

Knit Designs: Possibilities of tubular knitting in Design Developments for Pakistani knitting Industry

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Abstract

Textile industry has preeminent position in economic structure of Pakistan. Textile industry is capable of making yarn to garment products. In Pakistan Fabric manufacturing sector mainly divided into two main categories one is weaving and second is knitting goods. During September, 2016 the 9 selected commodities of Textile Manufactures contributed 59.55% of total exports in which the share of knitwear, bed-wear, cotton fabrics, articles of apparel & clothing accessories (excl. knitwear), cotton yarn, and towels were 11.95%, 11.27%, 10.96%, 10.56% and 5.71% respectively. These value indicates that knitwear industry in flourishing day by day and putting its major role in export performance. Major type of knitted goods accounted as t-shirts, socks, and other apparel goods. For such industry which accounted important role in economy of economy needs more improvement and attention in terms of product development and also needed to be produced more fashion and design goods. Weft knitting technique is dominant in Pakistani textile industry over warp knitting technique, various small to large companies are operating in this sector. But mostly focused on export orders, very less companies are developing their own product and attracting European, American and other customers in the world. In the technique of weft knitting by using hand flatbed machine which is easy to operate and has ability to develop fabrics from 2 to 14 gauge fabrics with also many easy possibilities in product development. Various small to medium size factories of Pakistan can produce such products by consuming less cost in terms of technology investment. One of technique that can be used is tubular knit fabric on hand flatbed machine. Through developing tubular knit fabrics and by adding or stuffing digital print designs in it can give aesthetically good product which gives cost effectiveness as well. This paper will explain various possibilities of tubular knit fabric in Design development which will be suitable for coarser to finer fabric of various end uses such as tops, lowers. Knitted jackets etc. So by producing such value added products, Pakistani Textile Industry related to knitted goods can increase its overall competitiveness in terms of design developments.

Key Words:

Textile Industry, Weft Knitting, Tubular Knitting, competitiveness

Introduction:

The textile industry has preeminent position in the industrial structure of Pakistan, as it caters to one of the basic necessities of human life, namely, clothing. The demand of textile all over the world is expected to increase by 6.5% every year (springer 1995) and worth of total textile demand is around 800 Billion US \$ per annum in world (Khan 2014, WTO international statistics 2015). Consumption of clothing is more income and price responsive than food, for example the International cross-sectional analysis has shown clothing expenditure has an income elasticity of about 0.9 while food has an income elasticity of 0.1 to 0.3 in high-income countries (Seale, et al, 2003). According to the economic survey of Pakistan (2015) by Ministry of finance, Pakistan is the 4th largest producer of raw cotton in the world and now at 6th position from 5th exporters of raw textile goods in world. China, the European Union and India remained the top three exporters of textiles in 2015. Altogether, they accounted for almost two-thirds of world exports. The top ten exporters in terms of raw material/semi-finished goods, all experienced a decline in the value of their exports in 2015, with the highest declines seen in the European Union (-14 per cent) and Turkey (-13 per cent) and Pakistan of -8%. The smallest decline was recorded in China (-2 per cent). Among the top ten exporters of clothing, increases in export values were recorded by Viet Nam (+10 per cent), Cambodia (+8 per cent), Bangladesh (+6 per cent) and India (+2 per cent). The other major exporters saw stagnation in their export values (United States) or recorded a decline including Pakistan (WTO Statistics 2016). In terms of Revealed comparative advantage, Pakistan has 1st rank, in raw cotton textile manufacturing whereas India has 3rd rank, China 4th and Japan 12th in 2016 which was calculated using Bella Balassa Revealed comparative advantage index of 1965 (Grish Kumar, 2017). The textiles industry may rightly be called the buttress of Pakistan's economy for following three reasons. First, its backward linkage with the agricultural sector in form of raw material, the life line of Pakistan's economy. Second, yarns and fabric manufacturing are the biggest manufacturing units in the country, accounting for the largest share of manufacturing investment, value added products and employment. Third and most important, these are high export interest enterprises. In Pakistan fabric manufacturing sector is divided into two main categories one is weaving and second is knitting. In knitting major industry is related to weft knitting type. Most of sector

comprises of apparel and hosiery goods. The popularity of knit goods has grown enormously in the recent years because of the increased changeability of techniques, the malleability of many new man-made fibres and the growth in the consumer demand for wrinkle resistant, stretchable, cozy fitted garments, particularly in greatly expanding areas of sportswear and other casual wear-segments. Pakistan knitwear (hosiery) industry is playing a vital role in value addition of textile sector. The global knitting industry is growing at a fast rate and numerous technological innovations contribute to the success of the knitwear industry. Today, knitwear is also tantamount with trendy, fashionable wear for casual, sportswear as well as smart casual work wear. Pakistan knitwear (hosiery) industry is playing a vital role in value addition of textile sector. In the export field, the hosiery knitwear industry of Pakistan has managed to make a big name in many countries of the world. At present there are about 600 knitwear factories of various sizes with 13372 circular knitting machines, 10,646 flat knitting and 23,241 socks knitting machines spread all over the country. The capacity utilization is approximate 70%.

