating room should have equipments such as oxygen concentrator, suction machine, defibrillator, anesthesia machine, operating table, sterilizer machine and OR light to make sure that all procedures are done safely. An ideal OR room include space for equipment's and anesthetic trolleys which needs to be located with direct access to well ventilated corridors. It must also allow testing, storing and cleaning of the life care support equipment's including work bench and sink(s) (Harsoor.et al, 2022).

Under the EPSA OR establishment project medical equipment and supplies such as Oxygen cylinder with regulator, Suction Machine, Anesthesia Machine, Laryngoscope set, Major Surgical Set, Steam sterilizer, Patient monitor, Patient trolley/Stretcher, Oxygen concentrator, Minor Surgical Set, Tray-Instrument and Mobile OR light distributed. The equipment's and materials dispatched and distributed from EPSA Adama hub to different regional EPSA hubs including EPSA main Addis Ababa hub. The regional EPSA hub include; Dessie hub, Diredawa hub, Bahirdar hub, Gonder hub, Hawassa hub, Mekelle hub, Negelle borena hub, Arbaminch hub, Assossa hub, Gambella hub, Jigjiga hub, Semera hub, Nekemte hub) to get distributed further to the nearby healthcare service providers (health center).

Figure 2.Picture showing basic OR set up

Source; Wikipedia standard operating room set up, 2023

3.2. Research design

The main objective of the investigation was to look at SCI practices based on principal theories, standards, and administration rationalities that were implied to serve as useful benchmarks for evaluating the actual execution of the healthcare project. Accordingly, the situation company's existing SCI practices and the challenges that prohibited its effectiveness were assessed. Meaning the reason of the research was to discover the fundamental truths and actual circumstances existing within the case company with respect to SCI practices and describe the reality. It also focused on the cause-and-effect relationship between SCI and project execution within the case of EPSA. Determining how factors associated with one another and distinguishing cause-and-effect connections were included. Hence, the researcher favored to utilize a descriptive and explanatory research design, using both qualitative and quantitative information analysis.

3.3. Research Approach

Qualitative, quantitative and mixed methods are the three most widely used research methods. The type of information required to address the research question is anticipated by the researcher. Qualitative research involves discovery it is a comprehensive strategy. According to (Creswell, 2014), qualitative research can also be thought of as an unfolding model that takes place in a natural environment and allows the researcher to gain a high level of detail from direct participation in the research subjects' actual experiences.

One sign of a qualitative study is the social phenomenon being examined from the perspective of the participants where as quantitative research uses strategies of inquiry of surveys to collect data on predetermined instruments that yield statistical data. Quantitative research is capable of producing results that are prescriptive, explanatory and confirming. In a mixed approach, researchers can create a single research study that addresses both questions about the complex nature of phenomena from the participant's point of view and the relationship between quantifiable variables. The Project work used a quantitative approach to research SCI practices that were based on fundamental theories, principles, and management philosophies from different literatures. Additionally, based on fundamental theories, principles, and management in the selected OR establishment project, the research paper evaluated SCI facilitator on project performance and the barriers associated with SCI practices.

3.4. Population of the Study

To perform the research on project work, the target populations were composed of suppliers, Distributors, healthcare service provider executives and the executives of the EPSA on both main and regional hubs. The details of population size indicated below:

- The number of healthcare service providers, originally assumed to be included in the project: 56
- The entire member of the EPSA hub Representative, which were working in supply chain and related functions of the company: 20
- Number of employee working on the project from distributor side with supply chain section due to their work nature including (Project manager, service manager, Operation manager and Field service engineer): 20
- Number of suppliers suppling material and supplies and are working in this project closely: 8
- Number of customer to use the service are millions of patients around rural area where getting healthcare service is highly demanding.

As per the characterization above in the study population section the sampling design used in the research is stratified sampling since the population is heterogeneous i.e. different segments exist in the population. The researcher classify the population elements in to different strata, so that each stratum is nearly homogeneous and then sample be selected from each stratum. The research was focused on supply chain integration and OR establishment project performance; the procurement, project management, finance, administration, field engineers, and warehouse managers were units of the target population and the focus for data collection purposes because they were the units that are constantly involved in issues pertaining to supply chain integration. The population of the study are chosen from different project stockholders including suppliers, distributors, EPSA staffs and healthcare providing institutions. The total population intended to representative EPSA regional and main hub, healthcare service providers including suppliers and distributors are assumed for having the entire information about the project was forty eight (48), therefore census survey was used for the overview conducted on total set of observation objects belonging to the given population.

3.5. Data Measurement Instruments

Questionnaires and interviews were used as the main data collection instruments. Documentary sources such as relevant books, journals, articles, official publications, newspaper clippings, reports, and seminar papers were utilized to present the facts and substantiate the arguments to secure secondary data. In primary data, interviews, questionnaires, and observation, were used for collecting data. Personal, Phone communication, and mail / for those who are out of site/ are used in the data collection process.

3.5.1 Questionnaire

A survey containing both structured and unstructured questions were used in the study, since it is required to get test of respondents within the most limited possible time and cost. The SCI facilitator and barrier survey was adapted from (Asha, 2015) and Project performance survey questions were adapted from (Alem Shumiye, 2019).The supply chain concepts and practices, as well as numerous choice or categorical factors relating to respondent socioeconomics, were outlined to be replied on a five-point Likert scale. The questionnaire's fundamental area was made employing a 5-point Likert scale, with 1 being the strongest disagreement and 5 being the strongest agreement.

3.5.2 Interview

Various interview sessions were conducted as a strategy of information collection instrument for longer time. It was assumed a valuable information collection instrument in this study because it is an advantage to get detailed data approximately individual feelings, perceptions and conclusions.

It permitted more detailed questions to be inquired, and with generally great reaction rate. Semi structure meet was conducted for the reason of exploring the members understanding the practice of supply chain integration of the project.

3.5.3. Data Type and Sources

Data collection source were both primary (material managers, directors, distributors, manufacturers and GPO) and secondary data collected from (journals, EPSA documentations, researches, study and Manuals)

3.6. Reliability and Validity

The study used Chronbach's alpha to evaluate the inner consistency of factors within the research instrument. Chronbach's alpha is a coefficient of reliability utilized to measure the inner consistency of the scale. According to (Zikmund, 2010), scale with coefficient alpha between o.6 and 0.7 demonstrate reasonable reliability so for the research a Chronbach's alpha score of 0.70 or higher is consider adequate to determine reliability. As it is expressed within the Table 1 below the study's Cronbach's alpha value for 32 items is 0.94 which shows reliability of the measurement.

