Process Flow Chart and Factor Analysis in Production of a Jute Mills

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***Abstract*—Process flow chart is a useful tools for communicating how process work and also used for designing and documenting complex processes or programs. Bottlenecks and losses in jute mills, which will cause disruption in the operations, can be clearly identified through this technique. It helps to find out the most important and crucial dependencies in the process of production. There are several factors that may affect the production of jute mills so it's very important to control the range of factors inside the mills to get desirable production rate. Jute is the golden fiber of Bangladesh not only for the rich golden color of the fiber but also metaphorically, for jute's valuable contribution to the country's economy. This paper illustrates process flow chart and factors affecting the production of a jute mills in Bangladesh. Akij jute mills is a 100% export oriented Jute yarn Industry catering to the need to carpet manufacturers and other end users of jute yarn all over the world. Process flow chat and factors are analyzed in a production unit of Akij jute mills.**

***Index Terms*—process flow chart, Factors of production, Jute mills.**

I. INTRODUCTION

Jute is the golden fiber of Bangladesh not only for the golden color but also for the valuable contribution to the country's economy. Bangladesh holds the 2nd position as a Jute producer in the world with the average production of Jute 1.08 m ton/Year. Up to mid-twentieth century, about 80% of the world's jute was produced in Bangladesh and it was the country's highest foreign currency earner till early 80s. But, the emergence of petroleum-based synthetic substitutes, which were many times cheaper and convenient to use, quickly took over the market of jute. In 1980-81, jute and jute products jointly earned 68% of the country's total foreign exchange. The importance of jute in Bangladesh cannot be ignored. About 1.2 million farmers are still directly associated with jute cultivation. Jute sector provides about 10% of total employment (production, transportation, processing and marketing) in the economy. Akij jute mill is one of the biggest jute mills not only in Bangladesh but also entire world. In respect of production the mill is one of the largest in Bangladesh producing about 20,000 Metric Tons of Jute yarn annually. The mill is creating jobs to over 4,000 people most of them are destitute females of the locality. There are six production units in this mill and capacity of each production unit is 40 metric ton yarn per day.

Process flow chart and factors that may hamper production rate are analyzed in a production unit of Akij jute mill. Flow chart is the visual representation procedure of process work and used for designing the complex processes. Production processes of jute mill from raw material to finished product are represented by the flow chart diagram. There are many different types of flowcharts, and each type has its own repertoire of boxes and notational conventions. The two most common types of boxes in a flowchart are:

1) A processing step, usually called activity, and denoted as a rectangular box
2) A decision usually denoted as a diamond.

In order to improve a production process, it is first necessary to understand its operation in detail. The Flowchart is a simple mapping tool that shows the sequence of actions within a process, in a form that is easy to read and communicate. The production process is a complex one that can be impacted by many factors. There are several factors inside the production unit of jute mill and there are the greater possibilities of disruption to the smooth operations or production of jute mill. Though there are both positive and negative influencing factors, it is more common to hear about and know those factors which adversely affect production. One of the primary factors which influences productivity are both intrinsic and extrinsic factors related to the employees in charge of the production process. There are many factors which can affect productivity of yarn. These can be intrinsically related to employees at an individual and interpersonal level and can be extrinsically affected by nature, acts of God and other similar uncontrollable circumstances.

Earlier some works were carried out in production of jute, defects in textile industries, global and dynamic impacts of jute, Eco- friendly jute processing etc. [1], [4]. But there is no illustration of process flow chart of jute production and factors responsible for the production. Castor oil having low content of unsaponifiable matters was chosen for the development of new jute batching emulsion processes. Different recipes for the production of emulsions were standardized in the industrial scale and their suitability was assessed according to their stability, specific gravity, temperature, viscosity and pour points

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Ref. [1]. Yarn manufacturing is one of the biggest manufacturing processes in textile of india (Neha Gupta, P. K. Bharti), in this paper yarn manufacturing process and defects is analyzed in textile industry Ref. [2]. Global and dynamic impact of yarn production is illustrated in (Suvalee Tangboonritruthai, Nancy L. Cassill & Willam Oxenham) paper. There several factors examination is done that affect the yarn production and consumption. This research examine trade literature and government statically reports regarding the yarn production, exports and imports, movement of machinery, preferential trade agreement and yarn consumption. This paper provides the factors that should be consider in yarn production Ref. [3]. Primary objective of this research work was to develop an alternative to mineral JBO that will be eco-friendly in addition to retaining desired properties, particularly strength and longevity. The study was conducted by processing jute with castor oil as well as the traditional mineral JBO Ref. [4].

