

INVESTIGATE THE IMPACT OF BLOCK CHAIN VISIBILITY, SUPPLY CHAIN AGILITY & SUPPLY CHAIN INTEGRATION ON FIRM'S PERFORMANCE IN AUTOMOBILE INDUSTRY

Fareena Imtiaz Hussain^{*1}, SH. M. Fakhr-e-Alam Siddiqui²

^{*1}MBA Scholar, Faculty of Business Administration, Karachi University Business School, University of Karachi

²Assistant Professor, Faculty of Business Administration Karachi University Business School, University of Karachi

^{*1}fareenaimtiaz066@gmail.com, ²fakhrealam@uok.edu.pk

Corresponding Author: *
Fareena Imtiaz Hussain

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ABSTRACT

The purpose of this study is to identify how knowledge asset, business intelligence, Information exchange and information technology have a direct impact on supply chain integration and supply chain integration has direct impact on supply chain agility the intention to optimize the Automobile practices in the supply chain performance we survey from Automobile industry in Karachi Pakistan and analyze survey results using the Partial Least Squares Structural Equation Modelling (PLS-SEM) approach to test the research hypotheses and our theoretical framework. Finally, a sample business process is simulated to evaluate how Industry automobile industry influence organizational process optimization and supply chain performance. The findings of this empirical study indicate that business intelligence, knowledge asset and information technology negative impact on supply chain integration and information exchange has a positive impact on supply chain integration and supply chain integration has a positive and direct impact on supply chain agility and supply chain agility has a positive and direct impact on supply chain performance and intention to optimize business processes plays a key role in enhancing supply chain performance. The simulation results demonstrate the potential benefits from automobile industry applications in the functions of supply chain performance.

Keywords: Information Exchange, Information Technology, Business Intelligence, Knowledge Asset, Supply Chain Integration, Supply Chain Performance, Supply Chain Agility.

INTRODUCTION

We will discuss in this chapter the following things include background of the study, problem statement, Research objective, research questions, significance of the study, scope of the study and the elaborated key definitions

1.2 Background of the study:

The execution of a production network has a clear impact on the hierarchical presentation, regardless of whether it is associated with assembly, administration, or medical treatment, and so on (Walker et al., 2008) As a result, it is critical to

assess the present position with SSCM issues and, if necessary, explore the arrangement estimations in light of industry. The Indian auto industry is one of the largest manufacturers of vehicle parts. Many developed countries choose India for seaward shipping of automobile products rather of assembling in their own country. (Yadav et al., 2019). The reason for this is the availability of modest employment, cheap capital on terrains, and low inventory network and strategy expenses, among other things. This also attracts unfamiliar direct interests in the nation. Focuses on the

importance of organizational perspective in delivering execution results, particularly with reference to Vehicle Industry supply chains. The impact of organizational characteristics (such as entertainers, assets, and exercises) on overall store network execution has been studied. A two-stage bunch inspecting was used to achieve focus on goals by delivering review. Material businesses from Punjab and Sindh were chosen for data collection. Network Entertainers (Vehicle Firms), the exercises they execute, and the assets they own have a significant and beneficial impact on inventory network execution. Furthermore, it is argued that coordinated Organization Variables might have a significant impact on Inventory Network Execution.

1.2 Problem Statement

Associations are coping with challenges and unplanned events as Supply Chain (SC) responsibilities expand. Deferred conveyances, out of the stock, some time quality issue, correspondence issues, mechanical disappointments, for example, floods and Earth quakes, and man-made disasters, for example, psychological warfare, are all of the disaster that ensure influence the production network. (Chapman et al., 2002; Machalaba and Kim, 2002; Mitroff and Alpaslan, 2003). As organizations grow and expand, in addition to having greater adaptive functional units and trendsetting innovations, they are meeting many risks. (Scholten et al., 2014). There is a requirement to locate diverse systems in order to lessen the detrimental impact of vulnerabilities. A firm's production network is linked with many diverse parts and organizations, and as a result, they have greater freedom to experiment with aspects. Because the

SC involves several partners and businesses, the possible hazards is misleading. (Wieland and Durach, 2021). There are incidents that do greater harm in the manufacturing network that go unnoticed because they are either excluded from hazards in the first stage or were initiated by the organization enterprises. (Akkermans and Van Wassenhove, 2018). As a result, the notion of supply chain integration (SCI) evolved to fill this need. Gao et al. (2016) in such cases, it has been argued that strength can play a therapeutic role. SCI has been depicted in a variety of ways because different specialists/creators have differing

viewpoints on "joining," which is complicated and diverse. The most widely accepted definitions of SCI are the ability of a storage network to return to its original form after being disrupted within a specified time period. (Brandon-Jones et al., 2014). Regardless, because of its complicated and interdisciplinary sets of combination include the capacity, flexibility, planning, reaction, recovery, time, initial shape, and superior form. (Tukamuhabwa et al., 2015). SCI addresses the ability that prompts the advancement of internal and external cooperative energies among production network entertainers, to incline towards arrangement among cycles and expand deceivability, This is essential for anticipating, responding to, and recovering from unexpected events while minimizing their impact. (Schoenherr and Swink, 2012). This addresses the problem of inconvenient and incorrect data and correspondence between individuals, preventing the inventory network from properly responding to ecological changes. . (Jajja et al., 2018). SCI has already piqued the curiosity of researchers and experts. (Belhadi et al., 2021). There has been a call for improved supply networks to deal with various interruptions and dangers. (Jacobsen, 2020). While all partners play an important role in strengthening store networks across the board and developing a diverse inventory network, there has been little experimental proof available on provider and client connections, particularly with SCI. (Mubarik et al., 2022) as well as organizational performance (OP). Unfortunately, the link between various stakeholders and SCI and OP has received little attention thus far. According to one study, Aslam et al. (2020) focuses on supply chain ambidexterity and agility in particular whereas Asamoah et al. (2020) argue that organizations' outer and inner organizations can be beneficial in establishing hierarchical SCR and recommend future investigation in various geographical contexts. The interaction between provider/client relationships and SCI is usually overlooked, particularly in growing economic sectors. Because global supply chains are interrelated, store network practices are important for global company, not just inside one nation. Furthermore, there is a scarcity of observational research in the field of SCI. (Ali et al., 2017). Pettit et al. (2019) Furthermore, I recommend putting external enhancements into SCI. As a result, more investigation is anticipated to determine the

linkages among partners (particularly suppliers and clients), and so a production network and Over powered are necessary. The purpose of this study is to examine and comprehend the impact of partners' (providers and clients) ties on SCI and Overpowered. The survey aims to contribute to the literature on SCI in Pakistan by focusing on both the assembly and administrations domains in all over Pakistan.

1.3 Research Objective:

According to the research questions, the current study sought to accomplish the following objectives:

RQ01: is there any impact of knowledge asset on supply chain integration?

RQ02: Is there any impact of information technology on supply chain integration?

RQ03: Is there any impact of Information Exchange on supply chain integration?

RQ04: Is there any impact of Business intelligence on supply chain integration?

RQ05: Is there any impact of supply chain integration on supply chain agility?

RQ06: Is there any impact of supply chain agility on Supply chain performance?

1.4 Research Question:

The following research topics were addressed by the current study in context of the gaps previously mentioned:

RQ01: is there any impact of knowledge asset on supply chain integration?

RQ02: Is there any impact of information technology on supply chain integration?

RQ03: Is there any impact of Information Exchange on supply chain integration?

RQ04: Is there any impact of Business intelligence on supply chain integration?

RQ05: Is there any impact of supply chain integration on supply chain agility?

RQ06: Is there any impact of supply chain agility on Supply chain performance?

1.5 Significance of the study

Extend the storage network's standard structure-direct execution system (Ralston et al., 2015), thus we see Supply chain integration as a driver of another DC (SCA) rather than an immediate driver of prevalent execution. According to our understanding, EI and Supply chain agility are the primary DCs driving common execution. We

anchored these findings in this particular area such like agro food sector or mainly focus on core supply chain region that has not previously been utilized as a unit of research in studies on store network membership and finesse. (Ramirez et al., 2020), despite the fact that the situation is quite unpredictable. As a result, OF, SCI, and SCA are key components to address from an SCM standpoint in these scenarios. Finally, while the overview did not collect explicit Corona virus information, reactions were obtained the time of covid-19 time; this contributes to the continuing SCM discussion over how supply chains should be altered in the new post-Coronavirus business climate. (Shih, 2020; Butt, 2021).

Extend the supply chain's standard structure-conduct-performance framework. (Ralston et al., 2015), SCI and OF, as we see them, are not direct drivers of improved performance, but rather drivers of another DC (SCA). According to our analysis, the most essential DCs to promote higher performance are EI and SCA. We contextualize these findings in a specific context: agrifood supply chains, which have not previously been used as a unit of investigation in store network collaboration and nimbleness research. (Ramirez et al., 2020), despite the fact that the situation is quite unpredictable. As a result, from an SCM standpoint, OF, SCI, and SCA are critical components to handle in these instances. Finally, while the review did not capture explicit Coronavirus information, responses were obtained during the pandemic, adding to the ongoing SCM conversation about how supply organizations might be reorganized in the post-Coronavirus business climate. (Shih, 2020; Butt, 2021).

1.6 Scope of the study:

The study focuses on the Automobile industries of Pakistan.

1.7. Key variables definitions

1.7.1 Supply Chain Integration

may be defined as the extent to whereby a manufacturer works proactively with its manufacturing network partners and jointly supervises intra-and cycles to get feasible and profitable motions of labor and products, information, cash, and options, in order to increase the worth to the client. (Flynn et al., 2010) In reality, the amount of reconciliation assesses the

production network's ability to form alliances with various members of a similar organization in order to outperform competitors by delivering them more value. (Shou et al., 2018; Wiengarten et al., 2019). Integration abilities are this is especially true in uncertain settings. (Wong et al., 2011; Huang et al., 2014) It is critical that under have integration capabilities.

1.7.2 Supply Chain Agility:

Organizations are expanding their interests in the creation of more agile stockpile chains in order to adapt to advertising adjustments swiftly and effectively. (Lee, 2004; Bottani, 2010; Whitten et al., 2012; Blome et al., 2013; Shih, 2020). "The result of coordinating the inventory network's attention to changes (open doors/challenges) - both interior and ecological - is SCA," the definition states. The store network's ability to include assets in optimal and adaptive ways to respond (proactively or reactively) to such changes. (Liet al., 2008).

