IJISET - International Journal of Innovative Science, Engineering & Technology, Vol. 5 Issue 4, April 2018
ISSN (Online) 2348 – 7968
www.ijiset.com

Apparel Production Plan System and Its Implementation Process in Ready Made Garment Manufacturing Process

Rajib Das[1], Nazmun Nahar[2], Hafsana Yasmin[3], Mithila Kabir Tarafder[4], Mr. Ashraful Islam[5] , Solaiman Kabir Mamun[6]

[1] Lecturer, Apparel Manufacturing Management & Technology, Shanto-Mariam University of Creative Technology, Uttara, Dhaka-1230, Bangladesh.

[2&4] Lecturer, Fashion Design & Technology, Shanto-Mariam University of Creative Technology, Uttara, Dhaka-1230, Bangladesh.

[3] Lecturer, Fashion Design & Technology, Uttara University Uttara, Dhaka-1230, Bangladesh.

[5] Lecturer, Fashion Design & Technology, Port City International University. South Khulsi, Chittagong, Bangladesh.

[5] Junior Lecturer, Apparel Manufacturing Management & Technology, Shanto-Mariam University of Creative Technology, Uttara, Dhaka-1230, Bangladesh.

Abstract

The knowledge about different production System will enable you to adopt and organize different production system for efficient production. The acquaintance about time study will also help to organize the production time efficient manner that is better production in less time. Food, Clothing, education, health and housing are basic human needs is the responsibilities of a government to provide the people are opportunities to satisfy the needs, before the introduction of modern clothing technologies. People used different materials such as animal sight ,grass lift to cover the body for comfortable for thousands of years with invention of techniques of producing yarns from different natural fibers and the technique of producing fabric from yarn .People start using handmade garments. Clothing of the fine fabrics made from linen and silk has a tradition of several thousands of years.

People of Ancient Egypt, Greece, china, Japan and many others civilization used to wear clothing of different variety seven to eight thousand years ago with the invention of sewing materials. People tradition to make garments at home or by local custom tailors.

In the history of RMG Industry First garments production started in Paris in 1821 with 80 sewing machines. Small scale Industrial production of garments starts at the middle of 19th century which also marks in the industrial revolution in Europe. The commercial Production clothing begins in the earlier part nineteen century. During the initial period clothing merchants of Europe employed tailors to manufacture to wear cloth of sale I the shop with in shorts spend of time the manufacturer of clothing started in industrial scale and this sector spend quickly within few day careers during the later part of nineteen century.

Keywords: *Challenges of Apparel Production Plan, Different Production Plan, Time and Action Plan, Straight Line production, ETON Production, Unit Production System.*

1. Introduction

Today clothing industry is a global business and global trade surplus 400 Billion dollars and expected to surplus 600 Billion dollars by the year 2010; Bangladesh entered to global market in the early 1980 exporting garments of few thousands of Dollars and spend of 40 years it become 28 billion market and the prospect of Bangladesh RMG sector is very bright. If we can manipulate the certain things that will increase our competitiveness. Manipulation of production plan system and use of time study are two main important factors that demoting the efficient of production system which ultimate enhance the competences.

There are different production system can be categorized as,

- Make through Production System.
- Sectional work system.
- Progressive bundle system.

- Conventional bundle production system.
- Main line assembly with offline sets.
- Straight line production system.
- Modular/Unit Production system.
- Eton Unit production System

To run all production system smoothly it needs different type's sewing machine basic and advances and many others machine attachment.

Different types of sewing Machine,

1) 1-NEEDLE LOCK STITCH MACHINE.
2) DOUBLE NEEDLE LOCK STITCH MACHINE.
3) DOUBLE NEEDLE CHAIN STITCH MACHINE.
4) MULTI-NEEDLE CHAIN STITCH MACHINE.
5) OVER LOCK STITCH MACHINE.
6) BUTTON HOLE STITCH MACHINE.
7) BUTTON ATTACH MACHINE.
8) BAR TAKING MACHINE
9) POCKET WELTING MACHINE.
10) FEED OF THE ARM MACHINE.

