

Report On  
Using RFID for inventory management  
and operations of R-pac

By

Fahim Hasan  
ID: 15304023

An internship report submitted to the BRAC Business School in partial fulfillment of the  
requirements for the degree of  
Bachelor of Business Administration

BRAC Business School  
BRAC University  
November, 2019

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## **Declaration**

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at BRAC University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

**Student's Full Name & Signature:**

**Supervisor's Full Name & Signature:**

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**Fahim Hasan**

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ID: 15304023  
**Md. Mamun Habib, PhD**

Associate Professor, BRAC Business School  
BRAC University

## Letter of Transmittal

Md. Mamun Habib, PhD  
Associate Professor,  
BRAC Business School  
BRAC University  
66 Mohakhali, Dhaka-1212

Subject: Submission of Internship Report.

Dear Sir,

This is my pleasure to display that I have successfully completed my three months internship at operation department of R-Pac packaging Bangladesh company ltd., which I was appointed by your direction as a requirement for the completion of my BBA program.

I have attempted my best to finish the report with the essential data and recommended proposition in a significant compact and comprehensive manner as possible.

I trust that the report will meet the desires.

Sincerely yours,

---

Fahim Hasan

ID: 15304023

BRAC Business School

BRAC University

Date: December 17<sup>th</sup>, 2019

## **Non-Disclosure Agreement**

This agreement is made and entered into by and between [R-Pac Company] and the undersigned student  
at BRACU Student .....

## **Acknowledgement**

This Internship report has been completed with the combined efforts. First of all, all praise and glory are to Almighty Allah for all the bounties granted to me and only with the guidance and help this achievement has become possible. Further, I would like to thank BRAC University to give me such a platform to learn. Then I would like to sincerely honor Dr. Md. Mamun Habib, Associate Professor of BRAC Business School (BBS), and BRAC University. I am indebted to his sincere guidance. It is with his proper directives and suggestions that this report has come to be fruitful. Finally, I would like to express my gratitude towards my Supervisor Md. Mamun Mia, production manager of R-Pac packaging Bangladesh company Ltd. who has provided effort with moral support and valuable suggestions, which has made the learning even finer and hence this report as a result.

## **Executive Summary**

R-Pac is a packaging accessories manufacturer for garments industry. R-Pac basically produces different types of labels, packaging items, tags, and RFID tags. They have six different departments and they are offset, PFL, Weaving, HTL, flexo, and thermal and RFID department. While I was doing my internship at R-Pac I was assigned to every department for a specific period of time and gain a practical experience of their operation. Offset department produces tags and packaging items. PFL and weaving department produces printed labels. HTL department produces heat sensitive labels. These labels are directly attached on the fabric with heat and pressure. Flexo department mainly produces sticker items. R-Pac's one of the most efficient and productive department is thermal and RFID department. Thermal and RFID department mainly produce barcode and tags attached with RFID. RFID is the updated version of barcode which has a microchip attached with the barcode. These microchip contains specific information and can be tracked without manual labor. RFID can ensure the security of the and also gives us the capability of continuous monitoring of the product.

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## List of Acronyms

WIP	Work in process
PFL	Printed fabric label
HTL	Heat transfer label
RFID	Radio Frequency Identification
FLEXO	Flexography
EPZ	Export Processing Zone
ERP	Enterprise Resource Planning

## Origin of the Report

Internship Program is a requirement for Post-Graduation for BBA students of BRAC University. The main purpose of the internship program is to expose the students in the job world and to gain a practical experience of job,

The internship program and the study have following purpose:

- To experience the real business environment.
- To apply theoretical learning in practical job sector.
- To get organize and learn the job responsibility.
- To fulfill the requirement of BBA Program.

This report has been prepared while doing three months internship program at r-pac packaging Bangladesh Ltd. Company for the competition of the BBA program of BRAC University. This reports

includes the information about r-pac and their operation process and also includes how RFID tags can be used in inventory management.

## **Objective of the Report**

The primary objective is to fulfill the Bachelor of Business Administration (B.B.A) degree requirement under the faculty of BRAC Business School, BRAC University.

The study includes the following aspects:

- To give an overview of r-pac packaging Bangladesh Ltd. Company.
- To focus on the products, and operation process of r-pac.
- To follow the supply chain of r-pac.

## **Scope of the Report**

The main intension of the study is to follow the operation process of r-pac packaging Bangladesh Ltd. Company. The report covers details about their products and making process, and SWOT analysis of the products. Besides, it also includes how RFID tags can be used in inventory management.

## **Methodology**

The study is conducted in a systematic procedure starting from selection of the topic to final report preparation. The overall process of methodology followed in the study is explained below:

**Selection of the topic:** My mentor and Honorable faculty Dr, Md. Mamun Habib assigned the topic of the study. Before the topic was assigned it was thoroughly discussed and we have selected a few option where we can focus for internship report. Among of these topics we analyzed them and selected the best topic so that we can develop a valuable internship report.

## **Sources of Data**

**Primary Sources:** Primary data was collected from the practical work from every department. I have collected most of the data directly from the employees and workers who are working at r-pac packaging Bangladesh Ltd.

**Secondary sources:** Different documents are provided by the concerned officers and employees. Besides I have collected some data from online searching.

## **Collection of Data:**

The data was directly collected from the employees of r-pac packaging Bangladesh Ltd. Company. The data shows the production and delivery capacity of the r-pac. Some data are also collected in order to safety stock and reorder point calculation.

### **Classification, analysis, Interpretations, and presentation of data**

Some diagrams and tables are used in this report to show the capacity, production, and profit growth of r-pac.

### **Final Report Preparation**

The final report is prepared after some valuable suggestions and my honorable advisor gave corrections.

### **Limitations**

The main limitations was collecting the financial data. As I needed financial data to complete some calculation it was quite difficult to collect them because of confidentiality.

## **Chapter1**

R-Pac was established in 1987 in New York and their product is manufacturing printed packaging and apparel trims for the garment and accessories industry. Having become well known for their expertise in brand design and manufacturing solutions, during the mid-1990's they recognized the demands of globalization and began building their unique global infrastructure. Currently r-Pac is running their operation in around 30 countries and Bangladesh is one of them. R-Pac started their operation in Bangladesh in 2009. Their main office is situated in Dhaka and they have two manufacturing plants. One is situated in Adamjee EPZ, Narayanganj and another is situated in Tangail. Currently they are producing packaging solution which includes box, label, hand tag, bar code, RFID tags and etc.

