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Editorial Note

I am pleased to introduce the "**South Asian Management Review**" (SAMR), a peer-reviewed journal under SAG Publishing. We have been started in the year 2022 and are growing continuously. We are pleased to announce that our current issue has been published on time. All published articles in this journal are included in the indexing and abstracting coverage of various scientific databases. The submissions to the journal are subject to the peer review process by two (minimum) external subject experts. The complete editorial processing of the manuscript is done through the SAG Publishing submission system (OJS) for greater transparency and faster article throughout. During this calendar year 2022, Editorial Board and Advisory Board comprises prominent expert Editors and Reviewers who joined *SAMR* and contributed their valuable services towards the journal's quality.

I would like to express my gratitude to all the authors, reviewers, the SAG publishing, Assistant Editors, and the Editorial Board of *SAMR*. With their support, we have released Vol. 1 and Issue 2 for the calendar year 2022. This is the second issue in Vol. 1, and we look forward to bringing out the next issue in December 2022.

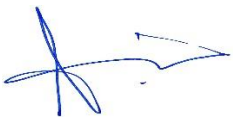

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Table of Contents

South Asian Management Review
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Impact of Environmental Factors on Supply Chain Practices in Textile Sector

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ABSTRACT

In today's era, supply chain functions play a significant role in every business model, whether service-based or product based. Effective and efficient supply chain practices help the business grow, provide value to its buyers, and help make rational decisions that encompass the nation's economic, social, and environmental benefits. These supply chain functions can only be implemented and provide sustainable benefits if no direct or indirect disruption is inferred due to internal or external environmental factors. Our nation's textile manufacturers and exporters are the primary sources that propel the nation's economy. In short, the textile industries drive ninety per cent of the economy. Eventually, their supply chain practices are surrounded by many factors, which lead them to run or halt their operations. If we enlighten the past, a major global environmental factor, significant supply chain disruptions occur and especially strikes our country's primary economy-driven sector. It is a cross-sectional study. The present study was conducted in the urban areas of Karachi, Pakistan. Data collection will be through questionnaires and surveys. It is designed for information collection so it can use to determine the impact of this factor in significant supply chain functions, including procurement, warehousing, logistics, and import & export.

Keywords: *Green supply chain, Textile, Procurement, Logistics, Warehouse, Import and Export, COVID.*

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Impact of Environmental Factors on Supply Chain Practices in Textile Sector

1. Introduction

The study covers a thorough analysis of the problems that the textile industries have faced due to the environmental factors in their primary supply chain functions, including logistics, procurement, warehousing, import & export, along with the limitations, importance, hypothesis and background of the research (Bode et al., 2011). The environmental factors have a significant impact on national and international economies & Supply chains. It has a significant impact on various businesses. Depending on its impact, they have suffered varying losses due to the procedure (Shaheen, 2022). Furthermore, enterprises are currently confronted with several issues, including decreased demand from customers and other businesses, supply chain interruptions, cancelling of external demand disturbed the warehouse facilities, shortfalls of resources required in production, and transportation interruptions. As a result, businesses and nations severely impacted economic growth (Anwar, 2022). Considering the pandemic as a disruption, every nation's economy has a severe downfall. Each sector of the country, whether the manufacturing or service industry, is oppressed to adapt to this "New Normal". Pakistan's textile manufacturing industry is among the significant economy-driven sectors. It serves employment to millions of people who had to face a severe downfall because of a significant obstruction in their supply chain functions. Once this factor started its disruption in most nations around the world by March, sellers in China, Bangladesh, and India experienced significant order cancellations or delays. (Hashmi et al., 2021a). Due to sudden cancellations, Pakistan's textile manufacturers must fulfil these orders. Even clothing and textile Firms which have reopened their operations in China or South Korea they were always dealing with a slew of supply-chain issues, including a labour shortage, a scarcity of textile raw materials, and a significant increase in storage, shipping, and transportation costs (Baloch & Rashid, 2022; Lu, 2019). Unfortunately, Pakistan's textile sector cannot fulfil the demands of high dependency on China for cotton and chemicals.

The export-oriented textile industry is facing the worst liquidity crisis ever. Overseas contracts have already been rejected, and shipping has been halted, putting smaller businesses out of business. This is especially problematic during economic distress when logical changes are desperately needed to help industrial textile recover (Amjad, 2022). As a result, to safeguard our output cotton industry from the severe economic effects of this environmental factor which is having a negative influence on exports, extreme steps must be implemented. Due to the shortage and import of cotton into Pakistan this year, a reduction in exports and import duties is judged necessary, highlighting the shift to the polyester market (Rasheed, 2022). Pakistan is one of the countries where daily reported cases have been steadily decreasing. The issue with this factor will always pose an uncertainty, though, is that we can still do not know much more about it. What happens when there is a fifth wave in Pakistan? What would be the outcome of supply chain implications? This article briefly used an up-to-date general equilibrium model to estimate the impact of falling trade streams associated with market slowdowns (Amjad, 2022). All markets were assumed to be perfectly competitive, and prices were adjusted to ensure that all markets were in equilibrium.

1.3 Research Objectives and Research Questions

The main aim of this research is to determine the impact of the environmental factors on Pakistan's largest economy driven and serves employment to millions of people in our nation is Textile Industry, including their primary supply chain functions such as Logistics, Procurement, Warehousing, Import & Export and to determine the most critical supply chain disruptions faced by Pakistan's textile manufactures after the pandemic.

Keeping in view, this research study is based on the following questions:

Q1. To what extent do environmental factors effects Warehousing in the textile industry?

Q2. To what extent do environmental factors effects Procurement in the textile industry?
Q3. To what extent do environmental factors effects imports & exports in the textile industry?
Q4. To what extent do environmental factors effects Logistics in the textile industry?

2. Literature Review

The study enlightens the in-depth analysis of various supply chain functions in the Pakistan Textile Manufacturing industry along with the literature summary, and also determines the impact and disruptions on effective supply chain practices, including textile importing and exporting commodities, warehousing practices, textile logistics system and procurement**.** The textile industry plays a significant role in developing sustainable economic growth for our nation. It contributes more than 60% of export-based earnings and approximately 46% of the total manufacturing that can employ millions of people in Pakistan. The textile sector has proven itself a primary foreign exchange earner. It has a solid supply base for almost all artificial and natural yarns and fabrics, including cotton, rayon, and others, to the United States, United Kingdom, Germany, China, and the Netherlands. It seems to be a simple export process through a bird-eye-view, but the finished items that must be exported or sold must pass through many processes. There has always been the involvement of various departments, including, Spinning, Processing, Seizing, Warping, Loom shade, Pressing, folding, Stitching, Quality control, packaging and warehousing etc (Ali et al., 2018).

It starts by procuring the raw materials, including chemicals and cotton, mainly from China and local manufacturers. Pakistan's textile sector imports 1.49 billion of cotton from China since China has been a bulwark of exporting textile-related materials with its rapid growth over the last two decades. Our textile sector also imports textile-related instruments and machinery, specifically from Switzerland, Germany, China, Italy and Turkey. The process starts by sending the cotton to the spinning department to produce yarn and make it stronger by applying different chemicals in the processing department where yarn cones have been produced. The processed yarn is sent to the Sizing and Warping department, where warping machines convert these yarn cones into a beam, and we make multiple beams. These multiple beams have been sent to the Sizing machine, where the sizing machine converts these multiple beams into a single beam & applies the chemical as per requirement (Ali, 2022). A single beam has been sent to another department, where the beam has been converted to a loom and processed further to produce the cloth. The cloth has now been sent to the dying machine, where the colour and design process occurs. After the dying process, it is transmitted to the press department, where the cutting of clothes takes place and further processed to the Stitching department. The processed cloth has been stitched according to the requirement specifications and transferred the finished goods to the quality control, where the items have been checked from every aspect before being transmitted to the packaging department (Victory et al., 2022). After packaging the finished goods, all the items are shifted to the warehouse and stored in a controlled environment.

From production to export, all the primary supply chain practices are involved, including procurement, manufacturing, warehousing and logistics and these functions require a streamlined and well-maintained area. Whether in terms of environment, human resources, political intervention and others, a sudden breakdown happened in the form of a pandemic, and the textile sector needs to fight this imperceptible competitor (Alam, 2022). The first disease began in China's Wuhan, then spread throughout the realm, and is now recognized as one of the darkest periods in human history. Almost all of the world's major economies, including Asia, the United States, India, and several European countries, are on full or partial lockdown. The pandemic has shaken humankind as well as the economy of those countries, and supply chain disruptions have occurred due to the complete closure of borders (Victory et al., 2022). Because of the panic produced by this factor outbreak, orders for textile products from abroad and domestic sales have ground to a standstill. Due to the lockdown, all textile-associated factories were closed, and it is challenging to risk a wager while the ones might be allowed to open. Workers were strolling right here and there amid all kinds of confusion. The commercial enterprise network is scared due to coins' crunch, deliver chain disturbance and manpower-associated issues (Asif, 2022). All throughout the world, the garment industry has taken a beating. Because of large stockpiles,

stores were closed, and practically all purchasers were cancelling or postponing orders. They might also not be able to place an order in the coming months. The daily wage worker, who makes up 80% of the workers in garment factories, is out on the streets or at home. The worst-affected countries include India's primary export markets, Europe and the Middle East. It is difficult to predict when these nations will return to everyday living, and even if we do, when people will begin spending again, given that the lockout will result in job losses (Uddin, 2022).

Hence Pakistan's textile industry is the country's largest industrial sector, and it ranks as Asia's eighth most significant exporter of textile goods. Pakistan's textile industry contributes 8.5 per cent to the country's GDP. Furthermore, the sector employs roughly 45 per cent of the country's overall workforce and 38 per cent of the manufacturing workers. Pakistan is the world's fourth-largest cotton grower, with the third-largest significant input in Asia behind China and India, accounting for 5% of worldwide spinning capacity. There are currently 1,221 textile seed units, 442 spin units, 124 big spinning units, and 425 small spinning units. Since Pakistan's fabric and garment industry is facing the worst ever liquidity crisis. The export value of textiles in May 2020 was US$751 million, a decrease of 37% compared with the export value of US$1.19 billion in May last year. We need to take drastic actions to rescue our export-oriented textile business from the detrimental economic effects worldwide.

2.1. Importing and Exporting Commodities

Minimization of cost is the primary goal that needs to be accomplished by any manufacturer or services sector in order to obtain a sustainable competitive advantage over competitors. However, they had to maintain the quality of the product. Hence, it is not an easy process (maintaining quality with minimum cost). The same goes for textile manufacturers. They had to reasonably import or procure the best-in-class raw material and then produce the finished commodities efficiently (Ayaz, 2022). After the pandemic, our textile industry suffers a significant disturbance while importing raw materials from China. Pakistan's textile sector is required to proactively increase imported equipment from other countries because environmental factors have broken the buyer-seller relation worldwide and reduced the export flow. Globally the large importers are stuck in bankruptcy, or some stopped their companies due to the global pandemic, leaving Pakistani exporters without customers. Both demand and supply sides have been splitting the change in the external sector, and a currency crisis is appearing. Pakistan's fabric area was employed at the complete volume of their production level after the government implemented the new duties and taxes on the import of raw cotton in January 2020. On the other side, Pakistan started higher export orders from other countries, primarily for textiles, at that point when China was on the battlefield against the pandemic. The world textile material purchasers are diverted from China to Pakistan, and 70-80% of creation was disturbed (Ali et al., 2020).

Among Pakistan's main exports are textiles, cereals, leather-based products, surgical tools, chemicals, and other products. Moreover, over two-thirds of all fabric products are shipped to Western countries, making them the essential destination for finished goods from the fabric and cowhide industries. The demand for Pakistani textiles continues to diminish due to continued cutbacks and shutdowns (repercussions in supply-aspect and demand-aspect disruptions). Total exports in Pakistan may not fall entirely due to this strand, but they may fall due to a decrease in imports (Muzammil, 2022). These are then used to provide things for domestic consumption and distribution to the rest of the world. As a result, the drop in importation of such commodities will result in a distribution failure today.

2.2. Warehousing Practices

Warehousing is one of the primary supply chain functions that enable the manufacturer to store all the elements, whether produced or used in the production, that is, the raw material and also plays an essential role in streamlining the overall process. However, the warehousing function has its own cost,

including direct and indirect costs, and the manufacturer needs to bear all the costs related to the warehousing. The same goes for the textile manufacturers in our country during the pandemic, when all the territories were closed and even the giant textile suppliers in foreign nations, especially China, stopped their processes. It was challenging for Pakistani textile firms to import the raw materials and other textile-related machinery they needed to bear their warehousing cost, as more than 60% of the warehousing is outsourced. They had to suffer from its cost without storing anything in it (Hunaid et al., 2022).

2.3. Logistics

According to the data, it has a statistically unfavourable and significant influence on air freight (Lu, 2019). Furthermore, terrestrial traffic is economically significantly negative, whereas the effects on maritime freight are statistically minor. The policymakers should expand their support to improve Pakistan's textile sector's logistics and transportation performance. The main goal of logistics and transportation companies is to move, store, and move items efficiently using the proper routes. Nevertheless, it has been stated that this environmental factor epidemic has a significant and negative impact on established businesses. It is worth noting that the epidemic has highlighted the brittleness of affairs and activities in the textile industry and offered new obstacles.

Furthermore, the textile industry has difficulty controlling its supply chain across borders and enabling business and trade. As mentioned in the paper, the epidemic has interrupted supply and influenced supply and demand in many countries. Because of the underperformance of logistics management, trade opportunities are limited. In order to reduce the odds of prospective procurement hazards, the transportation businesses also performed several modes of transportation and logistics, such as transporting goods, warehousing, inventory management, and other multi-model transportation. Likewise, global manufacturers have used their routes and transportation techniques, which can be regarded as an essential part of delivering goods and services to customers. Based on the distinct roles and operations enterprises conduct for trade, there is a good bond between logistics and the economy, eventually increasing the economic returns. The Pakistan lockdown scenario's repercussions were noted to harm transportation and logistics. Furthermore, it was discovered that the notion of long-haul trucking has fallen under 15% for the year 2019. It had previously climbed by 92 per cent in February, which was a success element for Pakistan's logistics and transportation sector and a boon to a variety of other companies (Basit, 2022; Rashid et al., 2022).

2.4. Procurement

Textile Procurement implications are owing to our considered elements. Supplies are facing a shortage due to the closure of ports. Manufacturers are unable to produce their products due to uncertainty of the market and also unable to code the prices due to the unpredictability of the ports and labour storage. There is significant uncertainty in the market as we do not know what the will be the rate day after tomorrow. Bulk storage has become a massive issue as providers cannot produce the appropriate quantity at our desired rates. Fleece, rib, and jersey are all reaching new heights since they significantly impacted the production houses. The cost of plastic and other types of bags is high. Because the cards in the market are bleach cards, art cards, and craft cards from Sri Lanka, the problem is to tackle a sudden change in rates. The former rate was 210, but after one, the reel, which was 400 to 500 reels, made a difference. We will have to recycle waste if we do not have enough material. The other issue is that the material has become scarce in the market, and if we talk about the import, which was a Wonder C obligation, it would be delayed by two to three months. There was also a reduction in procurement and output.

As a result, we had to induct other sources against it, where all of the documentation work was completed. Most industries are recovering, and it is critical to act on the lessons learned from the crisis and reform sourcing and procurement activities. The functions must structure their recovery and address some essential areas to emerge stronger. Improve the visibility of the supply network to detect threats and capacity challenges. Examine suppliers' financial health and dependability, and strengthen collaboration to find cost-cutting options. Restructure stock levels, and review category plans to align with comment supply chain planning. Monitor clients to determine if their requirements have changed (Haque et al., 2021).

2.5. Relevant Theory

2.5.1. Contingency theory

The research has relevance to the theory of contingency as it approaches the most appropriate management style that depends on the situation's context or decision (Rashid & Amirah, 2017; Rashid et al., 2019). In our research, the situation will be considered a pandemic which causes disruptions in significant supply chain functions of the textile sector, especially in the procurement of raw materials from China or other countries. Since the pandemic has risen, major suppliers like China have closed all their operations, primarily exporting textile-related materials. Pakistan textile exporters have a high dependency on China in procuring cotton & chemicals. However, Pakistan's textile manufacturing industries had a chance to increase their export because many importers were interested in placing textile-related orders with Pakistan's local textile manufacturers. Due to the closer of China, India & Bangladesh, local manufacturers could not fulfil the demands. On the other hand, they faced a labour shortage and raw materials, which tended to decrease their operations. As a result, the textile's procurement department needed to suffer with little or no raw material procurement, which led them to stop their production and eventually affected the export. Figure 1 illustrates the research framework.

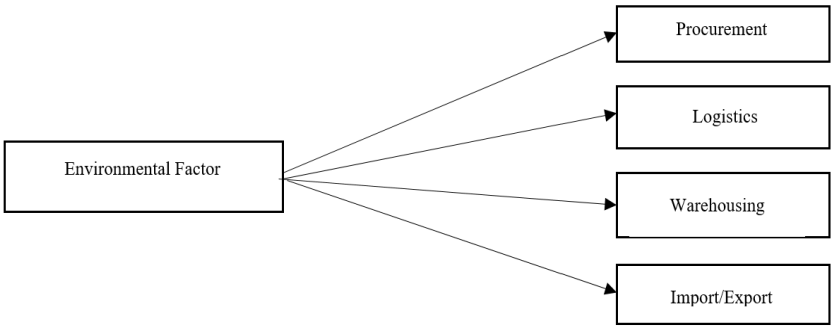

Figure 1: A research framework

2.6. Hypothesis

The following hypotheses were tested in this research:

H1: Environmental factors has a significant effect on procurement.

H2: Environmental factors have a significant effect on warehousing.

H3: Environmental factors have a significant effect on Import/Export.

H4: Environmental factors have a significant effect on Logistics.

3. Research Methodology

The research is based on quantitative design and enlightens the post-paradigm structure because of the empirical data (Rashid et al., 2021) and relies on data collection from a large population of textile manufacturers in Karachi. Further, explanatory research seeks fresh insight to expand, develop, build, or test a theory and complies with our research framework variables that depend upon a situation (Rashid et al., 2021). The quantitative research method is used along with questionnaires and surveys to determine our chosen population's responses. As the questions that have been asked from the respondents generally implies on their experiences of what situation they had faced during the environmental factors and what implications take place in order to deal with this situation, and afterwards what strategies will be adapted in order to run their functionalities in this new normal. Some probing questions have also been asked in order to grab quality-based answers and determine the overall thinking of the respondents. In order to obtain relevant answers from the respondents, we will prepare a questionnaire along with probing questions so respondents can determine their thinking and the strategies that have been implemented. In order to do so, the quantitative-based data collection method will be helpful and reliable. SPSS software is used to analyze the overall data as this software helps to find out accurate results and in order to minimize the chances of error. Statistical technique in this research is used to spot the result. The correlation model is also applied for finding the research's best result and measuring the relationship between the independent and dependent variables. These techniques & criteria provided the findings and inspected the data in a particular manner. This study was carried out in compliance with all of the study's ethical standards. This study ensures that no one's privacy is violated, and it does not contain any negative language or materials.

3.1. Sampling

Probability sampling will be used for prejudice when selecting a sample. Therefore, it is not used adequately to reflect the population, but it is also used as random where the population is very high. We will conduct questionnaires and surveys from different textile-based supply chain departments, including procurement, logistics, import/export and warehousing (Rashid, 2016; Rashid & Amirah, 2017). The research will investigate the environmental factor's impact on procurement, logistics, export/import and warehousing for different textile manufacturers. The research design gives us choices and methods to conduct secondary research. The research is deductive based on existing models and theories (Rashid et al., 2021; Hashmi & Mohd, 2020; Hashmi et al., 2020a, b). The research is the explanatory method. The data is collected through questionnaires and organizational surveys from middle to top-level textile supply chain industries and their management. The sample size was obtained randomly from 123 respondents from various textile (SMEs) in Karachi.

3.2. Procedure of Data Collection

To investigate the relationship between post environmental factors intention with Logistics, Procurement, Warehousing, Import & Export. Data will be gathered through interviews and surveys from different textile supply chain departments, mainly procurement and logistics. The dependent and independent variables will measure by one tool at a particular time. Group of interest will be compared to the general public who are not involved in geographical location would be the place where we are living. The data source will be gathered from the interviews consisting of relevant questions, which will ensure that respondents understand study items that will satisfy the legitimacy of the interviews and survey.

