

Needle Management System in Apparel Industry

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Abstract— The Case study on needle management system in garment sector is a very important term for textile industries as they have to supply several items to production floor when they need. They have to order it from the supplier but the quantity should meet their requirement not less & not much. Employment of EOQ model can provide a company efficient and cheaper inventory management cost. There was several problems solved, some of items are purchased more than the demand. The total receives and total delivery was calculated of 14 months data. Then the extra purchase was calculated, holding cost and set up cost was included then by implementing the EOQ model the problem was solved. The problem should be reduced in inventory management is extra purchase. We got about 114227pcs of extra purchase of needles. It should be removed by the company to cover losses. The target of the project was to find out the problems in needle management system. The problems covered by establishing an EOQ for purchasing those needles.

Keywords: Demand, Economic Order Quantity (EOQ), Lead Time, Management, Needle, Inventory, Ready Made Garments (RMG).

1 INTRODUCTION

The textile industries of our country are now competing for the world's best position in the competitive world. To be the best we have to deliver the orders within lead time according to buyer's requirements. To procure optimal productivity we have to highly perform by proper using of man & m/c.

Needle management is a vital issue in the textile sector. Needle is one of the basic elements of garments sector. A huge amount of needle is required in a garments factory per day. But we could not purchase this element by day although it is needed by day. We have to purchase this most valuable element monthly or yearly. After purchase we have to store in perfect environment so that any kind of rust can never touch that element to protect from damages. It is performed by a management section. We must provide adequate needle in the production line when needed. But we have to remember that if any worker comes to exchange a needle due to breakage for laxness or unintentionally then we have to ensure first the full parts of the waste needles by using an especial measuring scale. It happens every day in garments sectors. If broken part of a needle does not found then we have to use metal detector for that lots.

2 OBJECTIVES

- To determine the optimum needle.
- To know that how to store the purchasing needle.
- To know that how to supply the needle in a production line.

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- To know that how to get back the broken needle from the workers.
- To know how to collect the broken needles.
- To know how to provide the exact needle to the workers for broken needles.

For the research, it's necessary to know first about the needle commonly used sewing needle in Fakir Fashion Ltd. from monthly spare parts stock should be stored in proper environment so that rust could not present in the needles. How to supply the needles in the production line & how to get back the broken needles from the workers need to be kept a clear knowledge about that.

3 LITERATURE REVIEW

The theory needed to know about needle management is discussed in this partition. Terms for broken purchasing, storing, providing, broken needles finding, recovering the broken parts and detecting needles from garments by using metal detector that will be discussed here.

3.1 Needle

Needle is one of the basic elements of knitting & sewing. It plays a vital role in the RMG sectors. Distinct types of needles are used in knitting & sewing both. From many other needles set point needle is mostly used for sewing the woven fabric & ball point needle is used for sewing the knitting fabric. [1] The needles are the most important stitch forming elements that are displayed vertically up & down and mounted in the tricks or cuts of the knitting cylinder [1].

3.2 The basic functions of a needle (All About Needles, 2016) [2]

- ✓ To create a passage in the material for the thread to pass through.
- ✓ To carry the needle thread through the material and form a loop which can be picked up by the hook or looping mechanism.
- ✓ To pass the needle thread through the loop formed by the

looping mechanism on machines other than lockstitch.

3.3 Economic Order Quantity

The economic order quantity (EOQ) is the order quantity that minimizes total holding and ordering costs for the year. Even if all the assumptions don't hold exactly, the EOQ gives us a good indication of whether or not current order quantities are reasonable. It is the method that provides the company with an order quantity [3].

Following is the formula for the economic order quantity (EOQ) model:

$$Q^* = \sqrt{2DS / H}$$

Where,

Q = Optimal order quantity

D = Units of annual demand

S = Ordering cost/ Cost incurred to place a single order or setup

H = Holding/ Carrying cost per unit

This formula is derived from the following cost function:

Total cost = purchase cost + ordering cost + holding cost

3.4 Assumption of the EOQ model [3]:

Without these assumptions, the EOQ model cannot work to its optimal potential.

The cost of the ordering remains constant.

The demand rate for the year is known and evenly spread throughout the year.

The lead time is not fluctuating (lead time is the latency time it takes a process to initiate and complete).

No cash or settlement discounts are available, and the purchase price is constant for every item.