Currently R-Pac has following departments:

- OFFSET
- Flexography
- PFL
- Weaving Production
- Heat Transfer
- Thermal and RFID

### Sales Performance of R-Pac

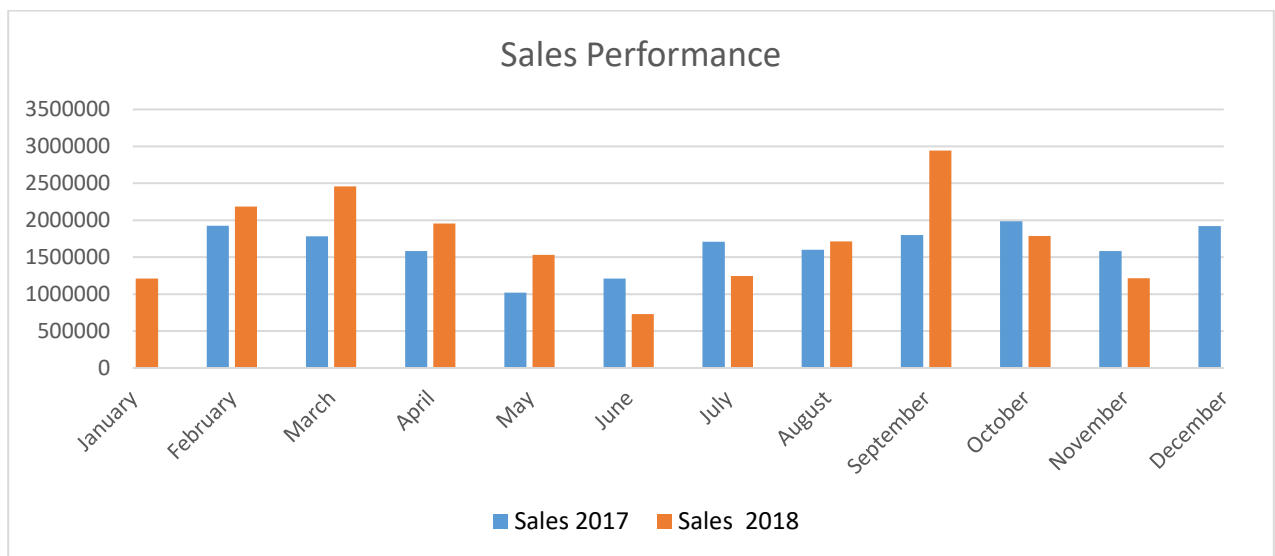


Figure 1

From the above chart we can see that sales of 2018 was better than sales of 2017.

### Mission

R-pac's mission is given below:

Our mission is to help our clients build brand integrity and reach their goals through optimal execution, sustainable and ethical business practices and the flexibility of being easy to work with. Today, we produce in over 25 countries, and at the same time, continue to invest and expand to support the growth of our customer's needs.

### Vision

To be the global destination for branded trim and packaging and to serve as the best in class solution provider and partner, while delivering quality and value to our clients throughout the retail supply chain.

### **Key success factor:**

R-pac started their operation in Bangladesh in 2009. Though r-pac is new in Bangladesh but they are doing well in the market and the key success factors are given below:

- R-pac has different production section to provide packaging products to the customer. They have faster production rate and they always try to ensure the urgency of the customer. As a result customer can get product with minimum lead time in case of urgency.
- R-pac provides quality products at lower cost to the customers compared to their competitors. As a result customer frequently give their orders to r-pac as they are getting their products at cheap cost while ensuring the quality.
- R-pac always try to ensure the customers demand. They never refuse their customer even if the quantity of the product is too small or the design of the product is too complex.
- R-pac provides customer support after delivering the products to the customers if needed. As a result it increases the customer satisfaction level.

These are the main key factors of r-pac's success in their sector.

### **Production Planning:**

Their working procedure starts from the head office which is situated in Tejgaon. Here customer service or sales department takes the order from the customer and update the order in SAP. CS include all the information like quantity and quality of the products, material of the products and so on which are provided by the customer. These orders are known as sales order. After inputting the sales order manufacturing department are informed about the order. When manufacturing department gets the sales order their work starts from the production plan department. Production plan department convert the sales order in the manufacturing order and release the job in SAP. After releasing the job, production plan department prepare a job sheet and send the job sheet to designated department in order to start the



printing process. Job sheet contains all the information which includes design of the product, raw material, dimension, and quantity of the product and etc.

### **Steps of converting a SO into MO:**

- Collect sales order form SAP.
- Check whether the order has already been released or not.
- If the order is not released then release the order and prepare a job sheet.
- Deliver the job sheet to the designated printing department.

Apart from releasing jobs Production Planning department also make a plan for all the department on a daily basis. In order to make a plan they collect all the necessary information from SAP. After collecting all the data they sort out the data and also check whether the target of the previous day target job has been achieved or not. If the target is not achieved they first make a plan so that responsible department can know about their performance and can make a plan to reach the target. Plate makers will synchronize the design with machine and input a thermal a plate in the machine. After synchronizing the design with the machine the design will be transferred into the plate.

### **Prepress:**

Prepress is basically the design and plate making department. Prepress department works in two phases. One is making the design and another is printing the design plate. In design phase designer mainly edit or adjust the design for plate making and these plates are used in the printer machines for printing the product. In order to print product designers need to adjust the design according to the machines specifications and this task is done by the designers of prepress department. When designing is complete it goes to QC department and if QC approves the design it goes to second phase which plate making section.

The work of the designers starts when a certain department transfer their job sheet to the prepress department for plate making. From job sheets they take the SO number and download the design from their server according to the SO number. The main design is provided by the customer to the sales department and sales department update the design in the server. After collecting the design of certain job they will edit the design where needed and will calculate a ups ratio and select which plate should be used in order to print the design. When the design is completed they will send the design for quality

checking and after quality checking if there is no problem with the design, then it will be sent it to the plate making department for making plate.

After finishing the first phase and quality checking the design transferred into plate making department where plates are printed for printing machines. By using these plates the products will be printed in the printing machines. There are three types of plate making machines where designs are printed for various departments.

The types of machines are given below:

- CTP
- Block
- Film Making Machines

CTP is used to make thermal plate for offset printing machines. The machine is operated by computer where the finished design is inputted and thermal plates are used as raw material. Plate makers will synchronize the design with machine and input a thermal a plate in the machine. After synchronizing the design with the machine the design will be transferred into the plate.

Film making machines are used to print film for block making and heat transfer department. Film making machine is also operated by a computer where film is used as raw material. The film making process is quite similar as CTP printing. In order to produce block we need another machine where film is transferred into block plate.

## Prepress SOP:

- Prepress department follows some operating procedures which are given below:
- Design team will receive the order sheets from EPZ planning team.
- Once the order sheet enters into design team the order sheet number, product id, time and date will be entered in the design production excel file.
- The customer support put the files in their allocated location in RLMS server.
- Once the order sheet enters, the design team verifies for all the details need to confirm as bellows:
- File should be in pdf format with approval signature by concern CS.
- Check the approval file whether the resolution of the design is above 300. If not inform PD and return the order sheet back to the planning.
- Check whether the trim card is available or not. If not confirm the PD.
- Check whether updated artwork is available in the order sheet and RLMS server and match with master artwork. If not check with PD and CS.
- Check the number of colors in the order sheet with approved layout or artwork.
- All information needs to be cross checked.
- Check with respective departments for available material size, printing order size, consider to gain maximum number of ups.
- Die line, punch hole, crease, and perforation to be included in the final die cutting which is given to outside party for die making. These needed to be recorded in offset die record.
- Replacement order comes to designer should check for replacement reasons. These have to be channeled through the department head.
- For fixed items needed to check updated artwork in the RBO web link, RLMS.
- After proof reading done make sure text outline file should be sent to indigo server, image setter rip, ctp rip.
- After verifying all the part designer required to plan using one of the below software:
  - I. Adobe Illustrator
  - II. Adobe Photoshop
  - III. Adobe InDesign

- After design is completed designer has to recheck the same in order to verify the accuracy.
- After recheck is completed the designer load the file in shared location for proofreading.
- Once the proof is approved transfer the file to ctp/image setter/indigo server.
- Before making the plates the machines has to be confirmed by concern department.
- Ctp operator need to check below:
  - Trapping
  - Whether the die line has been removed or not
  - Emulsion side up or down
  - Check LPI/DPI
  - Check whether order number, produce ID number and product dimension
  - Dispose the developed plate/film/for production.
  - CTP operator needs to confirm below.
    - If IC plate reading give +2 or dot value reading, the plate to be passed for production.
    - Check for spots on the plate this has to be recorded in job verification sheet.