4. Results and Findings

4.1. Demographic Attributes

The profile description of the various methods was used to examine the data. The first step is the evaluation of the respondent's profile. A sample size of 123 respondents was used in this survey. The size includes both males, 69.7%, and females, 30.3% genders. The age group of respondents are

classified as 620.3% are 25 – 30, 25.4 % are aged between 31 – 40, 10.7% are aged between 41 – 50 and 0.8% are aged between 51 – 60.

4.2. Reliability Test

To verify model uniformity, the reliability test was carried out. The collected data was analyzed by SPSS Software and found to be 0.890, more significant than 0.60. Therefore, the variables are reliable enough and fulfilling the test assumptions (Rashid et al., 2021; Khan et al., 2022a, b, c; Agha et al., 2021; Haque et al., 2021; Das et al., 2021; Alrazehi et al., 2021)

4.3. Hypothesis Testing

ANOVA stands for analysis of variance that helps to find out if survey or experiment results are significant or not. In ANOVA analysis, an F value is used to determine whether or not the model is fit. The value of F should be close to 1, which means that the model is significant. In our research, four variables are analyzed to check the overall fitness. Table 1 illustrates the hypotheses results.

Table 1: Hypotheses results

Model		Sum of Squares	df	Mean Square	F	Sig.
H1	Regression	14.734	1	14.734	30.610	.000[b]
	Residual	56.318	117	.481		
	Total	71.053	118			

a. Dependent Variable: Procurement

b. Predictors: (Constant), Environmental factor (COVID)

Model		Sum of Squares	df	Mean Square	F	Sig.
H2	Regression	20.153	1	20.153	65.707	.000[b]
	Residual	36.805	120	.307		
	Total	56.957	121			

a. Dependent Variable: Warehousing
b. Predictors: (Constant), Environmental factor (COVID)

Model		Sum of Squares	df	Mean Square	F	Sig.
H3	Regression	25.753	1	25.753	68.430	.000[b]
	Residual	45.538	121	.376		
	Total	71.291	122			

a. Dependent Variable: Import-Export
b. Predictors: (Constant), Environmental factor (COVID)

Model		Sum of Squares	df	Mean Square	F	Sig.
H4	Regression	35.062	1	35.062	117.181	.000[b]
	Residual	36.204	121	.299		
	Total	71.266	122			

a. Dependent Variable: Logistics
b. Predictors: (Constant), Environmental factor (COVID)

In the first hypothesis, the value of F stats is 30.6, showing the model is of good fit and significant at a 1 % significance level. For the second hypothesis, the value of F stats is 65.7, showing the model is of good fit and significant at a 1 % significance level. The third hypothesis analysis states that the value of F stats is 68.4, showing the model is of good fit and significant at a 1 % significance level. In the last hypothesis, the value of F stats is 117.1, showing the model is of good fit and significant at a 1 % significance level.

The coefficients describe the mathematical relationship between the independent and dependent variables. The linear regression results show that the model is significant at a 0.001 or 1% significance level. Therefore, there is a positive relationship between the independent variable and procurement. Results of linear regression show that one unit change in the independent variable can change in procurement by only significantly .532 times. For the second hypothesis, there is a positive relationship

between the independent variable and warehousing. Results of linear regression show that one unit change in the independent variable can change in warehousing by only significantly .626 times. In the third hypothesis analysis, there is also a positive relationship between the independent variable and import and export. The linear regression results show that one unit change in the independent variable can change import and export by only significantly .699 times. While analyzing the final hypothesis, there is also a positive relationship between the factor and logistics. Results of linear regression show that one unit change in environmental factor can change Logistics by only significantly .816 times. Table 2 illustrates the coefficients results.

Table 2: Coefficients results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
H1	(Constant)	1.016	.286		3.557	.001
	Environmental factor (COVID)	.532	.096	.455	5.533	.000
a. Dependent Variable: Procurement						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
H2	(Constant)	1.048	.228		4.598	.000
	Environmental factor (COVID)	.626	.077	.595	8.106	.000
a. Dependent Variable: Warehousing						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
H3	(Constant)	.612	.250		2.447	.016
	Environmental factor (COVID)	.699	.085	.601	8.272	.000
a. Dependent Variable: Import-Export						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
H4	(Constant)	.304	.223		1.362	.176
	Environmental factor (COVID)	.816	.075	.701	10.825	.000
a. Dependent Variable: Logistics						

It is used to determine the strength of the relationship between the model and the dependent variable and provides detail about the characteristics of the model. In our research environmental factor is considered the primary independent variable and acts as a constant while Procurement, Warehousing, Import-Export and Logistics are considered dependent variables. Table 3 illustrates the model summary results.

Table 31: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
H1	.455[a]	.207	.201	.69380
H2	.595[a]	.354	.348	.55381
H3	.601[a]	.361	.356	.61347
H4	.701[a]	.492	.488	.54700
a. Predictors: (Constant), Environmental factor				

If we look at the first hypothesis H1, which refers to the procurement variable, The value of R square shows that change in environmental factors brings a 20.7% change in outcome variable procurement. Similarly, for the second hypothesis H2, the value of R square shows that the change of environmental factor brings a 35.4% change in outcome variable warehousing. If we move on to the third variable, the value of R square indicates that the change of environmental factor brings a 36 % change in the outcome variable import and exports. In the last hypothesis analysis, the value of R square shows that change in environmental factors brings a 49.2% change in outcome variable logistics.

5. Conclusion

The study's leading element is to analyze the influence of different procurement strategies and techniques on the long-term viability of the supply chain process. Today, sustainability is captivating more consciousness at local and global levels, pushing concern about ways to incorporate sustainability into corporate strategy and operations. Sustainable supply chain management might well be a practical approach for businesses to adopt, from being receptive to trash and pollution reduction as well as other long-term solutions activities to show up proactive in respect of taking complete responsibility for their products. And their results from raw material acquisition to ultimate disposal from sustainability perspectives. Operational effectiveness has a consequence on the quality of results, Import, Export, Warehouse & logistic in the Textile industry. The management of the supply chain has evolved into a matter of contention due to ruthlessness. The motive of a chain of supplies management is to enhance an organization's operational efficiency. The chain of supplies further assists in operational convenience and frugality. The precaution we discuss above would impulsively make a remarkable contribution to the organization's overall performance & which will grow our country.

5.1. Discussion

The study's hypothesis shows that procurement strategies significantly impact the viability of supply chains. This hypothesis is accepted as a value of 0.000 in the co-efficient table by implementing sustainability in our procurement process and sourcing of raw materials. It reduces the risk of production shortfall. Operational effectiveness significantly affects the material's quality and environmental health. Cost reduction benefits and increased productivity can be found. It also improves energy efficiency. Environmental control of purchasing and the supply chain is now remarkably commonplace in the middle of larger companies. It is also increasingly used as a corporate practice after covid1-19. To participate in future planning initiatives with all the business partners, like an alliance with vendors to eliminate waste of time in dispatching the raw (Import & Export), logistic and warehousing as well. To build evaluation criteria with vendors, use of grading system for suppliers on their performance, design questionnaire for supplier evaluation, to set the standard of environmental process in the selection of strategic business partner, evaluation criteria should also apply in the buying process.

5.2. Implications

Research Implications recommend how the discoveries may be vital for arrangement, practices, hypothesis, and consequent inquiry. Research implications inquire about suggestions are the conclusions simply drawn from the output and clarify how the discoveries may be vital for policy, practice, or hypothesis. In any case, the suggestions should be substantiated by proof, the study's parameters should be clarified, and the impediments taken under consideration to dodge over-generalization of output. Once the study is conducted and we draw conclusions, we will be able to state the "Research Implications". That implies simply communicating how the study can influence prospects within the subject region of investigation and the approaches or controls that could be impacted since the pondering. Otherwise, hypothesize how the results can affect either hypothesizing a specific point beneath consideration or the possible angles of the same. The investigative implications are continuously upheld by solid factual noteworthiness and relationships from research, keeping in sight the study's inadequacy. The prompt activities that have to be executed to illuminate a specific address, what ought to be redressed & what ought to be dodged to unravel an issue, what is the possibility of your proposed approach, and explanations approximately the type and timing of an evaluation plan that would be used to determine the viability of the proposed strategy. Once more, what you think about these suggestions should be emphatically upheld. There is plenty of work to be done to establish global supply chain sustainability parameters. This procedure requires us — the manufacturers, the suppliers, and governments — to examine sustainability in a wide-ranging. It should also highlight the necessity of examining the whole supply chain rather than individual components. The only way to set sustainability in motion is by pushing managers to recognize a better approach.

5.3. Limitations and Recommendations

This study has some limitations, like other research studies. It has a time limitation as it was completed in a short span of time. Second, the study was self-contained and with no additional funds engaged in the research work. We have specifically targeted the textile industry of Karachi. It has Geographical constraints, and the research was conducted only in one city, i.e., Karachi, Pakistan. The research was conducted on the Impact of Environmental Factors on Supply Chain practices in the textile Sector. Further research may also be conducted by using different variables. This can be done in different regions of Pakistan and outside Pakistan. Different areas of the supply chain process for sustainability impact can be focused on highlighting other significant issues and improving and enhancing research possibilities for further learning and awareness. There is still much work to be done in developing global supply chain sustainability. Future research can be characterized as efficient thinking about conceivable future occasions and circumstances. It is distinctive from determining in a way that the previous includes a forward orientation and looks ahead, or maybe that in reverse, and isn't as numerical as estimating. There is a vast extent of strategies accessible that can be utilized to conduct prospect considers. The nature of decision-making utilizing the output of prospects can be drawn closer from four elective points of view; 1). Values point of view categorizes forecasted results of occasions and events as great or terrible. Appropriately, the esteem viewpoint tends to be exceedingly subjective due to esteem differences among individuals. 2). Rational viewpoint relates to determining an elective among choice choices guided by the degree to which each elective meets specific criteria. 3). Judgment heuristics is related to a propensity towards hazard taking and depending on instinct when locked in in choice making. Future research might use different approaches to investigate biases in standard methods. As the majority in the world enlarges and the availability of resources reduces or minimizes, many firms or companies come to understand that the process of supply chains must also be re-designed in the current scenario to deal with any disaster in future.

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A Study on Waste Disposal Management in Textile Industry: A Case Study of Gul Ahmed

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ABSTRACT

The objective is to determine how the disposal of Waste, GSCP, and WR affected the company's productivity. The study used a correlational design to examine the relationships between variables. Furthermore, the study was descriptive, and data were acquired using various methods (qualitative and quantitative). In addition, the study's quantitative component was a questionnaire-based survey, and its qualitative component was a series of in-depth interviews with key individuals. A Likert scale questionnaire was used to gather the research's primary data, while the secondary data was gathered through reviewing previous articles. The data gathered was then measured using a statistical technique and the SPSS software. The study concluded that Waste and WR disposal is significant, but GSCP has an insignificant impact on the company's productivity. Furthermore, waste directly impacts human development, both socially and technologically. Waste management is distinct from resource recovery, which is concerned with lowering the pace at which natural resources are used. All waste materials, whether solid, liquid, gaseous, or radioactive, are included in WM. WM practices might differ across developed and emerging countries, urban and rural areas, industrial producers, and residential areas.

Keywords: *Waste, Recycling, Disposal of Waste, Green SC Practices, Productivity of the Company, Gul Ahmed.*

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A Study on Waste Disposal Management in Textile Industry: A Case Study of Gul Ahmed

1. Introduction

Gul Ahmed's tale is the story of textiles in the Indian subcontinent. In the early 1900s, the gang launches their textile business. With the founding of the company, now known by its current name, Gul Ahmed Textile Mills Ltd., the group joined the textile sector in 1953. Since its first public offering on the Karachi Stock Exchange in 1970, the company has maintained a dominant position in the textile sector. It has been recognized as one of the top businesses experiencing rapid growth. Gul Ahmed is a significant player in retail as the owner of Ideas by Gul Ahmed. Gul Ahmed was founded in Karachi and now has the largest network of more than 40 retail locations around the country, providing the most incredible selection of products from home furnishings to clothing. Gul Ahmed has remained a byword for excellence, creativity, and dependability for over 50 years. Gul Ahmed Textile, like other textile businesses, struggles with poor waste management, but this issue can be resolved with a little extra effort (Javed & Khan, 2014).

Waste is a direct result of human technical and social progress. Resource recovery, which aims to slow down the rate at which natural resources are consumed, is distinct from waste management. Trash management includes all types of waste, including radioactive, liquid, solid, and gaseous. There can be differences in waste management practices between developed and developing nations, urban and rural areas, industrial producers, and residential settings. Local government agencies frequently manage non-hazardous residential and institutional waste in urban areas. In contrast, the generator typically manages non-hazardous commercial and industrial waste under the supervision of local, national, or international authorities. (Kavitha & Manimekalai, 2014). Production processes create waste of clothes and woven; the second is employee working activities that make different types of waste. Because it is a textile industry, thousands of people work there. So, it is necessary to monitor or check the waste and its amount so it will be easy to identify the waste areas and waste-generating activities. Hundreds of new products are produced due to modernization and increased purchasing power. So, the waste is also increasing daily and is dumped; some amount is sold at a low price for other use, so this is alarming pollution and will cause a profound effect on humans and the environment. Moreover, the land space is reducing. So, in this scenario, it is necessary to develop or adopt better waste management practices (Aishwariya, 2018).

Solid trash is created by the manufacturing operations (Waste from the fabric store) and is dispatched when needed. Therefore these textiles come from outside and may be damaged or of lower quality than necessary. As a result of the intended inspection and audit procedure, these damaged textiles may be recognized early, allowing for prompt waste reduction. Fabrics in the cutting room produce cutting waste, marker use, roll excess etc. (Aishwariya, 2018). This is a vital manufacturing process that generates trash. Fabric pieces are given to the bundling room before they are sent to the manufacturing floor. A significant quantity of garbage may be produced in the bundling room. This is the primary source of garbage. The process states that the loader fills the manufacturing lines with fabric bundles. The required inspection occurs here, and the operators discover damaged fabric pieces. In the textile business, aqueous systems are used for fabric preparation stages such as de-sizing, bleaching, scouring, and mercerizing. The textile business consumes a significant quantity of water. Water baths are used to apply finishing chemicals and other compounds to textile substrates. Several contaminants are present in the water when it exits the system. In addition, malfunctioning valves, leaks, and poor aqueous system management may result in significant wastewater generation in the sector. The textile industry has pioneered many chemical processes. Chemicals are used on cloth for a variety of reasons. This produces hazardous chemical Waste, which must be controlled inside the industry (Aishwariya, 2018; Victory et al., 2022).

Waste has a direct social, technological, economic, and environmental impact on the human

world. It is critical to managing solid waste to maintain the environment and natural resources for future generations. Even in the best-case scenario, the treated wastewater's quality prevents it from being used in delicate operations like textile dyeing. Ultrafiltration water may be recycled to feed "minor" textile processes (rinsing and washing) in which salt is not a concern (Minke & Rott, 1999; Asif, 2022). To decrease the environmental effect, it is necessary to conduct research and studies as well as innovations. There are two significant ways to generate waste in the textile business. The first path is made up of all waste-producing operations, and the second path is made up of all waste-removing activities. Pollution can be reduced in three ways: (1) by utilizing new, less noxious technologies; (2) by successfully treating effluent to ensure that it complies with all disposal regulations; and (3) Waste can be recycled multiple times before being discharged, which is seen to be the most practical approach. (Sule & Bardhan, 1999; Uddin, 2022).

The amount of clothing dumped in the US has doubled over the last 20 years, going from 7 million to 14 million tons. According to data from the Environmental Protection Agency, seventeen million tons of textile waste, or 5.8% of all MSW generated in 2018, were dumped in landfills. The World Resources Institute estimates that 2,700 gallons of water are needed to produce one cotton shirt. Textiles can take up to 200 years to decompose in landfills. (see other breakdown times here). Furthermore, many individuals may be surprised to find that 84% of clothing is disposed of in landfills or incinerators (McQueen et al., 2021). Textiles are a long-established industry with a wide range of goods dating back to the start of human existence. Flat or rotating screens are used for most printing, and the wastewater contains some leftover paste after each printing session. Adding fresh stock allows it to be used for printing in comparable tones. Colour distribution on fabric may now be controlled electronically using screen-free printing processes, such as ink-jet printing and electrostatic printing. Methods of printing without the use of screens are appealing for reducing pollution (Lukanova & Ganchev, 2005). Another critical aspect of the problem is the waste produced by manufacturing and using textile goods. Although all textile and clothing waste may be recycled theoretically, only a tiny portion of it is for as long as the existing linear system is in operation.

The linear economy is a crucial notion in analyzing and comprehending the situation. Since the Industrial Revolution, linear economics has been the dominant production model. It generally works like this: "subtract the raw material from the source, turn it into a product, sell the product to the customer, who then disposes of the product after use." Consumer-disc, these dyes are either adsorbed or retained in bio-flocs under this paradigm, impacting streams' ecology. Thus they must be distant from wastewater before disposal. Chemical coagulation, air flotation, and adsorption techniques may all be used to remove colours from wastewater (Malik & Sanyal, 2004; Seshadri et al., 1994). Carded goods are discarded as waste, frequently in landfills or through incineration. Keeping this in view, this research study is based on the following questions:

Q1. To what extent does waste disposal effect the company's productivity?

Q2. To what extent do green supply chain practices effect the company's productivity?

Q3. To what extent does waste recycling effect the productivity of the company?

2. Literature Review

Research on green supply chain practices is being more concentrated nowadays because the world is moving towards a shortage of resources, and industrialists are looking for tools and techniques to produce goods with a reduction of wastage of material and good quality. This can opt-in many different ways. One of them is lean manufacturing; Toyota was the first company to implement Just-in-Time (JIT), a part of lean manufacturing, back in 1950. Worldwide, businesses have been more focused on improving the quality of products during the last few years (Bendul et al., 2017). Therefore, many businesses or industries are more focused on reducing other related costs such as inventory and purchase costs by making it possible to recycle the excess purchase or purchase the raw materials depending on the current demand of a particular product. An industrialist may have a massive budget to make their

products consistently available in the market and influence their customers towards their products, which is leading us to a shortage of resources in the entire world at a high pace (Aslam & Azhar, 2013). Now this shortage of resources has gained more attention towards green supply chain practices of industries around the world. Industrialists are now accountable for complying with all environmental practices and rules by their government, NGOs and customers (Agi & Nishant, 2017; Laari et al., 2017). There are many barriers to shape wastage, reducing the production lead time and efficiency. According to Magee et al. (2007), various types of wastes in the process can disrupt production and are as follows:

a. Excessive production: Producing more goods than demand for certain products can occupy a warehouse space and extra transportation costs.
b. Delays in raw material: waiting for the raw material to reach to manufacturing plant can be a waste of production time
c. Extra processed: Due to using of inappropriate procedure, which adds no value to the final product
d. Excess raw material: Each extra raw material is associated with each extra cost. For example, an extra raw material would need extra warehouse space, extra WIP inventory and extra transportation costs.
e. Faulty products: Defective products are always a waste, which cannot be used or sold to the customers
f. Unutilized creativity: Not utilizing employees' ideas is termed unused employee creativity (Katz-Buonincontro & Anderson, 2020).

To get consistent improvement in the production cycle, we need to keep all these wastage possibilities in mind before heading towards the production process, including purchasing raw materials. Continuous improvement (CI) can be termed as an Organized and systematic approach aiming to improve industry performance (Alam, 2022). The action plan which leads to continuous improvement is problem-solving for the increased lead of production before acquiring the raw material, and some other (CI) tools such as a diverse multitasking team, compliance with policy and a team evaluating the (CI) process. To implement a successful (CI), the story does not end just giving training to employees regarding the use of tools and procedures but creating a learning environment so that its learning culture does not end in the company just by adopting skills one at a time (Collins, 2002; Ayaz, 2022). Continuously learning new skills, tools, procedures, and applications can bring continuous improvement to the industry. Otherwise, various industries have lost their values and failed to survive due to a lack of knowledge of a current trend, just like Nokia, a leading cellular phone manufacturing company.

