

# Implementation of a Kanban Inventory System to Improve Laboratory Material Restocking

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## Abstract

The pharmaceutical company Johnson & Johnson's supply chain team at the Guaynabo facilities was facing delays in laboratory activities due to the lack of an inventory system. This led to ordering materials only once they were out of stock, pausing activities for weeks. This impacted both the supply chain and laboratory teams. The proposed solution was a Kanban inventory system to tackle this problem. The system was integrated using Microsoft Excel and was tested during the following inventory cycle. Now, materials expected to be out of stock in the next month have orders in place for restocking. Restocking takes two weeks. Therefore, materials will be restocked two weeks before they are out of stock, allowing activities to flow without interruptions.

## Introduction

Johnson & Johnson (J&J), founded in 1886, is one of the leading pharmaceutical companies worldwide. The company manufactured the world's first mass-produced sterile surgical supplies. Previously, at the Guaynabo, Puerto Rico site, materials were ordered once they were out of stock in the laboratory. This led to days or weeks of delays in manufacturing processes. To tackle this problem, the supply chain department of the company, also located at Guaynabo, Puerto Rico, worked on the development of an inventory Kanban tool to track when materials in the laboratory need restocking.

The objective of this project was to improve inventory tracking and ensure timely material restocking to prevent delays in operations. This project aimed to implement a simple, accessible inventory tracking system using Kanban principles to improve material availability and minimize disruptions in laboratory operations. This goal served as the foundation for selecting and implementing a practical solution tailored to the needs of the supply chain and laboratory teams.

## Literature Review

The Kanban method employs visual cues, usually in the form of Kanban cards, to show when additional inventory should be ordered or produced. These cards include key details such as part numbers, quantities, storage locations, and more. As items are used, the

cards are moved from the "completed" section of the Kanban board back to the production queue to signal the need for more production. This establishes a continuous workflow where tasks are pulled through the system driven by customer demand [1].

Excel is an optimal alternative to create Kanban boards because there are existing free templates available for it. These can be used and modified, adjusting to client needs. There are other sources providing customized templates, such as Microsoft Word or manual paper, but they require constant manual work to update the information. Excel has a more organized interface and features to display, process and keep record of the information [2].

## Methodology

For this project, the DMADOV (Define, Measure, Analyze, Design, Optimize, Verify) methodology was applied as follows:

- 1. Define** – A need was identified for this case: the supply chain department of a pharmaceutical company sought the development of an inventory Kanban tool to track when materials in the laboratory need restocking.
- 2. Measure** – Meetings with both supply chain and laboratory teams were held to identify the current state of the process, communication channels, and current resources. A schedule of activities to visit the laboratory and record current inventory and inventory process was created. Information regarding orders, timing and process from the supply chain department was obtained. A risk assessment was conducted to determine the severity of not having an inventory system by the company. The business impact was studied as well. Figure 1 shows the approval levels of the supply chain and laboratory teams regarding the proposed Kanban inventory system. The laboratory and supply chain teams were asked whether they approved, were indifferent, or disapproved the project.

