



Lean Improvement Study of an Online Sale in a Small Distribution Company

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ABSTRACT

Small business companies play a huge role in the global economy. It is essential that these companies must be studied and analyzed to find any faults in the system that can be mitigated by using lean methodologies. The purpose of this research is to analyze the process in which this small business sells their product using Lean Manufacturing techniques. After analyzing the process, use the same techniques to mitigate any existing problems the process has. Using the DMAIC Cycle, the accounting process was analyzed in reference to the time spent on creating customer invoices. The studies showed that an area of improvement was to implement a new employee to take the client orders, so the seller does not have to waste time searching the orders. The analysis was successfully implemented, and a new solution was developed in response to that analysis. Further time is needed to correctly implement the solution to the process and an analysis of time spent vs time saved must be done to ensure its functionality

INTRODUCTION

A small distribution company, which sells an exclusive product and dispatches products different clients all around Puerto Rico, United States, and other countries, sells the product and online live sale. This "Garage Sale" is the main source of income for this company along with other activities and subscriptions for the product. The company is designed to be managed by 1 person, but generally, it is run by 3 people: the owner, who manages inventory, sale and distribution; and 2 assistants, who help with the online sale. Since it is a small company, one person oversees the inventory of the sale as well as being the seller. An analysis should be performed to help mitigate the time the owner spends on the Garage Sale and what solutions can be used.

OBJETIVES

The main purpose of this research is to apply tools learned in Lean Manufacturing, to improve or optimize the processes. Management claims that it does not have the necessary resources and the process is normal, complicated and demanding.

METHODOLOGY

For this project, the DMAIC methodology was used to analyze and help locate any problems in the Garage Sale process. The method is divided in five steps:

- Define: The purpose is to have the team and sponsors reach an agreement on the scope, as well as financial and performance targets of the project. A project Charter was used in Define as well as a SIPOC Diagram to understand the process.
- Measure: The purpose is to understand the current state of the process and collect reliable data to use for exposing the root cause. A process Map was created to collect data from the process and see where the problems lie.
- Analyze: The purpose is to brainstorm potential root causes, develop hypotheses as to why problems and the work to prove or disprove their hypotheses. An FMEA was used to evaluate the severity, occurrence and detention of risks to prioritize which ones are the most urgent.
- Improve: The purpose is to learn from pilots of the selected solution and execute full-scale implementation. A new process map was developed as well as an implementation plan.
- Control: the purpose is to adjust process management and control system for making sustainable improvement. Guidelines were provided, well as a routine check up will be programmed.

RESULTS & DISCUSSION

Define

A project Charter was used to classify which problem was being taken under consideration. Figure 1 displays the Project Charter assembled for this project. In the scope, it was described that it was used to analyze the Garage Sale and how it could be maximized by reducing its cycle time. The expected result will be reducing the cycle time by 20%. To capture critical information, a SIPOC diagram was used. Figure 2 displays the SIPOC created for this process. The SIPOC serves as a guide to understanding why each process and step is vital to the benefit of the company.

Project Charter details including Project Title, Manager, Project Leader, Scope, Project Goals and Measures, High Level Project Timeline, and Supported Required.

Figure 1: Project Charter

SIPOC Diagram showing Suppliers (Orchid Shopper Club, Sunset Valley, Material Suppliers, Mail Service, Online Streaming Service), Inputs (Supplies, Buyer and Students, Shipping Material), Processes (Seller Contacts, Online courses, Local activities, Seller organizes), Outputs (Sales Made online, training, Local activities), and Customers (Buyers, Students, Distributors, Mail service).

Figure 2: SIPOC Diagram

Measure

In the Measure phase, a Process Map for the Garage Sale was implemented to depict the process and classify what problems can occur during each step Figure 3 depicts the Process Map.



Figure 3: Online Sale Process Map

After the Process Map was completed, a brainstorming was done with the business owner and the obstacles were expressed. The obstacles were: Seller Contacts distributor for inventory; Seller begins to sell the product on the Garage Sale; Seller receives payment and order confirmation from the client; and the seller sets up shipping for the product.

During the brainstorming process with the process owner, the logistics of the process were discussed. This was done to understand how the Garage Sale was conducted, how much time is spent on the live sale and what are the earnings from the past month. Figure 4 is a table of the sales per country.

RESULTS & DISCUSSION

For research purpose, a study was done to identify the client profile based on their age and sex. Based on the graph, over 70% of the clients are women. Based on the seller's experience, women are not always searching for the same type of product. This means that having different distributors is great for diversity and keeps the clients happy. Figure 5 depicts the percentage of the gender and age group that prevail in the Garage Sale

Countries	Sales
Puerto Rico	8,560
United States	2,948
Dominican Republic	925
Colombia	340
Venezuela	319
Mexico	316
Argentina	162
Spain	130
Brazil	108
Costa Rica	103