The world's population has exploded in recent decades, and the same period has seen significant changes in living ethics. According to Ute et al. (2019), these two advancements have boosted textile consumption, increasing textile output. Globally, manufacturing all garments and knit textiles totalled more than 110 million tons per year, resulting in a large volume of textile waste. We must apply the circular economy model to maintain sustainability and minimize environmental effects in the textile and apparel business. Textile waste must be recycled if a circular paradigm is to be adopted. This study offers a comprehensive analysis of textile waste management, focusing on ensuring sustainability and minimizing environmental effects (Ütebay et al., 2019). Textiles are an old industry that extends back to the start of human existence, with goods ranging from necessities to technical marvels. The clothing business includes all types of knitted, nonwoven and woven textile garments. According to research, manufacturing (textile) is one of the most polluting businesses in the world since both the production and processing of raw materials contribute to massive pollution. Another critical issue component is the waste generated by manufacturing and using textile items. Though theoretically, all waste in the textile and garment business can be managed, it seems that we will not be able to utilize resources efficiently and reduce pollution as long as the linear system now used in manufacturing is in place (Ütebay et al., 2019). If current global trends continue, the textile industry will account for a quarter of the global carbon budget by 2050—26 per cent, to be exact. If present trends continue, the textile and garment industry's raw material consumption will exceed 300 million tons by 2050, with 22 million tons of microplastic dumped into the seas (Ali, 2022).

Linear management is a vital notion for examining and comprehending the issue. Since Manufacturing Revolution, the linear economy has essentially worked: "Minus the raw material from the primary source, turn it into a product, and then sell the result to the customer. Under this paradigm, consumer waste is viewed as rubbish and is frequently burned or dumped in landfills. (Çay et al., 2020). The core of the linear economics approach is the consumption of raw materials required for manufacturing. The world's limited resources appear to prevent the current dominant economic paradigm from existing in its current form. Observing raw materials is not a practical option. Furthermore, linear economy-oriented production and business models become an environmental problem—the environmental component, the damages they create, and the waste that emerges from them are typically not recognized (Çay et al., 2020). The central gap between old and new research shows how to control waste. However, new research shows how there is an alternate use of waste from fabric, keeping waste materials in use, and regenerating natural systems by making undergarments, cloths to cleaning mirrors, chair and table covers etc. from fabric waste.

Multinational companies' competition and vital changes in the retail market have put much pressure on industries; high-paced competition has led to firms' centres of attention on customer satisfaction to survive in the long run (Amjad, 2022). In this speedy competition, textile industries have also set their foot in the race to search for opportunities to reduce costs and improve quality, despite having various challenges in the garment industry such as pricing, sourcing of raw material, delivery and service etc. However, the garment industry has numerous opportunities to succeed in this tough competition by implementing the lean concept. (Mercado, 2007). By using lean practices, the garment industry can opt for many benefits, such as cost reduction, production lead time, and good customer service by delivering quality products at the right time. Lean principles can help reduce the work in process time as other countries are also practising lean tools and observing a tremendous response (Bruce et al., 2004).

Research has been done on the relationship between lean practices and firm manufacturing performance Ferdousi and Ahmed (2009); Papadopoulou and Özbayrak (2005) have shown that lean techniques improve manufacturing. A Mexican business that manufactures world-class power and signal distribution equipment looked at its present production system and identified possibilities for improvement. Lean was applied to enhance the current performance of the organization. According to the research, applying lean resulted in a 34% reduction in inventory and 93.5 per cent uptime during 12 months. According to the study, flexibility is one of the secrets to developing quality in manufacturing. According to a 2002 Society of Production Engineers report, Novartis International AG's manufacturing process might use some improvement. They implemented a lean picking system to transport items from the warehouse to the packaging lines. This new material supply system is similar to a Kanban system. The company's waste decreased significantly as a result of this picking procedure.

2.1. Productivity

According to the article, waste directly affects productivity, material loss and the project's consummation season, bringing about a loss of a lot of income (Hunaid et al., 2022). Waste does not simply colossally affect our current circumstances; it can likewise adversely influence business. Suppose the textile sector generates too much trash. In that case, it will raise company costs and create an unconcerned appearance about sustainability and lowering carbon footprints (Nikmehr & Najafi-Ravadanegh, 2015). Other than the expenses for organizations discarding much waste, there are additionally ecological expenses to consider. Most waste is shipped off landfill destinations to be covered, and here it produces harmful landfill gas, contained basically methane, which adds to the nursery impact. Synthetic substances can likewise defile the dirt, harming plants and creatures, and they can get into neighbourhood lakes and waterways (Jenkins & Orth, 2004). One of the primary necessities of efficiency improvement is quantifying creation (of items and additional benefits), the human and actual assets utilized, and their connections. Without usefulness measures, we do not have the foggiest idea of where we are or how we could get to the next level. (Bernolak, 1991). While the fundamental standards of efficiency are similar at both the large scale and miniature levels, it is fundamental to acknowledge both in principle and practice that at the microeconomic level, a durable "family" of

usefulness estimates should be utilized in a casing work coordinated with productivity. This strategy gives practical solutions to the monetary inquiries that are important to the microeconomic players, which is, after all, the pith of financial aspects at the miniature level. The result of this measurement system is illustrated by numerous examples of lessons learned by company managers and corrective activities carried out because of the actions (Hunaid et al., 2022).

2.2. Disposal of Waste

Textiles are items made with ingredients and procedures that are safe for people and the environment, from the production of textile fibres to the final product's composition that can be disposed of without damaging human health or the environment. Incineration, decomposition, and recycling are all options for waste disposal. Textile wastes are categorized as either post-industrial (resulting from industrial processes) or post-consumer (resulting from consumer procedures). Post-industrial textile waste generated throughout the textile and garment production process includes cutting waste, quality rejections, and surplus fabrics. (Dissanayake et al., 2021). Post-industrial textile wastes produced throughout the textile and clothing manufacturing process include cutting waste, high-quality rejects, and surplus materials. (Dissanayake et al., 2021). Environmental programmers should focus first and foremost on waste management. It is necessary to design appropriate policy procedures with the cooperation of governmental and waste management/environmental authorities to dispose of, collect, and sort textile waste.

The textile industry is vital to our economy, contributing more than $2.5 trillion in global revenue and supporting more than 75 million employees. Between 2000 and 2014, clothing production increased, demonstrating that the sector witnessed a tremendous boom. People bought 60% more clothes in 2014 than in 2000, but they only kept them for half as long. Although the textile industry is expanding, a more significant focus is being placed on the sector's numerous detrimental environmental effects. The production of textiles is responsible for 10% of the world's CO2 emissions, water resource depletion, environmental damage, and pollution of streams and rivers. In addition, 85% of all textiles are thrown annually. Some clothing kinds discharge much plastic into the water when they are washed. The equivalent of a garbage truck full of garments being burned or dumped in a landfill happens every second. About 60% of all materials used in the textile industry are plastic. Each year, washing garments contribute 500,000 tons of microfibers to the ocean, the equivalent of 50 billion plastic bottles. The textile industry is responsible for 8–11% of all worldwide carbon emissions, more than all international flights and marine freight. If current trends continue, the textile industry might contribute 26% of the carbon budget by 2050. The textile sector uses 93 billion cubic meters of water annually, enough to supply five million people's needs and dramatically worsens water shortages in some areas. The clothing sector causes around 20% of worldwide industrial wastewater pollution. In just a few decades, the amount of clothing purchased per person in Pakistan has increased by 40%, thanks to lower prices and faster delivery of textiles to consumers. Clothing contributes between 2% and 10% of the environmental effects of fabric usage. (Swaby, 2020). The effect is commonly seen in third-world nations since most manufacturing occurs outside the country. Producing raw materials, spinning them into fibres, colouring and weaving clothing uses a lot of water and chemicals, including insect repellant in the case of cotton. Because of the water, power, and chemicals used in washing, tumble drying, and ironing, as well as the microplastics released into the environment, consumer consumption significantly negatively impacts the environment. Because techniques for recycling used clothing into virgin fibres are still developing, less than half of them are collected when they are no longer needed for reuse or recycling. Only 1% of them are recycled into new clothing. (Swaby, 2020). Along with changes in technology over the past few years, changes in the textile industry and many other industries have significantly impacted how bad environmental problems have become. The main effect of the textile industry on the environment is the release of large amounts of chemicals into the environment (Toprak & Anis, 2017b). High use of chemicals and water, energy use, pollution of the air, solid waste, and smells are all critical factors. The textile and garment industry's environmental problems begin with the pharmaceuticals used in natural fibre production and the pollutants released during synthetic fibre production. To treat the fibres and generate the final textile product, many procedures require hundreds of different chemicals, tons of water, and a large amount of energy (Toprak & Anis, 2017a).

2.3. Green SC Practices

Manufacturing facilities are believed to be the core reason for the negative environmental impact (Zhu et al., 2008). Accepting the method of green design and practices can help improve environmental friendliness in a manufacturing facility. It is also considered that green supply chain practices are one of the main reasons for creativity, building a brand image and business communication (Santolaria et al., 2011). Previously there have been studies regarding the implementation of green manufacturing, which mainly focuses on green technology, raw material and production time to reach the environmental friendly goal. A model has been used to build a bridge between vendor and firm to ensure green raw materials and components selection. A method has been used by Tsai et al. (2016) to select a green technology by costing over every activity and has also proposed that investing in green can help improve the environment, which brings value to the investment (Rashid et al., 2022). Combining green and lean manufacturing methods has decreased manufacturing costs by 10.8% (Laosirihongthong et al., 2013).

Remanufacturing is also one of the well-known green supply chain practices methods, which reuses the scrap raw material or used material to remanufacture it. This manufacturing is essential for the environment. It has the potential to reduce badly affecting factors of the environment. As per Atasu et al. (2008), remanufacturing is good in a competitive market, even though the un surety of a zero-life product's quality and quantity makes it difficult for remanufacturing for economic performance. Economic performance can be gained by optimizing the resources used in this process. This will increase the need to optimize the production plan, including the cost of reverse logistics, remanufactured inventory, and processing costs. Correll and Martinoli (2011) discussed that remanufacturing would lead companies to replace their suppliers, which are below average quality and reconditioned.

2.4. Waste Recycling

Recycling is sending material through a system that permits it to be reused. The collection, classification, and cleaning of waste products are all part of waste recycling. Waste recycling lowers energy consumption and saves raw resources by reducing the demand for new goods and consumables. Recovering used or other textiles from landfills for reuse or material recovery is known as textile reclamation. The foundation of the textile recycling industry is; intelligent, used clothing, fibre industries, and association of wiping materials all represent this group in the US. Key phrases in the recycling of textiles include donation, sorting, gathering, processing, and finally transporting used clothing, rags, and other recovered materials to end consumers. The textile industry is, of course, the foundation for developing a textile recycling business. Clothing, furniture and mattress material, draperies, linens, recreational equipment, various other products, and cleaning materials have grown nearly $1 trillion worldwide. The textile industry is, of course, the foundation for the developing textile recycling business. Clothing, together with furniture and mattress material, linens, cleaning supplies, leisure equipment, and a range of other things, has evolved into a roughly $1 trillion global industry. Recyclable textiles are becoming increasingly important, and this awareness is growing. Worldwide, an estimated 100 billion pieces of clothing are made each year. The US EPA estimates that in 2018, there were over 17 million tons of textile municipal solid waste (MSW), or 5.8% of all MSW produced. In 2013, 13.0 per cent of the textiles used to make clothing and footwear were recycled, while 15.8 per cent of the textiles used to make sheets and pillowcases were recovered. As a result, textile recycling is a critical concern that must be tackled as we work toward a zero-waste future.

Furthermore, many worldwide issues are causing significant worries in the waste management industry. Of course, the textile sector provides the cornerstone for the growing textile recycling business. Clothing, together with furniture and mattress material, leisure equipment, linens, draperies, cleaning supplies, and a range of other things, has evolved into a roughly $1 trillion global business. Furthermore, given China's ‘National Sword’ considerable disruption of traditional recycling operations, this issue has been cited as a top worry for our industry, underpinning and supporting theories and models (Sarkis & Dou, 2017). Theories of waste disposal management in materials address a more top-to-the-bottom record of the area and contain practical examinations of waste, the action upon

squander, and a comprehensive perspective on the objectives of garbage removal by the executives. Waste disposal management theory is founded on the expectation that squandering the board will forestall squandering, hurting human well-being and the climate (Fedorova et al., 2019).

2.4.1. Evolving theories of technology in waste disposal management

Constructing Waste Management Theory (WMT) is an effort to identify waste administration. WMT is a conceptual explanation of waste management that defines all waste-related concepts and proposes a waste management system. It is a work to put together the various factors of the waste administration framework the way things are today (Lee et al., 2022).

2.4.2. Defining waste – Analysis of the concept of waste management

Controlling trash disposal was the primary goal of regulations governing waste disposal. However, the secret to efficient waste management is waste minimization, particularly waste reduction at the source. Waste reduction is the primary goal of the Community Waste Strategy, according to Sixth Environment Action Program (Wilson, 2007). This dual objective of resource conservation and removal strategy brings about the absence of precise meanings of key terms. Suppositions wander strongly on the legitimate meaning of Waste (Zhang et al., 2022).

2.5. Empirical Review

According to Sushil (1990), the waste management hierarchy governs most waste management processes. Trash management may be broken down into a series of steps ranging from reducing waste to reusing to recycling to finally disposing of it. A hierarchical framework categorizes these waste management solutions depending on the most environmentally friendly way to dispose of rubbish. Recycling and reuse are favoured over landfill disposal because waste management is shown in a hierarchical form (Wilson et al., 2006). According to Phillips et al. (2002), waste accounting is essential in waste management since it expands the literature via its knowledge base. According to the literature, trash may be handled in various ways, with the most acceptable method being one that not only preserves the environment but is also cost-effective. This means that waste management is a deductible method for reducing Waste (Porter & Van-der-Linde, 1995). According to the literature, controlling waste formation during manufacturing leads to reduced or no waste to handle. As a result, the reduction is at the top of the waste management food chain (Price & Joseph, 2000). Input and output waste are two distinct sorts of waste; the term input waste refers to input that has not been extensively recorded in the literature, while output waste refers to output that has been documented. Because of this, waste is a byproduct of both the input and output systems, with input waste arising primarily in the service industry (Singh, 2017). This input waste introduces the new waste management paradigm in the company. The research adds to the notion of input waste by using TISM to construct a hierarchical link between waste management components. TISM is frequently used in the management and technical domains to model conceptual frameworks (Bala et al., 2020; Kademani et al., 2013; Srivastava, 2013). The paper aims to identify essential waste management components and construct a model that depicts the hierarchical connection between them. Based on the literature the figure 1 illustrates a research framework and the following research hypotheses will be empirically tested:

H1: The productivity of the organization is significantly impacted by disposal of waste.

H2: The productivity of the organization is significantly impacted by green SC practices.

H3: The productivity of the organization is significantly impacted by waste recycling.

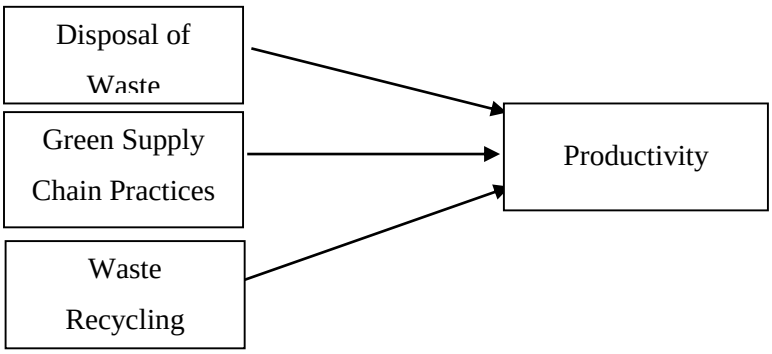

Figure 1: A research framework

3. Research Methods

This study aims to ascertain the connection between the textile industry's productivity and the effects of waste disposal. This study was produced by combining research, synthesis, and analysis. Secondary and primary data sources were anticipated to address the study topics. The topic will centre on the industry's view on trash disposal, critical waste management problems, and other essential queries regarding the operations and culture of the sector. In order to help the respondent better understand the idea of waste disposal, the survey requires a lot more research and explanation. A semi-structured interview was conducted to understand the relationship between the various components indicated in the concept. This study aims to ascertain the relationship between industrial production and trash disposal. This study was created by a mix of investigation, synthesis, and analysis. The study is explanatory since we will measure trash's effect on Gul Ahmed Textile (Hashmi et al., 2021a; b).

Explanatory research. In order to answer the study questions, the research endeavour anticipated using both secondary and primary sources of information (Hashmi et al., 2020a; b**).** The inquiry will focus on the company's perspective on trash disposal, the key obstacles of waste recycling management, and other pertinent topics about the industry's output. In order to help the respondent better understand the idea of waste disposal, the survey requires a lot more research and explanation. In a study that explains something, a semi-structured interview is performed to understand the relationship between the various elements discussed in the concept. Our study aims to increase public knowledge about solid waste management. All solid wastes produced by human and animal activities discarded as useless or undesirable are considered solid waste. (Peavy et al., 1985; Muzammil, 2022). Inadequate solid waste disposal may result in unsanitary circumstances, which can cause environmental contamination and outbreaks of vector-borne disease. Increasing population, a thriving economy, expanding urbanization, and rising communal living standards significantly impacted. It is increasing the development of municipal solid garbage in emerging nations (Minghua et al., 2009; Basit, 2022). Some garbage may be valuable to someone in its current condition or after it has been converted. The term "trash" has become increasingly popular in recent years. The overall state of the environment will improve if waste is properly managed. Trash management refers to the activities and procedures required to manage waste from its conception to its ultimate disposal. This includes waste collection, treatment, disposal, transportation, monitoring, and control. In addition, it contains a legal and regulatory framework for waste management and recycling rules. Even a few decades ago, environmental deterioration due to unplanned trash dumping and improper waste management in urban areas was not a significant worry in developing nations like Bangladesh (Bhuiyan, 2010). However, environmentalists consider scientific waste management a vital issue in urban planning in emerging countries because of the growing urban population. The research will be qualitative as we find results through the internet and interviews with a group of people related to the research knowledge.

3.1. Sampling Design

The sampling design allows us to survey with a smaller sample size than all eligible

respondents. Because of the following factors, sample design is critical: It is challenging to conduct a poll that includes all eligible respondents/households. With the time spent on the survey, gathering data from every group member when performing research is rare. Instead, pick a sample. The sample size is the number of persons participating in the study. It must carefully evaluate how it will choose a sample typical of the whole group if it wants to make correct conclusions from the data. The study was descriptive, and data was gathered using various methods (qualitative and quantitative). A questionnaire-based survey served as the quantitative component of the study, while in-depth interviews with key informants served as the qualitative component. The researchers used a cross-sectional strategy that combined systematic and purposeful selection processes to choose the study area and respondents. The questionnaire's household and demographic characteristics portions were adapted from a conventional questionnaire, while the authors created the remaining components based on the study's objectives and a literature review. Each of them has its sample design function. The researcher's position and priorities will influence the sampling approach selected. Occasionally, non-probability sampling techniques such as convenience sampling will be utilized (Alrazehi et al., 2021; Das et al., 2021; Haque et al., 2021; Agha et al., 2021; Hashmi & Mohd, 2020).

3.1.1. Target population

Gul Ahmed textile mills are the primary focus of this study. Gul Ahmed Group started selling textiles in the initial twentieth century. When the group decided to pursue a career in industry, they created Gul Ahmed Textile Mills Limited, a privately held firm, in 1953. A publicly traded Pakistani textile company, Gul Ahmed Textile Mills Limited, produces and sells various textile goods. In 1972, it was listed on the PSX. The firm has developed fast since then and is now one of the world's top composite textile companies.

3.1.2. Sample size

From whom we may create output, the Gul Ahmed textile mills employees are the sample from which we will conduct our surveys using questionnaires and other methods. The company manufactures, sells, and distributes a wide range of textile products, including home textiles (bed linen, curtains, towels, kitchen and bath yarn, accessories, woven fabrics such as lawn, custom-made garments for women, men, and children, and fashion accessories like handbags and shoes). It is the major exporter of home textiles in Pakistan, including bed linen, curtains, and fabric. Nevertheless, our target employees are from the waste, disposal and recycling management department. Therefore, 30 respondents will constitute a sample for this study (Rashid et al., 2021).

