

## KNOWLEDGE MANAGEMENT MODEL IN THE PRODUCTIVE CHAIN OF HEALTH SERVICES PROVIDING ENTITIES

LAURA DANIELA SALAMANCA GONZÁLEZ, DIEGO FERNANDO CASALLAS CAMACHO  
& VICTOR HUGO MEDINA GARCÍA

*Universidad Distrital Francisco José de Caldas, Facultad de Ingeniería, Cra 7 No 40B-53, Bogotá, Colombia*

### ABSTRACT

*In this article, an adequate knowledge management model is formulated and presented based on the dynamic model of knowledge creation of Nonaka and Takeuchi, for the improvement of the productive chain of health providers with quality assurance in the user care services, taking into account their importance, and the inefficiency that occurs when accessing them, for this, the diagnosis and analysis of the quality of the health service is carried out, taking into account that the result of the same It is related to the efficiency of the links and actors of the production chain, which provides the parameters for the creation of the knowledge management model, architecture and therefore its respective adaptation. After this, two multidimensional tools for measuring the quality of the service are mentioned, SERVQUAL for the measurement and evaluation of the quality of the customer service provided to users and SERVQHOS the evaluation of the perception of the quality of the service, with which the Health provider entities will be able to evaluate and analyze the effectiveness of the proposed model and the processes to be improved in the production chain and also promote the creation of a permanent knowledge society in the organization.*

**KEYWORDS:** Knowledge management, Service quality, Production chain, Dynamic model, Knowledge creation & Organizational knowledge

**Received:** Dec 09 2020; **Accepted:** Dec 29, 2020; **Published:** Jan 27, 2021; **Paper Id.:** IJMPERDDEC202087

### 1. INTRODUCTION

The quality of the service is a key factor for the provision of services in the different organizations, therefore it is important that it be a key competitive tool, since its importance leads to the achievement of organizational objectives, which manage to meet the expectations and needs that arise on the client, so that the service is provided efficiently. The quality of customer service has become an area of special interest for researchers and managers, due to its impact on business performance, cost reduction, customer loyalty and profitability (Guru, 2003), (Otálora & Orejuela, 2007). This creates a challenge for health service providers, since services must be provided to clients in an appropriate way and based on a system that allows interaction between existing knowledge in the organization and the conversion of knowledge, being the organization is the entity that fosters the generation of knowledge, its incorporation and respective dissemination, making use of information and communication technologies.

The quality of customer service in the health area is a critical factor since its effectiveness and the quality of the health system processes are questioned, since although it is true, problems of equity, efficiency and, above all, persist results, this is due to the fact that the search for profitability by health organizations has led them to adopt a perverse quality approach, which, although it is true, guarantees the success of companies in the market, relegates quality to the background technique, because it uses these aspects as distracting elements, which hide the

failures of health institutions in providing quality services in a more efficient and equitable way (Calderón, Botero & Martínez, 2011).

This can be evidenced by various investigations regarding the quality of health services. A recent study estimates that, in Colombia, 33,917 deaths per year are attributable to the health care system; Of these, 65% (22,080 deaths per year) are due to the use of poor quality care, while the other 35% (11,836 deaths per year) are due to unassisted use or poor access (Kruk, Gage, Arsenault & Jordan, 2018), (Veillard, 2019), and this is only at the Colombian level; a country that according to the Health Systems Performance Ranking (Colombian Association of Hospitals and Clinics, 2017) is located in position 48 out of 99 countries evaluated, the outlook is even more discouraging in those that score in lower positions and It presumes that it should be similar for the 94 remaining countries that were not taken into account in the study, evidencing this the deficiency in the productive chain of the health providers that finally breaks down into the quality of service care.

That is why knowledge management is essential since its application articulates the management of information and knowledge that the business environment has at all levels of the production chain, ensuring a better organizational structure. Knowledge and its management have become one of the most important assets for organizations, because its management creates wealth or added values, which facilitate reaching an advantageous position in the market (Nieves & León, 2001).

Therefore, the quality of the service is linked to the management of knowledge in the productive chain of the health providers, generating the bases for the articulation of the organizational strategies, the productive chain of the health services organizations present innumerable deficiencies, the measurement indicators show this, according to a study carried out in the article on Knowledge Management Processes and Practices in Productive Chains of Colombia (López, Hernández & Marulanda, 2014) in an evaluation of the processes related to organizational knowledge management, Below average values stand out in the health services production chain.

