DEVELOPMENT OF MONTHLY ORDERING SHEET TABLE (MOST) FOR BLOW MOLDING PROCESS

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Abstract: Monthly Ordering Sheet Table also known as Material Requirement Planning in other company. Its function almost same related to material use in producing products in every industry and it also computer based system. Microsoft Excel have been used and it formula, Vlookup function have been chosen to carry out this study. Vlookup is stand for Vertical lookup which is its function can ease the user who need to key in many data.

Keywords: *Material Requirement Planning, formula,*

1. Introduction

Monthly Ordering Sheet Table (MOST) is a system using by PIC Material Requirement Planning (MRP) which is function to calculate material and child part needed to manufacture product also identify the needed and scheduling of purchase (Sagbansua, 2010). The product's raw material, parts, and other elements are classified as dependent demand. There is a need for a new approach rather than the traditional inventory management methods to meet this kind of demand. The disparity in inventory management stems from the disparity in the market structure for certain items. The demand for goods such as raw materials and parts used in finished product production is called dependent demand. For example, because the demand for parts and components needed for automotive production depends on the amount of demand for the car, it is known as dependent demand.

2. Methodology

2.1. MOST project framework

A conceptual framework focuses on the main scopes to the studied, the factors or variables and the presumed relation between them or, in other words, something which explains the main things to be studied, either graphically or in narrative form. Through theoretical structure, we refer to the conscious and deliberate outcome produced by a researcher in terms of theory or a combination of theories that direct his research effort. Therefore, from the previous section, the aim of this section will be to summarize, review the related major concept, and also to summarize the key theories used in the research study.

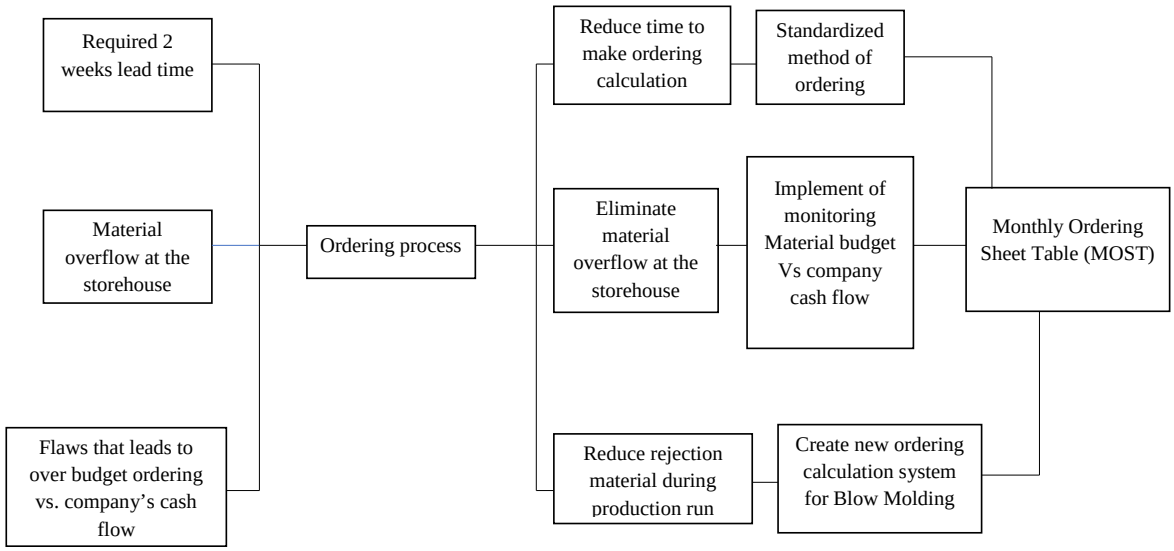
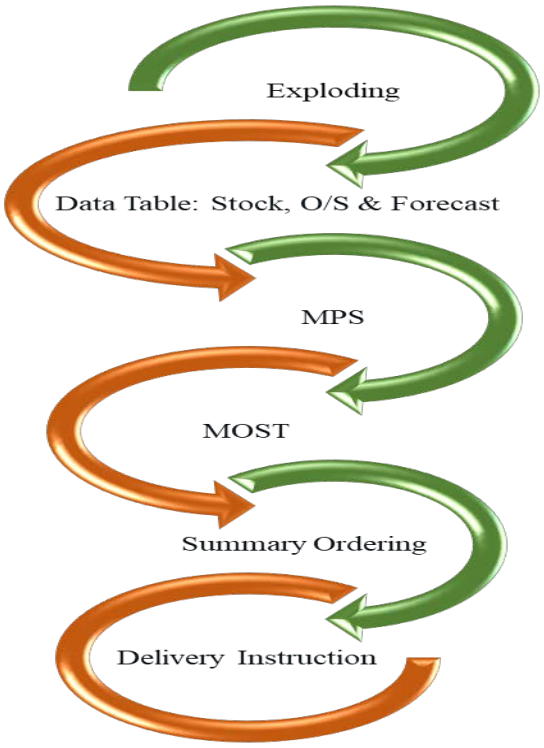


Figure 1. Project Framework (Ermoshin et al., 2018)