3.1.3. Sampling technique

A sampling technique is a label or other indication of the precise process by which the sample entities were chosen. And simple random sampling, a type of probability sampling in which participants are selected at random from a population, is the sampling technique we use in our study (Khan et al., 2021; Rashid et al., 2021)

3.2. Instrument of Data Collection

Our study's primary data is collected using a Likert scale questionnaire. The questions are based on our hypothesis, which proposes the relation of our independent variables to our dependent variables. While our secondary is collected from reviewing previous articles. The primary data collected will then measure using a statistical technique using SPSS software.

3.3. Reliability and Validity of Instrument

A regression model assesses a dependent variable's link to many independent factors. The regression model determines the relationship and significance level between each independent variable and the dependent variable. Additionally, a correlation model will be employed to determine the effects

of each independent variable's relationship to the dependent variable (Rashid & Rasheed, 2022).

3.4. Procedure of Data Collection

According to this heading, we use the qualitative method in Gul Ahmed textiles to get the data by making a questionnaire, as it is the most effective technique to measure responses from the respondents. The research data is qualitative, and the instruments used are pre-defined. For sampling, we use a random sampling technique by involving specific departments in our selected company. From the supply chain department, we use the manager. We use the head of the supply chain department to understand historical events of wastages and production deficiency, past performance, and work strategies and then analyze to study and propose a solution.

3.5. Statistical Techniques

The statistical analysis gives meaning to the meaningless numbers, bringing life to the dead. To ensure data accuracy, researchers must choose the correct query sample size. A questionnaire must be 500 to 1000, depending on the company and department size. Our research uses a sample size of 50-75 respondents.

4. Data Analysis and Findings

This is the fourth chapter of the thesis, and it has substantial importance regarding statistical analysis and hypothesis testing approach. This chapter provides the demographic profile of the respondents, followed by validation of the model, including descriptive statistics of the variables based on mean, standard deviation and Skewness/Kurtosis statistics for the normality test. Later, the chapter provides reliability analysis using Cronbach's alpha to estimate the variables' internal consistency. Furthermore, this section has discussed model summary and ANOVA statistics for model fitness estimations, while this chapter has finally employed multiple linear regression analysis for hypothesis testing. The last section of the chapter provides a hypothesis-testing summary.

4.1. Demographic Profiles

Table 1 displays the demographic analysis of 30 respondents. Regarding the demographics, the study has collected data from 30 respondents. Of these, 28 (93.3%) were male, and 2 (6.7%) were female. Also, 11 (36.7 %) were between the age bracket of 20-30, 14 (46.7%) were between the age bracket of 31-40, 4 (13.3%) were between the age bracket of 41-50, and 1 (3.3 %) were between the age bracket of 51-60. Moreover, 6 (20%) participants were intermediate, 19 (63.3%) were graduate, 5 (16.7%) were post graduate. Additionally, 9 (30%) have work experience between 0-5 years, 10 (33.3%) have experience of 6-10 years, 4 (13.3%) have experience of 11-15 years, and 7 (23.3%) have experience of 16 years and more (Rashid et al., 2020).

Table 1: Respondents' profile (n = 30)

		Frequency	Per cent
Gender	Male	28	93.3
	Female	2	6.7
Age	20-30 years	11	36.7
	31-40 years	14	46.7
	41-50 years	4	13.3
	51-60 years	1	3.3
Level of Education	Intermediate	6	20.0
	Graduate	19	63.3
	Postgraduate	5	16.7
Working Experience	0-5 years	9	30.0
	6-10 years	10	33.3
	11-15 years	4	13.3
	16 years and above	7	23.3

The variables' descriptive statistics are displayed in table 2 below. As seen in the table, there were 30 responses with the mean value of 3.860 and the standard deviation of 0.458 for waste disposal, 30 responses with the mean value of 3.720 and the standard deviation of 0.636 for green SC practices, 30 responses with the mean value of 3.153 and the standard deviation of 1.043 for waste recycling, and 30 responses with the mean value of 3.633 and the standard deviation of 0.691 for company productivity. Additionally, all variables have Skewness and Kurtosis coefficients between 2 and 7, respectively, which is considered acceptable (Mishra et al., 2019); therefore, data is usually distributed.

Table 2: Descriptive statistics

	N	Mean	S. D.	Skewness	Kurtosis
Disposal of Waste	30	3.860	0.458	0.304	-1.563
Green SC Practices	30	3.720	0.636	0.310	-1.060
Waste Recycling	30	3.153	1.043	-0.751	0.628
Productivity of the Company	30	3.633	0.691	0.064	0.436

Table 3 shows the reliability analysis result for estimating the variables' internal consistency (Khan et al., 2022a). Hashmi et al. (2021a); and Khan et al. (2022b; c) suggested that the alpha coefficient should be higher than 0.70 (70 per cent) for acceptable internal consistency of the variable. The above table shows that waste disposal has 74.3 per cent internal consistency, green SC practices have 75.1 per cent internal consistency, waste recycling has 94.9 per cent internal consistency, and the company's productivity has 78 per cent internal consistency. Therefore, all variables have achieved substantial internal consistency for data analysis.

Table 3: Reliability analysis using Cronbach's alpha

Variable Name	N Items	Cronbach's Alpha
Disposal of Waste	5	0.743
Green SC Practices	5	0.751
Waste Recycling	5	0.949
Productivity of the Company	5	0.780

The regression analysis's model summary is displayed in table 4 below. The above table shows that the company's productivity has been predicted up to 93.3 per cent by all the exogenous variables in the model. Therefore, model fitness has been validated based on R-Square statistics (Hair et al., 2018).

Table 4: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.966	0.933	0.925	0.189

a. Predictors: (Constant), Waste Recycling, Disposal of Waste, Green SC Practices

The following table 5 shows the ANOVA statistics of the regression model. The above table has shown that F-Statistics was estimated 120.916 and found statistically significant at 5 per cent; therefore, ANOVA has manifested that model fitness has been achieved for regression analysis (Hair et al., 2018).

Table 5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.921	3	4.307	120.916	0.000
	Residual	0.926	26	0.036		
	Total	13.847	29			

a. Dependent Variable: Productivity of the Company

b. Predictors: (Constant), Waste Recycling, Disposal of Waste, Green SC Practices

4.2. Hypothesis Testing

The study used regression analysis for hypothesis testing because the model has one outcome variable and more than one predictor (Ramli et al., 2018). The following table 6 shows the result of regression analysis for hypothesis-testing. The above table shows that waste disposal has a beta value of 0.396 and a probability level below 5 per cent with a VIF coefficient below recommended 5 (Rashid, 2016); therefore, hypothesis-1 has been accepted/supported, and there is no evidence of multicollinearity with other predictors. Moreover, green SC practices have a beta value of 0.037 and a probability level above 5 per cent with a VIF coefficient below recommended 5 (Rashid & Amirah, 2017); therefore, hypothesis-2 has been rejected/not supported, and there is no evidence of multicollinearity with other predictors. Lastly, waste recycling has a beta value of 0.604 and a probability level below 5 per cent with a VIF coefficient below recommended 5 (Rashid et al., 2019); therefore, hypothesis-3 has been accepted/supported, and there is no evidence of multicollinearity with other predictors.

Table 6: Multiple regression analysis

	Beta	S. E.	t-Stats	Sig.	VIF	Decision
(Constant)	0.061	0.346	0.176	0.862		
Disposal of Waste	0.396	0.078	5.106	0.000	1.029	Supported
Green SC Practices	0.037	0.078	0.475	0.638	1.987	Not Supported
Waste Recycling	0.604	0.047	12.821	0.000	1.970	Supported

Dependent Variable: Productivity of the Company

5. Conclusion

The study aimed to ascertain how waste disposal, GSCP, and WR impacted the company's production. The research effort anticipated using secondary and primary data sources to address its research questions. The study also measured the impact of waste on a company's productivity using explanatory research, and the study employed qualitative research to find results and conducted interviews with a group of individuals who had information related to the research. The study used a correlational design to examine the relationships between variables. Furthermore, the study was descriptive, and data were acquired using various methods (qualitative and quantitative).

Also, the study's quantitative component was a questionnaire-based survey, and its qualitative component was a series of in-depth interviews with key individuals. In order to choose the study area and respondents, the researchers employed a cross-sectional strategy incorporating systematic and purposeful selection methods. A Likert scale questionnaire was used to gather the research's primary data, while the secondary data was gathered through reviewing previous articles. The data gathered was then measured using a statistical technique and the SPSS software. Additionally, a random sample of participants was taken from the study's population using the simple random sampling technique. A regression model was used to analyze the connection between a dependent variable and numerous independent factors. The study concluded that Waste and WR disposal is significant, but GSCP has an insignificant impact on the company's productivity. Furthermore, human development is directly

impacted by garbage, both socially and technologically. Resource recovery is different from waste management, which is concerned with lowering the pace at which natural resources are used WM encompasses all waste products, whether they are solid, liquid, gaseous, or radioactive. WM practices might differ across developed and emerging countries, urban and rural areas, industrial producers, and residential areas.

5.1 Discussions

5.1.1. disposal of waste and productivity of the company

The study found a significant relationship between waste disposal and the company's productivity. This result is also supported by Jimenez et al. (2019). They concluded that companies are satisfied with developing a system for eliminating waste, i.e. increasing recycling can save disposal costs and increase profits. Tracking waste management activities on a single platform and utilizing a set of uniform indicators makes sharing information with stakeholders and boosting business productivity simpler. WM is a crucial component of essential urban services and an environmental health service. Companies may increase productivity and sustainability by managing waste, water, and energy more effectively. Improving an organization's sustainability may enhance its image, attract desirable tenants to its facilities, and increase employee engagement (Baloch & Rashid, 2022; Shaheen, 2022). Also, Ushakov et al. (2021) indicated the same result and concluded that waste management is crucial for a company's profitability. In order to obtain the benefits of downstream waste reduction and the strength of incentives for upstream and downstream innovation, a company may be able to charge more for its product if it can lower the cost that its customers must bear. This will increase the resource productivity of the company.

5.1.2. Green SC practices and productivity of the company

The study also identified an insignificant effect of GSCP and company productivity. This outcome is also in line with Zhu et al. (2011) and showed that most firms across a wide range of industries could categorically state that GSCP is considered an environmental innovation. Firms must adopt GP to increase productivity since they improve environmental performance via decreased pollution and create economic gains through reduced energy and resource use. Similarly, Pinto (2020) found that each firm must effectively measure performance to manage its operations, activities, and SCM. The financial advantages for firms with environmental management plans are not assured. This can result from the significant financial resources required to fund such initiatives. Due to a shortage of resources, firms must view GP as an expense rather than a means of firm development. In order to increase productivity, companies must have the resources to invest in green policies. Agyabeng-Mensah et al. (2020) also indicated that GSCPs produce eco-friendly products and services that satisfy customer needs and promote financial success and operational excellence. Integrating green practices throughout the whole SC is essential if a company wants to increase the performance and competitiveness of its supply networks. The GSC collaboration is essential to increasing a company's productivity since it is linked to better quality, delivery, and flexibility and forms the standard dimensions of manufacturing performance (Anwar, 2022).

5.1.3. Waste recycling and productivity of the company

The study also analyzed that WR significantly affects a company's productivity. This result is also with Alhamdi et al. (2019) and revealed that reducing waste improves production and quality while lowering costs and speeding up customer deliveries. This effect results from the company's goal to promote flexible systems that deal with waste recycling and environmentally friendly products to help decrease waste. Also, Nyemba et al. (2018) indicated the same result and stated that recycling also benefits the company financially and environmentally. Using recycled materials will cost the company significantly less than producing new materials from the beginning. Consequently, firms may reduce their costs by using recycled materials. The savings achieved when recycling is widely implemented can be very significant. Therefore, companies may increase their productivity by adopting WR. Likewise, Kowalski and Makara (2021) identified that reducing, reusing, and recycling also helps to reduce the company's environmental effects. It will be necessary to divert waste from landfills and toward more ecologically friendly solutions to manage waste sustainably. Furthermore, minimizing

environmental effects through sustainable WR may improve a company's reputation and image with customers, employees, and external stakeholders. It can also provide a competitive edge while seeking business opportunities (Rasheed, 2022).

5.2. Implications

This study has provided several managerial implications. Firstly, GSC practices affect a company's productivity. Managers must increase consumer awareness of environmentally friendly operations, product design, and organizational practices to attract consumers to buy products from companies that care about the environment. As a result, businesses will adopt GSC techniques to flourish in cutthroat marketplaces and boost production. Additionally, coordination and integration must be maintained for businesses to benefit fully from GSCM processes. Additionally, senior management's support can make it simpler and more successful for firms to apply GSC techniques and increase productivity. Managers should also implement green practices into their supply chain to meet financial and business objectives. This encourages firms to adopt the GSCP to constantly improve their operations' environmental friendliness, reduce risks to people and the environment, and enhance their goods and services, all of which will raise their productivity.

Likewise, GSCP adoption promotes environmental safety in firms, reducing environmental accidents and saving them money on medical costs. As a result, firms can direct their resources toward projects that will increase their productivity. Managers need to be encouraged to keep implementing the GSCP to fulfil the environmental needs of customers on the global market, grow market shares and sales, and ultimately improve profit margins and earnings per share. Second, waste recycling also affects a company's productivity. The firm's manager should be interested in waste management, and any actions to execute the policy should be widely published so that all employees know their commitment. Further, environmental education and stricter enforcement of sanitation bye-laws should be combined with the encouragement of WM cooperation. Therefore, managers should provide environmental education that raises awareness of the environment and alerts individuals to environmental problems. The firm's manager should also make stricter policies and enforce them since it is necessary to stop individuals from dumping carelessly.

Moreover, a firm may benefit significantly from green initiatives focused on sustainability-related to industrial products sold through retailers. Recycling for a firm is easier when products are given to consumers or returned to them by retailers. The firm's manager should provide information on product sales to support the success of loyalty programs by enticing current customers to exchange their old products for new ones. The company's manager also tries to limit waste, cut expenses, and utilize resources effectively through green initiatives. The management of such projects aims to make all people aware of the demands of the environment and urge them to contribute to sustainability by encouraging them to use products or services. It encourages marketing to persuade consumers to be careful of the items they consume. Lastly, waste disposal has an impact on a company's productivity. Increasing the workforce's contribution to waste disposal, recycling, segregation, and garbage collection is essential. The firm's manager should give the employees proper training, a morale program, extra benefits, and incentives that will encourage them to increase the company's productivity. Strong regulatory measures must also be made to implement the specified policy properly. The firm's manager should create strict laws and regulations that will offer practical ways of influencing the general public to behave sustainably. Such a law should forbid the use of plastics and increase the cost of grocery bags, polythene, and plastic materials, including alternatives to polythene and plastics, permitting households and companies to offer incentives for those who reduce the quantity of waste and create sustainable solutions for waste disposal. The management of the company should also regularly run awareness campaigns. Such campaigns should educate people about waste segregation, reduction at source, environmental protection and public health responsibilities.

5.3. Limitations

The current study's limitations limited the findings' generalizability and applicability. Firstly,

the limited sample size did not represent conclusive results. Second, because the study was limited to textile firms, its conclusions might not be generalizable. Furthermore, while adequate measures were taken to prevent or reduce common method bias, the study's conclusions might still be affected. The textile mills in Karachi, Pakistan, were also the subject of this study. Additionally, the current study solely included data from manufacturers of textile mills and used a correlational design for hypothesis testing. Also, the generalizability of this study may be limited because it was restricted to Karachi, Pakistan. Importantly, this research was conducted on a tiny scale due to a lack of time. The study, however, ignored the comprehensive viewpoint and in-depth perspective of the phenomenon because it was purely quantitative. Furthermore, the thorough literature review demonstrated that the research model only included a small number of the framework's factors and that the model might be improved by integrating a few more significant variables. Lastly, the sampling method for this study was an online questionnaire survey, which could have biased the results. The complete research model developed in this study needs more empirical validation.

5.4. Recommendations

Several future recommendations are included in the paper. Firstly, by increasing the sample size, more studies can make a more significant contribution. To make this research's contribution more comprehensive and applicable to a broader range, other industries can be investigated. Moreover, future research may examine how the GSCP affects other performance metrics, such as environmental and social performance, to test the model in various economies. Also, a change in the pattern of producing and distributing green products may arise from future research that demands more resources to implement GSCP reasonably. In the future, this research may be conducted in any developing country except Karachi, Pakistan. Likewise, the influence of several other factors on the manufacturing industry's productivity may be studied in the future. Future research may also minimize common method bias by collecting data using observational analysis and qualitative techniques. Future studies might select samples using different sampling techniques. Lastly, similar studies might be carried out using various other research approaches, methodologies, and techniques, together with a different theoretical background.

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Appendix-A: Questionnaire

Part 1 –Demographic Profile

a) Gender

Male Female

b) Age

20-30 Years 31-40 Years

41-50 Years 51-60 Years

c) Level of Education

Matric Intermediate

Graduate Postgraduate

d) Experience in Dairy Sector

0-5 Years 6-10 Years

11-15 years 16 Years and above

Part 2 –Please rate strongly agrees or strongly disagrees on the basis of options mentioned below of the dependent and independent variables related to waste disposal management in Gul Ahmed Textile industry by placing a checkmark in the suitable box.

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

Title	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1) Disposal of Waste					
1.1) The innovation in the production process in the textile industries has an impact on waste disposal.					
1.2) Most issues that arise in the production in the textile industries could be minimized if the disposal of waste is managed properly.					
1.3) The disposal of waste is a major issue currently affecting the production process in the textile sector.					
1.4) Recycle and reuse practices of waste in textile industries could be the solution to reduce pollution in the environment.					
1.5) Waste recycling has an essential role in the productivity of the company.					
2) Green Supply Chain Practices					
2.1) The green environmental management in the textile industry will be affected by competitor's green environmental protection strategy.					
2.2) The government requires textile industries to use the green supply chain management practices to reduce the pollution.					
2.3) Textile industries can use solar energy system to contribute in green environment. Less usage of fuel can reduce pollution of environment.					
2.4) The use of organic fiber in textile helps to create a green and sustainable environment.					
2.5) The practice of green supply chain management significantly influences the competitiveness of business in the textile industry.					
3) Waste Recycling					
3.1) Company can save their cost of production by recycling the waste generated in cutting of fabrics.					
3.2) Quality of recycled garment products is as good as the original ones.					
3.3) Waste Recycling saves the time & cost of re-ordering the new material from suppliers.					
3.4) Waste recycling makes a major positive and healthy impact on the company's profitability.					
3.5) Waste management system includes the processes and actions required to manage waste from its inception to it's the processes.					
4) Productivity of the Company					
4.1) Reduce timeline in textile industries can enhance the productivity of the company.					

4.2) Waste recycling management system has an positive impact on the productivity. 4.3) Increase in productivity also enables reduction in prices. 4.4) More productivity ensures good quality of the final products. 4.5) Benefit of higher productivity ensures stability of the company.	

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Role of Management in Implementation of Sustainable Supply Chain Management

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ABSTRACT

Businesses are increasingly focusing on acquiring and delivering products and services that have the least negative impact on planning, execution, and collaboration. As a result of the above, industry and academia have taken an interest in the concept of sustainable supply chain management, owing to its importance in terms of environmental, social, and corporate responsibility, as well as its e-commerce component. The most important theoretical contribution of this research is that it demonstrates that independent factors have a positive impact on organizational growth. Because of commercial concerns, Sustainable Supply is a major issue in the corporate sector. Supply chain management has gotten increased attention since the 1980s when companies began to illustrate the benefits of reciprocal ties in the workplace. As a result, academics are concentrating their efforts on developing new supply chain theories that benefit businesses. The main goals of this study are to provide a written assessment of possible supply chain management based on publications published from 1990 to the present. The moment provides a conceptually plausible supply chain process model based on the triple foot line premise. The results from the study on cost-effective supply chain management don't add up. Most previous studies have focused on the environmental, social, and economic aspects of one could in the supply chain. The majority of previous inquiries were focused on overwhelming conceptual nature. There is a scarcity of research on long-term supply chain management based on extensive observational evidence. This research focuses on the Pakistan supply chain's triple foot line maintainability, taking into planning, execution, collaboration and coordination factors. This consideration also emphasizes the importance of PhD research in this sector in the future.

