Methodology for the creation of an entrepreneurial web-based quality management support service for the ISO 9001:2008 standard, which will provide a collaborative environment between quality certification professionals and hotel companies wishing to achieve this certification.

Metodología para creación de un servicio emprendedor de apoyo para la gestión de calidad vía web para norma ISO 9001:2008, que proveerá un entorno colaborativo entre profesionales certificadores de calidad y empresas hoteleras que deseen alcanzar dicha certificación.

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Abstract

In this research, we proposed the design of an innovative support project for Ecuadorian hotel companies wishing to be certified under the ISO-9001:2008 standard through the use of one of the most successful ICT tools, the Internet, as a collaborative platform for quality management. A collaborative environment is sketched out between Ecuadorian hotel companies and professionals in the quality area. The beneficiaries of this project are: the hotel companies as such, since they would have a collaborative tool to achieve quality certification; the professionals in the area of quality management who would be the managers of change in the certifying companies being these placed through the proposed tool that outlines an environment of communication between companies and professionals in the area of quality in order to create sources of economic income through the placement and insertion of these in the possible certification projects. The Guayaquil hotel sector was chosen as a specific market, with which the project would start successfully. Based on the study conducted, it was shown that this project is welcomed by the respondents and therefore the conceptual design of the site www.certificatuhotel.com.ec was proposed, which outlines the solution to the problem presented in this study by offering a portal of good practices for the improvement of quality management oriented to the ISO 9001:2008 standard. The proposed site also provides information free of charge for visitors in general and access to the best practices tools will be for subscribers. The technological services platform on the Internet has a very favorable impact on improving quality management.

key words Quality Management System, ISO 9001:2008, Quality Management Platform on the Cloud, KMKey Quality

Resumen

En esta investigación, se propuso el diseño de un proyecto innovador de apoyo para las empresas ecuatorianas hoteleras que deseen certificarse bajo la norma ISO-9001:2008 a través del uso de una de las herramientas más exitosas de las TIC la cual es el Internet como plataforma de colaboración para la gestión de calidad. Se bosqueja un ambiente colaborativo entre las empresas hoteleras ecuatorianas y los profesionales del área de calidad. Los beneficiarios de este proyecto son: las empresas hoteleras como tal, dado que contarían con una herramienta de colaboración para lograr la certificación de calidad; los profesionales del área de gestión de calidad quienes serían los gestores de cambio en las empresas certificantes siendo estos colocados por medio de la herramienta propuesta que bosqueja un ambiente de comunicación entre empresas y profesionales del área de calidad en aras de crear fuentes de ingresos económicos por medio de la colocación e inserción de estos en los posibles proyectos de certificación. Se escogió al sector hotelero guayaquileño como mercado específico, con el cual iniciaría el proyecto de forma exitosa. En base al estudio realizado se demuestra que este proyecto tiene acogida por parte de los encuestados y por lo tanto se planteó el diseño conceptual del sitio www.certificatuhotel.com.ec con el cual se bosqueja la solución al problema presentado en este estudio ofreciendo un portal de buenas prácticas para el mejoramiento de la gestión de calidad orientado a la norma ISO 9001:2008. El sitio propuesto además brinda información de forma gratuita para los visitantes en general y el acceso a las herramientas de buenas prácticas serán para los usuarios suscriptores. La plataforma de servicios tecnológicos en Internet tiene un impacto muy favorable para mejorar la gestión de calidad.

Palabras clave Sistema Gestión Calidad, ISO 9001:2008, Plataforma Gestión Calidad en la Nube, KMKey Quality.

1. Introduction

Quality Management in Ecuador is a topic that should have special consideration, both by the Ecuadorian Government, as well as by the business sector and in general it affects all Ecuadorians. I felt the passion to direct research towards finding a mechanism that promotes and supports the quality of our country since I believe that in this way I could contribute as a student, professional and Ecuadorian and with the vision of envisioning our country as a producer of quality services and products taking it to an international competitive position which would produce a multiplying economic effect and could make us a developed country. Although it is true that the government of now President Econ. Rafael Correa Delgado has promulgated the National Quality Plan, these types of efforts are still insufficient to raise the quality level of the products and services currently offered, with the primary creation of real

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quality policies and the provision of resources to achieve them being essential.