2. History of United Kingdom (UK) Garment Manufacturing

The apparel and textile industry is a fascinating example of manufacturing and the supply chain. This sector is under constant pressure, competition is fierce, and there are always rival firms waiting to challenges .Competition will increase still more in 2005 when countries with export quota restrictions to Europe and USA are freed from those constraints.

In the heyday of garment production in this country in the 1960s.70s and early 80s, manufacturers named their price based on their costs plus profit. They offered ranges of garments to the retailer or wholesaler. After the latter had made their selection, they placed a firm order for substantial quantity and expected one large delivery a few months later.

This scenario has completely changed. The retailers now drive the garment supply chain:

- They know exactly what they want in terms of actual merchandise.
- They decide price according to consumer pressure and expectations (designers must work to price points costing is done on a price minus basis, squeezing the manufacturer's margins.
- They decide when they want it and in what quantities-not all at once but as per pre-determined delivery schedule, that could last over weeks, and changed at any time!

The retailer want to remain as flexible as possible, responding to consumer demand as accurately and as quickly as possible. They use technology (Such as EPOS-Electronic Point of sale) to gather this information and seek suppliers who can respond to their needs. It is the same in many other sectors such as the food chain for example.

The main problems in clothing manufacture include:

- Strong traditions, for instance in the culture of organization, job design, work organization, and the way operators are paid; it is the same for their suppliers.
- Unresponsive and inflexible production system.
- Fabric/cloth purchasing difficulties: due to the nature of the process this takes at least two weeks to produce and often much longer.

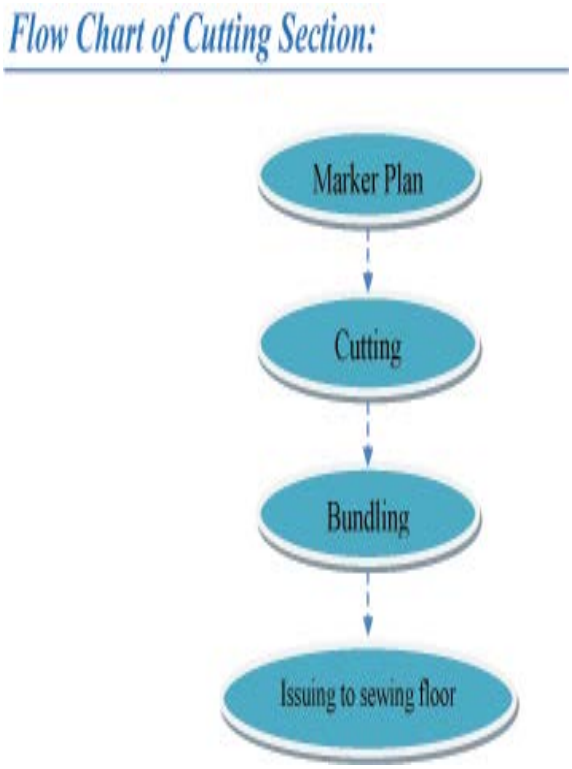
Many companies, such as the Spanish group Inditex (who own the Zara retail Chain), reduced this problem by restricting the base fabrics their designers can use, Few retailers work like this and are therefore faced with anything between 4 and 12 week lead times, immediately restricting responsiveness and flexibility .Benetton were the first to pioneer this flexible approach with their grey state garments that were dyed, Jaeger then adopted the same approach".

2.1 Make through Production System:

In this system most suitable cutting system is smartly all parts of same size are arranged in a group for cutting. The size of all parts of one garment together bundled and tighten in the make through production system garments garment parts from the cutting section is delivered in bundle.