Therefore, this research work proposes a dynamic model of knowledge creation of Nonaka and Takeuchi (1995) in the productivity chain of health service providers, with the identification of the essential elements of the productive chain for the improvement of the quality of service of health organizations, which seeks to identify existing knowledge, both tacit and explicit, through information and communication technologies appropriate for each knowledge, starting from databases, intellectual capital to collaborative software or groupware, and along with it the appropriate approach to the model and its architecture.

Given that knowledge and its management is considered a value generation factor for organizations, it is intended to provide a basis for the productivity chains in health service providers that seek to incorporate knowledge management, thus improving their productivity and competitiveness.

## **2. FOUNDATIONS OF SERVICE QUALITY IN HEALTH AND KNOWLEDGE MANAGEMENT**

Service quality is the final perception that a customer has about a service, in which the final customer makes a comparison between what he expected to receive and what he received from the service provider, this perception can be expressed qualitatively or quantitative. It is important to highlight the nature of the services, since they are intangible and cannot be owned as a good, that is why when measuring the quality of the service it is very important to know the expectations of the clients and to be able to supply them so that the perception of the service provided at the time of measurement is favorable

for the organization (Arellano, 2017).

The quality of the service has essential characteristics, of which intangibility, inseparability, impermeability and heterogeneity stand out, this will help to establish mechanisms for the perception of the client regarding the service obtained in the health providers, with this information Initially, an information survey can be carried out on how the current environment is and what action mechanisms have been proposed by health providers (Arellano, 2017), (Sánchez, Carlos & Hernandez, 2019).

Although the quality of the service is important for health providers, it is observed that at present the perception by the end user of health services is very low, according to recent studies it is observed that 23% of people Those who receive health services feel satisfied with the quality provided, another factor that affects the perception of the productive chain of health providers is the response time for customer care. Although improvement has been evidenced in recent years, the end user feels that it is not enough and nearly 75% of them state that response times are too long to obtain medical attention. An important factor, speaking of the perception of the end user, is the reliability generated by the productive chain of the health sector, according to the studies indicated, trust by the end user is very low, where it is seen that only 26% of the population believes that health services provide the best treatments to users (Ipsos Group, 2020).

It is convenient to emphasize that the productive chain of the promoter entities of the health sector not only have these problems when it comes to improving the quality of the service, but there is also a fundamental problem; the overload of health services, this is currently evident with the pandemic, where health services have been oversaturated in all areas, causing user care services to become burdened and not provide effective solutions to communities, According to the External Evaluation of the Quality of Care in the Health Sector in Colombia (Veillard, 2019) and the Global Health Service Monitor 2020 (Ipsos Group, 2020) data it is observed that 55% of the population considers that the productive chain of health systems is oversaturated.

Productive chains are groups of social actors, such as agricultural and agroforestry production systems, suppliers of services and inputs, processing and transformation industries, distribution and marketing, as well as final consumers of the product, by-products and services (Simanca, Montoya & Bernal, 2016), (Isaza, 2009), (Ilima et al., 2001).

These provide important elements for the design of business support policies that favor the generation of wealth through the consolidation of competitive advantages (Simanca, Montoya & Bernal, 2016), (Isaza, 2009).

The productive chains are made up of constituent elements, actors and activities that define their structure and operation; Among the elements that make up a productive chain are the links, segments, flows and organizational environments, which are differentiated, interacting structures that contribute to the construction of a common goal. The links refer to actors involved in the activities of the chain; the segments are groups of homogeneous actors within the same link; and flows allow understanding the relationships between links and segments, increasing understanding of the chain (Simanca, Montoya & Bernal, 2016).

It should be noted that there are multiple methods to monitor the perception of the client when receiving the service that allows quantifying the perception of the quality of the service through multidimensional models such as SERVQUAL and SERVQHOS, which allow to objectively evaluate how they behave the expectations and perceptions of the clients, providing a more precise view of the variables in which there are greater shortcomings in terms of quality of service in health providers, also allow for an adequate information gathering. With the help of information management, it

will be possible to have a greater flow of information in the organization (Sánchez et al., 2019), (Numpaque & Rocha, 2016).

Knowledge management in health promoting entities makes it possible to take advantage of the knowledge that is generated both inside and outside of them, observe which are the existing knowledge flows and thus improve their organizational culture and their operation in the area, with the help of knowledge management the flows of both knowledge and information are much more efficient and the existing knowledge leaks are treated and managed in the best way so that solutions can be given to the problems they have (Rodríguez, Medina & Tarazona, 2013), (Medina García, Medina Estrada & Rivas, 2018), (Díaz, Medina & Tarazona, 2019), (Rodríguez, Medina & López, 2015).