Currently, the poor management of continuous improvement in lodging in the tourism sector in Ecuador is being a focus of concern for the National Government of Econ. Rafael Correa delegating this priority to the Ministry of Tourism in order to improve quality in said sector, as a cornerstone for strengthening the tourism sector and seeking increased annual income for our country from the items in this sector [1].

The Hotels in the city of Guayaquil have disorganized, unstable, inefficient processes and do not comply with the requirements demanded by ISO 9001: 2015, for certification in said Standard. Among these processes are the lack of employee training, non-compliance with INEN Standards, poor quality Customer service, etc. For these reasons, it is a priority for Hotels to take on the challenge of embarking on a culture of quality that helps improve their processes and with them obtain good service for domestic and international tourists.

Essentially the theoretical aspect is based on the fact of contrasting whether the creation of a technological tool for quality management via the web can be a contributing factor to the continuous improvement of the services provided in the hotel sector of the city of Guayaquil. The theoretical pillar is based on the potential implementation of the ISO 9001: 2008 standard that helps solve previously identified problems at both process improvement level, as well as in service improvement to the client and increasing functional competencies for employees [2].

Ultimately, the primary pursuit is that a model as successful for quality management through ISO 9001:2008 can be channeled using information and communication technologies and serves as a factor that catapults quality and excellence service to the hotel sector of the city of Guayaquil [3].

The Ecuadorian government is promoting quality strengthening of the hotel sector as policy. This must be taken advantage of by quality area professionals to be cornerstones of this process. For this task it has delegated functions to the portfolio of the Ministry of Tourism based fundamentally on increasing the participation of Tourism in our country and in turn being a true participant in globalization. Based on that premise, the practical aspect of this research is limited to the hotel sector of the city of Guayaquil, leaving open the possibility for it to be used for later study [4].

Once a current diagnosis has been made, the guiding objective of this research is to perform an in-depth analysis of the reality of the hotel sector in the city of Guayaquil, in order to discover the hotels that are concerned with the continuous improvement of their processes and the application of a system of quality management with the ISO-9001: 2008 standard. All this as a result of the design of an entrepreneurial Website that facilitates and serves as support for quality management in the Hotel sector and thus encourage tourists from all over the world to visit our Country.

The importance of this study is vital for the economic and administrative development of the hotel sector in the city of Guayaquil since the hotels that are certified will be able to increase their profits, thus producing a multiplying effect of improvement for their workers and additionally our country will be able to increase its level of global competitiveness.

1.1 PDCA Cycle

The PDCA was designed by Dr. Walter Shewhart back in 1920, but its great dissemination and use is attributed to Dr. William E. Deming for improving the quality of Japan since the 1950s." Hence it is also named the Deming Cycle. In summary of its creators, it is a methodology that provides a basic reference guide for the management of the activities and processes that make up the basic structure of a quality management system, and is adaptable to any type of organization [5].
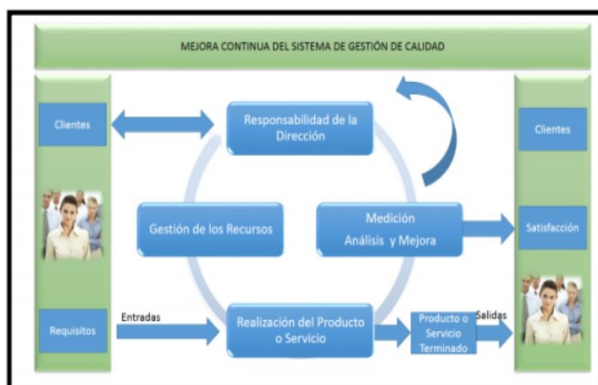