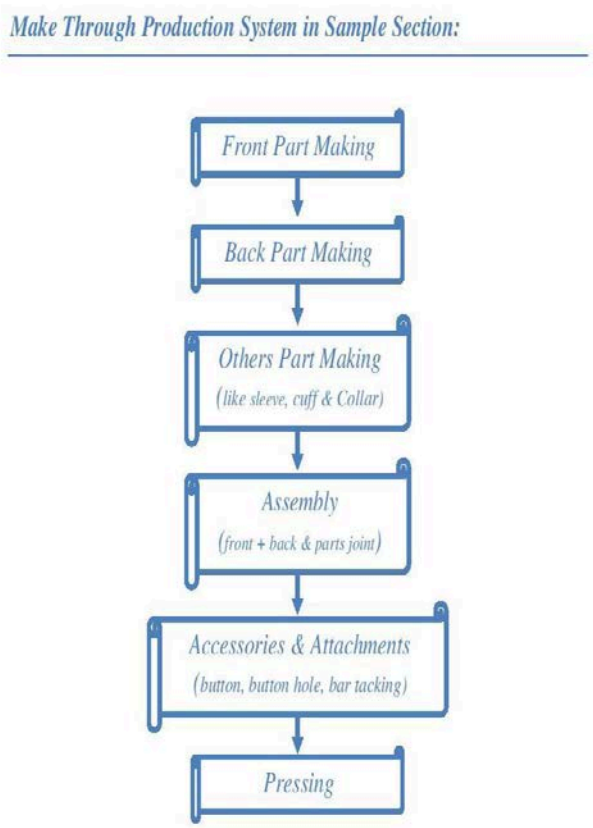
ISSN (Online) 2348 – 7968
www.ijiset.com

Flow chart of cutting section:



This flow chart is common production system in tailoring shop but for industrial production this system are not workable for mass production. In the production the tailoring production system are only used in sample making or low volume high fashion garment industries in this system one operator will made the whole garments. This system of production are required multi killed operator that means the single operator must know all activities of production of that item.In sample section one operator he makes all parts in one garments as per sequence.

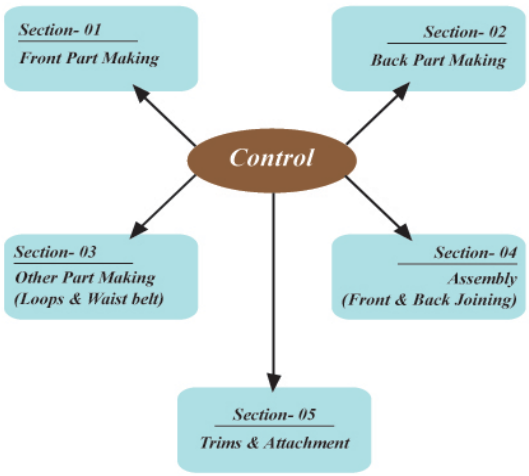
MAKE THROUGH PRODUCTION SYSTEM IN SAMPLE SECTION:



2

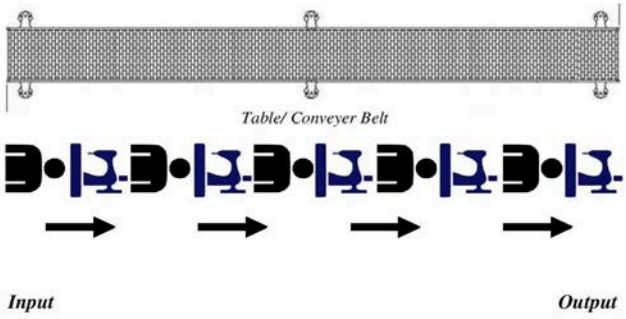
The work placed up several well defined parts and one operator machine is do the all operations in the particular parts that a construction of sleeve, collar and bodies etc. in this system the operators have must specialized knowledge about all activities as well as use of different equipment of machines. Sectional work system commonly used in manufacturing of shirts, trousers and over all how efficient in this system is mass production:

Sectional Work System:



production line or more usually a center fit table without a conveyer.

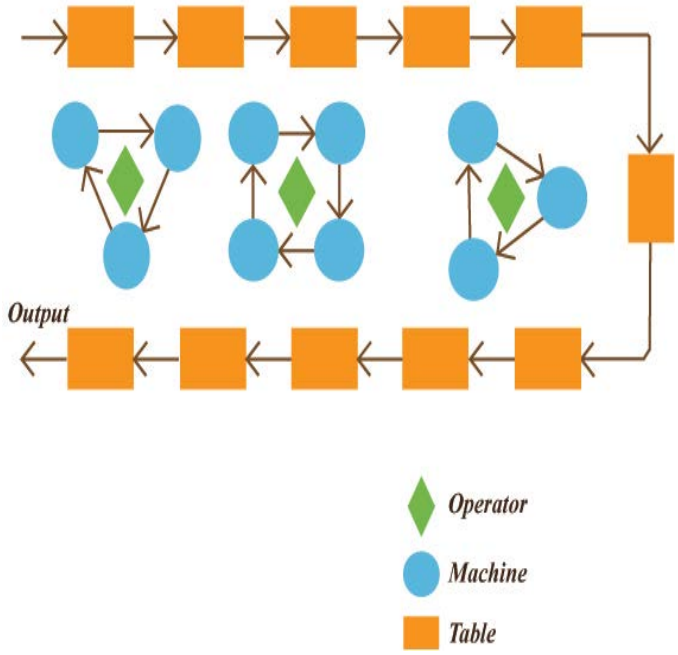
Straight Line Production System:



