

Methodology for Indirect Material Control in a White Line Company

João Bosco Rodrigues Pereira

bosco.rodrigues23@gmail.com

FAMETRO University Center – Brazil

David Barbosa de Alencar

david002870@hotmail.com

Galileo Institute of Technology and Education of the Amazon – ITEGAM

Alexandra Priscilla Tregue Costa

ptreguep@yahoo.com.br

Engineering Coordination at FAMETRO University Center – Brazil

Antônio Estanislau Sanches

novo.sanches@gmail.com

Engineering Coordination at FAMETRO University Center – Brazil

Abstract

At the fierce level that companies generally find themselves in, it is no longer allowed to let the missing material off the shelf of a stock, be it material that is part of the product or indirect material that assists in assembly activity. People involved in the item buying activity need to have full control of inventory, whether planning, changing the planned or planning the unexpected. For the preparation of this study, the daily activity of indirect stock operators of a White Line Company was observed. The factory material control system (ERP) has many functions that made control complex. In parallel to the ERP system, a material control worksheet was created and shared in the cloud that allows all necessary information regarding an item to be easily viewed, where the indirect material worksheet manager needs to update daily by downloading every morning information from the ERP system. Getting better inventory supply chain management, better execution of activities.

Keywords: White Line Company; ERP system; Material control; Inventory supply chain;

1. Introduction

Good inventory management is not one that allows your inventory to be completely full of the same item, to the point that a certain part risks spoiling or making an item obsolete, but one that has full control of everything it has stocked, in other words also called inventory management and control. And you can safely maintain just what you need without compromising any of your customers.

But it is not enough to have everything written down on a clipboard, as it is very likely that one of the reasons why materials are tracked is because one is remembered and the other is forgotten, so it is necessary

to have daily monitoring by those responsible, always having to resort to an electronic system for better stock viewing and control. Poorly managed stock allows room for a production process to be interrupted due to lack of material that may be in the local, national or international supplier.

The White Line Company uses an ERP system, which controls all the items used in the process. Production auxiliary materials called indirect items are allocated to indirect stock (0003). And all the information that pertains to this part is added to the system. To maintain inventory accuracy (0003), intense time-wasting activity is required to check every item stored, in stock, in transit, or needs to be purchased.

From this principle a Spreadsheet parallel to the main system was gaining body in order to improve the visualization process, making the process much broader, which information can be verified on the same screen, avoiding that several screens are searched, which, often need pre-authorization.

2. Theoretical References

According to Hong Yoh Ching (1999), companies are not making the best use of their spaces, which results in higher costs and higher final prices, both being passed on to final consumers.

The square meter of a business needs to be well utilized and sized to the best of its ability, depending on whether the building is owned or rented, the location should be multifunctional, depending on the need, and usually the largest spaces are those that the lines of production is used and where the material is stored. For Viana (2002, p. 42), the registration aims to register the products necessary for the maintenance and development of the company, which implies the recognition of their classification, establishment of codification and determination of the specification, aiming at the issuance of catalog for use by those involved in material management procedures. Registering and coding the material is of paramount importance to keep track of who is managing a stock, as usual a stock has many items and all are important to keep the process going.

Gonçalves (1979) says that three operations involve the registration of materials, they are:

Include material item in material register; Change when any material item changes in some of its characteristics; Exclude when an item is no longer on the company bill of materials.

Product storage, handling and control are important and essential components of the logistics system because their costs involve a high percentage of a company's total logistics costs "(POZO, 2001, p. 76).

Each item has its proper form of transportation and storage, such as flammable (solvents, oxygen, nitrogen, LPG and ink), label and Styrofoam.

2.1. Material Control

The control system applied to this stock was systematically a warehouse production operator, a minor apprentice (part-time) and an intern. They are the people responsible for the activities of releasing the materials for the production process, give up, receive and They store the materials that come from the Receiving sector, after the receipt of the incoming invoice is released and also after the release by the quality Inspection.

Arnold (1999, p. 26) states that: Materials management is a coordinated function responsible for planning and controlling materials. Its objectives are: Maximize the use of company resources; Provide the required

level of customer service.

The material comes to stock 0003, and is controlled by the people involved in this sector, and are controlled systemically, where buyers in the area are responsible for purchasing replacement items, devices from all areas of the company and thus taking too much of your time. Activities include various calls, e-mails and other forms of electronic contact to suppliers from various locations, negotiating better prices and looking for new, secure and better sources of supply.

