

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

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Abstract — *Small businesses play a huge role in the global economy. It is essential that these companies 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 a certain small business sells its product using Lean Manufacturing techniques. After analyzing the process, the same techniques are used to mitigate any existing problems in the process. 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 clients' 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*

Key terms — *DMAIC, FMEA, garage sale, process map*

INTRODUCTION

A small distribution company that sells an exclusive product and dispatches products to different clients all around Puerto Rico, the United States and other countries sells the product on an 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 one person, but it is generally run by three people: the owner, (who manages inventory, sale and distribution) and two assistants (who help with the online sale). Since it is a small company, one person is in charge of the inventory of the sale as well as being the seller.

In addition to selling the product, the company travels and attends fairs to promote the product, as well as trains on the product's handling. The company also promotes a membership with which the client may receive benefits.

Research Objective

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.

Research Contributions

The contribution from this research is to provide the company with a process improvement in product sale. An improvement in sales means that the quality of the process will improve. For this company, this could translate into better time management, which could have an economic impact to the company.

LITERATURE REVIEW

Small Businesses

Small businesses start as an idea by the founder. It is what happens to that idea what determines the business's success. *Entrepreneur* states that nearly half of all start-ups fail within the first three years. Sometimes, an idea alone is not enough. It must be combined with entrepreneurial spirit, defined as willingness to take risks. In business, there is always going to be risk, but successful entrepreneurs know how to take risks, as well as manage it.

The Small Business Administration (SBA) defines a small business as a one that has at least 250 or at most 1,500 employees. These are privately owned corporations, partnerships, or sole proprietorships that have less revenue than larger businesses. Small businesses generate 44% of the US economic activity. According to SBA, they

create two thirds of net new jobs and drive US innovation and competitiveness. Before 1880, America thrived on small businesses. Only when technology began to evolve, large corporations could rely on technology to produce on grand scale. When big companies decided to mass produce, the population of small businesses started to shrink. Even though large companies became the focal point of American economy, small businesses were able to adjust to the presence of large corporations [1].

Characteristics of an Online Sale

Shopping has changed over the years, partly due to the Internet, apps, adds and brands. Shoppers now are able to search for their preferred brand or website, order at any time, look up products, read reviews, compare prices among retailers, choose a retailer, and even purchase from their mobile devices. A survey in April 2017 stated that 40% of Internet users in the US frequently shop online at least several times a month. In the same survey, 14% of US shoppers actively search for the product or service online before buying it in a retail store [2].

The advantages of being able to operate 24/7 from any part of the world are many when considering that brick-and-mortar stores operate only at certain hours, usually local business hours. Most people have their time committed to responsibilities such as work and time spent with family. According to the US Census, in 2018 the average US person 15 and older spent approximately 10 hours per month shopping for consumer goods. Studies have shown that time spent shopping has decreased since the average time for shopping was 12 hours in 2013. One of the factors for this decline was online shopping. Rather than having to go to a store or multiple stores, to purchase essential and personal items, people can purchase them online from their homes or mobile devices [3].

Lean in Business

Lean is a process improvement methodology that focuses on reducing the elapsed time required to execute a process or product, from start to finish. A process is a sequence of sequential steps that are

done in sequential order to accomplish the goal. Every business has a process, and the final step is the delivery of the product or service; businesses can detail each step involved in the delivery of the product or service in a sequential diagram. Although Lean originated in the manufacturing industry, it can still be used in nearly any industry [4].

Lean can be achieved in 5 steps:

1. Specify value from the standpoint of the end customer by product family.
2. Identify all the steps in the value stream for each product family, eliminating steps that do not create value.
3. Make value-creating steps that occur in tight sequence so the product will flow smoothly toward the customer.
4. When flow is introduced, let customers pull value from the next upstream activity.
5. When value is specified, value streams are identified, waste is eliminated, flow and pull are introduced, the process begins again and continues until perfection is reached. This is when perfect value is created with no waste.

