

# “DESIGN OF A MODEL OF PROCESS MANAGEMENT IN THE AREA MAINTENANCE SERVICING AUTOMOTIVE IN THE COMPANY SAVE”

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**Abstract.** *This project was developed in the Automotive Services Company and Sales Co. Eight Save. Ltda, in the operational area of provision of maintenance and auto repair. The company located in the city of Ibarra, Imbabura province, has been operating since 2010..*

*The work carried initiated on the basis of information obtained in the internal and external initial diagnosis of the company, which identified significant problems in the development of operational processes and establish improvement actions supported by the Process Management to improve operating performance of the company.*

*The Process Management Model consists of the documentation of processes and procedures manuals of the operational area of service delivery; and serve as support for the company to establish a cycle of continuous improvement by obtaining information from process control and evaluation of customer satisfaction, thus generating competitive advantages in the market for the provision of maintenance services and auto repair.*

## Key Words

Process, procedure, customer, quality, control, continuous improvement.

## 1. Introduction

The Company Services Automotive Sales Save Eight Co., Ltd., dedicated to the provision of maintenance and auto repair center, is located in the city of Ibarra, Imbabura province; and has been in operation since 2010. In order to improve the performance of operational processes of the company, the development of a Process Management Model focused on establishing a cycle of continuous improvement based on the assessment of satisfaction arises the client's.

Based on a situational analysis in the operational area of provision of maintenance and auto repair company, it was identified that the inappropriate operating and administrative management in the company causes problems regarding the provision of resources to the process and in responsiveness to customer and prevents the development of strategies to achieve the effective implementation of the service in terms of quality.

Model Process Management enables the company of automotive services to establish a cycle of continuous improvement focused on the analysis, improvement, standardization and control of operational processes and the monitoring and evaluation of customer satisfaction regarding service provided, thus generating competitive advantages in the market to which the company belongs.

## 2. Material and Methods

The diagnostic phase was carried out using different tools for the collection and analysis of information obtained. The tools used are focused on diagnosing the internal and external environment of the company in what concerns its operating performance. Then diagnostic methodology employed is described.

### 2.1 Administrative Staff Interview

The interview was made in order to obtain information about the administrative management of the company from the point of view of the General Manager and the Service Advisor it.

### 2.2 Survey addressed to the Operational Staff

The aim of the survey is aimed at workers obtain relevant information that can highlight issues affecting the operating performance of SAVE Cia. Ltda.

The survey is conducted for the seven workers operating in the area of providing automotive maintenance services. It is noteworthy that five of the seven workers surveyed have a level of technical training and the remaining two have a level of secondary education training.

### 2.3 Identifying Top Selling Services

To identify what services best selling company made an analysis of the billing information for the months of March and April 2015. The process activities and times were analyzed using a data-analysis process.

Job Types	Frequency	Percentage	Percentage Acum.
Change of engine oil and filter	85	44%	44%
Brake Maintenance	70	36%	79%
Change of timing belt	16	8%	88%
Discs of brake rectification	15	8%	95%
Clutch kit replacement	9	5%	100%
TOTAL	195	100%	

Table. 1.Common jobs performed during March and April 2015.

### 2.4 Process analysis diagram

Once identified the services demanded by customers SAVE Cia. Ltda., The activities involved in the process of providing some of these services with the aim of identifying non-value activities and downtime were analyzed.

### 2.5 Sample's size calculation

For evaluation of customer satisfaction the company SAVE, a telephone survey focused on gathering relevant information about the customer perception regarding the service provided in their vehicles was applied. The method for calculating the sample size is simple random sampling, and considering a population of 150 customers; which corresponds to the average number of vehicles receiving maintenance services in the company for a period of one month. The following formula was used to perform the calculation:

$$n = \frac{k^2 * p * q * N}{(e^2 * (N-1)) + k^2 * p * q} \tag{1}$$

where:

p=0,5

q=0,5

N=150

k=1,96

e=10%

NC=95%

Substituting the values in the formula is obtained that the sample size n = 108 customers, which number over the telephone satisfaction survey will apply.

### 2.6 S.W.O.T. Analysis

To perform the analysis of the internal and external situation of the company SWOT diagnostic tool, which could assess the internal environment through the strengths and weaknesses, as well as the external environment established by the opportunities and threats were used.