This paper analysis the process flow chart and factors those are responsible for the decreasing of production rate in a jute mill. Production rate of jute mill can be enhanced by applying this processes, will also help to understand the common causes of production degradation.

The rest of paper is organized as follows: section 2 flow chart analyses later on factors analysis those are responsible for decreasing production rate, in section 4 linguistic terms analysis and Rest of the paper is comprised of conclusion. There is also acknowledgement and reference annexed at the last portion.

II. Process Flow Chart Analysis

Jute is one of the most environmentally friendly 100% bio-degradable crops; it has many uses and thus reducing the impact on other, less sustainable natural resources. It has a cultural heritage that stretches back hundreds of years and plays a key role in the economic development of vast areas of Bangladesh as producers meet the demands of their competitive internal and export markets. Various grades of jute are used according to their quality and individual properties. Lower grade jute is often utilized as soft, protective packaging in situations where jute natural breathability is a key attribute. Jute is also used for making ropes, agricultural textiles, foods and even medicines. The most appealing application for high quality jute, however, must surely be in the production of rugs and other furnishings, where its strength and subtle iridescent shine sets it apart from the crowd.

Bangladesh produces different types of jute goods due to its worldwide demand. Process flow chart of jute production is completely different from others production like cotton production.

A. Selection of Jute for Batch

In raw jute selection process, raw jute bales are open to figure out the defect of raw jute and remove the defective portion from the mora by the skilled workers. Raw jute is classified into two types one is 150kg weight and the other is 180 kg with or without top portion cutting. Raw jute bales are assorted according to end use like Hessian weft, sacking wrap, sacking weft etc. Raw jutes are graded according to the batch of production, jutes grade are three types mostly called A, B & C here C is the very good, B is good & A is fear. Jutes grade are used according to the quality of production regarding byers order.

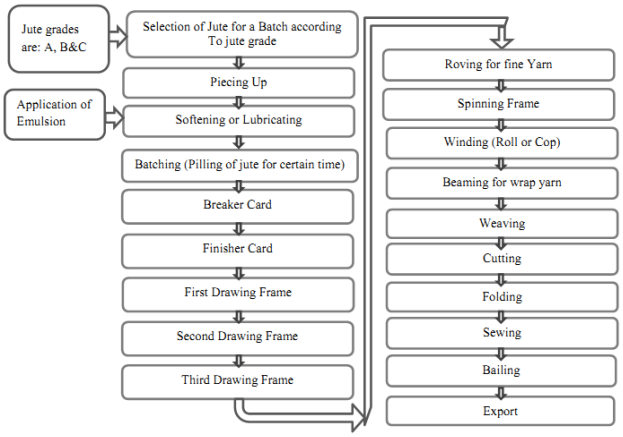

Figure 1. Process flow chart of jute production.

B. Piecing Up

At first ropes are cutting by using axe and then kept aside for treatment. Jutes are packed tightly; they are loosened by beating through a hammer. After then bulky layers are spilt into handful and each handful is 2-3lbs. various qualities of jutes and color are mixed together. Fibers are more or less in loose so beating is not required anymore. Skilled workers separate the defective jute kept aside and those are used to produce low grade yarn. Bale cuttings are baled when the roots is wet because they are very hard and difficult to separate from the bale. After then bales are cut down or bales are broken by hammering and separated by hand.

C. Softening or Lubricating

The jutes fibers and joints in the mesh of jutes are treated through oil water emulsion in order to make the material suitable for subsequent machine. Jutes are cleaned from adhered extraneous matter during processing. The natures of emulsion are classified with type of products that are manufactured. Mineral oil is used as the softening medium for all standard jute products. The emulsion of oil and water and the pressure of fluted rollers through which it passes make fiber damp and pliable. Two methods are used for softening; use of softening machine and use of jute good spreader. Generally an emulsion plant with jute softener machine is used to lubricate and soften the bark and gummy raw jute. The emulsion plant consists of gear pump, motor, vat, jet sprayer, nozzles, emulsion tank and the jacket. In this softening process jute becomes soft and pliable and suitable for carding.

