

PREFACE

Mohandas Karamchand Gandhi – the Mahatma used to spin cotton in a *Charka* (spinning wheel) for nearly four hours a day. Once he said, “this spinning is growing on me. I seem daily to be coming nearer to the poorest of the poor and to that extent to God. I regard the four hours (of spinning) to be the most profitable part of the day. The fruit of my labour is visible before me. Not an impure thought enters my mind during the four hours. The mind wanders whilst I read the Gita, the Koran, the Ramayana. But the mind is fixed whilst I am turning the wheel...”

Mahatma Gandhi considered the *Charka* as a tool of economic reform and a mode of concentration of thought process for the *swaraj* (freedom struggle) of India. He visualized a self-reliant progressive and prosperous India, free from all bondage and chains of backwardness. He was an ingenious and sensitive artist of symbol. His *Charka* became a symbol of inspiration for attaining *swaraj* of all kind.

Today, the textile industries of the country is looking beyond the symbolic *Charka* to the modern machineries and processes, complete with computer controlled production and quality control units. To become cost competitive and to survive in the global market the industry has to exercise total quality control at reduced production cost. This calls for the adaptation of newer technologies and also to explore new methodologies. The following pages are the beginning of an exercise towards this direction.

The work embodied in this thesis has been carried out at the Department of Applied Physics, Calcutta University between 1996 and 2000. The financial help came from the Council of Scientific and Industrial Research in the form of a fellowship. The inspiration came from the father of the nation, Mahatma Gandhi. It is a small tribute to the great soul on this day of his death anniversary.

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