DMAIC

DMAIC is a structured problem-solving methodology used in business. DMAIC stands for Define, Measure, Analyze, Improve, and Control. Like Lean, DMAIC helps improve quality of products, increase yields, enhance productivity, reduce costs, and improve customer satisfaction [5].

METHODOLOGY

For this project, DMAIC will be used as a tool to develop the methodology as a quick improvement effort. It will be used to complete a statistical analysis. Data will be collected from the business owner and will be presented to him. This data will be collected by interviewing the owner, primarily asking about the dynamics of the business, what sort of problems the company is having, and how to mitigate these problems for future company growth. After the interviews are conducted, DMAIC will be used to establish the company's priorities and areas

of growth, and showcase the possible areas of improvement. The method is divided into five steps:

- **Define:** The purpose is to have the team and sponsors reach an agreement on the scope and financial and performance targets of the project. A Project Charter and a SIPOC Diagram were used in Define 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 table was used to evaluate the severity, occurrence and detention of risks to prioritize which 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, and a routine check-up will be programmed.

RESULTS AND DISCUSSION

Define

For the Define phase, a Project Charter (figure 1) was used to classify the problem or situation being taken under consideration. The charter shows that the scope of the project was to analyze the online “Garage Sale” and how it could be maximized by reducing its cycle time. Reducing the cycle time will help the owner to not waste time looking over orders, time that could be better spent on other aspects of the business that include seminars, membership perks, and online classes. The expected result will be reducing the cycle time by 20%.

Since the online sale was the one being analyzed, a SIPOC diagram (table 1) was used to capture critical information. The SIPOC diagram shows the business’s major steps it undergoes in a regular basis. Most of the major steps have to do with the online sale because it is the process that requires the most time and steps to complete. Since it is also one of the most profitable processes of the business, this required an analysis of who is involved in this process, what are the inputs and outcomes, and who receives these outputs. The SIPOC diagram serves as

Figure 1
Project Charter

Project Charter			Project Title: Online Sale		
Mentor		Company CEO		Project Leader	
Rafael Nieves		Reynaldo Rodriguez		Rafael Gonzalez	
Scope			Expected business results		
<p>The company distributes the product, but also provides seminars and online courses on product management.</p> <p>We are looking to maximize the companies’ profits by monitoring the online “Garage sale”.</p> <p>By focusing on the online sale, we can determine where the process need change and how much time is wasted on the customer orders.</p>			<p>The expected business results will be a reduction in the cycle time for the Online Garage Sale.</p> <p>By reducing the cycle time, the owner can now focus on the online courses and seminars.</p>		
Project Goals and Measures			Expected Customer Benefits		
<p>Reduce the cycle time of the online sale by 20%</p> <p>Safety compliance</p>			<p>A more fluent cycle for the online sale</p> <p>Less time for the owner to worry about the customer orders</p> <p>The time saved can used for the other aspects of the business like the seminars, training and membership exclusivities.</p>		
High Level Project Timeline			Supported Required		
Phase	Start	Finish	<p>Routinely check-ups on the online sale.</p> <p>Meetings with the company CEO</p> <p>Brainstorming by the mentor and project leader.</p>		
Define	Nov, 9	May, 4			
Measure	May, 4	May, 5			
Analyze	May, 5	May, 5			
Improve	May 6,	May, 8			
Control	May, 9	May, 9			

