

Design of a quality management model for microenterprises in the region of Tuxpan, Veracruz.

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Summary:

A quality management model was developed for SMEs in the municipality of Tuxpan Veracruz, based on the ISO 9001:2015 standard in order to increase profitability and meet the needs of consumers.

To realize the quality management model, the Deming cycle was used. First, a diagnosis was made to determine the level of compliance with each section of the standard, then the strategic planning to define the direction of the organization.

In addition to the above, the documented information was established where formats, a quality manual and relevant documentation were developed. Finally, a final evaluation was carried out to determine the level of compliance with ISO 9001:2015.

The results obtained were a documentary structure and a quality manual to support the quality management model of SMEs.

Keywords: Quality management system (QMS), continuous improvement, ISO 9001:2015, SMEs (Small and medium-sized enterprises).

Introduction:

A Quality Management System can help to have a better control of each of the internal processes of an organization, from an approach based on interrelated processes. Therefore, a culture of quality must be based on specific requirements such as customer satisfaction in all its extension and on the basis of the principle of continuous improvement [2].

A particular characteristic of quality management models is their global character, since it includes the entire organization: people, departments, faculties, activities, processes. All members of the organization have the duty to identify, control and improve the degrees of quality under their responsibility [1].

ISO 9001 defines the requirements for the implementation of a quality management system. The main objective of this standard is, by means of

of continuous improvement, achieving maximum customer satisfaction, based on the manufacture of products and provision of compliant services. This standard is suitable for any type of business, sector and company, regardless of its size" [11].

Companies use this standard to ensure compliance with the needs and expectations of consumers, the benefits offered by the standard are that SMEs manage to be more competitive compared to others and this makes a growth in their economy and quality to the customer.

Currently a large number of existing grocery stores in the city of Tuxpan Veracruz, do not have continuous improvement processes that allow them to be competitive in an increasingly demanding market. Therefore, the reason for building the quality management model is to provide a standard for SMEs to have a solid foundation to improve their practices to ensure quality and satisfaction of the client.

Methodology:

The Deming cycle was used to develop the quality management model, because it is a methodology that handles the ISO 9001:2015 standard to manage quality. This article sees

First Performance Evaluation	
ISO Section	Compliance rate %
Context of the organization	14%
Leadership	46%
Planning	4%
Support	33%
Operation	32%
Performance evaluation	10%
Improvement	24%
Average Value Obtained.	23%

will use a sample of 10% of SMEs in the municipality of Tuxpan Veracruz.

- Diagnosis of the level of compliance with the requirements of ISO 9001:2015 in SMEs.

To know the current status, a checklist was used to assess and know the level of compliance. The diagnosis was applied to 10 SMEs in the municipality of Tuxpan, Veracruz. The results obtained are presented in the following table:

Table 1: Performance evaluation.

Based on the above results, a compliance value of 23% was obtained on a scale of (0-100%). For this reason, the quality management model was developed to have a better regulatory level so that SMEs stand out in the market and in turn have better incomes.

The percentage obtained is extremely low, but in reality it is a positive factor because grocery stores have a small notion according to what the standard establishes. Although SME owners have no knowledge of the scope of application of the standard, they manage to meet a minimum percentage in some sections of the standard. This means that some sections of the standard are used but not quite correctly.

- Define the strategic planning of SMEs.

The strategic plan of an SME should be the tool that defines everything you want to achieve in the company as much as the objectives which are the points to which the company wants to reach, in the stores of It is common to find that they do not have set goals, but they all agree that they have goals, such as:

- Achieve a good level of sales.

Standard Section	Applicable formats
Context of the organization	<ul style="list-style-type: none"> ▪ SWOT analysis ▪ Needs and expectations ▪ Scope of the QMS ▪ Process description
Leadership	<ul style="list-style-type: none"> ▪ Quality policy ▪ Roles and responsibility
Planning	<ul style="list-style-type: none"> ▪ Risk and opportunity management ▪ Quality objectives ▪ Change planning

- Offer high customer service.

- Always have a good assortment for greater customer satisfaction
- Have frequent customers.
- To be the store with preference among customers in the area.
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To define strategic planning, the requirements established by the context of the organization, leadership and planning sections were reviewed. Formats were developed to comply with the sections of the standard, which are presented in the following table:

Table 2: Formats applicable in the standard.

With the formats elaborated, they were very useful to know the context of the organization of SMEs and based on this formulate the quality policy and establish the roles and responsibilities in the organization.

To manage risks and opportunities, the information obtained from the SWOT analysis was used. The quality objectives were elaborated based on the quality policy so that there was a congruence between the two.

Finally, the planning of the changes was developed based on the requirements established by the section of the standard.

With the implementation of the formats shown in Table 2, they will support having a good strategic planning in the organization.

- Design the documentary structure for the quality management model.

The documentary structure of the QMS is of great importance to provide the necessary support for the assurance of the processes effectively.