Information and communication technologies play a fundamental role with regard to knowledge management, managing to integrate the knowledge of the organization into information systems and thus meet the expectations set, and along with this process apply a series of indicators monitoring so that it can be objectively evaluated how the SGC is developing (Medina García, Medina Estrada & Tarazona, 2019), (Rosabal, Vázquez, Vidal & Reyes, 2017).

### **3. IMPLEMENTED METHODOLOGY**

For the realization of this project, the explanation method was implemented, since a knowledge management model was developed to provide support and improve interaction in the productivity chain of health service providers, and with it the quality of the service and the perception of it.

The justification corresponds to a practical and methodological justification where the development of the project proposes strategies that help to solve the identified shortcomings, and in this way a new strategy is proposed based on knowledge management that generates reliable and valid knowledge through intellectual capital in the organization, and the use of enabling technologies that support the processes necessary for the transfer of knowledge and knowledge management in the organization.

The methodology was divided into 3 fundamental phases:

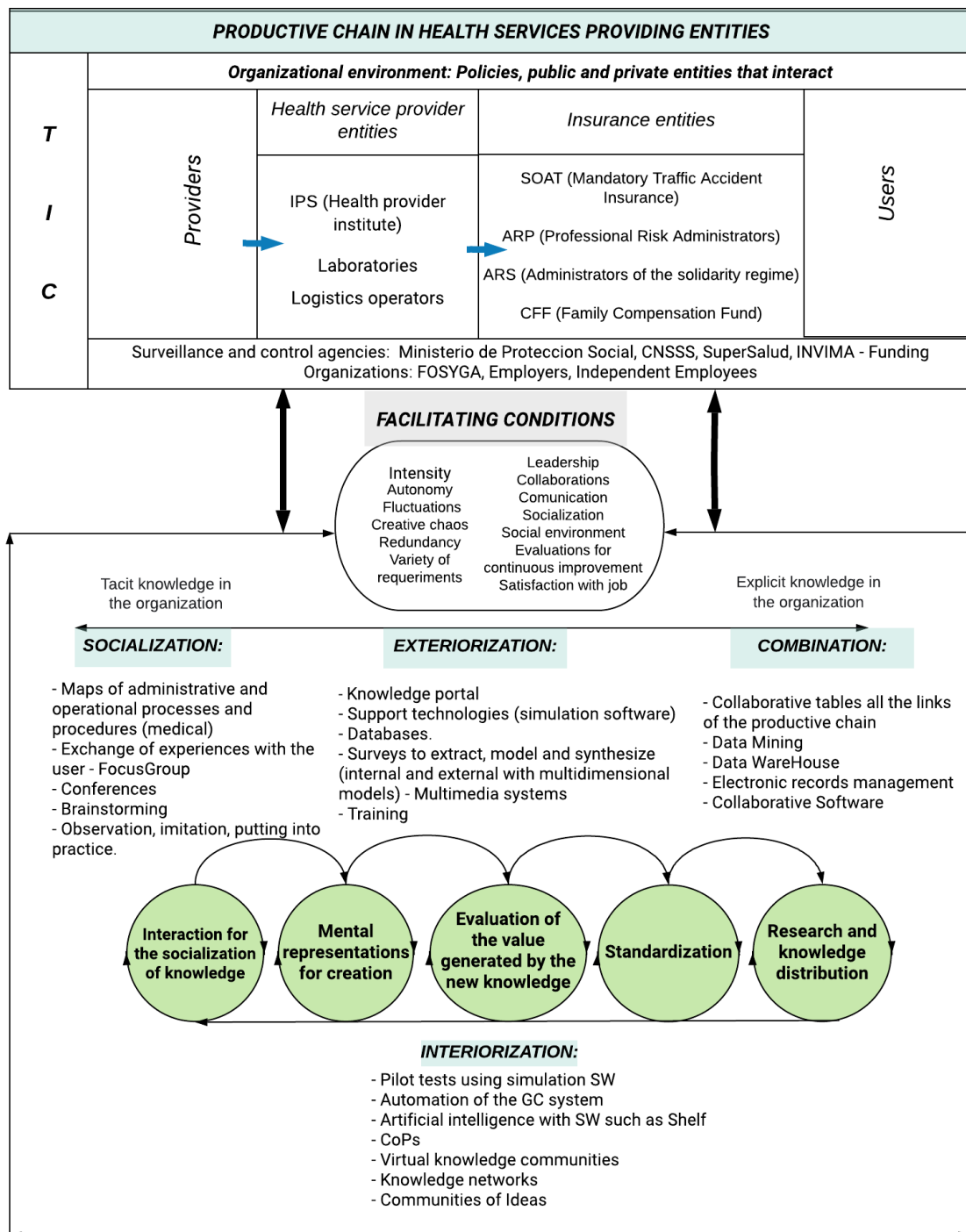
- The first phase aims to carry out a diagnosis and identification of the productivity chain of the health services promoter entities, the existing knowledge and interaction flows through an analysis of the strategies used in the entities with respect to the provision of the service and after that, the purification and classification of the information obtained, to identify the difficulties that arise and limit the adequate performance of the knowledge generation and management processes.
- In the second phase, the formulation and construction of the architecture of the model and the dynamic model of knowledge management are carried out based on the identification of the production chain, the state of the art and the information collected from various investigations.
- In the third phase, multidimensional measurement tools are enunciated for the evaluation of the perception of the quality of the service, which gives the health service provider entity visibility of the viability of the applied management model, and the identification of the correct interaction of flows between the links in the productivity chain.