2.2. Indirect Material

At some point during the workday, there may be lecture training, medical consultation, power outages, meeting, computer problems and on-site activities, the days are not equal. Thus, there is a possibility that some productive material may be missing from the shelf due to focus deviation.

On the shelves there is nothing that catches the eye as a way to identify, because the ivory being full or empty, does not draw attention through colors or any other way, signaling "contain or not contain".

The two ways to know that an item is missing is by looking systemically or physically visualizing in the ivory. When it comes to physics, that's when we need to pick up the ivory and pay for process material or weekly audits. "A company without strategy does any business." (Michael Porter, 2004)

Indirect material is material that is not part of the product but is embedded in the cost of the product. They are various materials that help assemble them and spare parts of equipment called spare parts, such as: screwdriver tip, cutting disc, pen, notebook, bubble bag, garbage bag, paper towels, toilet paper, glass disposable, transformers, lamps, USB cable, code reader and epi's. The list is very long and this stock exceeds \$ 500,000.00.

Finally, Indirect Material Inventory is a sector that is totally necessary for the company as a whole, where items are removed and replaced, which can cause line stop and stopping the line, the company stops producing and delivering.

We can define inventory as the stored accumulation of material resources in a production and / or operations system. Broadly and generally, stock can be understood as any stored resource. In this way, a queue would be a stock of people waiting for service; a bank would have a stock of people and ATMs to serve customers; A law firm would have stock of lawsuits.

Generally speaking, inventory is clear and defined by storing certain items in order to preserve them for later use, i.e. to fulfill a demand / order. In some cases, these items will undergo transformations to meet their intended purpose. Every company, whether small or large, has a stock to serve its customers faster, always keeping track of their time, allocation, suppliers, quantity, unit value, total value or whether it is an imported or national part.

Inventory: is a practice used through the identification, classification and counting of stored products in order to check if this information is in accordance with the reality of what was given as goods entry and exit, but is very laborious, it depends size, amount of material to be counted, weighed or sized.

This process requires inventory to be counted at a predetermined frequency (daily, weekly, biweekly, general inventory, or otherwise). In this way, the inventory information is updated in cyclical periods, according to the company's needs to supply a demand.

2.3. Stock

In general, a stock is where the most relevant part of the company is located, even though it is hidden inside two cardboard boxes. If the required flow of items is not met, they risk becoming obsolete or damaged. Just as there can be no excess, there can also be no shortage, which means that a stock ceases to obey the natural order.

Among the many controls is the Kanban Tool (card) created by Taiichi Ohno after a trip to the US supermarkets, which can be used in many ways. Example: colors, frames and etc.

Specifically speaking of the stock of Indirect Material there was a need to make it even more robust by continuously studying it and creating situations necessary for its strengthening.

To have access to inventory you need to ask the leadership for authorization, authorization that allows you to see information regarding the stocked items that goes from who supplies to who makes the request, which makes the manufacturing system a management / control, even if by Permissible access stages, if you need price, quantity, total value, unit, shelf, vendor, etc., the system can provide one screen at a time.

In the system only you can see the total quantity and other information mentioned above, do not contain safety stock or minimum stock, in a nutshell or have the material in stock or do not have.

Making control somewhat difficult, opening up opportunities for failure, which can maximize a serious problem should an item go unnoticed, creating the view that the system is flawed, and the system relies on human propulsion. to input the information.

If a wrong input happens, a positive or negative stock hole occurs, depending on how the system is fed, so weekly inventory is required; About 576 items in the Indirect Material stock are parts that have quantity, volume, specifications, smaller box, larger box, some take up less space and others take up more space.

2.4. Inventory Management

The amount of material stored is directly linked to the production process and the supply chain and programming made by the company's PCPM. In low periods, commonly called this, it is very natural to meet the schedule made for this time of low production and few employees (resizing).

Demand generally tends to have a gap, either buy or sell. But it still crashes, it just slows down, part of the focus is on buying machine parts, which happens in advance to do scheduled maintenance. Along with the reduction in production, comes downtime and collective vacations, at the same time happens the general inventory, counts all stocks to evaluate possible divergences.

It is time to set up the company internally for the next few months to meet the requirements, without leaving the inventory zero, systematically tracking the items, preparing the inventory for the period of high production.

