

The Effect of e-Procurement Technology on Performance of Apparel Industry in Sri Lanka: The Mediating Role of Procurement Practices

R.S.P. Amarathunga¹

*International College of Business & Technology,
Sri Lanka
nethu20030@gmail.com*

H.D.D.Champika Liyanagamage

*Open University of Sri Lanka
hdcha@ou.ac.lk*

Abstract

The apparel industry in Sri Lanka is one of the vital sectors in the country's economy having recorded substantial development over the past. The entire procurement process of the industry, from the purchase of raw materials through to the delivery of the finished product, is crucial to supply chain management and decision-making. Use of electronic procurement technology (EPT), procurement practices, and procurement performance are the three key factors that affect this process. This research aims to explore the relationship among EPT usage, procurement practices and procurement performance of the apparel sector in Sri Lanka. More specifically the study investigates the mediating effect of procurement practices on the relationship between EPT and procurement performance. Data were collected through a structured online questionnaire from randomly selected 40 supply chain and procurement management staff of three leading apparel companies in Sri Lanka. Collected data were analyzed by using SPSS statistical software with descriptive and inferential statistics. The results of the analysis provide evidence for statistically significant positive effects of EPT and procurement practices on procurement performance. Moreover, the study found a statistically significant mediation effect of procurement practices on the relationship between the usage of EPT and procurement performance. Thus, this study contributes to the literature by providing new insight into the importance of investments in new technology for effective procurement processes.

Keywords: e-Procurement, Performance, Apparel industry, Sri Lanka

1. Introduction

Supply chain management is referred to as "the set of interdependent firms that work together to provide a product or service to a customer" (Cox, 1999). The term "supply chain" describes the whole series of processes and planned operations that work

together to transport a product from its place of origin to its end consumer (Croom & Brandon-Jones, 2007). A series of economic transactions are involved during the period when raw materials are converted into a finished product. One of the many things that fall under the purview of supply chain management is making sure that the business has a system in place that maximizes the effectiveness of its people and material assets (Cox, 1999). Businesses cannot maintain its productivity if they do not get the required supplies and services in adequate quantities, on schedule, from reliable sources and at reasonable costs (De Sousa Jabbour et al., 2011). Corporate management and academic specialists cooperate with each other in regulating this significant method of operation and also to make the operational processes simpler by introducing a number of information systems and application technologies (Tseng & Liao, 2015). Recent studies have shown that integrating technological and informational systems into supply chain management can bring about significant benefits. For instance, research has shown that advanced supply chain management technologies enhance efficiency and productivity (Croom & Brandon-Jones, 2007). Some of the emerging technologies that have been discovered in recent years include electronic data interchange (EDI), electronic sourcing and procurement, and electronic auctions (Smith & Correa, 2005).

According to Croom & Brandon-Jones (2007), e-procurement is the use of the internet for commercial transactions. E-procurement is defined as "a technological solution that enables company purchasing through the Internet" (Daniel & Wilson, 2002). It is often the first step in a company's e-commerce journey (Smith & Correa, 2005). Sri Lanka has one of the best supply networks in South Asia's clothing industry, and it relies heavily on e-procurement to keep things running smoothly. Once they shifted their attention from reactive to proactive tactics, a significant improvement was made in their procurement procedures. This was done primarily to address the challenge of increasing the efficacy of procurement procedures (Ssenoga, 2006). As a consequence of applying such methods, companies have been able to build an efficient procurement system that is reliable and transparent. The employment of efficient procurement methods has been a crucial factor in the growth of the thriving clothing industry which has improved its resilience in tough economic situations while maintaining its strategic objectives and quality of production.

The effectiveness of procurement system in supporting organizations in achieving their goals and reducing waste may be attributed mostly to its efficacy and efficiency (Van Weele, 2002). Multiple studies have shown that businesses were to achieve their objectives, maintain growth, reduce waste, and motivate greater performance from their suppliers, they must continually endeavor to improve their procurement performance (Kelegama, 2009). The "procurement effectiveness" statistics measure how well a given procurement strategy achieves its goals (Young, 2022). In addition, it shows comparison between the actual performance and organizational expectations,

which is helpful for management to assess how well their resources are being used and make necessary improvement plans.

A vacuum can be noticed in the published studies regarding the performance of procurement and the various e-procurement technologies, despite the fact that the majority of the available information on electronic procurement focuses on internet procurement (Quesada et al., 2010). Additionally, the impact of procurement practices on the relationship between e-procurement technologies and its performance has not, however, been examined in previous research when it comes to the Sri Lankan apparel industry. It also appears that prior studies have overlooked the potential impact of procurement practices on the connection between e-procurement technologies and procurement performance.

At the same time, while past research has explored the influence of procurement on buying procedures, it has not taken into consideration the effect of procurement practices that impact on the link between e-procurement technologies and its performance, within the context of the Sri Lankan apparel sector. It appears that previous research has not considered the possible effect of procurement practices on the relationship between e-procurement technologies and procurement performance too.