The operations or broken down and arranged such a way that fit as nearly as possible as fixed scale time speed of a conveyer. The size of all parts and bundle is same offer cutting all parts of one garments together bundle and tight as per size and serial ways bundle supply to serial floor. Less number of parts garments is suitable for the production system and this production system number of operator will be sited in a straight line. Operator sitting arrangement could be face to face or one direction face. Production flow should always in one direction individual operation complete one operator.

2.4. Unit production / Modular production system:

Unit Production/ Model Production System:



Modular Production system is more suitable for small size order quantity of garments as well as less critical garments. In Modular manufacturing the Operators of the Production group are engaged in Pattern called module. The team works on one or few garments as a time instead of bundle garments. The Operators are stand to sited their station and rotated to different machine as they work. One Operator can more one Operation to another machine because in this system one operator works multiple Operations. In this system Operator need to be multi skill worker. In modular system the sewing machines are set in to “U” shape manner and all necessary machine are made available, Types of

machine is one of the most important factor in this system and standing Machine is more preferable.

2.5. Main Line Assembly with Offline Sets:

The development of progressive bundle system aims to reduce work in progress through input time. Through output time is total time work in progress in each section from input to Output Plus delay time between each section. The Sub assembly stages are offline and perceive concurrently and mainline is fronts and backs, garments assembly and collar setting. A service Operative is required to reassemble to bundles from the different stages. A bundle contains only, a single part of a garments such as sleeve, collar, cuff and front, back etc. Bundle standards size around 20 to 30 pcs. This is very common production system in Bangladesh clothing Industry. Now detail discussion about short production system in the industry. Cutting Floor working procedure with Mainline Assemble with the offline sets;

In this system marker plan making spare with packing assortment ratio and order sequence. In this production system parts numbering is very important because when assembly of parts it should be hundred percent maintain others wise garments will defect. Bundle standard size 20 to 30 pcs. Bundle will be supplied in the sewing Floor as per sequence of packing. This type of production system is more effective large order quantity production and advantages this system are shorter throughout time, reduce work in progress. Productivity will high. Individual operator will completed individual operations. Production line set in straight manner, Number of sewing machine and others equipment set in a line. Production starts from back side and progress through forward as per sequence of production. Individual section such as considering basic woven full sleeve shirt,

Collar Section: Operator added the collar run stitch, collar Top stitch, collar band hem, collar and band join, and collar top stitch.
Cuff Section: Cuff run stitch, cuff Top stitch.
Sleeve section: sleeve upper and lower placket stitch.
Front: Front part, Upper placket and lower placket join, pocket attach.
Back: Back part, back yoke join, collar, cuff join, bottom hem.
Attachment: Button hole, Button attach.

2.6. ETON System (Unit Production System):

Eton system is the innovative unit production system focusing on sound product industry. Eton system not only automatic materials flow to production process its minimize material handling for each sewing operator at the work station and also in corporate real time production control collecting both labor cost and work in progress informational the work place. The possibility to short product using different criteria such sizes and colors and it's also automatic while quality can be treats automatically to the process. For this production system line setup needs huge investment all the will long run this system will be more effective.

The Planning Process in Clothing Manufacture:

- The basic process includes the following stages:
- Receive the order.
- Plan to check if there is available capacity in sewing to achieve the delivery date required.
- Plan to check the available capacity in non-sewing areas (cut, embroidery; print, wash and pack)
- Plan to check sufficient lead time to order and receive fabrics, trims, approve sample, carry out lab tests.
- Confirm delivery date to customer and reserve capacity.
- Communicate plan to all departments.
- Monitor progress against plan.
- Re-plan as required as return to pint 5.

