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Impact of Information Sharing on Supply Chain Performance with Mediation of Trust

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ABSTRACT

This paper investigates the impact of information sharing with suppliers on supply chain performance while mediating the effect of trust. In this descriptive study, quantitative research will involve a questionnaire as a research instrument with boundary-spanning managers involved in sharing information with suppliers. Multiple research papers in different industries are used to see the impact of information sharing. In this study, information sharing with suppliers is integral in improving supply chain performance, impacting the overall business performance. Trust as a mediating factor improves sharing of information, but it will not directly influence the enhancement of supply chain performance. The findings will help managers understand and evaluate the importance of information sharing with a supplier and its effect on supply chain performance and enable them to make better decisions that enhance supply chain performance. The study is conducted in a specified time frame which bound the research to a particular period. Geographical boundaries also limit the study as it determines the impact of the research on the pharmaceutical industry of Pakistan, located in Karachi. Organizations need to develop a system that promotes information sharing by investing in technologies that support exchanging information between partners. Building trust and forming collaborative ties will ensure progression in the results of the supply chain network.

Keywords: *Supplier, Procurement, Logistics, Information sharing, Supplier trust, Pharmaceutical*

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1. Introduction

A supply chain is an emerging field in terms of theory and its execution. This management field has one of the most researched topics on mathematical methods for supply chain optimization or specific issues. Today, the challenge for firms is to carry out supply chain practices and implement them to accomplish the desired objectives. Performance measurement is a systematic process that efficiently quantifies any concept (Neely et al., 1997). Improving supply chain performance is a continuous process, which can be done by the set of variables determined through different supply chain practices (Ramdas & Spekman, 2000; Hashmi et al., 2021a). Supply chain performance is the target for all firms, and different have dealt with the issue differently. Some firms have completely transferred the logistics and supply to third parties, while others have made it an integral part of their production processes. Different organizations have their distinct objectives to achieve when it comes to performance. These objectives can further divide into long and short-term objectives like enhanced productivity, minimized inventory and improved lead time, increased market share and integrated operations (Lyons et al., 2004; Li et al., 2006; Hashmi et al., 2021b). These objectives are highly interdependent and cannot achieve alone. Therefore, any business entity's performance depends upon its supply chain partners' performance and willingness and ability to align business activities in the SC network.

Information flow is essential to SC because it helps direct the material flow. The literature reveals that better information sharing between the channel members can mitigate various deficiencies. Although information sharing can be significant, it will not be enough to lessen uncertainty's effect. In addition, the nature of information depends upon the advantage of exchanging information. The performance of the supply chain can be improved if closer information-based linkages form, which help to manage resources and capabilities in a way that will produce improved results (Ding et al., 2011; Baloch & Rashid, 2022). The effort that companies make to satisfy their customers' needs can go all in vain if their partners are not aligned and responsive to the rapidly changing needs of the customers (Li & Lin, 2006). By sharing information, each member receives accurate, up-to-date and correct data for timely decisions regarding production and inventory (Bargshady et al., 2016; Shaheen, 2022). Data integration with channel members provides an equal opportunity to enjoy the experience gained by offering extra value to customers (Kwon & Suh, 2005). There is a discernible benefit of information sharing on the bullwhip effect (Levary, 2000; Zhang & Chen, 2013).

Information sharing is essential, and the performance of the SC also depends on it, so it is essential to know what information we are sharing, how we are sharing and to whom we are sharing (Holmberg, 2000). Suppliers are essential to channel members for any organization because they provide the desired raw material for the product. Information sharing with a supplier is integral to supplier integration and collaboration. When companies want to cater to the changing demands of the customers, suppliers are one of those partners who help to meet the changing demand and try to produce at the lowest possible cost. Nevertheless, organizations are reluctant to provide information to suppliers as they want to maintain secrecy, which ultimately impacts on final execution of the supply chain. Information sharing would be accurate, secure and ready so that it provides its benefits. If not undertaken adequately, these characteristics of information sharing, companies aiming to improve their performance can face numerous challenges.

The implementation rate of information sharing is low because of the risks in the quality of information and outflow of private information (Shaheen, 2022; Madenas et al., 2015). If supply chain partners cannot hold or maintain privacy between inter-organizational information sharing, this can lead to mistrust between partners and eventually impact competitiveness (Zhang & Chen, 2013). When partners lose trust and faith in each other, they hold buffer inventories to safeguard themselves from demand uncertainty. Trust is the concept which relies on the entity and to whom have confidence. Building a relationship between the SC partners requires a certain level of trust and commitment, and

without that, any effort is likely to be unfruitful (Handfield & Nichols, 2004; Anwar, 2022). Quality of information across the whole supply chain network impacts the overall supply chain performance and can help develop strategies that motivate the seamless flow of information. Trust is an essential factor influencing information sharing and will enhance the relationship between information sharing and SCP.

A supply chain is now difficult to manage with the increasing number of alternatives. Competition is not only limited between products and services, but it is now between supply networks. Companies need to organize relationships with their partners well so that all can make a joint effort to compete as a unified entity. The dilemma is that companies still do not understand that their supply chain performance depends upon their integration and collaboration with their supply chain partners. The supply chain performance can improve and enhance by sharing information necessary to put minds on the same page. Information sharing is an essential part of any SC network. Sharing information impacts the cost, order fulfilment, and shorter cycle time (Badia, 2021; Baloch & Rashid, 2022). Companies need to consider the whole supply chain as an integrated entity, where each member of the supply chain network is interdependent's performance. Customer responsiveness is the strategic aim of any organization, which can be achieved through better alignment and integration of SC activities. Information sharing plays a vital role in increasing the operational efficiency of the supply chain, through better integration with the partners, especially with suppliers. Information sharing can be done if the organizations have a trust factor to foster performance. Trust helps to understand the capability of reaching the desired destination.

Although much research has been done to determine the impact of information sharing, less attention has been paid to trust as mediating variable between information sharing and SCP. Trust delivers ease in a business transaction and boosts customer satisfaction (Eckerd et al., 2022; Amjad, 2022). It helps to solve problems mutually and promotes a cooperative environment. Trust reduces the complexities in negotiation and allows partners to think for mutual gains. Trust allows open information sharing, as buyer suppliers are reluctant to share required information, and this behaviour leads to inefficient performance. To enhance the performance of supply chain operations of any organization, firms need to change this unsatisfactory relationship and develop an atmosphere of trust. It also helps to share challenges and compete as a unified body (Rasheed, 2022; Saikouk et al., 2021).