The optimal plan is calculated for only one product.

There is no delay in the replenishment of the stock, and the order is delivered in the quantity that was demanded, i.e. in whole batch.

These assumptions are the key to the economic order quantity model, and these assumptions help the companies to understand the shortcomings they are incurring in the application of this model.

3.5 The Inventory Cycle [4]

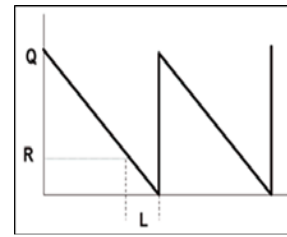


Fig.1.The Inventory Cycle

Where,

Q= Quantity on hand

R= Reorder Point

L= Lead Time

Inventory ordering & usage occur in cycles. A cycle begins with receipt of an order of Q units, which are withdrawn at constant rate overtime. The optimal order quantity reflects a balance between carrying costs & ordering costs. As order size varies, one type of cost will increase while the other decreases [5].

Annual carrying cost is computed by multiplying the average units of inventory on hand by the cost to carry one unit for one year, even though any given unit would not necessarily be held for a year.

Total annual carrying cost= $Q/2H$

Where,

Q= Optimal Order Quantity

H= Holding Cost per unit

Annual ordering cost is a function of the number of orders per year & the ordering cost per order.

Annual ordering cost= D/QS

Where,

D= Units of annual demand

S= Ordering cost

A) Carrying costs are linearly related to order size.

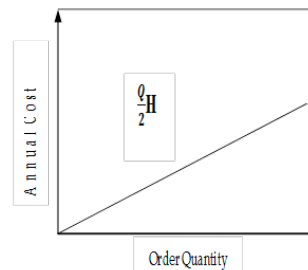


Fig.2.Carrying Cost Curve

B) Ordering costs are inversely & nonlinearly related to order size.



Fig.2. Ordering Cost Curve

C) The total cost curve is U shaped.

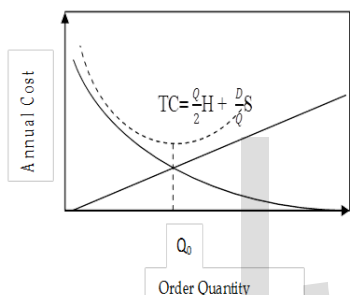


Fig.4. Total Cost Curve

Now,
 The total annual cost, $TC = \text{Annual carrying cost} + \text{Annual ordering cost}$

$$= \frac{Q}{2}H + \frac{D}{Q}S$$

An expression for the optimal order quantity, Q^* can be obtained by using calculus that given below [6],

$$Q^* = \sqrt{\frac{2DS}{H}}$$

This is the equation of the economic order quantity (EOQ).

3.6 Needle Suppliers of Bangladesh

3.6.1 Groz-Beckert

Groz-Beckert is the world's leading provider of industrial machine needles, precision parts and fine tools as well as systems and services for the production and joining of textile fabrics. The products and services support the fields of knitting, weav-

ing, felting, tufting, carding and sewing. The family-owned company, founded in 1852, employed around 7,800 people and generated a turnover of around €628 Mio. Groz-Beckert operates with agencies, production and distribution subsidiaries in more than 150 countries around the world [7].

3.6.2 ORGAN NEEDLE CO. LTD

Since 1939 Sewing machine needle production machine is completed. Production of them starts under the ORGAN brand. In 1950 First export of sewing machine needles to the United States. In 1963 company name changed to ORGAN NEEDLE CO. LTD. In 2002 Receives ISO9001 approval for the knitting machine needle department receives ISO14001 approval for main factory. Its capital is over 300 million yen [8].

3.6.3 SCHMETZ Needles

Since 1851 SCHMETZ has been the leading manufacturer of quality sewing machine needles in the world. Euro-Notions enthusiastically serve the home sewing industry with outstanding service and high-quality products through wholesale distribution. For over 30 years Euro-Notions a family owned business headquartered in Willow brook, Illinois has imported the home sewing industry's most essential notion and most recognized brand of uncompromised quality SCHMETZ Needles from Germany [9].