1.7.3 Knowledge Assets:

Nonaka et al. (2000) stated that Information resources (KAs) are defined as "firm-explicit assets required for the creation of significant worth for an organization," and they serve as the premise or cornerstone of the information enhancement process. These researchers classified KA into four groups: fundamental information resources, routine information resources, reasonable information resources, and experiential information resources. Theoretical resources of an organization include KA, which represents critical resources and sources of considerable value generation. (2012) Schiuma et al. In general, KA status refers to viability, particularly in emergency situations; the state of resources, such as offices, stocks, hardware, and people, is critical for exercising good judgement. (Pettit, 2008) In any event, in order to convert this status into information, it must be sent to the appropriate audience at the appropriate time in an organization that they can use. As a result, it is critical to assess KA as employees recognize, represent, and quantify factors related to their KA condition. (Lerro et al., 2012). Malaysian SMEs and SCI performance were shown to be favorably and significantly connected with KA as part of block chain visibility. (Abu Hasan et al., 2020)

1.7.4 Information Technology:

Scientists' advantage in the relationship between block chain innovation and SCP is growing as a result of mechanical advancements in IR 4.0. Because of innovation, a few businesses have increased production while utilizing fewer assets and natural resources. (Yeo et al., 2021). Data innovation (IT) plays an important role in store network administration. IT has aided organizations in increasing the volume and complexity of data that must be sent to their trading partners. Similarly, multinational corporations (MNCs) employ IT to share knowledge and competence across critical functions. corporate boundaries Indeed, IT allows organizations to transmit continuous store network data, such as stock levels, dispersion status, creation planning, and booking, allowing them to screen and regulate their store network operations. It may now obtain entire data execution from the production network organization and distribute it to several organizations thanks to block chain. (Hong and Hales, 2021)

1.7.5 Business Intelligence:

Business intelligence (BI) should be observable as a cycle as well as a full descent that climbs over the inventory network's constraints. The goals are to incorporate driving indicators of possible trends and anticipate competitor, manufacturer, shopper, and mechanical behavior. Ventures, economies, commodities and administrations, and the entire commercial environment all benefit from a certain amount of constancy. (Pettit, 2008). To lessen the discontinuity caused by a lack of connection between advertising and producing enterprises, specifically the actions of competitors or competitors, BI may also interface the interest for completed merchandise with the interest for unprocessed components. (Liu, 2010)

1.7.6 Information Exchange:

Information exchange (IE) is the quantity of communication that occurs among the chains partners (Villon, 2012) the coordination of tasks within the production network is based on the exchange of appropriate, high-quality data in order to operate with dynamic activities and autonomous direction. SCM research has focused on inventory network openness and information

trading. Furthermore, expanding Access to data improves organizations' ability to successfully They must adapt to changes in their corporate environment. (William and Roy, 2013)

1.7.7 Supply Chain Performance::

Supply chain performance is measured using characteristics for example, inventory turnover rate, shipment timetables, furthermore, length dependent on value (Kabiriyants et al., 2021). These indicators enable businesses to build and implement effective inventory network frameworks while monitoring all types of movements. (Queiroz et al., 2019; Wu & Lai, 2019). It is conceivable because of retailers. May carry out exchanges that, thanks to cutting-edge technology, should be easily retrievable and verifiable in order to avoid mistakes.

1.8 Conclusion

The present study investigated the above-discussed research problems and gaps that is identified the relationship between procurement (strategy, planning, review and adoption of big data) and enhanced circular economy performance.

1.9 Organization of the study

This paper includes five chapters. In the first chapter, background of the study, problem statement, research objectives and questions, significance of study, and the key definitions are given. In Chapter 2 provides a literature review, theoretical framework, hypothesis and conceptual modal. The research methodology will be discussed on chapter 3. Statistical analysis of data and results will be provided in chapter 4. Finally, future recommendation and conclusion will be concluded in chapter 5.

LITERATURE REVIEW

2.1 Introduction

The objective of this study was to check out at the effect of obtaining. (Planning, system, and execution survey) on the roundabout economy, as well as to investigate the receipt of massive information influence on the roundabout economy operating in Pakistan's automobile sector. This section provides an overview of the automobile industry. It then discusses the speculations that aided the current review. Then, it audits the critical writing on the relationship between the acquisition system, acquisition

planning, acquisition execution survey, and the receipt of massive information on the supply chain performance. The hypothetical system and proposed guesses are introduced based on the writing.

2.1 Overview of Automobile industry in Pakistan

After being shattered by nationalization, Pakistan's auto embroidered artwork flourished in the first ten years of the twenty-first century. Even though the image appears to be far from bright today. At the time of independence, Pakistan's car industry was vastly different from what it is today.

The automobiles on the streets were either English or American, and they were mostly used by the world's elite. From 1947 through the late 1960s, models imported into the nation included Portage, Chevrolet, Mercedes, Morris, and Volkswagen. These organizations even had their own branches in the Sub-Landmass's major cities, including Karachi, Bombay (modern-day Mumbai), and Dhaka.

By the mid-1950s, European models had also pushed towards this part of the world, and by the 1960s, a fraction of the country's bigger merchants had set up their own assembly lines, with American-marked Passage trucks being assembled here. "Trucks were the main vehicles that saw development and broadening, and they also gained notoriety," Auto Master Mashood Ali Khan told the Express Tribune.

"At the same time, local component producers, also known as second-level and third-level merchants, began to expand." By the late 1960s, the country developed a network of auto-parts manufacturers, or small and medium-sized businesses (SMEs). However, in the late 1960s, monetary tactics, a mix of provincial heritages and Mahbubul Haq's beneficial imbalance concept, brought disparity to the two wings of Pakistan, resulting in lower contemporary area growth," he reasoned. "Following the political split in 1971, Zulfikar Ali Bhutto's nationalization strategy laid the groundwork for a communist financial approach and changes were acquainted with animate development." This came as yet another surprise to industrialists and financial supporters, despite the fact that the tactic was common in many countries at the time," Khan remarked.

"Many people left the country in dismay, and there was a schism in the development path that began in the 1950s." This failed nationalization trial also

had an influence on the car industry and the business community.

"It has fostered a profound distrust of public authority," he added. "From 1980 onwards, the government shifted its focus back to the automobile industry." This time, the principal market competitors were Japanese companies. Suzuki moved quickly to establish a collection plant in Pakistan. Toyota entered Pakistan as the market expanded in the mid-1990s, and Honda followed suit. This marked the beginning of the time of Japanese engines," Khan explained. "The section of Japanese automakers gave a new open door to neighbourhood part producers; in any case, Pakistan couldn't haggle better terms, attributable to the late history of nationalisation had shaken the certainty of public and global financial backers," he said.

"In order to continue modern action, Pakistan may request that they arrive in their own specific manner and conditions." In an ideal world, the government would have approached the unknown firms with a detailed plan, where the organizations would be obligated not just to begin localization of auto parts, but also to trade a few models from here. Pakistan may have also urged that Japanese financial backers include Pakistani component producers in their supply networks. Instead of long-term planning, our goal was to lure them into the Pakistani market despite the fact that convincing them to do so was a big accomplishment," Khan said. "At the same time, the government provided an individual stuff and gift conspire for overseas Pakistanis, through which they could return with a vehicle when they returned to Pakistan." Despite the fact that this was a good strategy, merchants took advantage of it. They began trading the automobiles, causing harm to adjacent assembly as a large number of vehicles were imported. This disrupted interest and supply for neighboring manufacturers, resulting in sluggish neighborhood car market development," he reasoned.

From 1999 to 2000, the volume of Pakistan's car industry stayed at 35,000 units. During the same time period, cruiser production was 86,000, while truck and transport production remained at 913 and 1,460, respectively. "There was no Games Utility Vehicle (SUV) culture during this time period," Khan emphasized. "From the year 2000 onwards, Korean automakers entered Pakistan's car market, bringing new models and options to

customers looking for traveler vehicles and business trucks." "They were warmly welcomed," he observed. "During the 2000s, Pakistan presented its most memorable auto approach for motorcycles, in which the government issued approximately 60 licenses to cruiser manufacturers."

This was an improvement intended to assist the majority of people who were unable to obtain a mass vehicle framework, notably in the port city of Karachi. This was also the time when Chinese companies joined the market, as the bicycle manufacturers were from China," Khan explained. "Approximately 2,000 cruisers were built in 1999." This clearly shows that the automobile company is off to a great start. In 2005-6, the country produced around 170,000 automobiles. During this period, the economy, like the auto sector, was thriving," he noted. "During the 2000s, cruiser volumes approached 500,000. Organizations were reinvesting at a time when the market was exploding.

This explosion was also determined, to a lesser extent, by shared military guidance from the United States, which was flooding into the nation since Pakistan was a non-NATO participant in the Conflict on Fear. Loan costs were in the single digits (5.6%), boosting automobile support and further fuelling the explosion," Khan explained.

Despite the fact that demand was high at the time, the government allowed the import of threeto-five-year-old trade-in automobiles. This eventually led to the automotive business being scaled back. "Because the import of used cars was permitted by the government in the late 2000s, traveler vehicle volumes dropped by nearly half." The cancelling plan was abandoned in the mid-2000s. It was replaced with a duty-based system," he realized. "The cancellation programmed was encouraging organizations to replace imported vehicle leaves with privately manufactured ones in order to reduce reliance on imports." The tax-based approach allowed automakers to import anything they wanted by paying a fee.

This provided immediate revenue to the public coffers, but in the long run, it undermined incentives for automakers to limit components," Khan stated. "In 2004, Pakistan marked the World Exchange Association (WTO) agreement under which the nation will undoubtedly open imports on a levy-based framework," said Abdul Rehman Aizaz, the previous executive of Pakistan

Association of Car Parts and Extras Makers (PAAPAM), adding that while the agreement may have had positive results in various areas, it resulted in a lack of engagement in the localization of car parts, as organizations could without much of a stretch import from. "Under the cancellation programmed, organizations will undoubtedly replace some level of their vehicle parts, but at that point it became their own," he made sense of.

There were also technical hindrances since Japanese organizations don't simply shift innovation to Pakistan because of the low quantities. "Cruisers and farm vehicles have been confined because their volumes are in the millions," Aizaz explained. "From 2000 to 2012, the public authority issued a vehicle industry advancement plan." This strategy included the development of testing centers, innovation advancement for vehicle parts, and numerous other significant things, but these were not carried out because nobody followed the strategy's course of events," Khan bemoaned, adding that the arrangement missed the center components of natural substance assembling and product improvement by giving motivators to the confidential area.