Moreover, trust is the factor which helps us to know the degree of variation between information sharing and SCP. Hence there is a need to conduct the current study to deal with the problems manufacturers and suppliers face regarding information sharing and trusting partners. The research conducted before on this topic has different geographic coverage. This research has been conducted in Karachi, Pakistan, to analyze the effect of information sharing on supply chain performance with the mediation of supplier trust. Based on the research purpose following research questions will be investigated:

a. *To what extent does information sharing with suppliers influence SCP?*

b. *To what extent does trust will influence information sharing with a supplier?*

c. *To what extent does trust influence supply chain performance?*

d. *To what extent does trust mediate the relationship between information sharing and supply chain performance?*

2. Literature Review

2.1. Information Sharing

Information sharing is transferring helpful information to help drive the desired results (Sun et al., 2005). Information sharing is the method of distributing the desired information within the SC network, and the level of information sharing will determine the level of integration (Monczka et at.,

1998). The intensity of communication and cooperative behaviour will allow better information flow (Klein et al., 2007). The conducive environment between the inter-organizational levels will provide a better opportunity to perform as a unified body. Information sharing enables dependable deliveries and new product markets in time with better coordination between supply chain members (Sezen, 2008; Hunaid et al., 2022).

Information sharing helps organizations integrate with their partners through better communication channels and delivers desired outcomes cost-effectively. The main aim of the firms is to maximize profit by satisfying and retaining customers; information sharing is one of the ways that make it easier to understand the end user requirement, and each member of the supply network will work accordingly (Ding et al., 2011). Knowledge sharing enhances relationships; whether personal or professional, it benefits both the parties, who receives the information and who shares it. It gives an impression of giving value and welcoming partners to harmonize their inter-organizational Relationships (Cheng et at., 2008). Information sharing includes different information such as consumer demand, order status, sales forecast, inventory level, manufacturing capabilities, quality and lead time (Stevenson & Spring, 2007; Ali, 2022).

Companies are now becoming more customer-oriented in running their businesses (Bullinger et al., 2002; Alam, 2022). Firms want to serve their customers what they want, when they want and how they want to have their product and make their presence in the customers' minds by being available and accessible. In this environment, being stuck out is the worst situation to deal with as many competitors out there who can simply replace by substitute products. IS plays an essential role in reducing the effect of bullwhip but cannot eliminate it (Bullinger et al., 2002). The significant impact of bullwhip can put companies in danger because of the increased cost of holding inventory. Firms do not want to diminish their presence, which makes them keep safety stocks to maintain their service level (Chen et al., 2000).

2.1.1 Information asymmetry

Information asymmetry means unequal distribution of knowledge and information between two parties; it would be unevenness in quality or quantity. These inequalities will lead to inadequate decision-making and resentfully influence bargaining power. Information asymmetry can occur because of different asymmetrical types, such as size asymmetry, power asymmetry, knowledge asymmetry, and cost asymmetry. The leadership role defines size asymmetry, as larger organizations cannot accept others to rule over them, distorting partners from integrating and sharing information (Rashid, 2016). Power asymmetry defines by the difference in the authority of a party, which dictates terms to comply with operational guidelines. In knowledge asymmetry, organizations do not share adequate information required by other channel members (Sarkis & Talluri, 2004; Asif, 2022). Asymmetries impact the long run and distort the supply network, as decisions rely on adequate information, which can seriously harm any organization. Asymmetries can link with the zero-sum game, where one player wins at the cost of another. Information asymmetry can be harmful because it influences decision-making, hinders benefits, and creates inefficiencies in improving supply chain performance.

2.1.2 Information technology

Advancement in information technology has made information sharing more significant because of the ease of transferring the required information. It provides interactive ways to be integrated with supply chain partners operating far away from each other (Ray et al., 2005). EDI (electronic data interchange) is a system that helps transmit information and data along the supply network so that anyone can access it at any time, maintaining privacy and security simultaneously (Uddin, 2022). Vendor-managed inventory technology would be feasible enough to support the concept of sharing data regarding inventory levels with the suppliers so that they would automatically refill it by managing it electronically. The effect of bullwhip influences the whole supply chain widely in terms of the cost of holding inventory and backorders. The chances of going stock out or holding excess inventory can be minimized if information technology is utilized in the information sharing process (Kelle & Akbulut, 2005)

2.1.3 Information sharing with supplier

Information sharing provides better management of production scheduling, the structure of the price and managing consumer demand (Ganesh et al., 2014). Information sharing enables firms to integrate with suppliers and make steadfast commitments in supply chain management operations (Sezen, 2008). As the supplier is the one who supplies the raw material, which will be further furnished to form a finished product, so it means that the supplier has a direct connection with the performance of the SC, so sharing information with the supplier is essential (Lascelles & Dale, 1989). If firms do not invest in the supplier relationship, it will eventually impact the cost of inspection, rework, delays and overproduction. So sharing of information will make the firm efficient in cost reduction but also make the firm's presence competent (Garvin, 1987; Giunipero & Brewer, 1993). Sharing information with suppliers allows the firm to respond to consumer demand promptly (Ganesh et al., 2014). It improves the inventory cost, replenishment of the inventory, and material flow and reduces demand forecast errors (Sezen, 2008; Ayaz, 2022).

2.1.4 Bullwhip effect

Many industries and institutions have now considered bullwhip an essential factor in understanding the variation in supply and demand. The bullwhip effect is that the slight change in the downstream demand results in a significant change in the supply upstream. Information sharing helps reduce bullwhip's effect by sharing the demand information (Lee et al., 1997). Lee et al. (1997), the bullwhip effect lies between the retailer-supplier relationships and flows throughout the supply network. The bullwhip effect impacts the forecasting as well. It balanced out the result and made the lead time even longer Chen et al. (2000). Costantino et al. (2014) identify that poor information quality and lack of significant information sharing become the root cause of the bullwhip effect. The bullwhip effect leads to higher safety stocks and holding inventory cost and show the mismanagement between the partners in the supply network (Costantino et al. (2014). The holding of inventory will project the buffer, which will smooth the flow of the goods in response to the demand fluctuation. However, holding excess inventory in terms of not losing the revenue opportunity will lead to the bullwhip effect and increase the cost (Blinder, 1986).