In an ideal worlds, this cycle would be carried out in a systematic way.NO plan is ever perfect. But all that we have learned about total quality management reminds us that we must aim at the ideal rather than settle for 'Acceptable Quality Levels' that have a built in failure rate. Although the first priority is the customer delivery date, the factory must also consider the best place to make each product, taking in to account both skill and machine constraint. Production efficiency depends upon this. In the clothing industry, Planning will typically focus on sewing, as it can account for up to 80% of the skill and resources required. However, the capacity constraints of supporting areas also have to be assessed. In particular, the pre-production events must be planned to ensure that production begins on schedule.

Basic Capacity Calculations:

In the clothing Industry, most companies still work to standard minutes, which is the calculated or measured standard time to produce a garments. A basic calculation may be as follows:

8 working hours per day = 480 minutes
10 operators per team
Capacity = 4800 minutes per day
Standard Minutes for T-shirt style a = 12 std min @ 100% efficiency =4800/12=400 pieces per day.

However, it may be necessary to take into account the skill and efficiency of different teams, or the ability of a team to make different products. For instance, if a team normally make woven garment s, to change to knitted – shirt means that they are less skilled at handling that item of clothing. If they can only achieve 75% efficiency, the output is only 300 pieces per day. The impact on the production plan is huge.

Many readers will be used to volume manufacturing of widgets and know about the steady automation of their industries. The clothing industry is still very heavily dependent on human labor, despite increasing use of automated processes. Add to this the whims of the fashion marker, which cause constant style changes (equivalent to the constant engineering changes that manufacturing engineers so hate), and you have huge difficulty, in achieving efficiencies and optimizing operator skills. If you can keep a team of operators making the same they of product as long as possible, production loss is minimized. The plan must also consider the specialist support areas. Working back from the sewing plan, it is necessary to calculate where the loading will impact resources. The plan must then allow for post sewing operations such as garment washing, otherwise the sewing plan will be acceptable but WIP builds up in the other areas. Critical path analysis is a vital tool in this process-If the Plan moves, so must the priorities.

3. Coping with Planning:

Most business systems offer some capacity planning, often limited to rough cut capacity planning. Many of these systems are not graphical, are complex to use, and not user friendly .Many use spreadsheets, which are often well applied but they have several drawbacks:

- They are designed by one person and not transparent.
- They are not visual
- They cannot be shared on a network and therefor limit coordination.
- They do not highlight problems clearly.
- They are cumbersome and difficult to manage with large numbers of orders.
- They are very difficult to amend when customer requirements change.

These systems therefore do not give answers quickly enough for the dynamic world of the fashion industry. A system named Fast react designed to overcome these problems is now used in over 25 countries world-wide. The case study described here demonstrates how the implementation of a comprehensive planning system can contribute to efficiency and productivity gains.

3.1. Achieving Success:

In the early nineties the company underwent huge changes, responding to the changing needs of their main customer (to which they at that time sent about 70% of production) with 3 other main customers. Now they only supply one customer. The changes include:

- From flow line production to production cells, with team-working and multi skilling.
- JIT approach to inventory.
- Strategic partnerships with fabric suppliers to gain shorter lead times.
- Service orientation rather than product orientation.
- Changed emphasis from volume of output to accuracy of output.

These changes were facilitated were facilities through increased emphasis on planning and control activities. Planning and buying activities have been merged and in 1997.Fastreact planning software was introduced. Lead-time and margins had become even tighter, and the need for really effective control became critical.

- The Planning and control activities at this company include:
- Long term capacity planning, up to 18 months ahead.
- Short term detailed planning of factory units.
- Planning of cutting room activities
- Planning of sewing room activities.
- Production Control.
- Inventory Control-raw materials purchasing, finished goods; Call off etc.

3.2. Critical Path control:

The management structure includes a planning Executive (PE), Merchandising Executive, 4 Factory Planners (One for each factory), and 2 Planner? Buyers in each factory. Huge amounts of human resource are devoted to planning and control activities-which is unusual in traditional manufacturing organization.