Table 1
SIPOC Diagram

Suppliers	Inputs	Processes	Outputs	Customers
Who supplies the process inputs?	What inputs are required?	What are the major steps in the process?	What are the process outputs?	Who receives the outputs?
Orchid Shopper Club (Seller)	Supplies (Orchids)	Seller Contacts Distributor for supplies and makes a list of the inventory to sell	Sales Made online	Buyers
Sunset Valley (Distributor)	Buyer and Students	After the seller has the list of inventory, an online Facebook Live is done to sell the inventory	Online courses and training are done for customers	Students and club members
Material Suppliers	Orchid Shopper Club (Seller)	Once the Online sale is finished, the seller mails an invoice to the customer for payment.	Local activities are being orchestrated to learn and connect with customers and suppliers	Distributors
Mail Service	Shipping Material	After Payment is complete, the seller prepares and ships the product to the customer		Mail service
Online Streaming Service (Facebook Live)		Seller organizes an online live training on the aspects and care of the product		
		Seller organizes and participates in activities involving the product		
		Seller offers a membership to repeating customers and customers who are interested		

a guide to understanding why each process and step is vital to the company.

Measure

For the Measure phase, a Process Map for the Online Sale process (figure 2) was implemented. The purpose of a process map is to depict the process and classify what problems could occur during each step of the process.

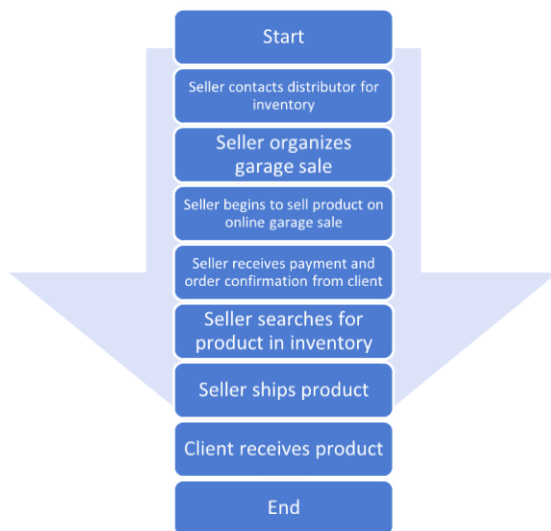


Figure 2
Online Sale Process Map

After the process map was developed, a brainstorming session was done with the business owner to find out what were his biggest obstacles during each step. The obstacles in the steps are:

- **Seller contacts distributor for inventory:** The seller has close to 17 distributors in Puerto Rico and the United States. Since diversity is particularly important for the Garage Sale, the seller searches for different types of the same product. Therefore, time is spent on researching for inventory.
- **Seller begins to sell the product on the online Garage Sale:** Since it is run by one person, it can become difficult to stream the Garage Sale while promoting product and checking the comments to see what the customers ordered.
- **Seller receives payment and order confirmation from the client:** If the seller does not prepare the invoice, the customer cannot pay the seller and the product cannot be shipped.
- **The seller ships the product:** The seller gives the client the options of shipping the product or local pick-up. If the product is not packed appropriately, it could get damaged.

During the meeting 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 was being spent on the live sale, and what were the past month's earnings. At the same time, the Garage Sale was being monitored. On average, the Garage Sale lasts 1.5 to 2 hours. These Garage Sales are typically done once or twice a week. The number of sales per Garage Sale ranges between 70 and 100 orders. These transactions can fluctuate between \$100 to \$600 per sale. The owner sells the product both domestically and internationally. Table 2 shows sales per country.

Table 2
Sales per Country

Countries	Sales
Puerto Rico	8,560
United States	2,948
Dominican Republic	925
Colombia	340
Venezuela	319
Mexico	316
Argentina	162
Spain	130
Brazil	106
Costa Rica	103

For research purposes, a study was done to identify the clients' 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 3 shows the percentage of the sex and age group that prevailed in the Garage Sale.

Analyze

As discussed in the Measure phase, an FMEA table (table 3) was used to classify the most troubled steps. FMEA, or Failure Mode Effective Analysis, is a proactive method for evaluating a process to identify where and how it might fail and how to assess the relative impact of different failures, to identify which part of the process is the one that needs most change.