### **SWOT Analysis of prepress:**

The main strength of prepress department is cost saving. When PD sends the job to prepress department they try to utilize the maximum space and reduce wastage while printing. As a result it reduces the manpower, electricity cost, and machine run times. Moreover, it helps them to increase productivity and efficiency in working process.

Though prepress department does not have any noticeable weakness but one error can occur while working is wrong plan. Wrong plan means failing to achieve the maximum utilization of the design. If they plan the design in the wrong way it will increase the cost for the company which will reduce the profit.

Prepress department has the opportunity to increase their skills. Prepress department needs to work with different departments like Flexo, PFL, Heat Transfer, and etc. While they are working with other departments on different projects it gives them an opportunity to learn something new. As a result day by day it helps them to increase their skills.

The main threat for prepress department is wrong plan. Wrong plan means failing to achieve the maximum utilization of the design. If they plan the design in the wrong way it will increase the cost for the company which will reduce the profit.

## **Chapter 2**

### **Offset Department:**

Offset printing technology is used to print paper items like cards, letterhead, catalogs, tags and etc. Offset printing is known as lithographic process and lithographic process is based on the repulsion of oil and paper. In offset printing we use aluminum plate and these plates are used to transfer image into a rubber blanket. Then rolling the blanket onto paper image are transferred into paper. The reason this printing process is called offset because the ink is not transferred directly to the paper. Offset is the best choice for printing larger quantity and it also provides clean and accurate color reproduction.

### **Offset Printing Process:**

In order to start offset printing first we have to make design plates which will be used in the machine to transfer images. After making the plate we have to attach the plate in designated cylinder and we also need to input required ink in ink section. After setting up the machines we will start the printing and the raw material is basically paper for printing. When printing is completed we move forward to finishing sector. In this sector basically we do varnishing, laminating, and cutting if needed. After completing the cutting we start to package according to customer's need and also check the quality while packaging.

### **SWOT Analysis of Offset:**

The main strength of offset is color accuracy and efficiency. Though, printing technology has been upgraded gradually but still now offset printing is one of the best processes for printing larger quantity where color reproduction is accurate and production rate is also higher. Besides, using lithography or offset for printing is also much cheaper than other printing processes.

The weakness of offset printing is wastage. In order to set up the machine and bring out the accurate color we have to adjust the machines manually. As machines are adjusted manually sometimes wastage is higher for adjusting color. Moreover, the machines are outdated which results in difficulties in maintaining the machines.

We can use any type of paper as raw material in offset printing and there is an increasing demand in the market from garments packaging accessories to hand bill where paper is used. Moreover, using offset as a printing process we can ensure the low cost for production. It is a great opportunity to grab the market where we will be able to produce product which is more accurate and also has a lower manufacturing cost.

The main threat for offset department is digital printing machine. Digital printing is the most modern technology which is used for printing. Digital printing can print much faster than offset printing machines and setting up the machines for printing is much easier and quicker than offset printing machine. As a result people are diverting to digital printing which can be a substitute for offset printing.

### **Printing Capacity of Offset Department**

#### **Printing Capacity**

<b>Printing Machine</b>	<b>Printing Capacity(Per Hour)</b>
SX	4000 Impression
GTO 5 Color	3750 Impression
GTO 2 Color	25000 Impression
GTO 2 Color	25000 Impression
Total	12750 Impression

**Table: 1**

### Packaging Capacity

Products	Capacity (Per Hour)
Packaging Products	20,000 Units
Tags	400,000 Units

**Table: 2**

### Cutting Capacity

Cutting Machine	Cutting Capacity( Per Hour)
Cutting Machine 1	1200
Cutting Machine 2	1200
Cutting Machine 3	1200
Cutting Machine 4	3000
Total	6600

**Table: 3**

### Varnishing Capacity

Machines	Varnishing capacity (Per Hour)
GTO 1 Color	2500 sheets
Varnish Machine	3125 sheets
Total	5625

**Table: 4**

### Foiling, Laminating, and UV varnish capacity

Machines	Capacity
Foiling	1920 sheets
Laminating	1000 sheets ( For large Sheets) 1500 sheets (For medium sheets) 2000 sheets (For small sheet)
UV machine 1	1400 Sheets
UV machine 2	1400 sheets

Table: 5

### Monthly Sales Quantity of Offset In 2018



Figure 2



From the above data we can see the quantity of monthly sales of offset department.

**Calculating Safety stock for 350 GSM paper in offset department**

Date	Quantity
21-Nov	19,600
23-Nov	81,699
24-Nov	97,500
25-Nov	14,100
26-Nov	28,119
27-Nov	65,242
28-Nov	41,360
3-Dec	39,782
7-Dec	53,870
<b>Total</b>	<b>441272</b>
<b>Average</b>	<b>29418</b>

Average daily demand = 29418 sheets

Standard deviation of daily demand = 26501 sheets

Lead time = 30 days

Service level = 90%

Z= 1.29

$$SafetyStock = Z\sigma d\sqrt{LeadTime}$$

$$=Z \sigma d\sqrt{(LeadTime)}$$

$$= 1.29 * 26501 * 5.48 \text{ sheets}$$

$$= 187340 \text{ sheets}$$

$$Reorderpoint = (Averagedailydemand * Averageleadtime) + SafetyStock$$

$$= (29418 * 30) + 187340 \text{ sheets}$$

$$= 1069880 \text{ sheets}$$

## **Chapter 3**

### **Flexography:**

Flexography is a printing process where we use a flexible relief plate for printing. It is updated version of printing letter where we can use almost any types of substrate for printing which includes plastic, metallic films, cellophane, and paper. It is widely used in food packaging industry.

### **Flexo Printing Process:**

A flexographic prints is made by making a positive reflected ace of the necessary picture as a 3D alleviation in an elastic or polymer material. Flexographic plates can be made with simple and digital plate making process. The picture areas are raised over the non-picture regions on the rubber or polymer plate. The ink is moved from the ink roll which is mostly drenched in the ink tank. At that point it moves to the anilox or ceramic roll (or meter roll) whose surface holds a particular measure of ink. In order to avoid smudgy or lumpy we have ensure that the ink on the printing plate is not excessive. We use a scrapper to remove extra ink from the printing plate and this blades is also called doctor blade. The printing sheet then finally sandwiched between the plate and the impression cylinder to transfer the image. After printing the sheet goes through dryer to dry the ink. If a UV-curing ink is used, the sheet does not have to be dried, but the ink is cured by UV rays. The types of paper we used for printing are Vellum TTR (Uncoated paper), Raflacoat (Semi-gloss paper), Transcode (Synthetic paper), and coated board (0.076 mm- 0.305 mm). Our raw materials supplier are Avery Dennison, UPM, and Polytex. We use two types of ink for flexo printing and they are water based ink and UV based ink.

