

**ABSTRACT OF PH.D THESIS ON**  
**“ROLE OF TECHNOLOGY ADOPTION IN LEATHER FOOTWEAR FIRMS OF NCTD”**  
**BY NITIN RAJ SETH**

**TECHNOLOGY: CONCEPT AND ITS ADOPTION**

A firm performs this transformation process through its various functions such as operations, finance, human resources, marketing, accounting and control. To integrate the various resource inputs of a firm and its various functions, technology acts as a major resource tool that plays a central role in integrating a firm’s business activities. It not only integrates but also acts as an impacting variable in leveraging all business functions for improved performance of the firm. Thus, technology is at the core of all dimensions of business activities. It acts as a driver or an enabler related to each of these business functions and also impacts a firm’s performance with respect to productivity, quality, cost, speed and flexibility in its operations. Technology can be described as a scientific knowledge and skill, or an applied science concerning, mechanization, automation like, machines, computers, robotics, artificial intelligence and software. Although firms have been traditionally modeled to employ capital, labor, and other factors of production to increase output, but the paradigm shift in the production function through technical change has made the economist realize that knowledge is the primary creator of value.

Since, technology adoption was identified as the most prominent stage, it was imperative to understand the adoption process and how, when, why and by whom were the technologies adopted.

**RESEARCH METHODOLOGY**

**RESEARCH OBJECTIVES**

The research seeks:

- (i) To study the technological developments in the leather footwear firms of National Capital Territory of Delhi (NCTD);
- (ii) To study the innovative developments in manufacturing technology within the select leather footwear firms;
- (iii) To study the technologies adopted by select firms in leather footwear manufacturing; and
- (iv) To assess the implications of technology adoption on manufacturing performance of selected leather footwear firms

**LITERATURE SEARCH**

Articles related to the conceptual issues of technology adoption, technology transfer process, development, performance measurement tools and techniques as well as trade statistics on leather footwear industry were reviewed. The data have been sourced from government statistical year books, viz Economic Surveys, annual reports of Council for Leather Exports, Journal of Technology Management, Journal of Operation Management and a number of national and international journals and magazines.

After a thorough review of literature and researcher's practical experience in the leather footwear industry, the important studies conducted at national and international level have been discussed under the following dimensions of technology adoption:

- (i) Technology and Economic Development;
- (ii) Globalisation and Technological Changes;
- (iii) Technology: its impact on Growth of Firms;
- (iv) Technology in small and medium enterprises;
- (v) Technology Adoption, Knowledge Management and Market Orientation of Firms;
- (vi) Technology Adoption and Exports; and
- (vii) Government's Role in Adoption of Technology

## **DATA SOURCES**

The data in the research have been collected both from secondary sources and primary sources.

### **2.4.1 Secondary Data Sources**

The research study has utilized the following sources for secondary data collection.

- (i) Economic Surveys of India, India Development reports, annual reports publication of Council for Leather Exports, industry expert articles in business newspapers and journals pertaining to the historical development of the Indian leather footwear industry.
- (ii) The technological developments and support services provided by the government agencies such as central Leather Research Institute (CLRI), National Small Industries Co-operation (NSIC), Footwear Design & Development Institute (FDDI) and Council for Leather Exports (CLE).
- (iii) Books, periodicals and newspapers covering articles on technology development, transfer, adoption, measurement, innovation, both from national as well as international journals.
- (iv) Syndicated research reports and information on leather footwear firms.
- (v) Academic studies, dissertations and seminar proceedings on the subject area of technology adoption, and innovation.

### **Primary Data Collection**

A survey was conducted with the help of a structured questionnaire which covering aspects such as organization detail; and status of technology adoption, influencing factors, reasons, mechanisms of technology adoption and degree of success in its implementation in terms of the benefits realized in areas of quality, cost, productivity, savings, market presence, and competitiveness.

