

**An Analysis of the critical success factors of
innovation of Small and Medium
Enterprise's in science technology operating
in Sri Lanka**

BY

A.K.G.C. Karunathilaka

An Analysis of the critical success factors of innovation of
Small and Medium Enterprise's in science technology
operating in Sri Lanka

By

A.K.G.C.Karunathilaka

A research project submitted to the University of Sri Jayewardenepura in partial
fulfillment of the requirement of the degree of Master of Business
Administration on 19th December 2015

DECLARATION

The work described in this research was carried out by me under the supervision of Prof. K.D.Gunewardena and a report on this has not been submitted in whole or in part to any university or any other institution for another degree.


A.K.G.C. Karunathilaka

Date ...04./07./2016

5266FM2010057

SUPERVISORS' APPROVAL

I certify that the above statement made by the candidate is true and that research is suitable for submission to the university for the purpose of evaluation.



Prof. K.D. Gunewardena

Supervising Member

Date ..05/07/2016..

Coordinator
PhD in Management Program
Faculty of Management Studies & Commerce
University of Sri Jayewardenepura
Nugegoda.

LIST OF ABRIVIATIONS

SME	-	Small and Medium Enterprises
GDP	-	Gross Domestic Product
GOSL	-	Government of Sri Lanka
IDB	-	Industrial Development Board
IPS	-	Institute of Policy Studies
SMEA	-	SME Authority
BDS	-	Business Development Services
R&D	-	Research and Development
WTO	-	World Trade Organisation
CP	-	Cleaner Production
USA	-	United State of America
UK	-	United Kingdom
IT	-	Information Technology
MoTR	-	The Ministry of Technology and Research
ARF	-	Agency Results Framework
MIC	-	Ministry of Industry and Commerce
NSF	-	The National Science Foundation
NARESA	-	Natural Resources, Energy and Science Authority of Sri Lanka
NSC	-	National Science Council
ITI	-	The Industrial Technology Institute
CISIR	-	Ceylon Institute of Scientific and Industrial Research
SLSI	-	Sri Lanka Standards Institute
ISO	-	International Organization for Standardization
SWEDAC	-	Swedish Accreditation Board
SLAB	-	Sri Lanka Accreditation Board
IIS	-	Import Inspection Scheme
SLS	-	Sri Lanka Standard Specification
NERDC	-	National Engineering Research & Development Centre
NCC	-	National Crafts Council
NDC	-	National Designs Centre

- SLHB - Sri Lanka Handicrafts Board
- NGO - Non-Governmental Organizations
- OECF - Overseas Economic Cooperation Fund
- SMILE - Small and Micro Industries Leader & Entrepreneur Promotion

CHAPTER 1- INTRODUCTION.....	1
1.1 Introduction of the study.....	1
1.2 Problem Statement.....	2
1.3 Problem Justification.....	3
1.4 Objectives of the Study.....	4
1.5 Overview of the Methodology.....	5
1.6 Significance of the Study.....	5
1.7 Scope of the study.....	7
1.8 Organisation of the Study.....	7
CHAPTER 2 – LITERATURE REVIEW.....	8
2.1 Introduction.....	8
2.2 Small and Medium Enterprises Definition.....	9
2.3 Small and Medium Enterprises in Sri Lanka-An Overview.....	11
2.4 Importance of Small and Medium Enterprises in social and economic development.....	12
2.5 National Strategy for Small and Medium Enterprise Sector Development in Sri Lanka.....	15
2.6 Main constraints faced by SMEs.....	18
2.7 Public sector framework of Support Services.....	21
2.8 Science, Technology and Innovation Strategy for Sri Lanka (2011 – 2015).....	35
2.9 Innovation.....	38
2.9.1 What is Innovation.....	38
2.9.2 Innovation types.....	39
2.9.3 Product innovation.....	41
2.9.4 Process innovation.....	41
2.9.5 Service innovation.....	43
2.9.6 Critical Success factors of innovation and growth of SMEs.....	46
2.9.7 Innovation and Business Performance.....	50
2.10 Chapter Summary.....	54
CHAPTER 3 – RESEARCH METHODOLOGY.....	56
3.1 Introduction.....	56
3.2 Theoretical Framework.....	56
3.3 Conceptual Framework.....	56
3.4 Variables definitions.....	57
3.5 Hypothesis of the study.....	57

