

# Effect of Garment Sample Development Delays on the Sales Performance of Apparel Companies in Apparel Trade Shows

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**Abstract** Garment sample development is an important activity or process in the apparel industry. Apparel samples are very much important for getting orders from the buyers both from international and domestic markets. Delay in sample development may lead to the loss of orders which would affect significantly the sales performance of the apparel companies both in export markets and domestic markets. Road shows are trade shows, where the apparel manufacturers will showcase their new garment samples to the buyers to get the orders. So proper planning should be done on the sample development process and its related lead time. This study aims at to study the effect of material and process delays that occur in the sampling process of Blazers and Suits in Apparel Company which is doing business in the domestic market. A sample size of 320 garment samples were taken from the previous season Time and Action (TNA) plan of a domestic apparel company in India for study. The results show that there is a significant positive correlation between the fabric supply delay and the sample delay. Subsequently, sample delays have a significant effect on the sales performance on the apparel company in the trade show. Based on the findings managerial implications and suggestions have been recommended.

**Keywords** — *apparel industry, garment sample, lead time delay, product development, sales performance*

## I. INTRODUCTION

Apparel industry is one of the leading industries in India. Apparel includes both export and domestic markets. In the apparel industry, sample development is an important activity whether it is an export order or domestic order. Apparel samples are very much important for getting orders from the buyers both from international and domestic markets. Delay in sample development may lead to the loss of orders which would affect significantly the sales performance of the organization (Babu, 2006) [1]. In the Indian apparel domestic markets, Road shows are very much important for business transactions. Road shows are trade shows, a kind of the buyer-seller meet where the apparel manufacturers will showcase their new garment samples to the buyers to get the orders. Based on the orders from the buyers for the particular garment sample, bulk production will be done. So garment samples are very much important sales tool for the domestic apparel manufactures (Khan & Mazedul, 2013) [2]. So proper planning should be done on the sample development process and its related lead time. Lead time is the amount of time required to complete a service, a production lot or an order. Lead time is inter-related with the other production

management support tools (Mahmud, 2013) [3]. The ultimate aim of the designing and Product Development (PD) team is to display the planned range option to the customers in trade show (Gaskil, 1992) [4]. If number of new samples planned for display is not displayed in the trade show then it will affect the sales performance of the apparel firm. In this study, an effort is made to analyze the impact of sample development delays on the sales performance of an Indian domestic apparel company in Apparel Trade Shows. This study focuses on the effect of material and process delays that occur in the sampling process of Blazers and Suits in Apparel Company which is doing business in the domestic market.

## II. REVIEW OF LITERATURE

### A. Garment Product Development

In apparel manufacturing process several garment samples have to be developed for various reasons like to check the fit and quality, workmanship, production feasibility, getting orders etc (Bruce et al., 2004) [5]. The clothing sample development process can be a complicated and challenging task. There are many steps to the process, which include fabric selection, garment design, pattern making, sampling

production, and quality control. Sample development is the first stage of clothing sample making where fashion designers work with a product development team to create a sample that best reflects their desired vision for a garment. These steps need to be done carefully so that you will have an accurate representation of your final clothing prototype (Bomme Studio, 2023) [6].

Garment samples are inevitably important and are developed tested before starting the bulk production. It means making a sample of the garment or fabric which requires to be sold (Manoj Tiwari, 2013) [7]. Sampling / Sample development is one of the main processes in garment industry and it has a vital role in attracting buyers. Because the buyers generally places the order after they are satisfied with the quality of the samples. The collection of designs developed by the fashion designers and the designs that have excellent prospects should be selected and taken for sample development process (Noor Ahmed Raaz, 2021) [8].

Karthikeyan (2012) [9] mentions that the function of sample production is not only to get order from the buyer and also it gives some added benefits to the apparel manufacturer. The firm can calculate approximately the yarn consumption for developing the fabric or have an idea on costing and manufacturing difficulties by sample production. Also the firm can optimize the processing parameters for mass production, which helps to avoid all kinds of bottle necks.