It is almost a ripple effect that happens, that is, depending on the company's follow-up, the other segments also slow down, the period is cost reduction, saving on water, electricity, telephone, paper, uniforms, food and transport.

Inventory management is focused on planning strategically so that if there is production planned, if there is no production planned; if there is a reduction in the planned pace a redesign is required. Planning goes on continuously to reduce as many stockpiles as possible. In this white goods company, for some parts Just in time happens, others are bought according to a priority order.

In this sector there are two of the eight wastes that is excess material stock (incoming stock) that can be from parts for production and in the next stock (outbound stock) there can be overproduction that is stock stopped with finished material. If not well observed, a stock that enters and does not produce or produces and has no output can lead to any bankruptcy. Otherwise, any inventory that is well managed and controlled tends to be profitable for the company.

Since what is being dealt with in this article is a white goods company stock, there is no way to make a promotion and zero the stock, as in a clothing store, for example. Therefore, everything that comes in has to be used for production in a short time.

3. Tools and Methods

For the development of this work, the following steps were performed: Analyze survey items from indirect stock; Research the best way to perform daily activities; Chronoanalysis; Create a material checklist in parallel with the manufacturing system; Apply materials control methodology; Verify objectives achieved. A spreadsheet was created in the cloud to help control indirect materials when the spreadsheet was started, after a while it was shared with people in the industry. Where suggestions were given to make it robust and there were no errors in the execution of the activity or duplicity of information.

Where the Excel spreadsheet is downloaded from the company's main system (ERP), then taken to the cloud where the spreadsheet is on Google drive.

After the upload happens, automatically through the macros and formulas created, all data is updated according to the main system. each properly directed to information previously prepared to be updated.

Making the spreadsheet Dynamic, where you can view all the information necessary for the follow-up of the part (chart). Anyone in the industry or outside (if shared) can understand that the spreadsheet originates from the Indirect Material Stock and concerns the parts used in certain locations of the company and can be found, even the machine of its use and etc.

However, an internal survey was needed to know how the material behaved, also called the manufacturing script (its entry, storage and absorption by the productive demand).

Have shop floor visits been made for a better understanding of the flow, such as the part that is allocated on the shelf in block 1, section A, where this part is used? What is the daily consumption? Weekly? Monthly? And annual?

Among the many information contained in the spreadsheet it is possible to see the location of the supplier, for example, if it is national or international, this information is important for the delivery time of the material, because when the supplier is next to us (Just in Time) the Delay time is not that significant.

Unlike the supplier that is in another country and its delay is three months to deliver the order.

4. Application of Study

As shown in the worksheet there are points to note, showing that a particular material requires observation, whether to show that there is material in “stock”, “attention” and “request”.

This becomes one of the first steps for inventory process improvement, line sourcing, and replenishment. It is knowledge that companies must have to control their inventory of indirect or direct and for this it is

necessary to manage it, either through an ERP system, a simple material control worksheet or a clipboard to check what it contains, enters or exits. . Good management controls and maintains the sanity of monetary values, stock stopped is money stopped or waste.

Along with this you need to apply just in time (JIT), keeping only the necessary and without leaving the items missing for production. The point of resupply should be continually observed, as a patient who is in a hospital and under observation, there must always be someone on duty who understands the matter, who can remedy if an emergency occurs and who applies the proportion of the measurement. in the correct dosage, so that the patient (stock) is reintegrated into everyday life and 100% healthy (zero waste).