Pakistan's knitwear industry is also almost completely export-oriented, however domestic use of garments such as vests and underwear are common in all urban groups. The products made in Pakistan include T-shirts, jogging suits, jerseys, sport shirts, children wear, gloves, tracksuits, sweaters, socks etc. There is a great potential of a further development in this industry as there is extensive value addition in the form of knitwear apparel, sportswear, socks and even knitted shoes. This sector has remarkable export potential, however; the sector remained under pressure from its competitors mainly from Bangladesh, India and the Far East. China, India, Sri Lanka, Vietnam, Bangladesh, Korea, Bangladesh, Jordan and Kenya are among major competitors in the industry. Small units face more challenges, as they get no facilities with regards to electricity services and financing. The foreign buyers in some segments were turning towards our competitors.

Pakistani exporters were losing export earnings on one hand, while losing their reliability due to non-fulfilment of export commitment in international markets due to load shedding and higher costs of inputs. During the past few years, the segments of knitwear and selected items of ready-made garments have shown an appreciable rising trend in exports. The use of knitwear (hosiery) has increased primarily due to its low price, as compared to cotton woven shirts due to easy-to-wash nature. Inherent qualities like softness, coolness, sweat-absorbent and durability have made

knitted garments popular especially in developed countries. Knitwear goods exported from Pakistan are known for their fine quality in European, American and UAE markets. It is a highly value-added item, earning much valuable foreign exchange, as per kg cotton converted into finished garments fetches better margins.

A series of new finishing processes have been incorporated with improved shades, texture and luster. Some of the bulk export items, which have gained popularity, are 100% cotton T-shirts, vests, slippers, children's pyjama suits, sports shirts, undergarments, bathing suits, knitted garments and knitted tabular or flat fabrics.

The main items of export in knitwear from Pakistan are elegant men's T-shirts, fancy ladies T-shirts with exquisite embroidery and sequined work, night shirts for ladies and men's pyjamas sets and sportswear and jogging suit and boxer sets. Techniques of designing, printing, embroidery and dyeing of the fabric have become well developed.

Export of Knitwear (Hosiery) increased from US \$ 2.04 billion in 2012-13 to US \$ 2.36 billion in 2015-16, thus showing an average increase of 5% per annum. Exports of knitwear are given in *Table 1*.

Year	Quantity (000 Doz)	Value (US \$ Million)
2010-11	197,144	2,306
2011-12	98,716	1,983
2012-13	97,921	2,043
2013-14	108,135	2,294
2014-15	111,068	2,406
2015-16	110,835	2,364

Source: Trade Development Authority of Pakistan.

In knitwear, the US market alone accounted for 41% of total knitwear with exports of \$961 million in 2015-16. About 32% of knitwear exports went to EU, while the share of rest of the world was only 27%. USA, UK, Germany, The Netherlands, Spain, Belgium, France, Italy and Canada are the top nine trade partners for Pakistan. Country-wise exports of knitwear are given in *Table 2*

**Table 2 : Country-wise Export of Knitwear (Hosiery)
 (Value in \$ 000)**

Country	2015-16	2014-15	2013-14
U.S. America	961,035	1,095,712	1,065,623
United Kingdom	362,840	357,349	335,331
Germany	151,812	128,101	137,662
Netherlands	128,607	127,527	120,986
Spain	188,777	134,827	117,205
Belgium	138,133	110,357	47,962
France	55,375	55,779	106,157
Italy	57,587	59,733	46,965
Canada	34,642	40,578	44,996
U.A.E	44,155	50,370	43,590
Sweden	14,010	12,831	15,793
Australia	16,145	13,451	12,454
Denmark	16,771	12,131	10,678
China	14,173	10,350	10,343
Japan	13,795	10,782	9,038
Poland	13,339	9,616	8,345
All others	152,426	176,997	160,540
Total	2,363,622	2,406,488	2,293,668

Source: Trade Development Authority of Pakistan.