Keywords: *Sustainable supply chain, Planning, Execution, Collaboration, Coordination.*

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Role of Management in Implementation of Sustainable Supply Chain Management

1. Introduction

There has been an increasing focus in recent years in examining the impact of sustainable supply chain integration capabilities in improving and implementing business performance in organizations. The word "sustainability" has been characterized in the literature as a company duty to persons from various groups, where responsibility refers to the need to eliminate adverse business impacts (Bratt et al., 2021). A holistic approach to a company's planning, execution and environmental components is required for sustainability (Florescu et al., 2019). Environmental stewardship has evolved into a critical component of company operations. Since the early 2000s, sustainable supply chain management has captivated the interest of both industry and academia. Organizations examine their products and activities in order to deliver items and services that are more ecologically friendly. A vast number of publications have been written to keep up with the trend. Sustainable Supply chain management concepts, such as defining Supply Chain Management and building suitable roadmaps and frameworks, are the focus of current Supply Chain Management research (Jia et al., 2018). Sustainable Supply Chain Management is the systematic integration of important business activities that enables businesses and their supply chains to achieve environmental objectives. Increased focus on business sustainability adds to the strain, but it also creates new chances for innovation and competitive advantage. As a result, businesses who embrace it may be able to meet short-term financial objectives while also being proactive in dealing with supply chain activities that have long-term environmental and social effects (Florescu et al., 2019). The necessity to incorporate sustainability thinking into firm actions and advantages is becoming increasingly apparent in the global business sector (Bratt et al., 2021). Sustainability management is becoming a critical component of business continuity, allowing companies to fulfil present societal expectations without jeopardizing their ability to meet future needs (Bastas & Liyanage., 2018).

Despite the fact that sustainable supply chain management benefits from a large amount of research. As a consequence of implementing sustainable supply chain management operations, manufacturing companies have a better awareness of the need to be environmentally conscious as well as the economic implications. Since the United Nation’s Sustainable Development Goals were established, the importance of sustainability has only grown. Improving the commerce operation is also crucial in order to save time and enhance productivity. This may be accomplished by employing the tools provided across the supply chain- Supply Chain Management. Several variables influence the supply chain's viability. We present an implementation process model for sustainable supply chain management in this paper (Bastas & Liyanage., 2018). We do this by combining findings from a survey of the literature on sustainable supply chain management and organizational learning, as well as a case study with a firm wanting to be a worldwide leader in sustainable lighting. By integrating these findings, we discover that effective adoption of sustainable supply chain management necessitates sustainability being embedded in a company's vision and integrated into all processes. We also contend that organizational learning, particularly learning with external stakeholders such as suppliers, an operational definition of socioecological sustainability among stakeholders, and procedural support for the creation of strategic change plans are essential for achieving a truly sustainable supply chain (Mazzucchelli et al., 2020). This definition allows for attention to be directed toward strategic ecological and social practices, along with the joint handling of trade-offs and economic considerations among stakeholders. As we build a foundation for a sustainable supply chain management implementation process model, more action-based research to uncover the complex nature of sustainable supply chain management, as there are unique challenges and dynamic relationships in every supply chain (Fiano et al., 2020). This definition and creation enable stakeholders to focus on strategic ecological and social practices, as well as the cooperative management of tradeoffs and economic concerns. We employ a science-based framework for strategic sustainable development to lay the groundwork for a sustainable supply chain management implementation process model. We advocate for additional action-based research to discover the complex nature of sustainable supply chain management, since each supply

chain has its own set of difficulties and dynamic interactions.

The global business community is rapidly understanding the need of incorporating sustainability thought into its operations and benefits. A "license to operate" is increasingly requiring public legitimacy to demonstrate accountability and society participation (Bratt et al., 2021). Several writers have also identified direct self-benefits for organizations that pursue sustainability, innovation, and market possibilities proactively. With rising globalization and complexity of supplier networks, there is a greater commercial interest in controlling the sustainability performance of these networks. Supply chain management is the integration of important business processes from end user to original suppliers, resulting in goods, services, and information that bring value to consumers and other stakeholders. The few existing studies on the topic focused on supply chain performance improvement through innovation strategies and open innovation programs (Florescu et al., 2019).

The supply chain is a set of operations within an organization's management that focuses on the data, people, actions, and assets of clients and providers. Everything from the manufacturing handle to the distribution of the wrapped items to the most enthusiastic clients falls within this category. Within generation, unrefined materials are handled, and others are transformed into packaged goods. It also raises the value of the things and assurances in a reasonable way. "Supply Chain Organization comprises the planning and administration of all activities connected to sourcing and procurement, transformation, and other coordinating administration responsibilities," according to the Chamber of Supply Chain Administration Experts (Swierczek, 2020; Rashid et al., 2022). The hub of the supply chain is the successful coordination of partners such as mediators, providers, third-party logistics suppliers and others. It focuses on formulating a reasonable request and managing the supply chain. It is in charge of the commerce organization's work coordination (Jambulingam et al., 2020). It communicates with a diverse group of people. With the rise of globalization and the complexity of supplier networks, businesses are becoming more interested in monitoring their long-term success (Bratt et al., 2021). Global conflicts – whether owing to trade or security – or environmental and social governance concerns may cut off supply sources, in addition to COVID-related interruptions. Sanctions are being more widely used, affecting logistics supplies, particularly from China.

Its main attraction is a high-performance trade show. Several actuates are included in the coordination. It oversees fundraising, showcasing, deals, item planning, funding, and data execution among other facets of the commerce business (Swierczek, 2020). The purpose of this research is to investigate how to deploy Sustainable supply chain management as part of a strategic organizational transformation process. In this research we have discovered that the transformative process improves stakeholders' sustainability, planning and execution (Srivastava et al., 2017). Furthermore, we seek to address a vacuum in the sustainable supply chain management literature by providing a comprehensive view on sustainability as well as procedural assistance for implementing more sustainable management practices. Supply chain management is concerned with the movement of commodities and their administration. It takes into account the raw and wrapped-up item capacity of the company. It has capability from the point of manufacturing to the point of consumption (Del Giudice et al., 2020). Material, information, and capital movements, as well as collaboration among enterprises in the supply chain, are all managed while taking into consideration goals from all three aspects of sustainable development (planning, execution, and logistics management) which are generated from customer and stakeholder needs. The use of sustainable supply chain management may help to mitigate the detrimental effects of operations (Florescu et al., 2019). A sustainability framework should include procedural support for the creation of visions and strategic plans for practical application (Bratt et al., 2021). The operation administration, acquisition, coordination, and data innovation, as well as their successful cooperation across various offices, are the focus of supply chain administration.

1.1. Problem Statement

Organizations have evolved and changed viewpoints in recent years. Every business aspires to be the best. The gatherings are intended to attract customers looking for high-quality items and exceptional service. However, owing to a lack of resources, several organizations do not implement

Sustainable Supply Chain. However, the tendency has altered, and corporations have adopted or applied sustainable supply chain practices to include appropriateness in supply networks (Florescu et al., 2019). In organization supplier selection is very crucial role because if cannot get raw material on time so your overall production is going to downside. It will be effect on your efficiency, quality and also it shows that reluctance to implement performance-based scorecards (Yazdani et al., 2019). Product stewardship improve environmental performance by less use of carbon footprint. Also, a worker safety issue highlight in many areas so it is important to handle wherever it notices in your operational activity (Babu et al., 2018). Usually, logistics problems are occurring in your delivery operations like in the past pandemic that all operations are freeze due to covid-19. If you want to run your logistics operations smoothly so focus on 3PL suppliers' selection and also compare that which logistics supplier is reliable for your product deliveries on time (Aharonovitz et al., 2018). Increase the organization performance planning an important because the if demand increase so you cannot be boosting your production so you have to plan something this happen before (Swierczek, 2020). Sometimes you planned well but the execution is not going well as you think, so handle your orders properly and also check you inventory to fulfill your orders because it can be dangerous at the end of the month to shipped your order the customers (Srivastava et al., 2017). Contact to your supplier on time because due to work load you missed the important email and the deadline as some to an end. So, monitor your performance on daily basis and exchange information each other (Jambulingam et al., 2020). When facing difficulties to fulfill demands so collaboration is required both the organization. Sometime miscommunication is happened, low trust between the organization and also handle difference in culture and values (Panahifar et al., 2017; Rashid & Rasheed, 2022). The existing and future supply-chain management difficulties in Pakistan were the subject of this study. The purpose of this study is to determine the most significant obstacles to building a long-term supply chain. Because effective supply chain management provides various advantages to businesses, overcoming obstacles to keep things operating smoothly is a major responsibility for supply chain specialists.

2. Literature Review

Sustainable Supply Chain Management (SSCM) is an integrated approach to supplier chain management that enables businesses and their supply chains to achieve economic, environmental, and social objectives. A lot of research was done in the early 1990s. The idea of supply chain management has been identified by many scholars. The few studies that have been done on the subject have focused on how to enhance supply chain performance through open innovation initiatives and innovation techniques (Baloch & Rashid, 2022; Florescu et al., 2019; Rasheed, 2022). Companies that use it can meet short-term economic goals while also becoming proactive in fulfilling long-term environmental and social objectives. Operations in the supply chain have evolved from being merely supporting parts of the global enterprises to their most crucial aspects. The firms are compelled by increasing market rivalry to forge stronger, longer-lasting connections with their suppliers (Yazdani et al., 2019; Shaheen, 2022; Anwar, 2022). To develop a coordinated supply chain to efficiently handle the material, information, and capital flows related with the procurement, manufacturing, and distribution, social, economic, and environmental issues are actively linked with the major inter-organizational business systems (Dubey et al., 2016; Amjad, 2022; Victory et al., 2022). The important role of logistics management is a key element of any supply chain organization because if the demand is not meet the market so cannot not survive in the long-term strategy (Dobroszek, 2020; Hunaid et al., 2022). The current research on the subject concentrated on improving supply chain performance through innovation strategies and open innovation initiatives (Azman et al., 2017; Ali, 2022; Alam, 2022).

The few studies that have been done on the subject have focus on open innovation initiatives and innovation methods for supply chain performance improvement. Development of suppliers by management programmers' that can recognize and control the dangers to the environment and society that are present in their operations (Florescu et al., 2019; Asif, 2022). The significance of execution has been emphasized by researchers at every step of the development of strategic management (Srivastava et al., 2017; Uddin, 2022). The supply chain is a fascinating area where social and physical science intersect. The showcase's multi-generational, multi-scale, and multi-dimensional aspects are being examined (Jia et al., 2018; Ayaz, 2022). Demand planning for supply chains requires a managerial

process, but this process has not yet been practiced. Demand planning, which is frequently seen as one of the biggest performance gaps, is similarly misunderstood by supply chain and company leaders (Basson et al., 2019). At each step of the development of strategic management, researchers have emphasized the significance of execution. As a reason, managers have more skill in developing strategy than in carrying it out. This has consistently been one of the most significant causes of corporate failure in many business contexts (Srivastava et al., 2017; Muzammil, 2022).

When partners work together with other parties to make sure that their supply chain can respond to changing market demands, collaboration has a significant potential to improve business performance (Byrne et al., 2018; Basit, 2022). It includes managing connections with suppliers and buyers both upstream and downstream in order to provide better customer value at a lower cost to the supply chain. In general, we suggest that the partnership is motivated to reduce or avoid the transaction costs of their exchange. Transaction costs are simply the expenses incurred when carrying out operations like acquiring data, bargaining, evaluating performance, etc (Jambulingam et al., 2020). To establish the barriers in SCM, future research fields, the structure of this research, literature evaluation, and study techniques are included. Furthermore, enhancing operational performance necessitates an organization's internal operations, which include environmentally friendly activities, green management with a holistic perspective, and employee participation. The areas of inquiry include understudies, inside and outside ventures, and so forth. It takes on the disorderly aspect of the university supply chain (Kazancoglu et al., 2019).

Supplier selection strategy is important for your organization because if they deliver your raw material on time with follow all the SOPs that cannot effect on environment that improve your overall performance and your organization ranking is comparatively high (Yazdani et al., 2019). Product Stewardship strategy is an area that have a very important role for conserving resources and is creating a differentiation advantage for an organization. It involves to manage the hazardous waste also minimize the environmental impact of the products through the life cycle (Ceptureanu et al., 2019). Logistics Management services and expertise are the major elements to provide sustainable solutions for your organization. The development towards logistics from both the supplier to fulfill the market demands with less costing (Aharonovitz et al., 2018). Planning is the process of correctly arranging the course of a material or product from the raw material stage to the ultimate customer. The planning process is very complex and required long term demand, network and distribution planning with large numbers of supplier and customers (Swierczek, 2020). Execution functions are managed orders, raw material, inventories and product delivery as well as they warehouse operations and manage logistics issues. With the help for execution, it can be fulfilling your demands. Efficient execution is heavily reliant on supply chain planning. Both organizations required to cooperate each other and boost productivity both ends (Srivastava et al., 2017). Coordination is required to analysis your orders, try to fulfill your pending orders and optimizing the process of procurement and distribution. Exchange the information is highly recommended to improve the organization performance and also follow the SOPs to sustainability in supply chain management (Jambulingam et al., 2020). Collaboration is major part to develop relationship between both organizations because both have same vision and goals. Your company must exchange crucial information in real time with supply chain partners in order to collaborate effectively. In order to extend your efforts to provide the right product to the right client in the right market at the precise moment they want and need it, you are trying to create a network of collaborators through almost transparent communication (Panahifar et al., 2017).

The researcher conducts a literature evaluation with the goal of increasing knowledge about the use of sustainable processes in supply chain systems in companies. The literature focuses on the adoption of sustainable supply chains to capitalize on the best potential advantages to enterprises, but it clearly fails to clarify how these components are applied in an organization. The researcher was unable to articulate the additional factors that led to the organization's enhanced success.

3. Research Method

A "methodology" is a set of techniques for doing various forms of research. A variety of

interrelated scientific issues exist. Research is classified into two types: qualitative research and quantitative research (Hashmi et al., 2021a; Omer et al., 2018; Rashid et al., 2021). The research consisted of quantitative method of research, which included interviews questionnaire. The paradigm of the research has been selected due to reasons that are very relatable in organization. It is to establish a link that sustainable supply chain effect on organizational performance. The research was cross sectional and used the positivist paradigm and quantitative research methodology (Rashid et al., 2021). Therefore, the conceptual model that was created using supporting evidence from the literature will be validated utilizing information from a real-world setting. the greatest way to study natural problem since they provide the researcher the depth and richness necessary to fully comprehend the what, how, and why questions relevant to a certain scenario (Dubey et al., 2016).

We used a quantitative survey as a method of data collection in our study (Agha et al., 2021; Das et al., 2021; Haque et al., 2021; Alrazehi et al., 2021; Khan et al., 2021; Khan et al., 2022a, b, c). Consequently, the structure of the interview questionnaire corresponds to the goal of the paper and enables to test the postulated hypotheses (Swierczek, 2020; Hashmi & Mohd, 2020). An online survey of 121 responses from different firms' employees was conducted and the resulting data were analyzed to investigate the role of management to implement sustainable supply chain in organization (Byrne et al., 2018; Hashmi et al., 2020a). This research was sought to uncover supply chain management issues in order to ensure the sector's long-term survival in Pakistan. The goal of this research is to give an explanation. The expectations and experiences of the supply chain was being examined. This research was addressing the key issue of supply chain challenges. As a result of this example, the supply chain of this distribution system was be transformed (Chierici et al., 2020). In this situation, several speculative judgments were made. As part of this investigation, several options were being tested. The study's purpose is to explore further into this phenomenon using a quantitative method in order to gain a better understanding of how key green supply chain practices impact overall organizational sustainability efficiency.

Further, a sampling process in which each sample has an equal probability of being chosen is known as random sampling. A survey conducted at random is meant to be unbiased and representative of the entire population (Ktikan et al., 2017; Hashmi et al., 2020b). This test was aid us in finding the links and dependencies between variables; in the future these approaches will aid in explaining our explanatory variables. SPSS has investigated statistics and is also used to translate data acquired from questionnaires and surveys into comprehensible statistics and information. In order to investigate the data, the multiple regression approach was applied (Azman et al., 2017).

4. Results and Findings

4.1. Demographic Analysis

Various approaches are used to analyses the descriptive profile of data at this phase. First, the responders' profiles are assessed and the results are illustrated in table 1. Males account for 76.9 percent of respondents, while females account for 23.1 percent. 30.6% of respondents are between the ages of 20 to 30, 24.8 percent are between the ages of 31 to 40, 19 percent are between the ages of 41 to 50, 25.6 percent are between the ages of 51 to 60. Respondents' educational backgrounds are classified as follows: 26.4 percent have a matric student, 26.4 percent have an intermediate student, 19.8 percent have a graduate degree and 27.3 percent have a postgraduate degree. Respondents' professional experience is divided into four categories: 31.4 percent have 0 to 5 years of experience, 19.8 percent have 6 to 10 years of experience, 22.3 percent have 11 to 15 years and 26.4 percent have 16 years and above of professional experience.

Table 1: Demographics

Demography	Group	(n=121) Frequency	Percentage
Gender	Male	93	76.9
	Female	28	23.1
Age (years)	20 - 30	37	30.6
	31 - 40	30	24.8
	41 - 50	23	19.0
	51 - 60	31	25.6
Level of Education	Matric	32	26.4
	Intermediate	32	26.4
	Graduate	24	19.8
	Postgraduate	33	27.3
Professional Experience	0 - 5 years	38	31.4
	6 - 10 years	24	19.8
	11 - 15 years	27	22.3
	16 years and above	32	26.4

Each variable was subjected to reliability testing to ensure that the model was consistent. According to (Straub, 1989; Rashid et al., 2019; Rashid et al., 2020), the Cronbach's alpha value should be greater than 0.60. The reliability test results are illustrated in table 2 and demonstrating that all the variables are reliable enough (> 0.60) (Rashid, 20216; Rashid & Amirah, 2017; Hashmi et al., 2021b).

Table 2: Reliability analysis

		Cronbach's Alpha	N of Items
Independent Variable	Supplier Selection	.856	4
	Product Stewardship	.912	4
	Logistics Management	.746	4
	Planning	.772	4
	Execution	.676	4
	Coordination	.785	4
	Collaboration	.924	4
Dependent Variable	Sustainable Supply Chain Management	.729	4

Table 3 shows the model summary for study hypothesis. The values led to the adoption of the following Hypothesis between Depended Variable-DV (Sustainability in Supply Chain Management) and In-Depended Variable -IV (Collaboration, Execution, Supplier Selection, Logistics Management, Product Stewardship, Coordination, planning to have impact of Sustainable Supply Chain Management). As all the hypotheses are significant; therefore, have been accepted.

Table 3: Model summary

Variable	Mean (*n=121)*	Standard Deviation	Model Summary		ANOVA	Coefficients		
			R	Adjusted R Square	F	St. Coefficient Beta	t	Sig.
Supplier Selection	9.4917	3.67366				2.418	6.616	.000
Product Stewardship	9.4380	3.30739				.261	3.206	.002
Logistics Management	8.9525	2.99936	.960[a]	.921	187.562	-.248	-4.089	.000
Planning	8.9360	3.25841				.248	2.415	.017
Execution	11.0103	2.55734				.767	13.035	.000
Coordination	10.1612	2.83888				.375	3.500	.001
Collaboration	9.2583	3.79170				-2.993	-8.420	.000

a. Predictors: (Constant), Collaboration, Execution, Supplier Selection, Logistics Management, Product Stewardship, Coordination, Planning, b. Dependent Variable: Sustainable Supply Chain Management

5. Discussion

In literature review, Organizational performance is influenced by a number of things. In this study, seven of such elements were chosen to focus on better organizational performance: to incorporate sustainable supply chain experience within the organization. Factors that have been shown to have a

significant impact are referred to as experience. Discussions on how to perform better are a regular focus for organizations; they want to know how we can perform better. Each factor, in accordance with this study, enhances organizational performance. Businesses aim to create sustainability in order to secure the upstream. Organizations have a wide range of options for implementing long-term business strategy. If one wants to optimize the efficiency of the supply chain, green supply chain practices must be used. guaranteed. Calculation inputs from the suppliers must be used by the management of the suppliers. It's necessary to use less energy and water. So, there won't be as much overproduction. Improvement of supply chain metrics must be given top priority. For enterprises and organizations, sustainable supply-chain management is becoming extremely important. They may now compete globally because to it. Traditional supply chain barriers will be used in the management paradigm. Benefits will flow across the corporation's whole commercial business. To maximize value, several companies participate in the supply chain. Many businesses are becoming more interconnected as a result of information technology, globalization, and outsourcing. There are various important business actions. Organizational supply chain management helps the firm remain effective over the long run. At many stages, the various supply chain participants must cooperate. The structure of the supply chain is influenced by several different types of networks. There are numerous firms now thanks to information technology, globalization, and outsourcing.

