Operational efficiency to financial efficiency – a case study on 'apparel sector' in Sri Lanka

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Abstract: This is an era of economic instability and high inflation in Sri Lanka. Apparel sector is the largest gross export which contributes as the largest net foreign exchange earner from 1992 in Sri Lanka (Dheerasinghe, 2009). In 2002, the apparel industry in Sri Lanka contributed almost 6% of the GDP with a primary foreign exchange value of 40% from exports and 52% from industrial products exports (Embuldeniya, 2015). As a leading apparel brand in Sri Lanka, the ABC Company continuously faces a decreasing movement in operational efficiency. This research examines the factors affecting towards the operational efficiency of the ABC Company to avoid operational inefficiency. Therefore, as a major finding of the study, it has identified the inventory management as the most largely affecting factor towards operational efficiency and the second highest influencing factor as the labour productivity. The least influencing factor is the information system management.

Keywords: economic stability; major export; operational efficiency; financial efficiency; apparel industry; Sri Lanka.

Reference to this paper should be made as follows: Jayawardena, N.S. (xxxx) 'Operational efficiency to financial efficiency – a case study on 'apparel sector' in Sri Lanka', *Int. J. Services and Operations Management*, Vol. X, No. Y, pp.xxx–xxx.

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1 Introduction

The demand for the apparel industry increases with the growth of global population. Even though apparel production increases over time, the rate of increment is not sufficient to fulfil the increasing demand. Over the last three years, there is a positive gap between total production and demand in Sri Lanka. There is a high demand for apparel industry as it has a great potential to contribute economies of countries which produce apparels. While global production is increasing, the total apparel production of Sri Lanka is

decreasing over recent years. Hence, Sri Lanka was unable to get economical advantage of increasing demand in global market (Embuldeniya, 2015)

1.1 The main objective of the research

The main objective of the study is to analyse and improve the apparel industry production process at ABC Company in Sri Lanka to measure the operational efficiency and productivity ultimately resulting towards high yield of production per year and thereby providing exemplary guidance to improve the productivity of a major export industry in Sri Lanka. While analysing about the factors affecting operational efficiency of operational level activities at ABC Company, it is a must to have a comprehensive understanding about what type of critical factors affects towards the operational efficiency in the ABC Company. Therefore, in this research, it focuses on the factors affecting operational efficiency of supply chain activities. This research objective is addressed using a close-ended questionnaire and a range of literature sources on operational efficiency research.

1.2 Problem statement

> "What are the factors affecting the operational efficiency in the ABC Apparel Company in Sri Lanka?"

As a leading clothing brand, ABC Company faces an operational inefficiency in the operational level activities. Therefore, the top management will not continue to achieve financial targets of the company. Consequently, this research will examine the factors that affect the operational inefficiency. The applicability of these findings will support to eliminate such gaps in Sri Lanka and in other Asian countries which use the apparels as the main export source. This is a quantitative research and the empirical findings of the study can apply to similar other apparel companies in Sri Lanka and other Asian countries.

2 Literature review

2.1 Operations management

Operations are one of the main tasks in an association sideways by supply chains, marketing, finance and human resources (Staiger, 2017). The operations function needs administration of the production of goods and services. The handling, manufacturing or service processes more than a few categories comprise of operations strategy, product design, process design, quality management, capacity and facility planning (Sayer et al., 2013). Each of these processes needs an ability to examine the present state and discover superior explanations to advance the efficiency and effectiveness of the workshop or service procedures (Gaither and Frazier, 2002).

According to Tuuli and Rowlinson (2010) mentioned that the "operations management is a part of administration distracted with the planning and monitoring protocols which makes and reforms commercial operations in the manufacture of goods or services." Operations are one of the main tasks comprises with the supply chains, marketing, finance and human resources (Staiger, 2017). The identification of the

manufacturers' competitive advantages is highly important in the manufacturing research studies. However, there are relatively limited studies which measured the constructs in the published research (Cheng et al., 2017). In operations management research, it is evident that few studies focus on individual corporate decisions relates on inventory management and supply chain management (Cheng et al., 2017; Feng et al., 2014).