#### **4. KNOWLEDGE MANAGEMENT SYSTEM TO IMPROVE THE QUALITY OF SERVICE IN THE HEALTH AREA**

This proposed model is based on the model of Nonaka and Takeuchi (1995), which is an infinite, spiral or cyclical model, where an interactive transformation of tacit knowledge is carried out, with the adequate use and conversion of individual knowledge for the promotion and the creation of a knowledge society in the health service provider entity, an intellectual capital as the main component of human capital in the actors of the productivity chain and with this the strengthening of the quality of customer service, thus reducing the barriers to knowledge transfer with a collaborative organizational culture.

For this, the four essential processes for the conversion of knowledge are taken into account: Socialization, externalization, combination and internalization.

Next, the representation of the relationship between the productive chain identified in the entities providing health services is shown (Figure 1), which has 4 fundamental links for the correct generation of interaction flows, and the management model of knowledge proposed for the improvement of the quality of attention and service to the user.



**Figure 1: Knowledge Management Model Based on the Productive Chain of Health Service Providers.**  
Source: Authors

In the first form of knowledge conversion, which is SOCIALIZATION, a conversion of knowledge from tacit to tacit is carried out, where harmonized knowledge is generated through the creation of a field of interaction between the actors of the productive chain of the provider entities. of health services, fostering mental models in the chain actors, socialization of experiences, observation, imitation, implementation, and brainstorming (Nonaka & Takeuchi, 1995).

This is followed by the second form of conversion called EXTERIORIZATION with which the generation of

conceptual knowledge is intended with the conversion of tacit to explicit knowledge, supported by a fundamental process for the creation of knowledge (Nonaka & Takeuchi, 1995), this is carried out based on metaphors and analogies, in order to create new explicit concepts based on the tacit knowledge identified, through surveys of multidimensional models, training throughout the production chain, and support technologies to support conceptualization.

As a third step is the COMBINATION process in which an exchange of knowledge and systematization of concepts is carried out that allow the generation of a knowledge system, and this in turn generates a systemic knowledge, in this process the knowledge is from explicit to explicit . In this process, it is essential to produce processes in the integration organization (Nonaka & Takeuchi, 1995) and dissemination of knowledge through tools that integrate the areas of the production chain.

Finally, there is the INTERIORIZATION process and where experiences are internalized by the individuals of the organization, generating a transition of knowledge from explicit to tacit, summarizing this process with the phrase; “ Learn by doing ” (Nonaka & Takeuchi, 1995), with the implementation of concepts and the interaction of knowledge flows between the links in the production chain.

These four forms of knowledge conversion mentioned above are obtained in a spiral, generating the creation of new knowledge at any stage of the interaction of the actors in the production chain.

To adequately raise the model, the productive chain identified for the health service providers and the five phases for the process of creating knowledge in the organization were taken into account, which are; Sharing tacit knowledge, creating concepts, justifying concepts, building an archetype, and expanding knowledge, which were focused on the productive chain of entities. Each of the phases is related to the forms of knowledge conversion.