2.1.5 Benefits of information sharing

Sharing information between the SC partners brings many benefits to the industries. Among these benefits, a manufacturer or a firm will gain two most important benefits: cost reduction and inventory reduction (Lee et al., 2000). The information sharing will benefit the manufacturer in such a way that it reduces the inventory cost by 5 to 35 per cent while maintaining the product availability in the market (Zhao et al., 2002). There are other benefits in terms of reducing lead time, reducing the bullwhip effect, reducing lead time, meeting customer expectations and reducing complaints (Lee et al., 2000). The information sharing will ensure visibility and help to alter the existing plan and improve future operations and approaches (Fiala, 2005; Muzammil, 2022). Sharing information related to demand or customer orders will provide close anticipation of the consumer's actual demand (Basit, 2022).

2.2 Trust

Trust is a multidimensional construct which binds the other construct with one another (Handfield & Bechtel, 2002; Kwon & Suh, 2004, 2005). Trust is confidence in honesty and integrity in one's personality or ways of doing things (Rousseau et al., 1998; Rashid et al., 2022). The relationship theory states that trust and commitment are a relational exchange between the partners and develop a direct or mediating relationship (Morgan & Hunt, 1994). As the supply chain involves different fragments of ownership and in this kind of complex relation, trust is the factor which plays a vital role in the long-term partnership (Wilson & Eckel, 2006). Trust ensures the partners' willingness to share important information and maintain relationship-based resources (Morgan & Hunt, 1994). The difficulty in coordination among the network and barriers to cooperation because of mistrust will impact

the strategic performance of the firms (Gao et al., 2005). A company needs to unify its goals and integrate them with its partners to achieve them efficiently (Gao et al., 2005). The atmosphere of trust will open the ways to integrate freely and reduce hesitation in the buyer-supplier relationship, which will enhance the long-term commitments and improve future operations (Paulraj et al. (2008). Trust is the factor that binds the inter-organizational relationship. When it comes to the supply network then, it fosters the commitment through which operations are performed efficiently (Kwon & Suh, 2004). Trust constitutes fair dealing with its partners, a sense of reciprocity and partners' reliability (Morgan & Hunt, 1994; Hart & Saunders, 1997). As trust is not a temporary engagement, it helps to grow and strengthen the bond between the partners and helps to make steadfast commitments for a more extended period (Sahay, 2003). Trust is a mediating factor that will raise the supply chain's performance bar (Sahay, 2003; Hashmi & Mohd, 2020).

Trust is the factor that is not only present in practice, but theories also emphasize a lot on the significance of it. Trust opens up new dimensions with its domain: commitment, integrity, honesty and many more (Das & Teng, 2001). Trust develops the integrated perspective of inter-organizational relationships, which is now needed in today's competitive world (Manu et al., 2015). Trust is the confidence gained mutually that no party will be deceitful with each other and could not be able to exploit others' weaknesses in the name of it (Table 1993). Other researchers have defined trust as the subjective factor in which one can be prejudiced while taking actions or performing any activity, irrespective of the level of the objectiveness of the situation (Gambetta, 2000). Trust is the psychological stimulus through which the person will respond to it, and so is the organization that works on a similar pattern (Rousseau et al., 1998; Das & Teng, 2001; Costa & Bijlsma-Frankema, 2007). Trust has some relation to the cost. A lack of trust impacts the operational cost, including other costs like verification, inspections, monitoring and certification costs between the supply partners (Beccerra & Gupta, 1999; Kwon & Suh, 2004). Trust comprises different aspects, which entails different ways of projecting trust, like integrity, faith, loyalty, consistency and dependability (Morgan & Hunt, 1994; Kumar et al., 1995; Beccerra & Gupta, 1999; Kwon & Suh, 2005). In trust, decisions are made mutually for the benefit of both parties to show the affirmative behaviour of each other. Trust is a commitment in a relationship to have positive expectations and trigger actions that persuade mutual gains. In today's world, trust between organizations is essential for sustainability and survival (Zaheer et al., 1998).

The depth of a relationship can be determined through the level of trust between the parties, which is why trust is a crucial factor in measuring the significance of relationships. The global competition has put organizations into collaborations with supply chain partners to meet the customer needs on time by mutually identifying their needs and gaining an advantage from them. Without trust, the integration will not be possible between the partners. Joint operations must ensure the process of building customer perception about the company and its relationship with its supplier. If trust exists between such integration, it will surely pop up through the efforts both parties put in to fulfil the customer's needs (Gounaris, 2005).

2.3 Supply Chain Performance

SC management is the network of businesses, mainly suppliers, manufacturers, distributors, wholesalers and retailers. Many researchers have defined SCP as delivering the right product at the right time, in the correct quantity, and at the lowest cost to the right customers (Green et al., 2005). SCP depends upon the potential of the supply chain network and the efforts that SC partners put in to achieve the desired outcome (Hashmi et al., 2020a). Organizations alone cannot achieve a competitive advantage. The whole supply chain network is responsible for it, which will, in turn, impact the overall business performance (Chen & Paulraj, 2004). Now firms should have some kind of competitive advantage over their competitors to survive in this globally competitive world. To sustain a competitive edge, companies need to improve their supply chain performance (Rashid et al., 2022). Several studies have identified different performance measurements for supply chain performance, including operational cost, lead time and customer order responsiveness (Lee & Billington, 1993; Pyke & Cohen, 1994).

SC is an enormous field in which many concepts help determine operational efficiency and deliver essential services to build a competitive edge through SCM practices. Different organizations work for a unified goal in a supply chain network. If one firm is not able or willing to cooperate or coordinate in the whole supply network, then operational inefficiencies, lack of delivery of required services and unfulfilled customer needs would result (Hall & Saygin, 2012). Supply chain performance has multiple dimensions to measure its performance. However, by reducing excess inventory and providing improved products, the whole network can serve its customers on time with enhanced product quality by decreasing set-up time and altering capacity (Wang et al., 2004; Vonderembse et al., 2006). Customer satisfaction is one of the main aims of any organization or supply chain network. Every customer has different levels or priorities of satisfaction concerning their choices, with some focusing on quality and others on price and on-time delivery (Fawcett et al., 2007). Now companies have to vary vigilant while choosing the performance metrics for measuring SCP because the chosen metrics would be insufficient to cater to the umbrella term, SCM (Hausman, 2004). Supply chain performance can be measured in short and long-term objectives, which include decreasing inventory level and reducing lead. In contrast, long-term objectives would be increased market share and integrated activities, which determine organizations to evaluate their supply chain performance concerning the objectives (Li et al., 2006b; Lyons et al., 2004; Hashmi et al., 2020b). As the supply chain is linked with overall organizational performance, it has a direct and significant positive relationship with one another, whether small, medium enterprises or large organizations.