Overall reliability test	Cronbach's Alpha	N of Items
	0.94	32

Table 1. Reliability statistics of the pilot study

Source; Survey Results and Own Computation, 2023

Validity is the degree to which difference found with measuring instrument reflecting genuine differences among those being tested in order to guarantee the quality of the research design content and develop validity of the research. Construct validity establishing correct operational measures for the concepts being examined (Creswell, 2007). The literature survey is conducted and thoroughly inspected to make sure that the substance of measurement is pertinent to the study and experts' opinion is taken. The survey was adopted for the study in accordance with a set of organized goals to ensure construct validity, which is a factor within the questions' exactness. The study depend on explanations inferred from existing writing and SCI hypothesis, as well as competing clarifications for the discoveries, which is one of the other validity issues.

According to Engel and Schutt (2014), basis validity is established when results from one degree are comparable to those from a more direct or already approved degree of the same phenomenon. The study utilized validated measurements from prior studies to measure the same phenomenon, expanding certainty that the estimations captured the original intent.

The thought of triangulation was also utilized to progress the validity of investigate discoveries. In order to allow for cross-validation of results, Bryman (2003) defined triangulation as "the use of numerous approaches or source of information within the study of a phenomenon." Triangulation was utilized within the study's examining procedures to compensate for the drawbacks and biases that may result from the use of fair one technique for selecting respondents.

3.7. Measurement Variables

The general objective of the research is to assess the current supply chain integration practices of EPSA on Operating room establishment project. The following are the variable constructs of the research work:

Strategic supplier partnership

Using quality as number one criterion in selection of suppliers, solving regularly problems jointly with its suppliers, continuous improvement programs that include its key suppliers and actively involve our key suppliers in new product development processes

Customer relationship

Frequently determine future customer expectation, facilitate customers' ability to seek assistance, interact with customers to set reliability, responsiveness etc. standards and measure and evaluate customer satisfaction.

Internal Operation

Shows regularly continuous and instantaneous product and service improvement, uses up- to-datedness of production, has flexibility of production system and uses automated production process automation.

Information sharing

Sharing share delivery scheduling data with our most important suppliers, design and manufacturing data with most important suppliers, order, demand, and forecast information and inventory, production, sales information with our most important suppliers.

Exchange Quality of information sharing

Information to partners timely, exchange information to partners accurately, exchange complete information to partners and adequate information to partners.

Information technology

Use uninterrupted IT system, uses IT-based automated ordering system, uses up-to-datedness of IT technologies throughout the supply chain and has adequate IT systems throughout the supply chain.

Challenges/ Barriers for effective SCM implementation

Faces supply uncertainty (supplier inability to carry out the promise), Trusts its partners to share confidential data and willing to share risks and benefits Faces inventory fluctuation due to inaccurate information sharing (bullwhip effect).

Project performance

Identifying whether the project objectives were met; project was completed within budget and schedule; Project stakeholders were satisfied with this project and the overall quality of the project outcome was high were the measuring factors.

3.8. Data Analysis Method

Information and data collected during the research summarized in the form to be handled by Software Package for Social Scientists (SPSS) version 27. The findings of the work were organized and displayed within the form of words, numbers and percentages by using tables and figures. Information collected from surveys were displayed in tables and figures and the central tendency of a distribution was taken as an assessment of the "center" of a distribution values. In addition, standard deviation was utilized as a degree of scattering to the spread of values around the central tendency.

The project work also employments graphic investigate to draw comparisons between other respondents in different studies. The study inspected the relationship and impact of SCI on project execution utilizing relationship and regression analysis. The investigation utilized a Pearson relationship and regression analysis to decide whether the defined hypotheses were acknowledged. Secondary information was employed under information interpretations for primary information triangulation. The regression equation is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4$$

Where: Y is Project Performance, the dependent variable
β_0: is the regression constant,
β_1, β_2, β_3 and β_4: are the slopes of the regression equation
X_1: Linkage of organizational relationships
X_2: Coordinating and sharing resources
X_3: Integration of information
X_4: Barriers to SCI

3.9. Ethical Considerations

The survey outlines that respondents have no commitment to incorporate their names within the survey, hence ensuring secrecy, and consolidates common information about the study's aim. Respondents are invited to take part within the study based on their readiness. By hiding and securing the title of the member or any other identifiers, the study ensured the informants' secrecy. Participants were informed that data collection would happen all through the study at any point they were able to cooperate. The study moreover supported utilization of information obtained through the instrument solely for academic purposes.

Chapter Four
Results and Discussion
Introduction

The study's data were analyzed, presented, discussed, and interpreted in this chapter. Therefore it includes the research approach, research design, data source, data collection method, target population, sampling method, and data analysis method. The results of the methodology used and the data analysis that followed to address the research questions regarding the impact of SCI on project performance in Ethiopian Pharmaceuticals Supply Agency are illustrated in this chapter. The results and raw data analysis provided clues to the study's research questions. The study used a variety of techniques, including descriptive analysis, correlation matrices, and linear regression to analyze the data gathered from the study's chosen participants. Statistical Package for Social Science (SPSS v.27) was used to analyze the data collected using a five-scale Likert scale utilizing the established research design, methodology, tools and techniques for data collection, verification, and analysis. The data was gathered from 48 project stakeholder members. Forty Eight (48) of the sixty (60) questionnaires that were distributed were returned, which is a response rate of 80%. This is a reliable response rate for data analysis as (Mugenda, 2003) found that a response rate of 70% and above is adequate and reliable for further investigation. A response rate of 50% and above is the minimum range for drawing conclusions.

4.1. Data Editing and Coding

Following the data collection from the project stakeholders of the institute which gathered at various levels, editing of the data was done to ensure that it was accurate, complete, and consistent. First stage of data processing and analysis is editing (Zikmund, 2003). The data gathered showed that all measurement items in the constructs for the conceptual model and basic information section had data, and none of them were missing.

	N	Mean	Std. Deviation	Missing Count	Missing Percent	No. of Extremes Low	No. of Extremes High
Linkage of organizational relationships	48	3.6875	.87898	0	.0	0	0
Coordinating and sharing resources	48	3.3958	.79532	0	.0	0	0
Integration of Information	48	3.2538	.66142	0	.0	0	0
Barriers to Supply Chain Integration	48	4.0104	.97162	0	.0	2	0
Project performance	48	3.4625	.91061	0	.0	0	0

a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

Table 2. Univariate Statistics
Source; Survey Results and Own Computation, 2023

4.2. Analysis of the Measurement

The reliability of the data was assessed using the Cronbach's alpha reliability test. Chronbach's alpha was used in this study to evaluate the internal consistency of the research instrument's variables. According to the table below, the internal consistency of the variables in the research instrument was evaluated using Chronbach's alpha and the reliability test, which was based on each dimension.

