

Documentation of the post-sales service process in a car dealership in southern Sonora

Documentación del proceso de servicio postventa en una empresa concesionaria de automóviles del sur de Sonora

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Abstract

The company under study started in 1944 as a manufacturer of bicycles and motorcycles. In 1974, it began producing automobiles, in 1986, it began exporting them, and in 1992 it began producing engines and transmissions. Since then, the company has experienced great growth and expansion in the world, offering a wide range of vehicles. Today, it is one of the most popular and recognized car brands in the world. In one of its concessionaires located in the south of Sonora, Mexico, it is planned to carry out the accreditation of an internal audit, necessary for the corporate. In this audit, it is stated that all activities must be carried out in compliance with the quality parameters established by the company in all its concessionaires. For this, a process documentation is proposed and developed to ensure its correct operation in the post-sale area. This area gives you follow-up regarding the maintenance of the cars sold by it. With the process documentation, it was possible to accredit the audit required by the corporate, work instructions were developed that explain in detail the flow of actions to be followed in the different processes to comply with the quality points established by the company.

Resumen

La empresa bajo estudio inició en 1944 como fabricante de bicicletas y motocicletas. En 1974, comenzó a producir automóviles, en 1986, inició a exportarlos y en 1992 comenzó la producción de motores y transmisiones. Desde entonces, la compañía ha experimentado un gran crecimiento y expansión en el mundo, ofreciendo una amplia gama de vehículos. Hoy en día, es una de las marcas de automóviles más populares y reconocidas a nivel mundial. En una de sus concesionarias ubicada al sur de Sonora, México, se planea realizar la acreditación de una auditoría interna, necesaria para el corporativo. En esta auditoría se plantea que deben realizar todas las actividades cumpliendo los parámetros de calidad dispuestos por la empresa en todas sus concesionarias. Para esto, se propone y desarrolla una documentación de procesos que asegure su correcta operación en el área post-venta. Esta área le da seguimiento respecto al mantenimiento de los automóviles vendidos por esta. Con la documentación de procesos se logró acreditar la auditoría requerida por el corporativo, se desarrollaron instrucciones de trabajo que explican detalladamente el flujo de acciones a seguir en los diferentes procesos para cumplir con los puntos de calidad establecidos por la empresa.

Documentation, Quality, Process, Service

Documentación, Calidad, Proceso, Servicio

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Introduction

Cubillos and Rozo (2009) describe quality as a concept inherent to the very essence of the human being, who from the very origins of man has understood that doing things well and in the best possible way provides him with a competitive advantage over his peers. Conspicuous and on the environment with which it interacts. According to ISO (2015), the standard that specifies the requirements for quality management systems states that the quality of products and services is determined by the ability to satisfy a need and by the expected and unforeseen impact on the relevant stakeholders. With this, ISO asserts that the quality of products and services includes not only their function and intended performance, but also their perceived value and benefit to the customer. This quality within an organization promotes a culture that results in behaviors, attitudes, activities and processes to provide value by meeting the needs and expectations of customers and other interested parties (ISO, 2015).

From this scenario and with an increasingly competitive market, where quality is understood as a fundamental variable in the results of organizations, it is necessary to manage it as one more resource, within them. Since 1987, the ISO body proposes the quality management system (QMS) as a tool to achieve quality management, it includes activities through which the organization identifies its objectives, determines the processes and resources required to achieve the desired results. This QMS posed by the ISO standard achieves results for the relevant parties, managing processes that interact and resources that are required to provide value (ISO, 2015).

Various studies have shown that Continuous Improvement Systems generate greater productivity and competitiveness within companies, one of the main tools that supports continuous improvement is a Business Process Management. However, Castillo and Carreño (2020) that within the companies even when they have implemented Quality Management Systems, they are not productive because in the characterization and design of the processes they present errors.