It includes the accountability of guaranteeing that change operations stand effectively in terms of expanding as limited resources as desired and efficient in terms of gathering consumer necessities (Gaither and Frazier, 2002). It is evident that by handling a whole production structure which is the procedure that transforms inputs (in the procedures of raw materials, labour and energy) into outputs (in the method of goods and/or services), as an asset or carries a product or services. Operations produce products, achieve quality and make service (Hugos, 2018).

2.2 Operational efficiency

According to Jacobs et al. (2014), "the operational efficiency is about the output to input proportion, it needs to be calculated on with the input and output values." Other studies focus on operational efficiency in the prior research which conducted on effective internal control measurements are Dhaliwal et al. (2011) and Feng et al. (2014). According to Feng et al. (2014), it hypothesise that ineffective internal controls has a negative effect on firm operational efficiency. Ineffective internal control can result in inaccurate internal management reports (Feng et al., 2014). To achieve operational efficiency (Jacobs et al., 2014), an organisation must collect, record and analysis data to define the extent of probability. Operational efficiency is the key determinant for long-term solvency for any business, in fact, firm-specific determinants of financial performance involve operating efficiency and financial risk. According to Bhagavath (2006), in 2009, the operational efficiency concept has become a major concern due to increasing competition, business processes and new technology evolution. Whenever there is high uncertainty, business establishments may decide to diversify their portfolios and raise their liquid holdings to reduce the high risk. Therefore, intensity of change in the business operations environment affects the competition levels among the firms and proper operational performance is critical for a successful business (González and Álvarez, 2001).

Improving operational efficiency has a direct impact on the organisations profit margins and efficient firms are more cost-effective. The operational efficiency aspect of any type of business is vital and considered by senior management to earn a healthy and sustainable financial performances (Sufian, 2007).

Operational efficiency is often achieved by streamlining the organisation's core procedures. This contributes to respond efficiently to continually changing market forces in a cost effective way (Barnett and Burgelman, 1996). Therefore, it is vital to increase the international market share for any firm to be competitive in the international market. It is highly essential for business organisation's to improve their operational efficiency wherever possible. Thus, any business organisation not using effective operational practices experience financial drawbacks (Slack et al., 2013).

As per Gaither and Frazier (2002), operational efficiency is a strategic planning method of an organisation to keep an effective balance between cost and productivity. It identifies that wastage procedures provides drainage of resources and organisational profits (Jones and Robinson, 2012).

The operational efficiency measurement is essential for any manufacturing related firm. The operational efficiency is the output to input proportion. It needs be calculated on with the input and output values (Jacobs and Chase, 2012). Moreover, business evaluates mainly the input as an example the unit manufacture cost or the man hours' which are compulsory to generate single unit of the output (Bocij et al., 2008).

Moreover, before preparing the close-ended questions, the study will conduct a preliminary analysis using a pilot study with secondary data. Thus, it eliminates the limitations occurs due to completely excluding quantitative or mixed methodology. "Some scholars don't recognize that both methods can be used in addressing any type of research question" (Atieno, 2009). The variables presented in the conceptual framework are based on the knowledge gained through the practical work experience of the researcher. Therefore, the three variables analyses the specific phenomenon of the study. Consequently, conceptual framework comprised of only three independent variables which are labour productivity, inventory management and information system management. The below description is a detailed literature review of the following variables.

2.3 Labour productivity

For the service sector, it is essential to have an exact method to measure the input and output ratios rendered by the workers. Productivity is well-defined as the ratio between the output volume and the input volume (Hulten, 2001). Workforce productivity is the amount of goods and services that a worker produces in a given amount of time. Out of all the factors of production labour, hours are of highest priority and the most important factor of production and play an essential role in parts of efficiency and superiority. He also stated that, "the concept of productivity is often measured differently. However, in a more subjective manner, by asking about the degree to which the work environment influences productivity" (Hulten, 2001).

