

## Abstract

With the increasing demand for guidewires worldwide, Abbott decided to make changes in the manufacturing line in order to meet these demands. In an evaluation of the manufacturing process, they considered that the area that needed the most improvement was the packaging lines. Therefore, the assignment was to make the packaging lines faster. Various alternatives for each module were evaluated in order to give the company more choices to match their specific needs, including different machinery layouts and various changes in their process in order to make it faster and more effective. All the options were analyzed and the one which suited the company the most was putting two labelers, one for the box and one for the pouch. It was also decided to eliminate the printed instructions from inside the packaging and indicate on the label that the instructions could be found on the company's website. A tab used to identify the guidewire was also eliminated and instead use a color code on the dispenser matching the color of the product label.

## Introduction

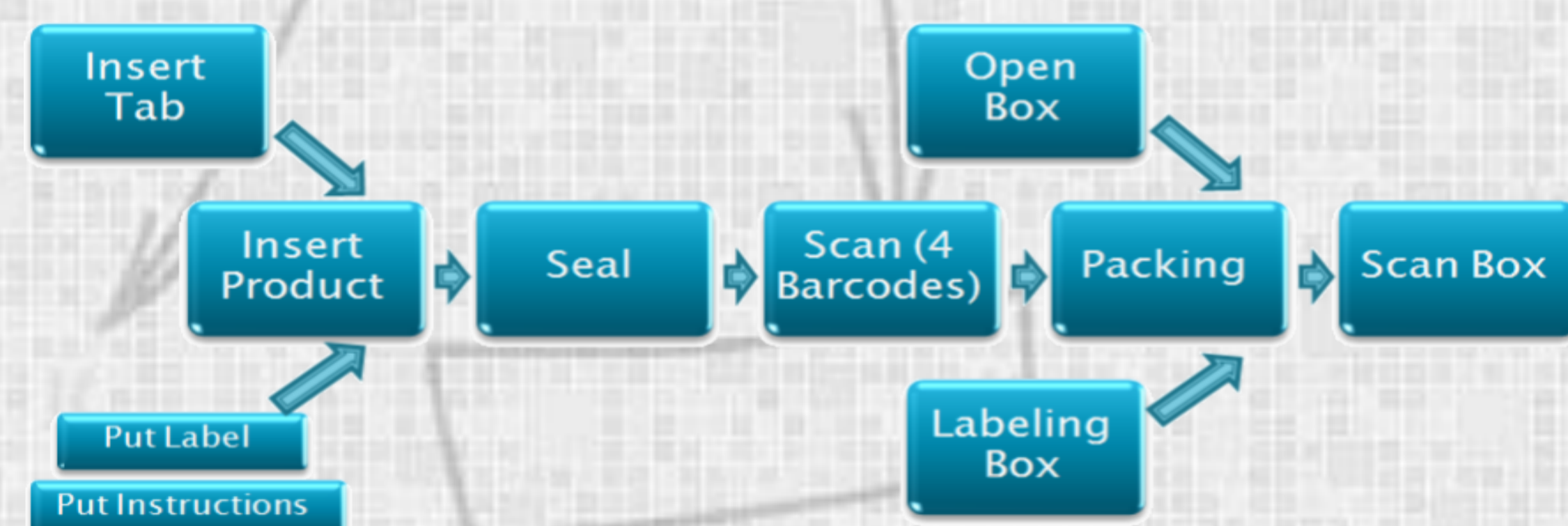
Abbott Vascular PR, located in Barceloneta, is a medical device company dedicated to the manufacturing of guidewires. Within the guidewire manufacturing areas, there are 3 main non automated packaging operations. Abbott Vascular PR is interested in considering an automated process to reduce labor cost and improve productivity and efficiency. This will provide more production of the guidewires which are in constant growing demand every day.



