

Shipper Harmonization to Lower Machine Cost

*Luis O. Rivera Santos
Master in Manufacturing Competitiveness
Advisor: Carlos González, Ph.D.
Industrial and Systems Engineering Department
Polytechnic University of Puerto Rico*

Abstract — *This shipper harmonization process to lower machine cost project was focused in improve the packaging process and machine cost reduction in this case a Case Packer by going to a shipper harmonization process. The harmonization process will be performed to the case packing process in which the folding cartons (IFC) pack outs will be harmonize by standardizing the number of shipper utilized, which in turn will minimized or reduce the number of shipper and also obtain a better quote when bidding the case packer machine. Harmonization consists of adjustment of differences and inconsistencies among different measurements, methods, procedures, schedules, specifications, or systems to make them uniform or mutually compatible [1] in which in this case the packaging process will be benefit because at least it can reduce the changeover process, waiting between lots and will provide a most reliable packaging process due to a less change parts and different materials sizes utilized. To improve the case packing process and also to be successful in shipper harmonization process, the DMAIC methodology can be used. DMAIC is an acronym for a series of steps used to measure defects in business processes and improve profitability. The term DMAIC stands for the five main steps in the process; Define, Measure, Analyze, Improve and Control. This project seeks to obtained a competitive alternative for the machine and also provide a reliable process. DMAIC is a data-driven quality strategy used to improve processes. It is an integral part of a Six Sigma initiative, but in general can be implemented as a standalone*

quality improvement procedure or as part of other process improvement initiatives such as lean [2].

Key terms — *Case Packer Machine, Cost Reduction, Harmonization, Shipper Harmonization.*

INTRODUCTION

Pharmaceutical companies have a lot of challenges due to changing in global expectations and competition between other pharmaceutical companies in which can provide or conquest the market with the better pharmaceutical products. This time now they needs or have to focus in cost reduction, increment profits sales and customer satisfaction, but also maintaining and providing quality products to the customers. Also due to new political view and regulations for the Puerto Rico site companies is the competition among them and against since most of these companies are multinational and have plants around the world that can do the same work and can be their competition.



Figure 1

Shipper Harmonization

PROBLEM STATEMENT

During the Case Packer buying process it was and after reviewing the quotes submitted by different suppliers it was seen that machine cost were up high. In order to obtained an affordable price in which both can be beneficiated it was requested to find an opportunity in which the machine price can be lowered without affecting the machine performance and also that complies with all the necessary requirements to it was intended for. After analyze what kind of improvement can be made it was agreed that a shipper harmonization can be an acceptable solution that can satisfied the company in terms of machine price but also satisfying the packaging process.

With the reduction of quantity of shippers used at the packaging line, machine cost can be lower due to necessary change parts required can be minimize. In order of achieve this goal, we can use a DMAIC methodology in this project.

PROJECT DESCRIPTION

The main objective of this project requires buying a new case packer machine to support packaging process but also satisfies the requirements and regulations for what's intended for. It is important that machine provides good to excellent functionality but also be cost-effective, increase customer satisfaction and delivered products in compliance.



Figure 2
Case Packer

RESEARCH OBJECTIVES

This project main objective is to achieve the best and cost effective case packer option and through the shipper harmonization activity it can be achieve. But also requires to provide an efficient and reliable system so the users can handle always following the require processes and regulations.

RESEARCH CONTRIBUTIONS

This project seeks to maintain a reliable packaging process while buying and install the best case packer option in which company is favor and also provides continuity in the packaging process. Shipper harmonization activities pretend to lowered the case packer cost and also improve the changeover time by reducing the machine changes between lots. If it goes deeper in the term of harmonization this system not only positively affects our packaging area, but also impacts the finances, facilitates the purchasing processes, promotes the standardization of other processes and contributes to minimizing the errors or confusions that may arise can cause by the different components used.

LITERATURE REVIEW

Thru the past of the years, maybe two or three decades ago packaging was just package something and that's all. It was the container or shipper that allowed people to transport their food, drink and other items from one place to another. Everything that was intended or sought was to do the job of transporting something and was easy to handle and that's it.

As of today that's all different now. The modern packaging industry, rightly, is under huge pressure to constantly evolve, to meet new standards, and to create products that are as we call now more efficient, more reliable, and probably that can be used in different applications.

Harmonization means essentially enabling all parts of a global enterprise to align processes and remain consistent. This is accomplished by creating standard process that can be used by each site. By harmonizing, the organization will enable a common platform and ensure consistency, while allowing them to maintain unique business processes [3].