The Organization for Economic Co-operation and Development defines the work force productivity as "the ratio of a volume measure of output to a volume measure of input." The concept of productivity is often measured differently, with the degree to which the work environment influences productivity in a more objective manner by using the number of hours or percentage of idle time (Bergs, 2002). A number of indicators provides as an indication to represent these factors. Similarly, Bergs (2002) uses the quantity of work, quality of work, meeting deadlines, frequency of errors, responsibilities, creativity and interpersonal relations as the main factors.

The main objective of human resources management is to utilise the human resources in a most optimal manner so that targets can be achieved very effectively and efficiently. For this purpose, managing performance of employees is vital. Therefore, the performance management maintains, develop and motivates the people at work to give better results. In the present competitive situation, the organisation that gives better results can survive, stabilise, grow and excel in the performance. It helps a lot in achieving the objectives of 'human resource management'. Performance management includes activities to ensure that goals are consistent effective and efficient. Performance

management can focus on performance of the organisation, a department, processes to build a product or service, employees, etc. (Kotler and Armstrong, 2010).

2.4 Inventory management

According to Jarkas and Bitar (2011), "the objective of inventory management is to strike a balance between inventory investment and customer service." Therefore, it is impossible to achieve a low-cost strategy without a proper inventory management system (Jarkas and Bitar, 2011). Therefore, Stevenson and Hojati (2007) states that to accommodate the functions of the inventory, there are four main types of inventory as follows such as 'raw material inventory' which is the materials that are usually purchased hence in the working progress stage in the manufacturing process. This inventory can be used to decouple supplier from the production process.

However, the preferred approach is to eliminate supplier variability in quality, quantity or delivery time so that separation is not necessary. Second, 'working in process (WIP) inventory' that are components or raw material should undertake some changes. WIP exists because of the time it takes for a product to be made (cycle time). Reducing cycle time reduces inventory. Third, 'maintenance/repair/operating supply inventory' that are inventories devoted to maintenance/repair/operating inventory supplies are necessary to keep machinery and processes more productive. This type of inventory exists as the need and timing for maintenance and repairing for some equipment is unknown. Although the demand for MRO inventory is often a function of maintenance schedules, other unscheduled MRO demands must be anticipated. Finally, finished goods inventory is a completed product awaiting the shipment. Finished goods are inventories as future customer demands are unknown, but still an asset on the company financial statements.

2.5 Information system management

Many manufacturing business organisations are using information and communication technology (ICT) in there all supply chain management activities (Naude and Badenhorst-Weiss, 2011). ICT is the latest technological concept defined as an extensive method (Yew Wong et al., 2005).

3 Research methodology

According to a study of Zikmund et al. (2013), the conceptual framework is considered as "a theoretical basis that defines basic philosophies which defines concepts that are related to each other and the explanation of why you believe that these variables continue in relating to each other." Therefore, research which planned in a more quantitative method are more positivistic research paradigms.

This is the conceptual framework which was selected by the researcher. In order to limit the scope of the study, there are only three independent variables.

Figure 1 The research 'onion' of this study (see online version for colours)