Cookling & George (2000) [10] describe that sampling is a continual process in the apparel industry. During the development of new garment samples the following factors have to be considered: i) New materials and processes have to be experimented with to establish their suitability for mass production; ii) The production garment patterns have to be altered and perfected to rectify faults discovered during the making-up of the samples. iii) At the sampling stage, the quantities of fabric and trimmings are established and a quick costing made. iv) The finished sample garments undergo a thorough scrutiny to evaluate whether they fit in with the overall picture the company wants to present in this particular collection. Then the garment samples are accepted or rejected.

Bye and Labat (2005) [11] conclude that fit is also an important criteria in a consumer's evaluation of an apparel product. During the product development process, the main point of evaluation for a sample product is the fit session. When an apparel firm receives a sample product, it is typically checked for compliance with specified product measurements, fabric type, and construction details.

Jackson (2000) [12] states that samples can range from prototypes, called 'fit samples', to development samples; size set samples, preproduction samples, shipment samples, photo samples. There are different stages of sampling. The first stage involves the development of the initial concept or

design idea through its approval by the customer and full review/risk analysis by the development and production teams. The second stage involves the process following acceptance of the first prototype sample and includes the functions of sourcing and ordering component, testing the product and carry out trials. Once the finalized sample specifications have been drawn up, the third and final stage commences. This stage includes a range of activities that are carried out before large scale or bulk production capacity outside the home producer/developers wherever this is applicable (Karthikeyan, 2000) [13].

One important task in this is for retailers to have an efficient PD and sample process, due to the fact that it's in this stage where the retailers still have time to make changes and prevent problems along the supply chain. In response Tyagi et al. (2014) [14] also implied that retailers can look into the product development (PD), which has also emerged as an area of improvement, and surprisingly many organizations consider improving this process as a primary tool to beat the competition. One way, according to Kurt Salmon (2012) [15], is to implement a lean approach in the PD which will help to identify and minimize non-value adding activities, while making sure a more efficient process that keeps the costs down. By using lean tools in PD processes could generate more value for companies and ultimately have huge effects on the consumer (Pal & Peterson, 200) [16].

### *B. Lead Time in Apparel Industry*

Lead time is referred to as the amount of time required to complete a service, a production lot or an order (Nuruzzaman, 2009) [17]. Lead time is inter-related with the other production management support tools (Priest, & Sanchez, 2001) [18]. A more conventional definition of lead time in the supply chain management realm is the time from the moment the customer places an order to the moment it is received by the customer (Kurt Salmon, 2012) [19]. Total lead-time is made up of time devoted to processing orders, procuring and manufacturing items, and transporting items between the various stages of the supply chain (Mahmud, 2013) [20]. Lead-time typically includes two components: Information lead times (the time it takes to process an order) and Order lead times (the time it takes to produce and ship the item). Production lead time is the time from order start to order completion inside the factory. Another thing is customer lead time which is the time from customer order placement to receipt of goods (Saiful & Tusnim, 2013) [21]. In enhancing supply chain performance in textile industry, Godinho and Veloso (2012) [22] emphasize the importance of reducing lead time through efficient supply chain management practices. Chan and Chong (2013) [23] also stress that firms should focus more on making their supply chain more efficient and flexible in the global supply chain. As textile/apparel supply chains are becoming increasingly global, the rising level of outsourcing

has placed increasing focus on lead time with shorter lead time demanded in meeting deliveries (Čiarnienė and Vienažindienė, 2014) [24]. In the garment sample making, sampling lead time is the time design indents are given and the time of completion of the sample garment.