	Reliability statics		
Variable	**Dimensions**	**Cronbach's Alpha**	**No of items**
Linkage of organizational relationships	Strategic supplier partnership	$0.798 \cong 0.8$	4
Coordinating and sharing resources	• Customer relationship	0.831	8
	• Internal Operation Practices		
Integration of Information	Quality information sharing	0.784	11
	Level of Information sharing		
	Information technology		
Barriers to Supply Chain Integration	Challenges for SCI implementation	0.907	4
Project Performance	Project Performance	0.815	5
	Overall reliability test	0.939	32

Table 3, Cronbach's Alpha Reliability Test Results
Source; Survey Results and Own Computation, 2023

The findings demonstrated that 48 cases were validated at 100% or without a missing value, with all reliability statistics values above 0.784. According to (Kothari, 2004), a minimum of 0.70 would be a suitable level for the acceptable value. Each dimension scale had a coefficient alpha greater than 0.70, which indicated a strong reliability and was regarded as sufficient to determine reliability, according to this table.

4.3. Demographic Profile of Respondents

Gender	**Frequency**	**Percentage**
Female	20	41.7
Male	28	58.3
Total	48	100
Age	**Frequency**	**Percentage**
18-30	19	39.6
31-40	24	50
41-50	5	10.4
Total	48	100
Tenure	**Frequency**	**Percentage**
2 year and below	12	25
2-3 years	9	18.8
3-4 years	8	16.7
5 years and above	19	39.6
Total	48	100
Educational Level	**Frequency**	**Percentage**
1st Degree	34	70.8
Post graduate /Masters	14	29.2
Total	48	100
years of company working in the business	**Frequency**	**Percentage**
Less than 5 years	8	16.7
5-10 years	14	29.2
10-15 years	8	16.7
15-20 years	7	14.6
More than 20 years	11	22.9
Total	48	100

Table 4. Demographic Profile of Respondents

Source; Survey Results and Own Computation, 2023

The results of Table 4. above Present the demographic profile of employees and managers in the EPSA both regional and main hub, distributor and supplier that participated in the study. Most of the respondents were males (58.3%), while females constituted 41.7 %.

The age of most of the respondents was between 31 and 40 years. Specifically, 39.6% were between the ages of 18 and 31 years; 10.4% were between the ages of 41 and 50 years. The amount of years of experience of the respondents working in the sector shows 39.6% for 5 years and above. 25 % of the respondents work experience shows 2 year and below. 18.8% and 16.7% of the respondents have a tenure of 2-3 years and 3-4 years respectively.

The educational distribution showed that 70.8 % had attained their first degree while 29.2 % had attained their masters/postgraduate. The company work experience existing in the business showed 16.7 % for both less than 5 years and 10-15 years. For company work experience existing in the business showed 29.2 % and 22.9 % with 5-10 years and more than 20 years respectively. 14.6 % of the respondent's company work experience existing in the business showed 15-20 years.

4.4. Descriptive Analysis

Based on the investigation performed on the information gathered on each and every measurement, descriptive analysis clarifies and discusses the discoveries of the research constructs. By combining the diverse information collected through essential and secondary data collection, the study's findings were examined. This section looks into and assesses the assumptions that are required with respect to the relationship between factors for additional statistical investigation before showing the discoveries of the descriptive analysis and ANOVA analysis. The dialog makes an exertion to realize the study's objectives and react to the investigate questions posed during study.

4.4.1. Descriptive analysis of supply chain integration

The study inquired the respondents to rate their execution on a five-point Likert scale (1= strongly disagree, 2= Disagree, 3= Neutral, 4= Agree, and 5= strongly agree) in arrange to degree the effect of SCI on project execution. The statistical mean investigation was utilized to summarize the Likert scale information, and it was based on the presumptions that a mean score value less than 2.5 signified disagreement among respondents, a mean score value of 2.5 signified respondents' nonpartisanship toward the questions posed, and a mean score value greater than 2.5 shown agreement among project stakeholders with the explanation. A standard deviation of >0.9 indicates a significant contrast within the respondents' SCI methodologies for the variable.

I. **Linkage of organizational relationships**

The respondents' degrees of agreement regarding the linkage between the institute's organizational relationships practice and the SCI practice. The majority of respondents demonstrated that their projects involved considering quality as the top selection criterion, with a mean score of 3.85 and SD of 1.01, which is the highest of all the other practice dimensions for linking organizational relationships. The respondents also agreed that their ongoing projects solve issues in collaboration with their suppliers (M=3.73 and SD=1.106). The majority of respondents (M=3.63 and SD=1.114) agreed that their projects actively involve key suppliers in the new product development process, and their projects also have continuous improvement programs (M=3.54 and SD=1.11). According to the results, linkage of organizational relationships has been adopted to a greater extent within the institute, as shown by the composite (Mean=3.7 and SD=1.11). This demonstrates how organizational relationships are linked to accomplish organizational strategic goals.

II. **Coordinating and sharing resources**

The coordination and resource sharing table shows that respondents have only a slight consensus regarding the supply integration system's flexibility and how frequently they measure and evaluate customer satisfaction (M=3.0 and SD=1.11). With scores of (M=3.35 and SD=1.17) and (M=3.4 and SD=1.23), respectively, the respondents agree a bit on the adoption of process automation to all potential suppliers and up to datedness of the supply. With a mean of 3.56 and SD=1.21 and 1.09, respectively, the respondents also indicated that they agreed that it was possible to facilitate customers' ability to seek assistance and frequently determine future customer expectation policy. With an average mean (M= 3.73, SD=1.125), and (M= 3.48, SD= 1.27), respondents agreed on the regular continuous and immediate product and service improvement as well as frequent interaction with customers to establish dependability and responsiveness. The respondents' agreement with various coordination and resource sharing practices was indicated by the average coordination and resource sharing (M=3.4 and SD=1.17). The industry should concentrate on improving coordination and resource sharing practices because the benefits are potentially greater the more integrated suppliers are into the supply chain (Frohlich & Westbrook 2001, p. 48).

III. **Integration of Information**

The adoption of information integration in the Ethiopian pharmaceutical supply agent is the study's next independent variable. The term "information integration" describes the process of combining data from various data sets with various data structures into a single, uniform data structure. Respondents with (M=2.9 and SD=1.057) and (M=3.04 and SD=1.129) only slightly agree on the existence of sharing of order, demand, and forecast information as well as the up-to-datedness of IT throughout the supply chain. With a mean M=3.5 and SD=1.22, the respondents also agreed on the timely exchange of information with partners.

With a score of (M=3.08 and SD=1.217), the respondents' agreement with an IT-based automated ordering system is only marginal. With a mean score of (M=3.25 and SD=1.17), the respondents generally agreed on information integration with institute partners. The outcome demonstrated that there was a high adoption of information integration, which has a significant impact on the institute's project performance because information integration has an impact on project quality and completion time.

