

Reduction of inventory discrepancies due incorrect bill of material in an electrical manufacturer

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Abstract — In the company EM, during the last inventory (2020), a lost cost of over US\$100,000 was calculated due to incorrect bill of material or discrepancies related to deviations not implemented. This paper focuses on finding the optimal follow-up system to prevent inventory discrepancies due to bill of material errors and on managing future issues related to this subject. The technique followed was the Waterfall Methodology, for which the management expressed the need of a project where the items flagged during the inventory were reduced. During the implementation of the project, the data was divided by deliverables, focusing on vendor lead times and usage of the parts. Four deliverables were completed and, as a result, 500 items were reviewed and 25 projects started, which should be concluded during 2021.

Key Terms — Bill of material, inventory discrepancies, inventory inaccuracy, supply chain

INTRODUCTION

In the industries, one of the key metrics is inventory. If there is a controlled inventory, they can operate without material stops and can fulfill their customers demand, but in order to accomplish that, they must keep control in the correct functioning of their enterprise resource planning (ERP) system and correct bill of material (BoM) for each product. In the company EM, in the last inventory during 2020, it was calculated a cost lost above US\$100,000 due incorrect bill of material or discrepancies related to deviations not implemented. Figure 1 shows the top negative root cause adjustment for the 2020 inventory.

A top concern of the management is to reduce those costs and have a healthy inventory which can guarantee that all customer orders will be shipped on the scheduled date. To achieve this goal,

different departments have to work as a team to evaluate the situation and define the date to complete the project.

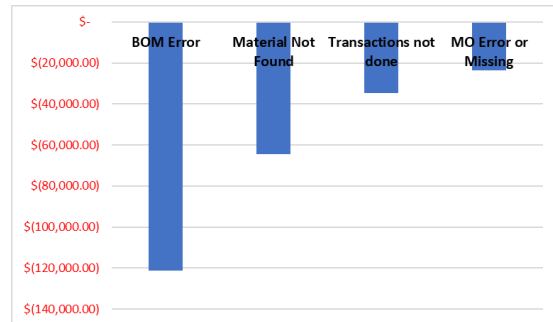


Figure 1
Top negative root cause adjustment for Inventory 2020

OBJECTIVES

The following objectives were established for this project:

- Reduce the numbers of hits on key metrics as On Time Performance and Stock Fill Rate due a material stop related to an incorrect BoM.
- Reduce the number of deviations not implemented during 2020
- Reduce material stops due incorrect BoM

LITERATURE REVIEW

Nowadays, companies or businesses have different situations in a daily basis such as low productivity, low yield, finish good or final assembly not shipped on time, but also inventory management, which can be translated as inventory inaccuracy. This discrepancy frequently comes from misalignment between the system and the physical goods.

Inventory inaccuracy is an issue in the manufacturer companies which can be generated by internal or external factors, incorrect codification, and administrative errors [1]. Some people might

think that this is something new, but the phenomenon of inventory inaccuracy is well-known in the supply chain as a possible detractor.

There is a limited amount of examination that has been carried out to study the effect of inventory inaccuracy on supply chain performance. Some investigations explain with simulations the impact of forecasting error on supply chain performance but do not take into consideration discrepancies in the inventory data [2].

In order to maintain a good practice, the methodology followed has to drive the team to the main goal. The Waterfall Methodology is a linear project management approach where the requirements of the customers and stakeholder (plant manager) are gathered at the first cycle and then a project plan is designed to fulfill them [3]. During the different phases, the methodology draw a path to follow which are:

- Requirements
- Design
- Implementation
- Verification
- Maintenance

In every phase, different task are assigned to reach the goal of an effective project.

WATERFALL METHODOLOGY

Requirements

After the physical inventory of the Company EM last year (2020), the management requested a project to reduce their inventory discrepancy which can be monitored and easy to implement.

Design

After the request of the data, it was shown that the deliverables should be divided in the following order:

- First, the items with the longest lead time and high usage.
- In second place, the items with pending dispositions and high usage.

- Third, items with the longest lead time and lower usage.
- Finally, items left to complete the demand.

Implementation

In accordance with the management requirements, the items already divided into deliverables were worked on as follows:

- **Deliverable 1:** The items with the longest lead time and high usage are the top priority because most of them have only one vendor approval. To reduce the impact, all items must be checked if it is applicable to start sourcing a secondary vendor which can provide a better lead time or a higher quantity of order. After items were organized, at least 110 items were selected as priority 1 and a different project was started with the sourcing and procurement team. To complete this priority, other departments were needed to give their specialize inputs.
- **Deliverable 2:** The items with the pending dispositions and high usage were the second priority of the management because it is an available inventory which can be used but for any reason it is pending of a disposition such as use as is, scrap or return to supplier. To complete priority 2, the team was aligned to work with 250 items divided in different vendor, which the departmental team worked to be completed within a week. As a result, 100 items were introduced to the production lines, 75 items were placed on hold for further analysis, 50 were reworked to be used and the rest (25 items) were returned to supplier as scrap. Also, as complementary activity, lead time of the supplier were checked to validate if there was a need to move any item to priority 1.
- **Deliverable 3:** The items with the longest lead time and lower usage were located as priority 3. It may be shocking to think that items with a lower usage were a production blockage, but in most cases, the items with lower usage have more monetary value in terms of quantity of

the item vs. sales price. These items were the fourth detractor of the top negative root cause adjustment for the 2020 inventory, as shown in Figure 2, named as MO Error or Missing.

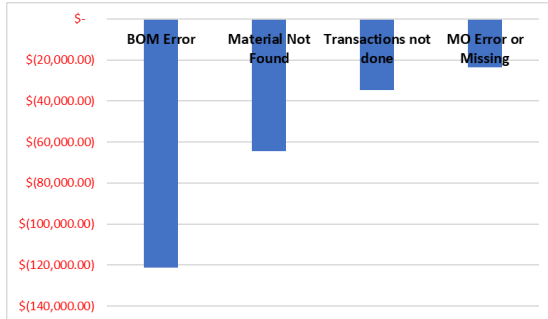


Figure 2
Top negative root cause adjustment for Inventory 2020

- **Special Deliverable:** As special deliverable was added the items with discrepancies related to a deviation pending to be documented or to be originated.

Verification

At least 500 items were looked and corrected, and 25 projects were started, divided by the different vendors.

Maintenance

Projects for different departments were started and pending to be concluded during 2021 and a continuous follow up of BoM discrepancies.

DISCUSSION

As part of the project, it was debated which department should have the ownership of the different projects and the continuous work. After this issue was presented to management, it was decided that Finance along with Manufacturing Engineering will take the lead of the continuous of the deliverables and the start of new projects for the plant, not only one production line.

CONCLUSION

In order to maintain a healthy inventory, a teamwork must be practiced not only by the sourcing and purchasing team, but also finance and

all the departments must be aware of the discrepancies to prevent production stops. As a preliminary conclusion, a continuous work of Product Line Support Engineer/assistant must be added to maintain a healthy system which is a copy of the actual production floor usage, to prevent false usage or overused of any item. Also, the projects started with Deliverable 1 must be completed within this year.

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