3.6.4 Jiangsu Flying tiger Needles Co. Ltd

Jiangsu Flying tiger Needles Co. Ltd build in 1976, It has more or less 500 employees till today, it is on a land covering 37,000 square meters, it is in the construction of 30,000 square meters, with an annual of 700 million needles, it is one of the biggest needle-producing enterprise in China, it's enroll fund is five million RMB, it is a shareholding system enterprise, best quality make the company be the biggest needle-producing company in China. It develop brand of "Flying tiger " and "Qite" needle, the product honored by the user, the product won the title of quality product of Jiangsu province 1989, and of national light industry department and Jiangsu famous brand in 1990, in Feb, 2001, it won the certification of Registration of ISO9002, between 2003-2006, as only one famous product enterprise be choose of cadre man part of sewing mechanism department in China, also it become the unit of sewing machine mechanism ISOC [10].

4 METHODOLOGY

Methods for the collecting data of broken needle will be described here and also a short description will be overviewed about the data analyzing process. The solution process and application of solution will also be described. Data will be collected from a Garments well known industry. The data will be

analyzed and appropriate cause of needle breakage and an appropriate solution with better management system will be found out.

5 CASE STUDY

Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A conclusion might elaborate on the importance of the work or suggest applications and extensions. Authors are strongly encouraged not to call out multiple figures or tables in the conclusion – these should be referenced in the body of the paper.

TABLE 1
MAHINE USED IN BANGLADESH (SEWING)

Machine name	Brand Name	Model	Needles
Single needle lock stich m/c	JUKI	DDL-8300N	DB x 1 (16 x 257) (16 x 230 for leather)
Single needle lock stich m/c	JUKI	DDL-8300NH	DB x 1 (16 x 257) (16 x 230 for leather)
Single needle lock stich m/c	JUKI	DDL-8700WB/EC10	DBx1 (#14) #9~#18,134 (Nm90)
Single needle lock stich m/c	JUKI	DDL-8700H7WB/EC10	Db x 1 (#21) #19~#23, 134 (Nm 130)
Single needle lock stich m/c	JUKI	DLM 5200 ND	Db x 1 (#14),134 (Nm90)
Double needle lock stich m/c	JUKI	LH 3128 GF	DPx5 (#9) #9~#14
Double needle lock stich m/c	JUKI	LK 3168 GF	DPx5 (#21) #18~#22
Bar tack	JUKI	LK 1850U	DP x 5 #14, #16
Bar tack	JUKI	LK 1900 AHS	DP x 17 (#21)
Shape tacking m/c	JUKI	LK 1930 HSS 5045Z	S: DP x 5 #14, H: DP x 17 #18
Shape tacking m/c	JUKI	LK 1920 HSS 5045Z	S: DPx5 #14, H: DPx17 #18
Button hole	JUKI	MEB 3200 JSKA	DOx558 (Nm100) Nm100~Nm110
Flat lock	JUKI	MF 7723C10 B56	UY128GAS 9-14
Flat lock	JUKI	MF 7823U10B56	UY128GAS 9-14
Double needle walking foot m/c	DURKO PP ADLER	867	DK 867-190040
Chain Stitch	JUKI	MH 380 FU	TVx7 (#14) #9 ~#21
Chain Stitch	JUKI	MH 481 U	TVx7 (#11) #9 ~#18
Chain Stitch	JUKI	MH 382 U	TVx7 (#14) #9 ~#21
Over lock (4T)	JUKI	MO 6714 SBE 644H	DC x 27
Over lock (5T)	JUKI	MO 6716 SDE 400H	DC x 27

IJSER

TABLE 2
MAHINE USED IN BANGLADESH (KNITTING)

Machine name	Brand Name	Needles
S/J & D/J knitting m/c	FUKAHARA (JAPAN)	Latch Needle
S/J & D/J knitting m/c	ORIZIO (ITALY)	Latch Needle
S/J & D/J knitting m/c	MAYERR & CIE (GERMANY)	Latch Needle
S/J & D/J knitting m/c	HANMA (CHINA)	Latch Needle
S/J & D/J knitting m/c	HUPTER (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	JIUNN LONG (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	MASA (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	DONG HO (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	WELL (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	JINHAR (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	PAILUNG (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	LISKY (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	TAYO (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	HUN-LUNG (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	FUKAHAMA (TAIWAN)	Latch Needle
S/J & D/J knitting m/c	ZENTEX (SINGAPORE)	Latch Needle
Flat bed knitting m/c	SHIMA SEKI (JAPAN)	Latch Needle
Flat bed knitting m/c	STOLL (JAPAN)	Latch Needle
Flat bed knitting m/c	JY-LEH (TAIWAN)	Latch Needle
Flat bed knitting m/c	KAUOHENG (TAIWAN)	Latch Needle
Flat bed knitting m/c	JAMES (TAIWAN)	Latch Needle
Flat bed knitting m/c	FLYING TIGER (TAIWAN)	Latch Needle

S/J= Single Jersey, D/J=Double Jersey

5.1 Collected Data

Table 3 that had been made from the collected data where the total received quantity & total delivery quantity were not same. In some case the deviation was too small that could be negotiable but could be problem for further.