4.1. Old process flowchart for part to be searched, information separated by screens.

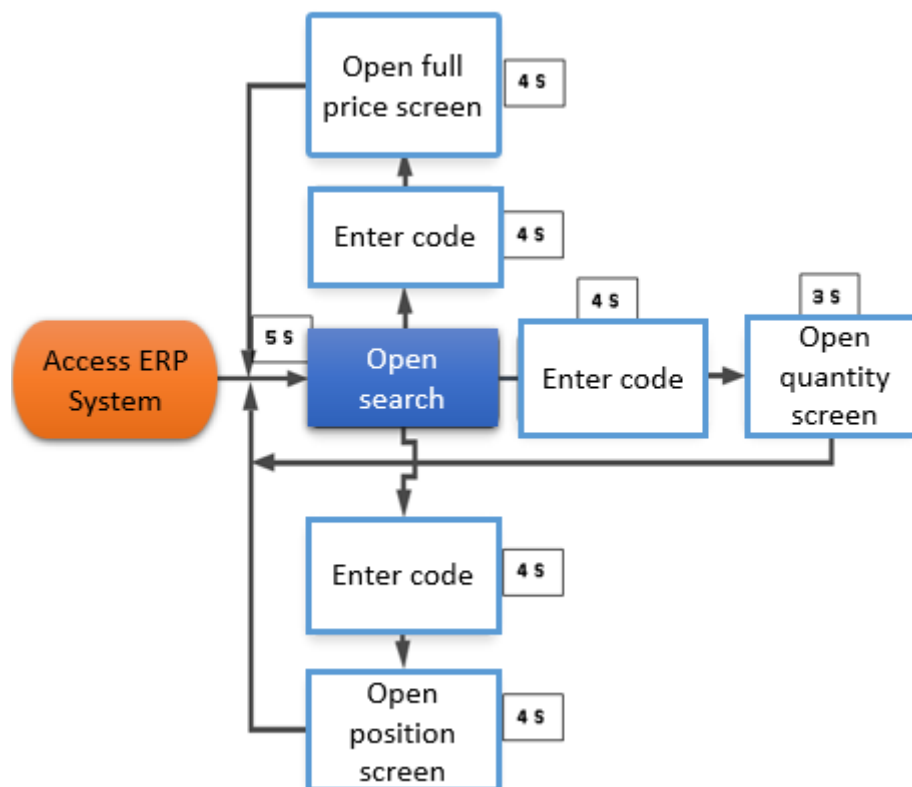


Figure 1 - Old Material Search Process

Source: The Author

All this being thought that one of the items may end and that there is a distance from the supplier to the requesting company, there is a time from the receipt of the order until delivery (delay), i.e. preparation, shipping and delivery.

A large company cannot stop due to mismanagement in its inventory, every second a company goes down, there are millions of products that are no longer being produced, operators stopped, products that are no longer delivered and a dissatisfied customer.

The consumer when looking for a specific brand, be sure to take another for not finding the preferred brand. When a company stops producing the next competition, it is in full swing, often working 2 or 3 shifts and putting its product on the shelf.

These days, the level of competition between companies is very high and wins the one that is best planned

and with a greater focus on internal management, without forgetting to look at the foreign market, which means the level that your competitor is.

The more you apply to lean philosophy, the more likely the reduction is to happen naturally. And in some situations, a case study is needed, so that the project to be implemented is very clear and defined.

This does not mean that a stock should not have anything stored, but rather make the best possible use, remembering that there are numerous possibilities for a material to arrive late at its final destination. That goes from lack of raw material in the supplier to the fall of bridges on Brazilian roads.

Even with spreadsheet deployment, attention to items is required, a large enterprise system can fail, people can fail, and vendors can fail. The spreadsheet is nothing more than just another work tool that helps employees perform their role to the best of their ability.

4.2. Problem Identification.

After realizing the possible failure in inventory control and management, it was initiated the study and research in a White Line Company, in order to avoid wasted working hours, inefficiency of operations and facilitate the execution of the activity to This difficulty requires a little more time from the buyer, so the process was analyzed in order to improve the management of this stock.

A new Methodology for Indirect Material Control, visualizing the activity of each Buyer daily and Production Operator.

Given the uptime for a particular item, how many screens it took to get all the information about that single item, and so on.

Since the system generates multiple screens and sequential material access information, it takes some time for materials to be tracked one by one, leading to exhaustion in their search, that is, too much time to check the stocked items.

As for example: quantity in stock, entry into the company, if you returned to supply it, reason for return, total value, unit value, place of use and so on.

5. Results and Discussions

After applying the Indirect Material Worksheet, it was possible to realize the return in the form of benefit (short and long term), which will include: Optimized storage space (especially when a company uses all its manufacturing space); There was no availability of labor; Creation of new safety stock (according to seasonality); Inventory reduction; Reduction of obsolete; Better use of space; Better use of time; Less downtime; Easy access to information.

