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Evaluation of E-procurement Adoption and its Impact on Apparel Supply Chain Performance

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1. Introduction

E-procurement is the use of internet and technology to replace manual activities in the procurement process. According to Nawi et al. (2016) e-procurement is the automation of an organisation's procurement processes using web-based applications [1]. When looking at the apparel industry, apparel design, manufacturing, and exportation can be considered as parts of one of the biggest manufacturing industries in Sri Lanka, which plays a major role in the advancement of economy. Propelled by globalisation, the apparel industry must cope with high demanding customers. Consumers in today's market demand products to be produced at a competitive price with the fastest turnaround time possible. Textile and apparel sourcing companies, therefore, have to be nimble enough to respond promptly to changing consumer preferences and value-added activities [2]. This research focuses on implementing e-procurement in apparel supply chain and elaborates factors affecting its implementation, challenges in implementing e-procurement and the impact of e-procurement strategies on the performance of the apparel supply chain.

2. Literature review

Researchers have defined e-procurement in different ways in relation to different aspects. E-procurement can be termed as the modern way of utilising electronic tools like the internet and e-mail for business-to-business purchases. Besides, it also helps to source and provide services for online sales using internet-based technology [3]. Numerous researchers have explored the benefits of and barriers to implementing e-procurement in different industries. As per the researcher's knowledge, the existing literature mainly covers banking, construction, tea, and hospitality industries. Use of e-procurement in obtaining contracts supports in achieving benefits such as increased efficiency of employees, saves costs by getting cheaper goods and services at a faster pace, improves transparency and reduces corruption in procurement services among employees and managers.

Moreover, it is claimed that a company engaging in e-procurement can reduce costs by 8% to 15% [4]. It is expected that the emergence of web based e-procurement would

reduce the order fulfilment cycle time, lower inventory levels, and enhance order fulfilment [4]. Literature relevant to e-procurement and the performance of organisations are rarely found. According to Tai et al. (2010), many companies fail to see the impact of e-procurement on organisational performance, especially in developing countries like Sri Lanka. It has both long-term and short-term influences on performance [5]. These impacts include rate of return on investment, payback period, profit, and annual revenue.

3. Methodology

An extensive literature survey was carried out to identify the foundation for the questionnaire focusing on the themes such as type of e-procurement system used, their general benefits, barriers to implementing e-procurement and key performance indicators used to measure performance increment resulting from e-procurement. Based on the findings of the literature review, a questionnaire was developed, and primary data was collected using this questionnaire. This questionnaire mainly collected information on benefits gained by e-procurement, the extent of barriers affecting implementation and data which can be used to measure latent variables in proving the third objective. The data was collected on the basis of perception using Likert-scale. The questionnaire was distributed to around 100 industry practitioners in Sri Lanka using an online form and via email. Thirty responses were collected, where most of the respondents were managers employed at different levels in procurement and supply chain divisions. This assured the accuracy and relevance of information because all respondents are experienced and knowledgeable in the field.

4. Data Analysis and Results

Descriptive analysis was used to determine the key benefits of implementing e-procurement. Analysis shows that there are several key benefits achieved by the organization in implementing e-procurement. This includes benefits such as eliminating paperwork, visibility and transparency in transactions, and reduction of errors.

There are certain barriers to e-procurement and an exploratory analysis was used to identify them. Research shows that to proceed with factor analysis the KMO value (Kaiser-Meyer-Olkin Measure of Sampling Adequacy) of the sample should be greater than 0.5. In this case, the KMO value is 0.685. Therefore, the data set is appropriate to continue with factor analysis. The output from EFA (Exploratory factor analysis) extracted three basic factors: Organizational barriers, Human Resources barriers and External barriers.

Table 1 shows these factors and the observed variables which belong to each. Reliability of extracted factors was determined through Cronbach's Alpha test. Research shows that for a factor to be reliable the Cronbach's Alpha value should be greater than 0.7.

As shown in Table 1, the Cronbach's Alpha values obtained for each factor is above 0.5, implying the obtained factors are reliable.