"The auto policy for the period 2016-2021 attempted to encourage new entrants with Brownfield and Greenfield incentives." Companies from China and Korea have joined the Pakistani market. However, the nation was unable to negotiate better terms and circumstances, such as the future export of any of their models and the establishment of research and development offices in Pakistan," he added.

Peugeot, a European vehicle organization, said in March 2022 that it will begin producing automobiles in Pakistan in collaboration with Fortunate Engine Partnership (LMC). LMC arose as a result of the government's Auto Modern Improvement Strategy 2016-21. In an interview with the Express Tribune, LMC CEO Asif Rizvi described the approach as "effective," claiming that it made concessions to new brands and goods and created a fair playing field for present and new market competitors. As a result of the campaign, 12 new car manufacturers have joined Pakistan, bringing the total number of vehicle manufacturers to 15. The agreement also aided in the introduction of 25 new automobiles in the country.

In addition, in collaboration with other vehicle manufacturers, the firm created a manufacturing facility to make seats, wiring harnesses, air conditioners, and injection molding parts for the automotive factory. It also signed eight technical assistance agreements with four Korean auto part companies for knowledge transfer to Pakistan.

At the moment, however, all automobiles built in the nation are made by Japanese, Korean, or Chinese manufacturers. "At the moment, we have an auto policy in place for the period 2021-2026, with the goal of increasing auto exports." The goal is lofty, but for the first time, the government has set the goal of making the engineering industry export-oriented. "The government has also committed to improving auto parts manufacturers' production in order to stimulate exports," Khan added.

The government must urge producers of steel and plastic sheets-key raw materials for the car industry-to establish operations in Pakistan in the next policy. Pakistan imports \$6 billion in various types of plastics. The most essential thing to do is to invest in human resources. Youth make up over 60% of the 214 million populations.

This widely publicized reality will become a burden on the country in the future if these young people are not taught and equipped with market-based skills. Only Changing Master Motors has recently announced ambitions to export, but Khan believes that other competitors will follow suit because they have 40 years of market expertise. "The auto industry issue is a macroeconomics issue," Aziz pointed out. "Auto parts SMEs are exporting on their own, but we will not be able to achieve the required volumes until original equipment manufacturers (OEMs) start exporting as well."

OEMs, including the major automakers, have a well-established supply chain and deal in large numbers," he continued. "However, the auto industry is currently in ICU due to government restrictions on raw materials." As a result, for the time being, we can only discuss survival," Aizaz said..

2.2 Supply Chain Performance:

The evaluation that associations have employed to differentiate whether the task or exercises are fulfilling their objectives is called execution. To put it simply, execution is calculating the disappointment and outcome when all other

factors are equal, including efficiency and benefit. Agami et al. (2012) accepted that exhibition estimations in SCM may be considered as an entry cycle indicating whether the store network organizations have increased or decreased. As a result, quick organization supply execution may be eased out as a strategy to deal with evaluating the shop network framework's exhibition. Since the late 1990s, execution rating difficulties at SCM have attracted various experts and organizations from across the world. (Beamon, 1999) However, monitoring network supply performance is a difficult process, owing to the numerous aspects that go into network supply. According to Gunasekaran et al. (2004), SCM plays a significant role in acquiring a competitive edge and increasing organizational productivity and profitability noted that many corporations these days are constantly in constant development in the manufacturing network. One reason some organizations fail to capitalize on their production network's point of view is failing to define the presentation measures and indicators in the first place.

In 1999, Beamon (1999) develops a framework for supply chain performance metrics that incorporates three categories of performance measures: flexibility, resources, and outcomes. However, Ibrahim & Ogunyemi (2012) According to past academics, there is still no one declaration about the optimum supply chain performance measurements. In the same year, the same measurement was performed using cost containment and reliability indicators. Sezen (2008) Flexibility, output, and resource performance were used to assess supply chain performance. In addition, Vanichchinchai and Igel (2009) to measure production network execution, I wanted to use the variables cost, flexibility, relationship, and responsiveness. Analysts picked three production network execution points, according to this writing. For starters, asset estimations related to the productivity of engaging assets in network supply, such as cost and stock levels. Following that are the creation outcomes, such as filling rates, timely conveyance time, customer reaction time, and adaptability measures. Store network execution was the extent to which an S&OP programmed has resulted in an improvement in production network measures compared to a regular gauge execution. In practice, this might be appraised

(beyond the review instrument) by respondents across items or over time, which has been studied independently in examinations Go & Eldridge (2015). Inventory network writing has traditionally given two distinct execution metrics, specifically costs and a mix of expenses and client response. Stock expenditures and operating expenses may be included in cost measurements. Supply chain performance, according to Pujawan, is a performance of measurement used method with a traditional measuring of instrument used to jointly observe supply chain performance between two organizations. (Yousuf et al., 2020). The capacity of the supply chain to fulfil end customer needs and efficiently transmit consumer wishes is defined as supply chain performance. (Hong et al., 2019). Supply agility is an operational tactic approach that focus on increasing level of supply chain adaptability. (Balaji et al., 2015) The capacity of a supply chain to adjust to market changes in order to preserve competitiveness is referred to as supply agility. Businesses must remain competitive and have a shorter life cycle so that they may continue to innovate and produce new goods and services. (Dubey et al., 2018). Overall, supply chain performance (SCP) is defined as the benefits received from the efficiency and flexibility of supply chain operations in an ever-changing environment. It assesses how effectively a company's shop network meets its customers' expectations for product quality while also keeping

"costs" to a minimum. SCP and its forerunners have already received a lot of attention. Associations should have areas of strength for chain flexibility in order to succeed in business and the commercial centre. According to SCP, asset proficiency, yield viability, and versatility execution at the hierarchical level are all included. Client worth, for example, quality, evaluating, and conveyance time, may be increased more productively, effectively, and quickly; store network execution (SCP) can continue to make esteem in a stormy and uncertain environment. Inventory network execution is a critical component of any significant system that supports hierarchical efficiency and productivity vital nowadays. However, there is still a gap that must be filled in order to improve supply chain efficiency, notably in enterprises situated in the United Kingdom (UK). According to a survey conducted in the United Kingdom, supply chain-

related activities consumed approx. 40% of the nation gross domestic product (GDP) of the country. (Gunasekaran et al., 2004). In this way, such findings and advancements demonstrate a major visible influence of shop network executives on organizational resources and the UK economy. A huge percentage of the supervisors in the assembling association are heavily focused on store network execution. Because it plays a critical role in cost management and overall organizational productivity. As a result of the widespread use of GDP (Gross Domestic Product) on shop networks, it is vital to collaborate with UK store network organizations and reveal many factors to improve store network performance.

2.3 Theoretical Background

2.3.1 Resource Based Theory

RBT has been a critical crucial administration viewpoint, and it is gaining some reasonable forward pace in domains such as tasks the executives. The OM area is also dealing with important and large-scale challenges like as supply chains. As a result, RBT has been seen to have unique integral features to a handful of OM's core issues. (2009) (Pilkington and Meredith). (RBT investigates effectiveness-based variants in hierarchical execution based on asset accessibility) that address authoritative characteristics that contribute to the foundation of seriousness and the execution of approaches to achieve the organization's aims (Doorman, 1981).

By efficiently absorbing and transmitting assets, a business might get a long-term advantage. 2007 (Barney and Clark).

Furthermore, differing degrees of asset efficacy will result in a variable presentation level in an organization. For example, an organization with unrivalled assets will outperform others with subpar assets. Furthermore, a competent organization will create more value with lower costs than a wasteful organization, and this effectiveness is measured in terms of net benefits after deducting the organization's expenses. (Miles, 2012). The thesis discusses how firms may be exceptional or unique while being competitive. RBT, on the other hand, provides a unique method of analyzing the supply chain in order to study the supply chain's actions both individually and collectively. Block chain technology integration will increase supply chain is more efficiency and effectiveness in the entire

organization, allowing businesses to cut operating expenses. (Helo and Hao, 2019). As a result of employing the RBT theory in this study refer, the resources discovered and assessed will assist organizations in gaining and maintaining a competitive edge

2.3.2 Network theory

The goal of organizational theory is to explain the aspects of between hierarchical linkages by emphasizing particular interactions and the structure of shared trust via beneficial alliances and cycle trades. (Halldorsson et al., 2007) Associations should build links to have access to resources outside of the company. This will aid in the establishment of secure and dependable partnerships through a variety of coordinated efforts: Exchange cycles and variation approaches among creation network partners contribute to hierarchical advancement in relation to the supply chain. (Johanson and Mattsson, 1987)

An earlier report involving network hypothesis to look at and configuration fabricating techniques underway frameworks in view of level and vertical advances and processes.(Karlsson and Sköld, 2007). Without a doubt, network hypothesis has been perceived as a solid hypothetical system for store network the board. This is on the grounds that it can possibly make sense of specialist conduct as far as their organization position, thus trust and power in purchaser provider communications with regards to OM. (Dekkers et al., 2020). The study of dyadic links that are deeply buried in networks is the focus of network theory. Halldorsson and colleagues (2015). The promise of block chain to build a "trust-less network" is accomplished through network theory. (Werbach, 2018) can be investigated. Furthermore, data transparency through block chain integration will aid in the development and give a relational viewpoint foundation for evaluating the function and usefulness of inter-organizational networks inside businesses, however, the overall relevance and quality of inter-organizational connections may decline.

Werbach (2018). From the perspective of organizational theory, there are various connected problems and direct consequences in regard to impede chain deceit, such as affiliations, trust, devotion, and data sharing.