### **Work Flow Process of Flexo:**

In first stage CS send a mail with booking sheet to the planning department for design or production. Then planning department provides a physical order sheets along with approved layouts. Then the order sheets is sent to the production supervisor. Production supervisor receives the order sheets, keeps record, collects materials from the store and send the order sheet to the design department for making the printing plate. When the plate making is finished then the supervisor allocates the orders to the machines or operators. Operator then setup materials and machines and start the production according to the schedule with the consent of supervisor. Operators also do quality checking while printing. After completing the order operators do overall QC, pack the goods and finally put them in delivery boxes

and update the SAP. Finally with the consent of supervisor and distribution department operators carry the boxes to dispatch.

### **SWOT Analysis of Flexo:**

The most important point of flexo printing is it can print on any surface whether it is metal, paper or plastic. Not only that but also it can print at a large capacity. Flexo machine can print 80-100 meters of paper per minute. Besides the print quality is also better for flexo printing. Finally another strong point for flexo printing is it is a self-sufficient printing unit. If we look at the other printing process we will see we have to use different machines for printing, varnishing, curing, and die-cutting. However, in flexo printing we do not need separate machines for completing all the process as flexo machines itself has all the specification included for varnishing, curing, and die-cutting.

Though flexo machines can produce accurate color for printing but it is difficult to print CMYK process color. If we compare flexo printing with the offset printing, print clarity is better in offset printing. Not only have that but also some times printed quality in flexo machines depends on plate quality. Finally, one of the most important drawback for flexo printing is multi-color jobs depends on machines color unit capacity. If I have machine capacity of 5 color and my job is a 6 color job then I will not be able to do the job.

As we already know that flexo printing machines can print at much higher rate it can be used for printing larger quantity. Moreover, as flexo can print, varnish, cure and cut in a single machine we can convert offset or digital printing into flexo printing. It will help to increase our productivity.

The most popular used method in printing industry is using CMYK process color for printing. By using CMYK we can produce any types of color. However, it is quite difficult to use CMYK process color in flexo machines. It is the most important threat for flexo machines because if we are not able to use CMYK effectively then it can be replaced by new technology.

## Monthly Sales Quantity of Flexo In 2018

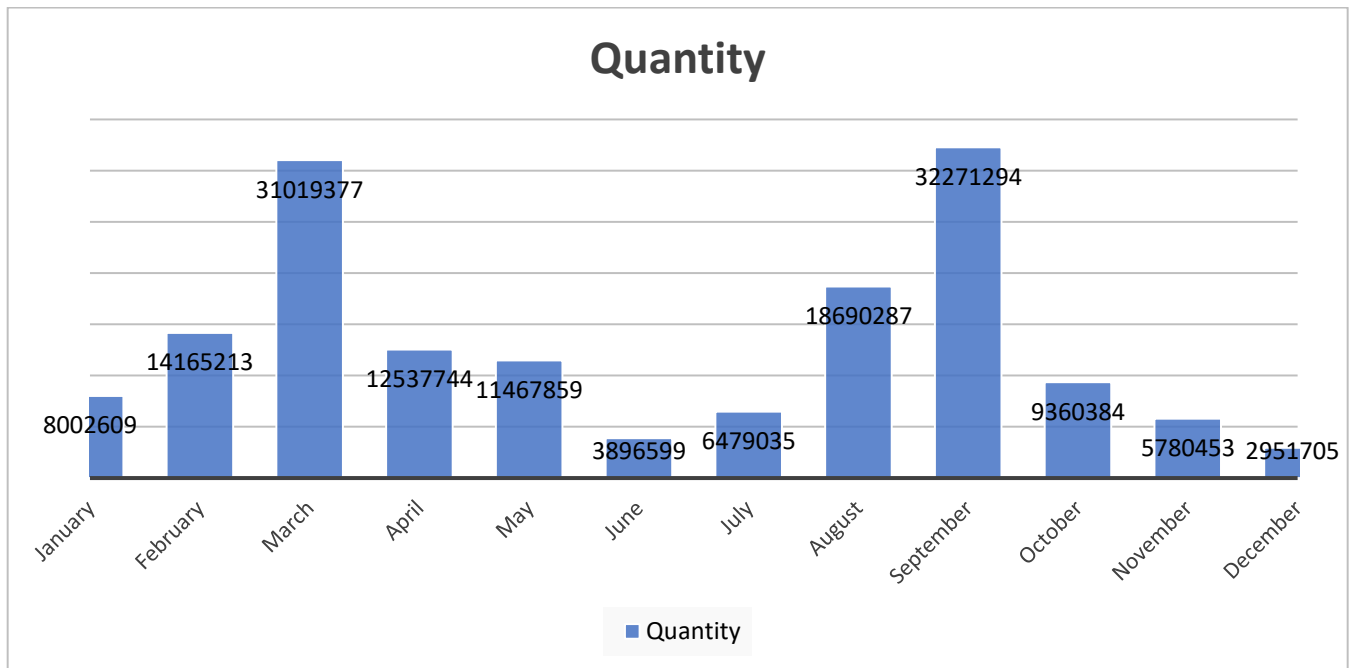


Figure 3

From the above data we can see the quantity of monthly sales of Flexo department in the year 2018.

## Chapter 4

### Printed Fabric Label

There are various types of labels and various types of information are included in a label. For example, a label can include information like fiber content, wash and care instruction, size of the garment, and brand name. There are two types of label, one is woven label and another is printed label. The printed labels are the labels where we narrow fabric or ribbon to print information. The main raw material is satin tape or ribbon tape which is used for printing. There are various sizes of ribbon which we used for printing. The second material we use in printing is liquid ink. We also use reducer mixer and color smoothing agent. Reducer mixer is used to make the ink thicker and color smoothing agent is used to make smoothing of color during printing. We also mix drying agent in the ink because if we do not use drying agent then the color will not last longer after washing.

## PFL Printing Process

The machine we use for printing PFL is called rotary. First we have to set the ribbon tape roll on the ribbon tape holder. Then we need to take out the ribbon tape and set it with the roller. After setting the ribbon we need to set the rubber block in another designated roller. The ink is transferred from ink pot to rubber block and then to another roller which is called blanket roller. From the blanket roller then image is transferred into the ribbon. When the printing is finished we need to keep the labels in a dryer for drying the ink. After drying is completed we use ultrasonic cutting machines to cut the labels. When cutting is finished we send the labels to packaging section. In packaging section workers do QC and then packet according to customers demand.