A number of important strategic decisions must be taken. Supply chain management inside an organization increases a business's long-term viability. The supply chain's numerous actors must cooperate with one another on multiple levels. Numerous different networks have an influence on the supply chain's structure. The corporate world is evolving in the 21st century. Collaboration throughout the supply chain is necessary for globalization to be successful. These have contributed to supply chain management's development. These activities are impacted differently by agile manufacturing, the Just-in-Time (JIT) technique, and Lean manufacturing. Various technical advancements have significantly lowered costs. In the twenty-first century, there are changes in the corporate environment. The globalization process needs supply chain cooperation for a better output. These have benefited in supply chain management's progress. In the business environment, the twenty-first century has brought major changes. Collaboration in the supply chain is needed to optimize the globalization process. The growth of supply chain management has been aided by these. These activities are affected differently by the Just-in-Time (JIT) production method. Multiple technical advancements have allowed for significant cost reductions. A major factor in outstanding performance is the sustainable supply chain approach. Utilizing data and analysis, it is a highly helpful tool for improving corporate performance. The organizational performance of the business will be excellent. By implementing a sustainable supply chain strategy, organizations may enhance their overall performance. Because, based on the results, improved organizational performance has a significant positive impact.

5.1. Conclusion

The supply chain has to be well managed for a company to grow successfully and sustainably. Businesses promote cost-cutting initiatives because they have a direct impact on their bottom line. Unfortunately, they did not give much thought to preserving the sustainability of their supply networks in the long run. Companies have come under pressure from environmental activists over the past 10 years to consider how their supply chain operations affect the environment and society. Some companies have increased the sustainability of their supply chains, making them some of the most sustainable companies in the world and improving their standing with customers. Businesses may be able to pay the higher expenses involved in developing sustainable supply chains with the support of stronger brand loyalty. In the long term, activist and regulatory scrutiny will make non-sustainable supply networks ineffective. Businesses' sustainability would be challenged if such supply networks were unable to fulfil demand. Supply chains may be made more effective and sustainable by implementing modern software and cooperating with other supply chain participants.

5.2. Recommendations and Limitations

After detail analysis of given research our analysis of the findings, We highly recommend

implementing standards, standard operating procedure, waste elimination, and resource efficiency in order to develop a sustainable supply chain process. It is a fantastic instrument for boosting organizational performance. A corporation will achieve organizational strategic goals over the long run when it adopts a sustainable supply chain strategy. We could improve the supply chain process to help the business operate more effectively. Because our research demonstrates that improved organizational performance achieved via the application of information technology has a significant positive impact. If we adopt a sustainable supply chain and actively reduce impending threats to our current businesses, we can address and solve many issues.

Because of environmental factors (the Covid-19 pandemic), which continued throughout the study, this research had to be conducted apart from its participants and from their educational resources. The availability of suitable analytical tools, effective communication, technique selection, and literature access thereafter become problems. The present study's authors are still learning how to do quantitative data analysis using statistical tools and publish academic publications. Additional skills and knowledge of statistical testing may enhance the research. The choice to conduct this research in a particular country and region was addressed as another constraint. This issue can be resolved by doing the survey again in other geographic areas to corroborate the results. In the future, the researcher may include more sectors and international corporations in the supply chain, improving the chance of a successful conclusion. They can also offer their challenges, implementation, aims, advantages, and disadvantages.

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Appendix: Questionnaire

Section A: Demographic Data

No. of respondent:

Name:

Question #01: Please specify gender?

A. Male
B. Female

Question #02: Please specify your Age?

A. 20 - 30
B. 31 - 40
C. 41 - 50
D. 51 - 60

Question #03: Education level?

A. Matric
B. Intermediate
C. Graduate
D. Postgraduate

Question #04: What is your professional experience?

A. 0 – 5 years
B. 6 – 10 years
C. 11 – 15 years
D. 16 years and above

Section B: Questionnaire

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

6) Strongly disagree
7) Disagree
8) Neutral
9) Agree
10) Strongly agree

1) Supplier Selection Strategy	
1.6)	When selecting a supplier, the organization considers the supplier's capacity to satisfy sustainability standards.
1.7)	When selecting a supplier, the firm considers environmental certification.
1.8)	When selecting a supplier, the organization considers the potential of a long-term connection.
1.9)	When selecting a supplier, the business considers the provider's reputation.
2) Product Stewardship Strategy	
2.1)	The business considers eco-friendly and secure packaging when selecting a provider.
2.2)	When picking a supplier, the business considers the insurer's history and respect for safety rules.
2.3)	When choosing a manufacturer, the business considers the supplier's participation in the creation of new products and services.
2.4)	The firm thinks about the fact that its products include product safety warnings to comply with current standards when picking a supplier.
3) Logistics Management	
3.1)	The business promotes the use of recyclable packaging by suppliers.
3.2)	The business is in favor of using fuel-efficient automobiles.
3.3)	The business favors environmentally sustainable ways of transportation.
3.4)	The business does car repair and inspection in a responsible manner.
4) Planning	
4.1)	When deciding on transportation options, the organization takes into account sustainability.
4.2)	The company is planning locations for warehouses by considering sustainability.
4.3)	Utilizing sustainable resources for materials and energy is taken into account by the firm.

4.4)	The business is dedicated to achieving long-term competitive advantages.
5) Execution	
5.1)	The business views fulfilling internal and external customers' expectations as crucial.
5.2)	When carrying out supply chain activities, the company takes punctuality and accuracy into account.
5.3)	The business keeps track of accident rates and takes precautions to prevent them.
5.4)	The business uses supply chain sustainability performance monitoring tools.
6) Coordination	
6.1)	The organization thinks about the advantages for the areas where activities are taking place.
6.2)	The company is considering about stakeholders' assistance and training.
6.3)	Company is allocating resources for negative environmental impacts of its supply chain.
6.4)	The firm is figuring concerning how to distribute costs for supply chain activities.
7) Collaboration	
7.1)	The order to improve the business regular communication and information exchange among its supply chain members.
7.2)	Company is evaluating sustainability for outside stakeholders.
7.3)	The company is promoting among its supply chain participants a greater understanding of sustainable supply chain management values and objectives.
7.4)	The organization is evaluating sustainability for internal stakeholders.
8) Sustainable Supply Chain Management	
8.1)	Developing a Sustainable supply chain management requires a focus on the supply chain and the active participation of supply.
8.2)	Sustainable supply chain management implementation may reduce the negative impacts of operations
8.3)	Become proactive in addressing supply chain activities' long term environmental and social expectations.
8.4)	Sustainable supply chain management represents the systemic integration of critical business.

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Impact of Lean Manufacturing on Organizational Performance through a Moderating Role of ERP

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ABSTRACT

Lean manufacturing is regarded as a rewarding production approach because of its sound effects on organizational and economic efficiency in various sectors. Given the increased environmental consciousness, the environmental successes of lean manufacturing also have significant economic importance. According to some experts, lean manufacturing is a business technique utilized to enhance an organization's process performance. This is because it leads to an increase in both the bottom-line outcomes and customer satisfaction. As a result, many studies have demonstrated that lean manufacturing significantly influences an organization's operational effectiveness. Furthermore, introducing an ERP system brought several benefits in meeting the changing expectations of consumers by delivering accurate and timely information about customers to the company so that they could make adjustments in their choice, respecting the customers' demands. Furthermore, in this study, the researcher discovered the influence of lean manufacturing on organizational performance in connection to the mediating function of ERP. Furthermore, the researcher examined all of the lean manufacturing methods that were interconnected.

Keywords: *JIT, Purchasing, Production, Total quality management, Total production management, Operational performance, Financial performance*

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Impact of Lean Manufacturing on Organizational Performance through a Moderating Role of ERP

1. Introduction

Manufacturers all across the globe are adopting new tools and practices to enhance their manufacturing processes due to the advent of technological developments, competitive pressure, ever-increasing globalization and an uncertain environment. Manufacturers are more focused on enhancing their manufacturing processes because improved manufacturing within industries leads to better supply chains, operations, and overall enhanced industry performance. Several manufacturers have adopted practices of lean manufacturing like JIT (just-in-time), TQM (total quality management) and TPM (total productive maintenance). These practices are helping its users enhance the quality of products and the organization's productivity. According to the study conducted by Yusuf and Adeleye et al. (2002), it is revealed that these tools and practices of lean manufacturing are essential. However, they cannot be effective and efficient enough if implemented in a complex and uncertain environment. Many organizations have integrated the technique of agile manufacturing to identify the effect of lean manufacturing practices on the organization's overall performance. Numerous scholars and researchers have depicted the significant impact of the integration of lean manufacturing on the environmental, social, as well as the financial performance of an organization (Baloch & Rashid, 2022).

According to the study executed by Yang et al. (2011), it is found that lean manufacturing is the methodology which is formed for reducing the production cost of the company, which implements it through curtailing waste production. On the other hand, the study conducted by Bellisario and Pavlov (2017) states that lean manufacturing is considered the strategy of conducting business which intends to perk up the functioning of production processes of an organization while considering the significant improvement in the bottom line results and level of customer satisfaction. Hence, different studies have shown different definitions of lean manufacturing. However, all the definitions portray the significant influence of lean manufacturing practices on the operational performance of the firm which implements them. At present, every business organization is focused on improving its performance through the deployment of information systems because of ever-increasing competition in the business environment globally. The integration of information systems assists businesses by decreasing the cost of production, reducing the time cycle and improving customer services. In addition to lean manufacturing, businesses are integrating ERP systems into their business functions to meet their customers' varying needs and expectations by providing timely and accurate information. This is assisting businesses in gaining a high level of customer satisfaction towards their services or products. ERP systems are helping businesses in changing their business-related decisions according to the expectations of their customers (Shaheen, 2022; Alam, 2022).

Many studies have focused on the deployment of the tools and practices of lean manufacturing and their impact on the overall organization’s productivity and performance. For instance, the study of Bellisario and Pavlov (2017) states that significant improvement has been observed in the operational performances of the organizations which integrated lean manufacturing tools and practices through attaining better employee engagement in the business operations and decisions. On the other hand, the study of Yang et al. (2011) depicts the positive impact of environmental management and lean manufacturing on the performance of an organization. According to this study, there is a positive linkage between environmental management practices and lean manufacturing, which ultimately results in the improved performance of an organization (Asif, 2022; Uddin, 2022).

According to another study conducted by Iranmanesh et al. (2019), lean manufacturing practices substantially ensure an organization's sustainable performance. The study has further elaborated that the organization that embraces lean culture bestows sustainable organizational performance by moderating supplier relationships' impact. Another study by Belekoukias et al. (2014) states that how lean manufacturing practices are implemented in the organization also significantly

controls organizational performance. Furthermore, the study has highlighted that there is less impact of just-in-time, i.e. JIT, lean manufacturing practice, on the performance of an organization compared to that of total productive maintenance, i.e. TPM and total quality management, i.e., TQM. Another study conducted by Khalfallah et al. (2020) has declared the influence of lean manufacturing practices on the financial and operational performance of the organization. This study has used the mediating role of agile manufacturing practices to determine the impact of lean manufacturing practices on overall organizational performance. The studies carried out by Fullerton et al. (2009), and Taj et al. (2011) depict that lean manufacturing practices significantly influence organizational financial performance. However, it does not impact the organization's operational performance.

The study has further highlighted how ERP plays a mediating role in explaining how practices of lean manufacturing affect organizational performance, as the study of Hassabelnaby et al. (2011) has declared that the deployment of ERP influences organizational performance. The previously conducted research work has determined the impact of lean manufacturing on the overall organizational performance, and it did not consider ERP as a mediator. On the other hand, the study conducted by Rashid et al. (2022) claims that the performance of an organization has been improved through the deployment of technology in its business functions. Although much research has been done to determine the association between organizational performance and lean manufacturing, the role of ERP as a mediator in forming a positive relationship between the two is still uncertain. Some researchers have only focused on business performance, whereas others have focused only on operational performance or an organization. Therefore, to fill the gap in previous studies, this study aims to determine the influence of lean manufacturing on an organization's organizational and operational level performance. Furthermore, this study will further observe the moderating impact of ERP on organizational performance and lean manufacturing practices (Ayaz, 2022; Anwar, 2022).

1.1. Research Questions

There are some research questions related to this study given as follows:

RQ1: To what extent does lean manufacturing influence organizational performance?

RQ2: To what extent does ERP moderate the relationship between lean manufacturing and organizational performance?

2. Literature Review

2.1. Lean Manufacturing and Performance

The research work carried out by Khalfallah et al. (2020) has evaluated the mediating impact of agile manufacturing on an organization's organizational performance and lean manufacturing. The link between the performance of an organization and its lean manufacturing practices while considering the factors of TQM, TPM, JIT production and JIT purchasing will be determined in this study. Around 205 manufacturing organizations have been selected from Tunisian, and SEM is used to examine the collected data of the study. This study has found that lean manufacturing practices are positively and directly linked with agile manufacturing. In addition, the study revealed the highly positive impact of agile manufacturing on organizational performance. This study has further found that lean manufacturing practices do not significantly impact the organization's operational performance. Moreover, this study highlighted that the linkage between organizational performance and lean manufacturing practices was mediated by agile manufacturing. Hence, this study has emphasized the significance of agile manufacturing practices for improving an organization's operational performance (Amjad, 2022; Hunaid et al., 2022).

There is one more study which was conducted by Bellisario et al. (2017) revealed how organizations make use of performance management practices while implementing lean manufacturing in order to enhance their organizational performance. The impact of these practices on organizational performance has been determined in the study. This study chose the method of systematic review to

discover the relationship between organizational performance and lean manufacturing practices between the period of 2004 to 2015. This study has further explored the significant role of performance management in lean manufacturing practices, consequently improving the organization's financial performance. However, this study revealed some issues while carrying toward the operational performance and lean manufacturing practices, so it is recommended that businesses must deploy strategic performance practices while integrating performance management and lean manufacturing practices (Rashid & Amirah, 2017).

Another study by Yang et al. (2011) examined the impact of environmental management and lean manufacturing practices on organizational performance. Hence, this study aimed to determine the association between environmental performance and lean manufacturing practices and business performance outcomes. This study gathered data from around 309 international manufacturing organizations and used the technique of AMOS to analyze the data and verify the research's proposed hypothesis. This study further found that there is a highly positive relationship between environmental practices and lean manufacturing practices of an organization. It is further explored that there is a negative effect of the practices of environmental management on the operational as well as the financial performance of the organization. The study revealed that better environmental performance practices could lead to an improved financial performance by diminishing the negative impact of environmental practices on an organization. Therefore, the study suggested deploying effective environmental management practices, which should be evaluated sporadically to attain improved organizational performance outcomes (Rasheed, 2022; Victory et al., 2022).

Another study conducted by Iranmanesh et al. (2019) has discovered the influence of lean manufacturing practices on overall organizational performance. The moderator selected for conducting this study was the lean culture which helped evaluate the relationship between the organizational performance and lean manufacturing practices of an organization. This research work revealed that non-government organizations, governments, and customers impose high pressure on manufacturing firms to carry out their production processes sustainably. It is further found that the deployment of lean practices within the manufacturing firms has played a significant role in benefiting the organization in terms of environmental, social as well as economic context as it ultimately assists in attaining sustainable performance within the organization. This study explored the effect of lean manufacturing practices on an organization's environmental performance, gathered data from around 187 manufacturing firms in Malaysia, and used the PLS method to analyze the collected data. This research work has found a significant positive impact of the supplier relationship, equipment and process, product design and customer relationship on an organization's sustainable performance. This study further found a moderating impact of supplier relationships and the equipment and processes in the presence of lean culture on the organization's sustainable performance (Ali, 2022).

2.1.1. JIT and performance

The research work of Bashar et al. (2019) determined the impact of JIT production on overall organizational performance. The area of apparel manufacturing was selected in this study as the manufacturers of apparel confront tremendous pressure to improve the performance of their manufacturing processes to attain a high competitive advantage within the marketplace. The study found that manufacturers are required to involve themselves in the implementation of advanced as well as new manufacturing methods in order to make their manufacturing processes even more effective and productive. Integration of innovative and advanced manufacturing methods within developing countries appears to be highly challenging because of several barriers or obstacles. This study focused on the integration of JIT production and measured its influence on both the operational as well as the financial performance of an organization. Around 227 manufacturers of apparel were chosen from Bangladesh to gather data for this study through the deployment of a convenient sampling approach. Afterwards, AMOS and SPSS software was chosen to analyze the gathered data for this study to determine the impact of JIT production on organizational performance. This study found a direct and highly positive impact of the integration of JIT production on both the operational as well as the financial performance of an organization (Muzammil, 2022; Basit, 2022).

Another study by Danese et al. (2012) identified the relationship between JIT supply, organizational performance and JIT production. This study aimed to assess the impact of JIT practices, specifically the practice of JIT production, on organizational performance. The moderating impact of JIT production was measured in this study on the performance and efficiency of an organization. Six hypotheses were developed in this study to determine the relationship between efficiency, organizational performance, JIT production and JIT supply. Around 206 manufacturing firms were chosen to gather data for this research. The collected data was then analyzed with the help of regression analysis. Highly positive impact was identified of JIT production practices on the delivery as well as efficiency of the organization's products. Moderating impact of the practices of JIT supply was also observed on the relationship between JIT delivery and JIT production of the organization's products. On the other hand, no moderating impact of JIT supply on the performance efficiency of an organization was observed. Hence, the study revealed the two-fold role of JIT supply as a moderator. In contrast, JIT production influenced the overall organizational performance and production considerably.

Another study by Phan et al. (2019) measured the influence of JIT production and TQM on organizational performance. This study found the association between TQM, JIT production and organizational performance specifically for manufacturing companies. The sample size of 280 manufacturing firms was selected to gather data for this study. Furthermore, these manufacturing firms were selected from twelve different countries. Furthermore, this study used regression analysis and correlation methods to analyze the collected data for this study. This study found a significant and close relationship between JIT production, organizational performance and TQM. In addition, this study revealed the highly positive impact of JIT production on the flexibility of organizational performance. The study suggests that it can be further improved by deploying the practices of TQM. Hence, the study found that the organization's flexibility performance can be improved by integrating the JIT production and TQM. This is because it improves the impact of each other, which ultimately leads to better organizational flexibility performance.

2.1.2. Total quality management (TQM) and performance

The study by Valmohammadi et al. (2015) identified the relationship between organizational performance, TQM and organizational culture. This study was found to be circulating around the four main aims. The first objective of this research work was to determine the impact of TQM and culture on overall organizational performance. The study's second aim was to evaluate and assess the manufacturing organization's culture. The third aim of this study was to investigate the deployment of different types of TQM practices and their influence on manufacturing organizations. Lastly, this study compared the two models to define the relationship between the organizational culture, TQM implementation and organizational performance. Senior managers were asked to provide data for conducting this research, and around 209 manufacturing companies were chosen as the sample for this study. The study revealed that organizational culture is dominant in directing the organizational performance. The study further elaborated that the selected organizations efficiently integrated TQM practices, and these practices have had a highly positive influence on organizational performance. Therefore, it can be concluded that there is a significant and highly positive impact of TQM on financial, operational, and organizational performance. Hence, it can be said that this study determined the relationship between the practices of TQM, organizational performance and organizational culture. This relationship was measured on an individual basis to achieve the findings of the study.

The study conducted by Brah et al. (2006) found the impact of TQM and technology on the organizational performance of logistic companies. The study revealed that integrating technology and TQM had gained more attention from business organizations to challenge market opponents and achieve their business goals. As businesses are increasingly using TQM and technology to remain competitive, competition in the business environment is continuously increasing in today's marketplace. Internal integration has been improved by the deployment of TQM of all logistic companies, and they benefit their companies through technology. The study found the relation between technology, organizational performance and the practices of TQM for logistics companies. This study revealed that there is a substantial effect of technology as well as TQM on organizational performance. Hence, it can be said that the deployment of both the TQM and technology plays a significant role in improving the

performance of an organization. Therefore it suggests implementing high technology into the business operations of logistic companies.