2.4. Supply chain integration:

The SCI is a detailed plan for store network folks; by and large, each shop network segment has clear aims because of corporate objectives, serious strategies, business techniques, and unexpected events in their various company situations. (2016) (Wang et al.). SCI focuses on bringing out extra productive solutions to remove deficiencies caused by inventory network discontinuities, emphasizing the importance of combining every association with operations and data connections. Evangelista and colleagues (2012). Recently, academics and specialists have focused on production network mix (SCI), which has been identified as an important instrument for further enhancing execution. (2019, Zhang et al.) Many previous studies have discovered that focusing on authoritative and functional execution with proximate and robust production network connections is an effective method. (Vafaei-Zadeh et al. 2020)

2.4.1 Relationship between Supply chain integration and supply chain performance

According to Kim (2006), level of the association's combination with providers, how much cross-utilitarian reconciliation inside an organization and the level of its mix with purchasers may be in every way surveyed to evaluate the build? The examination in this point uncovers, nonetheless, that the connection among SCI and SCP isn't really nonstop and is reliant upon the hierarchical construction of interrelated parts. SCI works at an essential level for the collaboration connection between partnerships, getting advantages to SCP terms of cost, quality, adaptability, and conveyance execution. (Kim, 2006). Chen et al. (2009) express that SCI upgrades production network capacities while additionally further developing SCP. Similarly, as proposed by Silvera (2017), Production network joining might further develop SCP, like on-time conveyance of quick customer merchandise (MMCGs) by SMEs in London. In like manner, Kumar et al. (2017) SCI improvement is decidedly connected with SCP of UK food makers, as per the review. Additionally, Delic et al. (2019) It was guaranteed that SCI fundamentally affects the SCP of vehicle producers in the European Association (EU).

2.4.2 Relationship between Knowledge Assets and supply chain integration:

Nonaka et al. (2000) expounded on Knowledge asset (KA). As the premise or underpinning of the

data improvement process, they are depicted as "firm-express resources basic for the making of critical incentive for an association." These specialists gathered bring KA is partitioned into four classes: down to earth data assets, sensible data assets, routine data assets, and major data assets. KA is a hypothetical asset part of an association that recognizes significant resources and wellsprings of critical worth development. (Schiuma et al., 2012). In everyday the state of resources, like offices, inventories, gear, and representatives, is basic for fruitful navigation. (Pettit, 2008). Be that as it may, making an interpretation of this status into information requires coming to the proper. Thus, KA assessment is essential since workers should perceive, portray, and evaluate considerations relating to their KA status. (Lerro et al., 2012). As a component of the block chain deceivability, not entirely set in stone to have a positive and significant relationship with SCI and Malaysian SMEs' do execution on industry.

2.4.3 Relationship between Information technology and supply chain integration:

Given the technical breakthroughs in the field of IR 4.0, academics' interest in the interaction between block chain technology and SCI has grown. Using technology has enabled various industries to increase output while using less resources and raw materials. (Yeo et al., 2021).

Data innovation (IT) plays an important role in the store network's responsibilities. IT has assisted organizations in increasing the quantity and complexity of data that must be sent to their trading partners. Similarly, multinational corporations (MNCs) provide IT with trade data and capabilities that span vital and organizational boundaries. Without a doubt, IT enables organizations to provide continuous store network data, such as stock levels, distribution status, creation planning, and booking, allowing them to screen and guide their production network activities. Based on block chain, it is now prepared to acquire all out data execution from the production network organization and supply it with various endeavors. (Hong and Hales, 2021) Several scholars in the present literature have stressed the importance of IT utilization in SCI. IT uses computerized technologies to link supply chain activities and offer visibility into internal procedures and processes. In this aspect, IT

facilitates essential supply chain functions such as procurement and order execution. (Swaminathan and Tayur, 2003). Internal integration entails cross-functional interactions that allow the organization to absorb and apply knowledge to improve flexibility. According to Pettit (2008), visibility may successfully come from different types of media in today's age of electronic data interchange (EDI), radio frequency identification (RFI), and web presence. With today's organizations producing large amounts of data, electronic distribution, filtering, and monitoring may be both speedy and cost-effective. Kim (2017) gathered surveys from Korean manufacturers, discovering that IT has a positive association with SCI and concluding that IT plays a crucial role in SCM. In their most recent publication Buer et al. (2021) Norwegian manufacturing enterprises were polled, and it was discovered that both IT and SCI contribute favourably to SCP. Similarly, Vafaei-Zadeh et al. (2020) observed a favourable and substantial relationship between IT and SCI in Malaysian manufacturing firms.

2.4.4 Relationship between Information Exchange and supply chain integration:

The amount to which information is transmitted between the chain's partners is characterized as information exchange (IE). (Vilko, 2012). Working with dynamic activities and direction necessitates the exchange of necessary large amounts of data in order to coordinate actions within the production network. The examination of SCM has directed a lot of attention towards information exchange and, much more currently to store network openness. Moreover, increased access to data works on the limit of organizations' ability to consume to change in their working or business environment. (William and Roy, 2013). Sharing information is critical for preserving supply chain accountability. (Panahifar et al., 2018). Furthermore, information exchange is viewed as the gum or glue that connects the actions and resources throughout the supply chain together, from raw material procurement to customer support. (Holcomb et al., 2011). Ramayah and Omar (2010) claimed that knowledge exchange can increase SCP by around 50%. Sharing information and knowledge exchange across supply chain affiliates is a key component in increasing block chain visibility. Gunasekaran et al. (2017) emphasized that in

order to increase visibility, firms should priorities IE and knowledge exchange in order to convey quality and relevant information. Another study found that information sharing was beneficial and crucial for the SCI and SCP of Japanese automobile industries. (Maulina and Natakusumah, 2020)

Similarly, IE was revealed to be quite important towards SCI in the Indonesian car industry (Hasibuan et al., 2020). Sharing knowledge greatly boosts its potency since it decreases uncertainty and provides a buffer to maintain adequate inventory levels.

2.4.4 Relationship between Business Intelligence and Supply chain integration

Business knowledge (BI) may be view an interaction and a product that goes beyond the confines of the manufacturing network. The goal is to combine proactive components of expected occurrences and to estimate the actions of competitors, manufacturers, buyers, innovation, ventures, economies, labor and goods, and the general business environment with confidence (Pettit, 2008). BI may also connect the desire to finish goods use for consume the interest for unprocessed components to lessen the impact of discontinuity caused by a misuse of contact between advertising and making new goods in firms, particularly the actions of competitors or competitors (Liu, 2010). A large amount of information is generated inside the store network, which must be managed; the greater the volume of information, the greater the degree of conflict. The assumptions for quick response in manufacturing execution and navigation are reasonable. In this way, BI provides associations with the resources they need to achieve development and stay up with their store network (Langlois and Chauvel, 2017). Rather, MNCs must have a more prominent profile in terms of market knowledge since it enables quick and competent decision-making to support normal exercises, particularly in difficult or emergency situations. Despite a protracted writing search, insufficient attention has been paid to the relationship between BI and block chain perceive ability and SCI. As a result, there is a need to undertake more research to learn more about how this area may be improved in terms of the SCP of Malaysian semiconductor companies.

2.5 Supply Chain Integration:

Inventory network reconciliation with clients incorporates close arrangement (Jia et al., 2020; Kalyar et al., 2019) and coordination inside an organization's store network with its key clients, including activities such as sharing of critical data (for example, request forecast, stock level, and production plans) over a planned shared correspondence channel. Birasnav and Bienstock, (2019). Production network integration with the provider is a sort of tight arrangement and cooperation inside an organization's production network the board. Some fundamental data exchanged throughout a well-organized common organization and correspondence channels include interest forecasts, stock levels, and production plans. The reconciliation inside the association's limitations and over the inner inventory network exercises is alluded to as interior inventory network coordination (Turkulainen et al., 2017). Furthermore, Flynn et al. (2010) identified SCI as crucial because it serves as the foundation for provider and client collaboration, although ineffectively According to Flynn et al. (2016), joining results in increased reliance on Partners, both inside and external to the organization. Earlier writing has discussed the production network mix and its relationship to business and authoritative execution (Ralston et al., 2015 which demonstrated that store network mix expects organizations to share and surrender control over what was once considered restricted data and to rely on the data with their inventory network accomplices in the expectation that they will act to their best ability this idea was expanded by stating that inventory network inclusion has an influence on functional execution, and the level of reconciliation has an impact on cost and proficiency, as well as collaboration with providers and clients.

2.5.1 Relationship between Supply chain integration and supply chain agility

SCI is working on the presentation of the production network. Previous research investigated the relationship between production network mix, discovering that a coordinated store network confronted with ecological externalities, collaboration, and combination will have a greater impact on its exhibition. Fayezi and colleagues (2017) it is assumed that both inside and outward (customers and providers) mix are important in

laying out dexterity in an organization's stockpiling chains. This focus also identified production network agility (SCA) as a critical capability that enables an organization to swiftly discover and respond to external and internal threats through compelling storage network reconciliation. A quick-witted organization can quickly overcome obstacles and seize incredible opportunities. Deftness, while basic and essential, should be used and maintained across the retail network to ensure decent company success (Fayezi et al., 2013). Jia et al. (2020) and Christopher and Towill (2001) honed in on the movement of store network from lean and practical to spry and redid and demonstrated that store network readiness incorporates an organization wide idea portrayed by profoundly cutthroat capabilities; where, aversion to the market, cycle and organization combination, and presence of robotic participation are critical determinants of relationship mix. Store network dexterity is also proportional to the store network's ability to respond or answer. It determines how quickly one organization responds to a remotely formed movement, rather than the capacity and execution of the production network itself, which is frequently influenced by internal considerations. As an economist evolved and trading conditions changed, it became increasingly important for organizations with a dexterous inventory network to define an organization of collaborators (Fayezi et al., 2017). To ability do some mutual benefit linkages with outside collusions is a critical component of nimbleness and checks out under fundamentally unsound and unstable settings. Organizations that can assess their external changes and climate by forming mutually beneficial coalitions with partners, clients, and sellers and buyers to these developments at a faster rate than competitors will gain an advantage in the new environment.

2.6 Supply chain agility

Production network execution is a critical but sometimes overlooked metric in production network research, owing to the difficulty of implementing a development that exceeds the firm's capabilities (Cadden et al, 2020). However, the ability to assess and improve SCP is a critical component of overall organizational success (Eckstein et al. (2015). Despite the fact that monetary indicators, such as profit from

speculation, typically stand out (Cadden et al., 2020), they fall short on the combination and specialized components required for inventory network achievement (Cadden et al., 2015; Gunasekaran et al., 2004). The SCP develops standards that go beyond a monetary measure to include other functional metrics such as adaptability and delivery performance. (Cadden et al., 2020; Gunasekaran et al., 2004; Zhan and Tan, 2020)

2.6.1 Relationship between supply chain agility and supply chain performance

The link between production network deftness and execution is widely noticed in current literature (Wamba and Atker, 2019; Eckstein et al., 2015; Gligor et al., 2016; Lee, 2002), and this is notably evident in the region of cost reduction and functional execution. Eckstein et al. (2015) discovered that production network sprightliness has enabled organizations to all the more likely achieve equilibrium market interest, which may decrease stock and transportation expenses. .