D. Batching (Pilling)

Jutes fiber is placed under a closed cover between 48-72 hours after pilling with emulsion. This produces facilitating softening of jute seeds by biological action.

During piling superficial moisture penetrates inside fiber and "Thermo fillic" action take place which softener the hard portion of the root. After piling for nearly 24 hours the pile breakers carry the material to the carding machine. Generally root cutting is done after piling near the hand feed breaker carding machine. The root weight varies from 5 to 7% of the total weight of jute.

E. Carding

Carding is a combination of operation and it is carried out to convert the long and meshy jutes into spin able fiber of desired linear density known as silvers. Carding is usually carried out in 2 or 3 stages. After 2 or 3days meshy structure of jute is passed through a sense of carding machines, which are arranged in an increasing order of fineness. There are three different carding sections:

1) Breaker Carding
2) Inner carding
3) Finisher carding

Breaker card is the machine used to break down the meshy structure into individual long entities of filament as far as possible and also remove dust and other impurities. Breaker carding machine soften jute after piling is feed by hand in suitable weight. The machine by action with different rollers turns out raw jute in the form of jute sliver for finisher carding. In this process root cutting is necessary before feeding the material to the hand feed breaker carding machine. The product is now finer, softer and cleaner in appearance. It is then passed through the inner and finisher card is only moderately uniform, while the fiber of which it is composed of somewhat mixed up, far from being straight or parallel. Finisher carding machine make the sliver more uniform and regular in length and weight obtained from the Breaker carding machine. Finisher carding machine is identical to the Breaker carding machine, having more pair of rollers, staves, pinning arrangement and speed.

F. Drawing Frame

Drawing is a process for reducing sliver width and thickness by simultaneously mixing 4 to 6 sliver together. There are three types of Drawing Frame machine. In most mills 3 Drawing passages are used in Hessian and 2 Drawing passages are used in Sacking. The slivers obtained from finisher carding machine is fed with four slivers on to the first drawing frame machine.

1) The first drawing frame machines makes blending, equalizing the sliver and doubling two or more slivers, level and provide quality and color. This machine includes delivery roller, pressing roller, retaining roller, faller screw sliders, check spring, back spring, crimpling box etc.
2) In second drawing, the Second Drawing Frame machine obtain the sliver from the First drawing machine and use six slivers and deliveries per head. The Second Drawing machine makes more uniform sliver and reduce the jute into a suitable size for third drawing.
3) In the third drawing, the Third Drawing frame machine uses the sliver from second drawing. The Third Drawing machine is of high speed makes the sliver more crimpled and suitable for spinning.

TABLE I. THE COMPARISON OF THE THREE DRAWING PROCESS

Drawing Process	Efficiency Range (%)	Productivity Mt/mc/shift
1st Drawing	55 - 73	1.75 – 2.2
2nd Drawing	64 - 74	1.62 – 1.9
3rd Drawing	67 - 70	1.31 – 1.4

G. Roving for fine Yarn

The silver which is produced from the comber is thicker and not suitable to feed into the ring frame directly to produce yarn. On this case drawing frame is treated before entering the into the ring frame. There is an intermediate process is done before going to the ring frame. This process is done by roving frame. The roving frame converts the thick drawn silver into thin silver with low twist. This helps produce fine roving which is suitable to produce yarn by feeding into the ring. In this process roving frame is the input and fine roving is output. The roving is feed into the ring frame for yarn production. Roving is essential for the production of cotton yarn in case of ring spinning by ring spinning system.

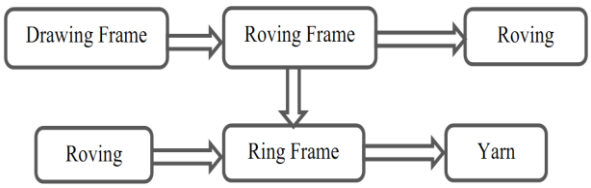

Figure 2. Principal of roving frame.