2.1.3. Total productive maintenance (TPM) and performance

The study by Singh et al. (2015) explained the implementation of TPM and TQM and analyzed their impact on the overall organizational performance. This study's primary aim was to explore the impact of TQM and TPM on the organizational performance of manufacturing firms. This study further supported the research work in the area of TPM and TQM by measuring the synergetic impact of these practices on organizational performance. Large-sized manufacturing firms were chosen to conduct this study and found the benefits of deploying TPM and TQM in terms of improving the organizational performance of manufacturing firms. The performance of such approaches was compared in this study which assisted in finding a significant impact of the integration of TPM and TQM on the organizational performance of manufacturing companies. This study further elaborated that TPM implementation can help companies improve their core competencies and their power to tackle business challenges in today's competitive business environment. This study also developed an understanding of TPM and TQM initiatives for manufacturing firms. Furthermore, this study revealed the highly positive influence of TPM and TQM on manufacturing firms' financial and operational performance.

The study of Ahuja et al. (2008) evaluated the initiatives of TPM integrated by the industry of India to improve the organizational performance of their manufacturing firms. In doing so, this study explored the practices of TPM that the manufacturing firms of India have adopted to improve their organizational performance. Statistical tools were used in the study to determine the correlation between organizational performance and the integration of TPM. The outcomes of this study revealed that there is a significant contribution of the deployment of TPM to the improved organizational performance of manufacturing firms. Certain success factors like the involvement of top management, effective leadership, and a holistic way of implementing TPM practices can bring about upgraded functions and operations of manufacturing firms. This study further revealed there is a positive impact of these success factors on the organizational performance of manufacturing firms. Hence, it can be said that this study focused significantly on TPM and revealed the positive impact of TPM on organizational performance in the case of manufacturing firms.

The study by Bashar et al. (2020) has drawn the relationship between organizational performance, TPM and people management. The main aim of this study was to find the association between these three elements specifically for the apparel industry of Bangladesh. The study revealed mediation and a direct effect of TPM on overall organizational performance. Around 227 large and small-sized garment organizations were selected from the garment industry for this study. A casual linkage was found between organizational performance, people management and TPM and the approach of SEM was used to analyze the collected data. This study has further found that people management has an indirect and direct impact on organizational performance. On the other hand, this study revealed TPM's mediating and direct impact on the organization's operational performance. Figure 1 illustrates the research framework of this study.

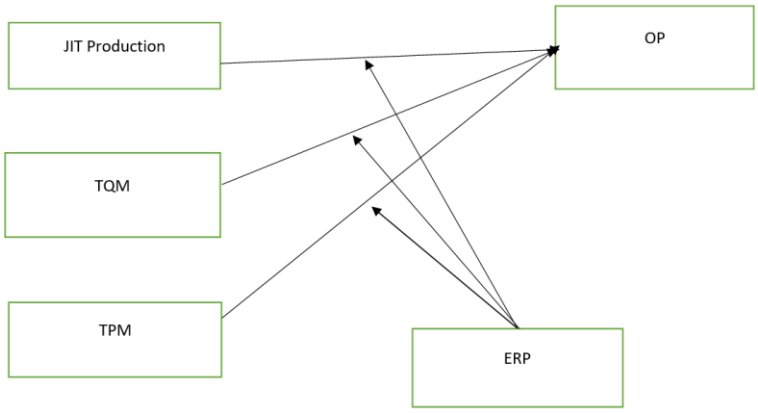

Figure 1: A research framework

2.2. Study Hypothesis

The hypothesis of this study is given as follows:

H1: JIT has a significant impact on organizational performance.

H2: TQM has a significant impact on organizational performance.

H3: TPM has a significant impact on organizational performance.

H4: ERP significantly moderates the relationship between JIT and organizational performance.

H5: ERP significantly moderates the relationship between TQM and organizational performance.

H6: ERP significantly moderates the relationship between TPM and organizational performance.

3. Research Methodology

The plan which is to be followed for conducting research is explained in the research approach, and it considers the broad assumptions used to carry out the collection of research data. Explanatory research and exploratory research are the two major types of research approaches which are used for explaining data analysis as well as data collection methods. Researchers use exploratory research when they need to gather more information related to the topic, which is vague (Alase, 2013; Rashid et al., 2021; Hashmi &Mohd, 2020). Hence, researchers use this approach when they are involved in investigating topic-related issues. On the other hand, researchers use explanatory research to enhance the understanding of the previously conducted research topic. Hence, this approach predicts future consequences and provides further details about the study. Therefore, the researcher in this study selected an explanatory research design to understand other lean manufacturing practices and their impact on organizational performance (Hashmi et al., 2020a, b).

3.1. Research Design

This is considered the strategy that explains the logical working of all the study components to ensure that the research problems have been addressed and the research objectives have been achieved. The four main types of research designs are descriptive, correlational, experimental, and causal research designs. When the relationship between independent and dependent variables is determined, researchers

use a correlational research design. The strength of each variable is explained in this research design. Researchers use descriptive research design when the information related to the topic is to be collected, or the phenomena or topic needs to be explained. In addition, a simple research design is deployed when the cause-effect relationship between the research variables needs to be identified. Therefore, this study needs to determine the relationship between research variables, so a correlational research design has been chosen (Hashmi et al., 2021a, b).

3.2. Sampling

The method used for collecting samples from the specified population is termed sampling (Rashid, 2016). The data is gathered from the population to research the collected data. Manufacturing organizations are the target population for this study to determine the practices of lean manufacturing being implemented by manufacturing organizations and the impacts they are observing on the organizational performance due to implementing lean manufacturing practices. The way in which data for the study is collected using a sampling technique. Non-probability and probability sampling are the two effective sampling techniques (Apuke, 2017; Rashid et al., 2019). In this study, the sample is selected randomly for collecting research data (Rashid et al., 2020). Ensuring a sufficient amount of participants for sharing their thoughts, ideas, information or thoughts related to the research topic is the primary purpose of setting the sample size for the study. The sample size incorporates a large population with the same behavioural pattern, employment background, interests, educational background or demographic characteristics. This study has selected a sample size of 177.

3.3. Instruments of Data Collection

The collection of data plays a significant role in conducting any research as the entire findings of the research rely on the data that has been collected from the participants of the research. Therefore, selecting the best suitable instrument for data collection is crucial as it will help gather appropriate data in the given time frame. There are different types of instruments used for data collection, such as questionnaires, interviews, surveys, case studies, observations and experiments. The validity and reliability of the selected research instrument are essential. This reliability and validity depend directly on the appropriateness and validity of the research findings. Hence, this study has opted for a survey questionnaire as a research instrument for collecting data for the study.

3.4. Procedure of Data Collection

This is also very important in how data is collected for conducting research. This study intends to circulate the survey questionnaire to the research participants, i.e. manufacturing organizations and the upper management and senior management will attempt the given survey questionnaire and return it to the researcher. The variables used in this research have also been highlighted in the questionnaire so that the participants quickly get to know how the influence of lean manufacturing practices on organizational performance is being measured through this research.

4. Data Analysis

The result confirmed that each response was valid as Cronbach alpha reported above 0.7. The construct validity is significant at the level of measured items taken from a sample of respondents. Literature shows that the results of outer loading should be more than 0.7 (Fornell & Larcker, 1981; Rashid & Rasheed, 2022). The results of factor loading showed that loaded items were significant based on their construct and higher than other constructs. This also explained that Cronbach's alpha should be more than 0.7 for the reliability of all items (Rashid et al., 2022). Table 1 shows the measurement model results based on factor loadings, CR and AVE, also known as construct reliability.

Table 1: Measurement model

Variables	Items	Loadings	CR	AVE
ERP	ERP1	0.769	0.842	0.667

	ERP2	0.874		
	ERP3	0.858		
	ERP4	0.759		
	JIT1	0.878		
JIT	JIT2	0.793	0.969	0.727
	JIT3	0.793		
	JIT4	0.937		
	OP1	0.877		
OP	OP2	0.881	0.788	0.564
	OP3	0.728		
	OP4	0.725		
	TPM1	0.794		
TPM	TPM2	0.709	0.727	0.521
	TPM3	0.87		
	TPM4	0.76		
	TQM1	0.841		
TQM	TQM2	0.744	0.772	0.573
	TQM3	0.715		
	TQM4	0.721		

Table 1 has been based on the different recommended thresholds as factor loadings can be accepted when the values are higher than 0.70 (Hashmi et al., 2021b). On the other hand, when the values are not accepted on this, it is recommended that it can also be accepted when the values are higher than 0.40. Moreover, the CR can only be accepted when the values are higher than 0.70 and AVE when the values are higher than 0.50(Hashmi et al., 2021a). Hence, the table has been based on these recommendations, and therefore, the measurement model has been achieved.

4.2 Discriminant Validity

Table 2 illustrates the Fornell and Larcker (1981) discriminant validity criterion. The results are based on the recommendation that diagonal values should be higher in their construct, both horizontally and vertically. Table 2 shows all correct values, and therefore discriminant validity was achieved using Fornell and Larcker's (1981) criterion. The above is based on the recommendation that all bold values should be higher in their construct when compared with other values (Rashid & Rasheed, 2022).

Table 2: Fornell-Larcker criterion

	ERP	JIT	OP	TPM	TQM
ERP	0.816				
JIT	0.693	0.852			
OP	0.741	0.156	0.751		
TPM	0.636	0.168	0.592	0.721	
TQM	0.723	0.003	0.73	0.71	0.757

The *p* value should be less than 0.05 for the significance of the hypothesis. As from table 3 we can see that the P value for each hypothesis except H4 (ERP significantly moderates the relationship between JIT and organizational performance) is less than 0.05. This means JIT, TPM and TQM have significant effect on organizational performance and ERP significantly moderates the relationship between TPM and organizational performance as well as TQM and organizational performance. The ERP does not significantly moderate the relationship of JIT and organizational performance. Therefore, it can be concluded that Hypothesis 1, Hypothesis 2, Hypothesis 3, Hypothesis 5 and Hypothesis 6 are supported; while Hypothesis 4 is rejected.

Table 3: A path analysis

	Standard deviation	T statistics	P values
JIT -> OP	0.055	2.231	0.026
TPM -> OP	0.096	2.115	0.045
TQM -> OP	0.103	3.986	0
ERP x JIT -> OP	0.048	0.801	0.423
ERP x TPM -> OP	0.071	2.4	0.016
ERP x TQM -> OP	0.072	2.369	0.017

5. Conclusion

Lean manufacturing, also known as Lean Production, is a manufacturing approach that has been widely adopted as a successful strategy by businesses of all sizes and in a wide range of industries throughout the world. Using tools like Total Quality Management (TQM), Just-in-Time (JIT), etc., lean manufacturing focuses on reducing or eliminating non-value-added steps and various forms of waste (MUDA) throughout the production process (JIT). In today's market, when businesses are facing fierce price rivalry in response to shifting consumer expectations, the ability to create the same volume of products at lower prices is more important than ever. Nonetheless, Khalfallah et al. (2020) research suggests LMP have little or no impact on business success. On the other side, lean manufacturing's positive impact on the environment may result in monetary rewards via acquiring new customers, competitive differentiation, and cost savings achieved via waste reduction. Additionally, lean manufacturing helps with bottom-line results because it reduces the administrative cost of reducing pollution by either educating business leaders on the need and value of pollution reduction or by decreasing the expense associated with enacting environmental improvement. These findings demonstrate the beneficial correlation between lean manufacturing and overall business success.

TQM, JIT, and TPM aim to boost organizational performance via continuous development and waste removal. The three methodologies of Total Quality Management, Just-in-Time, and Total Productive Maintenance all work together to provide a unified and systematic approach to manufacturing focused on excellence. Because of this, TQM, JIT, and TPM will likely be applied together in manufacturing facilities. However, most TQM, JIT, and TPM research focuses on each methodology independently. Nevertheless, research into the connections between TQM and JIT has been limited. Some studies consider all three programs, although indirectly concentrating on only one. TPM's connection to Just-In-Time and Total Quality Management pertains to its use and effect on business. Low costs, good quality, and reliable delivery performance are all positively related to TPM directly and indirectly through JIT. On the contrary, many academics challenge the need to study the interplay between several production software packages. For example, maintenance management may be the most challenging aspect of implementing TQM, JIT, or computer-aided production. There is a need to consider how to involve workers in implementing JIT, TPM, quality control, and industrial automation. TQM and TPM constitute the backbone of the JIT manufacturing system.

There are several ways in which ERP serves as a moderating influence on lean manufacturing processes and the efficiency of a firm. Furthermore, reducing transportation waste while transferring goods and resources to a new place, such as a staging area, warehouse racks, or shipping ports. Money is spent on equipment, labour, and time on these tasks. Because of the lack of benefit to either the producer or the consumer, this is a money-losing endeavour. ERP also helps lean manufacturing by providing tools for more innovative production methods and more effective logistics. Plus, there is less of a wait. This may occur because of factors such as a lack of coordination between production staff members or the inability to access crucial information. By centralizing all relevant data in one place, ERP boosts lean manufacturing in this scenario. It aids in locating bottlenecks, making better-informed scheduling and planning decisions, and facilitating the implementation of mission-critical initiatives. Moreover, overproduction is a root cause of every other type of waste in lean production. This occurs when businesses create more of a particular item than is needed by customers or when supplies are manufactured in advance of demand. Overproduction may be avoided and even cured with better supply chain management, purchasing, and demand planning. Thankfully, ERP enhances lean manufacturing by providing purpose-built tools for improved supply chain management, automating the procurement

process, and correctly estimating demand based on historical data and market trends.

5.1. Discussion

H1: JIT has a significant impact on organizational performance.

The hypothesis demonstrates that JIT improves organizational performance. Furthermore, the author discovered that implementing JIT by numerous organizations' owners and shareholders is expected to result in cost reductions, increased efficiency, and higher profit levels. Their key goal in implementing JIT is to retain or strengthen the company′s competitive edge in the marketplace. Furthermore, Bashar et al. (2019) found that implementing JIT manufacturing significantly benefits and directly influences an organization's performance. While the study of Phan et al. (2019) emphasized that using both TQM and JIT production techniques enhances an organization's flexibility performance because both improve the influence of each other to boost an organization's flexibility performance. Furthermore, the results of this study show that the p values are 0.026. Hence, JIT has a significant impact on organizational performance.

H2: TQM has a significant impact on organizational performance.

Based on the findings of this study, the concept that TQM has a favourable influence on an organization's financial presentation is maintained. Furthermore, the author explored that it boosts market share and saves costs through effective product design, resulting in increased revenues for the firm. TQM would also enhance operations by optimizing resource consumption and decreasing waste. Moreover, the results of this research study show that the p values are 0.000. Hence, TQM has a significant impact on organizational performance. Furthermore, Brah et al. (2006) said that TQM and technology significantly influence an organization's overall performance and that TQM has an incredibly significant result on performance when compared to the introduction of lower-level technology.

H3: TPM has a significant impact on organizational performance.

The hypothesis indicates that the TPM exerts a decent influence on the financial performance of a business. Further, the researcher identified that TPM might have quantifiable, enduring outcomes such as higher quality output, enhanced factory maintenance regime, decreased turnover and a proactive culture that 'Takes Pride in its Machinery'. Additionally, Singh et al. (2015) suggest that TQM and TPM confer significantly favourable influence on the operational as well as the financial performance of manufacturing businesses. Furthermore, this study also found the positive influence of TPM on the organization's financial performance. Further, the p values of this study are 0.045. It means that the TPM has a significant impact on organizational performance.

H4: ERP significantly moderates the relationship between JIT and organizational performance.

The hypothesis concerning ERP has a moderating influence on JIT production and organizational performance. Furthermore, the researcher investigated that JIT is a kind of inventory control that necessitates strong association with suppliers so that raw resources arrive when manufacturing is arranged to initiate, but not prior. The notion is to keep as little inventory on hand as likely to accomplish demand. Danese et al. (2012) stated that all JIT manufacturing strategies significantly impact an organization's efficiency and product delivery. JIT supply strategies have also had a moderating influence on the link between JIT manufacturing and product delivery. Moreover, this study also found the moderating influence of ERP on the organization's performance. Further, the p-value of this study is 0.423. Hence, ERP insignificantly moderates the relationship between JIT and organizational performance. This may be because ERP is a push-based strategy, and JIT is a pull-based strategy. Further study should be done in future to find out the reason.

H5: ERP significantly moderates the relationship between TQM and organizational performance.

Based on the findings of this study, the hypothesis that ERP has a moderating influence on TQM and operational performance is supported. TQM may also have an important and optimistic influence on worker and organizational improvement. Firms may build and preserve cultural standards that confirm long-term achievement for both customers and the firm by having all personnel focuses on the excellent organization and systematic development. Furthermore, Valmohammadi et al. (2015) said that organizational culture has a strong influence on an organization's success. Organizations have concentrated on TQM adoption since it has a highly favourable influence on an organization's performance. Thus, it can be claimed that TQM has a favourable impact on an organization's operational performance. Furthermore, this study found that ERP influence on TQM p-value is 0.017 on operational performance, which means the ERP significantly moderates the relationship between TQM and organizational performance.

H6: ERP significantly moderates the relationship between TPM and organizational performance.

The hypothesis concerning ERP has a moderating influence on TPM and operational performance. Further, the researcher discovered that TPM promotes efficiency, control, and profitability. A strong TPM provider will also provide an ERP-agnostic solution. Furthermore, Bashar et al. (2020) said that enterprise resource planning and TPM, directly and indirectly, mediate an organization's operational performance. Furthermore, this study found ERP influence on TPM; the p-value is 0.016 on operational performance, which means the ERP significantly moderates the relationship between TPM and organizational performance.

5.3 Research Implications

Managers of manufacturing companies can benefit from this study's findings. They will better grasp lean manufacturing processes, which might improve manufacturing companies' long-term viability. The findings benefit manufacturing organizations, which may then update the lean manufacturing model in light of the selected lean manufacturing practices that contribute most to long-term success. Due to their positive and substantial influence on organizational performance, process and equipment, product design, supplier relationships, and customer interactions should be combined to enhance the firm's present operational and financial performance. When improving the effects of process and equipment practices and supplier relationships on long-term performance, firms should focus on cultivating a lean culture. On the other side, the theoretical implications of this research are that this research contributes to the academic literature on lean manufacturing by highlighting the importance of lean manufacturing processes in achieving long-term success for the organization. This research adds to the existing body of information by examining how lean culture and manufacturing methods interact to affect long-term productivity.

5.4 Limitations and Future Research

The study accomplishes its aims. However, there are limitations to be considered before the results are extrapolated to the broader population. First, it is essential to note that the study is cross-sectional, so it cannot provide light on how performance evolves. Therefore, long-term research is required to accurately depict the impact of lean manufacturing processes on business output. In addition, data were obtained from a variety of sectors. This study’s conceptual framework may be tested in other nations in future research, expanding the applicability of the findings. Since the effect of lean manufacturing strategies on organizational performance may differ from one industry to another, future studies will need to narrow their focus to a single sector.

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Role of Management Accounting Systems in Sustainable Survival of SMEs in Pakistan: A Conceptual Framework

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ABSTRACT

This conceptual paper proposes a new framework for ensuring Pakistani SMEs' sustainable survival. SME owners always strive to survive in the long run, but most SMEs cannot sustain themselves due to resource constraints. In the ensuing survival of SMEs, the role of management accounting is critical. Management accounting provides financial and non-financial information for planning, controlling and decision-making. This information can persuade SME owners to think in a strategic way which can enhance their strategic thinking. Arguably, management accounting can cognitively engage SME owners by enhancing their strategic thinking, leading SMEs to enhance sustainable survival. Based on these arguments, a conceptual framework has been proposed in which strategic thinking mediates the relationship between management accounting systems and sustainable survival. This conceptual paper has endeavored to advance the understanding of strategic thinking in management accounting scholarship. Furthermore, this paper has also provided practical guidelines for SME owners to concentrate on sustainable survival by developing management accounting systems and focusing on strategic thinking.