2.4. Relevant Theory

2.4.1. Transaction cost theory

Transaction cost theory is the theory in which a firm will experience high transaction costs due to a lack of information or information asymmetry (Williamson, 1981). The transaction cost incurs due to the lack of IS ability and experiencing a high level of uncertainty. The transaction cost will be higher if the organization's behaviour is opportunistic because it includes different costs, such as monitoring and inspection (Kwon & Suh, 2004). Building a trust-based relationship is essential because it will minimize the behaviour's opportunism and increase the performance's effectiveness. Organizations must facilitate integration and collaboration between the supply chain channel members to avoid uncertainty and lower the transaction cost. As different businesses have different goals and objectives, to achieve them, it is essential to build strong ties between the partners, which will help to align the goals of the supply chain. Through better-informed partners, the supply chain would experience a reduction in uncertainty, more accurate forecasting and lowers transaction costs.

2.4.2. Resource-based view theory

The resource-based view is how organizations utilize their resources to gain a competitive advantage over their competitors (Conner, 1991; Fawcett et al., 2007). Resources can be physical or intangible in terms of machinery, equipment, supplies and knowledge, and innovativeness, which can become a competency for a firm which is difficult to imitate (Wernerfelt, 1984). Organizational resources are utilized to achieve efficient results, which is impossible if companies do not have trusted relationships (Grant, 1991; Varadarajan & Cunningham, 1995). The beauty of integration and collaboration is that the lack of resources is shared based on trust and mutual benefits with those who do not have that particular competency (Paulraj et al., 2008). This view helps to understand the importance of building a relationship through trust and information sharing, which will then lead to gaining a competitive edge over others and making higher profits through efficient supply chain performance.

2.5. Hypothesis Development

2.5.1. Information sharing and supply chain performance

Much research has been done to link information sharing and SCP. Researchers like Lee et al. (2000) empirically conclude the benefits of these variables in terms of cost minimization and reducing excess inventory, which will impact the overall performance of the businesses. Information sharing is being persuaded by two things which are connectivity and willingness, which helps to smoothen the flow of information and improves the overall SCP practices (Fawcett et al., 2007). Information sharing has a substantial impact on the supplier's activities because supply chain management is an integrated business where every business cannot work solely, as a supplier is one of the significant channel members of the supply network, so collaborating with them is necessary to establish a position in the market (Rashed et al., 2010). Information sharing is a prerequisite for a close bond between the supply chain partners, affecting the supply chain operations. The integrated supply chain now becomes a need for survival, and integration gives higher responsiveness to customer demand through which market share would increase (Lee, 2000). Effective integration would give a higher market share, provide a shorter cycle time, reduce logistics costs, and increase workforce effectiveness. Integration can be a source to open ways to collaborate on operations and work on a unified goal.

Information sharing can be a factor in improving or initiating the integration between organizations (Lummus & Vokurka, 1999). When firms give more importance to the flow of information than the flow of material, companies will experience better resource utilization and efficient flow of operations (Graham & Hardaker, 2000; Rashid & Rasheed, 2022). Eventually, customer service level determines the kind of efforts a company want to put in if they believe in higher customer service, so for long-term survival, companies need to cooperate and coordinate with their supplier through information sharing (Lai et al., 2010). So it can be determined that a higher level of information sharing would result in higher customer responsiveness which fulfils the aim of supply chain management (Forslund & Jonsson, 2007). Information sharing mitigates the bullwhip effect's impact, which helps improve supply chain performance. Sharing information is not an easy task. Suppose organizations want to benefit from it by sharing the correct information with the right quality and adequacy at the right time. In that case, it will reduce the impact of specific ineffective outcomes (Flynn et al., 2010). Supply chain management uses such kinds of remedies as sharing of information to improve the performance of different interlinked businesses (Flynn et al., 2010; Rashid, 2016).

Simatupang and Sridharan (2002) draw attention to the example of Walmart. This retailing firm shares its information with its main dealers, which shows that information sharing has a significant positive impact on the SCP. Customer satisfaction is the ultimate goal of any company. If they successfully satisfy their customers, they could have a competitive advantage over others, and information sharing can play a significant role in gaining a competitive edge (Nyaga et al., 2010). Information sharing between the supply chain channel members has a practical impact on the supply chain performance. In business, decision-making is an important task, and companies will bear huge losses if it is not correctly done. Information sharing plays a significant role in decision-making regarding inventory, forecasting and costing (Li et al., 2006; Iyer et al., 2009). Lack of adequate information sharing with partners results in poor decision-making (Du et al., 2012). In this competitive environment, customer orientation has become mandatory for companies to lead in the market over their competitor's chain (Bullinger et al., 2002). Information sharing helps compete in the market with customers' changing needs and demands (Swafford et al., 2008). The dynamic environment of the supply chain makes channel members inclined toward transmitting information (Malhotra et al., 2005). As information sharing in the dynamic supply chain is not a simple task, if information processing does not benefit the informed member of the supply chain in terms of profit, it is arguable whether it is sufficient to provide information. Information processing is used to maximize the network of supply chain performance (Baloch & Rashid, 2022). The shared information will help reduce decision-making errors and promote accuracy and persistence, which help to plan and act accordingly. In this way, SCP is optimized (Lee et al., 1997; Cachon& Fisher, 2000).

H1. Information sharing has a significant influence on SCM.

