CAPSTON PROJECT II

COMPARATIVE STUDY OF WEAVING UNITS ON THE BASIS OF PRODUCTION AND QUALITY

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Chapter # 01

Introduction

1.1 Objective

The project is related to the comparison of two weaving units on the production basis. In the project daily production of two units is compared and also the factors which can affect the production are discussed. Main objective is to study that how yarn and the machinery affect on the production of a weaving mill.

1.2 Textile industry in Pakistan

Textile industry has the largest potential for boosting exports from Pakistan. At present this sector contributes more than 60% share in the export of country. Apart from its basic contribution of clothing the nation and at the same time earning largest foreign exchange through exportable items, the textile industry holds the key to the growth and expansion of the country's cotton economy, which continues to be the main cash crop.

At the time of independence of Pakistan only two textile mills were in existence. After independence, the process of development of the textile industry started picking up gradually.

The organized development of cotton textile mills started in the late fifties with the first five-Year Plan. PIDC came into being with its main objective of the industrializing the country in major fields as envisaged in the then plan. By mid sixties, there were about 180 units of textiles bleaching, printing and processing units, mostly situated in Karachi and small number in the Punjab. In 1968, in consequence of change in the basis of collection of excise duty from capacity to production, most of the mills closed their weaving section. The looms removed from the mills as their weaving sections were closed the looms were installed outside the mills premises in units of four, which has been exempted from excise duty. This fragmentation dealt a deadly blow to textile weaving, in so far as its future development was concerned.

Contrary to the declining trend in the production of cloth in the mill sector, the non-mill sector or power loom sector, maintained a rising tempo of expansion in capacity and production. It made a major contribution to exports of different types of fabrics, including grey cloth, bed spreads, tapestry cloth, specialized cloth etc. In this way the power looms sector was also backed up by the mills sector. As a result, as against the declining trend in the production of cloth in mill sector, the production in the power loom sector kept rising. Most of the idle looms have been removed from the mill-sector and installed in the power loom sector.

The remarkable progress of the power loom sector is due to favorable government policies as well as market forces. This sector is producing comparatively low value added grey cloth of mostly an inferior quality. The power loom sector employs poor technology; it faces scarcity of quality yarn and lacks institutional financing for its development. The growth record of Pakistan's textile industry shows a reverse trend, especially in the weaving capacity of the

10,000 in 1999-2000, the working looms were reported to be only 4,000. Thus, the organized sector seemingly made an all-out shift towards cotton spinning and almost completely gave up efforts to develop and modernize the weaving sector.

1.2.2 Power Looms Sector

The non-mill or the power loom sector has registered a phenomenal growth over the last two decades. The exemption of excise duty acted as a catalyst. Labor unrest in large mills experienced in the late sixties was conspicuous by its absence in small units, these operated on contract or self-employed basis. Besides, periodical export booms also helped the power loom sector to establish itself. Its output rapidly increased when demand for cotton bags was created after the cessation of jute bags supplies from Bangladesh.

The number of power looms cannot be ascertained in the absence of any census. The number of operating looms keep on fluctuating, consumption of yarn and production of cloth by this sector is still more difficult to calculate because (a) this sector does not maintain production statistics. (b) The looms operate generally for one or two shifts and often stop suddenly, depending upon market demand or yarn availability. From the data furnished by the Textile Commissioner Organization, it has been estimated that the number of power looms working on cotton/blended yarn varies from 175,000 to 250,000. Production of cloth increased from 722 million sq. meters in 1971-72 to 4.550 million sq. meters in 1999-2000. The power loom sector accounts more than 90% of the total fabric production. As a result the non-mill sector weaving capacity continues to occupy predominated position.

The power loom sector produces low-grade fabrics for the following reasons:

- Most looms are non-automatic and lead to starting marks, thick and thin places and missing picks.
- The power loom sector has improper or no yarn sizing and lack humidity control.
- Transportation of Beam from sizing units damages the Warp.
- Yarn used in warp and weft is purchased in small lots and lack consistency, and so also use of remnants in warping.

At present most of weaving units are said to incurring losses in their operations and were forced to cut-down capacity utilization. The major cause is stated to be the rise in the prices of cotton yarn over the last two years. The hectic rise in cotton yarn prices also provides an insight to the serious cost-push problem faced by the entire fabrics manufacturing industry, including power looms and the rest of the textile ancillary industry such as hosiery garments manufacturers.

Independent Weaving Units: A new segment in the textile industry, known by the name of independent weaving units is in the process of creation. It is the setting up of shuttle less, width air jet or rapier looms, capable of producing better quality cloth with a width ranging from 70 to 140 inches.

In Pakistan shuttle less looms units may be divided into two broad categories. (a) The units using imported second-hand looms. (b) The units using imported new looms. The performance of the units using second-hand looms is unsatisfactory in respect of efficiency of production. However, the performance of the majority of units using new imported shuttle less looms of recent origin is satisfactory. There is sufficient market for the cloth produced by these looms both in the home and export market.

During the early 1990s there has been a rapid expansion in investment in new dyeing, printing and finishing technology and local readymade garments industry is emerging. But its penetration of export market depends upon the discipline it succeeds in imposing on suppliers of fabrics. Without a major improvement in fabric quality the new investment will not lead a surge in garments exports.