The importance of documented information control is specified in the ISO 9001:2015 standard, indicating that it must be ensured that the information is available and suitable for use, where and when it is needed; In addition, it must be adequately protected to avoid inappropriate use or plagiarism of information. According to ISO TOOLS (2020), there is not a single process that is exempt from failures, irregularities and inconveniences. On the contrary, they appear almost daily and it is the duty of the company to apply adequate solutions. These errors can occur in both manufacturing and service processes, therefore, the continuous improvement proposed in this standard can be implemented in both sectors.

According to data from the Mexican Association of the Automotive Industry (AMIA), in 2020, this sector represented 3.8% of Mexico's GDP and generated around 980,000 direct jobs and more than 3.5 million indirect jobs in the country. According to the Institute.

In addition, by 2020 Mexico was one of the main vehicle producers in the world. According to AMIA, the country is the fourth largest exporter of vehicles worldwide in 2020, with a total of 3.3 million units sold. Being one of the main manufacturing centers for components and parts for the automotive industry, which has attracted significant investment from international companies.

According to Bancomext (2022), the automotive sector is considered relevant for the economy in Mexico. It specifies that it is an industry that promotes technology transfer, develops advanced manufacturing ecosystems and also encourages the development of suppliers in the different stages of the production process. It also establishes that Mexico is the 6th largest car producer in the world. On the other hand, The Logistics World (2023) states that the automotive industry represents almost 4% of the national gross domestic product (GDP) and 20.5% of manufacturing GDP in Mexico.

The editorial team of THE LOGISTICS WORLD (2023) specifies that the National Institute of Statistics and Geography (INEGI) reports that the production and export of Mexican cars grew by more than 8% year-on-year in the first quarter of 2023. According to the article the sale of light vehicles increased by 24.79% at the end of the first quarter.

The concessionary company under study officially opens its first production plant in Mexico in 2016, that same year it acquires licenses to establish itself as a vehicle distribution concessionaire. With the mission of offering the best automotive purchasing and service experience, it seeks to be recognized as the leading Automotive Group in customer service in the country and the best place to work, generating a positive impact in the community.

Figure 1 presents a process map to describe the organization's processes. When conducting an unstructured interview with the person in charge of the after-sales service, service manager, the following information was collected: Within the company in the area of "After-sales service" there is a high rate of staff turnover, which causes Losses or leaks of information, failures are also generated within the process that impact customer satisfaction (customer satisfaction surveys) and are reflected in the way processes are carried out within the organization. "By not having official manuals or guides for internal procedures, when a position is vacated, the information on the requirements and activities to be carried out in said position is lost, this causes failures in the operation and consequently causes the correct operation to be prolonged. incorporation of new collaborators generating disagreements in the service provided." Services Manager

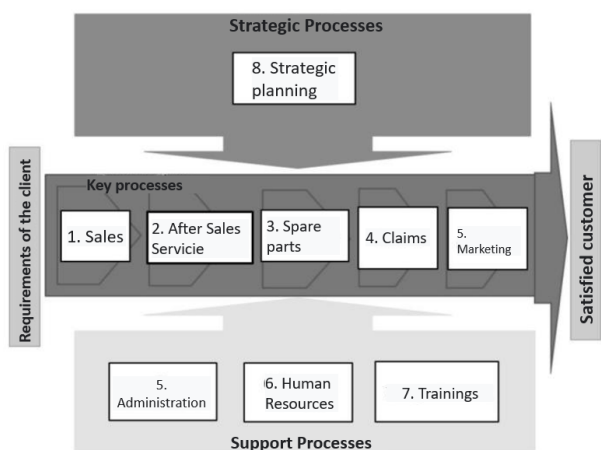


Figure 1 Automotive company process map
Source: Own elaboration

Table 1 summarizes symptoms that represent an opportunity for improvement for the company.