W	Weaknesses
1	Non-standard operational processes
2	Insufficient and obsolete hand tools
3	Poor customer focus
4	Delayed jobs
5	Process Flow unidentified
T	Threats
1	Competition positioned in the market
2	Competition with low prices on their services
3	Imported Parts price increase
4	Economic instability in the country
S	Strengths
1	Availability of modern technological equipment
2	Competent professional and motivated staff
3	Wide range of service
4	Open to various forms of payment for services
5	Availability of physical space to offer new services
O	Opportunities
1	Expandability the portfolio of services
2	Vehicles with technological features for diagnosis
3	Growing target market
4	

Figure. 1. SWOT Analysis – Weaknesses and Threats.

Figure. 2. SWOT Analysis – Strengths and Opportunities.

### 3. Results

#### 3.1 Results of interviews and staff surveys

The results obtained from interviews and surveys aimed at the administrative and operational staff of the company show improper performance under which the activities unfold, as shown below in the tabulation of results.

DESCRIPTION	YES	NO
A method is applied to identify customer needs?		X
Is the administrative performance based on the achievement of goals and objectives evaluated?		X
Does the method work focuses on compliance requirements?		X
Have you established roles and responsibilities for personnel working?		X
Have you identified processes that add value to the service?		X
¿Delays are generated in the work?		X
Are work areas are respected as established distribution plant?		X
Is there accumulation of vehicles in the areas of process work?		X
¿Delays are generated in the work?		X
Is communication between work areas clear?		X
Are there jobs or not taken into account to be collected inputs?		X
Is there a proper management of waste generated?	X	

**Table 2.** Tabulation of results - Personal interview Administrative

DESCRIPTION	YES	NO
<b>WORK INFORMATION</b>		
Do you receive a work order in which clearly specify the requirements of each customer?	14%	86%
Does knowing clearly the roles and responsibilities corresponding to his job?	29%	71%
<b>WORK METHOD</b>		
I have established a standardized method of working for the common operational activities?	29%	71%
Do you know the standard time it takes to perform common jobs?	43%	57%
<b>USE OF FACILITIES</b>		
Do you have clearly defined the type of work for which it is intended each service area?	100%	-
Is the use of work areas is respected by type of work established for each?	14%	86%
Do the work is performed in the order of arrival of the vehicles?	43%	57%
<b>TOOLS AND EQUIPMENT</b>		
Are all jobs are provided with tools / equipment needed?	14%	86%
¿Are generated downtime due to equipment or occupied tools?	86%	14%
Does it clearly identify the tools / equipment you need before making a job?	43%	57%

¿Downtime are generated due to the order of inputs / spare parts?	100%	-
Is there confusion, congestion in the storage areas of equipment, tools?	29%	71%
¿Accumulation of vehicles is generated in the process in the areas of service delivery?	43%	57%
<b>SECURITY CONDITIONS</b>		
Within the area where he works, he has witnessed unsafe working conditions or high proportion of accidents?	14%	86%
Within the area where he works, you have witnessed uncomfortable working conditions?	71%	29%
Are you provided with the personal protective equipment (PPE) for your activity?	100%	-

**Table 3.** Tabulation of results - Operating Personal survey

#### 3.2 Results of the analysis of the processes

As a result of analysis of the activities carried out for maintenance checks and oil change motor vehicles (services identified as the most sold), it can be concluded that there is variability in the method of carrying out each task, depending on the operator who performed, likewise the intervention of more than one worker to perform the same operation was evident also identified that in all observations 25% of downtime because of the absence of tools I work in the area.

#### 3.3 Evaluation results of customer satisfaction

Analyzing the results of the evaluation applied to customers it can be seen that the lowest score obtained in the survey corresponds to the question that assesses compliance with delivery vehicles, having a value of 6.3 points out of 10. This means the aspect that directly affects customer satisfaction the company corresponds to the performance of your vehicle delivery time, an effect that is generated at the rate of inappropriate operational management of automotive maintenance activities.