Duties of the Planning Executive:

- Liaise with Customer and Merchandising Executive to establish requirements for this season and next
- Agree delivery schedules
- Respond when changes need to be made as a result of changes in consumer demand.

Allocate garments to appropriate factories to achieve customer requirements (even though the PE is looking at planning at an aggregated level and looks at week, they must consider the skill level in each factory)

3.3. Control of critical path:

- Duties of the Factory Planner
- Take information form PE and loads factory appropriately, scheduling and sequencing work in line with delivery schedule
- Work closely with Factory Manager to ensure production efficiency
- Liase with main fabric suppliers to order fabric.

Duties of the Planner / Buyers (unique to this case):

- Detailed planning of work each line, using customer information – SMS (size management system) in store stock replenishment
- Purchasing of unique fabrics and trimming
- Loading of cutting room (which in turn dictates the work of the sewing lines)
- Use MRP to schedule deliveries and control inventory. Hold a maximum of 2 week stock, which is low for the clothing industry.
- Production Control – ensure that quantities booked into warehouse match cut quantities – the cutting room is where the statement of intent become a reality.

3.4. USING FASTREACT TO FACILITATE PRODUCTION:

The most extensive use of the planning Executive and Factory planner, where supply and demand must be reconciled. The software facilities:

- Loading and scheduling of the achieve required customer delivery
- Operator reconciliation
- Financial reporting
- Critical path Management.

Each factory has a planning board which when loaded with styles looks like a very colorful Gantt chart , each color giving the Planner important information (see Figure 1). Key features of the system include:

Transparency: it is a very visual system that makes it easy to see what is going on; layout, color it ties a huge amount of information together.

It is very easy to explore ‘what ifs’ with this software. By moving products around to see delivery consequences, the system supports a simulation process. Information and requests from the merchandiser (directly from customer) can be easily and quickly explored, and accurate answers can be giving to the customer, after having explored the through the simulation.

Before the introduction of this tool, planning was done using Excel Spreadsheets. This precluded the factory plan was separate both from the financial plan and from the operator reconciliation. Making changes and exploring ‘what if’ scenarios was a lengthy and complicated business. At the time, orders were large, returns in general were higher, changes were less frequent, but that is certainly not case now. A new system was essential to cope with the change in the business.

Setting up the System:

To set up production, certain information must be entered:

1. Production reference.
2. Order reference.
3. Order quantity.
4. Delivery schedule required by customer- dozen garments per week.
5. Selling Price per dozen.
6. Cost per Dozen.

3.5. Challenges of Apparel Production Plan:

Production planning and control department of a garment manufacturing unit is responsible for the timely shipment. Generally shipment is sent by sea as it is the cheapest mode of transport but if the shipment is delayed and can’t be sent by sea, it is shipped by air at the expense of manufacturer .Though it is very costly and affects the profitability of the organization badly but has to be done to avoid the order cancellation.

Re-occurrences of these incidents can lead to the loss of valuable clients. Any problem in the planning can lead to a chain of unpleasant events affecting the shipment schedule of subsequent orders. Thus production control should be seen as an inseparable function of production planning. In this article we will discuss various challenges in Production Planning and Production Controlling in the apparel manufacturing.

- Delay in Raw Material Sourcing and approval
- Delay in Sample Approval
- Production Delay
- Recording and communication wrong data
- Failing in Final QA inspection

Delay in Raw Material Sourcing and Approval:

Raw material should be procured by the factory well in advance to accommodate the time taken in inspection and testing as directed by the buyer. A plan should consider the worst case scenario when the procured raw material fails the test and buyer is not willing to accept the anomaly. In such cases there should be enough time to replace the raw material without effecting the subsequent operations.

Delay in Sample Approval:

Importance of sample cannot be undermined as buyers strongly follow the process. Buyer would not accept the product if the sample at any stage has failed. Generally

garment manufacturer starts the production after the approval of Gold Seal sample/sealer sample.

If the sample approval is delayed it will lead to the delay in production. Factories set up a separate sampling department to effectively handle the sampling. Merchandiser is responsible for the timely approval of the sample. A production planner should keep a keen eye on the sample approval.