Roving frame plays an important role in the spinning process. Various types of yarn fault could be appearing for the wrong drafting or twisting. Proper roving can give better yarn properties.

H. Spinning Frame

The spinning operations carried out to produce yarn from silver, which is subjected to elongation to the specified linear density and then twisting for developing necessary yarn strength. The object of spinning and of the process that precede it is to transform the single fibers into a cohesive and workable continuous length yarn. Basically, in the case of natural fibers, the processing involves opening, blending, carding (in some cases also combing), drawing and roving to produce the material for the spinning frame. The spinning frame machine is fitted with slip draft zone and capable of producing quality yarns at high efficiency with auto-doffing arrangements also. A 4 pitch slip-draft silver frames available of 20 spindles 100 spindles, having a production range 8lbs to 28lbs with a flyer speed of 3200 to 4000 rpm. Spinning of several types of yarn is processed by spinning frame machine using different kinds of bobbins such as Food grade HFC, Sacking Wrap and Hessian Weft.

I. Winding

Winding is the process of transferring yarn or thread from one type of package to another to facilitate subsequent processing. The handling of yarn is an integral part of the fiber and textile industries. Not only must the package and the yarn itself be suitable for processing on the next machine in the production process but also other factors such as packing cases, pressure due to winding tension must be considered. Basically, there are two types of winding: precision winding and drum winding.

1) Precision Winding: By precision winding successive coils of yarn are laid close together in a parallel or near parallel manner. By this process it is possible to produce very dense package with maximum amount of yarn stored in a given volume.
2) Non Precision Winding: By this type of winding the package is formed by a single thread which is laid on the package at appreciable helix angle so that the layers cross one another and give stability to the package. The packages formed by this type of winding are less dense but is more stable.

J. Beaming

Beamed yarns are another product created from continuous filament yarns in which creeled bobbin yarns are pulled in a continuous, parallel manner around a beam. In beaming operation yarn from spool is wounded over a beam of proper width and correct number of end to weave jute cloth. This operation helps to increase the quality of woven cloth and weaving efficiency, the wrap yarns are coated with starch paste. Adequate moisture is essential in this operation. A quality characteristic of a beam is width of beam number of ends and weight of stand and there is a continuous passage of yarn through starch solution from spools to the beam. Tamerine kernel powder (TKP) contains in water starch solution, antiseptic sodium silica fluoride (NaSiF4) and its concentration varies with the quality of yarn.

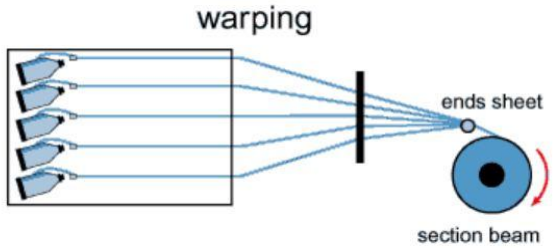

Figure 4. Beaming operation.

K. Weaving

Weaving is a process of interlacing two types of yarn known as warp or ends (run parallel to the weaving machine known as loom) and weft or filling yarn (run perpendicular to the loom) to produce a rigid fabric. There are separate loom for Hessian and sacking in weaving section. The Hessian looms, shuttle which contents cops can manually change. The sacking looms are equipped with eco-loader to load a cop automatically into the shuttle. In order to interlace the warp and weft yarn, there are three operations which often called primary motions are necessary.

Figure 3. Weaving process.

1) Shedding- The process of separating the warp yarn into two layers by raising the harness to form an open area between two sets of warps and known as shed.
2) Picking- The process of inserting the filling yarn through the shed by the means of the shuttle less while the shed is opening.
3) Beating- The process of pushing the filling yarn into the already woven fabric at a point known as the fell and done by the reed.

L. Cutting

Yarn cutting device for mechanical looms having a first blade carrier with an end-side blade and a second blade carrier with an end-side blade, at least one of said blade carriers being in an operative connection with a drive in order to carry out a yarn cutting function between the blades, wherein the drive is constructed as an electrically energized linear motor operatively connected to at least one of the blade carriers to cut yarn between the blades.