**Monthly Sales Quantity of PFL In 2018**

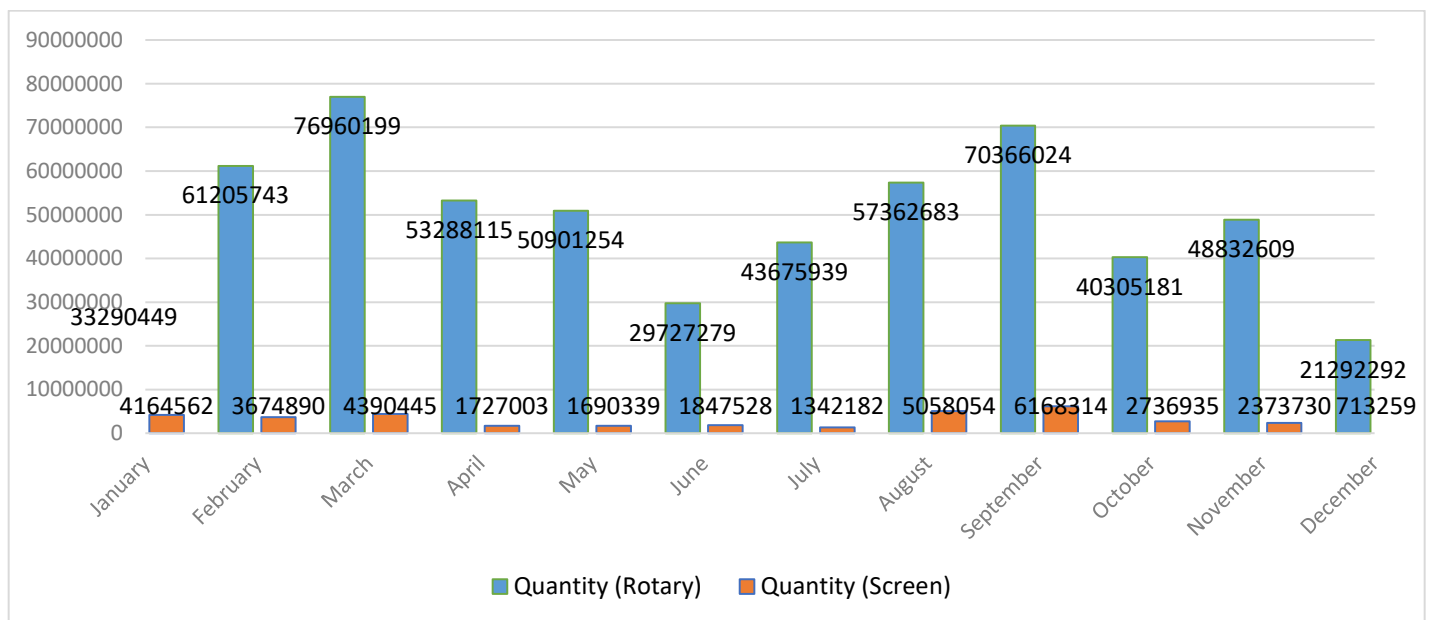


Figure 4

From the above data we can see the quantity of monthly sales of PFL department in the year 2018.

## **Chapter 5**

### **Weaving Department**

Woven labels are labels that are made with loom instead of being digitally printed. Woven is used to print logo, text, and artwork on the fabric. The main difference between printed labels and woven labels is woven labels are softer and comfortable than printed labels. Moreover, woven labels are more durable than printed labels. However, woven labels cost higher than printed labels. Basically woven labels are used to represent brand names or logo.

There are several types of woven labels and they are given below:

- Taffeta Woven Labels
- Satin Woven Labels
- Damask woven labels

Woven polyester threads are used to make taffeta woven labels. The fabrics are used to make taffeta labels are much thicker, and slightly stiffer. Taffeta labels are much cheaper and can display small text clearly. Moreover, it dries quickly and it is good for using items that might get wet like swim suits. However, taffeta labels are not that durable and it cannot display artwork properly.

Satin polyester threads are used to make satin woven labels. Satin labels are softer and shiny than taffeta woven labels. Satin labels are mostly used for baby garments. Satin woven labels are also used to bring luxurious look to the product. However, satin woven labels are priced higher than taffeta woven labels and does not display designs in details and clearly.

Damask woven labels are most common woven labels and 100% polyester damask threads are used to make damask woven labels. Damask woven labels are the softest woven labels and has very high quality and durability. Damask woven labels can print artwork and text clearly. However, damask woven label is more costly among other woven labels.

### **Woven Label Printing Process**

First production plan department will provide the job sheet to the weaving department where all the details information about the product will be included. After receiving the order supervisor will check for raw materials availability and will make some sample. After making sample they will match the sample with the actual design of the product. If everything matches according to the design of the

product then they will make a plan to start the production and will assign an operator for printing. Then the operator will start the print according to the plan. After finishing the production they will cut the product and will do an overall QC. After completing QC they will package the product and will send to the dispatch.

### SWOT Analysis of Woven

The main strength of woven is they have the latest brand machines and skilled, and organized workers. As a result they can weave any types of woven label while maintaining the quality of the production.

The main weakness of the woven department is lower productivity. As the machine setup time is higher and weaving process is slower it increase the lead time and lowers the productivity. Another issue with woven is material sourcing. As woven department uses yarn as raw material which are imported it increases the higher lead time for receiving raw materials.

Woven department can increase their productivity by reducing wastages. Reducing wastages will help them to increase their quality of the product. Not only that but also it will reduce the production lead time.

The main threat for woven department is quality issue. If they fail to maintain the quality of the product customer will reject the order which will create a financial loss. Not only that but also it will increase their cost.

Production Capacity (Per Hour)

Brand	Model	Availability	Production Capacity
Muller	MBJ-3(Rapier)	1	1425 pcs
Muller	MBJ-3(Rapier)	3	1767 pcs
Muller	MBJ-6 (Rapier)	2	2188 pcs
Muller	MBJ-6 (Air-Jet)	6	2907 pcs

Table 6

### Other Supporting Machines

Brand	Model	Availability	Function	Capacity
Muller	Musonic-2	2	Ultra Sonic Slitter	300 meter
CKY	CKY SF-150	1	Coating and Calendaring	8 roll
Wing Singa	WS 586	12	Cutting and Folding	48000 pcs