In apparel industry, lead time is the total amount of time required for completing a product beginning from the date of receiving raw materials to the stage shippable to the customer (Burns et al, 2012) [25]. Lead time, like in any other manufacturing fields, is undoubtedly one of the predominant issues in outsourcing and durable global marketing of apparel industry that largely depends on accomplishing an order within a certain elapsed time to meet the customer demands properly (Paneru, 2011) [26]. The three parameters cost, quality and lead time for apparel retailers are critical but one can't deny the importance of finishing a job as early as possible since it is perhaps some buyer's requirements (Islam, 2010) [27]. Product cost, quality and lead-time are correlated. Paying high cost to get the product that exceeds the sell period converts to huge loss to the retailer. Fast fashion apparel is time sensitive and follow a very tight timeline and meeting the deadline is important than ever (Peterson, 2012) [28]. The time needed for the raw-material like fabric, trims or other accessories is important as that would define the timing of the finished goods. Longer lead times generally tend to stock higher inventory levels for the retailers. Lead time data is effectively a measure of the total manufacturing process. It tells how quickly raw materials can be converted into delivered product to the customer (Yilmaz, 2012) [29]. Apparel manufacturing process is made up of many steps. Some of those involve a manufacturing process whilst many are just moving materials or product and waiting for materials or product. Having a high lead time is an indication that the process is not optimized.

### III. METHODS

The apparel company selected for this study is one of the India's fastest growing branded apparel companies and a premium lifestyle player in the retail sector. The garment sampling process for Blazers and Suits has been taken for this study. A sample size of three hundred and twenty styles was selected from the previous season's Time and action plan of the company. Feedback from the employee was collected manually about the changes required in the working procedure. Data is collected from various departments about lead-time & problems in achieving the planned activities. It concerns with gather accurate information about the problem. Based on the collected data, the following analysis have been made: i) designer performance ii) fabric supplier wise performance iii) average days delayed by the suppliers iv) fabric structure wise performance v) Cutting Operation performance v) Sewing operation performance vi) Finishing performance vii) correlation between fabric delay and the sample delay

viii) Planned and actual sample displayed ix) Effect of sample display in sales performance.

## IV. DATA ANALYSIS AND INTERPRETATION

### A. Designer Performance

The season starts from the fabric sourcing process. The selected fabric for the upcoming season as per the theme & color will be given to the fabric sourcing team with full details. Attached indents in next page.

Table 1 Designer Performance

Designers' performance	Nos.	%
Total Indents	320	100%
Issued Early	209	65%
On Time Issued	78	24%
Late Issued	33	10%

Source : Secondary Data

From the table 1, it is observed that out of 320 indents, 65% (209) of indents were issued early, 24% (78) were issued on time and 10% (33) were issued late after the target date.

### B. Overall Supplier Performance

Table 2 Overall Supplier Performance

S.No	Supplier	No of orders	On-time Deliver y	Delay	On time %	Delay %
1	Supplier 1 (AL)	45	35	10	78%	22%
2	Supplier 2 (AT)	27	27	0	100%	0%
3	Supplier 3 (BL)	4	4	0	100%	0%
4	Supplier 4 (BC)	4	4	0	100%	0%
5	Supplier 5 (DSML)	33	9	24	27%	73%
6	Supplier 6 (GF)	10	3	7	30%	70%
7	Supplier 7 (JCI)	14	14	0	100%	0%
8	Supplier 8 (LT)	24	17	7	71%	29%
9	Supplier 9 (LTC)	38	38	0	100%	0%
10	Supplier 10 (MI)	23	21	2	91%	9%
11	Supplier 11 (NIEL)	9	6	3	67%	33%
12	Supplier 12 (PM)	55	45	10	82%	18%
13	Supplier 13 (RL)	3	3	0	100%	0%
14	Supplier 14 (VF)	31	23	8	74%	26%
	Total	320	249	71		

Source : Secondary Data

From the table 2, it is inferred that out of 14 suppliers, 6 suppliers (Suppliers 2,3,4,7,9, &13) supplied fabrics on

time; 2 suppliers (Suppliers 5 & 6) supplied fabric with very much delay (70% & 73%) and 6 suppliers (Suppliers 1, 8, 10, 11, 12, 14) supplied fabric medium delay (between 9% - 33%).