Much progress has been made with the induction of new technology based on shuttle less looms but still there is room for further expansion in this sector for the sake of balanced growth of downstream value-added products. [1]

1.3 BASICS OF WEAVING

The process of producing a fabric by interlacing warp and weft threads is known as weaving. The machine used for weaving is known as weaving machine or loom. Weaving is an art that has

[1] Reference:http://goliath.ecnext.com/coms2/gi_0199-3099860/Textile-weaving-industry-in-Pakistan.html

been practiced for thousands of years. The earliest application of weaving dates back to the Egyptian civilization. Over the years, both the process as well as the machine has undergone phenomenal changes. As of today, there is a wide range of looms being used, right from the simplest handloom to the most sophisticated loom.

In this rang, the most widely prevalent loom, especially with reference to India, is the ubiquitous “plain power loom”. In this and in the chapters that follow, the various mechanisms associated with the plain power loom are discussed in elaborate detail.

1.3.1 Basic Mechanisms in a Plain Power Loom

In order to interlace wrap and weft threads to produce a fabric, the following mechanisms are necessary on any type of loom:

1. Primary mechanisms
2. Secondary mechanisms
3. Auxiliary mechanisms

Primary Mechanisms

These are fundamental or essential mechanisms. Without these mechanisms, it is practically impossible to produce a fabric. It is for this reason that these mechanisms are called ‘primary’ mechanisms. The primary mechanisms are three in number.

a. Shedding mechanism
b. Picking mechanism
c. Beat-up mechanism

Shedding mechanism

The shedding mechanism separates the warp threads into two layers or divisions to form a tunnel known as ‘shed’

Picking mechanism

The picking mechanism passes weft thread from one selvedge of the fabric to the other through the shed by means of a shuttle, a projectile, a rapier, a needle, an air-jet or a water-jet. The inserted weft thread is known as “pick”.

Beat-up mechanism

The beat-up mechanism beats or pushes the newly inserted length of weft thread (pick) into the already woven fabric at a point known as “fell of the cloth”. These three mechanisms namely shedding, picking and then beat-up are done in sequence.

Secondary Mechanisms

These mechanisms are next in importance to the primary mechanisms. If weaving is to be continuous, these mechanisms are essential. So they are called the ‘secondary’ mechanisms. They are:

a. Take-up motion

b. Let-off motion.

Take-up motion

The take-up motion withdraws the cloth from the weaving area at a constant rate so as to give the required pick-spacing (in picks/inch or picks/cm) and then winds it on to a cloth roller.

Let-off motion.

The let-off motion delivers the warp to the weaving area at the required rate and at constant tension by unwinding it from the weaver's beam. The secondary motions are carried out simultaneously.

Auxiliary Mechanisms

To get high productivity and good quality of fabric, additional mechanisms, called auxiliary mechanisms, are added to a plain power loom. The auxiliary mechanisms are useful but not absolutely essential. This is why they are called the 'auxilliary' mechanisms. These are listed below.

a. Warp protector mechanism

b. Weft stop motion

c. Temples

d. Brake

e. Warp stop motion (Predominantly found in automatic looms)[2]

1.4 Classification of Weaving Machines

Looms are classified mainly into handlooms and power looms. The power looms are classified further into the following categories.

[2] Reference: http://www.pdexcil.org/news/51N1203/weaving1.htm

1.4.1 Non- power looms

These looms have only the basic mechanisms, viz. primary, secondary and some auxiliary mechanisms. The following are examples of non-automatic power looms.

- Tappet looms
- Dobby looms
- Jacquard looms
- Drop box looms
- Terry looms

1.4.2 Automatic looms or conventional automatic looms

To get high productivity and good quality of fabric, additional mechanisms are added to ordinary non-automatic power looms. These looms are becoming popular because of their advantages of versatility and relative cheapness.

- Pirn changing automatic loom
- Shuttle changing automatic loom.

1.4.3 Shuttle less looms or unconventional looms

In the non-automatic and automatic looms, shuttles are used for inserting the weft yarns. In these shuttle-looms, preparation of weft yarn and the weft insertion mechanism itself limit the loom production and fabric quality; they are also prone to mechanical problems in propelling the shuttle. Hence loom manufacturers have developed looms with various innovative and alternative means of weft insertion.

These modern looms are known as “shuttle less looms” and some examples of the looms are:

- Air-jet loom

- Water-jet loom
- Projectile loom
- Rapier loom
- Needle loom[3]

[3] Reference: http://www.pdexcil.org/news/51N1203/weaving1.htm

1.5 Production Activities of Weaving Units

As our project is mainly about the production study so we start it from the production department of the weaving units.

1.5.1 Kohinoor weaving mill (Raiwind Division)

Warping

The arrangement of threads in long parallel lengths ready for weaving

- Direct warping (Creel capacity =1024)
- Number of machines =03
- Creel Type = V-creel

Sizing

The purpose of sizing is to make the yarn strongly enough to withstand the stress weaving.

- Double Nip
- Double Dip sizing machines
- Benninger Company
- Creel Capacity 28 Beams
- Double Box Sizing Machines
- Tow sizing machines

Drawing In

Drawing in is done according to design and weave of the fabric. Quality department will prepare article change program and forward to article team and all relevant department after signing of General Manager. According to article program drawing produced, drawing incharge will forward the drawing program to Drawing-in contractor and they do drawing.

Weaving Shed

- Total number of loom are 204
- 108 are running in shed are OMNI PLUS 800
- 96 are running in shed 2 are OMNI PLUS