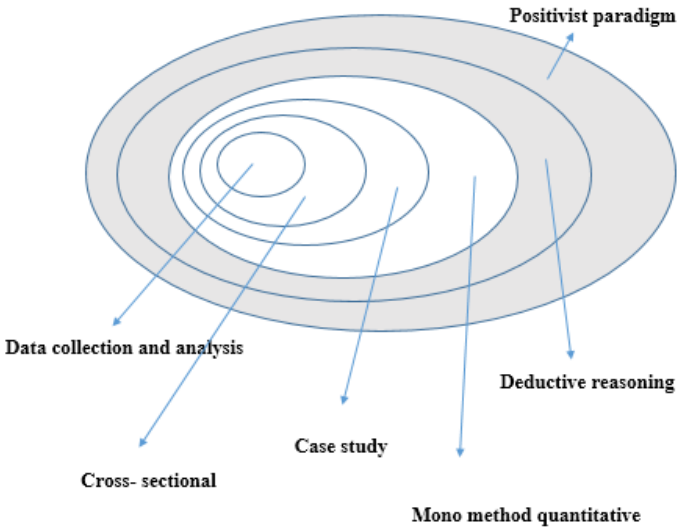
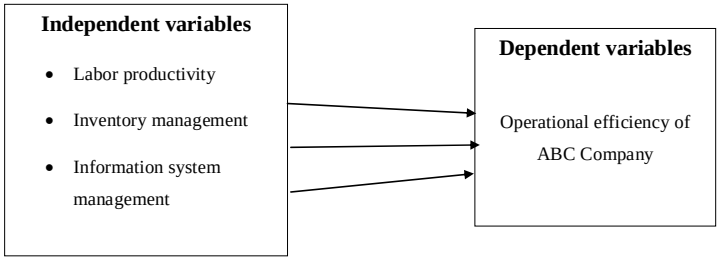


Figure 2 Conceptual framework



3.1 Populations

The total population consist of 260 total employees in the ABC Company. This includes senior management and middle management workers which is approximately 50 employees.

3.2 Sample selection procedures

All the other employees were taken into consideration as majority involves in the operational level activities. The sample represents 96% of the total population. The simple random sampling method was incorporated as all the elements in the population are considered and each element has an equal chance of being chosen as the subject (Sekaran and Bougie, 2016). Hence, out of 260 total populations, only 250 employees responded. Therefore, the sample size is 250 employees.

3.3 Data collection methods

Since this is a quantitative study, a detailed questionnaire was distributed as the main data collection method. The study adopted the mono method quantitative approach. In addition, Li et al. (2012), in their study stated that secondary study contains key information. Therefore, the researcher aims to use the secondary study sources with associated journal articles, annual reports and text books. Furthermore, a total of 260 detailed close ended questionnaires were distributed and total of 250 were selected for the analysis due to complete submissions as discussed in Section 3.2

3.4 Data analysing techniques

The close ended questionnaire was used to collect data from respondents in this study. The data was collected through the descriptive study and then it was tabulated in SPSS software for statistical analysis and descriptive statistics been used to understand the characteristics of the dependent variable and the independent variables in the research. Similarly, the correlations of coefficient and multiple regression analysis, hypothesis and reliability testing were used to understand the relationship between the dependent and the independent variables.

4 Data analysis

4.1 Reliability analysis

First, a reliability tests been conducted to examine the scale consistency. It provides the extent to which the data gathering indicator is free on biasness and errors. For this purpose, Cronbach's alpha test is used to analyse the reliability of the data. It is a statistical test to measure internal consistency which is commonly used to evaluate reliability of 'Likert scale' questions. In here, the alpha values greater than 0.7 considered as good.

As shown in Table 1, Cronbach alpha value for all the dimensions are greater than 0.7. Therefore, the reliability of the scale is conventional. This is also used as a pilot study to assure the reliability and the generisability of data collection.

Table 1 Summary of reliability tests

Dimension	*Items*	*Cronbach's alpha*
Labour productivity	Q1, 2, 3, 4, 5, 6, 7, 8, 9, 10	0.879
Inventory management	Q11, 12, 13, 14, 15, 16, 17, 18, 19, 20	0.800
Information system management	Q21, 22, 23, 24, 25, 26, 27, 28, 29, 30	0.908
Operational efficiency	Q31, 32, 33, 34, 35, 36, 37, 38, 39, 40	0.789

4.2 Development of hypotheses

A hypothesis contains operationally defined variables in testable form. To test the validity of conceptual framework, the following hypotheses were developed.