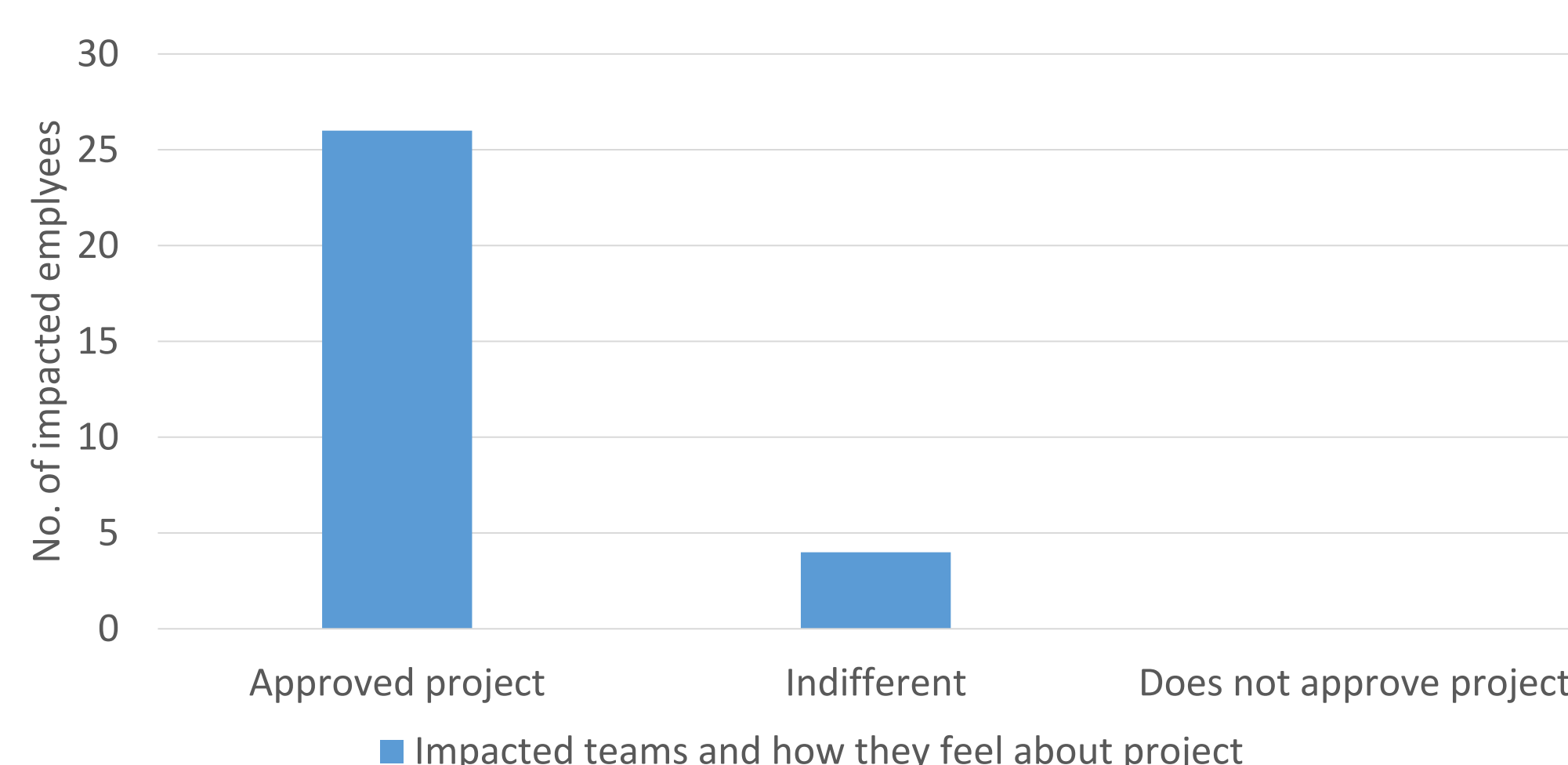


Figure 1. Approval Levels of Supply Chain and Laboratory Teams.

**3. Analyze** – All data obtained was analyzed to consider existing resources. The best software for developing the Kanban tool was identified, ensuring that both the supply chain department and the laboratory team had access to it. The software selected was Microsoft Excel. Once approved, the tool was customized for the needs of the teams during the design stage of the project.

**4. Design** – The tool was customized to be easy to use and to facilitate the tracking of inventory data, based on the identified needs.

**5. Optimize** – The final tool was presented to both teams and tested. If improvements to tool customization were found, changes were made to adjust to both teams' needs.

**6. Verify** – Once final customization was reached, the Kanban tool was delivered to the client. The tool was tested to ensure required customizations were finalized. The IT department was notified about data storage purposes and cybersecurity check-ups needed.

## Results

Once the Kanban inventory tool using Microsoft Excel was in place, it was delivered and tested by the laboratory team. Once feedback was received, the order status column was added to the sheet so the laboratory team can keep track of the orders. The laboratory team's feedback is that they feel more secure now with the continuity of laboratory activities without interruptions from now on.

Materials expected to be out of stock in the next month have orders in place for restocking. Restocking generally takes two weeks. Therefore, materials will be restocked two weeks before they are out of stock, allowing activities to flow without interruptions. The tool sheet depicted in Figure 2 shows how Kanban tool is visualized by laboratory and supply chain team members. It includes an order status column with alerts identifying status by colors. Color codes are explained in a legend attached in the sheet.

The sheet includes the following information: year, month, material name, amount in stock (package/box), units per package, order restocking (Yes/No), Order amount (package/box), and order status. Apart from his information the mentioned legend and a note were added to the sheet. The note added is a reminder that only supply chain and laboratory team members are allowed to edit the sheet. The feedback from the supply chain team was that now communication with laboratory team members for orders will improve and flow better.

Figure 2. Inventory Kanban Visualization

## Conclusions

The project received positive feedback from the impacted teams as mentioned in the results. For future work, more information and materials can be added by laboratory team members. Also, a Kanban inventory system of reactants or chemical solutions can be done in the future. In that case, access would be limited to laboratory manager and laboratory maintenance supervisor. Tools like this can be implemented in other departments like manufacturing, as Kanban tools are a visual way to track tasks, inventory, resources, and tools, among other items. It they can be used to assign tasks to manufacturing members for the week, month, or another specific period and keep a visual track of activity completion. One limitation for this project was having access to managers as they have busy schedules, but their approvals are needed for all work implemented in their areas.

## References

- [1] Six Sigma (2024, April 22) Kanban Inventory Management in Lean Manufacturing. Everything to Know <https://www.6sigma.us/manufacturing/kanban-inventory-management-lean-manufacturing/>
- [2] Kanbanchi + G Suite. (n.d.). How to Help Your Team Excel by Using an Online Kanban Board ? <https://www.kanbanchi.com/how-to-help-your-team-excel-by-using-an-online-kanban-board>