2.5.2. Information sharing and trust

The source of information is used to define the accuracy and authenticity of the information. The information will be considered vague if it does not conform to reality (Fu et al., 2016). The authenticity of the information can be judged by the level of trust both parties have in each other and their confidence in it (Simatupang & Sridharan, 2001). Trust shows that one party is willing to believe in the other party's verdict about something. The same happens within organizations where one party does not represent an individual but a whole organization (Simatupang & Sridharan, 2001). Integration in the supply chain provides ways to implement trust-based relationships between the parties. It helps to increase the bond, improves the overall performance and is responsive to the customer demand. Relationships that form based on trust show willingness to share. Trust-based relationships will last longer and benefit the supply chain's long-term objective, positively impacting its execution. Trust is formed through different factors, including honesty, integrity and faithfulness, which result in the long-term stability of the relationship or inter-organizational Relationship (Flynn et al., 2010). The confidence level defines the degree of trust in the relationship. In SC, it is essential to have trust in partners so that company's operations will perform smoothly (Lee, 2005). As customers have the power to influence the decisions based on the company's operations, so to be responsive to the market needs, companies must build a strong relationship with their supply chain partners through trust by making transparent policies and procedures, operations, requirements and fairness in dealing (Zhao et al., 2008). Trust can build indefinite boundaries through which utilization of resources and flow of information is at their fullest (Li & Lin, 2006). Some relationships required arm's length distance through which they would be able to build a network and share benefits with each member of the supply chain. Trust will ensure that others' loopholes will be covered through sharing competencies and expertise, which will strengthen the relationship even more (Cheng et at., 2008)

H2. Information sharing has a significant impact on trust.

2.5.3. Trust and supply chain performance

Trust plays an accelerating factor which binds the relations between the people; that is why trust is essential in relationships. The value of a relationship will determine by the level of trust each party possesses for the other. Trust in the supply chain is crucial, as to access the customers, companies need to collaborate with multiple organizations; without trust, no real integration would exist (Saban & Luchs, 2011). Trust higher the value of the relationship between the inter-organizational partnerships. It will impact the operations between the organizations and, in turn, the performance (Saban & Luchs, 2011). Trust exists in two forms reliability-based trust and character-based trust. Character-based trust is defined as trust based on the organization's culture and philosophy, and reliability-based trust is the ability that one party will fulfil his promise. Both forms of trust are needed in organizations to incorporate a conducive environment. Trust will ensure the supply chain performance as organizations work for mutual interest and seek the best results between the supply chain partners, especially with the suppliers. Seeking mutual benefit is not only an outcome but will protect each other's interests through a strong relationship bound by trust. Trust can result in flexibility, continuous improvement, learning and gaining advantage through reducing costs (Saban & Luchs, 2011; Rashid & Amirah, 2017). Trust satisfies the primary goal of the supply chain, which is customer service level, as trust enhances the relationship, which in turn impacts the SCP and ultimately impacts customer satisfaction (Gounaris, 2005). Now organizations are more inclined to build trust-oriented relations, which will impact long-term and mitigate control and command approaches, diminishing their potential to work together (Saban & Luchs, 2011; Rashid et al., 2019). The command approach tends to be more control centric, where one party dictates to another, eventually decreasing productivity and innovativeness. In contrast, trust-oriented relationships energize operations and are more accurate, leading to long-term success as both partners are willing to take part in each other operations in terms of time, cost and productivity (Saban & Luchs, 2011).

H3. Trust has a significant impact on supply chain performance.

2.5.4. Information sharing, trust, and supply chain performance

Many researchers have analyzed the impact of trust in business relations. Trust enhances the negotiation power when sharing information with critical business partners (Thompson, 1991). Trust also improves supply chain performance by increasing responsiveness and efficiency to potential market changes (Handfield & Bechtel, 2002). Many economists have used trust games to examine the part of a trust, in which two player plays anonymously with an experimenter. Player A sends some money to which the experimenter triple that amount and sends to player B. Then player B decides how much money he has to return to player A. In this theory, the author explains the trusting behaviour toward its partners to understand human psychology and its nature to counter. So trust increases the impact of sharing and exchanging information between partners and, thus, affects the performance of SC. The trust between buyer and supplier in deciding the supplier's manufacturing capabilities based on the buyer's forecast for demand ensures stable future operations (Taylor & Plambeck, 2007). In the supply chain, trust is crucial, as to access the customers, companies need to collaborate with multiple organizations, and without trust, no real integration would exist (Saban & Luchs, 2011). Trust satisfies the supply chain's main aim, customer satisfaction, as trust enhances the relationship, which impacts the supply chain performance and ultimately impacts customer satisfaction (Gounaris, 2005; Rashid, 2016). Figure 1 illustrates the conceptual framework of this study.

H4: Trust mediates the relationship between information sharing and SCP.

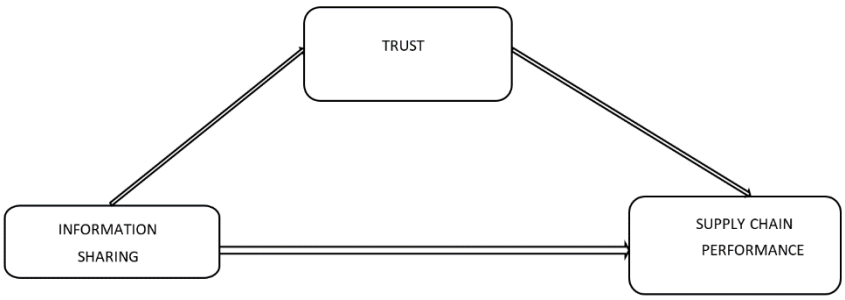

Figure 1: Conceptual framework

3. Research Methodology

This quantitative research uses numerical data to analyze the effect of variables. According to Rashid et al. (2021), the deductive approach relies on existing and proven theories. This approach is recommended for those studies where test assumptions are based on a conceptual and theoretical framework. It uses to test theories and assumptions regarding these variables. The role of quantitative research is to prove the point that lies between the construct and its hypotheses. Quantitative research establishes realistic results through statistical data and testing. The research approach is deductive, as it observed phenomena and is used to test a theory already developed. This approach relies on data collection from a large population. Besides this method, measure the objectives through actions and opinions to help describe the data rather than interpret it (Rashid et al., 2021). The variables of this research have already been identified, which are now tested by generating hypotheses. The study starts by analyzing the relationship between the variables and testing it in the manufacturing sector of Pakistan, which means the research goes from generalization toward specific data to analyzing the causal impact of the variables.

The purpose of the research is explanatory. The explanatory research finds those problems which were not catered to before or were not studied in depth (Khan et al., 2022a, b, c). Rashid et al. (2021) argued that explanatory research helps determine the cause of the occurrence of a specific phenomenon. This research usually explains a situation or problem in casual relationships and is

relevant to the quantitative method. This study will identify the causal relationship between the constructs and explain the significance by testing the hypotheses (Agha et al., 2021; Khan et al., 2021; Alrazehi et al., 2021; Dar et al., 2021; Haque et al., 2021). The variables, which are information sharing with suppliers, trust is used to define the impact on supply chain performance in the manufacturing sector of Pakistan. This research strategy is a survey used to examine the impact of information with suppliers on SCP. This study determines the causal relationship between the constructs by empirical testing. This study is conducted in a particular time frame that analyzes the effect of information sharing with suppliers on SCP.