Keywords: *SMEs, Management accounting systems, Strategic thinking, Sustainable survival, Cognitive psychology*

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Role of Management Accounting Systems in Sustainable Survival of SMEs in Pakistan: A Conceptual Framework

1. Introduction

Researchers have always been concerned with uncovering a response to what makes some entrepreneurs better than others, especially in SMEs from emerging economies that predominantly struggle with survival (Hyder & Lussier, 2016). Pakistan, a significant developing economy, confronts the same dilemma (Fatima & Bilal, 2019). It is evident that SMEs are a significant part of the economy, and the same is true for Pakistan, where 90% of the businesses are comprised of small and medium firms with a 40% contribution to GDP (SMEDA, 2019). Despite the significance of SMEs, these small and medium enterprises have numerous challenges and constraints in growth and survival owing to limited financial resources (Bilal et al., 2016; SMEDA, 2019). As a result of these challenges, SMEs in Pakistan witnessed a slump in their performance (Fatima & Bilal, 2020). Factors responsible for causing SMEs' failure have induced a significance of sustaining long-term or sustainable survival. For ensuring sustainable business practices, an emerging area of management accounting (MA) for sustainability has received the attention of scholars (Ghosh et al., 2019).

Over the last few years, there has been an escalated interest in building a better understanding of management accounting (MA) usage in organizations (Ma et al., 2022; Nandan, 2010; Perren & Grant, 2000). Notably, from the perspective of small and medium enterprises (SMEs), the usage of MA has become a significant area of concern in management accounting literature (Cleary et al., 2022; López & Hiebl, 2015). MA scholars are engaged in demonstrating a great effort to investigate SMEs (Azudin & Mansor, 2018). The contemporary competitive environment has persuaded SMEs to bring changes to respond to new challenges continuously (Pedroso & Gomes, 2020). These challenges have contributed to the accelerated significance of the quality of information valuable for decision-making purposes (Pedroso & Gomes, 2020). Arguably, in perspective of these challenges, management accounting is critical for managing the business efficiently and effectively (Youssef et al., 2020).

Management accounting systems are much significant that provide information at all levels of an organization. Particularly at the strategic level, there are specific management accounting tools such as "strategy mapping, core competencies analysis, long-range and business planning, risk management, environmental impact assessment, value for money audits, value engineering or value analysis, competitor analysis", etc. (Oyewo, 2021). All these MA tools provide enriched information that is useful for decision-making. In recent research, the role of accounting in generating strategic thinking in managers has been acknowledged, and even this is still an unexplored area of investigation (Aaltola, 2019). Accounting and control literature has highlighted the value of organizational strategizing and innovation activities (Davila et al., 2009). In this line of argument, the traditional accounting perspective focused on just strategy implementation has been questioned, as argued by Aaltola (2019). Scholars Otley (1994), and Kaplan and Norton (2004) have asserted that literature on MA indicates that strategies are interconnected in terms of formulation and implementation and that the role of the employees at various levels of the business lies in the intensive work to sustain its organizational competitiveness. On the other side, research in MA is now witnessing the extensiveness of applying psychology perspectives (Wibbeke & Lachmann, 2020). Kaplan (2018) has asserted that psychological theories can be potentially applied from the perspective of behavioral accounting. Traditionally, MA has been explored by applying various economic, sociological or organizational theories (Hopper & Bui, 2016; Lachmann et al., 2017). Nevertheless, psychological perspectives are scantly discussed in this regard (Wibbeke & Lachmann, 2020).

Considering these gaps in the literature, we propose a conceptual model in which strategic thinking can act as a potential mediator between management accounting and the survival of SMEs. This conceptual paper's contribution to MA scholarship and SMEs in emerging markets like Pakistan is threefold. Firstly, we have presented a novel conceptual model keeping in view the dilemma of SMEs'

survival. Secondly, the perspective of cognitive psychology has been incorporated as a theoretical lens which is highly acknowledged in recent scholarship (Wibbeke & Lachmann, 2020). Lastly, it reveals that the strategic thinking of managers of SMEs can be enhanced based upon information generated by MA, which ultimately addresses the survival problem of SMEs in a better way and endeavors to sustain survival.

2. Literature Review

2.1. Management Accounting in SMEs

Management accounting (MA) pertains to those activities that assist managers in planning, organizing and controlling to enhance organizational efficiency (Shields & Shelleman, 2016; Ahrens & Chapman, 2006). Management Accounting is defined as "a profession that involves partnering in management decision-making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization's strategy". There is a wide variety of MA concepts and tools discussed in the literature, such as budgeting systems, planning, performance management, strategic analysis, and financial and non-financial performance measures (Andersén & Samuelsson, 2016; López & Hiebl, 2015; Drury, 2019; Chand & Dahiya, 2010). Nevertheless, these MA systems are extensively discussed in larger firms where resource constraints are minimal, and managers use management accounting function for handling complex business situations (Ma et al., 2022; Pelz, 2019; López & Hiebl, 2015; Scapens & Bromwich, 2010;). Even Pelz (2019) has argued that the IMA definition of MA is primarily associated with larger firms and overlooks the specificity of SMEs, which is rarely addressed in the literature (Cleary et al., 2022).

Regarding the relevancy or irrelevancy of MA for SMEs, there are two schools of thought in the literature (Pelz, 2019). Some advocates argue that MA is not suitable for SMEs. For instance, planning systems (tool of MA) are not much beneficial for such firms due to the probability of high costs, which SMEs endeavour to avoid (Honig & Samuelsson, 2014; Sarasvathy, 2001). In this perspective, Granlund and Taipaleenmäki (2005) have argued that planning and budgeting systems are unsuitable for SMEs. In contrast to these arguments, other scholars emphasize the usage of management accounting for enhancing the growth of an organization (Davila & Foster, 2005; Davila et al., 2010), and corporate planning generates benefits for business (Ma et al., 2022; Delmar, 2015; Greene & Hopp, 2017). Even recent scholarship in this regard has asserted that the information provided by MA has the capacity to enhance the SMEs' competitiveness (Hamadi & Fournès, 2023; Pedroso & Gomes, 2020). Therefore, Chenhall and Moers (2015) have challenged the argument of the unsuitability of management accounting for SMEs. Because of innovation and specific organizational characteristics, SMEs may have different management accounting systems from larger organizations (Pelz, 2019). Due to this reason, recent research has emphasized exploring MA systems in SMEs (Azudin & Mansor, 2018; Albalushi et al., 2019; López & Hiebl, 2015; Pelz, 2019; Sandalgaard & Nielsen, 2018). Other recent studies (Kuttner et al., 2023; Latif et al., 2023) have argued that MA function in SMEs augments the probability of firm survival). Based on these paradoxes, it can be reasoned that MA is beneficial for SMEs' growth and addresses the survival concerns of these firms.

2.1.1 The role of management accounting in strategic thinking

The concept of *strategic thinking* can be defined in the words of Näsi (1991) as, "strategic thinking extends both to the formulation and execution of strategies by business leaders and to the strategic performance of the total enterprise. It includes strategic analysis, strategic planning, organization and control and even strategic leadership" (p. 29). In general, strategic thinking entails the acquisition of information regarding organizational circumstances to strengthen organizational governance (Ershadi & Dehdazzi, 2019). According to Lončar (2017), businesses that use strategic thinking strategies effectively acquire customers' loyalty and trust while developing and introducing new products. To achieve operational excellence, firms need also be proactive in analyzing and applying the results of strategic thinking (Hameed et al., 2022). Taboli and Baghadam (2016) also underlined

that strategic thinking has a role in innovation, leading to a reassessment of the company's primary operating strategies. Other scholars (Ershadi & Dehdazzi, 2019; Tan, 2017) argued that to determine the management abilities required for globalization, all managers chose *strategic thinking* as an essential skill necessary to enhance managerial performance. As argued earlier, MA provides information for planning, decision making and controlling. Some earlier studies (Davis & Albright, 2004; Van der Stede et al., 2006; De Geuser et al., 2009) have asserted that MA has a critical role in strategy development and implementation to enhance organizational performance. The plausible reason for associating MA with strategy development and implementation is that MA generates financial and non-financial information that is essential in decision-making, including strategic decisions (Oyewo, 2021). Even MA scholarship has focused on strengthening the association between accounting and strategic management (Roslender & Hart, 2003; Nyamori et al., 2001). Due to this association, recent literature has also discussed the significance of accounting in the context of management perspective (Aaltola, 2019).

MA provides information that assists managers at a strategic level; arguably, MA also reflects corporate-level information needs (Cinquini & Tenucci, 2010). Revellino and Mouritsen (2015) have argued that accounting as a calculative practice works as an engine that triggers the process of knowledge mobilization. Aaltola (2019) has also corroborated that MA literature reflects the strategy formulation process. Therefore, MA is relevant for strategy development, and the traditional viewpoint of the unsuitability of MA for strategy is defied (Chenhall & Moers, 2015). There are different MA tools, such as the balanced scorecard has become a significant performance management framework (Kaplan & Norton, 1996; Drury, 2019). Oyewo (2021) has argued that at a strategic level, MA tools such as strategy mapping, value analysis, risk management, long-range and business planning etc. Arguably, these tools generate enriched data that can stimulate the thinking of users of this data. Nevertheless, Aaltola (2019) has argued that in accounting scholarship, little attention is paid to MA and strategic thinking from a managerial viewpoint. Literature has discussed some inconsistencies in this regard. For instance, Brandau and Hoffjan (2010) have asserted the low usage of MA in strategic decision-making. Denis et al. (2006) proclaimed that unexpected results could be assumed under the power of numbers, which further restricts individuals' ability to make reasonable actions. They further asserted that numbers might jeopardize the ability to deal with the complex strategy development process. Asserting the implication of the accounting field in strategy, certain scholars (Nixon & Burns, 2012; Taipaleenmäki, 2014; Langfield, 2008) have argued the absence or partial presence of accounting in a strategic context. Despite this criticism, the role of MA in the strategic management field is evident, thus strategic thinking (e.g. strategy formulation and implementation) as well (Aaltola, 2019). Therefore, recent studies reflect that different MA tools are studied in the context of the strategic management field (Bracci et al., 2022; Krishnan et al., 2022).

As argued earlier, MA and strategic thinking are associated, but previous studies lack a theoretical explanation of this association (Aaltola, 2019). In the recent scholarship of MA, psychological perspectives, particularly cognitive psychology, have gained scholarly attention (Wibbeke & Lachmann, 2020). Earlier, Caplan (1966) argued that MA comprises behavioural functions, which can be analyzed robustly by incorporating psychosocial perspectives in MA (Wibbeke & Lachmann, 2020). The psychology domain exhibits differences in personalities, intelligence levels, and cognitive functions (Anastasi, 1971; Boyle & Saklofske, 2004). Due to this reason, the domain of psychology is thus termed "the scientific investigation of mental processes (thinking, remembering, feeling, etc.) and behavior" (Westen, 2002). Cognitive psychology observes the behaviors of individuals performing various tasks of cognitive nature in order to explore human cognition (Eysenck & Keane, 2010). In this behavior, certain processes are involved, such as perception, language, learning, memory, reasoning, problem-solving and thinking (Eysenck & Keane, 2010). Westen (2002) believes that cognitive psychology focuses on how people perceive, process and retrieve information for decision-making. Previous scholarship has emphasized incorporating psychological perspectives regarding the impact of MA systems and practices at the organizational level (or any non-individual or business unit level) (Hall, 2016).

In cognitive psychology, mental models are significantly addressed, meaning individuals process the information in their heads and try to envisage the possibilities (Johnson, 2013). This concept

is also incorporated in the investigation of diversity in performance management, a type of MA system (Hall 2008, 2011). Conversing about mental models, these exhibit the cognitive and subjection representation of concepts that assist in making judgments and decisions (Birnberg et al., 2006; Hall, 2008, 2011). In the line of this argument, Hall (2008) conversed about performance management systems (MA concept) that influence the psychological aspects, cognition and even motivation that ultimately enhance performance. Based upon arguments of previous scholars' debate in the perspective of cognitive psychology application, MA generates valuable information. Based upon that information, the cognitive aspect can be activated, which may assist in developing strategic thinking. As rightly argued by Hall (2008) that performance management systems influence psychological aspects and cognition. Therefore, MA systems and tools generate the data that influence the decision-makers psychologically, and strategic thinking can be provoked. Based on these assertions, it can be argued that MA can influence strategic thinking.

2.2.2. The role of strategic thinking in sustainable survival

Ahmad et al. (2020) have explained the concept of sustainable survival, which refers to the firm's longevity. They have argued that a firm may achieve sustainable survival after enhancing five key areas: *financial strength*, *customer orientation*, *internal capabilities*, *strategic* perspective, and *learning and growth*. Financial strength is associated with high-profit margins, positive cash flows, high return on capital, and abundant financial resources. Customer orientation revolved around the ability of the firm to maintain long-term customer relations by providing multiple communication channels. Internal capabilities are related to a firm's ability to produce efficient products, strong communication between departments, and robust internal controls. Strategic perspective revolves around communicating a strong vision and developing and implementing strategies. These five aspects jointly form the concept of *sustainable survival* (Ahmad et al., 2020). Ahmad et al. (2019) have termed sustainable survival as corporate sustainable longevity (CSL); arguably, both terms are equivalent. Other scholars (Ahmad et al., 2021; Rashid et al., 2022; Sharma & Salvato, 2013) has associated longevity with the long-term continuity of the firm. Previously, sustainable survival has been addressed from various perspectives. For instance, the role of corporate social responsibility in a family firm's sustainable survival (Ahmad et al., 2020); family involvement in a firm's survival (Ahmad et al., 2021); technology adoption in SMEs survival (Das et al., 2020); survival strategies in enhancing SMEs long term survival (Adebisi & Bakare, 2019); the role of creativity in enhancing SME's resilience (Zutshi et al., 2021); networking abilities in the survival of SMEs (Shah et al., 2019; Baloch & Rashid, 2022); managerial skills on SMEs' success (Ismail & Naqshbandi, 2022; Khan et al., 2022). These recent studies have revealed different factors that enhance the survival of SMEs. Despite the significance of these factors, the role of strategic thinking is scantly addressed in the literature (Aaltola, 2019).

Akinyele and Fasogbon (2010) have discussed that strategic planning has a significant role in affecting the survival rate of the firm. Hashmi et al. (2020) argued that strategic thinking plays a significant role in organizational performance. They further argue that psychological attachment enhances by incorporating all stakeholders in the planning process. Lončar (2017) has also identified the role of strategic management and strategic thinking in the context of strategic planning to plan and deploy business resources to augment business success effectively. Scholarship based on mental models has asserted that strategy maps influence decision-making quality, ultimately impacting long-term profit performance (Humphreys et al., 2016). It is further argued by Hall (2011) that the cognitive process of developing new and confirming existing mental models is supported by performance management systems that affect organizational performance. Theoretically, the mental models are thought of as cognitive representations of external reality and are used for building explanations, reasoning and events anticipations (Jones et al., 2011). In the field of cognitive psychology, theoretical evidence is mounted that people who use mental models are involved in reasoning and making predictions regarding the world around them (Jones et al., 2011). Arguing on the thinking patterns, Houghton et al. (2003) have exhibited that these patterns can influence the sustainability of the work teams from a cognitive perspective. In another research, Dane et al. (2011) argued that those individuals who think about problem-solving can exhibit more creativity. From the perspective of building construction, thinking pertaining to the life cycle approach can stimulate the sustainability of buildings (Ingrao et al., 2018;

Hashmi et al., 2021). All these studies have focused on the cognitive thinking of firms in enhancing their survival. Therefore, drawing on these assertions, strategic thinking can also influence the sustainable survival of the firms.

2.2.3. Strategic thinking as a mediator

As rightly argued by Goldman et al. (2015) an organization's performance depends on managers' thoughts and decision-making skills. Further, they argue that even the characteristics of employees play a crucial role in organizational development and performance. Ahmad et al. (2019) have asserted that an effective strategy plays a critical role in sustaining performance. Hall (2008) asserted that comprehensive performance management systems (type of MA) influence the cognition process and other psychological aspects that ultimately influence managerial performance. As management accounting systems provide the data even at the strategic level (Oyewo, 2021), arguably, data provided by these systems are responsible for stimulating the cognitive process because the formulation of judgments and decisions are based upon mental models (Birnberg et al., 2007; Hall 2008, 2011). To put it differently, MA can arguably be reasonable for cognitive simulation that can play a role in developing strategic thinking. Lončar (2017) also highlighted the role of strategic management and strategic thinking in strategic planning to prepare and deploy business resources efficiently to improve business performance. Ershadi and Dehdazzi (2019) have argued that strategic thinking is a technique that allows businesses to respond competitively to expected environmental changes. In particular, strategic planning provides a company and its environment with an attitude to identify an organization's present position and recognizes critical factors that influence its performance (Ershadi & Dehdazzi, 2019). Therefore, strategic thinking can argumentatively play a role in the success of an organization and reduce the survival problem; in other words, sustainable survival can be enhanced. Consequently, strategic thinking plays a crucial role in transferring the impact of management accounting systems towards ensuring the success and sustainable survival of the firm. In conjunction with the above arguments, we argue that *strategic thinking* mediates the relationship between management accounting systems and sustainable survival. the following conceptual framework has been developed below.

Figure 1: Conceptual framework

3. Discussion and Conclusion

Due to the increased interest in comprehending the factors that put SMEs on the verge of failure (Shepherd et al., 2013), it is ingrained in the owners of SMEs to focus on long-term survival (Fatima & Bilal, 2020). Hence, this study proposes a conceptual model for SMEs in Pakistan, considering the critical dilemma of sustainable survival. This conceptual study addressed the notions of MA systems, strategic thinking, and sustainable survival. Based on the cognitive psychology theory of mental models, we propose that strategic thinking might mediate between management accounting systems and sustainable survival. MA systems, such as performance management systems, influence cognition, motivation, and even self-psychological factors, hence improving performance (Hall, 2008). Performance management systems can facilitate the cognitive process of producing new mental models and validating current mental models, in order to improve firms' growth (Hall, 2011). Further, Hall (2016) has argued that cognitive psychology is advantageous in the study of MA in order to grasp how individuals in organizations interpret information generated by MA systems. Roetzel (2019) stated that as the information load increases, so does the decision-making capacity. Consequently, MA gives information for decision-making and may induce managers to process facts cognitively. Nonetheless,

we suggest that management accounting systems provide information that is actually responsible for stimulating strategic-level thought processes, ultimately motivating an organization to strive for sustainable survival, illustrated in figure 1.

In addition to the conceptual framework presented in figure 1, this has significant theoretical and practical implications. Theoretically, this conceptual paper has endeavored to highlight the research on strategic thinking, which is scantly addressed from the perspective of cognitive psychology (Wibbeke & Lachmann, 2020; Aaltola, 2019). This conceptual paper has also addressed the significance of MA in SMEs in Pakistan, where literature related to MA is also limited (Latif et al., 2023). This paper also contributes by advancing the role of MA in strategic thinking, which is arguably an emerging trend in MA scholarship (Aaltola, 2019; Shahul et al., 2022). Furthermore, this paper has presented that strategic thinking can potentially mediate between MA systems and sustainable survival. Although the literature has addressed the sustainable survival of SMEs from various perspectives, as debated in the literature section, however strategic thinking as a potential mediator is rarely addressed, due to which it has been proposed as a mediator.

3.1. Implications and Limitations

In the practical sense, this proposed conceptual model may assist SME owners and managers in diverting their thinking towards *strategic thinking* so that survival concerns may be diminished. SME owners could develop and improve MA systems in firms that can generate relevant information not only at the operational but also at the strategic level. This information at the strategic level may stimulate SME owners' strategic thinking, which can augment survival probability. Furthermore, SME owners need to invest in developing MA systems where these systems are not present or weakly developed. Literature has also emphasized developing MA systems in such firms to enhance the probability of survival (Latif et al., 2023). Lastly, SME owners should endeavor to develop strategic thinking not at the managerial level but production labor level as well. The plausible reason for this effort is that SMEs do not have strict formal structures, and SME owners have close ties with their workers and labor. Therefore, such workers and laborers must be trained to enhance their strategic thinking to put effort into sustainable survival.

This conceptual paper has limitations, but these limitations suggest a direction for further research. In this study, the conceptual model was proposed but not tested. Future research can empirically test in the setting of SMEs. The addition of potential moderators, such as education, age, experience, etc., is another possible direction in this regard.

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