TABLE 3
DATA FOR KNITTING NEEDLE (DEC-14)

Old Code	New Code	Page	Equipment	Category	Moving Type	Item Name	B/F	Received Qty	Delivery Qty	Balance	Unit	Location	Remarks
KN-1.13	KN-1.13	P-44	Knitting needle	Knitting needle	3rd Moving	Vo-78-52-T047	150	0	0	150	Pcs	Accoun	nts
KN-1.14	KN-1.14	P-45	Knitting needle	Knitting needle	3rd Moving	Vo-75.45-T05	150	0	0	150	Pcs	Accoun	nts
KN-1.15	KN-1.15	P-107	Knitting needle	Knitting needle	1st Moving	Vota-122.48-G02	4910	0	50	4860	Pcs	Accoun	nts
16.01.18	KN-1.16	P-08	Knitting needle	Knitting needle	1st Moving	Vo-122.48-Co4	4524	0	50	4474	Pcs	Accoun	nts
16.01.19	KN-1.17	P-59	Knitting needle	Knitting needle	1st Moving	VOTA-75.45-G002	3155	0	1238	1917	Pcs	Accoun	nts
16.01.20	KN-1.18	P-80	Knitting needle	Knitting needle	1st Moving	VO-75.45-G005	2807	0	1238	1569	Pcs	Accoun	nts
KN-1.19	KN-1.19	P-173	Knitting needle	Knitting needle	3rd Moving	Vo-154.50.G001	678	0	0	678	Pcs	Accoun	nts
16.01.22	KN-1.20	P-211	Knitting needle	Knitting needle	2nd Moving	Vo-78-52-G008	508	0		507	Pcs	Accoun	nts
KN-1.21	KN-1.21	P-342	Knitting needle	Knitting needle	2nd Moving	Vo-154.50-G0042	2092	0	977	1115	Pcs	Accoun	nts
16.01.24	KN-1.22	P-288	Knitting needle	Knitting needle	2nd Moving	Vo-78-52-G007	309	0	7	302	Pcs	Accoun	nts
KN-1.23	KN-1.23	P-172	Knitting needle	Knitting needle	2nd Moving	Vo-154.50-G0043	2274	0	972	1302	Pcs	Accoun	nts
KN-1.24	KN-1.24	P-64	Knitting needle	Knitting needle	3rd Moving	Vo-154.50-G002	716	0	0	716	Pcs	Accoun	nts

From the excel sheet the data was selected about most commonly used Knitting needle in Fakir Fashion Ltd. from monthly spare parts stock report on Dec-14

TABLE 4
DATA FOR SEWING NEEDLE (DEC-14)