Harmonization enables a process that offers the following benefits:

Repeatable: Consistency is needed before conformity to help ensure harmonization will be possible. Therefore, the process must be able to be repeated as needed to ensure it will provide consistent results. In fact, one of the things team members are looking for when reviewing standardization efforts is a process that provides duplicate, successful results from any site within the organization. This is important because if the process has results that vary from site to site, it has not been effectively standardized, which will affect harmonization.

Adaptable: Not all of an organization's sites operate on the same level, especially with technical resources. The process must be able to be tweaked as needed to accommodate all types of business systems, while still maintaining each sites' common practices.

Auditable: A process must be audited to ensure its accuracy and effectiveness. An automated QMS with an integrated audits program can help the organization to monitor and continuously improve its processes through the use of regularly scheduled audits.



Figure 3
Harmonization Benefits

General Concepts of DMAIC Methodology

DMAIC is an acronym meaning for: Define, Measure, Analyze, Improve and Control. It is a structure, discipline, rigorous approach to process improvement consisting of the five phases mentioned, where each phase is linked to the previous. All of the DMAIC process steps are required and always proceed in the given order. DMAIC can be used to any improvement project or application. (See figure 4)

- **Define:** is where you will be setting project goals and boundaries based on your knowledge of your organization's business goals, customer needs and the process that needs to be improved [4].
- **Measure:** is to focus the improvement effort by gathering information on the current situation [4].
- **Analyze:** is to identify root cause and confirm it and see where the problem is [4].
- **Improve:** implement solutions that address the root causes and eliminate or reduce the impact of the identified root cause [4].
- **Control:** is to evaluate the solutions and the plan, maintain the gains by standardizing the process [4].

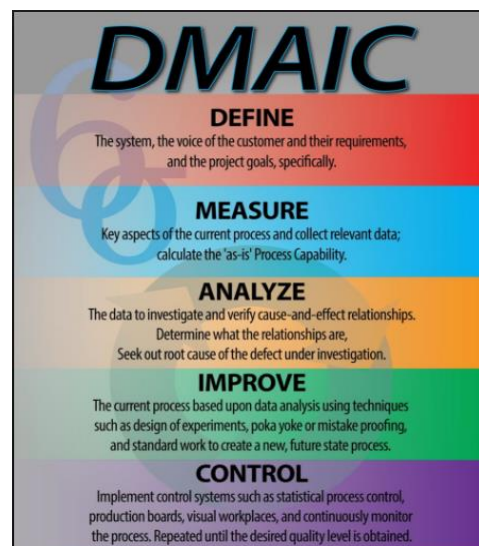


Figure 4
DMAIC

PROJECT METHODOLOGY

In a competitive world like the one we have, every organization needs to achieve the highest level. To sustain this competitiveness, each organization needs to have robust and reliable processes. The shipper harmonization in conjunction with this new equipment will provide a better and reliable packaging process; the DMAIC tools can provide the tools needed to obtain it.

At the Define steps the following tools will be used:

- Project Charter, is a statement of the scope, objectives and participants in a project. It provides a preliminary delineation of roles and responsibilities, outlines the project objectives, identifies the main stakeholders, and defines the authority of the project manager. It serves as a reference of authority for the future of the project. Also as part of our project a URS (user requirement specification) is developed to detail or specified the minimum requirements needed to comply.

At the Measure step we search the packaging components used at this packaging line, in our case folding cartons and shippers, to have a better point of view of quantity of packaging components are actually used.

At the Analyze steps the following tools a brainstorming following with fit test with the packaging components will be performed so best alternative can be obtain.

Improvement will be implemented after successful fit test and analysis were performed and best solution achieve.

Control will be determined during the project process according the previous steps results.

RESULTS AND DISCUSSION

The results obtained through the five phases of the DMAIC methodology follows.

Define – As part of the define phase the Project Charter was performed in order to determine the problem statement, the goal of the project and the metrics that will be defined. See Table 1. As mentioned before URS is submitted to the vendor so it can detailed if they can comply with our requirements, that document provide us important information by the time of selection which manufacturer it's the most adequate to provide a reliable machine.

Table 1
Project Charter

Project Charter
Problem Statement: Case packer machine cost needs to be lower
Goal: By shipper harmonization, machine cost can be lower due to a less change parts require

Measure – Data of what packaging components are actually used at the packaging line. Shipper with their respective sizes including the folding cartons used with each one was obtained to perform and analysis to see and provide the better options that meets our expectations.

The results were showed below: Table #2 and Table #3. Table #2 shows the existing components used in the packaging process and Table #3 shows the packaging components already harmonized in which we can see the reduction of shippers utilized in the packaging line.