Gligor et al. (2016) have argued that inventory network deftness can foster working schedule changes, enable authoritative asset re-design, and further build hierarchical detecting skill. For example, switching providers, recognizing new suppliers and markets, or collaborating with providers to develop new things can all help organizations save costs (Lee, 2002; Eckstein et al., 2015). Wamba and Atker (2019) have certainly claimed that store network deftness works with the expansion of authoritative capabilities that advance SCP, therefore adding to supported advantage.

2.7 Research framework and hypothesis

Based on the discussion on the key concepts, A designed and presented the research model that would be put to the test. in Figure 2.1. The model includes ten independent variables (procurement strategy, procurement planning, procurement performance review and adoption of big data) affecting on dependent variable (circular economy)

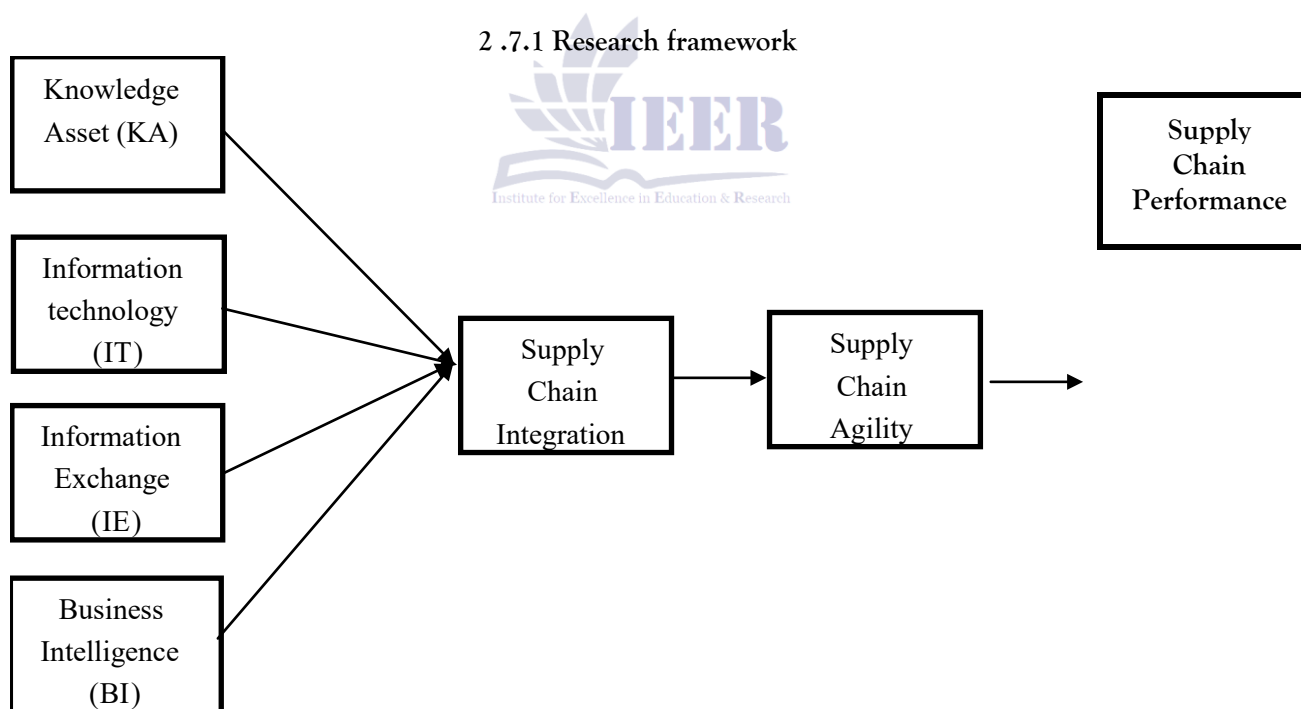


Figure 2.1 Research Framework.

2.7.2 Research Hypotheses

H1: Knowledge assets have a significant impact on supply chain integration.

H2: Information technology has a significant impact on Supply Chain integration

H3: Information Exchange has a significant impact on supply chain integration
H4: Business Intelligence has a significant impact on supply chain integration.

H5: Supply chain integration has a significant impact on supply chain agility. H6: Supply chain

agility has a significant impact on supply chain performance

2.8. Conclusion:

In this chapter we have discussed an overview of Automobile industry and relevant literatures on importance of big data. We have also discussed the relationships between (Block chain visibility) Knowledge asset, information technology, information exchange, business intelligence, supply chain integration, supply chain agility, supply chain performance. Further, we have discussed the two theories used in our research that are network theory and Resources Based View (RBV) Theory. Further, Hypothesis have discussed and generated and in last, we have presented theoretical framework.

METHODOLOGY

3.1 Introduction:

In this chapter we discuss the research purpose, approach, design and sampling techniques and we disclose the target audience and sample size. We prepare the questionnaire and mention our statistical techniques and last we set the principles that guide our research design and practices.

3.2 Research Purpose:

There are three sorts of research objectives: explanatory, exploratory, and descriptive. Explanatory research is defined as study conducted to uncover an issue that has never been thoroughly investigated in order to characterize it and improve the final results after providing clear explanations. (Allan, Mayo, McSweeney 1997). Following research is an explanatory research. In this research the relationship between Block chain visibility (Knowledge asset, Information Exchange, Information Technology and Business Intelligence) and supply chain performance using path Analysis of Supply Chain Integration and supply chain agility with the help of linking the past theories and literature related to the variables. The purpose of this research is to identify that what is the impact of Block chain visibility (Knowledge asset, Information Exchange, Information Technology and Business Intelligence) and supply chain performance using path Analysis of Supply Chain Integration and supply chain agility.

3.3 Research Approach

There are three types of research methods: qualitative, quantitative, and mixed methods. (1997) Schmid, Loannidis, and MauIt has been noted that quantitative research is a study strategy in which measurable data is investigated systemically utilizing statistical and mathematical approaches. We used a quantitative method in this study since the data acquired was numerical and was statistically assessed using PLS SEM.

3.4 Research Designs

The current study is based on correlation research, and cross-sectional research is monitored. Correlation research helps you to investigate the influence and nature of the link between variables. 2010 (Nițuc, Năstase, Mihăilescu, and Chioveanu). As part of the research, the findings of the statistical association between Block chain visibility (Knowledge asset, Information Exchange, Information Technology, and Business Intelligence) and supply chain performance were analyzed using Path Analysis of Supply Chain Integration and supply chain agility.

3.5 Sampling Technique

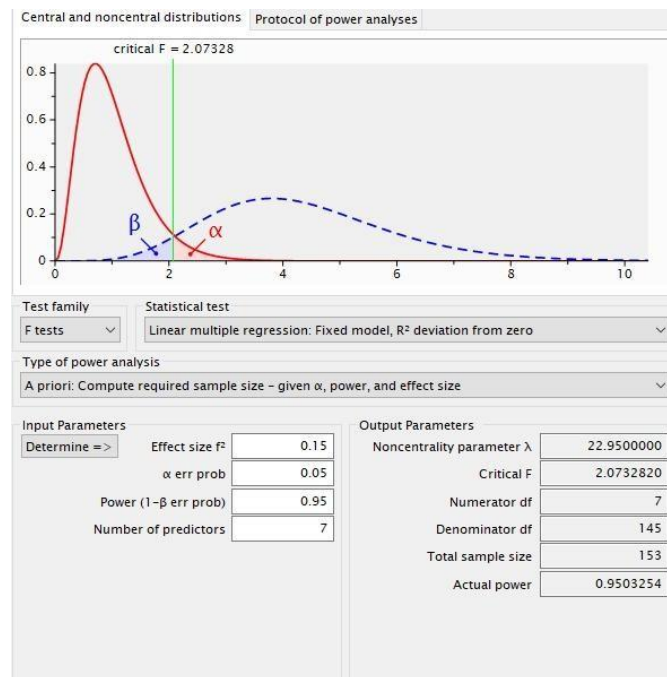
This research used non-probabilistic convenience sampling. Because the exact quantity of the target group is unknown, the sample is drawn from respondents based on their convenience and availability for participation in the study. The recommended sample approach was also collected for cost and time performance considerations. Jiang, Bi, Lu, and Han (2013) discovered in their research that the recommended non-probabilistic dependability value should be between 0 and 1. According to Ben-Haim (1994), when there is insufficient information to test a probabilistic technique, the non-probabilistic method is useful.

3.6 Target Audience

Our target audience includes Employees, Associates, Frontline staff, representatives, professionals and supply chain experts belong to the automobile industry of Karachi, Pakistan.

3.7 Sample Size

According to the result of Gpower software is 155 but we are considering our sample Size is 155. Results of Gpower is attached below.



3.8 Questionnaire And Measurement Instrument

In the research instrument, we included closed-ended questions on a Likert scale ranging from strongly disagree to strongly agree. The designated value or assigned values are Strongly Disagree (1),

Disagree (2), Neutral (3), Agree (4) and Strongly Agree (5). All of the measuring items for each variable were derived from previous research. The questionnaire was utilized to collect data for the current investigation. The replies were collected online using a Google form.

Construct	Items	Reliability
A Demographic	6	-
B Knowledge Asset	5	0.887
Information Exchange	4	0.852
Information Technology	5	0.932
Business Intelligence	6	0.917
Supply Chain Integrations	6	0.937
Supply Chain Agility	5	0.896
C Supply Chain Performance	8	0.913

3.9 Statistical Techniques

In this research “PLS-SEM (Partial Least Squares Structural Equation Modelling)” is applied for analysing.

3.10 Ethical Consideration

We follow the ethical concern which is taken for conducting this research. Confidentiality of the respondent will must be we adhere to the ethical concerns that were considered when doing this research. Respondent confidentiality must be properly protected to preserve data privacy. The

data was solely utilised for research purposes and was kept strictly secret. We also did not collect any personal information from our respondents, such as their names or addresses. Maintained strictly to ensure the data privacy. The data was used for only research purposes and kept confidential. Also, we did not take any personal information with our respondent like his /her name etc.