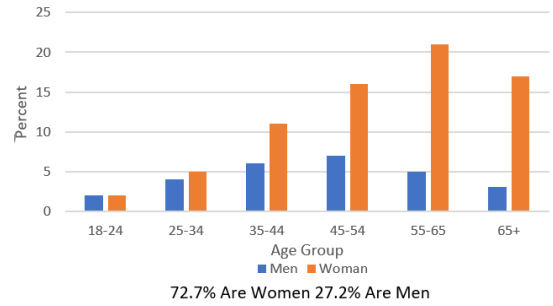


Figure 3

Age and sex difference among clients

After the FMEA was constructed, another meeting took place with the process owner to go over the possible problems that could happen in the process and how they are currently being handled. The FMEA table shows four possible problems that may arise during the process. The four problems are:

- Seller contacts distributor for inventory.
- Seller begins to sell product on online Garage Sale.
- Seller receives payment and order confirmation from client.
- Seller ships the product.

In the brainstorming process, every problem depicted in the FMEA was discussed with the process owner to see its tendency to occur and what were his solutions. When talking about how the seller contacts distributors for inventory, a possible problem was that maybe the distributor does not have merchandise, or that the product was not up to the seller's standards. The seller has over 17 distributors to choose for inventory. By having different distributors, the seller can be assured to have the inventory and diversity needed for this business.

Another step that showed problems was when the seller began to sell the product on the online Garage Sale. During the Garage Sale, the owner has to sell the product, keep track of the products being sold so that he does not sell a product that is out of stock, and promote giveaways and other business areas where a profit can be made. The process owner stated that the way the online sale is constructed is to be run by one person. Even though it is more difficult that way, the Garage Sale will not be cancelled

Table 3
FMEA Table
Failure Modes Effects Analysis

Process or Product Name: Online Garage Sale		Prepared by: Rafael Gonzalez		Page: 1 of 1	
Process Owner: Reynaldo Rodriguez		FMEA Date (Orig): 9/25/19		Rev. Station 1	

Key Process Step or Input	Potential Failure Mode	Potential Failure Effects	S C V	Potential Causes	O C C	Current Controls	D E T	R P N	Actions Recommended	Resp.	Actions Taken	S E V	O C C	D E T	R P N
What is the Process Step or Input?	In what ways can the Process Step or Input fail?	What is the impact on the Key Output Variables once it fails (customer or internal requirements)?	How Severe is the effect to the customer?	What causes the Key Input to go wrong?	How often does cause of FMEA occur?	What are the existing controls and procedures that prevent either the Cause or the Failure Mode?	How well can you detect the Cause of the Failure Mode?		What are the actions for reducing the occurrence of the cause, or improving detection?	Who is Responsible for the recommended action?	Note the actions taken. Include dates of completion.				
Seller contacts distributor for inventory	Distributor does not have product	There is no product for the customer	7	Distributor does not have inventory	1	Seller has over 17 distributors between US and PR	8	56	Calls distributor ahead of time and constantly looks for new distributors	Seller	NA	7	1	8	56
Seller begins to sell the product on the online garage sale	Seller does not have all the equipment for the online sale. Does not have personnel	Seller cannot maximize on the online sale (do promo and check client orders while selling live)	2	Not enough time to organize the Online sale	1	Seller verifies equipment before the online sale	10	20	Seller prepares the equipment for the sale hours before the live and days before the sale, the seller contacts personnel to help with the online sale	Seller	NA	2	1	10	20
Seller receives payment and order confirmation from the client	Seller did not prepare correctly invoice for the client	Client does not receive the product	10	Time Management, incomplete data in the invoice program	3	After each Garage Sale, the seller looks at the video (online sale) and prepares the invoice	10	300	An implementation of a new program that lets you prepare a customer invoice with ease.	Seller	NA	10	3	10	300
Seller sets up shipping for the product	Product is not set up for shipping. The client cannot meet up with the seller to deliver the product.	Client does not receive the product	10	Lack of organization between the distributor and seller, Lack of communication between seller and client	1	Before the sale, the seller makes sure with the distributor that the product is ready for shipping	7	70	Seller has three fixed locations to meet with the client to deliver the product in person.	Seller	NA	10	1	7	70

due to lack of enough personnel. This problem is often mitigated because the seller receives help from two other employees: one who keeps track of the products being sold and another who promotes the business while the process owner sells the product.