IV. Barriers to Supply Chain Integration

The barriers preventing supply chain integration are one of the other dimensions of SCI. The majority of respondents demonstrated that supply uncertainty is the biggest barrier to SCI dimensions, with a mean score of 4.21 and SD of 1.031. On the extent to which respondents agreement on Willingness to share risks and benefits is strong with the mean of M= 4.04 and SD= 1.1. On the extent to which respondents trusted partners with sharing, there was also some agreement (M=3.92 and SD=1.145). With a mean score of (M=4.01 and SD=1.1), the respondents largely concur on SCI barriers within the institute partners.

V. Descriptive analysis of Project Performance

The project performance shows that the standard deviation ranges from 1.057 to 1.307, with the average mean of project performance ranging from 2.9 to 3.8. As a result, the findings indicated that there is some minor consensus within the institute regarding the implementation of project performance dimensions. According to the descriptive analysis of the project, respondents agreed that the project's objectives were met (M=3.8 and SD=1.123) and that the overall quality of the project's results (M=3.7 and SD=1.057). The respondents' scores on project stakeholder satisfaction were only slightly out of agreement (M=3.31 and SD=1.307).

4.4.2. Summary of Study variables

The mean of all mean scores for the SCI dimensions and project performance were shown in the table below. The dimensions of Barriers to Supply Chain Integration scored the highest, whereas Integration of Information Tilts to Score the Relatively Lowest, and the mean of most of the dependent and independent variable were above the average.

It is clear that SCI practice has been taken into account as a way to lower project costs, improve project efficiency, and raise service levels within an organization. Project performance is hampered by operational inefficiencies caused by a lack of integration among supply chain participants (Lambert, 2004).

	N		Mean	Std. Error of Mean	Std. Deviation
	Valid	Missing			
Linkage of organizational relationships	48	0	3.68	0.13	0.88
Coordinating and sharing resources	48	0	3.39	0.11	0.80
Integration of Information	48	0	3.25	0.10	0.66
Barriers to Supply Chain Integration	48	0	4.01	0.14	0.97
Project performance	48	0	3.46	0.13	0.91

Table 5. Summary of Study variables

Source; Survey Results and Own Computation, 2023

4.5. Correlation Analysis

The bivariate Pearson's coefficient of relationship, which is spoken to by the little letter r, measures the quality of the relationship between two factors. Pearson product-moment relationship attempts to draw a line of best fit through the information of two factors, and the Pearson relationship coefficient was conducted to look at the relationship between factors. r, demonstrates how far away all of these information focuses are from this line of best fit (how well the information fits this modern model/line of best fit), and p demonstrates how closely the information focuses match the new demonstrate. Between +1 and -1 are the conceivable values for the Pearson relationship coefficient, or r. The absence of any association between the two factors is shown by a Pearson relationship coefficient value of zero. The relationship coefficient value between the ranges of 0.1 and 0.20 illustrated a weak and insignificant relationship, the value between the ranges of 0.20 and 0.40 illustrated a low relationship or weak relationship between the factors, the value between the ranges of 0.40 and 0.70 illustrated a direct relationship, and the value between the ranges of 0.70 and 0.90 illustrated a solid relationship or considerable relationship with within the factors (B. Burns & R. Burns, 2008). With a value of 0.574, the analysis' findings revealed a moderate correlation between Linkage of organizational relationships and Coordinating and sharing resources.

The outcome demonstrated that Integration of Information and Linkage of Organizational Relationships with a Pearson Coefficient of 0.594. With a Pearson coefficient of 0.796, the findings showed a link between organizational relationships and supply chain integration barriers is very high. The relationship between organizational relationships and project performance is shown in the correlation table with a Pearson coefficient of 0.547. Additionally, it was discovered that there is a strong correlation between coordinating and sharing resources and integrating information, with a Pearson Correlation value of 0.721, as it is stated in the hypothesis. The correlation analysis also revealed a Pearson coefficient of 0.529 between barriers to SCI and resource coordination and sharing. The analysis's findings demonstrated a strong correlation between the factors linking organizational relationships and barriers to SCI (0.796) and coordinating and sharing resources and project performance (0.884). The outcome revealed a moderate correlation between the integration of information with SCI barriers and project performance of 0.645 and 0.648, respectively. Project performance and supply chain integration barriers have a mediocre correlation with a value of 0.441.

		Linkage of organizational relationships	Coordinating and sharing resources	Integration of Information	Barriers to Supply Chain Integration	Project performance
Linkage of organizational relationships	Pearson Correlation	1	.574**	.594**	.796**	.547**
	N		48	48	48	48
Coordinating and sharing resources	Pearson Correlation		1	.721**	.529**	.884**
	N			48	48	48
Integration of Information	Pearson Correlation			1	.645**	.648**
	N				48	48
Barriers to Supply Chain Integration	Pearson Correlation				1	.441**
	N					48
Project performance	Pearson Correlation					1
	N					

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

Table 6. Correlation Analysis

Source; Survey Results and Own Computation, 2023

4.6. Regression Analysis

Regression analysis takes into consideration the normal value disseminations of a dependent variable and independent factors. The strategy assessed the impacts on project execution whereas utilizing the independent factors as inputs. A show of multiple regression was utilized within the study.

Diagnosis Tests

It is necessary to look at key assumptions in arrange to carry out an essential linear regression, which is helpful in coming to conclusions almost the population beneath study (Field, 2009). Furthermore, concurring to Saunders et al. (2009), key presumptions must be met when performing numerous regression analysis utilizing the regression condition.

As a result, in arrange to perform the regression analysis and decide the distinct impacts of different SCI characteristics, the researchers must make sure that the factors are linearly related, the information is normally distributed, the variances are homogeneous, and there's no collinearity between the factors. Taking after are the discoveries of the tests for normality, linearity, multicollinearity, and homogeneity of variances.

Normality

In addition to other methods, it is advised to look at a distribution employing a histogram and a P-P plot (probability-probability plot) in arrange to affirm the normality presumptions for fundamental direct regression analysis. As a result, the analyst employs a histogram and a P-P plot to check for normality in arrange to affirm the exactness of these presumptions. The normal dissemination takes the shape of a symmetric bell-shaped bend (Garson, 2012 and Field, 2009). Subsequently, the histogram shows up to have an ordinary distribution or bell-shaped bend, and the dispersion is normal, as seen in Figure 3. underneath. The curve is symmetrical and skewed also. In this manner, it can be said that the model works well with the information.