The data collected through the questionnaire and applied on selected firms in leather footwear industry of NCTD seeks to answer the following aspects of research:

- (i) Demographic Profile of Respondents**
  - Designation and education level of the respondents of select leather footwear firms;
  - Qualification of the top management personnel in select leather footwear firms;
- (ii) Socio Economic Characteristics of the Firms**

- Experience of the firms in the leather footwear industry in terms of years in the business;
- Workforce strength engaged in leather footwear manufacturing and the percentage of skilled workers employed;
- Firms' major product line and type of footwear manufactured;
- Target market segment in terms of: local, regional, national or international;
- External business environment challenges faced by the firms;
- (iii) Research & Development and Technological Initiatives of Firms;**
  - Firms investment in Research and development (R&D) and ability to innovate;
  - Technological initiatives of firms;
  - Knowledge based beliefs with regard to modern technologies;
  - The learning attitude of firms;
- (iv) Technology Awareness and Adoption Status;**
  - Leather footwear technologies adopted by firms;
  - Awareness and adoption level of some of the advance technologies;
- (v) Technology Motivators and Mechanism of Adoption**
  - Reasons of technology adoption;
  - Influencing factors in firms adoption decisions;
  - Technologies adoption mechanism;
  - Barriers faced by firms in the adoption process;
- (vi) Role of Technology Support Agencies**
  - Firms level of awareness, utilization and rating of government assistance and support; and
- (vii) Impact of Technology Adoption**
  - Impact of technology adoption in terms of cost savings, improved quality, and flexibility in operations.

## **DATA ANALYSIS**

The data have been analyzed using SPSS software. Over 180 variables from 40 questions were entered in the variable view and subsequently the data from 60 valid questionnaires was entered in the data view. Frequency tables were generated for all descriptive variables. Relationship of demographic factors with technologies adopted was also analyzed to establish the dependent and independent variables using chi-square. Cross Tabs in SPSS was used to conduct the chi-square test along with the given degree of freedom and confidence level.

## **SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS**

The study helped in assimilating the different dimensions and concepts of technology for better apprehension and knowledge on the subject. It can be adjudged that technology can be defined as a scientific knowledge, an applied science or skill, which is technical in nature and is embedded in hardware, software and brain ware of any firm. In other words, technology can be understood through the study of its components namely, Technoware, humanware, infoware and orgaware.

This awareness and knowledge of issues pertaining to the role of technology adoption in firms has helped in conceptualizing a comprehensive '*technology adoption model*' that considers the firms values, demographic factors, internal and external driving as well as restraining forces in the technology adoption process of: awareness, engagement and activation. The summary and conclusions of the study are discussed as under:

1. Significant Characteristics of leather footwear firms;
2. Technology adoption status of firms;
3. Status of Innovation and Technological Capabilities of firms;
4. Degree of Sophistication of technologies adopted in firms;
5. Constraining factors in technology adoption process;
6. Impact of technology adoption on firms; and
7. Policy implications.

### **POLICY IMPLICATIONS**

Leather footwear industry also experienced a protective environment, which resulted in a far less competitive environment and underutilization of its capacity. Given these inefficiencies it further resulted in its inability to compete in international markets. The role of the government and its policies cannot be undermined in the industrial growth of any manufacturing sector particularly, where a nation has a comparative advantage in raw material and labour such as: the leather footwear industry.

In view of the above, the study concludes that there is a need to approach the problems both from macro and micro angles separately and simultaneously.

### **To Sum Up**

The leather footwear industry has been producing largely with traditional methods, low-level of operations, which does not make it globally attractive. Hence, the policy should be to encourage technology adoption in leather footwear manufacturing sector so that the industry becomes competitive and improves quality to world standards. It is imperative for the industry to modernize in order to be globally competitive, through infusion of advanced technologies. Investing in innovations would be one of the pre-requisites for attaining market competitiveness. This can be achieved only when the industry designs, produces and offers products through latest technology at economies of scale, at affordable prices which are not only suitable for Indian conditions but are also appropriate for world consumption.