Table 1: Barriers and Cronbach Alpha for each factor

Factor	Variables
Organizational Barriers Cronbach's Alpha value - 0.889	Lack of expertise
	Cost of implementation
	Security concerns in information exchange
	Security concerns in online transactions
	Interoperability with existing
	Organizational policies
	Lack of new technological implications
Human Resources-related Barriers Cronbach's Alpha value - 0.762	Lack of motivation of employees
	Lack of top management support
	Resistance to change to new technology
External Barriers Cronbach's Alpha value - 0.767	Suppliers not willing to adopt e - platforms
	Difficulty in integrating organization information systems with suppliers
	National policies

Table 2: Variables used in objective 3

Latent Variable	Observed Variables
E-procurement usage	Level of usage of, • Online ordering • Electronic payment • Electronic catalogues • E tendering • Electronic data interchange • Communication with suppliers • Searching of suppliers • Order status control
Performance of the organization	Level of increase of, • Lead time reduction • Improve fill rate • Improve service level • Reduction in customer complaints • Reduce purchasing cost • Reduce total logistics cost • Reduce procurement cycle time

Objective 3 of the research was to identify the impact of using E-Procurement on the performance of the organization. Confirmatory factor analysis (CFA) and Structural equation modelling (SEM) were used for this purpose. Table 2 shows the observed and latent variables used to develop the model to carry out the CFA analysis. It was developed to measure the relationship between e-procurement usage and the performance improvement in the organization. To test the validity and the reliability of the model, CFA analysis was carried out using SPSS Statistics 21 software. Construct validity of the CFA model was determined through the indices chi-square/df (0.95), RMSEA (0.0), CFI, PClose (0.743). All the indices are found to be satisfactory.

Reliability of the model was tested using Cronbach's alpha test and the values obtained are,

- Performance - 0.896
- E-procurement usage - 0.745

After ensuring suitability of CFA, SEM analysis was carried out and based on the finding the SEM model was developed as shown in Figure 1. The hypothesis tested through SEM was

- H1 - E-procurement implementation has a positive impact on the performance of an apparel organization

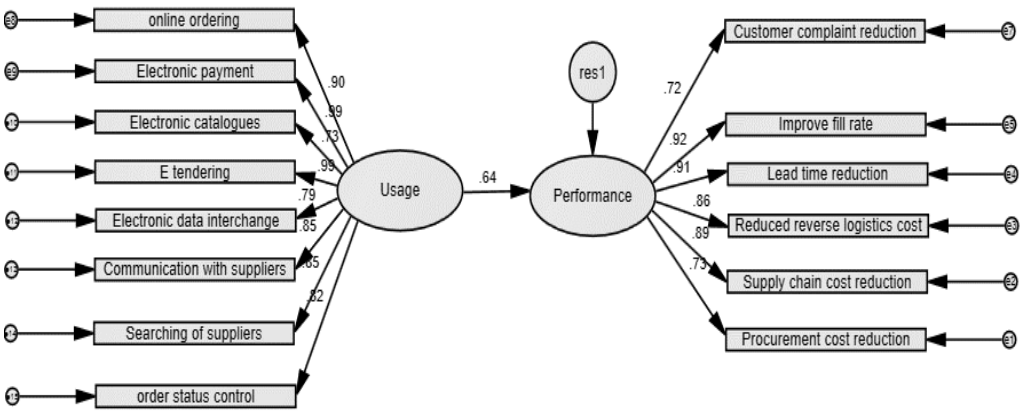

Figure 1: SEM output

The validity of SEM model was determined through the same indices used in CFA and same values were obtained. Considering the findings of the CFA and SEM analysis, H1can be accepted.

Figure 2 shows the extracted result from SEM. The output can be explained as 1% usage of e-procurement improves the performance of an apparel organization by 0.64%.

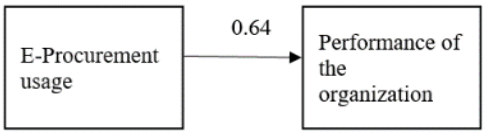

Figure 2: Relationship diagram

5. Conclusion

This research focused on three objectives. First it explored the benefits of using e-procurement. Findings show reduction of paperwork, improved visibility in transactions and reduction of errors as top three benefits. Secondly, it studied the barriers to implementing e-procurement. It shows that internal organization, human resources and external stakeholders stand as barriers when implementing e-procurement functions. Finally, through the study it is concluded that e-procurement has a positive impact on the performance of apparel organizations. When the usage of e-procurement is increased by 1%, the performance of the organization is enhanced by 0.64%.

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