H_1 There is a positive relationship between labour productivity and operational efficiency of the ABC Company.

H_0 There is no relationship between labour productivity and operational efficiency of the ABC Company.

H_2 There is a positive relationship between inventory management and operational efficiency of the ABC Company.

H_0 There is no relationship between inventory management and operational efficiency of the ABC Company.

H_3 There is a positive relationship between information system management and operational efficiency of the ABC Company.

H_0 There is no relationship between information system management and operational efficiency of the ABC Company.

Pearson correlation coefficient analysis is used to analyse the relationship between each dependent and independent variable pair. The Pearson correlation coefficient between two variables is defined as,

$$r = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 (y - \bar{y})^2}}$$

where x and y are the sample means for each variable.

Table 2 Interpretation of Pearson correlation coefficient

Pearson correlation coefficient	*Relationship*
+.70 or higher	Very strong positive relationship
+.50 to +.69	Strong positive relationship
+.30 to +.49	Moderate positive relationship
+.20 to +.29	Weak positive relationship
+.01 to +.19	No or negligible relationship
–.01 to –.19	No or negligible relationship
–.20 to –.29	Weak negative relationship
–.30 to –.49	Moderate negative relationship
–.50 to –.69	Strong negative relationship
–.70 or higher	Very strong negative relationship

4.3 Pearson correlation coefficient analysis between labour productivity and operational efficiency

There is a strong positive correlation coefficient value which is 0.926. This strongly stand as an evidence which indicates a strong positive relationship between operational efficiency and labour productivity. The correlation is significant at the 0.01 level.

Table 3 Correlation between labour productivity and operational efficiency

Correlations			
		Operational efficiency	*Labour productivity*
Operational efficiency	Pearson correlation	1	.926**
	Sig. (2-tailed)		.000
	N	250	250
Work force productivity	Pearson correlation	.926**	1
	Sig. (2-tailed)	.000	
	N	250	250

Note: **Correlation is significant at the 0.01 level (2-tailed).

4.4 Pearson correlation coefficient analysis between inventory management and operational efficiency

There is a strong positive correlation coefficient value again under inventory management and operational efficiency which is 0.967. This value is the most significant value in the study which affects the ABC Company operational efficiency.

Table 4 Correlation between inventory management and operational efficiency

Correlations			
		Operational efficiency	*Inventory management*
Operational efficiency	Pearson correlation	1	.967**
	Sig. (2-tailed)		.000
	N	250	250
Inventory management	Pearson correlation	.967**	1
	Sig. (2-tailed)	.000	
	N	250	250

Note: **Correlation is significant at the 0.01 level (2-tailed).

Table 5 Correlation between information system management and operational efficiency

Correlations			
		Operational efficiency	*Information systems management*
Operational efficiency	Pearson correlation	1	.221**
	Sig. (2-tailed)		.000
	N	250	250
Information system management	Pearson correlation	.221**	1
	Sig. (2-tailed)	.000	
	N	250	250

Note: **Correlation is significant at the 0.01 level (2-tailed).

4.5 Pearson correlation coefficient analysis between information system management and operational efficiency

There is a weak negative correlation coefficient value for information system management and operational efficiency which is 0.221. This value is negligible with comparison to the other two variables which are inventory management and the labour productivity. Therefore, the information system management is not influencing towards the operational efficiency levels of the company.

4.6 Multiple regressions analysis

Table 6 analyses the strength of the linear relationship between the conceptual framework variables of the study. The data analysed using the SPSS software.

Table 6 Model parameters

Model	*Unstandardised coefficients*		*Standardised coefficients*	*t*	*Sig.*
	B	*Std. error*	*Beta*		
(Constant)	–1.359	.154		–8.829	.000
Labour pro.	.327	0.80	.357	5.123	.000
Infor. syst. mgt.	.100	.061	.111	1.733	.000
Inventory mgt.	.411	.091	.312	4.318	.000

Note: Dependent variable: operational efficiency.