The documentation that supports the QMS was formed as follows:

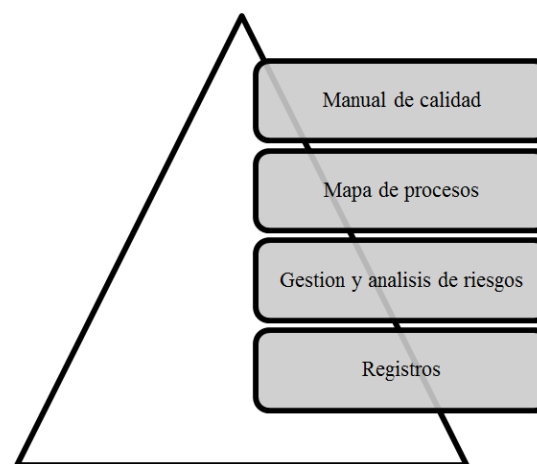


Figure 1: Documentary structure of the QMS.

By using this documentation as a diverse tool, it was possible to meet this objective of a documentary structure for the QMS model.

The creation and updating of documented information is one of the sections that requires greater attention from the people in charge of developing and modifying formats, because there may be inconveniences with mistakes or use of outdated formats.

Sometimes modifications are made to the documentation but it is not made known to the staff, causing mistakes and double documentation that at the end of the day is obsolete since it is not true in its entirety. With respect to this section of the standard, certain parameters will be used to control the documentation.

The formats must include the name of the document, date of preparation, author or verification number. They should also include their latest revision or approval to avoid confusion with outdated formats.

The control of documented information the organization must determine how to impart all the necessary documentation to its workers. In this case, each of the SMEs must see the most correct way to get the information to their workers in accordance with each of the scope and limitations of the organizations.

- Verify the behavior of the

Context of the organization		Evaluation	
Numerical of the standard	Quantity of Requirements	Applicable	Not Applicable
4.1 Understanding of the organization and its context	2	X	
4.2 Understanding of the needs and expectations of stakeholders	3	X	
4.3 Determining the scope of the quality management system	7	X	
4.4 Quality management system and its processes	12	X	
Chapter 5: Leadership		Evaluation	
5.1 Leadership and commitment	13	X	
5.2 Politics	7	X	
5.3 Roles, responsibilities and authorities in the organization	6	X	
Chapter 6: Planning		Evaluation	
6.1 Actions to address risks and opportunities	8	X	
6.2 Quality objectives and planning to achieve them	14	X	
6.3 Planning for changes	5	X	
Chapter 7: Support		Evaluation	
7.1 Resources	19	X	
7.2 Competence	4	X	
7.3 Awareness	4	X	
7.4 Communication	5	X	
7.5 Documented information	13	X	
Chapter 8: Operation		Evaluation	
8.1 Operational planning and control	10	X	
8.2 Requirements for products and services	19	X	
8.3 Design and development of products and services	36		X
8.4 Process control, externally supplied products and services.	21	X	
8.5 Production and provision of the service	26	X	
8.6 Release of products and services	5	X	
8.7 Control of non-compliant outputs	12	X	
Chapter 9: Performance Evaluation		Evaluation	
9.1 Monitoring, measurement, analysis and evaluation	16	X	
9.2 Internal audit	10	X	
9.3 Management review	17	X	
Chapter 10: Improvement		Evaluation	
10.1 General	4	X	

management of quality in the PLURAL OF PYME.

Once the strategic planning and the documentary structure have been established, it is of great importance to determine the level of compliance with the requirements established by the ISO standard. Therefore, performance evaluation formats were developed in order to improve the level of compliance and performance of the QMS.

The results Obtained What herself Present a continuation Belong a the evaluation of the performance carried out to the management model of the quality to determine the level of compliance of Requirements What Sets the norm ISO 9001:2015.

Table 3: ISO 9001:2015 compliance assessment.

Table 3 shows the sections of the standard according to the chapter, as well as the quantity of Requirements What Exists in every a loof y there is a section which is not applicable in the PLURAL OF PYME of shops of groceries y it the "8.3 Design and development of the products y services".

Table #4: Presentation of the results obtained:

Section of the Standard	Number of requirements norm	Number of requirements compliments	Level of compliance
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Leadership	26	26	100%
Planning	27	27	100%
Support	45	45	100%
Operation	129	93	72.79%
Performance evaluation	43	43	100%
Improvement	18	18	100%
Total	312	276	96%

How can Observe herself Obtained one level of compliance of the 96% in the Requirements of the norm. In total, the standard establishes 312 requirements, of the which were fulfilled 276 Requirements.

Table 5 makes a comparison between the first and last evaluation of the performance of SMEs.

Table 5: ISO 9001:2015 compliance level assessments

ISO Section	First Evaluation %	Second Evaluation %
Context of the organization	14%	100%
Leadership	46%	100%
Planning	4%	100%
Support	33%	100%
Operation	32%	72.79%
Performance evaluation	10%	100%
Improvement	24%	100%
Average Value Obtained.	23%	96%

In the preliminary assessment, SMEs managed to meet 23% of the requirements of ISO 9001:2015. After having carried out the quality management model, a

re-evaluation and a compliance level of 96% was obtained. Making a comparison between the first and last and performance appraisal carried out, there is a 73% increase in the level of compliance with the requirements established by the ISO 9001: 2015 standard.