Symptoms	
-	Partial compliance with internal audits that verify the proper functioning of the process.
-	Low rating in quarterly evaluations of the concession company.
-	Place 50 in the national Rankin of vehicle distribution agencies
-	Long incorporation times for new employees due to the lack of operating manuals with work instructions.
-	Feeling of work overload in collaborators caused by the lack of a definition of roles.
-	High staff turnover in areas related to the object under study (after-sales service process).

Table 1 Company Symptom Summary
Source: Own elaboration

The impact of the lack of official procedures can be identified and measured through the % of compliance with the company's internal quality audits (Audit Machine) and the performance in the evaluations carried out by the concessionaire company on a quarterly basis to its service advisors. based on customer surveys. In the latter, aspects such as the knowledge of the service advisor are evaluated; the last weighting obtained for the advisors within the object under study was 5, on a scale of 1 to 10, with ten being the best rating. It is necessary to mention that the internal training process of the company is long, the training lasts around three to four days in the format of face-to-face sessions in Mexico City, in addition said sessions are scheduled on dates already established by the high management, forcing the company to adjust to that calendar, this makes it impossible to provide immediate training to new employees, having to adapt the company to the training times already provided. The following table shows the indicators and their weighting. See table 2.

Indicator	Entrance	Process	Exits	Qualitative or quantitative	Real	Ideal
Internal audit Audit Machine		X		Quantitative	Fails	100%
Weighting in evaluation of quarterly services area		X		Quantitative	5	10

Table 2 Summary of indicators
Source: Own elaboration

Problem statement

Given the circumstances that arise within the company and the information collected in the unstructured interview, it is observed that there are deficiencies within the after-sales service process, which are reflected in errors during the operation, impacting customer satisfaction. Based on the above, it is argued that:

Within the After Sales Service process there are no formal documents which ensure the execution of the corresponding activities that must be carried out for the correct operation of the process.

Objective

Prepare the documentation that describes the after-sales service process to ensure the standardization and correct operation of the process.

Justification

At the end of this project, employees will have official documents with which they can rely to know exactly how and what activities should be carried out in the After-Sales Service. This project seeks to benefit the quality of service provided by employees to customers who will receive the After Sales Service process. The documentation of the process will also help to detect possible opportunities to improve it. The importance of this project lies in reducing the failures that could occur within the activities carried out by collaborators or new collaborators, improving the qualification in customer satisfaction surveys (Customer satisfaction survey, weighting of the dealership) and increasing the % compliance with internal audit requirements (Audit machine).

If the project is not carried out, the company risks that collaborators who do not know the process and the activities to be carried out well cause errors, altering the final result, in this case negatively affecting customer satisfaction.

Methodology to develop

The following authors were taken as a basis for the documentation of the processes: Alexander Servat (2005), Peach (1999) and Stebbing (1999):

Identification of the need

It will begin by identifying the activities that require formal procedures from a tour of the process and an unstructured interview with the people in charge. To define the scope of the documentation, a diagram will be made to describe the process under study and a map of the organization's processes showing the position of the process under study within the organization. The following points are considered as a necessity to define processes:

- The Management orders that the activities be formalized.
- The person responsible for carrying out the activities needs clear definitions of the corresponding activities.

Define the format for the procedure

To define the format of the procedure, take into account the elements required by the ISO / TR 10013 guideline: purpose, scope, procedure, references, definitions, documents. In this format, information will be collected that explains in a simple way to the reader who is in charge of doing what and when.

Document current practice

Through flowcharts, the activities currently used to carry out the process are described, confirming the information with all interested parties, in order to guarantee that the data is accurate. The information collected clearly describes how the activity is carried out, how each step of the process is started and how the next step is reached. This information passes to the formats already chosen in activity 1.

Write work instructions

The activities that need work instructions will be determined taking into account whether those involved describe it as a critical activity that impacts quality. The format and the elements that the work instructions should contain were defined with the result of current practice, these were prepared digitally, corroborating them with those in charge of the process through interviews and observation. The observations of the people in charge of carrying out the activity are considered within the instructions.