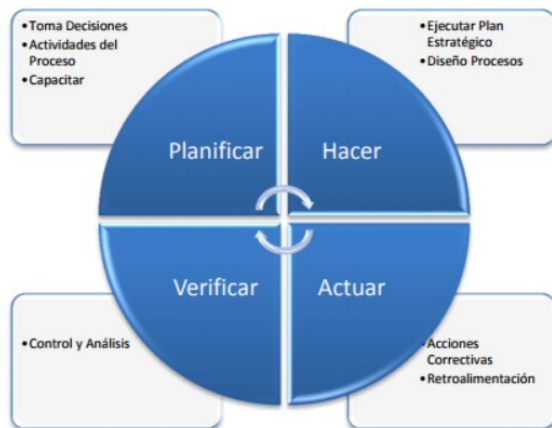Fig. 1. *ISO 9001:2008 QMS Structure*

Fig. 2. *PDCA Cycle*

Plan - It refers to establishing the necessary process activities to obtain the expected result. It should be based on meeting the specifications to be achieved and these are also transformed into an element to be improved. In this phase it is necessary: to collect data to deepen the knowledge of the process, detail the specifications of the expected results and define the necessary activities to achieve the product or service, verifying the specified requirements [6].

Do - It is executing the strategic plan it includes: organizing, directing, assigning resources and supervising execution.

Check - After a period planned in advance, collect control data again and analyze it, comparing it with the requirements initially specified, to know if they have been met and in that case, assess whether the improvement has occurred to monitor implementation and evaluate the execution plan documenting the conclusions.

Act - Based on the conclusions of the previous step, choose an option:

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- If partial errors have been detected in the previous step, perform a new PDCA cycle (from the English plan-do-check-act), with new improvements. If no relevant errors are detected, apply process changes on a large scale.
- If unsolvable errors have been detected, abandon process changes and finally provide Feedback and/or improvement in Planning. [7]

Certifying Companies. - They are companies whose purpose is to perform implementation, maintenance and control audits to finally proceed to issuing a quality certification. For the case of our country there are 6 companies that have the power to be certifying entities:

Coterna, Bureau Veritas and Icontec, International Quality in Certifications, ICONTEC and SGS [8].

1.2 Management as a concept
Today, managing business resources in an appropriate manner within companies is of vital importance since it allows them to offer quality services to their increasingly demanding customers within a market as competitive as the hotel industry in our country. For authors such as the concept of management, it is carrying out actions previously planned that are not carried out at random, but rather as the work progresses, organizations must classify which are the most convenient and effective to achieve their stated objectives, these actions will generate indicators that allow them to reflect which are better or more timely.

Management is a set of integrated actions, as a system of predetermined action within organizations and whose overall structure allows the company to focus on improving its achieved results, as well as the objectives set within these organizations.

It can be said that management is nothing more than the set of dynamic, interactive and efficient processes; which basically consist of projecting, organizing, leading and controlling what happens inside the company, all these actions aimed at the continuous improvement of the organization [9].

1.3 Quality as a concept
El origen de la palabra calidad está en el latín "qualitas" y fue empleada por primera vez por Cicerón filósofo de la antigüedad, para expresar este concepto en lengua griega. En la actualidad autores definen a este concepto como la capacidad que tienen los individuos para realizar bien las cosas que estos realizan dentro de la vida cotidiana [10].

The concept of quality indicates that it is the set of properties associated with everything, which allows measuring whether they are valuable, while at the business level it has been defined as doing things excellently meeting all the specifications that are offered.

The above reflects that this concept of quality is something that is already implicit in each individual, developing these capacities within organizations must be something that must necessarily be measured in two ways, both how it is provided within these organizations, as well as how it is perceived by customers who use the service, which leads to achieving total quality within the organization.

1.3.1 Total quality
Quality management has undergone major changes in the current era, leaving behind the simple concept that

Five Stars	8
Four Stars	19
Tres Estrellas	15
Two Stars	6
Otros Hostales, Etc	61
Total	109

That 10 do have ISO 9001:2008 certification equivalent to 22%, finally only 1 hotel has

3. Results

Question 1: Are you a Manager or Employee of your Hotel Company?