The study was conducted one time with a defined population and sample size. The time horizon indicates that this research is cross-sectional. The research population entails those individuals whom the research has been generalized. The target population is used to aim for a specific population which meets the criteria according to the requirements of the study. The target population of this research is the manufacturing sector of Pakistan, in which supply chain performance can be measured through sharing of information with them, mediating the effect of trust. This study narrows down the population in terms of accessibility of the population. The accessible population through which the research gathers data is the manufacturing sector of Pakistan, which has one of its facilities in Karachi. It is feasible to gather data from the Karachi region and determine the effect of these variables in this metropolitan city.

3.1. Sampling

Sampling is considered for the research data collection (Traat et al., 2004). As the study is quantitative, sampling would be based on a larger size to generalize the study to a broader population. The sampling frame lies under the population. It helps to define the sample size for the research. In this study, the sampling frame would be the pharmaceutical industry of Pakistan, which has its facility in Karachi. A list of licensed pharmaceutical companies would approach the data collection in this research. The supply chain personnel are respondents to this research, as the nature of the research is related to the supply chain field. The sample size can be determined through a sample frame of the pharmaceutical industry in Karachi, Pakistan. The sample size can be assessed through certain factors, such as the nature of the research, the number of variables, analysis, and sample size used in related research. A sample size of 50 is inferior, 100 is poor, 200 reasonable, 300 is good, 500 is very good, and 1000 is excellent. However, the sample size of 117 respondents from various pharmaceuticals located in Karachi (Rashid et al., 2021). The sampling technique or method is a process of selecting data from the sample size, which means analyzing the study through the part of the population and generalizing it to the whole. This research is a sampling procedure where each population unit has the same chance of being randomly included in the sample. Random sampling is used (Rashid et al., 2021). In convenience sampling, the study targets the supply chain personnel. Because of the method mentioned above, the target population symbolized the whole pharmaceutical industry of Pakistan.

The research instrument is the most critical component of the research, because it defines how researchers get their data. The questionnaire's questions are well constructed to cover every aspect of the chosen variables. A questionnaire was designed to collect the primary data through closed-ended questions. The questions' measurements are based on a Likert scale: five means strongly agree, and one represents strongly disagree. According to our research requirement, the questionnaire comprises important guidelines that ensure ethical issues and include the title and the characteristic of the respondent. In the data analysis method, the research undergoes various tests according to the particular requirement of the study and responses to the questions. Regression analysis is used in a research study to examine the cause and effect between the variables, i.e. independent and dependent. For the validity of the instruments, Cronbach-alpha was employed to evaluate the validity and to substantiate the relation of variables. Software IBM SPSS version 22.0 and SmartPLS made it much easier to analyze the data and examine the impact of variables.

4. Results and Findings

In this section, techniques of statistics are employed over the data acquired through the instrument. The research findings are obtained using IBM SPSS version 22.0 and SmarPLS software, and obtained findings are interpreted to test the hypotheses for the current research. The main objective is to test the hypotheses. The analysis is conducted here in three stages. Descriptive statistics in the percentage distribution of demographic variables are computed along with the graphs. Reliability and validity of the questionnaire are being done. Finally, the hypotheses are being tested.

4.1. Respondent Profile

This data analysis section entails descriptive statistics of respondent demographics, including frequency and percentage for each demographic element (Rashid et al., 2020). The demographic elements included in the instrument are gender, designation and years of experience. As the research is conducted on the pharmaceutical companies of Pakistan, which are located in Karachi, for the convenience of the collection of data, so the industry that is being catered to through the instrument is the pharmaceutical industry. Table 1 shows that 70.1 % of the respondents are male in the pharmaceutical companies of Pakistan located in Karachi that are accessible for this research. The number of years of age is categorized into four groups. The first one is those who have 20 to 30 years of age, and their percentage is 12.0%, the second are those who lie between 31 to 40 years of age, and they are 45.3%, third are those who lie between 41 to 50 years of age, and they are 24.8% in the respondents and the last, people who have lain between 51-60 years of age are 17.9% in the respondents. The number of years of education is categorized into four groups. The first one is those who have a Matric of education. Their percentage is 0.00%, second are those who lie between Intermediate of education, 4.3%, third are those who lie between Graduate of education. They are 55.6% of the respondents, and last, people who have Postgraduate education are 40.0% of the respondents. The number of years of experience is categorized into four groups. The first one is those who have 0-5 Years of experience and their percentage is 16.2%, second are those who lie between 6-10 Years of experience and they are 20.5%, third are those who lie between 11-15 years of experience, and they are 33.3% in the respondents. In the last, people who have more than 16 Years and above of experience are 29.9% of the respondents.

Table 1: Demographic distribution

Gender	Frequency	Per cent
Male	82	70.1
female	35	29.9
Total	117	100.0
Age		
20-30 Years	14	12.0
31-40 Years	53	45.3
41-50 Years	29	24.8
51-60 Years	21	17.9
Total	117	100.0
Education		
Ric	0	0
Intermediate	5	4.3
Graduate	65	55.6
Postgraduate	47	40.0
Total	117	100.0
Education		
0-5 Years	19	16.2
6-10 Years	24	20.5
11-15 years	39	33.3
16 Years and above	35	29.9
Total	117	100.0

4.2. Validation of Model

Smart PLS 4 was used as a statistical tool to analyze the hypotheses. Smart PLS is a Partial least squares (PLS) SEM software that enables users to use the PLS path modeling method. It is a variance-based software that uses a two-step data analysis approach. The measurement model is the first step in evaluating the SEM, including discriminant and convergent validity (Hashmi et al., 2021).

4.2.1. Reliability and validity analysis.

The reliability test is conducted to analyze the reliability of the instruments present in the questionnaire in the form of questions. Before SEM, the discriminant and convergent validity were considered for the conformity of the measurement model. Convergent validity is said to be established when composite reliability (CR) > 0.70, average variance extracted (AVE) > 0.50 and factor loadings >0.50 (Khan et al., 2022a, b, c). The Cronbach's alpha and Composite Reliability test is carried out to ensure whether items are reliable to this study, and the value of Cronbach's alpha and Composite Reliability should be greater than 0.7, which indicates that the instruments used in this study are reliable to proceed with the research. If the value is less than 0.7, then we must make changes in the instrument to make our research reliable to analyze. AVE greater than 0.5 indicates convergent validity exists.