3.6 Population	58
3.7 Selection of the Sample.....	60
3.8 Data Sources	61
3.9 Data Collection	62
3.10 Chapter Summary	62
CHAPTER 4 – ANALYSIS.....	63
4. 1 Introduction.....	63
4. 2 Pilot Test	63
4. 3 Analysis of Descriptive Statistics.....	63
4.4 Analysis of hypothesis	69
4.5 Chapter Summary	80
CHAPTER 5 – DISCUSSION	81
5.1 Introduction.....	81
5.2 Discussion of descriptive data findings.....	81
5.3 Discussion of findings on research questions	82
5.4 Chapter Summary	85
CHAPTER 6 - CONCLUSION	86
REFERENCES	88
APPENDICES	91

List of Tables

Table I – Sector wise Industries

Table II - Growth of Value Added in Industry

Table III – Employee analysis

Table IV – Turnover analysis

Table V – R and D expenditure analysis

Table VI – Business Performance analysis

Table VII – Product Innovation analysis

Table VIII – Process Innovation analysis

Table IX – Service Innovation analysis

Table X – Results of product component analysis

Table XI – Results of process component analysis

Table XII – Results of service component analysis

Table XIII – Reliability Tests results

Table XIV - Descriptive Statistics on Innovation Performance

Table XV – Mean Innovation Types last three years

Table XVI- Paired comparison t-tests for innovation types

Table XVIII - Paired comparison t-tests for innovation focus

Table XIX - Paired comparison t-tests on innovation performance

Table XX – Innovation performance by innovation focus

Table XXI – Regression analysis of sales turnover growth and net profit growth on innovative focus

Table XXII – Length of time the firm has been in business by innovative focus

LIST OF FIGURES

Figure 4.1 – Product Innovation

Figure 4.2 – Process Innovation

Figure 4.3 – Service Innovation

ACKNOWLEDGEMENT

With a deep sense of gratitude, firstly, I express my thanks to my supervisor, Prof. K.D.Gunewardena, for his great insights, perspectives, guidance and sense of humour. My sincere thanks go to all lecturers and staff in the Post Graduate Office, University of Sri Jayewardenepura, Sri Lanka for their help extended to me in various ways to clarify things related to my academic work in time with excellent cooperation and guidance. Sincere gratitude is also extended to all the superiors, co-workers and subordinates in the Ceylon Electricity Board.

I should thank many individuals, friends and colleagues who have not been mentioned here personally in making this educational exercise a success. May be I could not have made it without their supportive role.

Lastly, words fail me to express my appreciation to my husband and family members whose dedication, love and persistent confidence in me, have taken the load off my shoulder.

ABSTRACT

The study “Analysis of the critical success factors of innovation of Small and Medium Enterprises of science technology operating in Sri Lanka” identifies the critical success factors of innovation for promoting enhancement of performance of the Small and the Medium Enterprises (SMEs) in science technology industry operating in Sri Lanka. SMEs play an important role in any economy through generating of employment opportunities contributing to GDP growth, embracing innovations and simulating other economic activities. This sector is said to be the backbone of all developed and developing nations. For this study, relevant available literature was reviewed. Innovation has been a dominant factor in maintaining worldwide competitiveness.

A questionnaire was prepared to collect data from 35 SMEs. Follow-up interviews were conducted with a view to obtaining additional information. The data collected from the survey were analysed to establish relationships between the various factors and issues as well as their relative significance were taken into account. Four hypotheses were tested using paired sample student t-test and regression analysis and chi-square for independent samples and descriptive analysis.

It is found that the SMEs actively engaged in science technology have more focused on product innovation than a process and service innovation as well as more focus on SMEs incremental aspect and disinclined rather to radical innovations on products, process and service innovations. That means improvement on major or minor changes to the product, process and service innovation but not a radical change of new product to the existing market or new market, new process to existing product or new service to existing product. However, this focus on each type of innovation is not significantly related with business performance and innovation performance. It is observed that focus on incremental and radical innovations are related with the age of the firm in SMEs engaged in Science and technology.

Key Words: Innovation, Business Performance, SMEs, Science Technology, Sri Lanka

CHAPTER 1- INTRODUCTION

1.1 Introduction of the study

Small and Medium Enterprises (SMEs) play an important role in any economy through generating opportunities for employments contributing to GDP, embracing innovations and simulating of other economic activities. This sector is said to be the backbone of all developed and developing nations. SMEs perform as a useful engine of economic growth of countries because they have the capacity to achieve rapid economic growth, while creating to a considerable extent of employment opportunities. Therefore, development of this sector is of paramount important once for any country irrespective of their level of development. This development is even more important in those economies.