- Table 6 indicates that all the explanatory variables are significant at 5% level of significance.
- Interpretation of regression coefficients: (standardised coefficients).

When the labour productivity increases by one unit, the overall operational efficiency increases by 0.3 times while the other factors held constant. When the inventory management increases by one unit, the overall operational efficiency increases by 0.4 times while the other factors held constant. When the information system management increases by one unit, the overall operational efficiency increases by 0.1 times while the other factors held constant.

According to Table 7, it can be concluded that inventory management is the most largely affecting factor to operational efficiency of the selected company and similarly the labour productivity. The least influencing factor is the information system management. Therefore, the company should focus more on the inventory management and labour productivity enhancement systems to improve the operational efficiency.

Table 7 Model summary

Model	*R*	*R square*	*Adjusted R square*	*Std. error of the estimate*
1	.989[a]	.978	.977	.176

Notes: [a]Predictors: (constant), labour productivity, inventory mgt. and infor. system management.
R square statistic is a goodness of fit test statistic where it says that 97.8% of the variation of operational efficiency (dependent variable) is explained by the above regression model.

5 Findings and conclusions

The main objective of the research study is to investigate the factors affecting operational efficiency of operational level activities at ABC Company. The ABC Company is among the top ten apparel companies in Sri Lanka with more than approximately 30% overall market share from the apparel exports. Therefore, increasing the operational efficiency of the company affects the overall market share in the apparel industry. Furthermore, as a main findings, it has revealed that the both coefficient covariance and the multiple regression values indicated the inventory management as the most largely affecting factor towards operational efficiency of the selected company. The second highest influencing factor is the labour productivity which increases the labour productivity levels of the company which enhances the operational efficiency levels. The least influencing factor is the information system management. The company can focus less towards updated technology, new trends in the technology, as it is a least contributing factor towards the operational efficiency levels. First, company should undertake proper inventory management and handling systems such as ABC, 3PL, FIFO, LIFO and other inventory management systems. The company should focus more on the facility and capacity management with special reference to the facility layouts within the company. The proper warehouse management protocols and proper materials handling systems are essential for the company to enhance the operational efficiency levels. Second, highest influencing factor is the labour productivity levels. The company should have a proper human resource management system and productivity controlling system of the workers. This is possible through proper human resource management policies and appropriate company decision making systems.

The researcher found a weak negative relationship with the information systems and operational efficiency variables in the selected company. Even though, it is an impossible finding the information system management is not influencing towards the operational efficiency levels.

Therefore, it is negligible with comparison to other two main variables. The company should not focus more on the new trends in the technology or the updated technological methods, as most of the operational level employees do engage with manual work and do not have proper knowledge and skills in operating advanced technology, equipment and machinery. The main reason for this finding is that the study is conducted in a developing country context and the lack of updated technology in terms of apparel industry.

Finally, this research study investigated the factors affecting to operational efficiency of ABC Apparel Company in Sri Lanka and identified two key factors as labour productivity and inventory management which affects to the operational efficiency of the selected case company. Further, it identified that out of these factors, inventory management is the most influencing factor towards the operational efficiency levels.

6 Research limitations

The main limitation of the research is that most of the literature is based on western countries and lack of literature on Asian context. This is the major gap of the study. Previous studies based on other Asian countries are available in limited manner. However, the researcher carefully considered materials related to Sri Lanka and any other

emerging markets as the literature sources. The mixed methodology is disregarded and the mono method quantitative methodology lacks the broader viewpoints. The employee's perspective (single perspective) is incorporated throughout the study. The research is mainly limited towards three main variables based on the practical work experience and knowledge gained by the researcher which is subjective and provides a bias perspective.