Table 7

### Monthly Sales Quantity of Woven In 2018

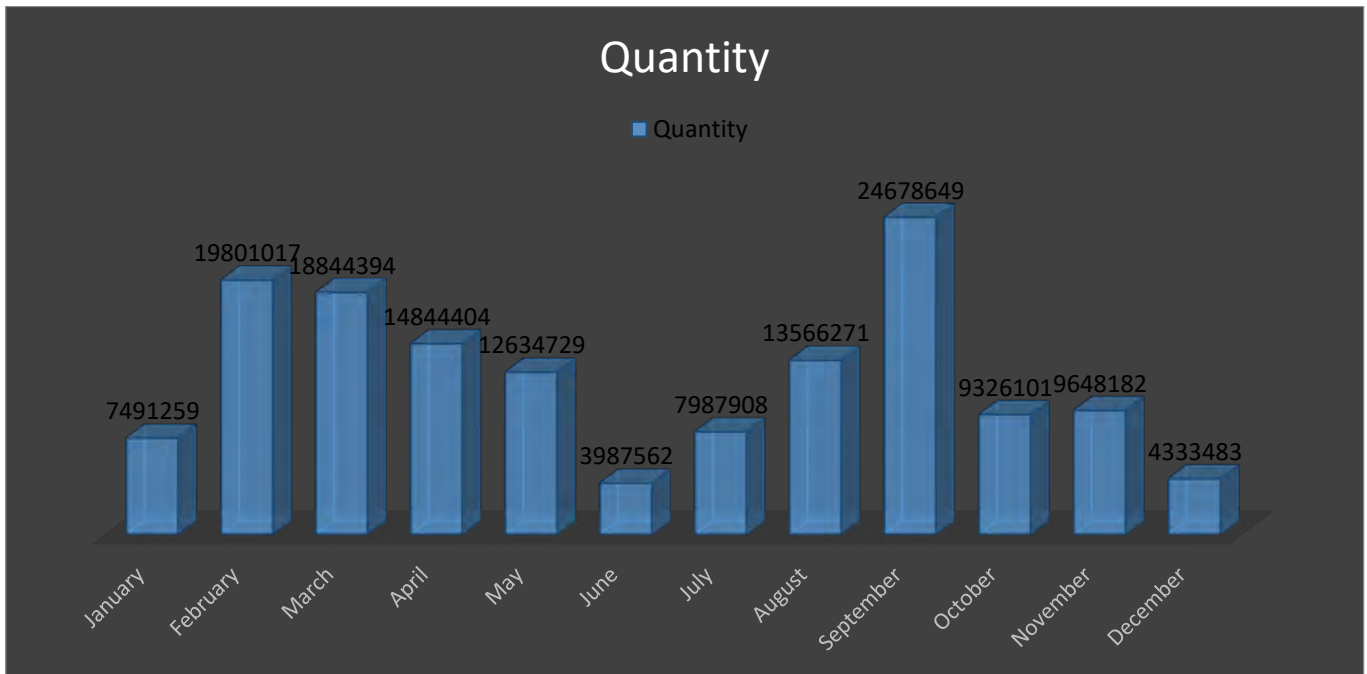


Figure 5

From the above data we can see the quantity of monthly sales of Woven department in the year 2018



## **Chapter 6**

### **Heat Transfer Label**

Heat transfer labels are directly attached in the fabric by using heat and pressure. Heat transfer labels can be stickers, brand logo, or labels with care instruction. Heat transfer labels are mainly used to make the products attractive and to highlight the brand name. As heat transfer labels attached directly into the garment products it is much comfortable than printed labels. Besides, heat transfer are also cheaper.

### **Heat Transfer Label Printing Process**

Heat transfer printing process starts after receiving the job sheet. After receiving the job sheet they send the job sheet to the design department for film making. When film making is completed then the film is transferred to screen making department. Screen operators uses different types of mesh to transfer the design from film to mesh. There are two types of mesh; one is yellow mesh and another is white mesh. Yellow mesh is to print ink and white mesh is used to print adhesive. There are different variant of mesh. Screen operators uses screen plate to bind the mesh. After binding the mesh into screen plate the start the emulsion process. In emulsion process they use a chemical named dirasol to strengthen the mesh. When emulsion is completed then operators put the mesh into dryer for drying the mesh. After drying operators attached film in the mesh and then it goes to the exposure machine. In exposure machine the film is exposed into mesh. After exposing the film into mesh they clean the mesh with water and put it in the drying machine. After drying screen is ready to be printing. Machine operators set the screen in the machine and do necessary adjustment and start the printing. The raw materials are used for printing is pet sheet, ink, and adhesive. Heat transfer color management is done by the ink master. Ink master uses different types of ink and chemicals to produce desired color and then give it to the machine operators. Machine operator uses those color for printing. Pet sheet is used as paper for printing and adhesive is used to bind the labels with fabrics. If we do not use adhesive then the design will wash away after first wash. There are two types of adhesive; one is water based adhesive and another is powder based adhesive.

### **SWOT Analysis of HTL**

The main strength of heat transfer department is faster production rate. A sakurai machine can print up to 1500 sheets per hour which helps the manufacturer the capability of faster production. Moreover, HTL machines are durable. The second most important part of the HTL department is the color

accuracy. Using heat transfer can produce more accurate color than printed labels. Another important part of HTL is the HTL sticker are more comfortable and durable.

The main weakness of HTL is maintaining the printing machines. HTL machines are very expensive and need to be operated carefully. If there is any issue with the machine then operators will not be able to print until the issue is fixed. Another issue with HTL printing is if the screen have any imperfection then the quality of the printing will be hampered and making a new screen will take at least 4 hours. As a result production will be hampered which can create a negative impact on overall production.

As HTL stickers are cheaper and comfortable than printed labels many garments manufacturer will be encouraged to use HTL stickers rather than printed labels. Not only that but also using HTL we can print larger design or sticker at lower cost. Moreover, HTL stickers are more attractive then printed labels or woven label and for that sports garments manufacturer usually uses HTL to print logo on the garments.

The main threat for HTL is the durability. HTL stickers are less durable than woven stickers. If any new technology can reduce the woven label manufacturing cost it might be a threat for the HTL. Another important issue for HTL is maintaining the raw materials. As HTL uses chemical and special printing sheet we need to maintain the raw materials carefully. If any of the raw material has any issue than the total production process can be hampered.

### Monthly Sales Quantity of HTL In 2018



Figure 6

From the above data we can see the quantity of monthly sales of HTL department in the year 2018.

## Safety Stock and Reorder Point Calculation for HTL Department

### Calculation of Demand

<b>Date</b>	<b>Quantity</b>	<b>Date</b>	<b>Quantity</b>	<b>Date</b>	<b>Quantity</b>
1-Sep	4500	23-Sep	6000	16-Oct	1000
2- Sep	6500	24-Sep	5000	17-Oct	5000
3- Sep	9000	25-Sep	3500	20-Oct	5500
4- Sep	6500	26-Sep	6300	21-Oct	1000
5-Sep	11000	28-Sep	4500	22-Oct	2000
7-Sep	7000	29-Sep	3500	23-Oct	1000
8-Sep	9500	30-Sep	9500	26-Oct	4000
9-Sep	7000	1-Oct	7500	27-Oct	7000
10-Sep	7500	3-Oct	2000	28-Oct	5000
11-Sep	10500	5-Oct	2000	29-Oct	2500
12-Sep	8500	6-Oct	1500	30-Oct	1500
14-Sep	6000	7-Oct	1500	31-Oct	4000
15-Sep	5000	9-Oct	2500		
17-Sep	4500	10-Oct	4000		
18-Sep	6000	12-Oct	4000		
19-Sep	8000	13-Oct	3500		
21-Sep	3500	14-Oct	3000		
22-Sep	5000	15-Oct	1500		
23-Sep	6000	16-Oct	1000		
24-Sep	5000	17-Oct	5000		
25-Sep	3500	20-Oct	5500		

### Calculation of lead time

Order Release Date	Order Receive Date	Lead Time
1/11/2019	8/12/2019	37
6/10/2019	13/11/19	38
8/8/2019	9/9/2019	32
2/7/2019	25/08/19	54
29/04/19	19/06/19	51
10/3/2019	23/04/19	44
	Average Lead Time	42.666667 days
	Standard Deviation of lead time	8.57 days