Old Code	New Code	Page	Equipment	Category	Moving Type	Item Name	B/F	Received Qty	Delivery Qty	Balance	Unit	Location	Remarks
16.01.81	SN-1.0	P-150	Sewing Needle	Sewing Needle	1st Moving	Needle DV-11	200	0	0	200	Pcs	Accoun	ORGAN
11.30.147	SN-1.1	G1/P-23;	Sewing Needle	Sewing Needle	1st Moving	Needle DV-57/14	1	0	0	1	Pcs	Accoun	ORGAN
16.01.82	SN-1.2	P-173	Sewing Needle	Sewing Needle	1st Moving	Needle DV-09	200	0	0	200	Pcs	Accoun	ORGAN
11.30.148	SN-1.3	G-21172	Sewing Needle	Sewing Needle	3rd Moving	Needle T/-168	0	0	0	0	Pcs	Accoun	ORGAN
16.01.83	SN-1.4	P-528	Sewing Needle	Sewing Needle	1st Moving	Needle DC-09	0	0	0	0	Pcs	Accoun	ORGAN
16.01.84	SN-1.5	P-190	Sewing Needle	Sewing Needle	1st Moving	Needle DC-11	788	r-i	60	728	Pcs	Accoun	ORGAN
16.01.85	SN-1.6	P-391	Sewing Needle	Sewing Needle	1st Moving	Needle DC-07	220	0	0	220	Pcs	Accoun	ORGAN
16.01.86	SN-1.7	P-435	Sewing Needle	Sewing Needle	1st Moving	Needle DC-14	3201	0	48	3153	Pcs	Accoun	ORGAN
16.01.87	SN-1.8	P-555	Sewing Needle	Sewing Needle	1st Moving	Needle DB-09	0	0	0	0	Pcs	Accoun	ORGAN
16.01.88	SN-1.9	P-579	Sewing Needle	Sewing Needle	1st Moving	Needle DB-11	7	0	0	7	Pcs	Accoun	ORGAN
16.01.89	SN-1.10	G2-193	Sewing Needle	Sewing Needle	1st Moving	Needle DB-K5Z1#11(Embroidaris	200	0	0	200	Pcs	Accoun	ORGAN
16.01.90	SN-	P-546	Sewing Needle	Sewing Needle	1st Moving	Needle	3119	0	33	3086	Pcs	Accoun	ORGAN

From the excel sheet the data was selected about most commonly used sewing needle in Fakir Fashion Ltd. from monthly spare parts stock report on Dec-14

TABLE 5
DATA FOR KNITTING NEEDLE (APRIL-15)

Page	Equipment	Category	Moving Type	Item Name	B/F	Received Qty	Delivery Qty	Balance	Unit	Location
P-31	Knitting needle	knitting needle	3rd Moving	Vo-82.60 GO3Alb	203	0	0	203	Pcs	Accou nts
P-32	Knitting needle	Knitting needle	3rd Moving	Vo-154.50 Goo3	75	0	0	75	Pcs	Accou nts
P-33	Knitting needle	Knitting needle	3rd Moving	Vo-154.50 To1	234	0	0	234	Pcs	Accou nts
P-34	Knitting needle	Knitting needle	3rd Moving	Vo-154.50T 02	710	0	0	710	Pcs	Accou nts
P-50	Knitting needle	Knitting needle	3rd Moving	Vota-122.48 TO2	225	0	0	225	Pcs	Accou nts
P-51	Knitting needle	Knitting needle	3rd Moving	Vota-75.45 T02	100	0	0	100	Pcs	Accou nts
P-37	Knitting needle	Knitting needle	3rd Moving	Vo- 154.50 T03	350	0	0	350	Pcs	Accou nts
P-38	Knitting needle	Knitting needle	3rd Moving	Vo- 122.48.T04	150	0	0	150	Pcs	Accou nts
P-40	Knitting needle	Knitting needle	3rd Moving	Vo-122.48 G06	318	0	0	318	Pcs	Accou nts
P-41	Knitting needle	Knitting needle	3rd Moving	Vo-154.50 T045	500	0	0	500	Pcs	Accou nts
P-53	Knitting needle	Knitting needle	3rd Moving	Vosa 75.73 G04	100	0	0	100	Pcs	Accou nts
P-43	Knitting needle	Knitting needle	3rd Moving	Vo-50.58- G01	210	0	0	210	Pcs	Accou nts

TABLE 6
DATA FOR SEWING NEEDLE (APRIL-15)