This study aims to analyze how the use of e-procurement technologies in the Sri Lankan apparel industry has affected the efficiency of the supply chain. The goal of this research is to examine the effect of e-procurement technology on the efficiency of conducted procurements. It will also study how procurement procedures may influence the relationship between e-procurement technology and procurement performance. More specifically the study attempts:

1. To explore the degree of e-procurement technology usage of the apparel sector in Sri Lanka.
2. To examine procurement practices and procurement performance in the apparel sector in Sri Lanka.
3. To identify the impact of e-procurement technology and procurement practices on procurement performance in the apparel sector in Sri Lanka.
4. To investigate the mediation effect (if any) of procurement practices on the relationship between e-procurement technology and procurement performance in the apparel sector in Sri Lanka.

One of the most important industries in Sri Lanka is the clothing industry, which utilizes a wide variety of procurement strategies to support its operations. The current study looks at the significance of e-procurement from a more comprehensive angle; as such, it has the potential to add to the existing body of knowledge, which is mostly focused on the effects that technologies have had on the procurement performance.

The information that is gathered throughout the course of the study, as well as the findings of the research, will almost certainly provide additional helpful insights into future business practices, with the end goal being to make e-procurement in the apparel industry in Sri Lanka as efficient as possible enabling it to reduce waste, improve quality and customer satisfaction,

2. Literature review

2.1. Electronic procurement

Purchasing products or services, typically for commercial purposes, is the act of procuring (Rajkumar, 2001). Businesses often have a connection to procurement since they frequently need to make significant purchases of goods and services. The procurement process is frequently included in the organizational strategy because the profitability of operations depends on the ability to get specific goods or services (Young, 2022). From the time of early beginning of commercial transactions, procurement has been a significant economic process of managing a company. Since the times of scribes who wrote their accounts on papyrus scrolls, e-procurement has been utilized into the twenty-first century which has its roots in that era (Jenkins, 2017). This is a wonderful example of how technology has been incorporated into business to increase the accuracy and efficiency of the processes. Research has shown that the use of technological information systems is closely linked with chain management. These new technologies include e-commerce, electronic data exchange, e-sourcing, inter-organizational platforms for e-procurement, and e-auction (De Sousa Jabbour et al., 2011).

The three main processes of electronic procurement, procurement methodologies, and procurement performance are interconnected within the act of procurement (Osmonbekov et al., 2002.) The fact that changing one of these three variables has a considerable impact on the other two, shows that they are interconnected. The primary component of e-procurement is the use of the internet for buying and selling procedures (Puschmann & Alt, 2005). It is a technologically sound solution that accelerates the buying and selling of products and services online (Croom & Brandon-Jones, 2007). Electronic procurement technology includes all forms of electronic communication, information exchange, and transaction. Information gathering and supplier interaction are among the procurement methods, and internal performance and internal customer performance are among the procurement performances (Kelegama, 2009). It should be emphasized that the terms "electronic procurement", "purchasing procedures" and "purchasing performance" refer to three different variables. This literature review primarily investigates the relationship between procurement technology and procurement performance within the apparel

sector in Sri Lanka and the intermediary impact of the procurement practices between the two factors.

According to Kauffman and Cater (2004), e-procurement is viewed as essential for all other supply chain components. They are also of the opinion that traditional procurement methods, such as contracting, market research, and supplier due diligence have a clear association with electronic procurement techniques. In an increasingly competitive market, businesses must adapt to the growing demand for technology in order to fulfill rising customer expectations (Nawi et al., 2016). The Sri Lankan apparel industry is estimated to contribute more than 7% of the country's Gross domestic product (GDP), therefore any reduction in productivity could be harmful to the economy.

Procurement is crucial in influencing the price and caliber of finished items along the supply chain. Switching to e-procurement has become crucial in the business sector with the growth and spread of technology use, partly due to the advantages it offers the company. The majority of companies in Sri Lanka began implementing e-procurement before considering the costs or benefits (Arasa & Achuora, 2012). Businesses must make a concentrated effort to maintain competent and effective procurement processes in the current, fiercely competitive market in order to save administrative expenses and remain up to date with market conditions. The businesses will benefit from this since they will be able to get high-quality products and services at the lowest possible cost. Maintaining such practices would also assist them in quickly obtaining the required number. As a result, most Sri Lankan apparel companies have integrated electronic procurement into their operations (Davila et al., 2003). Customers in the current economy demand products to be produced with the quickest turnaround times and for a fair price (Rajkumar, 2001). For this reason, sourcing companies for textiles and apparel must have a highly efficient process to respond to changing customer demands and maintain their trust and confidence in the final product.

2.2. Procurement performance

The procurement process takes into account internal performance, supplier performance, and internal customer performance (Kingdom & Ombat, 2015). The use of e-procurement must be established for the performance of the procurement to be documented. Unfortunately, the majority of businesses in Sri Lanka's apparel sector are unaware of how e-procurement affects organizational effectiveness and boosts its efficiency (Davila et al., 2003). It may have a significant impact on things like how they manage their annual income, how much money they generate from their investment, and how long it will take them to pay off their obligations. In view of improving the performance of the procurement process, the usage of new

technologies can assist companies to reduce unwanted expenses, manage resources. All this will contribute to improved productivity and efficiency and provide them with an opportunity to access untapped markets. Electronic data exchange use has been proven in studies on the benefits of inter-organizational information systems to considerably improve business operations and engagement with suppliers and customers (Ombat, 2015).