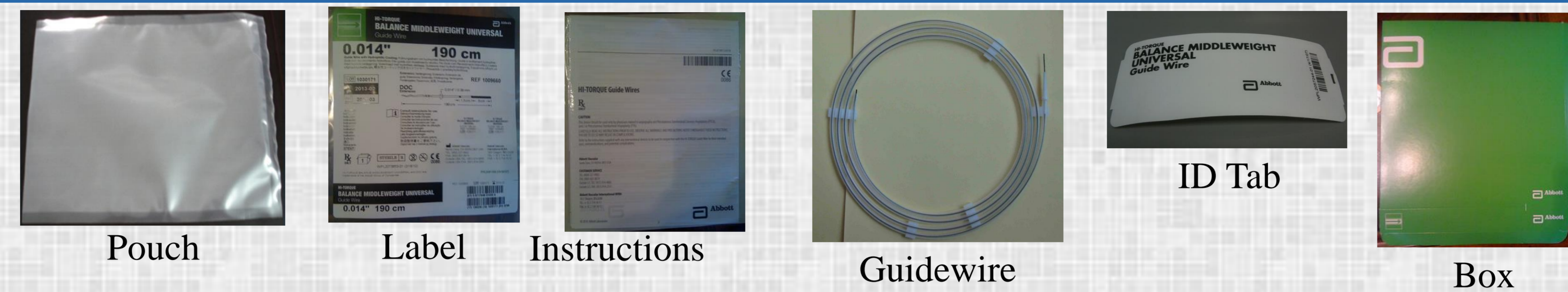
## Project Objectives

- Propose options for automated packaging process that fit Abbott Vascular needs.
- Perform calculations of Benefits and Return of Investment.
- Design a strategy for the deployment or implementation of automation processes.

## Current Situation



## Current Situation



It is shown that after the guidewire is fabricated and put into its protective plastic coil, a tab with the number of the wire is inserted on a clip on the plastic coil. Then the guidewire is put in a pouch. To the bag are attached a label, with the product name and in the backside the instructions, of the product. Next, the bag passes through a machine with a conveyor belt that seals the top of the bag thermally. Then the guidewire package has 4 barcodes that are scanned that include the information of the number of the wire, number of the package, the number of the instructions and tab number. After 5 guidewire s are scanned, they are put in a box. This box also has a label with two barcodes. The barcodes is used to count the box and it also contains the number of the box. Then a piece of tape is used to seal the box and put into a cart. When an accumulation of x boxes is reached, it is transported and packaged into the final box in another area. [1]- [3]

## Cost Analysis

The cost analysis was focus in the short term proposes and some of the suggestions will be postponing it as long term arraignments. This project generates significant cost avoidance. It will reduce five (5) head count, avoiding around \$400,000 in annual salary. The expected return of investment is 7.1 months after implementation.

Investment	Cost
Pouch Labeler	\$43,375.00
Pouch Labeler Spare parts	\$820.00
Pouch Labeler Training & Installation	\$5,125.00
Box Labeler	\$43,490.00
Box Labeler Spare parts	\$820.00
Box Labeler Training	\$5,125.00
Stationary Scanners (3)	\$1,050.00
Conveyor	\$2,500.00
Conveyor Sensors (1)	\$1,500.00
SubTotal	\$104,000.00
Validation Cost (15% of subtotal)	\$15,600.00
Total	\$120,000.00

## Conclusion and Recommendations

A research of different equipment and manufacturers and have come with some basic quotes on the equipment which is going to be used on this project. The prices have been reasonable on the budget and on the expectative of the company. After making the return of investment calculations, the investment is estimated to be \$120,000.00 dollars and would be making a profit in 7.1 months after implementation.

It was decided not to implement module 2, the case erector because the time it was saving was minimal and the cost of the machinery was too much, it would have bring more problems that it solved.

Some other recommendations for the company is to install the Optical Character recognition scanners which save on inspection time and reduce the wasted labels problems and re-work. Also in the future it is better to take the packaging lines out of the clean room environment. The benefits for this will be to: unite all the packaging lines into one, reducing the space needed for packaging. Another benefit is that they will be able to change the packaging box to a cheaper one without the clean room treatment. There will be more space for accommodating product outside of the building. The transportation from there to the truck will be an easier one. And finally there will be less clutter inside of clean room, making more space for people to move or to put more people in the manufacture of the guidewire.