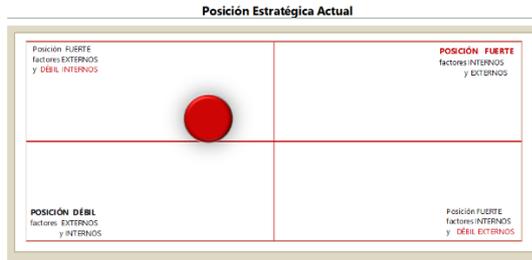
No.	Question	Average Score
1	Does the work meets your needs?	9,3
2	Does your vehicle was delivered in the promised delivery time?	6,3
3	Does your vehicle and belongings inside the service area are care?	9,7
4	Does the vehicle was delivered clean inside and out?	9,2
5	Rate the relationship between the value paid and the quality of service	8,8

**Table 4.** Tabulation of results - Evaluation of customer satisfaction

#### 3.4 SWOT Analysis Results

The results obtained from the analysis of internal and external environment deployed in the SWOT matrix indicate

that the current strategic position for SAVE Cia. Ltda., According to the weighting established for internal and external factors, is in quadrant II itself indicating strong for external and weak for internal factors position, this means that the organization is in a market where opportunities and present threats are matched, so the company is the need to strengthen the internal aspect to move to a stage of growth and development.



**Figure. 3.** Strengths and Opportunities - SWOT analysis.

**3.5 Redesign of operative processes**

In order to improve operating performance in the area of providing automotive maintenance services they have redesigned their own operational processes detailed below.

It was considered to create two additional processes in order to help close the cycle of continuous improvement in the flow of business processes within the company. These processes are of Scheduling and Monitoring Post-Service.

**3.6 Comparative Analysis**

The overall results obtained after developing the process management model in SAVE Cia. Ltda., Were:

Descripción	Sin modelo de gestión	Con modelo de gestión
Organization chart	It is not identified	Structuring the organizational chart placing hierarchically 9 current positions in the company.
Layout	Unprocessed	Distribution of administrative and operational areas of the company, represented visually and identified with their names.
Provision of tools	Jobs with incomplete or outdated tools	basic hand tools needed for each job identified, and on the basis of an initial inventory was determined that the three main operating areas of the company were deficient in this respect, achieving the approval of Management make the provision and renewal tools for mechanical area 1, area 2 and area mechanical brake.
Function's manual	Jobs without certain functions	Detailed description of the functions and responsibilities set for 9 business offices of the company, represented in a manual.

Manual processes	Unidentified operational processes	Characterization, description of activities and graphical representation in flowcharts for the 10 operational processes involved in the provision of maintenance services and / or auto repair center, described in a manual.
Procedures manual	Non-standardized procedures	Detail of standardized activities and visual representation flowcharts for the 18 operational procedures involved in the process of providing maintenance services and / or auto repair center, emphasizing the objective, scope and responsibility of each.
Management indicators	Unmeasurable processes	The 10 operational processes for the provision of services of the company have at least one indicator that gives them ability to evaluate their performance.
Induction processes operating personnel	Personal operating without knowledge of processes	7 operating area workers provide services of the company received an induction about the management of processes, their relationship to other areas and their assigned responsibilities.

**Table. 5.** Comparison of results

**4. Conclusions**

With the help of the diagnostic tools used could raise the initial operating situation of the company SAVE, where it was identified that the company he is working with poor operating processes because each operator performs maintenance activities on vehicles differently, unordered or standardized, not client oriented approach or resource optimization. It was also identified that work areas are not equipped with the tools and equipment needed to perform the correct vehicle maintenance activities.

Based on the problems identified in the initial diagnosis in the operational area of the company SAVE, it could raise improvement actions considering the capabilities of human talent, jobs and processes. In what concerns the human talent roles and responsibilities for each operating position of the company, established in an activity guide they were established.

in what concerns the processes, operating cash flow was redesigned placing in the initial processes to process vehicle diagnostic (review of 15 security points), also they process Scheduling and Evaluating Customer Satisfaction were created with which the cycle of continuous improvement based on customer requirements is closed.

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## About the Author...

**Rommel Arboleda.** He was born in the city of Mira province of Carchi and resided in that city until the end of elementary school, then moved to the city of Ibarra, Imbabura province for his secondary education at school Fisco-Mission "San Francisco". Then he began studying higher education in North Technical University where he participated in the organization of the Ninth Congress of Students of Industrial Engineering at the University of study.