2.2. Methods used in Material Requirement Planning



1. BILL OF MATERIAL
   - Master data for ordered parts
2. STOCK AND O/S DATA AND FORECAST TABLE
   - Key in manually monthly
   - 2 table:- OS/Stock and MPOF
3. MASTER PRODUCTION SCHEDULE
   - Based on forecast and order breaks into independent parts
4. MATERIAL ORDERING BASED ON DATA FROM STEP 2
   - Auto calculate:-
     - SAFETY STOCK
     - QUANTITY ORDER
     - PARTS ORDER
     - FOR WHEN THE PART IS ORDER
5. AUTO SHOWS LIST OF PART, QTY, FORECAST AND WHEN ORDER
6. TO KNOW WHEN THE ITEM NEED TO BE DELIVER

Figure 2. MRP system

2.3. Database used in the system

Microsoft Excel have been used and it formula, Vlookup function have been chosen to carry out this study. Vlookup is stand for Vertical lookup which is its function can ease the user who need to key in many data. For example, in this study we need to key in the data on Customer Ordering, Stock from OEM & Store and Monthly Production Ordering Forecast (MPOF) from customers. After the data have been key in, it automatically insert in the Monthly Ordering Sheet Table (MOST) (Sagbansua, 2010). Using the VlookUP, it helps to make the job more faster to be done. Without using the Vlookup, the job been more complicated and may cause error because we need to key in it one by one (manually). Besides, the job will take more time to be done (Felea and Albăstroiu, 2013).

3. Results

MOST been created to ease the ordering process at the right time, quantity and less mistake been made compare to before implementation system. As we can see, column for 'code' and 'item code' with the green color is only need one time key in. Its been made in other sheet and been transfer using 'VLOOKUP' formula. This can reduce our workload to make sure the item been key in correctly with so many times. At the right side column, all of them are auto calculate also with the formula. It is to ensure we do not need to check at many sheet when there is any error occur.

Here are the basic calculation on how the system ordering operate:

$$Part\ weight\ x\ Quantity\ of\ customer\ order = Total\ usage \quad (1)$$

From the total usage, we will make an addition 3% of current total usage to get the grand total.

$$Total\ usage + 3\%\ of\ rejection = Grand\ total \quad (2)$$

Next, we need to calculate the buffer stock also known as safety stock that need to be keep:

$$Buffer = \frac{Grand\ total}{Working\ days} \quad (3)$$

Furthermore, the supplier cannot tear the bag just to get exact value according to their customer. They might get loss if they did that. In company, the buffer stock been kept in 3 days amount.

$$3\ Days\ Buffer = \frac{Grand\ total}{Working\ days}\ x\ 3 \quad (4)$$

From all the Monthly Ordering Sheet Table, can be conclude that all of this data need to be consider to know what material need to be order and how much quantity of the material need to be order :

$$Stock + Outstanding\ PO\ (OSPO) - Grand\ Total - Buffer = Total\ Quantity\ Requirement \quad (5)$$

4. Discussion

In parallel with this research objective, to create new ordering calculation system for Blow Molding, it also can reduce time taken for the ordering process to complete which is it uses auto calculate system compare than before just using manual calculation system.
High rejection, additional factor, wrongly key in data and stock overflow are among the reasons why it can exceeds the limit. So, by using MOST, all the reasons can be control. On March, cause of pandemic Covid 19 also affect the material usage due to company shutdown.

The result shown that it is synchronize with the objective which is to implement monitoring material budget versus company cash flow. It can be seen that there is improvement on company cash flow activity. It is important to monitor the company's cash flow in order to know either gain profit or loss for the company on that month.

The main reason why material overflow occur is wrongly key in stock and outstanding purchase order and manually key in for stock buffer and fixed data of monthly vs customer ordering. On March, there is no data due to collection of the data only can be collect at the end of the month. On September 2019, company has merged their operation by combining the Bukit Beruntung plant with Rasa plant. Bukit Beruntung plant (Injection Molding) has used the MOST system but Rasa plant (Blow Molding) did not use it yet. Due to this situation, company's management have decided to standardized the system used in order to prevent material overflow at the storage which is material used for Injection Molding and Blow Molding is just same.

5. Conclusion

MOST has a lot of advantage for manufacturing company that have high capacity of production. By using it, cashflow for the company can be control and visualize. Furthermore, it also can reduce waste with the quantity material of needed use for machine setup already allocate. Besides, MOST also can make work more easier compare than before where ordering process been prepared by using manual. Using the formula, with only one time key in needed which can avoid mistake to occur. In addition, by using MOST, leadtime to complete the ordering process can be follow which is can be complete faster in the same way can inform the supplier the right types and quantity of material at the right time.

For the process data, list of formula that been mention in chapter 4 is used in order to calculate total quantity requirement. If the total is in positive form, it means the material unnecessary to order and if the total in negative form, it means the material need to order. Late arrival of material can affect the whole process especially in manufacturing products and then will face downtime, if the product did not reach to the customer at the right time. Avoid breakdown by plan a countermeasure to avoid downtime to the customer, any downtime happen will be charge by customer at the rate of 1-minute downtime equals to RM600.00. This will mainly affect the company's cashflow.

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