With the supporting relationships with stakeholders, the company will have the potential to influence at an international level and build its reputation within the sector. Due to the seasonal nature of clothing demand and pricing, the textile and apparel industries rely largely on effective procurement (Azadegan & Teich, 2010). Businesses have been able to decrease customer complaints while lowering lead times, fill rates, and service levels as a result of utilizing e-procurement practices (Nawi et al., 2016). In addition, there have been reductions in purchasing expenses, total logistics costs, and procurement cycle time (Kingdom & Ombat, 2015). The efficiency of the supply line will be greatly increased by all of these improvements, which will also keep it competitive. Being a developing country, Sri Lanka must use electronic procurement in the apparel industry to achieve the best outcomes and achieve desired goals.

2.3. Procurement practices

Procurement practices include information gathering, contacting suppliers, contracting, requisitioning, and intelligence/analysis (Quesada et al., 2010). Data gathering, provider search, relationships, and evaluation are a few of the functional processes that are essential elements of procurement practices and will contribute to increased level of operational efficiency (Jayawardhena & Jayaratne, 2018). In order to boost growth and security in the face of uncertain economic conditions, promote collaboration and connections among all parties involved, and enhance growth, manufacturers, such as apparel industry, may need to reevaluate the outdated procurement procedures and make adjustments. Businesses will improve customer happiness, and successfully respond to constantly changing supply chain demands with improved procurement strategies (Gunasekaran & Ngai, 2008).

Procurement practices act as an intermediate factor between e-procurement and procurement performance as the practices have such important information which is essential for the supply chain to function effectively. It includes every supplier contact, for instance, that may be found through electronic procurement. This can then be used to increase the procurement's effectiveness (Azadegan & Teich, 2010). It would also safeguard all information regarding the suppliers, including their effectiveness and legitimacy, for the advantage of their business. Additionally, the information gathering process is handled through procurement procedures, which is

necessary for the firm to make sensible decisions (Nawi et al., 2016). This is also where the acquired data is examined before pertinent information is transmitted up the management chain. It is true that the intermediary component of procurement practices gathers, stores, and makes all the critical decisions for the operation of the company (Jayawardhena & Jayaratne, 2018).

2.4. Association between electronic procurement and procurement performance

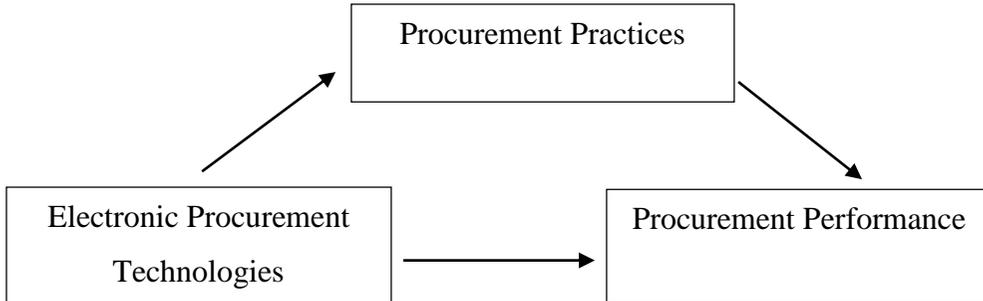
The effectiveness of procurement processes has been proven to be significantly impacted by the usage of e-procurement. Procurement can be seen as the operational element of a company's supply chain (Jayawardhena & Jayaratne, 2018). A corporation can engage in and sustain its operations and business through a variety of methods. Examples of such actions include locating effective sources and negotiating contracts for the purchase of goods and services. Additionally, they would guarantee that proper records are saved and kept for planning and analysis purposes at each stage of the process. Following the introduction of e-procurement, each of these jobs is now completed using technology. As a result, the performance will alter proportionately (Osmonbekov et al., 2002). For instance, because the process will be speedier and more efficient, using e-procurement will increase supplier-related performance. Through the internet, the company has access to a global network that will enable it to find suppliers that can offer the best items at the lowest prices. Using e-procurement will increase customer satisfaction and form profit margins after costs are reduced and quality is improved (Kothari et al., 2007). Such cost-cutting techniques will be of great significance for Sri Lanka and assist the growing industry to improve within the export market. Due to its favorable effects on GDP, the entire nation's economy will profit from this (Gunasekaran & Ngai, 2008).

Electronic procurement will make it possible for transactions to be completed more accurately and efficiently. Due to the fact that all accounting will be done electronically, there won't be much room for error. Accurate accounting will benefit the supply chain greatly, which will improve the performance of procurement. Using E-procurement will also enable a company to examine global economic patterns, allowing it to determine when and how to take risks and make market changes (Osmonbekov et al., 2002). This will be extremely helpful for a developing country like Sri Lanka where exposure to knowledge about investments is quite limited. Kauffman and Cater (2004) have stated that the company would be benefited from the information-sharing process used by e-procurement because it will allow them to improve procurement performance. The new technology will support the business to assess its customers and make wise consumer decisions. The company will be able to

better serve its customers, increase its profit margins, and acquire favorable market exposure if it takes this action.