Table 2 describes factor loading and the items' correlation with its construct. It should be equal to greater than 0.70, which indicates a strong relationship between the item and its construct. The above table displays the factor loading of the items present in the research instrument. The value of the items of information sharing displays that there is a strong association between them. The values of the outer loading of trust are also above 0.7, indicating a strong correlation between items and their construct. Table 2 depicts the reliability of the instruments present in this study. There are three constructs in which information sharing is an independent variable with six items. The value of Cronbach's alpha and Composite Reliability is higher than 0.7. All three constructs have a more significant than 0.7 value of Cronbach's alpha and Composite Reliability which shows that the instrument used in this research is reliable and valid. The value of AVE for all variables is more significant than 0.05, which shows that convergent validity exists.

Table 2: Reliability and validity of the constructs

Construct	Items	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE	No. Of Items
Information Sharing	IS1	0.746	0.844	0.849	0.561	6
	IS2	0.736				
	IS3	0.710				
	IS4	0.799				
	IS5	0.773				
	IS6	0.752				
SC Performance	SCP1	0.839	0.870	0.871	0.657	5
	SCP2	0.804				
	SCP3	0.823				
	SCP4	0.802				
	SCP5	0.785				
Trust	TR1	0.829	0.827	0.830	0.659	4
	TR2	0.855				
	TR3	0.816				
	TR4	0.743				

4.2.2. R^2

R^2 is the coefficient of determination used in the linear regression model to estimate the goodness of fit measure. R square explains the variation in the dependent variable explained by the independent variable. The value of r square should be more significant or close to 1, which indicates that the overall model is fit to explain the dependent variable. In this study, the value of R square is 0.529, which means that 52.9 % of the variation in SCP is explained by information sharing with suppliers.

4.3 Hypotheses testing

In SEM, all the hypotheses were tested based on beta values, p-values, t-values and the direction of the hypothesis (Hair et al., 2019). In addition to the path coefficient analysis, Hair et al. (2017) suggested that the predictive factor of SmartPLS is one of the significant reasons for which the software is used and suggested the bootstrapping of the indirect effect to run the mediation test.

Table 3: Hypotheses testing

Relationship	Path Coefficient	Standard Deviation	T Statistics	P Values
Information Sharing -> SC Performance	0.248	0.129	1.917	0.055
Information Sharing -> Trust	0.737	0.050	14.827	0.000
Trust -> SC Performance	0.531	0.130	4.089	0.000
Information Sharing -> Trust -> SC Performance	0.039	0.095	4.107	0.000

The tables 3 shows that at a 5% significance level, the data provide enough evidence to conclude that information sharing with the supplier has a positive relationship with SCP. The value of p is more significant than 0.05, and the value of t statistics is less than 2, indicating that information sharing with suppliers is not a significant estimate of supply chain performance. Thus, the null hypothesis is accepted. Table 3 shows that at a 5% significance level, the data provide sufficient evidence to conclude that information sharing with suppliers has a positive relationship with trust. The value of p is less than 0.05, and the value of t statistics is more significant than two, which indicates that IS with supplier significantly explains trust. Thus, the null hypothesis is rejected. Table 3 shows that at a 5% significance level, the data provide sufficient evidence to conclude that trust with SC Performance has a positive relationship with trust. The value of p is less than 0.05, and the value of t statistics is more significant than two, indicating that IS with SC Performance explains trust. Thus, the null hypothesis is rejected. Table 3 indicates the indirect effect of information sharing on SCP mediated through trust. At a 5% significance level, data does provide ample evidence to conclude that trust mediates between information sharing and SCP. The value of the t statistic is also greater than 2, which means that the null hypothesis is being rejected.

5. Conclusion

The research aims to investigate the impact of information sharing with suppliers on supply chain performance with the mediating effect of trust. The study conforms to the fact that this study does not support information sharing with its supplier, where competition is not solely based on company to company. However, they are competing with the whole supply chain network. Supply chain performance significantly impacts the company's success and brings competitive differentiation. In the operating environment of Pakistan, where the supply chain is still developing in comparison to other countries of the world, there is a strong need to focus on developing collaborative ties among supply chain partners.

On the other hand, trust is a critical factor when dealing with the exchange of information. Organizations might not allow themselves to share the information with their suppliers because of the fear of losing the competitive edge in the market. But the study concludes that trust has a positive influence on information sharing because trust enhances the intensity of willingness to share information with supply partners. Although trust impacts information sharing, it does impact and mediates the supply chain performance. The pharmaceutical companies of Pakistan located in Karachi, as the research respondents, concluded that trust is sufficient to mediate between information sharing and supply chain performance. Sometimes companies need to step out from their known partners to gain more penetration and exposure, which will help grow their supply chain network.

5.1. Discussion

The result of the research showed that information sharing with suppliers reasonably explained a significant impact on supply chain performance. Trust is also essential when SC partners are willing to share information with suppliers. However, regarding supply chain performance, trust does not impact or mediate between information sharing with suppliers and supply chain performance.

H1. Information sharing has a significant influence on SCM.

Information sharing with a supplier does not significantly impact supply chain performance. The finding of this study is not as per previous studies as IS impacts the cost, delivery, quality and flexibility of the supply chain performance as mentioned in the expected outcomes of the research. Some previous researches also have consistent findings that the benefits of sharing information with a supplier can impact cost reduction, reduce excess inventory and minimize customer complaints, which will affect the overall business and supply chain performance (Zhao, 2002; Lee et al., 2000). Collaborating and integrating with a supplier now becomes necessary as companies need to align with their partners to bring a competitive edge from their sides (Rashed et al., 2010). Companies trying to be on the top of the competition now focus on customers and their changing preferences, which require a customer-centric approach and willingness to serve what customers actually want within time (Nyaga et al., 2010). This customer orientation can be fulfilled with the desired customer service level, achievable through integrating with suppliers. Suggest with his survey that information sharing not only improves the performance of the supply chain but also it impacts high-profit margins with close bonds between companies. Lee and Wang (2000) stated that sharing information is the only way to gain supply chain efficiency. Pharmaceutical companies of Pakistan could not deny that the exchange of information is an essential part of improving the supply chain performance, as suppliers are the key partners of any manufacturing sector, and so is pharma.