The first phase that refers to Sharing tacit knowledge is closely linked with socialization, thus making it necessary to foster a field of interaction between the collaborators of the organizations in the health area, in order to share the knowledge that is possessed For this, tools are proposed that generate imitation, perspective, experience in the group, such as: process maps, exchange of experiences, Focus Group, conferences, Brainstorming, and thus define a strategic planning for the establishment of a management model of knowledge

In the next phase corresponding to the creation of concepts, sessions should be held where individuals discuss the mental representations that were generated in the socialization phase for the proper creation of the model, and its representation in each link of the chain productive, that is why the tools proposed for externalization should be used (Knowledge portal, simulation software, databases, multimedia systems, multidimensional models, training) which promote dialogue between individuals and therefore knowledge focused on the same direction, thereby achieving the correct conversion from tacit to explicit knowledge.

In the third phase pertaining to the justification, it is necessary to evaluate and investigate if the new concepts defined in the model add value to the production chain in general, and to the enrichment of the links and actors, Nonaka and Takeuchi state that the criteria for the justification of A new concept can be expressed as the degree of growth that this concept brings to the organization, in this sense the degree of increase in the quality of customer service, and the efficiency in the operations of the production chain and its relationships, for this purpose It must make use of existing technologies that allow the incorporation and adequate adherence of a centralized knowledge storage space.

Regarding the fourth phase of construction of the archetype (which is related to the Combination of the model), it

seeks to synthesize the new knowledge, for the productive chain of health service providers this is represented by the standardization and adaptation of new operational models, for this it is of utmost importance tools that facilitate dynamic cooperation as they are; Collaborative tables, Data Mining, Data Warehouse, Electronic records management and collaborative software, with which research, socialization and training are promoted to the organization's community.

The distribution of knowledge corresponding to the last phase is divided into the internalization of knowledge in the production chain with tools such as; artificial intelligence, automation of the knowledge management system, CoPs, virtual communities of knowledge with different entities that provide national and international health services that promote knowledge networks, providing the space for the acquisition of knowledge in the organization's productive chain, by On the other hand, the creation of knowledge must be continuous and therefore repetitive since the organization that creates new concepts must be a system that originates the constant exchange of knowledge with the environment (external variables), in turn these new concepts cause the generation of others that expand to all the links and actors of the production chain, therefore an important factor is continuous research. The proposed facilitators are those conditions that were considered necessary in the productivity chain to adequately allow the spiral of knowledge.

## **5. TECHNOLOGICAL ARCHITECTURE FOR THE COMPREHENSIVE HEALTH SERVICE**

The form of technological integration that was applied was used specifically in the functionality of the applications, through what can be called an application integrator or an integrator component of a knowledge management system and information systems, which helps to users in the evaluation, interpretation and adaptation of knowledge to a new context, domain or application. This application integrator, as shown for example in Figure 2. (database / knowledge), supports the sequential flow of explicit knowledge outside the repository. It also provides the means to share knowledge exchange, where members of the user community (eg. employees, doctors, researchers, patients, etc.) share, understand and contribute knowledge through their experiences.

Therefore, the following architecture of the comprehensive health service is defined through knowledge management and support of information and communication technologies (Figure 2).

Another very important aspect from the point of view of data is data storage or "Data Warehousing", online analytical processing (On Line Analytical Processing - OLAP), and data mining are three of the most important technologies. in the field of Business Intelligence (Rodríguez, Medina & López, 2015). Data storage can be defined as a "large" repository of historical data related to the organization that supports decisions (Medina Garcia, Medina Estrada & Tarazona, 2019). OLAP is a technology that is based on the multidimensional analysis of data and data mining is the process of identifying and interpreting patterns in the data to solve a specific business problem (Rosabal, Vázquez, Vidal & Reyes, 2017).