C. Average Days Delayed By Supplier

Table 3 Average Days Delayed By Supplier

Mill name	Avg. Delay(Days)
Supplier 1 (AL )	16
Supplier 5 (DSML)	3
Supplier 6 (GF)	25
Supplier 8 (LT)	10
Supplier 10 (MII)	10
Supplier 11 (NIEL)	19
Supplier 12 (PM)	18
Supplier 14 (VF)	11
<b>Average Days Delay</b>	<b>14</b>

Source : Secondary Data

From the table 3, it is inferred that the average days delay by the suppliers were 14 days, with Supplier 2 had the least delay ( 3 days) and supplier 6 had the highest delay (25 days).

D. Fabric Structure Wise Performance

Fabric structure is one of the important factor in the production efficiencies and quality effectiveness. This affects the lead time of the production of fabrics and its supply to the customers.

Table 4 Fabric Structure Wise Performance

Weave	No. of orders	On - time	Delay	On - time %	Delay %
Twill	70	60	10	86%	14%
Dobby	111	94	17	85%	15%
Satin	48	45	3	94%	6%
Velvet	1	1	0	100%	0%
Plain	28	16	12	57%	43%
Jacquard	26	3	23	12%	88%
Poplin	4	4	0	100%	0%
Others	32	26	6	81%	19%
Total	320	249	71		

Source : Secondary Data

From the table 4, it is inferred that out of 8 fabric structures, 2 fabric structures (velvet and poplin) fabrics were supplied on time without any delay; 4 fabric structures (satin, twill, doobby and others) fabrics were supplied on 6%, 14%, 15% & 19% respectively; 1 fabric structure (Plain) was delivered 43% delay; and 1 fabric structure (Jacquard) was delivered 88% delay. So, the jacquard

fabric structure had taken highest delay percentage.

E. Cutting Performance

Table 5 Cutting Performance

Particulars	No. of orders	%
On time	242	76%
Delay	78	24%
<b>Total</b>	<b>320</b>	<b>100%</b>
Avg. Days Delay	9	

Source : Secondary Data

From the table 5, it is inferred that out of 320 orders, 76% (242) orders were cut on time without any delay and 24% (78) orders were cut with delay. The average delay in the cutting process was 9 days.

F. Sewing Performance

Table 6 Sewing Performance

Particulars	No. of orders	%
On time	198	62%
Delay	122	38%
Planned	320	100%
Avg Days Delay	6.5	

Source : Secondary Data

From the table 6, it is inferred that out of 320 orders, 62% (198) orders were stitched on time without any delay and 38% (122) orders were stitched with delay. The average delay in the sewing process was 6.5 days.

G. Finishing Performance

Table 7 Finishing Performance

Particulars	No. of orders	%
On time	290	91%
Delay	30	9%
Planned	320	100%
Avg Days Delay	3.5	

Source : Secondary Data

From the table 7, it is inferred that out of 320 orders, 91% (290) orders were finished on time without any delay and 9% (30) orders were finished with delay. The average delay from the finishing process was 3.5 days.

H. Correlation between Fabric Delay and Sample Delay

Table 8 Correlation between Fabric Delay and Sample Delay

Pearson Correlation	Sample delay	Sig. (2-tailed)
Fabric delay	.487**	.000

Source : Secondary Data

From the table 8, it is observed that the Pearson

correlation value between fabric delay and sample delay is .487 ( $p < .01$ ). So it is inferred that there is a significant positive correlation between fabric delay and the sample delay at 1% level.

I. Planned and Actual Samples for Trade Show

Table 9 Planned and Actual Samples for Trade Show

Overall delay	Quantit y	%
Planned	320	100%
Displayed	249	78%
Dropped	71	22%

Source : Secondary Data

From the table 9, it is inferred that out of 320 samples planned for display in the trade show, 78% (249) samples were displayed in the trade show and 22% (71) samples were dropped because of the delay in sampling process.