### Calculating Safety Stock:

Average daily demand = 4726 sheets

Standard Deviation of daily demand = 2606 sheets

Average Lead Time = 42.667 days

Standard deviation of lead time = 8.57 days

Service level = 90%

Z = 1.29

$$SafetyStock = Z\sigma dLt$$

$$Safety\ Stock = Z * \sqrt{(AverageLeadTime * \sigma d^2) + \{(Averagedailydemand)^2 * \sigma^2\}}$$

$$= 1.29 * 43933.57588\ sheets$$

$$= 56,674\ sheets$$

$$Reorderpoint = (Averagedailydemand * Averageleadtime) + SafetyStock$$

$$= (4726 * 42.667) + 56,674\ sheets$$

$$= 258,318\ sheets$$

## Chapter 7

## **Thermal and RFID department (Radio Frequency Identification):**

As business industry is becoming more global day by day companies are now focusing on improving efficiency. All the companies whether they are large or small are trying to find new ways for inventory management in order to achieve efficiency. Because of continuous innovation companies have been able to find many ways for their inventory management which will reduce their cost. The most used method for inventory tracking is using barcode. However, if we use barcode for inventory management it will give us maximum 65% accuracy. On the other hand if we use RFID then we will be able to achieve 99% accuracy. RFID means radio frequency identification. Basically it is a microchip where data can be stored. In order to communicate with RFID tag we will need an RFID scanner which will generate radio waves. RFID chips wrapped in a plastic or paper for protection.

There are two types of RFID tags and they are passive RFID tags and active RFID tags. Passive RFID tags do not have any battery and they are powered by the waves from the reader. On the other hand active tags have their own power supply and for that active RFID tags can be tracked from longer distance.

RFID can be used in different sectors and some of them are given below:

- Tracking of Goods
- Automotive
- Tracking of animals
- Airport baggage tracking logistics
- Machine readable travel documents and etc.

## **The reasons of Using RFID**

Inventory management means managing the inventory of manufacturers. Inventory can be several of types and they are given below:

- Raw Materials Inventory
- WIP Inventory
- Finished Goods Inventory

Raw materials inventory means the total amount of raw materials stored into stock in order to use in production. WIP inventory means we have used raw materials to produce a specific part of the product

in order to use in making finished goods. Finished goods inventory means we have used our raw materials and WIP inventory and produced which are ready to be delivered in the market or waiting to be sold. Usually we use barcode system to keep track and manage our inventory. However, if we use RFID instead of barcode it will enable us to improve efficiency and accuracy of our inventory management, especially for finished goods inventory.

We should use RFID in inventory management for various reasons. The first and most important reason is if we use RFID it will ensure us the maximum security of the product. Using RFID can give us the continuous information about the products we have stocked in our inventory. If any products attached with RFID tags leaves the store than it will send us notification on our RFID controlling computer. For example, in a shop an expensive jacket is attached with a RFID tag. As soon as the jacket moves from its desired location then we will be able to see that the jacket is not in its desired place. Not only that but also RFID are more accurate than barcode. Besides, we will not need manual labor to read information. As a result it will give us more control over our inventory which will help us to reduce our inventory management cost. It will also help us in making better inventory plan because we will have all the data regarding all our inventory. Companies like amazon, Wal-Mart, Tesco are using RFID for their inventory management system.

RFID will help us in following way to manage our inventory:

- Enable us of continuous tracking of the Inventory.
- Reduces the chance of being stock out of any specific product.
- Helps to organize the overall inventory.
- Ensure the security of the product.
- Reduce the labor intensive work as we will be able to get the information from a distance. Hence it increases the efficiency.
- Reduces the inventory management cost.

### **RFID printing process:**

The printing process starts after receiving the job sheet from production plan department. When RFID team receives the job sheet then workers are assigned to perform specific job. In order to print RFID tags we use digital dot matrix printer. This is a single head printer where dry black ribbon is used as ink. There are three steps in RFID printing process and they are given below:

The first step of printing process is to setup the printing machine. In order to setup the machine we need to calibrate the machine. Calibration has two steps. First we need to calibrate the raw materials for the machine. After calibrating raw material we will calibrate the RFID chip with the machine.

When calibration is finished we move forward to the second step which is collecting the data. In this step operator check the job sheet and find out the order details from that sheet. They collect the information from their ERP software by inputting the sales order number or job number and match with the job sheet. If everything is alright then they download the data from the ERP.

After collecting data and calibrating the machine they go to the final stage. In this stage they start to print the product and adjust the machine if needed.

### **RFID encoding procedure:**

In order to encode data for RFID there is a website for the customer where customer input all their desired information and specification. After inputting all the data the website will automatically generate a sample RFID and customer will be able to see a preview of the RFID tag. If customer approves the RFID tag then they will confirm the order with the CS. CS will take the order and will update the order in their ERP software. From ERP production plan department will generate a manufacturing order or job sheet and will send it the thermal and RFID department. Then RFID department will start their production procedure.

### **RFID checking and cutting procedure:**

After finishing the printing RFID then go through for checking. There are machines which are used to check each RFID tags by scanning to check whether there is any multiple production of same RFID tags. If there is any multiple production of same RFID tags then destroy the duplicate copies. They also check if there is any defective production. After checking the tags are sent to another machine which are used for cutting, here tags are cut into pieces and packed according to customer's quantity.

### **RFID pasting procedures:**

Sometimes customers want their RFID tags to be attached to a label or hand tags. In order to attach the RFID in a label or tags they follow a procedure and this is called pasting. For pasting process we use another machine where we input the RFID tags and labels in separate section. Pasting machine then automatically attach the RFID tags with the label or hand tags.

## **SWOT Analysis of RFID:**

The main strong point for RFID is the accuracy. RFID printing process includes computerized process where all the steps is monitored by the computer program. As all the process from data entry to printing is controlled by computer and software it reduces the error in the working process. As a result in ensures more accuracy in the operations about information. The second most important part is if we use RFID is it will increase the efficiency in working. In traditional inventory management we need manpower to look after the inventory. However, if we use RFID we will be able to check all the information from a computer from a distance. Hence, it increases the efficiency in working process. Besides, it reduces the manual labor at store. Moreover, RFID ensures the security of the product. As we can track the RFID it will give us the continuous tracking of the products which will ensure us the security of the product.

The main weakness of the using RFID is the higher cost. As RFID raw materials cost is higher it results in higher cost for RFID and most of the company does not want to spend high price for the tags. Another issue of using RFID tags is their durability. RFID tags are sensitive to lighting, metal and water interruption. Hence, we have to be careful about the store environment as it is less durable.

Technology is improving day by day everyone is now using computerized system to manage their organization or business. As RFID is monitored by the computer business it will increase the demand of RFID for business industry who uses computerized system for operating their business. As a result industry will use RFID for increasing efficiency. Besides RFID is the most advanced technology and many retailer are moving into RFID.

Main threat for RFID is higher cost. As RFID tags cost higher than traditional Barcode small companies may discourage in using RFID and for that we have to find and efficient way to reduce RFID production cost.