Table 1 - Material Control Worksheet

| CODE | DESCRIPT. | QNT. | UNIT | VLR | STATUS | LOC. | PROVIDER | SECTOR USED |
|----------------|-----------------|------|--------|----------|-----------|-------|----------------------|-------------|
| | | | VAL. | TOTAL | | | | |
| 521.123 | Electronic Test | 8 | 200,00 | R\$ | Attention | B3/C3 | Discharge Electrical | Polymer |
| | Tip | | | 1.600,00 | | | Devices Ltda | |

| | | | | | | | | |
|----------------|-----------------|-----|-------|----------|-----------|-------|-------------------|--------------------|
| 521.160 | Extractor | 7 | 8,00 | R\$ | Attention | B4/A3 | North American | Tooling |
| | | | | 56,00 | | | Company of Iron | |
| 521.189 | Expansion Tool | 3 | 48,00 | R\$ | Request | B7/C7 | Metal Tooling | Assembly line |
| | | | | 144,00 | | | | |
| 521.468 | Screwdriver tip | 56 | 13,00 | R\$ | Stock | B1/D9 | House of | Assembly Processes |
| | | | | 728,00 | | | Construction | |
| 521.566 | Plastic bag | 400 | 0,98 | R\$ | Stock | B6/G5 | North Plastic Bag | Almox - Collection |
| | | | | 392,00 | | | Industry | Support |
| 521.098 | boot | 98 | 23,00 | R\$ | Stock | B9/F4 | Forte - Safety | Assembly Processes |
| | | | | 2.254,00 | | | Material | |

Source: Own Author

The Indirect Material Worksheet is still in application, its results are evident in everyday life, but it will become clearer with improvements that may happen.

You can already view multiple information at the same time, and at the same time realize what you need to request or what is in attention. Within the ERP system, information retrieval would take longer, and in order to maintain excellent controls on all materials stored in indirect stock, both parts and activities on the 0003 stock platform.

5.1 New Structure

The new structure contains the following elements: Code; Item; Quantity in system; Product situation (stock, attention and order); Unitary value; Amount; Unit of measurement; Location; Entry date; Last Move; Downtime; Sector used; Place of use (machine or workstation); Supplier (national or international).

Another benefit that the Control Worksheet brought was the improvement of rotating inventories, in normal mode you need to download a spreadsheet with name and code, one with positioning and another with quantity, from the spreadsheet you can print all this information at the same time. time.

6. Final Considerations

The Ultimate Material Control Worksheet helps you manage your 0003 stock materials while keeping a close eye on everything that goes in and out. At the same time passing the necessary information to the buyer of the part, through macros linked by Google Drive and information that changes color according to the quantity of part stored.

It will serve as a source of research for future academic work, through the richness of its content exposed here, through this course conclusion article.

The simple gains can already be seen through the spreadsheet, as it is no longer a laborious process, but side by side with the ERP system of the White Line company.

All questions were answered, according to the question for implementation, and is following a deployment flow that were: research, creation, adaptation, macro creation, linking and deployment throughout the process was in the monitoring of the head of the sector.

It is subject to improvement over time, should the process change, it needs to be updated to meet the need for the indirect material area.

7. Bibliographical Reference

- POZO, Hamilton, Administração de Recursos Materiais e Patrimoniais. 3 ed. São Paulo: Atlas, 2001.
- DIAS, M. A. P. Administração de materiais: uma abordagem logística. 4. ed. São Paulo: Atlas, 1993.
- ARAÚJO, L. C. G. Organização, sistemas e métodos e as tecnologias de gestão organizacional: arquitetura organizacional, benchmarking, empowerment, gestão pela qualidade total, reengenharia. 4. ed. São Paulo: Atlas, 2010.
- BARROS, A. J. S.; LEHFELD, N. A. S. Fundamentos de Metodologia Científica. 3. ed. São Paulo: Pearson Prentice Hall, 2007.
- BORGES C. T.; CAMPOS S. M.; BORGES C. E. Implantação de um sistema para o controle de estoques em uma gráfica/editora de uma universidade. Revista Eletrônica Produção & Engenharia, v. 3, n. 1, p. 236-247, Jul./Dez. 2010.
- CARDOSO, Elano. O dimensionamento de estoque Just in time: uma aplicação prática da ferramenta Kanban. Revista Científica Multidisciplinar Núcleo do Conhecimento. Ano 04, Ed. 05, Vol. 09, pp. 66-90: Maio de 2019. ISSN: 2448-0959.
<https://www.portaleducacao.com.br/conteudo/artigos/conteudo/o/53635>.
- PORTER, Michael. **Estratégia competitiva**. Elsevier Brasil, 2004.