The conceptual framework developed based on empirical literature is shown in Figure 01 below, which adapts electronic procurement technology as the independent variable and procurement performance as the dependent variable to describe various functionality of each aspect of the framework.

Figure 01: Conceptual Framework



Source: Based on Literature review

As per the theoretical and empirical literature (Davila et al., 2003; Ombat, 2015; Kingdom & Ombat, 2015; Osmonbekov et al., 2002; Jayawardhena & Jayaratne, 2018; Kauffman & Cater, 2004; Nawi et al., 2016), the following hypotheses were derived:

- e-procurement technologies have positive effect on procurement performance.
- e-procurement technologies have positive effect on procurement practices.
- Procurement practices have positive effect on procurement performance.
- The relationship between the e-procurement technologies and procurement performance is mediated by procurement practices.

This study will evaluate the influence of electronic procurement technology on the procurement performance. Since the research topic is based on a service that is being provided through the implementation of technology, the variables focus will be on the aspects that would affect the service being provided. Procurement practices hypothesized to play an intermediate role between e-procurement technology and procurement performance as the practices have such important information which is essential for the supply chain to function effectively (Gunasekaran & Ngai, 2008). Hence, procurement practices hypothesized as the process through which e-procurement technology affects procurement performance.

3. Research Methodology

This study used quantitative research methods with deductive approach. This allows the data to be quantified and examine the results while enabling the research to predict and describe potential trends affecting the industry (Holden & Lynch, 2004). As the study's research objectives can be measured and evaluated through numerical and statistical data, a quantitative approach is more salient for the current research.

Usage of e-procurement technology was measured using three indicators as the degree of usage electronic communication, information exchange and electronic transactions (Azadegan & Teich, 2010). Internal performance (reduce inventories, reduce transaction time, reduce transaction cost, reduce paperwork, and reduce search cost) and supplier related performance (data sharing improvements with suppliers, increase supplier communication, partnership improvement with the suppliers) have been used to measure procurement performance (Kingdom & Ombat, 2015). Procurement practices were proxied through few indicators as; effectiveness of information gathering methods, effectiveness of supplier contracting practices, effectiveness of order requisition practices and degree of analyzing and negotiating (Jayawardhena & Jayaratne, 2018).

Three large-scale companies in Sri Lanka's apparel industry took part in this research. Data were gathered from a random sample of 40 employees of those businesses who are supply chain and procurement managers. "If the research has a relational survey design, the sample size should not be less than 30, and the study should include at least 30 samples" (Borg and Gall, 1979 cited in Cohen et al., 2000). The population for this sample was 160 employees who were from the lower management to upper management and had knowledge of the process of procurement. The sample of the study represents 25% of the population. This ensured that the information gathered was relevant to the research and the respondents were able to provide answers with increased accuracy and confidence. The front-line employees are excluded from this sample as they do not have a direct knowledge or involvement in the practice of e-procurement.

An online survey was the main method used to gather data, and was distributed to a selected sample from three companies chosen for this study. This online survey can only be accessed via Google form and a link was sent to relevant people through email and WhatsApp. The respondents to this self-evaluation survey must select one of the responses from a 5-point Likert scale that has the ability to record respondents' opinion that may range from strongly disagree to strongly agree. The survey consists of three questions related to the respondent's demographics and nine statements related to e-procurement technologies within the company, e-procurement practice and performance. Prior to the completion of the survey, all respondents were able to read a brief description of the study, the reason for data collection, and the importance

of privacy. Only the English language version of the questionnaire was made available. To further strengthen the research's conclusions, secondary data from peer-reviewed papers and articles were employed. The data was analyzed using SPSS, a statistical software for social research. Factor analysis and Cronbach's alpha were used to examine the validity and reliability. Regression analysis was conducted and Sobel's test was used to examine the mediation effect.

4. Analysis and Discussion

4.1. Analysis of Demographic Variables

Based on the demographic analysis, the total number of 40 employees who responded to the online questionnaire on e-procurement included 27.5 percent of females and 72.5 percent males. The majority of the respondents belonged to the upper management category which was at 47.5 percent while the lowest category was the operational management which represented only 20 percent of the total number of respondents.

4.2. Descriptive Analysis of Research Variables

With regard to the responses to the questions pertaining to the variables of the study, 60 percent of the responded disagreed that their company use the e-procurement technologies (EPT) for communication tasks while another 32.5 percent strongly disagreed to the same. While no one agreed to the use of EPT within their company, 7.5 percent of the participants, however, responded to the question as neutral. Similarly, while 82.5 percent of the people disagreed and totally disagreed to the EPT in relation to information exchange, another 5 percent agreed in this regard. The use of EPT in relation to transactions were disagreed and strongly disagreed by 70 percent of the participants, 20 percent of them responded as neutral while the rest agreed.

Responses related to the procurement practices related tasks of gathering information, supply contacting, contracting and requisitioning, the majority of the participants disagreed or strongly disagreed (72.5 percent) the fact that the company gathers information of their supplies and previous contracts before to assess their quality and suitability. Similarly, 37.5 and 45 percent strongly disagreed and disagreed respectively of the fact that the procurement department do request quotes (RFQ), proposals (RFP) and bids when making decisions to choose their suppliers. The data in relation to the company's effort to negotiate with the suppliers regarding price, quality, standards and delivery schedules show that all respondents have either disagreed (45 percent) or strongly disagreed (55 percent) to this statement. The data also show that 87.5 percent of the respondents disagree that their procurement

department approves orders, processes supplier invoices and processes payments, when requisitioning orders.

