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CAD/CAM APPLICATIONS: A DEVELOPMENTAL STRATEGY FOR THE POTENTIAL FOOTWEAR INDUSTRY IN SRI LANKA

A dissertation submitted to the Department of Mechanical Engineering of the University of Moratuwa in partial fulfilment of the requirements for the Degree of Master of Engineering

by

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DECLARATION

This Dissertation paper contains no material which has been accepted for the award of any other degree or diploma in any University or equivalent institution in Sri Lanka or abroad, and that to the best of my knowledge and belief, contains no material previously published or written by any other person, except where due reference is made in the text of this Dissertation. I carried out the work described in this Dissertation under the supervision of Dr. U.P. Kahangamage and Mr. H.K.G. Punchihewa.

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ABSTRACT

The Sri Lankan Small and Medium scale Enterprise (SME) footwear industry is at crossroads. In order for the SME sector to survive and thrive in this competitive market, advanced technology needs to be introduced among other incentives. Developmental strategies for this industry are vital given the economic condition of these organisations and the global context of the footwear industry. The overall objective of this research is to identify the present state of technology usage in the SME footwear industry and to recommend pragmatic solutions to develop it.

Data was collected from the random sample ($n_x=14$) from the target population ($\xi_x \approx 40$). Semi-structured interviews were conducted with the participants during the “Footwear and leather fair in 2007”, which was jointly organized by the IDB and the Sri Lanka Footwear Association held at Bandaranaike Memorial International Conference Hall (BMICH) on 24th and 25th of November 2007. Further, unstructured interviews were conducted to collect data from the sample of experts ($n_y=4$) selected from industry to obtain the experts’ view about the industry to set benchmarks for the Common Resource Centre (CRC) and to validate the information collected from semi-structured interviews. Comprehensive analysis of the data elicited through the semi-structured and unstructured interviews was carried out.

The main outcome of this study is a proposal with recommendations based on stakeholder and expert views for a CRC, which is to provide services to the footwear industry. Since the large-scale manufacturers may be able to maintain their own Computer Aided Design and Computer Aided Manufacturing (CAD/CAM) facilities, the proposed centre is to provide services especially to the potential SMEs. This CRC mainly will consist of CAD/CAM division, testing and laboratory services division, education, training and skills development division, research development (R&D) division, and administration and customer care division to provide services to the industry. The facts gathered suggest the immediate need of the establishment of CRC to uplift the potential SME footwear industry.

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LIST OF ABBREVIATIONS

2D/3D	Two Dimensional and Tree Dimensional
BMICH	Bandaranaike Memorial International Conference Hall
BPR	Business Process Reengineering
CAD/CAM	Computer Aided Design and Computer Aided Manufacturing
CDLP&F	Centre for Development of Leather Products and Footwear
CFDC	Computerized Footwear Design Centre
CFTI	Central Footwear Training Institute
cfti	Central Footwear Training Institute
CISIR	Ceylon Institute of Scientific and Industrial Research
CNC	Computer Numerically Controlled
CRC	Common Resource Centre
DI	Department of Industries
EDB	Export Development Board
EU	European Union
FDDI	Footwear Development and Design Institute
GOSL	Government of Sri Lanka
GSP+	Generalised System of Performance plus
IDB	Industrial Development Board
ITI	Industrial Technology Institute
LE	Large scale Enterprise
NAB	National Apprentice Board
NAITA	National Apprentice and Industrial Training Authority
NC	Numerically Controlled
NIFT	National Institute of Fashion Technology
PC	Personal Computer
PVC	Poly Vinyl Chloride
QC	Quality Controlling
RP	Rapid Prototyping
SLSI	Sri Lanka Standard Institute
SME	Small and Medium Scale Enterprises
VAT	Value Added Tax

LIST OF SYMBOLS

n_x	Sample size of semi-structured interviews
n_y	Sample size of unstructured interviews
ξ_x	Target population
ξ_i	Population of LEs
ξ_j	Population of potential SMEs
e_i	An element of LE population
e_j	An element of LE population
n_j	Number of LEs in sample (n_x) population
n_j	Number of LEs in sample (n_y) population



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