Table 2
Packaging Components

IFC Size	Shipper Size
75mm x 53mm x 97.5mm	18.8125(478mm) x 9.0625(230mm) x 4.0625(103mm)
75mm x 95mm x 113mm	13.5" x 12" x 9.5"
75mm x 70mm x 97.5mm	16-15/16" x 12-13/16" x 4-3/16"
75mm x 85mm x 113mm	18-1/4" x 13-3/4" x 4-9/16"

Table 2 (continuation)
Packaging Components

75mm x 70mm x 97.5mm	12.75" x 9.0625" x 4.0625"
75mm x 26mm x 113mm	12.375" x 7.125" x 9.125"
75mm x 26mm x 97.5mm	18.8125" x 9.0625" x 4.0625"
75mm x 89mm x 97.5mm	14-15/16" x 9-5/8" x 5-1/2"

Table 3
Formats

Format	Shipper	Carton			Case		
		a	b	h	L	B	H
1	Actual	75	53	97.5	477.8375	230.1875	103.1875
2	New	75	95	97.5	342.9	304.8	205
3	Actual	75	95	113	342.9	304.8	241.3
4	Actual	75	70	97.5	463.55	349.25	115.8875
5	Actual	75	85	113	342.9	304.8	241.3
6	Actual	75	70	97.5	463.55	349.25	115.8875
7	Actual	75	26	113	314.325	180.975	231.775
8	Actual	75	26	97.5	477.8375	230.1875	103.1875

Analyze Phase – After final analysis and fit test it was successfully agreed to harmonize to use just three shippers only. The results obtained are show in Table #4 and Table #5.

Table 4
Folding Cartons Size

Product	a [mm]	x	b [mm]	x	h [mm]
Format 1	75	x	53	x	97,5
Format 4+6	70	x	75	x	97,5
Format 5	75	x	85	x	113
Format 8	75	x	26	x	97,5
Format 9	75	x	89	x	97,5

Table 5
Shipper Size

Format	L [mm]	x	B [mm]	x	H [mm]
Cases (Inner Case Dimensions)					
Format 1+8	477,8	x	230,2	x	103,2
Format 4+6	430,2	x	325,4	x	106,4
Format 5+9	465	x	366	x	118

Improve Phase – through the implementation of this new machine and after have achieved to reduce the quantity of shippers to be used at the packaging line, thus achieving a better price for machine which is one of the goals of this shipper harmonization process.

During the improvement phase we determine that we need to revise the packaging process performed at the packaging line so we can improve it and not just obtain a better and achievable price for the equipment to be install but also provide a reliable process to the packaging operators and mechanic so the main and final goal for any pharmaceutical process is to give a quality products to our customers.

After machine was installed a series of executions are performed to guarantee that the machine performed as required and information is documented in official documents: IQ (Installation Qualifications), OQ (Operational Qualifications) and PQ (Performance Qualifications) or PPV (Packaging Process Validations).

Also, as part of the implementation process, the voice must be kept that in order to maintain a good balance and standardization of processes, always look for the most cost effective way to provide any process and not only make implementations that look attractive, but that are also reliable.



Figure 5
Benefits of Harmonization

Control Phase – The main goal of this phase is to establish and implement effective control to ensure that the identified causes are effectively implemented and maintain a standardization of components to keep the process in control. This will be achieved by always offering our clients as a main alternative what we already have and have implemented, unless there are particular requirements that are regulated. But not closing the door to alternatives proposed by our clients.

The harmonization can be seen in a certain aspect as something easy to carry out or implement, but the reality there are many factors that can affect this type of activity, as it can be packaging requirements of other markets outside of the American territory. Our task here is always to keep our process in control complying with what is established. The control is not only based on what is want to be done, but also in many cases it must be taken into account that particular requirements can be met and analyzed if they are profitable.

CONCLUSION

Packaging's challenges will even more difficult in the future. Packaging is and will be under the microscope of all the company, not just because the competition between companies, but also the new regulations and cost reductions that every single company have at the moment. It has been proven not only with our case, that by using or implementing harmonization in all possible systems and at all levels, a better and reliable system can be obtained, which will provide cost reduction which translates into financial benefits for any area

In our case the shipper harmonization activity is still on an ongoing process. The first goal of the project was lower the machine cost and thru shipper harmonization it was successfully achieved.

The second goal of the project was to reduce changeover activity and also it was achieve since by reducing the quantity of shippers and pack outs formats the quantity of set of change parts were significant reduce.

After this Shipper Harmonization activity some real benefits will be implemented to the process like:

- Changeover time reduction between lots
- Packaging process standardization
- Change parts cost saving
- Cost efficient packaging process

The harmonization of products throughout the world is increasingly becoming a situation of importance for global companies. The benefits and management of strategies that this provides has helped or can help simplify the marketing approach, as well as being an attractive option for many companies worldwide.

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