J. Effect of Sample Delays In Sales Performance

Table 10 Effect of Sample Delay in Sales Performance

Samples Planned	320
Samples Displayed	249
Number of products sold	46167
Average sales per sample	185
Average Sales Price/pcs	₹ 2265
Un displayed Samples	71
Lost sales (in pcs)	13135
Lost sales (in ₹)	₹ 2,97,50,775

Source : Secondary Data

From the table 10, it is inferred that out of 249 samples displayed in the Trade show, the total sales in quantity was 46,167 pcs and the average order per sample was 185 pcs. The average sales price of the samples was Rs. 3265. So if the additional 71 samples had displayed that would have fetched additional sales of 13135 pcs, so the lost sales was about 13135 pcs. The average price range of the blazer products were Rs. 2265. So the lost sales in monetary value was Rs. 2,97,50,775.

V. DISCUSSIONS

The findings and recommendations of the study are discussed in the following headings:

A. Reasons for delay

The delays happened in the designing department are attributed to reasons like last minute addition due to sudden inspiration, indent returned from sourcing because of less information & re-issued with full details. So the design department should have proper planning in selecting the inspirations for their design collections well in advance. The design department should also provide enough detailed information while issuing the indents and a check list with

all the details for the same can be developed for the issuance of indents.

B. Supplier performance

From the supplier performance analysis, it is observed that few suppliers are supplying fabrics with very much delay. The reason for the same should be analyzed by having proper meeting with the suppliers. The suppliers give estimated delivery date (ETD) based on the requirements from the sourcing team of the apparel company. The ETD is based on the production capacity and available slot for the particular order. The delay from the suppliers may be because of the type of the fabric or miscommunication between the factories. For these kind mills we have to help them to organize the process flow and make the things happen.

C. Fabric structure performance

The analysis of performance related to fabric structure, shows that for complicated fabric structures like Jacquard etc., there was much delay in the fabric delivery. So the fabric indents for these kind of fabrics should be initiated in the earlier stage of the season to avoid delays. In case of last-minute addition that should be given to the highly efficient suppliers to avoid delays. Because of fabric delay, the cutting department is unable to perform the planned activities. So the prompt supply of fabrics will improve the performance of the cutting process.

D. Sampling Department performance

Besides the delay in fabric supply, another main reason for delay in sewing process was because of the less number of machines and capacity of the sampling department was less as per the actual requirement so the sampling department was unable to perform better. The maximum output of the sampling department is only 50 pcs per day. Because the sampling department is only required for 3 months before trade show. After that the sampling department will act as the production department. So the company has limited the sampling capacity. So the capacity of the sampling should be increased by adding additional sewing machines and workers. The suggestion for improving the capacity of the sampling department is discussed in sampling capacity analysis.

The performance of the finishing section is affected by the delay in the sewing sections and the finishing department is having the responsibility to ensure that the samples should go to the trade show with perfect measurement and with correct trims. Sometimes the reworking of samples will come under the finishing department. So the performance of this department is getting reduced.

E. Sampling Capacity Analysis

As discussed earlier, the one of the main reasons for delay in the sewing section was less number of machines and its related sewing capacity. The sampling capacity is very less

for that much big organization and totally 5 brands needs the sampling department during the tradeshow time. The present capacity of the sewing section is as follows,

**Table 11 Present Sampling Capacity**

Present Sampling Capacity		
Cutting Labours	6	56
Sewing Labours	36	
Finishing Labours	4	
Helpers	6	
Staff	4	
No of Machines		36
Capacity per day		50
Capacity per person		0.89

Source : Secondary Data

The capacity of the sampling should be improved to achieve the targets on time. Since the sampling capacity is very less the idle time of the fabrics which was received early was more. It was analyzed that the average idle time for the fabrics is 18 Days. In order to reduce the idle time the capacity of the sampling department. can be increased as follows:

**Table 11 Suggested Improved Sampling Capacity**

Suggested Improved Sampling Capacity		
Cutting	0	12
Sewing	12	
Finishing	0	
Helpers	0	
Staff	0	
No of Machines		12
Increased Capacity per day		11
Investment on Sewing machine		₹ 12,00,000
Cost Per person/Day		₹ 1000
Labour Cost for 3 Months (2 shifts; 75 days)		₹ 18,00,000
Overheads 10%		₹ 1,80,000
Total Additional Cost		₹ 19,80,000
Sales Loss due to Sample Delay		₹ 2,97,50,775
Profit Loss (40%)		₹1,19,00,310
Profit due to increased Capacity		₹ 99,20,310

Source : Authors

Here is the proposal for the sampling department’s capacity to reduce the idle time of the fabrics and to reduce the bottleneck during Tradeshow. This is just a tentative projection that the sampling team can achieve. So by adding additional 12 sewing machines, the additional cost increased by ₹ 19,80,000, but the sales loss due to sample delay was ₹ 2,97,50,775 and if the company has a profit of 40% then the profit loss was ₹1,19,00,310. This profit loss can be

avoided by increasing the sample department capacity at the cost of ₹19,80,000. So the profit due to increased capacity would be ₹ 99,20,310.

*F. Other reasons*

The following reasons were also observed which affect the efficiency of the sample development process:

- i. Around 21% of fabric delays are happening because of improper details, small sized swatch from the design team, and the sourcing team was unable to proceed the requirement, so they returned the indent to design.
- ii. Re-working on the indent is taking more time than the normal time for making the indent.
- iii. Next, the main reason for delays are last-minute addition of fabric to range, this is due to the improper planning of range required for the particular season.
- iv. Around 13% of the delays happened because of last minute addition, because of less time the mill was unable to deliver on time.
- v. Because of last minute addition the performance of the mill is also getting affected.
- vi. In sampling few range were dropped because of the measurement issue, and the sampling team didn’t get time to rework on the same & fabric doesn’t suit the style, because the style explosion happens through the mentality of a designer.
- vii. While style exploration, the designer just imagine the fabric with particular style, it may fail sometimes.
- viii. 3% of the range are dropped due to measurement issue and 3% of range is dropped due to fabric doesn’t suit the style.
- ix. The sampling capacity is very less for that much big organization and totally 5 brands needs the sampling department during the tradeshow time. The capacity of the sampling is as follows,

The above problems and challenges have to be rectified by proper planning, communication and coordination. There were also few major problems for the delays. The major problem from the designer side is that there is no particular format for the same fabric ordering. The required fabric is given to the sourcing department as swatch card or CAD file. Then the sourcing people is facing so much trouble to find the appropriate supplier to supply the particular kind of fabric. But the designers are getting the fabric swatches from the mills in the mill week. So the designers can provide the supplier details and technical details to source the fabric.

- Appointing a technical person in the designing department to identify the needs of the designer

and to provide the technical details to the sourcing team.

- The sourcing team has to implement the particular format for the designers to submit the sample yardage quires as displayed in the next page.
- There should be a track for the indents that the design team is giving to the sourcing team in digital form to avoid the delay and missing of indents.
- The IT team should implement a online method of submitting sample queries to the sourcing team.

## VI. CONCLUSION

Garment sample development process is an inevitable process in apparel industry and the importance of sampling and the effects of samples getting delayed are critical. From the study it was found that supplier performance, fabric structure performance and sample department performance have significant impact on the execution of required number of samples that are to be displayed in the apparel trade shows. It was found that by proper planning the capacity of the sample department would increase the sales by 40%. Major delays are at sampling stage will affect both the sales performance of the firm and also the production performance. So it is very much important to plan properly the sample development process with reduced lead time. And reduction of such time can help the company in meeting the delivery dates on time and also to showcase the samples in the buyer-seller meet so that the sales performance of the apparel firm is optimised.

### A.Future Scope

The study was focused on the lead time delay in the sample development of Blazers and Suits in the sampling department of an apparel company. It is also possible to examine the merchandising process / improvement level over time during different periods since present study has taken into observations one single time slot. In future, the similar study can be done for the sample development process of other type of garments like trousers, jackets etc. This type of study also can be conducted in the other departments of the apparel organisation. Also in future this type of study can be conducted in other industries also.

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