DATA ANALYSIS

4.1 Introduction:

This section presents the aftereffects of the investigation performed with SPSS and Halfway

Least Square (PLS) 3 way demonstrating. Starting information screening and starter examination is talked about. Then, at that point, the after-effects of the ongoing review are introduced in three structures: the consequences of the elucidating insights acquired from the estimation model, and the consequences of the underlying model which addresses the guessed primary ways. Last, the aftereffects of reciprocal PLS-SEM examination, intended to analyze the directing impacts in the underlying model, are additionally expounded.

4.2 Response Rate

A total sets of 160 questionnaires were distributed to the Employees, Associates, Frontline staff, representatives, healthcare professionals and supply chain experts belong to the pharmaceutical industry of Karachi, Pakistan. The response rate of the sampled data is displayed in Table 4.1.

The questionnaires returned were 155.

4.3 Data Screening and preliminary analysis

A preliminary analysis of the acquired data is necessary before moving on to PLS-SEM studies (Hair, 2007)

4.3.1 Common Method Variance Test

According to Podsakoff & Organ (1986), a principal component factor analysis was performed on each survey item included in this study.

4.3.2 Non Response Bias

Testing nonresponse bias was not possible because all participants were given two weeks to complete the questionnaires before the researcher personally collected them. This method of data

collection made it impossible to test for nonresponse bias. This made the difference between those who reacted sooner and those who responded later irrelevant

4.3 Demographics

Table 4.1 describes the profile of the participants. The vast majority of participants fell into one of two groups. the age 25-30 years (57%) and less than 25 years (57%), about 3% fell within the age of 26-30 years, 14% were in between 31 years to 35 Years, 21% were fell in 36-40 years' age bracket and the remaining 3% were above 40 years. Male participants dominated the response rate (86.5%) as compared to 13.5% female counterparts. In Pakistani culture, men have a dominant position over women, especially in private sector jobs. Almost (45.8%) of participants are master's/M.Phil. degree holders, 30.3% a bachelor's degree and 23.9% had a diploma or equivalent degree. On job tenure, 54.2% had less than 3-year work experience, 27.7% of Participants have 3 to 6 years of job experience in the organization., 2.6% between 7 to 10 years of work experience, and almost 15.5% has more than 10 years of working experience in organization. Designation wise, 47.7% are working on officer level designation, 18.1% are as Assistant manager, 18.1% are on manager and supervisor level and almost 16.1% are on Senior Manager Level. The household income profile of respondent's shows that 22.6% of our respondents are lies in 41,000 to 60,000 category. While 27.1% consists of 61,001 to 1000,000, 39.4% lies in Less than 40,000. And 11% are earning more than 100,000.

Demographic

variables	Category	Frequency	%age
Gender	Female	21	13.5
	Male	134	86.5
Age Group	Less than 25 years	57	36.8
	25 years to 30 years	57	36.8
	26 years to 30 years	3	1.9
	31 years to 35 years	14	9.0
	36 years to 40 years	21	13.5
	Above 40 years	3	1.9

Education	Graduation/Bachelor	47	30.3
	Intermediate/Diploma or less	37	23.9
	Master/M.Phil.	71	45.8
Designation	Assistant Manager	28	18.1
	Manager/Supervisor	28	18.1
	Officer	74	47.7
	Senior Manager	25	16.1
Experience	3 years to 6 years	43	27.7
	7 years to 10 years	4	2.6
	Less than 3 years	84	54.2
	More than 10 years	24	15.5
Income (PKR)	Less than 40,000	61	39.4
	40,001 to 60,000	35	22.6
	60,001 to 100,000	42	27.1
	More than 100,000	17	11.0

4.4 Assessment of PLS – SEM MODEL

Sarstedt and Henseler (2013) According to legend, the decency of fit measure is insufficient for validating an examination model. Furthermore, 117 members were opposed to utilizing the integrity of fit pointer to evaluate an exploration model. Due to recent improvements in the PLS course resulting in model approval a two-step procedure was utilized in this study to examine the PLS-SEM method, as described by Henseler et al. (2009), Jaw (1998), and Henseler et al. (2009).

4.5 Assessment of Measurement Model

According to Hair et al. (2011); Hair, Ringle, and Sarstedt (2013), while analyzing interior consistency steadfast quality, the dependability content legitimacy, discriminant legitimacy, and joined legitimacy are all considered of each individual item must be established. The current study adhered to the requirement who underlined the significance of individual item outer loadings and the average variance extracted value being at least. As a result, items with lower loading were deleted in order to enhance data quality. (Hair et al., 2011; Hair et al., 2013).

4.5.1 Individual Item Reliability:

To determine unified legitimacy, the variables' stacking and cross-loadings were first examined as a prerequisite for evaluating the external model. according to the borders provided by (Joseph F Hair, Rolph E Anderson, Barry J Babin, and William C Dark (2010b); Hair, Sarstedt, Hopkins, and G. Kuppelwieser (2014); Hair, Sarstedt, Hopkins, and G. Kuppelwieser (2014), Concurrent validity is achieved when the variable stacking of everything is more than 0.6 and no one stacking of something from another develop is more prominent than the stacking of the construct under consideration. According to the results, three components (ER5, ET6, and OS6) had a value of less than 0.6 and were removed, leaving 60 items. Table 4.5 showed stacking values ranging from 0.664 to 0.887.

4.5.2 Internal Consistency

Inner consistency dependability is the degree to which all the items on a single subscale evaluate the same concept (McCrae, Kurtz, Yamagata, and Terracciano, 2011). The acceptable reward for composite unshakable quality as described in the writing (Hair et al., 2011) should not be less than

0.7, and the usual difference separated (AVE) adequate worth should be around 0.5. Table 4.5 demonstrates that all of the variables were incredibly solid, and the AVE value of each variable was greater than the endpoint of 0.50, indicating that the estimate model was reliable for subsequent tests. Cronbach's alpha () was also calculated to validate the inner consistency of the

develops. According to George and Mallery (2003), the values greater than 0.9, 0.8, and 0.7 were labelled as excellent, terrific, and OK, respectively. Table 4.5 provides the overall AVE, Cronbach's alpha, and composite dependability ratings.

Table 4.4: Construct Reliability, Cronbach's Alpha, Composite Reliability, and AVE of Latent Variable

Cronbach's		Composite reliability (rho_c)	Average variance extracted (AVE)
alpha			
BI	0.966	0.971	0.848
IE	0.84	0.887	0.612
IT	0.917	0.932	0.734
KA	0.9	0.916	0.691
SCA	0.84	0.896	0.688
SCI	0.92	0.937	0.717
SCP	0.927	0.913	0.569

IE: Information Exchange, IT: Information Technology, BI: Business Intelligence, KA: Knowledge Asset, SCI: Supply Chain Integration, SCP: Supply Chain Performance, SCA: Supply Chain Agility

4.6 Discriminant Validity

According to Farrell and Rudd (2009), discriminant authenticity is the degree to which a given latent variable differs from other inactive components. The AVE values, the principles given by (Fornell and Larcker, 1981), predicted discriminant authenticity in this audit. Discriminant authenticity was established by

assessing the relationship between the lethargic factors along the square base of AVE (Fornell and Larcker, 1981). Fornell and Larcker (1981) advised that an AVE of 0.50 or higher be used to assess discriminant authenticity. They also advocated that the square underpinning of AVE be more than the value of the inactive parts. To test discriminant authenticity, this study assessed the model's external consistency and examined the AVE value of each and every lethargic participant. Table 4.6 shows that the 'square base' of AVE was more notable than the link between the inactive sections, indicating enough separate authenticity. Fornell and Larcker (1981).

Fornell and Larcker

Table 4.6: Fornell-Larcker Criterion

	BI	IE	IT	KA	SCA	SCI	SCP
BI	0.921						
IE	0.452	0.782					
IT	0.568	0.544	0.857				
KA	0.688	0.412	0.609	0.831			
SCA	0.631	0.529	0.703	0.646	0.829		
SCI	0.311	0.563	0.305	0.295	0.477	0.847	
SCP	0.682	0.395	0.462	0.749	0.523	0.299	0.755

IE: Information Exchange, IT: Information Technology, BI: Business Intelligence, KA: Knowledge Asset, SCI: Supply Chain Integration,

SCP: Supply Chain Performance, SCA: Supply Chain Agility

CROSS LOADING

The cross-loadings, where we analyze the things to recognize those high loadings on the very develop and those that heap profoundly on different builds. Hence, to lay out discriminant legitimacy at the thing level means there is a high relationship between's things of similar develop and a feeble connection between things of an alternate build. However basic as this approach seems to be, it has

no hypothetical legitimizations or observational confirmation (Henseler et. al., 2015). The segregation among the dormant builds and the cross stacking were short of what one in Table 4.7. Subsequently, following the cross loadings standards, all factors accomplished discriminant legitimacy.

	BI	IE	IT	KA	SCA	SCI	SCP	
BI1	0.94	0.545	0.577	0.612	0.663	0.365		0.604
BI2	0.969	0.438	0.579	0.715	0.648	0.331		0.656
BI3	0.968	0.464	0.57	0.719	0.602	0.355		0.728
BI4	0.9	0.307	0.466	0.54	0.556	0.159		0.571
BI5	0.905	0.308	0.491	0.557	0.474	0.161		0.611
BI6	0.835	0.189	0.293	0.578	0.376	0.115		0.564
IE1	0.259	0.902	0.237	0.173	0.258	0.503		0.249
IE2	0.187	0.699	0.045	-0.001	0.084	0.303		0.203
IE3	0.217	0.751	0.131	0.186	0.372	0.482		0.121
IE4	0.585	0.763	0.818	0.641	0.721	0.465		0.509
IE5	0.504	0.781	0.863	0.559	0.568	0.401		0.468
IT1	0.524	0.465	0.894	0.604	0.807	0.291		0.404
IT2	0.358	0.383	0.815	0.487	0.458	0.072		0.363
IT3	0.589	0.535	0.96	0.626	0.744	0.378		0.468
IT4	0.479	0.415	0.906	0.47	0.478	0.196		0.402
IT5	0.342	0.524	0.682	0.299	0.195	0.137		0.3
KA1	0.645	0.308	0.508	0.924	0.606	0.256		0.689
KA2	0.66	0.488	0.545	0.934	0.545	0.268		0.75
KA3	0.584	0.219	0.564	0.715	0.536	0.111		0.595
KA5	0.547	0.347	0.556	0.885	0.58	0.309		0.597
KA6	0.331	-0.088	0.356	0.659	0.239	-0.014		0.443
SCA1	0.301	0.284	0.229	0.439	0.631	0.473		0.331
SCA2	0.603	0.353	0.707	0.6	0.848	0.285		0.467
SCA3	0.583	0.655	0.64	0.495	0.882	0.492		0.442
SCA4	0.584	0.411	0.736	0.606	0.926	0.299		0.482
SCI1	0.268	0.519	0.34	0.328	0.43	0.771		0.276
SCI2	0.093	0.137	0.061	-0.026	0.125	0.595		0.012
SCI3	0.337	0.539	0.301	0.323	0.53	0.947		0.296
SCI4	0.263	0.53	0.205	0.213	0.473	0.913		0.253
SCI5	0.293	0.534	0.303	0.262	0.415	0.945		0.29
SCI6	0.218	0.387	0.203	0.201	0.24	0.856		0.24
SCP1	0.566	0.096	0.473	0.629	0.377	0.007		0.801
SCP2	0.621	0.412	0.575	0.75	0.585	0.335		0.919
SCP3	0.554	0.273	0.127	0.51	0.335	0.261		0.798
SCP4	0.406	0.244	0.056	0.39	0.107	0.133		0.774
SCP5	0.458	0.422	0.183	0.529	0.215	0.367		0.748
SCP6	0.386	0.116	0.194	0.474	-0.007	-0.017		0.645
SCP7	0.47	0.356	0.165	0.424	0.141	0.098		0.654