H2. Information sharing has a significant impact on trust.

The influence is positive and significant of information sharing on suppliers and trust. The result does not differ from the existing empirical evidence. Trust is now a need in the competitive world, which gives an integrated perspective of inter-organizational relationships (Manu et al., 2015). Trust increases the authenticity of information that partners are willing to exchange. Trust in different forms, like honesty, integrity and faithfulness, ensure the relationship's stability, which impacts the intensity of the information being shared (Flynn et al., 2010). The level of trust can open ways or make relations boundless, easing the flow of information and thus impacting resource utilization. Information sharing requires inter-organizational relationships, which will be possible if companies make transparent policies and procedures, operations, requirements and fairness in dealing. This will only be achievable if there is trust between the partners (Zhao et at., 2008). The respondents' response projects that Pakistan's pharmaceutical industry believes that trust is an essential factor when dealing with partners in terms of sharing information.

H3. Trust has a significant impact on supply chain performance.

Trust does have a significant positive impact on supply chain performance. Trust is identified to be a significant predictor of supply chain performance. This result establishes a positive effect that may be mediated and directly impacts supply chain performance. This is perhaps because although SC partners in the pharmaceutical industry of Pakistan consider trust to be very significant, they do consider it a sufficient condition to impact SCP. Previous research concludes that business development and growth would be stagnant if companies will not go beyond their comfort of trusted and known business partners (Rashid et al., 2022). Business performance of companies with rich resources of the network have better exposure and bring innovation and cost efficiency. Overreliance on trusted partners can only contribute to the lock-in effect, eventually obstructing business development at the macro level.

H4: Trust mediates the relationship between information sharing and SCP.

As the research analysis suggests that there is a significant relationship between trust and supply chain performance, trust directly affects the supply chain performance, which in turn enhances the indirect effect of mediation between information sharing and supply chain performance. Information sharing plays a crucial role in improving the results of SC, but trust is ample to mediate between them. Trust provides interdependence to one another and does give control over each other. Trust creates dependency and limits partners' actions to act of their own will due to the over-reliance on a trusted and known partner (Rousseau et al., 1998).

5.2. Implications

The Implications could be helpful if they were fully implemented and applied to all Pakistan manufacturing sectors. However, the study is based on the pharmaceutical companies of Pakistan as the research population, so the pharma industry would be more considerate in this regard.

5.2.1. Practical implications

Organizations need to invest in upgraded information technologies to respond to the rapid changes in the market. Investing time and money in new technology will reduce the inefficiency caused by incompatible software and legacy systems and eliminate barriers to collaboration between partners. The collaborative relationship with the supplier helps respond quickly to the uncertainty caused by the supplier's future plans and mitigate the risk of not delivering to the customer promptly. Trusting supply chain partners helps form a collaborative relationship, which promotes long-term cooperation and fairness in dealing and increases the level of comfort. The transparency of information will no longer be beneficial if it implies a single entity only, as sharing of information creates connectivity, a two-way process.

5.2.2. Theoretical implications

The top management must focus on creating an integration between partners and information transparency. Knowledge is the key to supply chain success, which helps to make better decisions, so the quality of the information sharing should be assessed from time to time to make quality decisions. Companies need to be more focused on the supply chain performance and try to find ways to help their network improve rather than only centring their attention on the profits. Trust will improve supply chain performance as sharing information will become more accessible and more reliable when it comes to exchanging with known partners.

5.3. Limitations

This research possesses a few limitations which require attention while analyzing the data for results. Although efforts have been undertaken to minimize many of these, some are inevitable. Firstly, in the context of the year 2020, covid'19 pandemic hit the nation badly, affecting economic growth and reducing social mobility, which hinders data collection by visiting the potential respondents to surge response rate. This research's cross-sectional data was collected in a particular period, although constructs like information sharing and SCP are dynamic and change over time. Large and medium-sized companies are considered in this research for the collection of data because small size firms have limited knowledge about SCM as supply chain and its concepts are still an emerging field among them.

5.4. Recommendations

If the study gets an opportunity to address it again, then a number of changes could be made. Firstly, the researcher will overcome the limitations of the present study that what aspects were limited by the previous researcher, which will be catered to in future research. Concerning the limitations of this research, future research will be on a more extended period. Future research can cater to more than one industry in the manufacturing sector of Pakistan. As manufacturing sectors involve different industries apart from pharma, future research on different industries would be a valuable study for other

industries and may find trust a useful predictor for supply chain performance. The geographical limitation will also minimize by crossing the region to collect data. Future research will determine the supply chain performance by adding more variables with information sharing and trust, so more variables remain to be explored. Convenience sampling is used to collect data, so it may not denote all members of Pakistan's pharmaceutical industry's supply chain comprehensively. Small-size firms will then be included in the respondents by framing them in surveys or interviews to get valuable insights from their managers.

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Appendix: Questionnaire

Questionnaire for "Impact of information sharing with supplier on supply chain performance: the mediating effect of trust"

Part 1 – Demographic Profile

a) Gender	
Male	Female
b) Age	
20-30 Years	31-40 Years
41-50 Years	51-60 Years
c) Level of Education	
Matric	Intermediate
Graduate	Postgraduate
d) Experience	
0-5 Years	6-10 Years
11-15 years	16 Years and above

Part 2 –Please rate strongly agrees or strongly disagrees on the basis of options mentioned below of the dependent and independent variables related to Adoption of blockchain in global supply chain management by placing a checkmark in the suitable box.

1) Strongly disagree
2) Disagree
3) Neutral
4) Agree
5) Strongly agree

Information Sharing
Our firm specify our schedules for delivery of products
Our firm share information of demand forecast with our supplier
Our supplier plays a vital role in designing and development of new product.
Our supplier share complete information
Our supplier share accurate information
Our supplier shares information timely
Trust
Our supplier is trustworthy
Our supplier is honest and fair in dealing
Our supplier keep confidentiality of information
Our supplier share significant level of information
Supply Chain Performance
Our firms on-time delivery performance has improved
Our firms order fulfillment rate has improved
Our company manufacturing lead time improved
Our firm's customer complaints has reduced
Our inventory costs are kept at a minimum level.