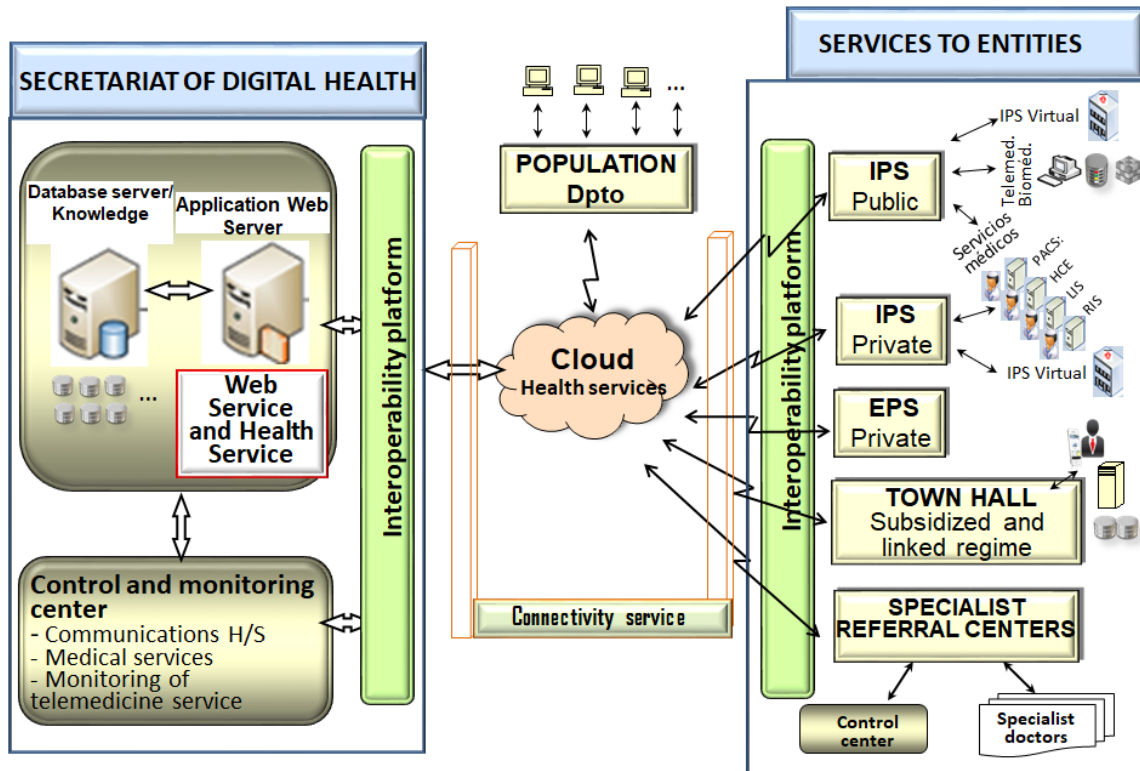


Figure 2: Technological Architecture of the Comprehensive Health Service.

## 6. TOOLS, MULTIDIMENSIONAL MODELS AND OTHER METHODS FOR MEASURING THE PERCEPTION OF SERVICE QUALITY IN THE HEALTH AREA

To guarantee the effectiveness of the implementation of the knowledge management model, a series of facilitators was proposed, since these are those conditions that were considered necessary to adequately allow the spiral of knowledge, which is why it is essential to apply a method of evaluation of the stages mentioned above by means of indicators based on the facilitators that provide parameters of behaviors of the individuals participating in the process of implementation and application of the CG model, thus achieving the objectives proposed in the strategic planning. These indicators should be used to constantly evaluate the processes implemented in the organization, in order to obtain relevant information for the continuous improvement of the model.

The indicators must be measurable, clear, specific to the 5 stages of the process and to the perception of the quality of the service, in order to obtain a diagnosis that is reflected in the correct management of knowledge in the productive chain of the entities that provide health services.

Therefore, to carry out the evaluation of the indicators, a selection of the hierarchy of activities to be carried out is made for each stage of the process, where the time per activity, the fulfillment of the proposed objectives and the perception that each has is evaluated. individual of the process, both individual and group, the latter through a questionnaire to assess contributions, interpersonal relationships, use of technologies, and consensual decision-making, with a quantitative assessment for subsequent statistical analysis, identifying weaknesses and strengths in the process.

Finally, it is essential to evaluate the perception of the quality of the service and the behavior of the knowledge management model in the productive chain of the entities that provide health services, thus helping decision-making through the tools and benefits obtained through the different multidimensional models as indicators of the quality of the

service from the point of view of the client (agent external to the organization); In the first place, SERVQUAL used as a mechanism for evaluating the quality of services, this tool aims to evaluate the quality of services, considering 5 dimensions; reliability, responsiveness, security, empathy and tangible elements, this contrasts what the user expects from the service with what they perceive, and SERVQHOS for the perception of the end user about the care received by health personnel, where A more specific assessment of the quality of the service is obtained by assessing a lower percentage of attributes, this model has been used in several investigations in Colombia, given its validation, it measures objective and subjective aspects related to the tangible and intangible processes of care in Health.(Numpaque & Rocha, 2016), (Donabedian, 1993).