IE: Information Exchange, IT: Information Technology, PPR: Procurement Review, Procurement

Planning, KE: Knowledge Asset, SCI: Supply Chain Integration, SCP: Supply Chain Performance, SCA: Supply Chain Agility

Heterotrait- Monotrait Ratio (HTMT):

HTMT is a cutting edge measurable technique created to test the discriminant legitimacy (Henz et al., 2014). It proposes the discriminant legitimacy is guaranteed, assuming each develop is

lesser than 0.80. Hence the variable remember for this table is satisfaction, online trust, effectiveness, security and framework accessibility.

Table 4.11: Heterotrait - Monotrait Ratio (HTMT)

Heterotrait-monotrait ratio (HTMT) – Matrix

	BI	IE	IT	KA	SCA	SCI	SCP
BI IE	0.452						
IT	0.535	0.658					
KA	0.694	0.462	0.636				
SCA	0.665	0.635	0.784	0.688			
SCI	0.27	0.591	0.276	0.255	0.52		
SCP	0.63	0.402	0.328	0.695	0.371	0.252	

IE: Information Exchange, IT: Information Technology, BI: Business Intelligence, KA: Knowledge Asset, SCI: Supply Chain Integration, SCP: Supply Chain Performance, SCA: Supply Chain Agility

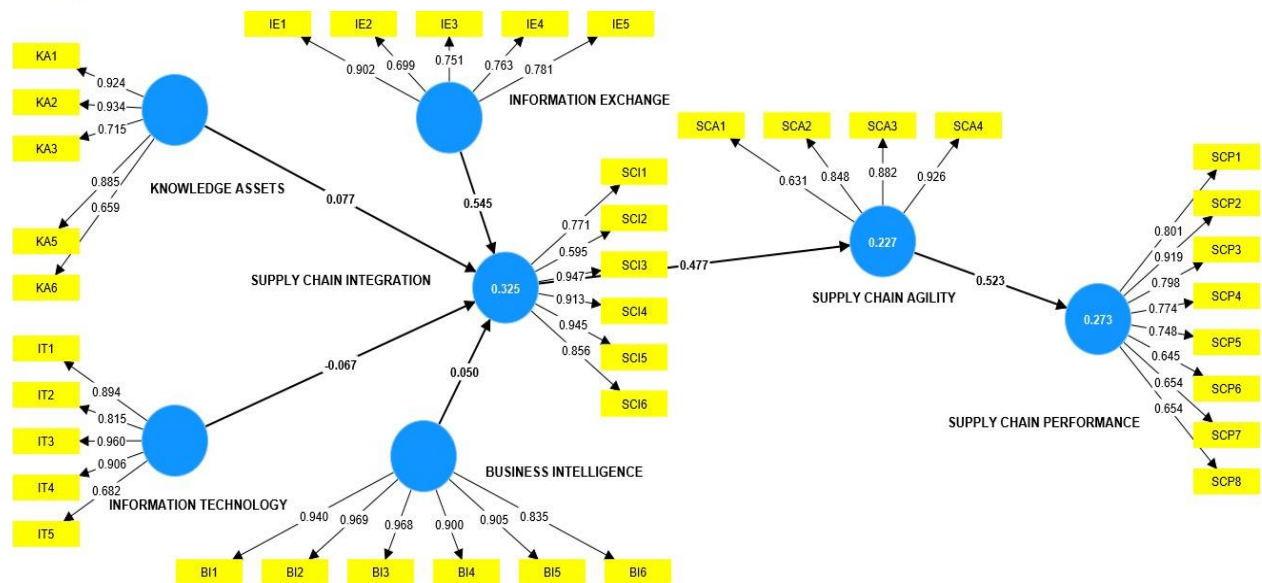
4.8 Structural Equation Model (SEM):

When the model's modesty had been set out, the subsequent stage was to analyze the speculations. By running PLS-SEM (PLS calculation and bootstrapping), primary model was evaluated (Jawline, 2010). To begin with, the core model's predictive power was measured using the

endogenous development's assurance coefficient (R² upsides), (Jawline, 2010; Henseler et al., 2009) and the importance level of the way not set in stone (Henseler et al., 2014). The R² esteem is the portrayal of the proportionate variety that can be made sense of by at least one indicator factors (Elliott and Woodward, 2007; Hair et al., 2010b). Falk and Mill operator (1992), and Hair et al. (2010b) suggested a base OK edge of an R² worth of 0.10. Jaw (1998) proposed the R² qualities evaluation standards 0.19 as powerless 0.33 as moderate and 0.67 as significant separately

Table 4.9 R Square:

	R-square
SCA	0.227
SCI	0.325
SCP	0.273



IE: Information Exchange, IT: Information Technology, BI: Business Intelligence, KA: Knowledge Asset, SCI: Supply Chain Integration, SCP: Supply Chain Performance, SCA: Supply Chain Agility

4.9 Path Coefficient:

	Original sample (O)	Sample (M)	mean	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Remark
BI -> SCI	0.05	0.049		0.092	0.548	0.584	Not supported
IE-> SCI	0.545	0.542		0.089	6.129	0	Supported
IT-> SCI	-0.067	-0.051		0.091	0.741	0.459	Not supported
KA -> SCI	0.077	0.086		0.078	0.979	0.328	Not supported
SCA-> SCP	0.523	0.555		0.076	6.873	0	Supported
SCU-> SCA	0.477	0.484		0.094	5.061	0	Supported

IE: Information Exchange, IT: Information Technology, BI: Business Intelligence, KA: Knowledge Asset, SCI:

Supply Chain Integration, SCP: Supply Chain Performance, SCA: Supply Chain Agility

H1. Business Intelligence has a significant impact on supply chain integration

The relationship between business intelligence and supply chain integration is found negative and insignificant because of the values ($t = 0.548$ and $P = 0.584$) which means that our first hypothesis is rejected.

H2: Information exchange has a significant impact on supply chain integration

The second portion that is related to information exchange and supply chain integration. Results Found that information exchange has positively effected on supply chain integration because the Value of ($t = 6.129$ and P was 0.000) which means that our second hypothesis is accepted.

H3. Information technology has significant impact on Supply Chain integration

Continue with the order, third path, the association between information technology and supply chain integration. The Relationship found insignificant because the value of ($t = 0.741$, $P = 0.459$) which means

H3 is rejected and not supported.

H4. Knowledge Asset has significant impact on Supply Chain integration

The relationship between knowledge asset and supply chain integration is found insignificant because the value ($t = 0.979$ and $P = 0.328$). It means that our fourth hypothesis H4 is also rejected because of the value of P.

H5. Supply chain agility has significant impact on Supply chain performance

The Fifth path is related to the impact of supply chain agility on supply chain performance. ($t = 6.873$ and $P = 0.000$) which means the hypothesis H5 is accepted.

H6. Supply chain integration has a significant impact on Supply chain agility

Lastly, the relationship between supply chain integration and supply chain agility is found positive and significant because the value of $t = 5.061$ and $P = 0.000$. Thus our last hypothesis is also supported.

CONCLUSION

5.1 Introduction

This chapter discusses the findings from previous chapters. Using the research objectives and questions from the beginning of this chapter. This chapter also covers the chapter's limitations and possible research options.

5.2 Recapitulation of the study:

The purpose of this study was to investigate theoretical linkages between information sharing and supply chain agility, supply chain visibility, technology innovation and supply chain agility, visibility and technology innovation direct relationship with firm performance. In line with the objectives above, data were collected from Employees, Associates, Frontline staff, representatives, and supply chain experts belong to the automobile industry of Karachi, Pakistan. A total of 155 responses were gathered from 170 surveys. Representing 91% response rate. SPSS and PLS-SEM were used to calculate the data. The hypotheses were tested using significance thresholds of 0.05 and 0.01. Five of the six hypotheses were supported.