Figure 4: Sales per Country

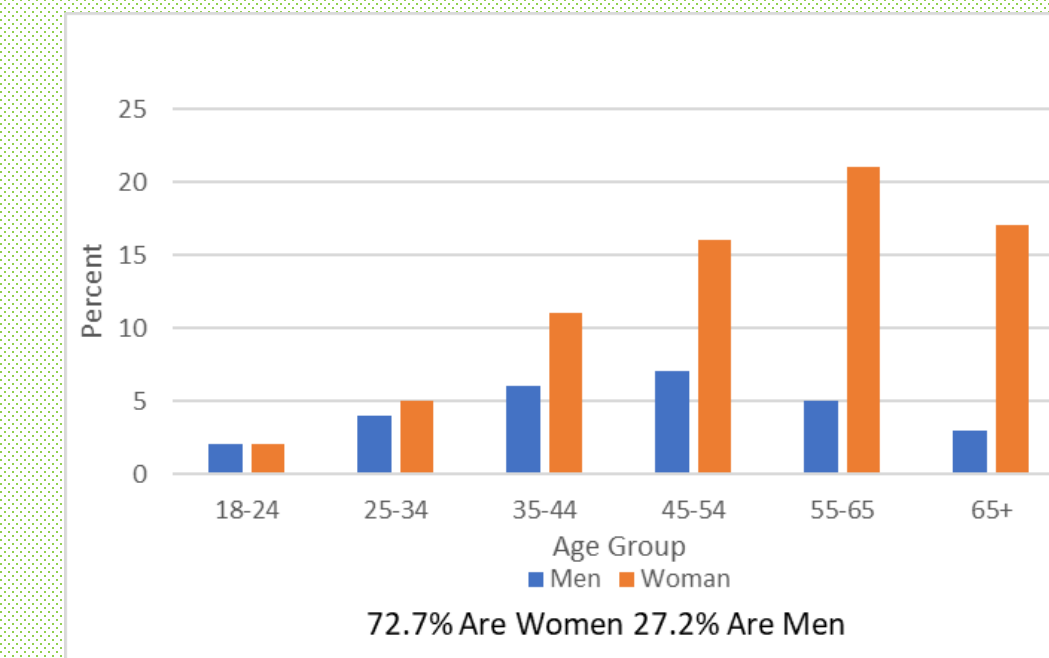


Figure 5: Age & gender difference between the clients

Analyze

After the problems were identified, an FMEA table was constructed to locate the problem that gives the seller the most trouble. Figure 6 illustrates the FMEA table

FMEA table with columns for Process or Product Name, Failure Mode, Potential Causes, Potential Effects, Current Controls, and Risk Priority Number (RPN).

Figure 6: FMEA Table

After the FMEA was constructed, another meeting took place with the process owner to go over the possible problems that can happen in the process and how it is being handled currently. After brainstorming the process and implementing the FMEA, the result shows that the area where the most trouble in the process is the payment and order confirmation from the client.

One way to possibly help the seller is a comparison between the program used by the seller to create the product order, and other similar programs in the market. Currently the program used by the seller is called Factusol. Apart from Factusol, there are many different programs used for accounting. Figure 7 depicts 3 different programs, including Factusol, and the benefits of each one.

Factusol	Quickbooks	XERO
Option to directly send the invoice by mail without exiting the program.	Can be used either in the computer or mobile device.	Great for small and medium business in need of a user-friendly approach to bookkeeping.
Documents can be exported to PDF and Microsoft Office.	Data is stored in the Cloud.	Available cloud storage.
Calculates the number of products sold and number of clients sold to in a determined time.	Supports Windows and IOS.	Can link bank account to software.
Can be used to manage multiple businesses.	Can create invoices with tax, discounts and shipping costs calculated.	Currency Conversion.
	Automatic invoice reminders.	

Figure 7: Comparison between accounting programs

Another possible area to reduce time in the order confirmation is studying how the seller prepares for the invoices and client orders. After analyzing the process, it was deduced that one area where the seller can make better use of time is when they see the video to make the client list. An improvement to this step will be beneficial to the owner and can be simple to implement.

RESULTS & DISCUSSION

Improve

After comparing each program and its uses for the process, it is concluded that the best software for the process is Factusol. An implementation plan was constructed to help the owner understand the different options the program Factusol can bring to help making the invoices. Figure 8 depicts the Implementation Plan for the key features recommended to use.

Implementation Plan table with columns for Action Item, Assignee, and Due Date.

Figure 8: Factusol Key Features Implementation Plan

Another possible solution for the process is implementing a Standardization with the orders. When the Garage Sale is taking place, the seller can hire a person who can list the orders based on the lot number assigned by the seller. If the list is done after the Garage Sale is finalized the seller can then make the invoice directly without looking at the video. Figure 9 depicts the list the new employee will fill out when the Garage Sale is running.

Garage Sale Client Order List table with columns for Lot Num, Date, and Lot Num.

Figure 9: Garage Sale Client Order List

A new process map was developed to identify the steps necessary for the employee to complete his work. With this process map, the employee can help the seller make invoices faster and time is saved by implementing a new worker to system, even though it is designed to be managed by one person. Figure 10 depicts the new process map.



Figure 10: New Employee Process Map

Control

When the system has been implemented, it is of great help to provide a guideline to the new employee on the tasks he must complete to help the seller. These guidelines are going to help the employee by remembering the important aspects of the process. When the guidelines are set up and the implementation plan for the accounting program are being used, a study will be conducted to measure the difference in time spent without the new process versus time spent with the new process.

CONCLUSION

A DMAIC cycle was used to understand and analyze the way this business was operating on their online Garage Sale. Due to the fact that there is a Coronavirus pandemic happening right now, some limitations were caused by this. Regular meetings with the process owner had to be done by telephone or messages instead of face-to-face meetings. For future recommendations, the new employee can take on more task, like helping the seller construct the invoice so that the orders can be processed faster. Another recommendation would be to create an SOP, or Standard Operating Procedure, to tabulate every step done by the seller when using the program and to tabulate the process done by the new employee.