## References

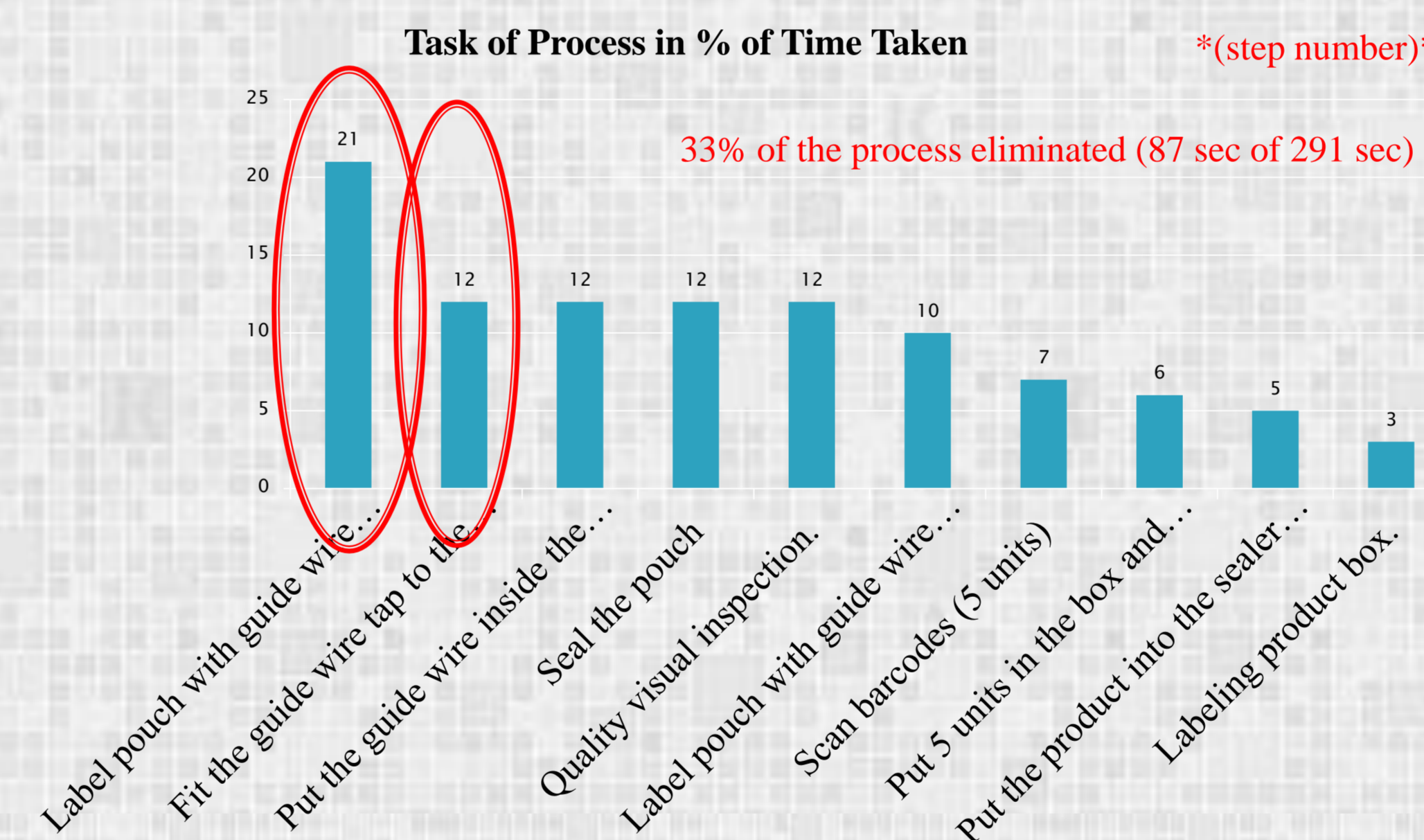
- [1] Dunlop, John T., et al., *Automation and Technological Change: Report of the Twenty-first American Assembly*, 1962.
- [2] Trevathan, Vernon L., *A Guide to the Automation Body of Knowledge*, 2006.
- [3] Sastre, Benjamin, *Industrial knowledge and Guidewire packaging line experience*, 2013