These two models provide visibility into deficiencies in the productive chain, since they evaluate the user's perception and expectations regarding the way in which the links in the chain provide health services, these multidimensional tools have a clear emphasis on the quality of the service provided to the end user, providing clear and concise guidelines on what is happening with the end user service, showing the virtues and / or shortcomings of the service, being a source of information for organizational decision-making in the production chain whose purpose will always be the satisfaction of the user's needs.

The knowledge management model must be supported to a great extent by the indicators for the production chain and by the multidimensional tools ServQual and ServQhos, since with their help the initial information for the development of information management in the chain, in addition to this is support for model feedback. By using the external management indicators of the QMS, it will be possible to identify the differences that exist in the modeling of the system and the application in the areas of customer service and the links in the chain, determining the gaps between the theoretical and the practical, an element fundamental for the recognition of information and / or knowledge leaks generated in the organization.

## **6. CONCLUSIONS**

In the present research work, a state of the art was carried out where it was possible to identify the deficiency of the quality in the customer service in the entities that provide health services, thus being evident the need to create a model that would allow managing the information and the knowledge in a correct way, through its identification, analysis, adaptation, dissemination and transfer of it. By making a correct adaptation of the proposed model, health organizations will generate qualitative and quantitative qualifications of the tools of the multidimensional models that improve with respect to the scores obtained before the application of the knowledge management model.

It is essential to emphasize the importance of ICTs, which will allow for the integration, consolidation and strengthening of KM as it provides the community with a constant knowledge society through scientific and technological research, avoiding the existence of information leaks and / or essential knowledge which will benefit the entities involved in customer service processes.

The application of this knowledge management model provides an extensive vision of what happens internally and externally in the organization, taking into account the changing environment, which is why the creation of knowledge must be based on external knowledge variables, promoting the fields of interaction and adequate spaces for continuous research that demonstrates the need to adapt to change, that is why the patterns to be followed, the behaviors of the environment and all the variables that affect the company must be clearly identified.

According to the aforementioned studies, it is concluded that the quality of the service is a consequence of the processes in the production chain, which presents difficulties in the collection and analysis of incoming information, in terms of knowledge, it is observed that in the links of the production chain, there are information leaks that limit the transformation of knowledge in organizations, and therefore the importance of knowledge management in the management of organizational knowledge flows and the generation of new alternative solutions to address problems quality in the service of health promoting entities.

The productive chain of the health service providers must take into account the information flows in each link because one of the biggest drawbacks when managing information in the productive chain is the leakage of information in the links, represented in the interaction with end users, which hinders proper knowledge management in the production chain, interrupting the knowledge cycle generated by health service providers, clearly seeing the impact on the quality of service in the Health services.

## ACKNOWLEDGEMENTS

A special recognition and thanks to the Industrial Engineering Program of the Engineering Faculty of the Universidad Distrital "Francisco José de Caldas", in Bogotá - Colombia, who facilitated the process of this research work.

## REFERENCIAS

1. Arellano Díaz, H. O. (2017). *La calidad de servicio como ventaja competitiva*.
2. Asociación Colombiana de Hospitales y Clínicas. (2017). *Ranking de desempeño de los sistemas de salud: Colombia ocupa el puesto 48 entre 99 países*. <https://achc.org.co/ranking-de-desempeno-de-los-sistemas-de-salud-colombia-ocupa-el-puesto-48-entre-99-paises/>.
3. Calderón, C. A. A., Botero, J. C., Bolaños, J. O., & Martínez, R. R. (2011). *The Colombian healthcare system: 20 years of achievements and problems*. *Ciência & Saúde Coletiva*, 16(6), 2817.
4. Diaz Piraquive N., Medina García V. H., & Tarazona Bermúdez G. M. (2019). " *Modelo de gestión del conocimiento de apoyo a la gestión de proyectos* ", libro, *Doctorado en Ingeniería - Universidad Distrital Francisco José de Caldas*. Amadgraf Impresores Ltda. ISBN: 978-958-787-097-8. Págs. 374. 1ª Ed. Bogotá, Colombia, Marzo de 2019.
5. Donabedian, A. (1993). *Continuity and change in the search for quality*. *Salud publica de Mexico*, 35(3), 238.
6. Guru, C. (2003). *Tailoring e-service quality through CRM*. *Managing Service Quality*, 13 (6), 520- 531.
7. Ilima, S. M., Castro, A. M., Mengo, O., Medina, M., Maestrey, M., Trujillo, V. & Alfaro, O., *La dimensión de entorno en la construcción de la sostenibilidad institucional* (2001).
8. Ipsos Group. (2020). *Global Health Service Monitor 2020*.
9. <https://www.ipsos.com/sites/default/files/ct/news/documents/2020-11/ipsos-global-health-service-monitor-2020.pdf>.
10. Isaza Castro, J. G. (2009). *Supply Chains: Approaches and Concepts (Productive Chains: Approaches and Conceptual Precisions)*, 8-25.
11. Kruk, M., Gage, A., Arsenault, C., & Jordan, K. (2018). *High-quality health systems in the Sustainable Development Goals era: time for a revolution*. *Lancet Global Health*, e1196-e1252.
12. López, M., Hernández, A., & Marulanda, C. E. (2014). *Procesos y prácticas de gestión del conocimiento en cadenas productivas de Colombia*. *Información tecnológica*, 25(3), 125-134.

