

## Automation and CAD/CAM adoption in knitwear production

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■ **ABSTRACT** :The present investigation was carried out to study the automation and CAD/CAM adoption in knitwear production. For this study, data were collected from 110 knitwear units of Ludhiana consisting 56 small scale knitwear units, 29 medium scale knitwear units and 25 large scale knitwear units by using interview schedule. The sample was selected according to the probability proportional to size by following stratified sampling technique. The results revealed that with the adoption of automation and CAD/CAM systems in knitwear production, there was considerable decrease in lead time of fabric and garment production which is very important to be competitive in the market. Majority of the units used CAD/CAM systems in pattern cutting and garment assembly. The impact of automation and CAD/CAM systems on knitwear production revealed that the rate of design production, quality of design, production capacity, quality of production and communication speed increased whereas lead time, manufacturing cost, overall labour cost, and manpower decreased.

■ **KEY WORDS** : Automation, CAD/CAM systems, Knitwear, Production

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Knitting is the second most frequently used method of fabric construction. The popularity of knitting has grown tremendously in the recent years because of the increased versatility of techniques, the adaptability of many new man-made fibres and the growth in the consumer demand for wrinkle resistant, stretchable, snug fitted garments, particularly in the areas of sportswear and other casual wear-segments (Vadhani, 2001). There have been many changes in the knitwear industry during the last few decades. Previously, knitweaves used to be processed manually but now-a-days, different technologies are available for producing good quality products in less time to compete internationally. Technological advancements have brought automation and computer aided designing/computer aided manufacturing (CAD/CAM) systems in all the areas of manufacturing including textile and garment industry. During the last decade, the hosiery industry also became dependent on CAD systems.

At present, knitwear accounts for 21 per cent of the total fabric production in the country. However, the global experience suggests that knitwear has a share of about 45 per cent in the clothing consumption indicating the tremendous

scope for increasing the share of knitwear fabrics. Ludhiana cluster can play a very important role for increasing the knitwear manufacturing in India. The need is to match the product quality, productivity standards and cost of production with international players (Dhawan, 2007). For achieving all this, automation is very necessary. Keeping in view the importance of automation and CAD/CAM systems, the present study was planned to conduct in Ludhiana, Punjab with the objectives to study the existing production practices and adoption of automation and CAD/CAM systems in the knitwear units and to assess the impact of automation and CAD/CAM systems on production.

### ■ RESEARCH METHODS

The investigation was conducted in 56 small, 29 medium and 25 large scale knitwear units (total 110) of Ludhiana city selected according to the probability proportional to size. An interview schedule was prepared to collect the data by using survey method. The schedule contained information related to production practices like manpower, installed machinery, automation and CAD/CAM and its impact on production. The