## Results and Discussion

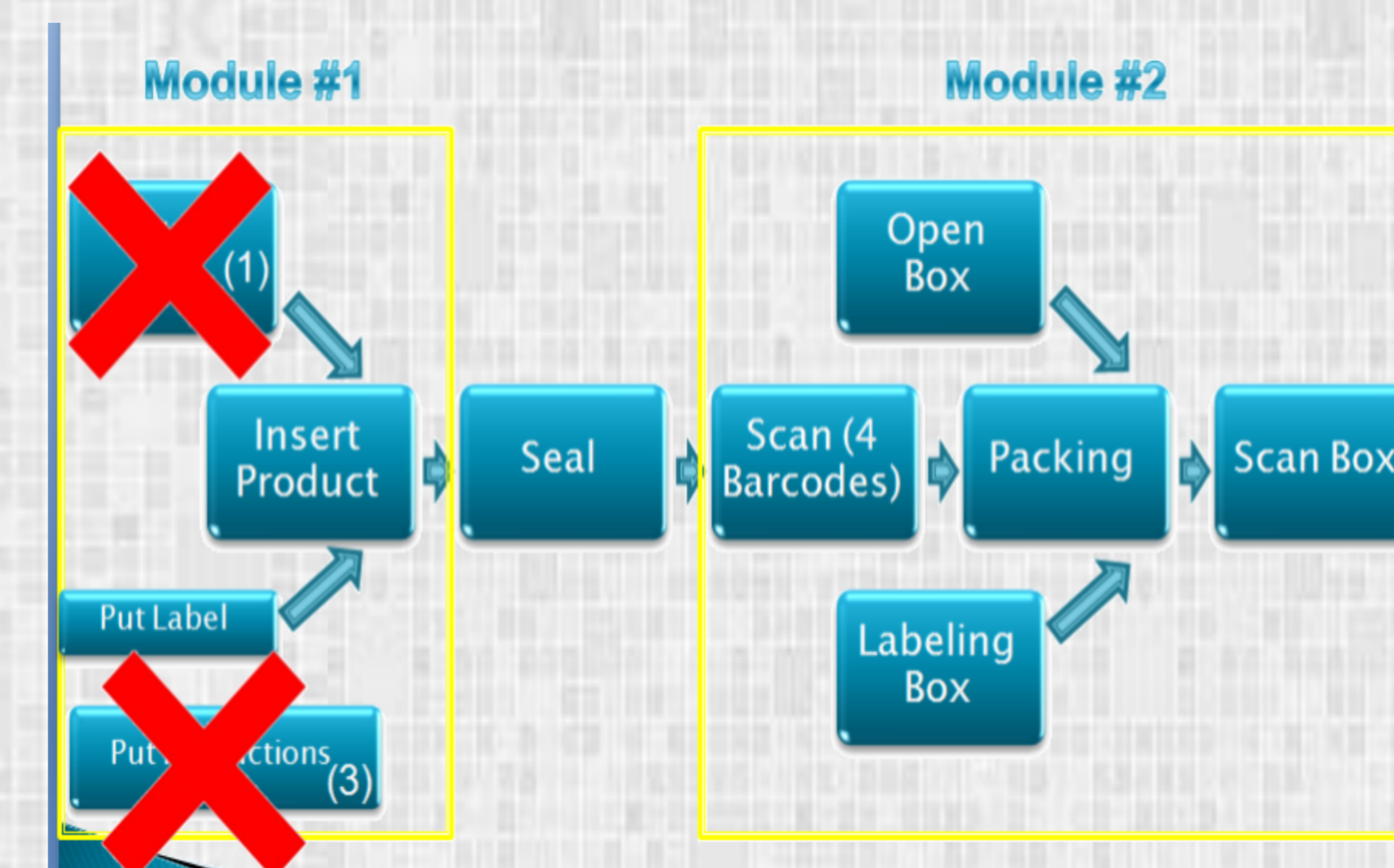
### Present Situation: Time Study

Step	Task Component	% of the Process
1	Fit the guide wire tap to the wire.	12
2	Label pouch with guide wire information.	10
3	Label pouch with guide wire instructions	21
4	Put the guide wire inside the pouch.	12
5	Put the product into the sealer machine.	5
6	Seal the pouch	12
7	Quality visual inspection.	12
8	Labeling product box.	3
9	Scan barcodes (5 units)	7
10	Put 5 units in the box and close it.	6

Total/seg 291  
Total/min 4.51



### Alternative Solutions



### Propose Situation: Time Study

Long Term: Box Erector	Time	350 units	Round-up
Fit the guide wire tap to the wire.	0	0	0
Label pouch with guide wire information.	0.416667	2.083333	2
Label pouch with guide wire instructions	0	0	0
Put the guide wire inside the pouch.	6.516667	32.583333	33
Put the product into the sealer machine.	2.5875	12.9375	13
Seal the pouch	6.369231	31.84615	32
Quality visual inspection.	0.416667	2.083333	10
Labeling product box.	0.416667	2.083333	2
Scan barcodes (5 units)	0.233333	1.166667	10
Put 5 units in the box and close it.	0.233333	0.233333	3

Total/seg 105  
Total/min 1.75  
Impact 61. 61%