Review and validate current methods

The current methods will be reviewed, with the help of the responsible personnel, they will be given a draft of the documented process and the work instructions so that they can operate the procedure and provide feedback with observations in order to evaluate the results and determine the following:

- a) If the process, as defined, meets the stated objectives
- b) The method to reach the stipulated level of compliance in the event that the stated objectives are not met.
- c) If these levels of conformity are sufficient to sustain the rest of the process.

Authorize and publish the procedure

It must conclude by reaching a consensus and validating the final document by the person in charge in the area of the organization, a unique code will be assigned in such a way that it is easily identified when it is published and distributed to all personnel. This publication will be in charge of the organization, defining the place and means of support.

Results

Identification of the need

It began by identifying the need within the process in the organization with an informal interview with the person in charge of the process. The clear need was established with the person in charge of official documents with the procedures as instructions to mitigate the problems that arise in the company. Once this need was defined, a SIPOC diagram was made in order to better understand the nature of the process. The SIPOC diagram is presented below describing the interrelationships of the object under study (suppliers, inputs, process, outputs and customers).

S Suppliers	I Inputs	P Process	O Outputs	C Customers
Customers Adviser spare parts supplier appointment manager	Appointments in CVIS service policy spare parts note diagnostic sheet Bill Work order Guarantee Carriage Status Diagnosis Format	PHASES: prior to service Service execution service tracking Back power and end of service	Bills stamped service policy Work orders signed and fulfilled Approved and signed spare parts orders	Vehicle owner High direction

Table 3 SIPOC diagram of the after sales service process
Source: Own elaboration

Define the format for the procedure

The proposal for the format to be used for the documentation continued to be prepared. This format includes what is required by ISO / TR 10013: "Guidelines for the documentation of quality management systems" for a documented process (Purpose, scope, procedure, references, definitions, documents). Figure 2 shows the format of documented procedures.

Logo
Company name

Code	Procedure name
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I. Aim
II. Scope
III. Extension and limits

IV. Procedure Description

Insumos o entradas:

Name of the activity	Description of activities	Responsible

Products or outputs

V. ANNEXES

- Flowchart
- Requirements of the services provided or the products generated with the procedure

Service and/or product	Requirements set by customers	Legal and/or regulatory requirements

- Policies
- Resources for product realization
 - Human Resources
 - Infrastructure
 - Materials
- Records
- Process indicators

Indicator	Upper Limit	Lower Limit	Responsible

Risk management

Identified risk	Impact

Change Control

Change Made	Date of Change	Authorized

Prepared and Updated by	Reviewed and Approved by:	Beginning of validity	Page
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Figure 2 Format of documented procedures
Source: Own elaboration

After having selected the format, it was also defined that the work instructions will be compiled in a process manual, this considers the recommendations that a manual should include according to the "Technical Guide for the elaboration of procedures" prepared by the General Directorate of programming, organization and budget management of organization.

Document current practice

To document the current practice, flowcharts began to be used, these in turn were verified with those in charge of the processes. Three flowcharts were obtained as results, each one describing one of the three phases of the process.

Once the diagrams with the process flow were validated, we continued to fill out the formats selected in step 2 of the methodology.

Document name	Document key	Objective	Activities	Responsible	Reference to documents	Applicable Records
Pre-service phase	SERVICIO - POP - PD - 01 - 00	Give instructions to carry out the pre-service phase of the vehicle	1. Preparation of appointment 2. Customer vehicle reception 3. Dagnóstico 4. Cotización	Appointment manager Spare parts Service advisor Técnico	SERVICIO - POP - IT - 01 - 00 SERVICIO - POP - IT - 02 - 00	Appointment in CVIS Repair order
Service execution phase	SERVICIO - POP - PD - 02 - 00	Give instructions in the execution of the service to the vehicle	1. Perform service 2. Final inspection 3. Preparation of pre-invoice	Service advisor workshop technician Car washer Encargado de refacciones Técnico master	SERVICIO - POP - IT - 03 - 00	Repair order Prefectura Guarantee Policy
Service monitoring and feedback phase.	SERVICIO - POP - PD - 03 - 00	Give instructions in the follow-up and feedback of the service	1. Vehicle delivery 2. Feedback	Service advisor Appointment manager	SERVICIO - POP - IT - 01 - 00	Guarantee Policy Customer satisfaction survey Nota de pago Diagnóstico del vehículo firmado