The globalisation of product and service markets is accelerating at a terrific rate. All companies, in particular SMEs face increasing competition for sales, technical know-how and skills. In this environment, competitiveness at the company level depends crucially on the speed with which new products can be brought to the market place and on new cost-saving improvements made. The issues or the question of creation of wealth and employment depend to a very large extent on the speed with which scientific and technological breakthrough is transformed into practical and attractive solutions. The ability to reap the rewards of scientific achievements requires much more effort than the ability to turn a new idea into a working product. Efficient flow of soft technology is not adequate, and finance and business skills are also important. There must be accessible protection for intellectual property, and adequate incentives for entrepreneurial drive. Therefore, SMEs have the tell need of a dynamic and self-sustaining culture of innovation.

Having understood this fact, successive governments in Sri Lanka have taken various steps, from time to time, to promote this vital sector since independence. When analyzing the present contribution of this sector to the national economy, it is clear that this sector has not achieved a corresponding or reciprocal level of contribution when compared with that of other developed and developing countries in the region. All our socio-economic developments are based on the innovation systems that need to be explored further. One of the positive features of adopting an innovation system perspective in the Sri Lankan context has been to explore small and medium enterprises that operate as a system towards

sustainability and contribute to socio-economic developments of the country enhancing the relevance of science and technology in the Sri Lankan context.

1.2 Problem Statement

The purpose of this study is to effectuate an analysis of the critical success factors of innovation of Small and Medium Enterprises in science and technology operating in Sri Lanka. Innovation is the main driver for companies to prosper, grow and sustain a high profitability. If product, process and service innovations on radical and incremental focus are brought into the reaching aspects will be important area of paramount the performance of SMEs. Therefore, it is essential to investigate into the impact of these innovations on the performance of SMEs.

However, small industries in the developing countries still suffer from severities of several inadequacies, technological backwardness, low production efficiency and poor quality of products. In order to make them technologically competent and enable them to manufacture product, based on the new edge technologies, a consistent effort must be made of facilitate transfer and diffusion of technologies from the academic and research institutions. New product development and improvement of productivity and quality of existing products are essential to the future of SMEs in their need to keep pace with the changing market economies and preferences. How innovation focus and similar types will impact on the SMEs' business and innovative performance in Sri Lanka?

The following research questions are expected to be asked to obtain answered to construe the research objectives.

RQ1. What types of innovations (Product, Process or Services) are predominant in the SMEs in Sri Lanka?

RQ2. For each type of innovation what is the focus in relation to the pursuit of radical versus incremental innovations?

RQ3. What is the relationship between SME's each type of innovation and innovation performance compared with competitors?

RQ4. What is the relationship between SME's innovation focus on each type and business performance?

1.3 Problem Justification

For socio-economic development of any country, a strong Industrial base is desirable. The natural resources need to be developed and utilised both as input to industrial production and as direct products for the social well-being of the people. The innovator is of paramount importance in the commercial success of innovative products in SMEs. The recognition of the importance of innovation and SMEs has led to the development of the National Systems of Innovation in several countries.

The SME sector is well recognised for its contribution to employment, innovation and economic dynamism and is considered as an engine of growth and an essential part of a healthy economy. It provides the industrial leaders of the future, improves the competitive edge of the economy by maximising the range of choice available through market provision and challenges the dominance of existing large industrial units, thereby forcing them to innovate.

Today, Sri Lanka SMEs operate under various conditions and constraints, which stand on the way to achievement of organizational goals. It has been suggested that SMEs operating high growth businesses are the engines of the economies and they provide the majority of new jobs. While much has been researched about high growth SMEs, their roles and importance in the economy, what has been lacking in many of the studies in this stream is the important role that innovation plays in fuelling such growth in the SMEs.

Innovation has been a dominant factor in maintaining worldwide competitiveness. It fuels organizational growth, drives future success, and is the engine that allows businesses to sustain their viability in a global economy (Gaynor, 2002). For companies pursuing excellence in this era of hyper competition, restructuring, lowering costs, and enhancing product or service quality are no longer sufficient. Porter and Stern (2001) argued that companies must be able to create and commercialize a stream of new products and