Production Delays:

- Production can be delayed due to many unforeseen circumstances
- Labor Strike
- Machine Breakdown
- Critical operation slowing down the efficiency
- Absenteeism
- Natural calamity
- Production being held due to quality problems.

Production planner should keep some buffer to adjust the delay. In case the delay is very critical the planner should take swift action and make the necessary amendments to ensure that the production plan remains viable.

Recording and Communicating Wrong Data:

With proper planning, a disaster can be averted. But a simple problem can play havoc if comes out of blue. Recording wrong production data for the sake of inflating the production figures to avoid the ire of management can lead to an even bigger disaster. A factory should device a production reporting system which is robust and can't be tinkered with as all the decisions will be based on the data only. Different factories follow different systems for recording the data both manually and electronically. Effective data recording will help in effective planning.

Failing of Final QA Inspection:

Once a shipment is ready it is offered to the buyer QA for inspection. The inspection is carried out on the basis of AQL standards as prescribed by the buyer. If a shipment fails the inspection, it is subjected to rechecking and offered to buyer after rectifying the quality issues. The process will continue till the buyer approves the shipment. Re-screening the shipment is very tedious. Most of the time re-screening may involve opening packed pieces and refinishing the garments. Rework anywhere any time in the manufacturing leads to wastage which might be avoided by doing the right work first time. It may delay the shipment and can even lead to air shipment which most of the times is on the cost of the manufacturer.

4. Conclusions

A planner need to have a cut off time of 3-7 days to give go ahead for the production of the order if the production order (PO) has cleared all the necessary pre-production approvals and the raw material is in-house. A process can be devised where the merchandiser has to give the PO production certificate verifying all the necessary approvals and material requirement to the planner so that he can schedule the production. Production Planner should have a good network of fabricators so that some orders can be outsourced to maintain the sanity of the production plan.

References

[1] Chase R, Jacob F & Aquilano N, "Operations Management for Competitive Advantages'. (10th Edition.) McGraw-Hill, 2004.
[2] Nayak Rajkishore ,Padhye Rajiv "Garment Manufacturing Technology" (1st Edition) Woodhead Publishing, 21st May 2015.
[3] Sarkar Prasanta "Production Planning & Control in Apparel Manufacturing: The Beginner's Guide" Online Publication, 2016.
[4] T. Karthik, P. Ganesan, D. Gopala krishnan "Apparel Manufacturing Technology" CRC Press, September 20, 2016.
[5] http://fashion2apparel.blogspot.com/2017/05/objectives-production-planning.html.
[6] http://smallbusiness.chron.com/production-planning-garment-manufacturing-80975.html
[7] http://www.onlineclothingstudy.com/2011/12/functions-of-production-planning-and.html
[8] http://www.emeraldinsight.com/doi/abs/10.1108/eb003018
[9] https://en.wikipedia.org/wiki/Production_planning
[10]https://clothingindustry.blogspot.com/2017/11/functions-production-planning-control.html

AUTHORS PROFILE

First Author: Rajib Das completed his Masters on Industrial Relation and Labor Studies year of 2016 from Institute of Social welfare and Research, University of Dhaka, Bangladesh. He has accomplished his MBA Degree with the specialization on Apparel Merchandising from the BGMEA University of Fashion and Technology in the Year of 2014 with outstanding triumph. He started his under graduation in Apparel Manufacturing Management and Technology at Shanto-Mariam University of Creative Technology and received his B.A (Hon's) Degree in the Year of 2011 with Cum laude Award. Although Rajib Das had a doable opportunities to set his career in dissimilar conglomerate but still he has clearly resolute his mind to be an Educator and serve the pioneers accordingly. As its significance, very firstly he joined at Kassim Textile (BD Office) in 2011 as a Marketing Executive (Fabric). After that he worked in Al Muslim group as a Sourcing Co coordinator during the Year of 2013-2014. At the Beginning of 2015 He joined as a Sr. Merchandiser at Sky Apparels and performed until 1st May 2015 with expected audacity and so on. The matter of righteousness, Rajib Das recently functioning as a Full Time Faculty Member (Lecturer) at Shanto-Mariam University of Creative Technology which is valued as "The First Design University in this Region". He also engaged as an Adjunct Faculty in some of the notable Fashion Institute like College of