When it comes to the internal performance of the company, 52.5 percent of the respondents disagreed related to reduction in their transaction time and cost. They were also in disagreement in the way in which the quality is assessed in raw materials to minimize any defects. Additionally, in relation to the improvement of internal performance, 30 percent of the people have responded as neutral while another 17.5 percent has responded as agreed. The study also reveals that the majority of respondents (87.5 percent) indicated as disagree or strongly disagree when related to the improved communication with their suppliers, improved trust in the quality of raw materials and the partnership the company has with the supplier.

Alpha values for e-procurement, procurement practices and procurement performance were found as 0.875, 0.703 and 0.701 respectively. This suggests that the reliability of the items under has a good internal consistency.

Table 01: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
e-procurement technologies	40	1.00	5.00	2.0000	.56488
Procurement practices	40	1.00	5.00	1.7438	.39013
Procurement performance	40	1.00	5.00	2.2875	.72402
Valid N (listwise)	40				

Source: Survey data

The mean value of procurement performance was found as 2.28 ($SD = .72$) which has the highest average for the series of items. The lowest value is found with the procurement practices which has a mean value of 1.74 ($SD = .39$). Mean value of e-procurement technologies are 2.00 ($SD = .56$). Based on the mean values of e-procurement technologies, it is evident that the level of usage of e-procurement within the apparel industry is low. It also shows the mean value of procurement practices is 1.7438 indicating the procurement practices is at a lower level in the sector. Finally, the descriptive analysis indicates the mean value of procurement practices as 2.2875. This indicates that the procurement performance is at a lower level in the apparel industry.

4.3. Regression Analysis

Regression analysis was conducted to examine the effect of each independent variable on the dependent variable.

Table 02: Results of the regression analysis - the effect of e-procurement technologies (EPT) on procurement practices

Model summary					
	R	R Square	Adjusted R square	S. E	
e-procurement Technologies	.546	.298	.279	.716	
a. Predictors: (constant), e-procurement technologies (EPT)					
ANOVA					
	Sum of Square	df	Mean Square	F	Sig
Regression	8.283	1	8.283	16.128	.000
Residual	19.515	38	.514		
Total	27.798	39			
a. Dependent Variable: Procurement performance					
b. Predictors: (constant), e-procurement technologies (EPT)					
c. *** significant at 1% level					
Coefficients					
	B	S.E	Beta	t	Sig
Constant	1.695	.282		6.016	.000
e-procurement technologies	.326	.081	.546	4.016	.000

a. Dependent Variable: Procurement performance

b. *** significant at 1% level

Source: Survey Data

The analysis above shows that there is a statistically significant direct effect of the independent variable, e-procurement technologies on procurement practices ($p < .001$).

Table 03: Results of the regression analysis – the direct effect of e-procurement technologies (EPT) on procurement performance

Model summary				
	R	R Square	Adjusted R square	S. E
e-procurement Technologies	.596	.356	.339	.895

a. Predictors: (constant), e-procurement technologies (EPT)

ANOVA

	Sum of Square	df	Mean Square	F	Sig
Regression	16.837	1	16.837	20.974	.000
Residual	30.506	38	.803		
Total		39			

- a. Dependent Variable: Procurement performance
- b. Predictors: (constant), e-procurement technologies (EPT),
- c. *** significant at 1% level

Coefficients

	B	S.E	Beta	t	Sig
Constant	1.710	.352		4.854	.000
e-procurement technologies	.465	.102	.596	4.580	.000

- a. Dependent Variable: Procurement performance
- b. *** significant at 1% level

Source: Survey Data

The analysis above shows that there is a direct effect of the independent variable, e-procurement technologies on the dependent variable i.e., procurement performance ($p < .001$) which is statistically significant.

Overall, the statistical analysis has shown that there is a statistically significant effect of the e-procurement technologies and procurement performance ($P < .001$). As evident by prior studies, this research also show that the use of modern technologies related to procurement will have a positive influence on procurement performance (Davila et al., 2003; Ombat, 2015; Kingdom & Ombat, 2015).

Table 04: Results of the regression analysis - the direct effect of procurement practices on procurement performance

Model summary

	R	R Square	Adjusted R square	S. E
e-procurement Technologies	.707	.500	.486	.789

- a. Predictors: (constant), Procurement Practices

ANOVA

	Sum of Square	df	Mean Square	F	Sig
Regression	23.650	1	23.650	37.931	.000
Residual	23.693	38	.624		
Total	47.344	39			

- a. Dependent Variable: Procurement performance

- b. Predictors: (constant), Procurement practices
 c. *** significant at 1% level

Coefficients

	B	S. E	Beta	t	Sig
Constant	.668	.428		1.563	.126
Procurement practices	.922	.150	.707	6.159	.000

- a. Dependent Variable: Procurement performance
 b. *** significant at 1% level

Source: Survey Data

The analysis above shows that there is a direct effect of the, procurement practices variable on the dependent variable i.e., procurement performance ($p < .001$).