7 Suggestions for future research

This study could enhance by using the "Pareto analysis, cause and effect diagrams and lean management tools." The current research is conducted only taking the viewpoints of the employees but the same study can be expanded by considering the perspectives of senior administrative bodies, customers, suppliers and other stakeholders. A study including views of customers, management, frontline staff, support staff and service suppliers would provide a more complete picture. For future research study, researcher recommends to practice a large sample of stakeholders covering a comprehensive range in organisational system. Moreover, in a larger sample the mathematical mistakes are low and improve the possibility on implying the findings to the world at large. According to Creswell and Clark (2007), "pragmatism avoids the argumentative issues in the reality and accepts theoretically, the existence of extraordinary and several realities that are open to empirical inquiry and positions itself toward answering practical issues in the real world." Therefore, a researcher can simply avoid practical constraints of forced choice dichotomy between post positivism and constructivism (Creswell and Clark, 2007). Moreover, researcher will not become a prisoner of a particular research methodology (Robson and McCartan, 2016). Therefore, the future researcher can enhance the current context findings through simply adopting the mixed approach (pragmatism paradigm) as an alternative. The same study can enhance through mix methodology of both quantitative and qualitative approaches. Morgan and Winship (2014) states "mixed method research has highlighted the real-world aspects of research methods in ways that both introduced pragmatism as a paradigm for social research, largely avoiding serious contact with the philosophical foundations of pragmatism."

Acknowledgements

This manuscript is a work of her own based on the work experience she had in the apparel sector of Sri Lanka.

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Appendix

Questionnaire

Table A1 Questions

1	On-time arrival for work.
2	Following the given deadlines by the supervisor.
3	There are policies within the company with regard to leaves/absenteeism.
4	The work given by the supervisor can be utilised/completed within the given working hours.
5	Idle time is low with regard to frequent machine breakdowns.
6	Low waiting time in other departments of the company.
7	Adequate support been given by the supervisor and the other senior staff
8	Employees set appropriate priorities for given tasks.
9	If you could not finish the allocated amount of work, do you work overtime to finish it?
10	As an employee, I think that I should render my best efforts towards this company.
11	Inventory management policies and procedures at ABC Company are well documented.
12	Does management at ABC Company regular monitor the write-offs of obsolete and inactive inventories?
13	Do you think that company is using updated inventory management techniques and systems?
14	Inventory items at this company regularly forecast requirements to match the demands of inventory items.
15	Inventory items been classified according to their importance levels.
16	Low waiting time in acquiring the raw materials form the warehouse
17	The number of defects/errors and damages which occurs inside the inventory management system is very high.
18	The warehouse supervising team is efficient and on time with regard to order delivery and order receiving process.
19	Space utilisation within the company is low with regard to inventory.
20	Facility layout of the company is of satisfactory.

Table A1 Questions (continued)

21	The inventory handling software's are up to date.
22	The company is utilising the computer technology and electronic organisation and automation in inventory management properly.
23	Company is leveraging modern technology to improve operational efficiency of ongoing production process.
24	Employees are updating with the latest technology.
25	Every employee does have a proper knowledge on the machinery, equipment which they engage with.
26	As an employee, I think the regular workshops and training programs with regard to updated technology is low.
27	The documentation is conducted using the existing software's rather than manual book-keeping.
28	Frequent training sessions with regard to new equipment/machinery instalment.
29	It takes a long time to correct the errors and defects inside the machines/software's, etc.
30	All the employees are having an average amount of knowledge on at least the basic methods in technology.
31	ABC Company is using its resources efficiently and effectively.
32	Company has established specific and measureable goals for apparel production.
33	The delivery of the orders takes place at right time with right quantity.
34	High delays/high waiting time/high amount of defects are very low.
35	Company is efficiently producing the required output as a whole.
36	The workforce of the company is really efficient and effective.
37	Achievement level of the required deadlines is high.
38	The time management of the employee during a one working day is satisfactory.
39	The number of customer complaints is low.
40	There is a good relationship between suppliers and the company.