Old Code	New Code	Page	Equipmen t	Category	Moving Type	Item Name	B/F	Received Qty	Delivery Qty	Balance	Unit	Location
11.30.1 47	SN-1.1	G1/P -232	Sewing Needle	Sewing Needle	1st Moving	Needle DV- 57/14	1	0	0	1	Pcs	Accou nts
16.01.8 2	SN-1.2	P- 173	Sewing Needle	Sewing Needle	1st Moving	Needle DV- 09	200	0	0	200	Pcs	Accou nts
11.30.1 48	SN-1.3	G- 2/17 2	Sewing Needle	Sewing Needle	3rd Moving	Needle TV - 168	0	0	0	0	Pcs	Accou nts
16.01.8 3	SN-1.4	P- 528	Sewing Needle	Sewing Needle	1st Moving	Needle DC- 09	0	0	0	0	Pcs	Accou nts
16.01.8 4	SN-1.5	P- 190	Sewing Needle	Sewing Needle	1st Moving	Needle DC- 11	565	0	40	525	Pcs	Accou nts
16.01.8 5	SN-1.6	P- 391	Sewing Needle	Sewing Needle	1st Moving	Needle DC- 07	220	0	0	220	Pcs	Accou nts
16.01.8 6	SN-1.7	P- 435	Sewing Needle	Sewing Needle	1st Moving	Needle DC- 14	3087	0	6	3081	Pcs	Accou nts
16.01.8 7	SN-1.8	P- 555	Sewing Needle	Sewing Needle	1st Moving	Needle DB-09	0	0	0	0	Pcs	Accou nts
16.01.8 8	SN-1.9	P- 579	Sewing Needle	Sewing Needle	1st Moving	Needle DB-11	7	0	0	7	Pcs	Accou nts
16.01.9 0	SN- 1.11	P- 546	Sewing Needle	Sewing Needle	1st Moving	Needle DB-14	2987	0	44	2943	Pcs	Accou nts
16.01.9 1	SN- 1.12	P- 481	Sewing Needle	Sewing Needle	1st Moving	Needle DB-07	419	0	0	419	Pcs	Accou nts

From the excel sheet the data was selected about most commonly used Knitting needle in Fakir Fashion Ltd. from monthly spare parts stock report on April-15

From the excel sheet the data was selected about most commonly used Sewing needle in Fakir Fashion Ltd. from monthly spare parts stock report on April-15

5.2 Data Analysis

TABLE 7
DATA SHEET OF EOQ

Sl. no.	Item name	Total receive	Total delivery	Extra purchase	Holding cost	Set up cost	EOQ Q*=√2DS/H
1	Needle DBX15517 FFG	14000	5696	8304	\$0.5 PER YEAR	\$85	19
2	Needle DOM 6519 FFG	34237	30235	4002		19	
3	Needle 08X175111 FFG	11500	2526	8974		6	
4	Needle DBXK5 6519 FFG	2500	578	1922		3	
5	Needle OCX15517 FFG	26300	12680	13620		13	
6	Needle DCX16519 FFG	48000	31793	16207		20	
7	Needle DCX175111FFG	3900	1712	21::		5	
8	Needle DPX17 70810 FFG	1200	610	590		3	
9	Needle UY128 SAN 5517 FFG	18998	4642	14356		8	
10	Needle UY128 GAS 6519FFG	51500	41016	10484		22	
11	Needle UY128 GAS 75111FFG	7300	5296	2004		8	
12	Needle UY128 SAN 75111FFG	7000	527	6473		3	
13	Needle UY1186KS 6519 FFG	1501	990	511		4	
14	Vota-122.48602	12005	6448	5558		9	
15	Vo- 122.48 Go4	12003	10108	1892		11	
16	VOTA-75.45 6002	16021	13262	2759		13	
17	VO-75.45 6005	15501	11503	3998		12	
18	Vo-Spec-79.75603	1502	549	953		3	
19	VO-Spec- 79.75 604	3750	2840	910		6	
20	VO. 14152. Goof	8020	6118	1902		9	
21	VOLS-141.52.6002	8005	6128	1877		9	
22	4/0.147.52.002516025)	1750	1724	26		5	
23	VOLS 130.526007	3003	2113	890		5	

D= 5696
S=85\$
H=\$.5 per year

So,
 $Q^* = \sqrt{\frac{2 \times 5696 \times 85}{0.5}} = 1391.6 \approx 1392$
Number of order per year
 $\frac{5696}{1392} = 4.09 \approx 5$

For Needle DBX1 65/9 FFG:

D= 30235
S=85\$
H=\$.5 per year
So,
 $Q^* = \sqrt{\frac{2 \times 30235 \times 85}{0.5}} = 3206.2 \approx 3207$
Number of order per year
 $\frac{30235}{3207} = 9.43 \approx 10$

Knitting Needle:

For Vota-122.48 G02:
D= 6448
S=85\$
H=\$.5 per year
So,
 $Q^* = \sqrt{\frac{2 \times 6448 \times 85}{0.5}} = 1480.6 \approx 1481$
Number of order per year
 $\frac{6448}{1481} = 4.35 \approx 5$