5.3 Discussion

The findings show how the link between Block chain visibility (Knowledge asset, Information Exchange, Information Technology, and Business Intelligence) and supply chain performance can be demonstrated utilising SCI Path Analysis and SCA. Because of the values, the link between business intelligence and supply chain integration is determined to be negative and unimportant, as indicated in the previous chapter. ($t = 0.548$ and $P = 0.584$). BI may also link the need for complete items to the want for raw components in order to mitigate the impact of discontinuity produced by a lack of contact between promoting and manufacturing enterprises, notably the acts of competitors or competitors. (Liu, 2010). The second part is concerned involves the exchange of information and the integration of the supply chain. Results It was discovered that information exchange has a favourable impact on supply chain integration since the Value of ($t = 6.129$ and $P = 0.000$) Information sharing is crucial for maintaining supply chain accountability. (Panahifar et al., 2018). Furthermore, information sharing is considered as the glue that holds the activities and resources in the supply chain together, from raw material procurement through customer service. (Holcomb et al., 2011). Third The relationship between information technology and supply chain integration is known as the route. The relationship was shown to be unimportant since the value of ($t = 0.741$, $P = 0.459$). (Hong and Hales, 2021) Several authors in the current literature have emphasised the significance of IT use in SCI. IT connects supply chain operations and provides visibility into internal procedures and processes by utilising computerised technology. IT aids critical supply chain tasks such as procurement and order execution in this regard. (Swaminathan and Tayur, 2003). The value of the link between knowledge assets and supply chain integration is shown to be minor. ($t = 0.979$ and $P = 0.328$). Because of the value of P, our fourth hypothesis, H4, is also rejected. As a result, KA evaluation is critical because employees must recognise, define, and measure their KA status ideas. (Lerro et al., 2012) KA was discovered to have a beneficial and significant connection with SCI and Malaysian SMEs' performance as part of the block chain visibility. (Abu Hasan et al., 2020). KA is a component of an organization's theoretical

resources and denotes major assets and sources of considerable value growth. (Schiurma et al., 2012). The Fifth path is related to the impact of supply chain agility on supply chain performance. ($t = 6.873$ and $P = 0.000$). Gligor et al. (2016) have argued that inventory network deftness can foster working schedule changes, enable authoritative asset re-design, and further build hierarchical detecting skill. For example, switching providers, recognising new suppliers and markets, or collaborating with providers to develop new things can all help organisations save costs (Lee, 2002; Eckstein et al., 2015). Finally, the link between supply chain integration and supply chain agility has been discovered and is crucial due to the importance of $t = 5.061$ and $P = 0.000$. Fayezi and colleagues (2017) stated that It is assumed that both inside and outward (customers and providers) mix are important in laying out dexterity in an organization's stockpiling chains. This focus also identified production network agility (SCA) as a critical capability that enables an organisation to swiftly discover and respond to external and internal threats through compelling storage network reconciliation. A quick-witted organisation can quickly overcome obstacles and seize incredible opportunities

5.4 Managerial Implication

Information must be prioritized and assured to flow freely across the organization with little distortion and delay. Firms might gain technological innovation in their internal operations in this manner to reach the highest performance. The successful implementation of information streams not only results in technical innovation but also improves company performance. The current study's findings support the business intelligence, knowledge asset, information exchange; information technology, supply chain agility and supply chain integration are linked to information sharing on firm performance

Although information exchange is seen to be critical in delivering superior results, it is important to highlight that business intelligence; knowledge asset, information technology, supply chain agility and supply chain integration all play key models in maintaining sustained and increased firm performance levels. As a result, information sharing that increase to improved supply chain visibility, technological innovation,

and supply chain agility, as highlighted in this study, gives policymakers and managers with win-win possibilities for boosting business performance.

5.5 Future Recommendation:

Although the current research has fulfilled its objectives, certain major constraints must be addressed. First, our research obtained sample data from automobile sector businesses in Pakistan. Similar research can be conducted in other nations. Cross-country comparisons will be an attractive route for future study in other growing markets (for example, China or India). Furthermore, further research might be conducted by recruiting varied samples (e.g., vehicle, parts manufacturing) in order to improve the going review model. Second, our examination configuration was cross-sectional, which might add to predisposition in research discoveries since it can't test causality; in any case, we applied different tests to defeat the likely worries of normal technique change (CMV), and the discoveries portrayed no issue of such variety; be that as it may, future investigations ought to be directed in longitudinal exploration plan to conquer the expected worries of CMV extra amounts of time.

Future examination can likewise consolidate extra attributes of data handling, like data administration, data responsiveness, and data innovation, as well as different arbiters, like hierarchical learning and development, to anticipate all out business achievement. Besides, future examination ought to extend our review model by incorporate factors like as commitment to advancement. The review incorporates a couple of deficiencies that may be addressed in ongoing examinations to work on comprehension of supply networks in a more extensive viewpoint. In the first place, in light of the fact that the review zeroed in on assembling ventures, the ends are restricted to that industry. Future research can look at other industries because all businesses, the variables used in this study were treated as composites, reducing the comprehensiveness of these notions to some extent. Further research to have a better understanding of these issues, finally, it will be critical if data can be collected many extra time increase and accurate assessment and benefit for the of given the constant changes in various levels of data innovation are available. Taking use of these existing paper constraints will significantly

improve scholar and expert knowledge on inventory network concepts.

5.6 Limitation and Delimitations:

There are a few limitations to the study, but they can be addressed in follow-up research to advance understanding of supply chains in a more extensive setting. First, because the study focused on manufacturing companies, its findings are somewhat limited to those sectors.

Because all businesses have supply chains, future research can take such industries into account. Second, the variables included in this study were modelled as composites, which reduced the amount to which these notions were comprehensive. Future review can show a portion of these factors on their sub-parts or aspects to give a more full comprehension of these ideas. Last but not least, given the ongoing growth of information technology platforms, it will be essential in the event that information could be assembled over the long run to increment precise assessment and comprehension of the drawn out effect of data sharing on supply chains. For academics and practitioners alike, capturing these existing paper constraints will significantly improve comprehension of key supply chain concepts.

5.7 Conclusion

The approach behind this research is to explore the impacts of retailer brand equity RBE on customers' loyalty. A total 250 questionnaires were found from those who purchases from any retail outlet. Partial least Squares Structural Equation Modeling (PLS SEM) was used to evaluate the

relationship. In this research there were 8 Independent variables used such as Access, Assortment, Atmosphere, Convenience, Employee Behavior, Product Quality, Product Value and Private Brand. The dependent variable of this study was Customer Loyalty. Our 4 hypothesis out of 8 got rejected and remaining got accepted. The findings of the study will helpful for retail traders. The study of relationship between customers and firms through retail outlets supermarkets that is the most significant side or running the eminent business as a result of fulfilling the customer's demand on one visit. This study tells the organization that the way to satisfy their clients and retain them for while as long as customer can connect with the corporate which suggests they're loyal to the corporate

RESEARCH APPENDIX

RESEARCH QUESTION

Dear Respondent,

I am a research student of Iqra University and the questionnaire is related to impact of Block chain visibility (Knowledge asset, Information Exchange, Information Technology and Business Intelligence) and supply chain performance using path Analysis of Supply Chain Integration and supply chain agility.in Automobile sector of Karachi, Pakistan. It will require 10 minutes to fill the questionnaire all your information will be confidential and used for academic purposes only. Regards

Name: Muhammad Afnan Zahid

Email: Afnan.16508_n@iqra.edu.pk

Iqra University Student.

Section A: General Information

Kindly mark ☐ in the box that best describes your response.

☐

Gender

☐

Male

☐

Female

Age Group

☐

Less than 25 years

☐

26-30 years

☐

31-35 years

☐

36 to 40 years

☐

Above 40 years

Education

☐

Intermediate or less

☐

Diploma

☐

Graduation

☐

Master / M. Phil

☐

PhD

Designation

☐ Supervisor ☐ Assistant Manager ☐ Manager ☐ Senior Manager ☐ Director

☐ CEO

Job Experience

☐ Less than 3 years ☐ 3-6 years ☐ 7-10 years ☐ Above 10 years

Income

☐ Less than 35000 ☐ 35001-50000 ☐ 50001-80000
☐ Above 80000

Section B: Independent Variables

i) KNOWLEDGE ASSET (KA):

1 Strongly Disagree		2 Disagree	3 Neutral	4	5 Strongly Agree				
		Agree			1	2	3	4	5
S.#									
KA1		Our firm has real-time data on the location and status of supplies, finished goods, equipment and employee							
KA2		Our firm has regular interchange of information among supplies, customers and other external sources							
KA3		Our firm has effective business intelligence gathering programs							
KA4		Our firm has detailed contingency plans and regularly conduct preparedness exercises and readiness inspections							
KA5		Our firm has order status tracking							
KA6		Our firm has knowledge of distribution center stock levels							

ii) INFORMATION TECHNOLOGY (IT)

1 Strongly Disagree		2 Disagree	3 Neutral	4 Agree	5 Strongly Agree				
					1	2	3	4	5
S.#									
IT1		Our firm has information systems that accurately track all operations							
IT2		Our firm has knowledge of suppliers order status information							
IT3		Our firm has knowledge of customer demand forecasts							
IT4		The information available in our firm is accurate							
IT5		Our firm has adequate ability to share information externally with key suppliers							

iii) INFORMATION EXCHANGE (IE)

	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
S.#	1	2	3	4	5
IE1	Our firm shares relevant information with supply chain partners				
IE2	Our firm exchanges timely information with supply chain partners				
IE3	Our firm shares accurate information with supply chain partners				
IE4	Our firm and supply chain partners share confidential information				
IE5	Our firm and supply chain partners share complete information				

iv) BUSINESS INTELLIGENCE (BI) GATHERING:

	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
S.#	1	2	3	4	5
BI1	The company's information system is comprehensive				
BI2	The company knows its large/small competitors				
BI3	The company recognizes the strength and weakness of its product market				
BI4	The company knows the main resources and capabilities of competitors				
BI5	The company is well aware of the competitive industrial environment (in which it operates)				
BI6	The company knows the wants and needs of its customers				

v) SUPPLY CHAIN INTEGRATION (SCI)

	1	2	3	4	5
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
S.#	1	2	3	4	5
SCI1	Information exchange with suppliers through IT				
SCI2	The level of a strategic partnership with suppliers				
SCI3	The participation level of suppliers in the process of procurement and production				
SCI4	Stable procurement through a network				

SCI5	Data integration among internal functions through a network					
SCI6	Real-time searching of logisticsrelated operating data					

vi) SUPPLY CHAIN AGILITY (SCA)

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
S.#				

SCA1	Our organization can quickly detect changes in our environment					
SCA2	Our organization continuously collects information from suppliers and customers					
SCA3	Our organization is characterized by the speed in adjusting delivery capability					
SCA4	Our organization is characterized by the speed in improving customer service					
SCA5	Our organization is characterized by the speed in improving responsiveness					

Section C: Dependent Variables:

vii) SUPPLY CHAIN PERFORMANCE (SCP)

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
S.#				

SCP1	Our firm improved product variety					
SCP2	Our firm improved the adjustment of the capacity					
SCP3	Our firm improved the volume changes					
SCP4	Our firm improved the rapid design changes					
SCP5	Our firm improved the response time to demand changes					
SCP6	Our firm improved speed of delivery relative to competitors					
SCP7	Our firm improved the accuracy of the predictability of delivery dates					
SCP8	Our firm improved capacity utilization					

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