Table 2. Summary Question 1

Answer	Population	Percentage
Manager	0	0%
Administratot	23	50%
Supervisor	23	50%
Employee	0	0%
Total	46	100%

Result and Analysis Question 1:
Of a total of 46 respondents: 23 are administrators resulting in 50% and 23 are supervisors, equivalent to the remaining 50%. The objective of this question was to filter the survey data to find out if the focus of the study is towards the senior management group or towards the workforce group, with administrators and supervisors being the main participation groups.

Question 2: Age?

Table 3. Summary Question 2

Answer	Population	Percentage
20 - 30 years old.	15	33%
31 - 40 years olds.	25	54%
41 - 50 years old.	6	13%
51 and older	0	0%
Total	46	100%

Result and Analysis Question 2:
Of a total of 46 respondents: 25 belong to the age group "31-40" years equivalent to 25% and 15 belong to the group "20-30" years equivalent to 33% and 6 are categorized in the group "41-50" years equivalent to 13%. The objective of this question was to filter the survey data to find out the main age groups in which the hotel representatives are located.

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supposed that this quality should be focused on delivering functional and appropriate services to customers. Currently, new paradigms emerge such as total quality management which for this management within organizations is focused on using all processes within them, based solely on quality to offer their services, these will allow these organizations to obtain advantages over the rest of their competitors, achieving total customer satisfaction [11].

Total quality management for hotel organizations in the country ceased to be a simple concept to follow, but rather it is already a standard to implement properly within these organizations, so that it allows them to compete in this market, total customer satisfaction is what will allow sustainable development in the short and long term for these organizations as they will substantially improve their income by getting more customers to use their services [12].

2. Materials and Methods
Regarding the general perspective in which the research idea will be approached, it will be communicological and qualitative; The focus will be on aspects such as networks and communication flows between Guayaquil Hotel Companies, Certified Quality Professionals and Certifying Bodies accredited by the Ecuador Accreditation Body.

The researcher will participate actively in the process, with field work and description of found situations prevailing that will allow proposing a methodology that serves as a support environment for quality management systems.

Due to the nature of this work, the research design that will be followed according to the control of the variables is non-experimental, since we will analyze our independent variable (Collaborative Platform) to know the way in which these implementations help strengthen the process (Certification Process).

2.1 Population and Sample
The unit of analysis in this study will be the hotel business sector in Guayaquil, quality professionals certified in Guayaquil and accredited certifying bodies by the Ecuador Accreditation Body.

The total population of the hotel business sector in Guayaquil is 109 establishments, from which a research target market of 48 hotels is established that are segmented within the range of five, four and three and two stars:

Table 1. Guayaquil Hotels

Hotel X Estrellas	Quantity

Question 3: What category is your hotel?

Table 4. Summary Question 3

Answer	Population	Percentage
5 stars.	8	17%
4 stars.	19	41%
3 stars.	15	33%
2 stars.	4	9%
Total	46	100%

Result and Analysis Question 3:
Of a total of 46 respondents: 19 are categorized in the "4 star" group equivalent to 41%; while 8 are categorized in the "5 star" group equivalent to 17%. The objective of this question was to check the information obtained about the categorization of hotels to validate this study both types of certifications equivalent to 1% of the group surveyed. The objective of this question was to obtain from the official source, the possession of the quality certificates.

Question 4: Do you have quality certifications?

Table 5. Summary Question 4

Answer	Population	Percentage
9001:2008.	10	22%
Ambiental.	0	0%
Integral.	1	2%
Ninguna.	35	76%
Total	46	100%

Question 5: Do you have knowledge of the ISO 9001-2008 Standard?

Table 7. Summary Question 5

Answer	Population	Percentage
Very Sufficient	8	17%
Sufficient	4	9%
Little sufficient.	0	0%
Insufficient.	34	74%
Total	46	100%

Result and Analysis Question 5:
Of a total of 46 respondents: 34 affirm having insufficient knowledge of the ISO 9001:2008 standard equivalent to 74%; while 8 affirm having very sufficient knowledge equivalent to 17%. The objective of this question was to find out how much they know about the ISO 9001:2008 standard.

Question 6: The importance of the Quality Control area, in your opinion; It is correct.