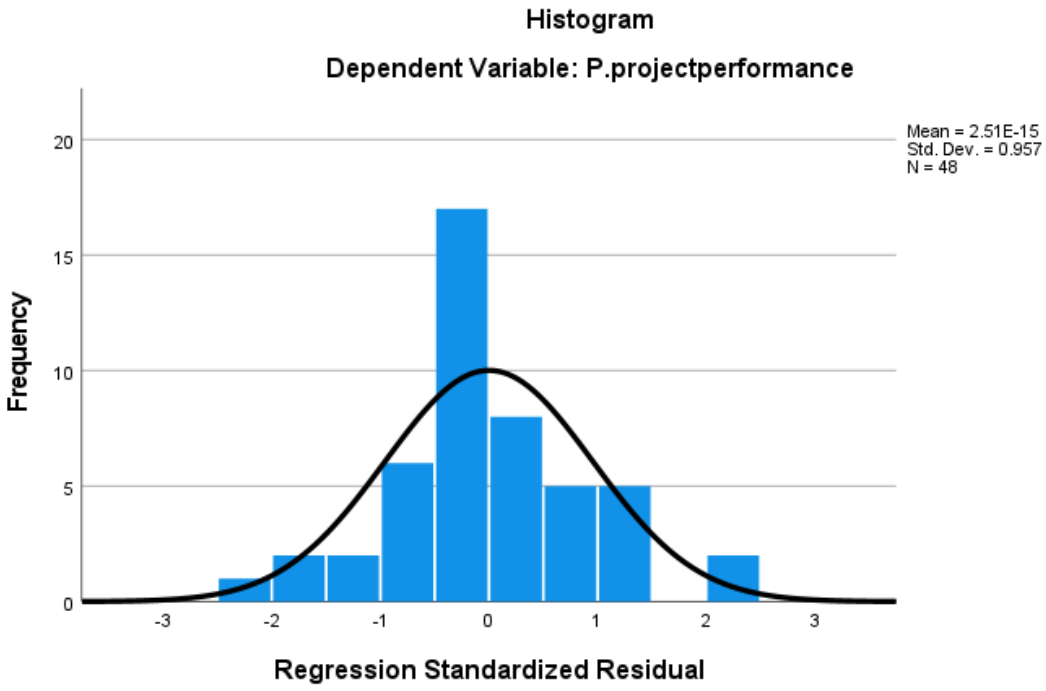

Figure 3. Normality Histogram

Source; Survey Results and Own Computation, 2023

The typical probability plot moreover appears deviations from normality. In this graph, the straight line speaks to a typical distribution, whereas the dots speak to the observed residuals. Subsequently, all points lie on the line when the information set contains a perfectly typical distribution (Field, 2009). The dots are closely adjusted with the straight line within the Figure 4, appearing small or no deviation from normality. Hence, the elemental presumption of straight regression has been met, and it can be concluded that the demonstration is exact and generalizable to the whole population.

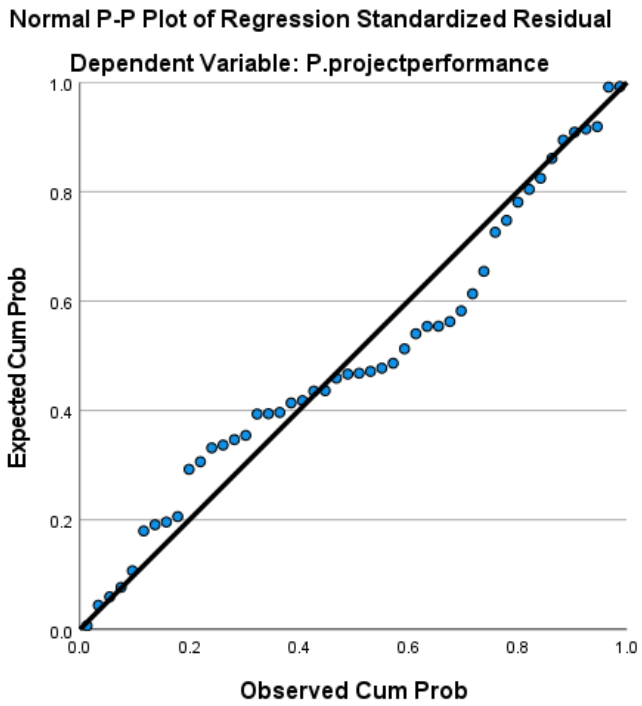

Figure 4. Normal P-P plot of Regression

Source; Survey Results and Own Computation, 2023

Linearity

It is widely used for identifying whether a connection is nonlinear by performing a standard analysis of scatterplots (Garson, 2012). In order to determine whether the variables have a linear relationship, the researcher uses a simple scatterplot. According to the assumption of linearity, the median values of the dependent variable for each unit of the predictor should follow a straight line (Field, 2009). The simulated relationship, however, is thought to be roughly linear. The dots are scattered in the form of a straight line, as shown in the Figure 5 below. This may be the result of a number of factors, including the effect of a smaller population size. According to the correlation matrix, the dots also exhibit an upward trend (positive slope), demonstrating a positive linear relationship between two variables (SCI facilitators and project performance).

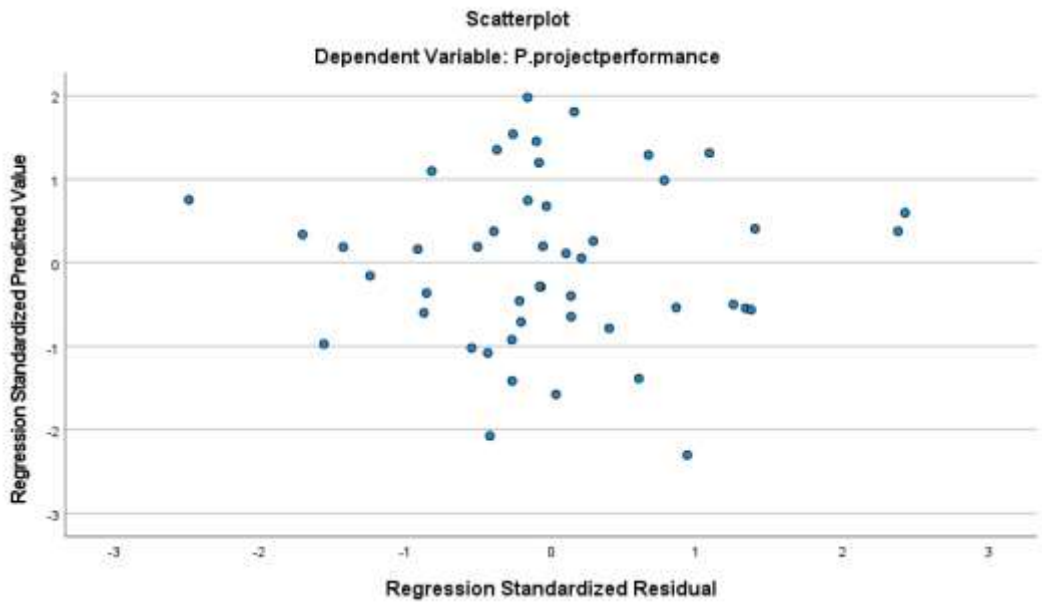

Figure 5. Scatterplot of standard residual Vs predicted value

Source; Survey Results and Own Computation, 2023

Multi- collinearity

The reliability of the regression comes about diminishes in numerous regression analysis as the degree of relationship between the factors increases. As a result, multi-collinearity could be a problem that ought to be tended to in case there's a critical level of relationship between independent variables (Kothari, 2004). Analyzing the Pearson relationship coefficient between predictor factors can help with this. In case the Pearson relationship coefficient (r) esteem is less than 0.9, at that point there's no critical relationship between the indicator factors, and there's no multi-collinearity issue (Field, 2006). Table 7, Records all of the Pearson relationship coefficients. Because of this, there's no overlap between the factors and no collinearity impact, which might constrain the model's capacity to predict. Multicollinearity, is said to exist when the VIF esteem is higher than 5 and the tolerance value is lower 0.20. (Hair et al. 2010). Agreeing to the multicolinarity insights table, the tolerance values are more than 0.2 and the VIF values are less than 5, which recommends that there were no issues with multi-collinearity within the study's independent factors.