M. Folding

The folding station comprises a plurality of co-operating claws, pneumatically controlled, which fold the skein in half and push it through the center of a hollow tubular support member which has positioned around its outer surface a pre-formed paper band. Subsequent to the introduction of the folded skein into the tubular member a doffing mechanism simultaneously removes the folded skein and the pre-formed band from the tubular member, resulting in the band being positioned around the central portion of the folded skein. The apparatus also comprises means for wrapping and sealing band forming slips around the tubular member prior to the introduction of the skein into the tubular member.

N. Sewing

Sewing threads are made for efficient, smooth stitching that will not break or become distorted for the life of the sewn product. Its main function is to hold together parts that could be of textile, leather etc. to form garments or other end products. Sewing machines are used to join the parts with the sewing thread in a process called Sewing. There are three types of sewing operation:

1) Mechanical: stapling, sewing.
2) Physical: welding or heat-setting.
3) Chemical: by means of resins.

The formation of seams by physical and chemical methods is restricted to a few specialized applications, as these processes tend to alter certain properties of the

textile material. Among mechanical sewing techniques, sewing maintains its prevailing position by virtue of its simplicity, sophisticated and economical production methods and the controllable elasticity of the seam produced.

O. Bailing

Yarn bailing process is widely appreciating clients all over the world. Such equipment is made using high grade raw material, which ensures their longer working life. Hank yarn baling press is widely used in textile industry. This press is widely appreciated for its features of superior quality, simple operation, low maintenance and durability. The resources are used to customize presses according to customer's specification.

P. Export

Yarn is exported as per customer's requirement and quality. After achieving 100% customer requirement, it is allowed to export otherwise it's got back into the re-production. According to Akij jute mill rules and regulation, quality is the customer and customer is the king.

III. Factor's Analysis

Production is very important for every company to improve the global market as well as countries development. There are several factors those are directly related to the production of a jute mill as well as quality of yarn production. It is very essential to keep in mind about the control of factors in production of jute mill so that produced goods should meet customers or buyer's satisfaction. There are some qualitative factors; those are affecting the production.

A. Raw Material

Raw jute reeds after retting and drying are packed in the form of bales of 150 kg or 180 kg for easy transportation to jute mills. The bales from the mills godown are taken to the selection section where all the jute bales are opened to find out any defect and to remove the defective portion from the morah by experienced workers. The bales are assorted according to end use like hessian weft, sacking wrap, sacking weft, etc. After selection, jute bales are carried to softening/batching section by workers. The process of adding oil and water emulsion on jute batches is called as batching. The stack of fiber blends from different types of jute for a particular class of yarn is called a batch. The department where the jute is prepared for carding is called the batching house. In this section the fibers are conditioned by adding oil and water to it for easy processing in consequent processes. For making the jute fiber bundles suitable for next carding operation the morah prepared in selection are processed through softener or spreader machine. During its passage through these machines, oil in water emulsion is applied on jute for its moistening or lubrication.

B. Working Environment

When one employee is not performing at the satisfactory level, customers may notice a lack of service. This can happen for a number of reasons. It's wise to consider if the work environment at business is negatively affecting employee productivity. The ergonomics of an employee's work station also impacts performance and productivity. If desks and chairs are adjusted properly, workers are able to accomplish more. In addition, comfort levels of environmental stimuli, such as lighting and noises, can affect employee output. Another very important factor in creating a productive work environment is management's personal concern for employees. Especially relevant for employees was management's reaction to positive and negative milestones in their lives, such as births and deaths in the family.

C. Machine Maintenance

Maintenance is an important factor in quality assurance, which is another basis for the successful competitive edge. Inconsistencies in equipment's lead to variability in product characteristics and result in defective parts that fail to meet the established specifications. Beyond just preventing break downs, it is necessary to keep equipment's operating within specifications (i.e. process capability) that will produce high level of quality. To establish a competitive edge and to provide good customer service, companies must have reliable equipment's that will respond to customer demands when needed. Equipment's must be kept in reliable condition without costly work stoppage and down time due to repairs, if the company is to remain productive and competitive. Failure or ml-functioning of machines and equipment's in manufacturing and service industries have a direct impact on the following:

1) Production capacity: Machines idled by breakdowns cannot produce, thus the capacity of the system is reduced.
2) Production costs: Labor costs per unit rise because of idle labor due to machine breakdowns. When machine malfunctions result in scrap, unit labor and material costs increase
3) Product and service quality: Poorly maintained equipment's produce low quality products. Equipment's that have not been properly maintained have frequent break downs and cannot provide adequate service to customers.
4) Employee or customer safety: Worn-out equipment is likely to fail at any moment and these failures can cause injuries to the workers, working on those equipment's. Products such as two wheelers and automobiles, if not serviced periodically, can break down suddenly and cause injuries to the stress.
5) Customer satisfaction: When production equipment's break own, products often cannot be produced according to the master production schedules, due to work stoppages. This will lead to delayed deliveries of products to the customers.

D. Employer's Motivation

Unmotivated employees are likely to spend little or no effort in their jobs, avoid the workplace as much as possible, exit the organization if given the opportunity and produce low quality work. On the other hand, employees who feel motivated to work are likely to be persistent, creative and productive, turning out high quality work that they willingly undertake. Motivation is based on growth needs. It is an internal engine, and its benefits show up over a long period of time. Because the ultimate reward in motivation is personal growth. The only way to motivate an employee is to give him challenging work for which he can assume responsibility. Human motivation is so complex and so important, successful management development for the next century must include theoretical and practical education about the types of motivation, their sources, their effects on performance, and their susceptibility to various influences. Employees are the company's best assets. If employees are not as motivated, it will have a tremendous effect on productivity. The organization's overall efficiency will decline by unmotivated employees. Managers may even need to hire additional employees to complete tasks that could be done by the existing force. Proper motivation of employees is directly associated with productivity and with maintenance factors. Workers who are content with their jobs, who feel challenged, who have the opportunity to fulfill their goals will exhibit less destructive behavior on the job. They will be absent less frequently, they will be less inclined to change jobs, and, most importantly, they will produce at a higher level.

E. Facility Layout Design

Facility layout and design is an important component of a business's overall operations, both in terms of maximizing the effectiveness of the production process and meeting the needs of employees. Layout planning is very important as it eliminates unnecessary costs for space and materials handling which leads to producing goods and services at a higher rate. The primary objective of selecting a layout is to minimize a function related to the travel of parts meaning the total material handling cost, the travel time and travel distance. Proper layout design helps to minimize nearly 30% to 40% of the manufacturing cost is accounted for, by materials handling. Every effort should, therefore, be made to cut down on this cost. Plant layout is a significant factor in the timely execution of orders. An ideal layout eliminates such causes of delays as shortage of space, long-distance movements of materials, spoiled work and thus contributes to the speedy execution of orders.

F. Material Handling

Material handling in addition to handling of materials in an industry is also significant in terms of costs in overall production because it is something that is quite common to all manufacturers. But when once its nature is exposed it may be difficult to overlook it as a major potential of effecting cost reduction. Material handling ranges from movement of raw material, work in progress, finished goods, rejected, scraps, packing material, etc. These materials are of different shape and sizes as well as weight. Material handling is a systematic and scientific method of moving, packing and storing of material in appropriate and suitable location. The importance of material handling function is greater in those industries where the ratio of handling cost to the processing cost is large. Today material handling is rightly considered as one of the most potentially lucrative areas for reduction of costs in production. A properly designed and integrated material handling system provides tremendous cost saving opportunities and better production rate.

G. Planning & Scheduling

A solid plan and schedule helps keep costs down and allows you to operate according to a budget with high production rate. A manufacturer must create an operations plan and schedule for the production process. Companies that have to order supplies and raw materials on a regular basis need an ordering schedule. If the company utilizes shift workers, there must also be a schedule detailing the availabilities of employees and needs of the business. High level objective of operation's planning is to decide the best way of allocation of labor and equipment as to find balance between time and use of limited resources within the organization. An operation planning ensures that proper workflow is established by ensuring allocation of job on appropriate machines before the advent of production activities.