13. Medina García, V. H., Medina Estrada L. M., & Rivas Trujillo, E. (2018). "Integral Knowledge Management System in Health", in *Journal Communications in Computer and Information Science* 877. *Knowledge Management in Organizations*, Ed. Springer-Verlag Berlin, ISSN 1865-0929, pp. 368-379. ISSN: 1865-0937 (electronic) August, 2018.
14. Medina García V. H., Medina Estrada L. M. & Tarazona Bermúdez G. M. (2019). "Investigación en Ingeniería apoyada por la gestión del conocimiento y la internet social", libro, *Doctorado en Ingeniería - Universidad Distrital Francisco José de Caldas. Amadgraf Impresores Ltda.* ISBN: 978-958-787-082-4 Págs. 230. 1ª Ed. Bogotá, Colombia, Marzo de 2019.
15. Nieves Lahaba, Y., & León Santos, M. (2001). *La gestión del conocimiento: una nueva perspectiva en la gerencia de las organizaciones.* *Acimed*, 9(2), 121-126.
16. Nonaka, I., & Takeuchi, H. (1995). *The knowledge creating company*, 1ª edición, Oxford University Press, New York (1995).
17. Numpaqué-Pacabaque, A., & Rocha-Buelvas, A. (2016). *SERVQUAL and SERVQHOS models for the evaluation of quality of health services: A literature review.* *Revista de la Facultad de Medicina*, 64(4), 715-720.
18. Otálora, M. L., & Orejuela, A. R. (2007). *Health service quality: a literature review from a marketing perspective.* *Cuadernos de administración*, 20(34), 237-258.
19. Rodríguez Bernal L. L., Medina García V. H., & López Quintero J. F. (2015). "Knowledge Management and Intellectual Capital in a University Context", in *Journal LNBIP* 224 - *Lecture Notes in Business Information Processing*, Ed. Springer-Verlag Berlin, ISSN 1865-1348, pp. 741-753. ISSN: 1865-1356 (electronic) August 4, 2015.
20. Rodríguez Rojas, L. A., Medina García V. H., & Tarazona Bermúdez G. M. (2013). "Gestión del conocimiento en el turismo de salud", libro Editorial Servitec. ISBN: 978-84-695-8324-1. Págs. 201. 1ª edición. Oviedo, España, Julio de 2013.
21. Rosabal, E. M. D., Vázquez, A. E. G., Vidal, J. M. D., & Reyes, D. D. L. C. S. (2017). *Las TIC y la gestión del conocimiento.* *Revista de Investigación en Tecnologías de la Información: RITI*, 5(10), 28-35.
22. Sánchez, A. A. C., Carlos, M. D. O., & Hernández, J. G. Á. (2019). *Evolución del concepto de calidad y los modelos de medición de calidad en el servicio (Evolution of the concept of quality and service quality measurement models).* *Innovaciones de Negocios*, 15(30).
23. Simanca, M. M., Montoya, L. A., & Bernal, C. A. (2016). *Gestión del conocimiento en cadenas productivas: El caso de la cadena láctea en Colombia.* *Información tecnológica*, 27(3), 93-106.
24. Veillard, J. H. M. (2019). *Evaluación Externa de la Calidad de la Atención en el Sector Salud en Colombia (No. AUS0000853, pp. 1-130).* The World Bank.