Table 4 First version of the documented processes

Source: Own elaboration

Write work instructions

The work instructions are drafted according to the recommendations in the ISO / TR 10013 standard: instructions and observations by the current operator.

Document name	Document key	Objective
Work instructions for: Appointment preparation	SERVICIO - POP - IT - 01 - 00	Give instructions to make an appointment in the CVIS system.
Work instructions for: order preparation	SERVICIO - POP - IT - 02 - 00	Give instructions for the elaboration of orders.
Work instructions for: close order	SERVICIO - POP - IT - 03 - 00	Give instructions for closing work orders.

Table 5 Work Instructions Servat

Source: Own elaboration

Review and validate current methods

Once the first version of the work instructions and the documented procedures were finished, they were sent for review for approval or editing by the organization under study. From the validation, the corresponding adaptations were made and the latest version of the documents ends.

Authorize and publish the procedure

Once the work instructions documents are approved, they are transferred to the most convenient means for the organization. In this case, the work instructions will be stored digitally for easy access by collaborators who require it, while the documented procedures will be incorporated into a process manual which will be physically available within the company.

Document Name	Document Key	State	Documents Control
Pre-service phase	SERVICIO - POP - PD - 01 - 00		Operation manual
Service execution phase	SERVICIO - POP - PD - 02 - 00		Operation manual
Service feedback and monitoring phase.	SERVICIO - POP - PD - 03 - 00		Operation manual
Work instructions for: preparation of appointment	SERVICIO - POP - IT - 01 - 00		Digital files on usb
Work instructions for: elaboration of order	SERVICIO - POP - IT - 02 - 00		Digital files on usb
Work instructions for: close order	SERVICIO - POP - IT - 03 - 00		Digital files on usb

Table 6 Table of approved procedures

Source: Own elaboration

Conclusions

It is concluded that the objective of the documentation of the post-sale service process is successfully fulfilled since it helps to standardize the activities, giving it the opportunity to be improved in the future, allowing new collaborators to have a guide on which to base themselves to carry out their activities.

The realization and implementation of a QMS is recommended for the development of continuous improvement within the organization. A SGC would allow the company to have more practical control over its quality objectives as well as give the company the opportunity to point its quality objectives towards what the company might really need, this mostly points towards the needs of the customer.

In addition, a standardization of processes in the workshop area within the company is also recommended, this would in turn ensure the maintenance that is carried out by the technicians. If these actions are carried out, it is possible to control and observe possible deficiencies in the activities that involve the different maintenance of the vehicles.