H. Safety Management

A safe work environment impacts a project's bottom line both directly and indirectly. Costs associated with incidents, including lost costs, worker's comp claims, insurance costs and legal fees are minimized in a safe work environment. A safe work environment boosts employee morale, which, in turn, increases productivity, efficiency and profit margins. Companies can improve business operations through the use of safety procedures. Improving operations may be an unintended benefit of safety procedures. Business owners and managers that educate employees on how to best complete business functions may find new ways to improve the efficiency and effectiveness of the production process. Safety procedures may also allow employees to work quicker and improve their production output.

I. Research & Development (R&D)

Research & Development (R&D) is a scientific investigation that explores the development of new goods and services, new inputs into production, new methods of producing goods and services, or new ways of operating and managing organizations. Research and Development (R&D) is a key element of many organizations and, when well-planned and used, enables a business to generate increased wealth over a period of time. The research phase includes determining product specifications, production costs and a production time line. The research also is likely to include an evaluation of the need for the product before the design begins to ensure it is a functional product that customers want to use.

J. Production Management

Production management's responsibilities are summarized by the "five M's": men, machines, methods, materials, and money. "Men" refers to the human element in operating systems. The production manager's responsibility for materials includes the management of flow processes—both physical (raw materials) and information. The smoothness of resource movement and data flow is determined largely by the fundamental choices made in the design of the product and in the process to be used. The production manager must plan and control the process of production so that it moves smoothly at the required level of output while meeting cost and quality objectives. Process control has two purposes: first, to ensure that operations are performed according to plan, and second, to continuously monitor and evaluate the production plan to see if modifications can be devised to better meet cost, quality, delivery, flexibility, or other objectives.

IV. Linguistic Value

There are several factors which are directly or indirectly related with production expressed as linguistic value. Linguistic values are classified in five categories. Linguistic value is a term used in knowledge representation. It is simply knowledge in a particular field that contains no nominal value.

TABLE II. The Linguistic Terms.

Linguistic term	Value
Very Good(VG)	5
Good(G)	4
Fair(F)	3
Poor(P)	2

Relationships of factors are converted with linguistic value. Factors values are stetted in accordance with the importance of production rate. Some factors are strongly related with production and some are not, those are expressed through linguistic value.

TABLE III. Factors in Linguistic Value.

Factors	Linguistic Value
Raw Material(RM)	2
Working Environment(WE)	3
Machine Maintenance(MM)	3
Employer's Motivation(EM)	4
Facility Layout Design(FLD)	3
Material Handling(MH)	2
Planning & Scheduling(PS)	5
Safety Management(SM)	3
Research & Development (RD)	4
Production Management(PM)	5

This figure shows the linguistic value of factors related with production. Linguistic values are arranged in accordance with the importance of production. Factors of linguistic value expressed in a graphical method (Fig. 5); which shows the graphical representation of factors relation in production.

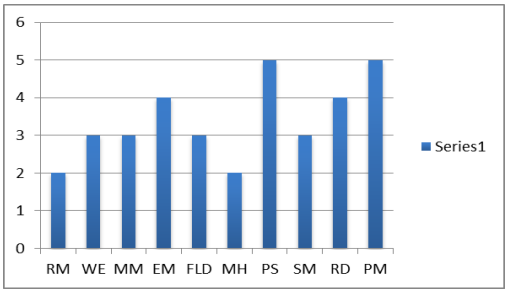

Figure 5. Graphical presentations of factors.

V. Conclusion

Bangladesh is an under developing country and jute is the golden fiber not only for the rich golden color but also for the valuable contribution in countries economy. Jute mill created a huge employment opportunity for most of the destitute families in Bangladesh. This paper illustrated the process flow chart and factors analysis in production of a jute mill. Process flow chart in jute mill is completely different comparing with others manufacturing industry because jute mill is an agro based industry. All of the necessary data for the analysis of this paper was taken from the production unit of Akij jute mill. They have more than six production units and they are producing 215 metric ton yarn per day. Process flow chart analyzed in this paper represents the working process of yarn production in Akij jute mill. There are several factors behind the production unit of a jute mill and those factors are intrinsically and extrinsically related with the productivity of yarn. If it is possible to confirm the application of these factors effectively then these will definitely help to enrich the productivity of yarn in Akij jute mill. Fig. 5 show the graphical presentation of factors relation with production. This graphical relationship is build up with the importance of factors comparing production.

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