ISSN (Online) 2348 – 7968

www.ijiset.com

Fashion and Technology and so on and also involved with compliance Development project under Accord Bangladesh as a research analysis. He has already internationally published a number of Journals/Manuscripts from several countries and in globally recognized Editions. Since 2012 to till now He has been Operating a garments merchandising related blog. His area of interest is Tools and Techniques of Merchandising, Computer Aided Design and Manufacturing, Social Compliance, Fashion and Apparel Marketing, Apparel Production Planning and Control. He participated in a number of professional Trainings and Workshops and frequently participates as a Trainer to contribute the business phenomenon. He engaged with several types of social and cultural activities. He attained some Conferences, Trainings and Workshops in, Thailand and India.

Second Author: Nazmun Nahar completed her MA Fashion Design and Technology also accomplished of her B.A. (Honors) in Fashion Design and Technology from Shanto-Mariam University of Creative Technology, Bangladesh. She is also completed her Higher National Diploma in Fashion and Clothing from Bangladesh Institute of Art and Design. She is functioning as a Lecturer, Department of Fashion Design and Technology at Shanto-Mariam University of Creative Technology, Bangladesh and engaged with as a Coordinator BTEC Fashion and Clothing Programme for last Five years. Her area of interest is Pattern Development, Computer Aided and Design, Fashion Application, Pattern cutting and design, Communication through art & design. She engaged with several types of social and cultural activities..

Third Author: Hafsana Yasmin Received a MBA in Apparel Merchandising from BGMEA University and BA (Hon's) in Apparel Manufacturing Management and Technology from Shanto-Mariam University and Technology. She was the Coordinator of a multinational Company. Now she is working as a lecturer of Fashion Design and Technology Department at Uttara University. She received different types of Training Program relevant her work field. She consider herself as an assertive and dynamic individual who has the confidence needed to engage with experienced multi-disciplinary teams. She always work hard to establish effective working relationships and to set a good example through her own professional conduct.

Fourth Author: Mithila Kabir completed her MBA in Product and Fashion Merchandising and also accomplished of her B.A. (Honors) in Fashion Design and Technology from Shanto-Mariam University of Creative Technology, Bangladesh. She is also completed her Higher National Diploma in Fashion and Clothing from Bangladesh Institute of Art and Design .She is functioning as a Lecturer, Department of Fashion Design and Technology at Shanto-Mariam University of Creative Technology, Bangladesh and engaged with BTEC Fashion and Clothing Programme for last Five years. Her area of interest is Pattern Construction and Development, Garment production, Printed Textile and Design. Production Technique. And also she is involved as an entrepreneur and freelancer Designer.

Fifth Author: Mr. Ashraful Islam completed his B.A Honors in the 'Fashion Design and Technology' in 2013 and Masters in the 'Masters of Arts and Fashion Design' in 2015 from Shanto-Mariom University of Creative Technology, Dhaka, Bangladesh. He worked as a Designer at the Hure Fashion House, Dhaka from February to September, 2013. After that, he worked as a faculty at the Dhaka Institute of Fashion and Technology, Dhaka from March, 2015 to May, 2017. Since June, 2017, he has been working as a Lecturer at the Port City International University, Chittagong. As goal he aims to develop his career in the field of Pattern Making of fashion design**.**

Sixth Author: Md. Solaiman Kabir Mamun was born in Tangail district, Gopalpur Thana, in 1989. He had completed his S.S.C from Madhupur Shahid Smrity High School, and H.S.C from Madhupur Degree Collage and also completed his under graduate and higher graduate from Shanto-Mariam University of Creative Technology .When he was studied his under graduate (2011) 3rd year on that time he has done his internee ship from interstoff apparel ltd . For his good activities they offered to join their company. Then he joined that company. After that he join Chittagong CEPZ, JMS apparel ltd. In 2014 he concomitant ABA group besides he also joined Uttara University as a permanent part time faculty. In 2015 he joined as full time Junior Lecturer at Shanto-Mariam University of Creative Technology under the Department of Apparel Manufacturing Management and Technology.