Model		Sig.	Collinearity Statistics	
			Tolerance	VIF
1	(Constant)	.910		
	Linkage of organizational relationships	.155	.333	3.002
	Coordinating and sharing resources	.000	.444	2.253
	Integration of Information	.648	.383	2.611
	Barriers to Supply Chain Integration	.161	.318	3.144

Table 7. Multi-Collinearity

Source; Survey Results and Own Computation, 2023

Homoscedasticity

A degree of whether the relationship beneath examination holds true over the entire range of the dependent variable. Need of homoscedasticity is illustrated by higher errors (residuals) for a few portions of the range. According to Field (2009), the charts of *ZRESID and *ZPRED ought to take after an irregular cluster of dots around zero if the homoscedasticity measure is fulfilled. The focuses are distributed randomly and similarly all through the plot, with no glaring outliers on this cloud of dots centered on zero, as appeared in Figure 6. underneath. In this way, the presumptions of homoscedasticity and random errors have been fulfilled.

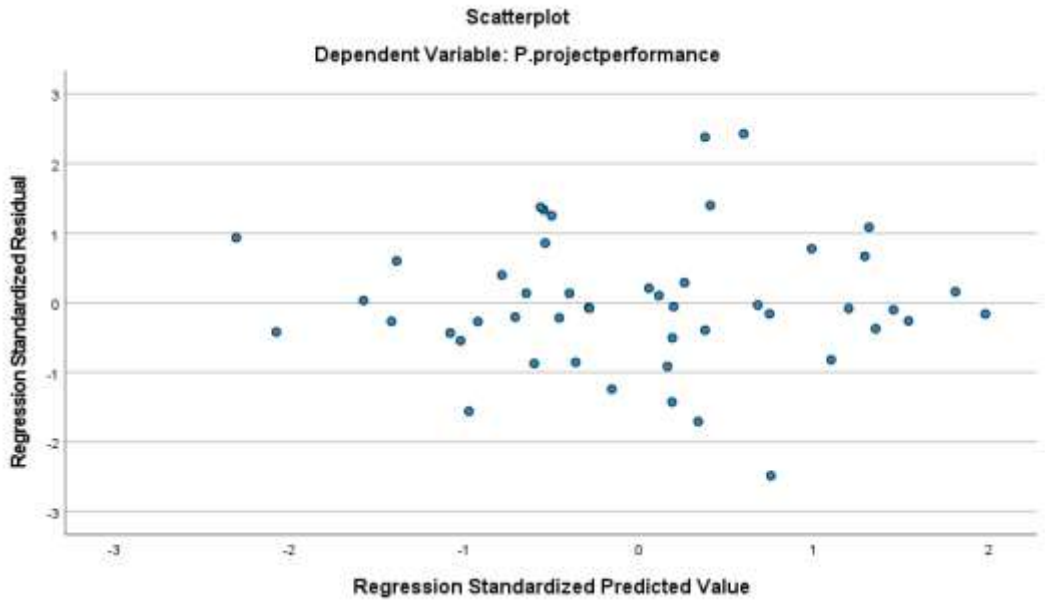

Figure 6. Scatterplot of Standard predicted value Vs Standard residual

Source; Survey Results and Own Computation, 2023

4.6.1. Regression Model

The three SCI variables' known values were used to predict project performance in the table bellow's regression model. R Square ($R^2 = 79.3\%, F = 41.3, \text{Sig} = .000^b$) displays the percentage of the project performance (dependent variable) representation by SCI independent variables or the independent variables in a regression analysis which means Project performance is represented by the Independent variables (Linkage of organizational relationship, coordinating and sharing resources, integration of information and barriers to supply chain integration) 79.3%.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.891[a]	.793	.774	.43270

a. Predictors: (Constant), B. Barriers to Supply Chain Integration, C. Coordinating and sharing resources, I. Integration of Information, L. Linkage of organizational relationships

Table 8. Regression Model
Source; Survey Results and Own Computation, 2023

ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.922	4	7.730	41.288	.000[b]
	Residual	8.051	43	.187		
	Total	38.973	47			

a. Dependent Variable: P. project performance

b. Predictors: (Constant), B. Barriers to Supply Chain Integration, C. Coordinating and sharing resources, I. Integration of Information, L. Linkage of organizational relationships

Table 9. ANOVA
Source; Survey Results and Own Computation, 2023

The alternative proposition, which states that supply chain integration has a direct impact on project performance in Ethiopian pharmaceuticals supply Agent, is acknowledged based on the analysis of variance, which excludes the null hypothesis, at (α≤ 0.05).

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.038	.335		-.114	.910
	L. Linkage of organizational relationships	.180	.124	.174	1.448	.155
	C. Coordinating and sharing resources	.961	.119	.839	8.070	.000
	I. Integration of Information	.071	.154	.052	.460	.648
	B. Barriers to Supply Chain Integration	-.164	.115	-.175	-1.426	.161

a. Dependent Variable: P. project performance

Table 10. Multiple Regression Analysis Coefficients
Source; Survey Results and Own Computation, 2023

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.150	.481		.312	.757
	SCI attribute	.924	.132	.719	7.022	.000

a. Dependent Variable: Project Performance

Table 11. SCI variables linear regression Analysis Coefficient
Source; Survey Results and Own Computation, 2023

By taking into account the provided known values of SCI variables, the regression model forecasts the value of dependent variables. In general, the regression analysis is used in two different ways: (1) as a way of considering data taking into account any other relevant variables by adjusting the random variable, and (2) to generate mathematical forms to be used to predict the random variable from the other (independent) variables. A regression equation is not only a mathematical linking of two variables yet serves as a pointer to questions. The study develops the following multiple linear regression model:

$$Y = 0.18X_1 + 0.96X_2 + 0.07X_3 - 0.16X_4 - 0.04$$

Where:

- Y: project performance,
- X1: Linkage of organizational relationships
- X2: Coordinating and sharing resources
- X3: Integration of Information
- X4: Barriers to SCI

According to the established regression equation, Project performance will be -0.04 as a result of the independent variables, assuming all factors (Linkage of organizational relationships, coordinating and sharing resources, Integration of Information, and Barrier to SCI) are fixed at zero. According to the study's findings, a single unit increase in the Linkage of organizational relationships will result in a 0.18 improvement in project performance, assuming that all other independent variables variable are set to zero.