References

- Cubillos Rodríguez, M. C., y D. Rozo Rodríguez (2009). El concepto de calidad: Historia, evolución e importancia para la competitividad. *Revista de la Universidad de La Salle*, (48), 81.
- Torres Sumeth, Ruiz Afanador, Solis Ospino y Martinez Barraza (2012) *La calidad y su evolución* Vol. 10 No. 2, págs. 100-107
- Secretaría de Economía (2012). *Industria Automotriz Monografía*. México. Dirección General de Industrias Pesadas y de Alta Tecnología.
- Organización Internacional de Normalización (2015). *Sistemas de gestión de la calidad — Fundamentos y vocabulario (ISO 9000:2015)*
- Organización Internacional de Normalización (2015). *Sistemas de gestión de la calidad — Requisitos (ISO 9001:2015)*
- Deming, W. E. (2007). *Calidad, productividad y competitividad: calidad de la crisis*. España. Díaz de santos.
- Imai, M. (2014). *Gemba Kaizen: Un enfoque de sentido común para una estrategia de mejora*. España. Mcgraw-Hill / Interamericana De España, S.A.
- Ishikawa, K. (2014). *Introducción al control de calidad*. Madrid. España. Díaz de santos.
- Crosby, P. (2008). *Filosofía de la administración de calidad*. México. Pax México.
- Alexander A. (2005). *Metodología para documentar ISO 9000 versión 2000*. México. Prentice Hall.
- Badia, G. A. (2002). *Calidad modelo ISO 9001 versión 2000 implementación, certificación, transición, auditoria y acreditación*, España. Deusto.
- Stebbing, L. (1999). *Aseguramiento de la calidad 5ª*. México. C.E.C.S.A.
- Robert, W. P. (1999). *Manual de ISO 9000 3ª*. México: Editorial Mcgraw-Hill / Interamericana.
- Garcia-Remigio, C. M., Cardenete, M. A., Campoy-Muñoz, P., & Venegas-Martínez, F. (2020). Valoración del impacto de la industria automotriz en la economía mexicana: una aproximación mediante matrices de contabilidad social. *Trimestre Economico*, 87(346), 437-461. <https://doi.org/10.20430/ete.v87i346.852>
- J. Castillo González y D. Carreño Dueñas, “Diseño metodológico para la caracterización de procesos, caso empresas metalmeccánicas del departamento de Boyacá”, *INGE CUC*, vol. 16, no. 1, pp. 241–251, 2020. <http://doi.org/10.17981/ingecuc.16.1.2020.18>
- Murrieta Saavedra, Y. A., Ochoa Avila, E., y Carballo Mendivil, B. (2019). Reflexión crítica de los sistemas de gestión de calidad: ventajas y desventajas. *Revista En-Contexto*, 8(12), 115–132. <https://doi.org/10.53995/23463279.668>
- Organización Internacional de Normalización (28 de Octubre del 2015) <https://www.isotools.org/2015/10/28/en-que-consiste-el-sistema-de-aseguramiento-de-la-calidad-iso-9001/>
- Organización Internacional de Normalización (28 de Octubre del 2015) <https://www.isotools.org/2015/12/20/en-que-consiste-la-politica-de-calidad-de-una-empresa/>
- KIA Motors (1 de Marzo de 2020) *Historia de KIA* https://www.kia.com/mx/discover-kia/our-story/heritage.html#h_2010

JATO (23 de julio del 2018) Blog de JOTA
<https://www.jato.com/latin-america-h1-2018-renew-kwid-climbs-in-market-up-by-7/>

JATO (23 de julio del 2018) Blog de JOTA
<https://www.jato.com/global-car-market-remains-stable-during-2018-as-continuous-demand-for-suvs-offsets-decline-in-sales-of-compact-cars-and-mpvs/>

Secretaría de Economía (13 de enero de 2012)
Comunidad de negocios – Automotriz
<http://www.2006-2012.economia.gob.mx/comunidad-negocios/industria-y-comercio/informacion-sectorial/automotriz>

Thomson Reuters Mexico. (2023, 27 marzo).
Desarrollo de la industria automotriz: ¿Cómo impacta a México?
<https://www.thomsonreutersmexico.com/es-mx/soluciones-fiscales/blog-fiscal/desarrollo-de-la-industria-automotriz-como-impacta-a-mexico>

TLW, R. (2023, 10 abril). Producción y exportación de autos en México crecen 8% primer trimestre de 2023. THE LOGISTICS WORLD | Conéctate e inspírate.
<https://thelogisticsworld.com/actualidad-logistica/produccion-y-exportacion-industria-autotriz-mexico-crecen-8-primer-trimestre-de-2023/>.