Apart from all there always a big galaxy for further development and expansion in this field. By taming value addition in exiting current products can helps in increasing revenues and obtaining attractiveness of the market. Fashion industry in Pakistan is flourishing day by day and trying to get its better position in front of their competitors. Various fashion shows, exhibitions are conducting in various part of the world especially European countries and In US as well.

Example of tubular knit:



Source: online



Source: online



Source: online

Research objective:

To develop various design based value added tubular knit fabrics for apparel and accessories goods

Research question

What are new possible ways of making design based tubular knit fabrics for value added products of apparel and accessories?

Significance:

Support local industry and improve export rate as well by attracting more customer through value added knit fabrics of apparel and accessories.

Machine and its justification

In this research paper author will proposed various design possibilities of tubular knitting which can helps in making and developing more value added products by using simple hand flatbed machine. New Product development can helped for getting new and more export orders related to fashion knitted goods from Europe and other parts of the world.

Hand flatbed machine is considered as in expensive and easy to handle type of machine. This machine of various models and make are using in various factories such as located in Forest

sweaters which is parent manufacturing unit of various brands like cross roads, Outfitters and along this other small units are also working in Green town area of Lahore city where different articles of various brands like Hang ten, leisure club, Break out etc are manufacturing using this hand flatbed machine. This machine is also considered source of bread and butter for local workers and small entrepreneurs. Development of various new designs and articles helps in creating new opportunities for their business which leads towards more market attractiveness. This machine is totally manual and no need of any electricity or other source of energy. A trained worker can make 4 to 8 sweaters in one shift. The production quantity can be obtained by placing more machines and workers.

Knit technique

Tubular knitting is a techniques widely used in weft knitting manufacturing. It is actually making fabric by using double V bed flatbed machine. In Pakistan this V flatbed machine is mainly using for coarser fabrics and for making ribs and body panels such as sleeves for sweater etc. there is a big room available in developing new product using this V bed machine which ultimately link towards value added products. In this paper only tubular knitting technique will be explored and proposed designs for various end uses. The major recommended end uses are sweaters, lowers, jackets etc. it is a technique in which in one course one bed works while second bed hold in order to make tube or layer.in manufacturing process cams are to switched off alternatively. The stitch length can be changed in different courses in order to make experimental fabrics using big and small length of loops.



Sampling:

Machine type: Hand Flat Bed V knitting machine

Make: Stoll and flying tiger

Gauge: 3, 5 ,7, and 10

Material: cotton, polyester and fancy yarns

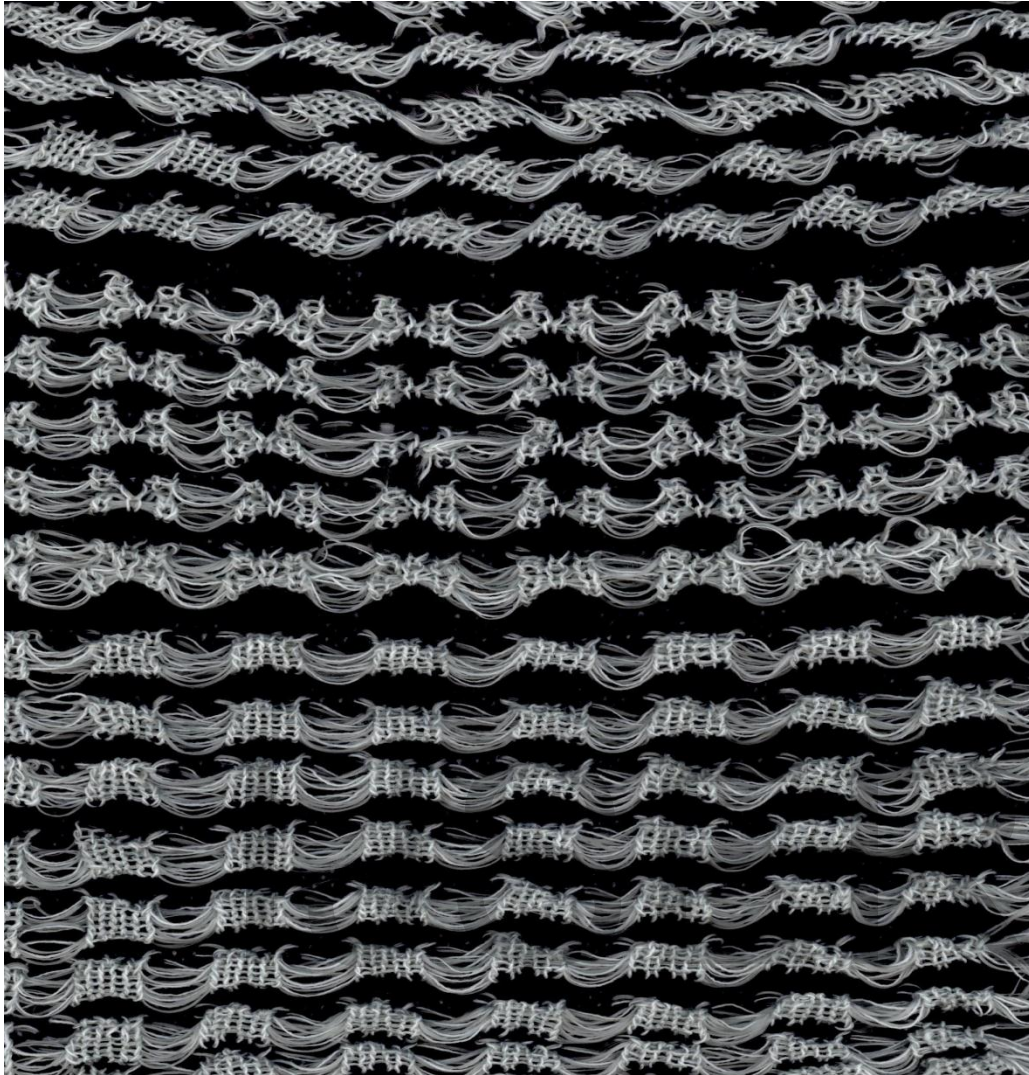
Fabric: jacquard knitted, digital printed fabrics etc.