Table 05: Results of the multiple regression analysis - the effects of e-procurement technologies (EPT) and procurement practices on procurement performance.

Model summary

	R	R Square	Adjusted R square	S. E
e-procurement Technologies	.750	.563	.539	.748

- a. Predictors: (constant), e-procurement technologies (EPT), Procurement practices

ANOVA

	Sum of Square	df	Mean Square	F	Sig
Regression	26.640	2	13.320	23.804	.000
Residual	20.704	37	.560		
Total	47.344	39			

- a. Dependent Variable: Procurement performance
 b. Predictors: (constant), e-procurement technologies (EPT), Procurement practices
 c. *** significant at 1% level

Coefficients

	B	S.E	Beta	t	Sig
Constant	.509	.411		1.238	.223
Procurement practices	.709	.169	.543	4.185	.000
e-procurement technologies	.234	.101	.300	2.311	.026

- a. Dependent Variable: Procurement performance
 b. *** significant at 1% level

Source: Survey Data

The regression analysis shows that e-procurement technology ($p = .026$) and procurement practice ($p < .001$), as individual predictors have an effect on the procurement performance. Regression model is statistically significant as p- value

of .000 is less than the alpha value of .05. This means that, both the independent variables (procurement practices, e-procurement technologies), taken as a set, will have a statistically significant influence on the dependent variable, procurement performance. The mediation analysis is conducted to identify the effect between the e-procurement technologies and the procurement performance as mediated by the procurement practices by use of the regression model.

Table 06: The results of the Sobel Test

Input:		Test statistic:	Std. Error:	p-value:
a	.326	Sobel test: 2.90431718	0.07958291	0.00368055
b	.709	Aroian test: 2.86228237	0.08075164	0.00420602
s _a	.081	Goodman test: 2.94826003	0.07839675	0.00319568
s _b	.169	Reset all	Calculate	

Source: Survey Data

Sobel's test was used to examine whether the mediation effect of procurement practices is significant on the relationship between the EPT and procurement performance. The first step was to measure the effect of the e-procurement technologies on the procurement practices which is indicated by “a” in the above table. Then the effect of procurement practices on procurement performance was calculated and this result is indicated by “b”. As per the Sobel test analysis this indirect effect between the EPT and procurement performance via the mediating variable of procurement practice is statistically significant, $p = .003$ (see table 06 above). The total indirect effect is estimated at 0.231 (.326 x .709). The current study indicates the relationship between the degree of e-procurement technologies and procurement performance is mediated by procurement practices. This suggests that while utilizing effective e-procurement technologies along with efficient procurement practices, it will bring about the best result for the company in terms of procurement performance.

The study demonstrates that the apparel industry in Sri Lanka is yet to understand the value of employing e-procurement technologies to increase productivity, cut waste, and improve efficiency in sourcing and procuring goods and services. This is consistent with research done by Jayawardhena and Jayaratne (2018) who noted that many Sri Lankan garment companies can and should welcome and invest more in cutting-edge technologies in the procurement process. The study further adds to the body of evidence that investment on innovative technologies within business practices will enable them to be creative and resilient within tough market environments. Liyanage (2005) is of the view that businesses who are hesitant to

adopt new and innovative technologies should consider the evidence in order to build strong relationships with suppliers and customers and raise customer satisfaction.

As evident from this study, the implementation of e-procurement technology and effective procurement practices will have a direct impact on the company's procurement performance. The significance of procedures and practices further suggests that vital information about business transaction between suppliers and contracts will have an influence on the internal performance and supplier performance. This means that it impacts how the company maintains long-term relationships with stakeholders as well as the quality of raw materials and trust and confidence in buyers. According to Dhillion (2018) when a corporation is able to cut waste in terms of time, money, and resources, it will enhance the intended business outcomes.

The study conducted by De Sousa Jabbour et al. (2011) has emphasized, businesses which have been successful in integrating e-technologies into their procurement procedures have been able to build more effective information systems, which has resulted in the avoidance of delays and a decrease in operational logistics-related expenses. The current study demonstrates the considerable influence of e-technologies on procurement methods, allowing businesses to assess the protocols for information storage and sharing with stakeholders in order to deliver goods on schedule and within budget. The meditative effect of procurement practice on the relationship between e-procurement and procurement performance cannot be underestimated, as this research makes clear. A high level of information management and high-quality processes are required in addition to advanced technology for success (Varajao et al., 2021). Any delays will result in line idling, overtime payments, garment air freight, and lost sales, thus it is imperative to arrange inspection, cutting, production, and finishing as planned.

Despite the known many advantages of increased use of e-technologies for efficient procurement practices and performance, the study shows the companies that have been asked to participate in the study still have a significant amount to fulfill before implementing procurement strategies for the best interest of their companies. It highlights the fact that despite the existing successes and achievements of the companies, it has potential for growth and sustainability. Increased attention to procurement practices will further strengthen the communication and contracting aspects of the procurement process allowing the company to be highly agile in their operations and logistics and help improve overall performance. Selecting proper procurement strategies and procedures are significant in the entire procurement process and mistakes may delay manufacturing, hence choosing the right procurement strategy is crucial. Higher costs might be incurred, which could be detrimental to the company's reputation.