Table 8. Summary Question 6

Answer	Population	Percentage
1 "Totally Disagree"	1	2%
2 "Somewhat Agree"	0	0%
3 "Agree"	9	20%
4 "Strongly Agre"	36	78%
Total	46	100%

Result and Analysis Question 6:
Of a total of 46 respondents: 36 strongly agree on the importance of the Quality Control area equivalent to 78% and 9 agree equivalent to 20; while only 1 totally disagrees equivalent to 2%. The objective of this question was to quantify the reality about the importance given to the quality control area in the hotels studied.

Question 7: Do you think a Quality Management system should be implemented:

Table 9. Summary Question

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	1	2%
3 "Agree"	1	2%
4 "Strongly Agree"	45	96%
Total	47	100%

Result and Analysis Question 7:
Of a total of 46 respondents: 45 strongly agree on the implementation of a Quality Management System equivalent to 96% and 1 agrees on said implementation equivalent to 88%. The objective of this question was to filter the survey data to find out the importance of implementing a Quality Management System.

Question 7: Do you think a Quality Management system should be implemented:

Table 10. Summary Question 7

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	1	2%
3 "Agree"	1	2%
4 "Strongly Agree"	45	96%
Total	47	100%

Result and Analysis Question 7:
Of a total of 46 respondents: 45 strongly agree on the

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implementation of a Quality Management System equivalent to 96% and 1 agrees on said implementation equivalent to 88%. The objective of this question was to filter the survey data to find out the importance of implementing a Quality Management System.

Question 8: Are different technological tools, such as the internet, Google, etc. used within your hotel to perform tasks or processes?

Table 11. Summary Question 8

Answer	Population	Percentage
1 "Totally Disagree"	4	9%
2 "Somewhat Agre"	13	28%
3 "Agree"	17	37%
4 "Strongly Agree"	12	26%
Total	46	100%

Result and Analysis Question 8:
Of a total of 46 respondents: 17 agree that technological tools are used to perform tasks and/or processes, equivalent to 37% and 70 belong to the workforce equivalent to 88%. The objective of this question; while 13 simply state that they are somewhat in agreement equivalent to 28%; while 12 state they fully agree equivalent to 26%. The objective was to filter the survey data to find out the degree of use of technological tools to fulfill tasks and/or processes within the hotel.

Question 9: Do you think the current supply management processes are adequate?

Table 12. Summary Question 9

Answer	Population	Percentage
1 "Totally Disagree"	7	15%
2 "Somewhat Agre"	21	46%
3 "Agree"	7	15%
4 "Strongly Agree"	11	24%
Total	46	100%

Result and Analysis Question 9:
Of a total of 46 respondents: 21 think they are somewhat in agreement with the fact that if the supply management processes are adequate equivalent to 12%; while 11 think they strongly agree, equivalent to 24%. The objective of this question was to filter the survey data to find out if the current supply management within the company is adequate.

Question 10: How often does your company invest in

training?

Table 13. Summary Question 10

Answer	Population	Percentage
1 "Totally Disagree"	4	9%
2 "Somewhat Agre"	19	41%
3 "Agree"	12	26%
4 "Strongly Agree"	11	24%
Total	46	100%

Result and Analysis Question 10:
Of a total of 46 respondents: 19 affirm being only somewhat in agreement with the frequency of training within the hotel equivalent to 41%; while 12 think they agree equivalent to 26%; while 11 think they strongly agree with the frequency of training equivalent to 24%. The objective of this question was to obtain training investment frequencies in the hotel class of the present study.

Question 11: Would you like to take web-based training courses?

Table 14. Summary Question 11

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	5	11%
3 "Agree"	13	28%
4 "Strongly Agree"	28	61%
Total	46	100%

Result and Analysis Question 11:
Of a total of 46 respondents: 28 think they strongly agree to receive courses through the web equivalent to 61% and 13 agree, equivalent to 28%. The objective of this question was to obtain acceptance data about the offering of courses through the web.

Question 12: Does your hotel focus on continuous improvement?