One possible problem in the process occurred when the seller shipped the product. The seller has two options for shipping: mail delivery and local pick-up. For local pick-up, the seller has three designated meeting areas where the product can be delivered to the customer. If the customer cannot reach these designated areas or is not a PR resident, then the product is shipped.

After brainstorming the process and implementing the FMEA, the result shows that the most troubled area in the process is the payment and order confirmation from the client. The Garage Sale is transmitted via Facebook Live and the way the clients order the products is by making a comment with the product's lot number assigned to facilitate inventory management. After the Garage Sale ends, the seller looks at the video and prepares product invoices to be sent to the clients for payment. If the invoice is not sent, the seller is not paid, and the product cannot be shipped.

One way to help the seller in this process is to compare the program the seller uses to create product

orders with other similar programs in the market. The program the seller is currently using is called Factusol. It is based in Europe, used to make invoices and control the inventory stock. It gathers all the company's administrative and accounting information, facilitating tasks that were once toilsome.

After researching programs that could be possibly used for this process, Quickbooks, XERO and Factusol were determined to be the most useful. Table 4 shows three different programs, including Factusol, and the benefits of each one. This table was done to compare and decide which program was more suited for the process.

Table 4
Comparison among accounting programs

Factusol	Quickbooks	XERO
<ul style="list-style-type: none"> Option to directly send the invoice by mail without exiting the program. Documents can be exported to PDF and Microsoft Office Calculates the number of products sold and number of clients sold to in a determined time Can be used to manage multiple businesses 	<ul style="list-style-type: none"> Can be used either in the computer or mobile device. Data is stored in the Cloud Supports Windows and IOS Can create invoices with tax, discounts and shipping costs calculated Automatic invoice reminders 	<ul style="list-style-type: none"> Great for small and medium business in need of a user-friendly approach to bookkeeping Available cloud storage Can link bank account to software Currency Conversion

Quickbooks is the most recognized accounting program in the US. It is supported by both Mac and

Windows. The program allows users connect to their account from a mobile device and handle the invoicing remotely. Quickbooks provides automated invoicing. For regular customers, invoices can be generated and sent automatically.

Like Quickbooks, XERO is a cloud-based accounting software that can be accessed anytime from any device. Unlike the other programs, XERO allows users to connect bank accounts to automatically upload transactions into the software. This program is used primarily in small- and medium-sized businesses because it is very user-friendly. Payment services like PayPal or Stripe can be used to accept payments for invoices online.

The final program, the one currently used by the process owner, is Factusol. Factusol is just as easy to use as XERO and has more features. With Factusol, users can control the accounting of various businesses, a feature that is particularly important to the process owner because he runs several businesses other than the distribution business. Like the previous programs, Factusol can store product information as well as client information for recurring invoices. This is beneficial because it saves time by storing the information and searching in the program; the data can be accessed more efficiently.

Another possible area to reduce time in the order confirmation is studying how the seller prepares for the invoices and client orders. To understand the process, a brainstorming session with the process owner was done. When the online sale is taking place, the seller introduces the item along with an assigned lot number. With this lot number, the seller begins to call out the lot number, and if the clients are interested in the item, they will comment with the lot number. The seller has an employee monitoring the comments and notifying the seller when an item has sold out. After the online sale ends, the seller watches the online sale video to check the comments and prepares the invoice to send it to the client. Once the invoice is sent to the client and payment is confirmed, the seller prepares to ship the order.