5. Conclusions and Recommendations

The study aims to explore and investigate three significant contributors in the process of procurement of goods and services within the apparel industry in Sri Lanka. The main contributors were identified as e-procurement technologies (EPT), procurement practices and procurement performance. It also examines the mediator effect of the procurement practices and the degree of relationship between the EPT and procurement performance. In addition, the objectives of the research included, understanding the use of EPT within the apparel sector and investigate whether there is a positive effect of EPT and procurement practices on procurement performance.

One of the issues the apparel industry is facing is that it cannot depend on traditional ways of doing business (Nawi et al., 2016) but needs to utilize current and advanced technologies to maintain their business relationships with suppliers and customers as well as minimize cost in view of sustaining their businesses with the competitive market conditions. While some apparel companies have taken onboard with the current trends, it is found that many companies are still reluctant to invest money for effective and efficient processes for diverse reasons (De Sousa Jabbour et al., 2011; Davila et al., 2003). While some studies have been conducted on the impact of EPT and procurement practices or procurement performance, no research has been conducted to recognize the mediator effect of the procurement practices on the relationship between EPT and procurement performance.

Procurement practices such as information gathering, supplier contact, contracting, requisitioning are significant tasks that contribute towards securing long-term business partnerships, quality assurance of products and delivery of products on time and on budget. These information and procedures are vital for the business decision making process and ensure that relevant stakeholders are properly contacted and informed at the correct time and respond to their queries with facts and figures. Hence, the study has considered procurement practices to be the mediating variable between the EPT and procurement performance.

The study shows that investment on new technologies and efficient procurement practices will have a significant impact on the company's procurement performance. This will support the apparel sector to continue the sustaining of their business through challenging market conditions while maintaining high level of trust and confidence among their suppliers and customers. It will also assist the company to minimize waste and improve productivity and efficiency.

The study provides evidence for maintaining supplier-management relationships through technologically advanced e-procurement processes to enhance the organizational efficiency and productivity. The digitalization of all aspects of the procurement process will assist the company to save money, resources and time while maintaining quality of products and relationship with their significant stakeholders.

This implies the activation of a proactive quality management system and the assignment of sub-tier contracts to auxiliary vendors. This will ensure that the company is prepared for the first step in the implementation process ensuring the vendors with whom the company is associated are embracing innovative technology and using their own forms of real-time data. Following that, it is critical to integrate the resulting data streams and leverage an analytics platform capable of identifying mission-critical supply trends. By ensuring that e-procurement strategy is effectively implemented and procurement department is well resourced and prepared, it will help the company to operate efficiently in a cost-effective manner. Making the right decisions, based on shared knowledge, common data and analysis, necessitates the existence of all information with a shared viewpoint, language, and methodology, ideally, on a cloud-based platform.

6. Limitations and Future Research

Given that the research investigates procurement procedures and e-procurement technologies with three large organizations that are a part of the apparel industry, it is likely that the findings may not be directly related to the smaller businesses within the garment industry. This is due to the fact that it is quite possible that the findings will lose some of their relevance as a consequence of the outcomes, and it is also highly likely that this will take place. It is recommended to conduct research with a larger population across small to large scale companies in the sector for greater reliability and generalization. Since the current study has had only 40 participants and from large scale apparel companies in Sri Lanka, the study's validity for the whole sector will be limited.

While there are numerous factors influencing procurement performance other than the e-procurement technologies and procurement practices, further research can be extended to either more independent variables or other factors that will have a positive effect on procurement performance. This will further assist companies to gain a better picture of different factors impacting the procurement performance and engage in proactive actions to enhance their procurement processes.

This study provides an insight into the procurement performance on e-procurement technologies by the mediating effect of the procurement practices. This study concentrated on primary data received through an online survey. As the population were from three large scale apparel companies in Sri Lanka, it not surprising that the use of EPT is at a high level. However, the analysis has provided adequate evidence for the sector on the importance of embracing new and advanced technology in the procurement process to improve its trust and confidence with suppliers and customers. It has shown that vital and modern infrastructure when securing goods and services from the time of planning to delivery of the finished products can make

a difference at the company's bottom line and its survival especially within volatile market environments.