The regression analysis indicated that a single unit rise in coordinating and sharing resources will lead to a 0.96 unit growth in project performance in the institute which is significant in this specific project, therefore as it is stated in the hypothesis, Coordinating and sharing resources significantly affects the project performance than the other independent variables. The result showed that a single unit escalation on the Integration of information will create a 0.07 Improvement in project performance in the sector. Besides the studies illustrated that a single unit growth on Barriers to SCI will lead to a 0.16 down turn in the project performance of the institute. Therefore the study implies that three variables (Linkage of organizational relationships, Coordinating and sharing resources, and integration of information) have a positive relationship with Coordinating and sharing resources contributing more to project performance in the institute, while Barriers to SCI affect the project performance negatively. Barriers to supply chain integration affect the project performance significantly in a negative way while information integration impacts slightly during project performance since the stakeholder of the project includes (Supplier, distributor, EPSA, and various healthcare institutes) the level of information being shared for different stakeholder at different level varies accordingly.

According to the coefficient table (Table 11), the relationship between SCI attributes and project performance is direct, with a beta-value of 0.719. Additionally, the B value (0.924) in the unstandardized coefficient column indicates that, when all other variables are held constant at zero, there is a 0.924 unit increase in project performance in EPSA for every unit increase in SCI attributes. This suggests that successful projects increase significantly as a project manager performs an effective SCI role at the company. Therefore, under these circumstances, the linear regression equation including the independent variable would be:

$$Y = 0.15 + 0.924\,X$$

Where:

Y: project performance

X: SCI attributes

4.7. Interview Result

Most of the interview participants were EPSA regional hub representatives and healthcare institute managers who were responsible and active in the OR establishment project. As per the response from EPSA regional hub representatives, the machines and equipment selected after the standard bidding process, high-quality systems were selected and imported from available distributors or suppliers.

The machines, materials, and supplies were dispatched and distributed from EPSA Adama Hub to different other regional hubs including Addis Ababa main Hub. From those hubs, the machine and materials which were needed for the project excussion, distributed to different healthcare service-providing institutions. Some machines, materials, and supplies (including oxygen regulator, Oxygen supply for the OR machines) were not delivered from the hub to the health center due to peace and security issue in the area where the health center was located. In some cases even though those OR establishment materials were delivered they were not completely delivered some materials were left so they need other fulfillment to proceed with in the project.

The responses have also shown some healthcare institutions were not ready for the project due to power disturbance or total power loss since they use generator as a power supply. Also equipment and supply like (oxygen regulator and Oxygen supply) were not available so it holds back the project from fully being delivered as per the schedule and preparation. There was also some employee turnover in the healthcare institute some of the healthcare workers were not available and there was an issue with trained and effective manpower to work in the OR area.
Therefore they were not ready to get the machines installed and start working in the area even though the project objective was highly valuable and the equipment's delivered were of high standard. Due to the healthcare institution readiness, peace and security issue, some materials, equipment's and supplies got in to another area so that they could get functioning there. In some healthcare service providing institution the equipment's are delivered, installed but they are not ready to start working on them due to the reason of manpower availability, so they need to wait a little bit which intern make some materials (parts, drugs and accessories) get expired.

Chapter Five
Conclusion and Recommendation
Introduction
This chapter presents and summarizes the key research findings that were utilized to address the research questions. The chapter also summarizes data findings on how Ethiopian pharmaceuticals supply agent established supply chain integration affect project performance. The chapters incorporate insightful conclusions and recommendations.

5.1. Summary of Findings
The Ethiopian Pharmaceutical Supply Agent is working on a number of health-related projects. The study's goal were to provide insight information about Supply chain integration in healthcare projects of the Ethiopia pharmaceutical supply agency (EPSA) and identify the supply chain integration strategies used by the institute and to identify how the various aspects of supply chain integration affected project success. The study also clarified the connection between the supply chain integration dimension and project performance.

The results showed that linkage of organizational relationships had been adopted to a greater extent within the institute, as shown by the composite (Mean=3.7 and standard deviation=0.88). This demonstrates that the institute has sufficient organizational relationships linked to its strategic objectives. The respondents' agreement with various SCI barriers was indicated by the average mean of those barriers (M=4.01 and SD=0.91).

The sector should concentrate on lowering SCI barriers because there is potential for greater be nefits and cost savings the more easily the supply chain can be integrated. The result showed that adoption of coordinating and sharing of resources has a significant impact on project performance (M=3.4 and SD= 0.8) because the interaction with customer (healthcare service provider) to project reliability have an effect on project deliverable quality and project completion date. Close cooperation between customers and suppliers since manufacturing is becoming increasingly dependent on transportation, and lowering costs and improving quality (Mason and Lalwani's, 2007). The integration of businesses with their customers includes the sharing of strategic information and collaboration between businesses and customers to enhance joint vision and planning. So there is a direct impact of information integration on coordination and resource sharing. The deeper understanding of customer expectations and market opportunities that can result from integration with customers allows businesses to respond to customer needs more quickly and effectively by adjusting their supply to meet those demands. Interview result has also showed that the need to a coordination and resource sharing is high and the company has to work on an implementation of the strategy for future ahead.

Integration of information has the lower mean score of (M=3.25 and SD= 0.66), since the project stake holders include EPSA international and external customers, healthcare institutes, suppliers and distributors) the level of information integration between different stakeholders varies accordingly depending on companies policy and strategy.

Three of the SCI variables Linkage of organizational relationship, coordination and resource sharing and, information integration have a positive correlations with each other and project performance while barriers to SCI has negative relationship with the project performance. The alternative hypothesis, which states that Coordinating and sharing resources have a high direct impact on project performance in Ethiopian pharmaceutical supply Agent OR establishment project Health acknowledged and the null proposition is rejected at ($\alpha \leq 0.05$).

5.2. Conclusion

The purpose of the study was to determine how project performance was impacted by SCI. The study came up with the following conclusion in light of its findings in relation to a particular goal:

- Institute has relatively good experience in the specific project of OR establishment in the area of strategic supplier partnership, considering quality as a selection criteria, however during project excussion a gap has been identified in delivering those quality product and materials to the consumer appropriately due to various challenges of supply chain integration such as lack of technology, knowledge gap and system compatibility.
- The fact that the dimensions of Linkage of organizational relationships were rated high with the average mean value of 3.67, provides insight into the high state of linkage of organizational relationship in the industry. The study's findings also showed that resource sharing and coordination has a big impact on project performance. Therefore, it was determined that improving supplier sourcing practices in terms of timely selection, level of collaboration, and level of strategic selection is necessary to improve project performance in terms of quality, cost, and time.
- The study's findings also showed that the lower linkage of the organizational status of healthcare by the EPSA has a significant impact on project performance. The institute is implementing linkage of organizational relationships ineffectively. It was therefore concluded that to improve project performance in terms of quality, cost and time, there is a need to enhance linkage of organizational relationship practice with respect to delivering the right product at the right place, knowing the need of the customer and understanding the challenges of the customer to implement the project.