For Vo- 122.48 Go4:
D= 10108
S=85\$
H=\$.5 per year
So,
 $Q^* = \sqrt{\frac{2 \times 10108 \times 85}{0.5}} = 1853.8 \approx 1854$
Number of order per year
 $\frac{10108}{1854} = 5.45 \approx 6$

5.3 Sample Calculation

Establish an EOQ for Purchase for a few selected items below:

Sewing needle:
For Needle DBX1 55/7 FFG:

6 FINDINGS

TABLE 8
TOTAL PURCHASED QUANTITIES (PCS)

SI No.	ITEM NAME	TOTAL RECEIVE (pcs)	TOTAL DELIVERY (pcs)	EXTRA PURCHASE (pcs)
1	Needle 06X15517 FFG	14000	5696	8304
2	Needle 06X16519 FFG	34237	30235	4002
3	Needle 06X175111 FFG	11500	2526	8974
4	Needle OBXKS 6519 FFG	2500	578	1922
5	Needle OCXI 5517 FFG	26300	12680	13620
6	Needle OCXI 6519 FFG	48000	31793	16207
7	Needle DCXI 75111 FFG	3900	1712	2188
8	Needle DPXI7 70/10 FFG	1200	610	590
9	Needle LIY128 SAN 5517 FFG	18998	4642	14356
10	Needle UYI28 GAS 6519 FFG	51500	41016	10484
11	Needle UYI28 GAS 75111 FFG	7300	5296	2004
12	Needle UYI28 SAN 75111 FFG	7000	527	6473
13	Needle UYI18 GKS 6519 FFG	1501	990	511
14	Vota-122.48 602	12006	6448	5558
15	Vo- 122.48 Go4	12000	10108	1892
16	VOTA-75.45 G002	16021	13262	2759
17	VO-75.45 G005	15501	11503	3998
18	Vo-Spec- 79.75 603	1502	549	953
19	VO-Spec- 79.75 604	3750	2840	910
20	V0.141.52. Gool	8020	6118	1902
21	VOLS-141.52.6002	8005	6128	1877
22	W0.147.52.0025(6025)	1750	1724	26
23	VOLS 130.52 G007	3003	2113	890
24	VOLS 130.52 G008	3000	1203	1797
25	SinkerJX002 0.15 0.25mm(Y G H)	13297	11472	1825
26	Vota 71.410S02	1500	1427	73
27	Vota 71.410S04	1500	1417	83
28	Vo 109.410S09	1500	1500	0
29	Vo 109.41 DS010	1500	1451	49
Total Purchased				114227 pcs

7 LIMITATIONS

There are several limitations found in our project about needle management. Some are shown below:

Limitation of data: We have worked on 14 months data of needle inventory. If we have more amounts of data we could have worked more precisely resulting more efficiency.

Limited items: We have worked on two item ex. Sewing and knitting needle if we have more items to work we can make a better projection of needle management.

Inaccurate sense about lot size & ordering: Needles are ordered in a specific lot. We don't have idea about which lot consist of how many needle. If we have the idea of lot size we can have clear sense about ordering number or how many lots to order.

Accuracy issues: The data had been analyzed doesn't have any accuracy certification though it is computerized but we can't insure the accuracy of it.

Inaccurate sense about ordering and lead time: It was difficult to have clear sense about ordering time and lead time from the provided data.

8 RECOMMENDATION

The study was on computer based reported data. It has to be operated by some person though it is not confirmed about its' accuracy if the manual inventory report was get then the study was more efficient. There are some limitations of data, some of data are missing and the previous data isn't provided. If we had more of previous data we may have worked more precisely. This study is only two types of items if we got to work with more items we may have more clear sense. When there is short of needle we have to order but many don't have precise idea about the lot size and when to order. If we had the data of lot size and ordering time we may have clear sense about it. If we could have removed these limitations it may provide a better result.

9 CONCLUSION

Needle management is the most frequently discussed issue in garments sector. We need to allocate it to determine the optimum needle & the cause of breakage of needles. Purchased needle storing, needle supplying in a production line, broken needle collecting & returning system, providing the exact needle to the workers, all of these are included in needle management system. On accounts of this system many more problems are dismissed or improved so that it could not be happen again in future which creates possibility to production hamper.

Really, by this case study we procured much more knowledge about needle management & how to handle this in a production line for achieving desired efficiency in current production.

10 ACKNOWLEDGEMENT

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