Table 15. Summary question 12

Answer	Population	Percentage
1 "Totally Disagree"	3	7%
2 "Somewhat Agre"	13	28%
3 "Agree"	14	30%

4 "Strongly Agree"	16	35%
Total	46	100%

Result and Analysis Question 12:
Of a total of 46 respondents: 16 affirm being strongly in agreement that there is importance in continuous improvement, equivalent to 35%; while 14, agree equivalent to 30% and 13 are simply somewhat in agreement, equivalent to 28%. The objective of this question was to filter the survey data to find out if the focus of the study is towards the senior management group or towards the workforce group, the latter being the majority.

Question 13: Would you participate in the process of implementing the ISO 9001:2008 quality standard in your company?

Table 16. Summary Question 13

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	0	0%
3 "Agree"	0	0%
4 "Strongly Agree"	46	100%
Total	46	100%

Result and Analysis Question 13:
Of a total of 46 respondents: 46 affirm being totally in agreement to participate in the process of implementing the standard equivalent to 100%. The objective of this question was to determine the predisposition of the groups surveyed to participate in a possible implementation process of the ISO 9001:2008 standard.

Question 13: Would you participate in the process of implementing the ISO 9001:2008 quality standard in your company?

Table 17. Summary Question 13

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agree"	0	0%
3 "Agree"	0	0%
4 "Strongly Agree"	46	100%
Total	46	100%

Result and Analysis Question 13:
Of a total of 46 respondents: 46 affirm being totally in agreement to participate in the implementation process of the standard equivalent to 100%. The objective of this question was to determine the predisposition of the groups surveyed to participate in a possible implementation process of the ISO 9001:2008 standard.

Question 14: Would you like to maintain your document management through the web?

Table 18. Summary Question 14

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	0	0%
3 "Agree"	2	4%
4 "Strongly Agree"	44	96%
Total	46	100%

Result and Analysis Question 14:
Of a total of 46 respondents: 44 affirm being totally in agreement to maintain their document management on the web, equivalent to 96%; while 2 affirm being in agreement, equivalent to 4%. The objective of this question was to determine the possible acceptance of the document management service through the web.

Question 15: Would you like there to be a technological tool to help you improve processes for possible certification?

Table 19. Summary Question 15

Answer	Population	Percentage
1 "Totally Disagree"	0	0%
2 "Somewhat Agre"	0	0%
3 "Agree"	0	0%
4 "Strongly Agree"	46	100%
Total	46	100%

Result and Analysis Question 15:
Of a total of 46 respondents: 46 affirm being totally in agreement that a technological tool exists to help improve their processes, equivalent to 100%. The objective of this question was to determine the possible acceptance of the technological tool as a pillar of support for quality management within hotels.

4. Conclusions

- As a first conclusion, only 22% of the hotels in the city of Guayaquil have ISO 9001:2008 certification, while 76% do not have any type of certification at the level.
- With regard to knowledge of the standard, 74% claim that information about it is currently insufficient, and only 17% claim to have sufficient knowledge.
- Regarding the impact of the little importance of the quality control area in the hotel companies of Guayaquil, 78% lean towards the criterion of "Totally Agree", which shows that they do consider the quality control area must have a place within the hotels of Guayaquil. Additionally, with reference to the implementation of a Quality Management System, it has an extremely favorable acceptance of 96%. This strengthens the need for a tool to facilitate said implementation.
- Regarding participation with the web collaboration tool, the result shows a favorable acceptance of the respondents. 46 of the 46 respondents are interested in participating and 44 would also like to have the support tool for the document management system through the web, which consolidates the point made above. Also, 63% of respondents indicate that they use ICT tools to improve their tasks and processes. This augurs a good result of expected use and acceptance of the proposed tool.
- Regarding training, it is denoted that 50% of respondents indicate that their company invests in training. This also opens an opportunity to provide education services as one of the secondary income.
- On the other hand, the main majority group surveyed believes that supply management is not being carried out properly, which denotes a weakness in this very important part for the Guayaquil hotel sector.
- With respect to the possibility of participating in the ISO 9001:2008 standard implementation process, the conglomerate in general strongly agrees to participate.

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