Selection of suppliers, computerized ordering system, frequent contacts with the customer, establishment of quick ordering system with major customer has also has significant impact on project performance.

- The findings showed a link between organizational relationships and supply chain integration barriers is very high. Also there is a strong correlation between coordinating & sharing resources and, integrating of information which will intern have a strong positive correlation with the company's project performance with regard to coordinating & sharing resources.

5.3. Recommendation

According to study's research findings, the researcher suggests that:

- Assessments of all projects, vendors, distributors and suppliers are required in order to improve project performance within the organization. It is important to properly define the scope of work that outlines what each party will produce or provide for the projects. Documents for institute projects' need assessments and supplier sourcing must also be in line with other channel participants. For each type of purchased goods or outsourced service, the projects should choose the right partnerships and assess possibilities for collaboration with regard to the customer potential status.
- The institute should adopt a SCI plan, which is a subset of the project management plan, just like all other management plans. The projects should use SCI analysis and contract type definition tools and techniques for Integration planning, the institute should also choose an efficient SCI facilitators and minimize the effect of barriers. Any contracts made with institute projects should include an incentive for finishing the work on a crucial milestone for the project.
- Supply chain integration between the institute and the customers should properly be managed so that the project deliverable meet the objective. The capacity or readiness of the customer or the healthcare provider should be analyzed before planning to get in to the project excussion.
- It is highly recommended to address the prerequisites of the project exaction needs before going right to the implementation.
- This study examined the effects of the four SCI practices— linkage of organizational relationships, coordinating and sharing resources, integration of information, and SCI barriers—on the effectiveness of healthcare project of Ethiopian pharmaceuticals supply agent. The researcher suggests conducting additional studies to examine the impact of other SCI attributes on Project performance. Further research should emphasize the other project performance dimensions, such as consistent supply procurement to make the project deliverable met the project final goal consistently without discontinuity and shortage, as the researcher was also focused on the time and quality aspects of project performance.

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Annex I: Questionnaire
ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

This survey is being done for a research project that will be submitted as part of the Master's degree program in project management.

The purpose of the research is to examine the impacts of supply chain integration practices on project execution performance in medical device importing companies. As a Medical Device importing company, you will be questioned about your supply chain integration practices and their impact on your project performance. This questionnaire will take about 15-20 minutes to complete.

If you wish to contact me or have any problem finishing the questionnaire, please contact me through Email: samrawit.solomon87@gmail.com or my phone No. +251910762583. Please be assured that your replies will be kept secure and confidential as necessary.

Part One – In relation to personal information, please tick X in the space provided

1. Age

18-30 □ 31-40 □ 41- 50 □ 51- 60 □ Above 60 □

2. Sex

Male □ Female □

3. Number of years doing the business (working) with this company?

Below 1 year □ 2years □ 3 years □ 4 years □ Above 5 years □

4. Working experience (total number of years)?

Below 1 year □ 2years □ 3 years □ 4 years □ Above 5 years □

5. Educational background <10 grade

High School and 10+2 complete □ Diploma □ Degree □ MA and above □

Part Two – You are requested to tick one of the five alternatives that can represent your rating on supply chain integration practices of OR establishment project.

Question 1: Please express your degree of agreement with respect to **Strategic supplier partnership** Indicated through the following statements.

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	Considers quality as number one criterion in selection of suppliers					
2	Regularly solves problems jointly with its suppliers					
3	Has continuous improvement programs that include its key suppliers					
4	Actively involve our key suppliers in new product development processes					

Question 2: Please indicate your agreement pertaining to **Customer relationship** based on the following statements.

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	frequently interact with customers to set reliability, responsiveness etc standards					
2	frequently measure and evaluate customer satisfaction					
3	frequently determine future customer expectations					

4	facilitate customers' ability to seek assistance					

Question 3: Please indicate your rate of **Internal Operation Practices** in terms of the following?

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	Uses up- to- datedness of supply					
2	Has flexibility of supply integration system					
3	Uses automated n process automation					
4	Shows regularly continuous and instantaneous product and service improvement					

Question 4: Please indicate your rate of **Quality information sharing** in terms of the following factors? **Information sharing**

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	exchange information to partners timely					
2	exchange information to partners accurately					
3	exchange complete information to partners					
4	exchange adequate information to partners					

Question 5: To what extent do you agree/disagree regarding level of information sharing?

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	often shares design and manufacturing data with most important suppliers					
2	often shares order, demand, and forecast information					
3	often share inventory, production, sales information with our most important suppliers					
4	often share delivery scheduling data with our most important suppliers					

Question 6: Please rate of **Information technology** in terms of the following factors?

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	Uses IT-based automated ordering system					
2	Uses up-to-datedness of IT technologies throughout the supply chain					
3	Has adequate IT systems throughout the supply chain					
4	Use uninterrupted IT system					

Question 7: How do you perceive and rate **Challenges/ Barriers for effective SCM implementation**? Please encircle the number with the answer you choose.

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	Faces supply uncertainty (supplier inability to carry out the promise)					
2	Trusts its partners to share confidential data					
3	Willingness to share risks and benefits					
4	Faces inventory fluctuation due to inaccurate information sharing (bullwhip effect)					

Question 8: How do you perceive and rate **the project performance**? Please encircle the number with the answer you choose.

NO	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	2	3	4	5
1	The project objectives were met					
2	The project was completed within budget					
3	The project was completed within the schedule					
4	Project stakeholders were satisfied with this project					
5	The overall quality of the project outcome was high					

Interview questions for customers

1. How can you explain the company's overall supply chain integration practices?
2. How do you select the supplier of materials and supplies?
3. Did all the equipment and supplies be received as per the contract, packing list, or any other documentation?
4. Did the pieces of equipment and supplies get delivered to the healthcare institution properly?
5. What factors affect or decrease the utilization of the capacity during the project delivery?
6. How do you measure project success in this specific healthcare OR establishment program?
7. What is the inventory management across regional hubs of EPSA on materials and supply chains?
8. Do you have backward integration to suppliers and forward integration to distributors or Wholesalers as a long term strategically?
9. Do you have experience sharing best experiences in the area of supply chain integration from benchmark distributor companies?
10. What supply chain integration challenges faced with suppliers and distributors in the OR establishment project?
11. What are the recommendations or possible solution to solve such challenges raised so far?