After analyzing the process, it was deduced that one area where the seller can make better use of time is when he sees the video to make the client list. The average run time of the Garage Sale is two hours, with some running up to four hours. This means that the average time the seller spends on re-watching the video is at least two hours. This does not include the times the video has to be stopped and checked to verify what the client ordered. The seller may take up to a day to complete the invoices based on this process. This is a tedious and exhausting process for the seller because he does not enjoy it, and it takes time from other potential business plans. An improvement to this step will be beneficial to the owner and can be simple to implement.

Improve

After comparing each program and its uses for the process, it is concluded that the best software for this process is still Factusol. The fact that certain steps can be made easier with this program, like sending invoices directly without exiting the program, export the documents in either PDF or Word, and the fact that it can handle multiple businesses, makes it the ideal program for the process owner. What can be done is maximizing the use of the program by studying the different features that are necessary for completing the process. An implementation plan was constructed to help the owner understand the different options the program Factusol can bring to help making the invoices. Table 5 shows the implementation plan for the key features recommended.

Storing client information in the program is an easy step when the program has the “Client” command, where the seller can either create a new client contact or search for an existing contact when creating an invoice. Storing product information and number can help with the way the Garage Sale exhibits the products. Since a lot number is assigned to the product before selling it, that lot number can be added to the product information feature in Factusol, as well as the product name and specifics.

Table 5
Factusol Key Features Implementation Plan

Action Item (List steps required to implement solutions)	Responsible (List person(s) responsible for action steps)	Due Date (Indicate when action items must be completed)
Locate where the client information is and how to create new client data in the software	Seller, Project Leader	05/12/2020
Create product info for to remember the product and study how the sales go	Seller, Project Leader	05/12/2020
Link the company's email to the program to send the invoices without exiting the program	Seller, Project Leader	05/12/2020

Finally, the last feature to implement will be linking the company email to the program. This means that as soon as the seller finishes the invoice, the program can send the invoice to the client via email without exiting the program.

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. Having a new employee means that costs will increase, but the seller will have saved time not checking the video when the sale ends. Based on the current market, the seller could pay upwards to \$30 to the new employee to stay during the Garage Sale (which is anywhere between 1 to 3 hours), have access to the Facebook Live platform and tabulate client orders that come up during the online sale. This investment could save the seller at least two hours when making the invoice. If the list is done after the Garage Sale ends, the seller can then make the invoices directly without looking at the video. Table 6 shows the list the new employee will fill out while the Garage Sale is running.

Table 6
Garage Sale Client Order List

Garage Sale:	Date:		
Lot Num :	Lot Num:	Lot Num:	Lot Num:
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
Comments:			
Lot Num:	Lot Num:	Lot Num:	Lot Num:
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
Comments:			

This table will be one of the tools used by the new employee. In the table, the employee will enter the lot number assigned by the seller to identify the product, the number of clients who ordered the product, and a comments section for reference purposes. This comment section will be used if the employee has any questions with either the lot number or customer order.

A new process map (figure 4) was developed to identify the steps necessary for the employee to complete his/her 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 the process was designed to be managed by one person. The time saved can then be used to handle other aspects of the business and the other business ventures the seller manages.



Figure 4
New Employee Process Map

Control

When the improvements are set in place, the Control phase will help regulate them. Once the seller decides to implement the suggested improvements, they will be used for two weeks. Since the seller organizes an average of two Garage Sales per week, it would be good to see if the new employee system will help in making the invoices get processed faster. Due to the COVID-19 outbreak, a lot of this process has been discussed over the phone and by text messages; therefore, face-to-face meetings have not taken place and the implementation has been put on hold until the pandemic is over.

