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DEVELOPING A STRATEGY TO EVALUATE THE PRODUCTIVITY PERFORMANCE OF ACTIVE GARMENT MANUFACTURING IN SMALL AND MEDIUM ENTERPRISE SECTOR

A. B. Wickramaarachchi

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Department of Mathematics

University of Moratuwa

Sri Lanka

University of Moratuwa
105307

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DECLARATION OF THE CANDIDATE

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A. B. Wickramaarachchi

DECLARATION OF THE SUPERVISOR

"I have supervised and accepted this thesis/dissertation for the award of the degree"

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Date: 22 May 2013

Prof. T.S.G. Peiris
Department of Mathematics
Faculty of Engineering
University of Moratuwa
Sri Lanka.

This report is dedicated to my parents, wife and daughter

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ABSTRACT

Apparel industry is one of the largest contributors in Sri Lankan economy while Small and Medium Enterprises (SME) play an important role. With the elimination of the quotas SME sector had to face the challenge of producing garments where competition is primarily based on price. Most consideration factors that affect on the price are high production cost, low productivity level, lack of skilled man power and lack of adoption to new and efficient technology. Enhancing the productivity respective to manufacturing process of the garment had been identified as a solution to face these emerging challenges of SME sector. However, at present productivity performance is evaluated by considering five Key Performance Indicators (KPIs) separately and this method creates problems in evaluating. Thus this study was carried out to develop a common index using five indicators based on three months data. Principal Component Analysis (PCA) and Cluster Analysis (CA) were carried out separately for all three months and as well as pooled data to achieve the objective.

Results found that the indicator developed consists of a linear combination of three Key Performance Indicators (Factory Efficiency – EFF, Defects Per Hundred Units – DHU and Absenteeism – ABS) can be used to asses factories either monthly basis or quarterly basis, instead of using the five KPIs separately. This new method is more efficient than the old method used. The developed indicator is named as "Direct Productivity Performance Indicator" and it is defined as: $PC_{QI} = 0.523Z_{EFF} - 0.531Z_{DHU} - 0.481Z_{ABS}$. This method can be used to compare different factories as well.

Key Words: Key Performance Indicator, Principal Component Analysis, Cluster Analysis and Productivity

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LIST OF ABBREVIATIONS

Abbreviation	Description
SD	Standard Deviation
PCA	Principle Component Analysis
CA	Cluster Analysis
SME	Small and Medium Enterprises
KPI	Key Performance Indicators
EFF	Efficiency
DHU	Defects per Hundred Units
ABS	Absenteeism
LT	Labour Turn Over
MN: MC	Man to Machine Ratio
Q1	Quarter One
A-D	Anderson and Darling Test