## **Sales Performance of RFID at R-Pac**



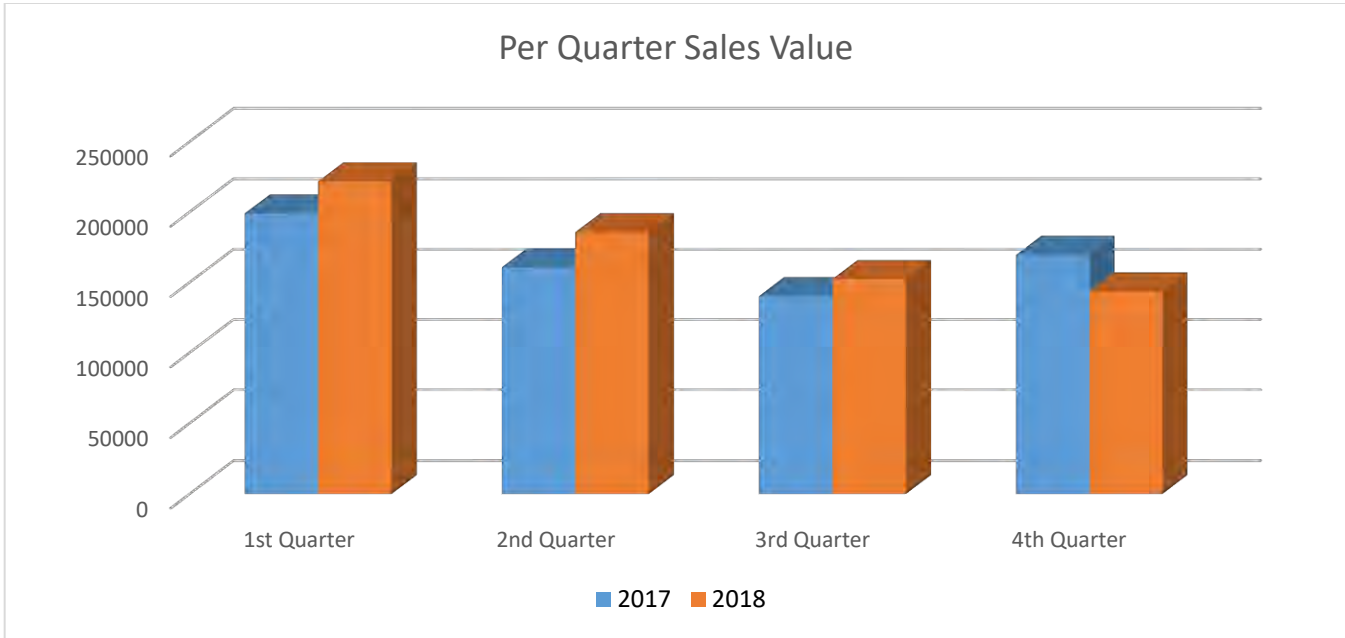


Figure 7

From the above data we can see the quantity of Quarterly sales of RFID department in the year 2018.

**Overall Sales Performance of RFID at R-Pac**

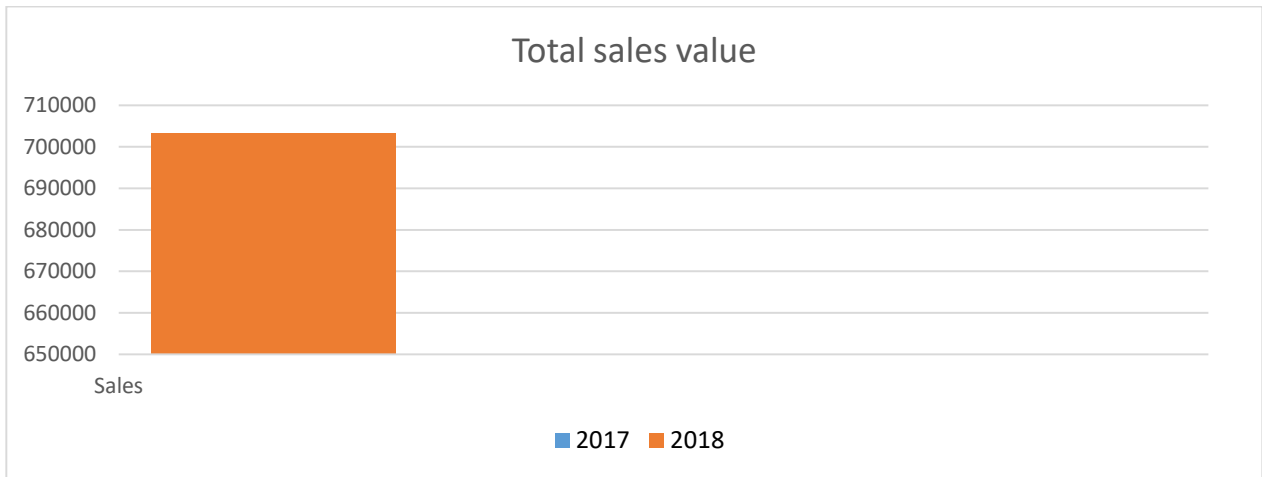


Figure 8

From the above data we can see the quantity of Yearly sales of RFID department in the year 2018.

**Global market demand of RFID tags**



Figure 9

From the above information we can see that the demand of RFID tag is increasing day by day. It is getting more popular among many companies. Some of the largest companies like amazon, Wal-Mart are already using RFID in their business. I have also seen the increasing demand for RFID tags while doing my internship at r-pac packaging Bangladesh Company limited. Recently Wal-Mart has ordered 10 million RFID tags to r-pac. I have also observed that companies like Tesco, Tchibo, and H&M are also increasing their RFID orders. They are focusing on RFID because it is helping them to control their inventory more efficiently while ensuring the maximum security. To conclude, I think in future RFID tags will be the main way to manage and control our inventory.

## Conclusion and Recommendation:

**Recommendations for r-pac are given below:**

- Increase the storage capacity.
- Use safety stock and reorder point to reduce raw material stock out risk.
- Provide necessary training to their employees and workers.
- Use updated machines and equipment for smoother operation.
- Change layout in order to reduce the space constrains.

R-pac has been doing their business for 10 years in Bangladesh. They are providing wuality products to their customers. They have been providing products at much lower price to their customers in order to gain the market share and to compete with their competitors. Moreover, r-pac always focus on customer satisfaction and tries to provide support their customer. They always ensures the customers demand and ensures the quality of the products. They have several production departments like offset, PFL, HTL, Woven, Flexo, Thermal and RFID. All the production departments focus on efficiency and effectiveness. They always tries to reduce the wastage and increase the utilization. For example, in offset department access papers or offcut are used in packaging. However, there are some issues too. As r-pac operate their business in pull system; they have lower production in off season. Hence, it decreases the efficiency. Not only is that but also in the production season there extra pressure on production department. Another issue is their storage for raw material is quite small. As a result they store minimum amount of raw material. Besides, they do not use any safety stock or reorder point system. As a result their production often got delayed because of raw material shortage. It also increases their production lead time. If r-pac can resolve these issues than they will be able to increase their efficiency and productivity.

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