Study variables:

For this research, the variables that are being handled in the project are qualitative and quantitative. In itself, the independent variables will be measured by means of a subsequent evaluation to determine if they are actually complying with all the requirements established by the ISO 9001:2015 standard.

Below is the following matrix of operationalization of variables, where

identify the breakdown of each of the variables with their respective indicators.

Dependent variable	Variable independent and	Dimensions	Indicator
Percentage of compliance or requirements of the standard.	Context of the organization.	Organizational direction	Performance evaluation result
	Leadership	Commitment of the workers.	
	Planning	Training of workers in the SME.	
	Support	Resource availability to operate in SMEs.	
	Operation	Quality of service	
	Evaluation of the performance	Evaluation and analysis of the performance	
	Improvement	Obtaining continuous improvement	

The project is based on the diagnosis of the current situation regarding the level of compliance that grocery stores have in accordance with the international standard ISO 9001: 2015.

An explanatory research will be conducted where it is sought to establish the cause-effect relationship of implementing a quality management model by analyzing its respective advantages and disadvantages. The environment where the data collection was carried out was in a controlled environment, because 10% of the total of the actual sample was monitored.

Results and discussion:

The final result of the work was the creation and proposal of a quality management model applicable to grocery stores, which contributes to quality assurance and improvement.

In the following table are located the most relevant records that were prepared to comply with the ISO 9001: 2015 standard, which are duly identified by a verification code for better management.

Table 6: Registration of documents for SMEs.

Document name	Verification code	Name of document	Verification code
GENERAL		SUPPORT	
Quality Manual	M – SGC	Recruitment of SMEs.	D – FLRE
Inventory format	F – INV	Training Record	F – CAPPER
Customer service.	F – ACLIE	Communication of the QMS.	F – COSGC
Maintenance format	F – RIVER	OPERATION	
CONTEXT OF THE ORGANIZATION		Order format.	F – PEDS
SWOT analysis	F – AF01	Evaluation to external suppliers	F – EVPEX
Needs and expectations.	F – NEYESP	Inventory format.	F – COINV
	E – SATCLI	Format mantenimiento.	F – RIVER
Scope management system of quality.	F – ASGC	Release of products and services.	F – LIPYS
Description of processes.	F – DEPROC	Control of non-compliant outputs.	F – NCONF
LEADERSHIP		PERFORMANCE ASSESSMENT	
Quality policy.	F – RESP P	Performance matrix.	F – MATD
Responsabilidad from the staff.	F – RRYAUT	Evaluation of performance.	F – EVALD
PLANNING			
Risk management and Opportunities	F – GRYOP		
Quality objectives.	F – OBJCAL		
Change planning.			

Future work:

The scope of the quality management model aims to significantly improve the quality of SMEs under ISO 9001:2015, for this reason when applying a QMS model organizations must consider the results of the analysis and evaluation they have as a company and the outputs of the management review that are presented, to determine if there are needs or opportunities that should be considered as part of continuous improvement.

All the criteria of the model must be taken into account to achieve excellence as an organization. The construction of the model is a single step towards the future, since you always have to be updated with new trends to be able to compete in the market.

The construction of the model is a support to improve the quality of products and services, in itself it depends a lot on the application of the quality manual to the letter to improve, but in the future it would be important for SMEs to achieve a certification where they are endorsed by an institution that accredits them that they have a high degree of efficiency and productivity.

Conclusions:

The conclusions obtained when carrying out this article on the design of a quality management model for microenterprises in the Tuxpan Veracruz region, specifically for the grocery store sector, were based on the different data collection and analysis processes obtained, with all this was possible to have a clearer vision of the situation in which this type of organization finds itself and it was possible to make a projection of improvements with the model used.

What is intended to be achieved by making use of the manual is that the owners of this type of stores know in his totality the Different Processes improvement continues and thus can stand out in the market, In addition of What Have one loud quality in the products that offer and that attracts more customers What Are satisfied with your purchased products and if they Have Greater earnings.

That is to say that with all this together, a very good functioning of the quality management system is foreseen for the organization that wishes to implement it within its respective SME.

A quality management model was designed based on the requirements established by the ISO9001:2015 standard because today's companies must always be at the forefront, to meet the needs of consumers. In an increasingly demanding market where consumers are more demanding, organizations must be up-to-date to provide the right products in the right place at the right time. These are some of the causes that motivated the development of a quality management model that was very useful and that was adapted for SMEs, mainly grocery stores. In addition to always taking into account that the application of standards seeks to improve the operation and efficiency in the use of resources, which well taken can lead to cost reduction and continuous improvement.

On the other hand, with the fulfillment and development of the specific objectives of the quality management model, they will allow the clear and efficient direction of organizations.

Finally, we can also highlight that the importance of implementing a QMS lies very much in the fact that it serves as a platform to develop in the organization, a series of activities, procedures and processes the which hand in hand achieve that the characteristics of the products and services of in this case the grocery stores meet all the requirements that customers want to obtain, that is, they are of total quality, achieving that the Percentage of sales generated by the organization increase and not decrease, which would help satisfactorily and give many benefits to all parties involved inside and outside the organizations.

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