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Sample 1:

Technique: tubular knit, rack, tuck binding element, needle drop method from front bed

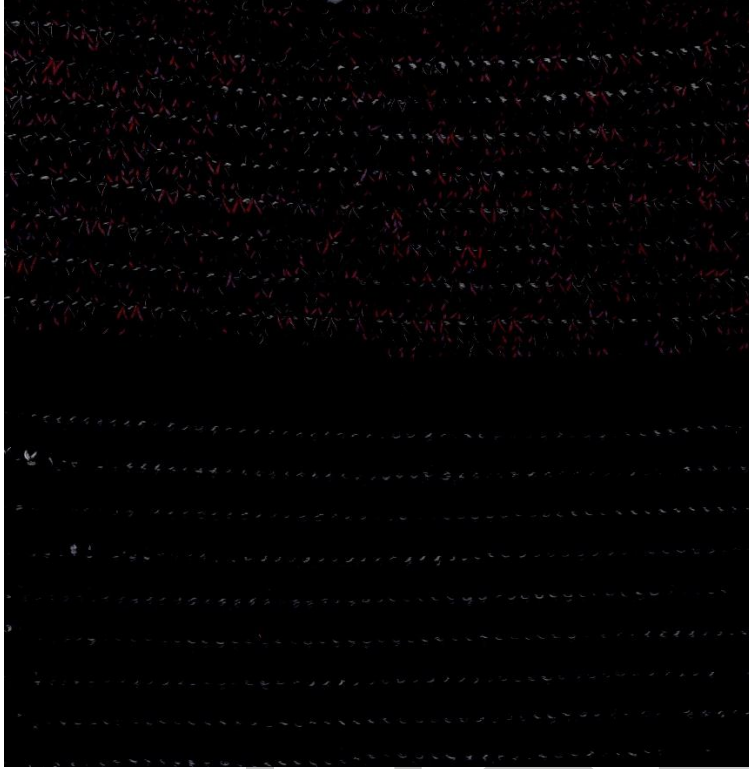
Front bed has to be closed for 8 courses and then back bed closed for 8 courses.





Sample 2: tubular knit , holding back bed for 6 courses in order to make tubes in front bed and can be done vice versa





Sample 3: stopping back bed for 6 courses and utilizing tuck stitch on front after every 4 needle

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Mapping

ADOBE CS 5 Photo Shop







Sample: 4

Tubular knit through stuffing method by inserting complete knit jacquard figure for enhancing designs, using transparent nylon wire in front bed in order to make fabric

While in sample 5, leather strips from waste added in to it in order to make interesting fabrics for various end uses







Conclusions:

By utilizing tubular knit technique various design possibilities can be made on v easy and effective way. The above mention examples are just few possibilities, by adding different designs as prints fabrics in to it will make more interactive and better designs. This paper only attempts to open up new easy ways for value added manufacturing of knit fabrics. Local industry will also be benefited if new products entered into market.

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