References

- Arasa, R.M., & Achuora, J.O. (2012). Antecedents to successful adoption of e-procurement in textile and apparel firms in Kenya. *International Journal of Scientific and Engineering Research*, 3(10), pp. 1-9.
- Azadegan, A., & Teich, J. (2010). Effective benchmarking of innovation adoptions: A theoretical framework for e-procurement technologies. *Benchmarking: An International Journal*, 17(4), pp. 472-490.
- Croom, S., & Brandon-Jones, A. (2007). Progress on e-procurement: experiences from implementation in the UK public sector. *Journal of Purchasing and Supply and management*, 13(4), pp. 294-303.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research methods in education* (5th ed.). London: Routledge/Falmer.
- Smith, A.D., & Correa, J. (2005). Value-added benefits of technology: E-procurement and e-commerce. *International Journal of Health Care Quality Assurance*, 18(6), pp. 458-473.
- Cox, A. (1999). Power, value and supply chain management. *Supply Chain Management: An International Journal*, pp. 4(4), 167-175.
- Daniel, E., & Wilson, H. (2002). Adoption intentions and benefits realized: a study of e-commerce in UK SMEs. *Journal of Small Business and Enterprise Development*, 9(4), pp. 331-348.
- Davila, A., Gupta, M., & Palmer, R. (2003). Moving procurement systems to the internet: The adoption and use of e-procurement technology models. *European management journal*, 21(1), pp.11-23.
- De Sousa Jabbour, A. B. L., Filho, A.G.A., Viana, A.B.N., & Jabbour, C. J.J.(2011). Measuring supply chain management practices. *Measuring Business Excellence*, 15(2), pp. 18-31.
- Dhillon, H. (2018). Iron triangle: Triple constraints of project management. [Online]. Available at <https://medium.com/@harpreet.dhillon/iron-triangle-triple-constraints-of-project-management-e818e631826c> [Accessed 02 08 2018].
- Gunasekaran, A., & Ngai, E. W. T. (2008). Adoption of e-procurement in Hong Kong: An empirical research. *International Journal of Production Economics*, 113 (1), pp. 519-175.
- Holden, M.T., & Lynch, P. (2004). Choosing the appropriate methodology: Understanding research philosophy. *The marketing review*, 4(4), pp.397-409.

- Jayawardhena, M.U., & Jayaratne, P. (2018). Evaluation of adopting e-procurement and its impact on performance in apparel supply chain in Sri Lanka. [Online]. Available at:
https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&as_vis=1&q=Evaluation+of+adopting+e-procurement+and+its+impact+on+performance+in+apparel+supply+chain+in+Sri+Lanka&btnG [Accessed 1 08 2022].
- Jenkins, A. (2017). Procurement and profitability. [Online]. Available at: <https://www.netsuite.com/portal/resource/articles/accounting/procurement.shtml>; [Accessed 1 09 2022].
- Ombat, K.O. (2015). The relationship between e-procurement systems and performance of procurement function in commercial banks in Kenya. *International Journal of Economics, Commerce and Management*. Vol. III, Issue 12, December 2015. ISSN 2348 0386.
- Kauffman, L., & Cater, C. (2004). Deciding on the mode of negotiation: to auction or not to auction electronically. *Journal of Supply Chain Management*, 40(2), pp.15-26.
- Kelegama, S. (2009). Ready-made garment export in Sri Lanka. [Online]. Available at: <https://www.semanticscholar.org/paper/Ready-made-Garment-Exports-from-Sri-Lanka-SAMAN/Kelegama/b3461967776db68b074519b902bbf0270bcf50c3> [Accessed 20 06 2022].
- Jooste, M.V., & van Schoor, C. de W. (2003). A framework for the implementation of e-procurement. *South African Journal of Industrial Engineering* 2003 14(2): 1-22.
- Kothari, T., Hu, C., & Roehl, W. S. (2007). Adopting e-Procurement technology in a chain hotel: An exploratory case study. *International Journal of Hospitality Management*. 26. 886-898. 10.1016/j.ijhm.2006.01.005.
- Liyanage, D. (2005). Reforms to the public procurement policy of Sri Lanka. [Online]. Available at: <https://tropicalclimate.org/data/SLDF05/paper-10.pdf> [Accessed on 02 09 2022].
- Nawi, N.M.N., Roslan, S., Salleh, N.Z., Zulhumadi, F., Harun, A.N. (2016). The benefits and challenges of e-procurement implementation: A case study of Malaysian company, *International Journal of Economics and Financial Issues*, 6 (7), pp. 329–332.
- Osmonbekov, T., Bello, D. C., & Gilliland, D. I. (2002). Adoption of electronic commerce tools in business procurement. *Journal of Business & Industrial Marketing*, 17(2/3), pp. 151-166.
- Puschmann, T., & Alt, R. (2005). Successful use of e-procurement in supply chains. *Supply Chain Management: An International Journal*, 10(2), pp. 122-133.

- Quesada, G., Gonzalez, M. E., Mueller, J., & Mueller, R. (2010). Impact of e-procurement on procurement practices and performance. *Benchmarking: An International Journal*, 17(1), pp.516-538.
- Rajkumar, T.M. (2001). E-procurement: business and technical issues. *Information Systems Management*, 18(4), pp.52-60.
- Ssenoga, F. (2006). Examining discriminatory procurement practices in developing countries. *Journal of Public Procurement*, 6(3), pp. 218-249.
- Tseng, P., & Liao, C. (2015). Supply chain integration, information technology, market orientation and firm performance in container shipping firms. *The International Journal of Logistics*, 26(1), pp. 82-106.
- Varajao, J., Trigo, A., Pereira, J.L.M., & Moura, I.C. (2021). Information systems project management success. *International Journal of Information Systems and Project Management*, 9(4), pp. 62-74.
- Van Weele, A.J. (2002). *Purchasing and supply chain management. Analysis, Planning and practice* (3rd Edition). Thomson Learning, London.
- Young, J. (2022). What is procurement? How it works in business and accounting. [Online]. Available at: <<https://www.investopedia.com/terms/p/procurement.asp>> [Accessed 1 08 2022].