When the system is implemented, it will be of great help to provide the new employee guidelines for the tasks he/she must complete to help the seller. These guidelines will remind the employee of the important aspects of the process. The guidelines are:

1. The employee must reach the area where the Garage Sale is taking place, which is usually the seller's property.
2. After the employee arrives, he/she must prepare the number of orders to be fulfilled by the seller. If the seller is selling 10 products, then the seller must accommodate 10 products on the table to be sold. This must be done before the Garage Sale starts, to decrease errors and time spent.
3. When the Garage Sale starts, the employee must set a stopwatch to the exact time the sale started.
4. During the Garage Sale, the employee must monitor the comments clients write during the live sale. As soon as the seller displays the lot number, the employee must tabulate the clients who are interested in purchasing the product.
5. If at any time, the employee was unable to write down the whole client list or if the seller decides to sell more product than stipulated, the employee must write down the time at which the sale took place.
6. After the Garage Sale ends, the employee must go over the list to check if there are any comments on the client list. If there are comments, the employee must check the video

at the time when the sale took place and correct any mistake or fill in the information that was missing on the list.

7. Once the list is verified by the employee, it is then handed to the seller to process the invoices.

When the guidelines are set up and the implementation plan for the accounting program is being used, a study will be conducted to measure the difference in time elapsed without the new process versus time elapsed with the new process.

CONCLUSION

A DMAIC cycle was used to understand and analyze the way this business was operating its online Garage Sale. The Garage Sale had a lot of steps to complete, so in the Define phase, a project charter was constructed to identify the scope of the project. After the project charter was completed, a SIPOC diagram was used to capture information regarding the process. On the Measure phase, a process map was done to see which area of the process can be changed. In the Analyze phase, an FMEA table was used to identify which problems can cause the most damage to the business. Based on the study done in the Measure and Analyze phase, it was decided that the area where an improvement could be made was in the invoice preparation process. After the area was identified, a study was done to compare the different accounting programs that could be used for this business and the result was that the program currently used by the process owner was the most efficient for the process. After analyzing the programs, a study was done to analyze the benefits of having an employee to help in the client order processing. For the Improve phase, an Implementation Plan was constructed to help the process owner understand key features in the program currently used, and a table was done for the new employee to use when the seller is selling the product online. Along with the table, a new process map was done to help the employee with steps he/she must take to help the process owner. Finally, in the Control phase, guidelines were implemented to help the new employee with the process created in the

Improve phase. Also, a checkup of the new process will be made two weeks after the process is implemented to ensure that it is working and that there is a change in how the invoices are being sent.

Research Limitations

Since there is a COVID-19 pandemic happening right now, there were some limitations. Regular meetings with the process owner had to be done by telephone or text messages instead of face to face. The nature of the outbreak has caused the way business is done to change to prevent further contagion. Because these changes had to come first, the process owner could not accept the recommendations in this study and had to continue conducting business the same way as before.

Future Projects

For future recommendations, the new employee can take on more tasks, 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. The SOP will help the process owner by guiding him/her and any other employee or volunteer through the invoice process while gaining time for other areas.

REFERENCES

- [1] G. McIntyre, "What is the SBA's definition of small business (and why)?", Fundera, Jan. 31, 2020. [Online]. Available: <https://www.fundera.com/blog/sba-definition-of-small-business>
- [2] C. Nguyen, "Retail vs. E-commerce: The future of shopping," Prisync Blog, Oct. 19, 2018. [Online]. Available: <https://prisync.com/blog/future-retail-vs-ecommerce/>
- [3] D. Fuller, "Advantages of shopping online," Aim Proximity Shopping, Sept. 14, 2016. [Online]. Available: <http://www.aimproximity.co.nz/advantages-of-shopping-online/>
- [4] O. Kherbach, M. L. Mocan, and C. Dumitrache, "Implementation of the lean manufacturing in local small and medium sized enterprises," *Journal of Innovation Management in Small and Medium Enterprises*, vol. 2017, Sept. 2017. doi: 10.5171/2017.799859

- [5] M. L. George, *The Lean Six Sigma Pocket Tool Book*. New York: McGraw-Hill, 2005.