Deployment of local e - government

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Abstract

This work aims to diagnose and demonstrate the importance of education and technological training to technologically modernize administrative and operational processes carried out in the local public administration in Mexico, once diagnosed the problem, and is proposed a solution integral. By collecting of information, contextualization of education and local government, make use of scientific methodologies: indicative, systemic - structural - functional to support this, in addition to field work by surveying the players involved in these processes. This obeys performed investigations in several municipalities of Mexico to successfully implement information technology in processes where the authorities and citizens are involved.

Keywords: Technological modernization, education, training, integral solution.

1.Introduction

Today, technological modernization in administrative and operational processes carried out in the local public administration in Mexico has become important by economic, human, and environmental factors that must be considered before are included in this, to successfully modernize these processes, also ensure their development and permanence short medium and long term. This is important to do research to diagnose and propose solutions to ensure technology implementations. This article presents just two factors according to the author, these are education and training. Shows in this article the types and methodology scientific of research, in addition to briefly contextualize education, public administration, technology upgrading and finally, the results and proposal.

2.Methodology of the research

Are presented, in the following points the research methodology employed in the investigation.

2.1.Type of scientific research

By the characteristics of this research, the following types of scientific research were contemplated: Descriptive, According to Fernández, Narez, & García[1], this type of research is the characterization of a fact, phenomenon, individual or group, to establish its structure or behavior. Explanatory is responsible for searching the reason of the facts by establishing cause-effect relationships. Field research, Says Hernández, Fernández, & Baptista[2] is the main technique is employing the survey. The Survey is a technique for acquiring information of sociological interest, using a questionnaire previously developed.

2.2.Scientific research methodology

It is important to consider in scientific research and technological development, the methodology to be used at the beginning and during the investigation as this guide and delimit the proposal is intended. Furthermore, this methodology should consider the findings that are generated during research for the purpose of founding and endorsed research. The research methodology provides the methods and procedures for scientific-research activity with quality.

The methods are access to sources, hence importance of their selection and use. In the case of this research the following research methods are distinguished:
•Structural Systemic Functional Method, according Fernández, Narez, & García[1] indicate the following: this type of method is used in structures and systems. Its action is evident in the interplay of ideas, connecting concepts, recommendations and systems modeling, methodologies, and strategies.
•Inductive. Indicates Castillo de la Peña[3] is the reasoning from the knowledge that the characters needed or necessary connection of objects in a class.

3.Context of education in Mexico

To locate the educational process that has taken Mexico since pre-Hispanic times to the present, then presents a brief sketch of this

3.1.Education in the erapre-hispanic

According to Escalante [4] was systematic, complex, and rigorous process by which societies prepare their children and teenagers for to performance into adulthood

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was very ancient in Mesoamerica. Schools were not just centers of education, as now are conceived. Among the Mexica schools were mainly species of temples, religious institutions that focused on children and youth for the service, the children went to work and to educate. Several school classes are mentioned in documentary sources. The calmecac ("place of the row of houses") was intended for the nobility, though not exclusively. The telpochcalli ("youth house") was the school they were almost all commoners. There were seven calmerac citywide; instead, the telpochcalli were very numerous, it is said that there were ten or fifteen in each neighborhood. Female school ichpachcalli ("house maids") is possible that they were more of them, dedicated to different gods.

3.2.Education in Mexico in the colonial era

With the arrival of the first missionaries to New Spain says Castrejon[5], the various religious orders took the training and education, initiatives to create educational institutions born of the need to train new priests and expand evangelism. It is for this reason that the church took such an important role in education. However, the religious orders had not intended to consolidate a formal education system, only educate and train new local elites. For nearly three centuries, until shortly after the culmination of Independence, the religious educational model relied heavily on Kant's doctrine, which established based on discipline as the central idea of the educational process instruction, represented a process of substitution or elimination of concepts and mental categories of the Hispanic cultures by new schemes and lifestyles more convenient to the Spanish culture.

Moreover, public education say Ramos [6] is one of duties of every enlightened government and only the despots and tyrants claim ignorance of the people to abuse their rights more easily. The educational rights are embodied in the Constitution issued by the Cortes of Cadiz in 1812 Curated in New Spain in September and later suspended and restored (twice) left in the hands of municipalities care elementary and noted as one of the duties of the councils promote education, in Article 366 of Title IX.

3.3.Education in the age of independent Mexico

The Federal Constitution of the Mexican United States of 1824 stood alone as power of government, through Congress, set all kinds of educational institutions. It stated that the same right should the state legislatures, but nothing about elementary education. Hence the lack of resources prevented any state action. This topic remains in the hands of the Lancastrian Company, founded in Mexico on February 22, 1822, and federal and state aid, the country was founded in elementary and normal schools. Says Meneses [7] that in 1867 the Organic Law of Education was promulgated, in her free and compulsory primary education was established, it precluded all curriculum and religious education contained provisions for secondary education, under the principles of positivism.

The school of Preparatory Studies laid the foundation of professional education. The law only applied to the Federal District and the federal territories, but exerted influence over state laws. During the Porfiriato according to Martínez[8], JoaquínBaranda, Minister of Justice and Instruction, convened two conferences where educators, teachers, intellectuals, and authorities met. The results of these conferences helped define a new government project of public education, which was

consolidated with the promulgation of the Compulsory Education Act 1888. With the arrival of Justo Sierra to the Undersecretary of Public Instruction in 1901 opened a new period in the history of Mexican education system. At this time the Department of Public Instruction and Fine Arts was established, which Justo Sierra was the first owner in 1905.

3.4.Education in post-revolutionary era

Indicates Monroy [9] that during revolutionary period, the forming process of the Mexican educational system had a significant setback, however, at the end of this period, with the promulgation of the Constitution of the Mexican United States of 1917, was first awarded to the constitutional right of every Mexican citizen has to receive a secular, compulsory and free education. Also, higher educational powers to the State to coordinate and monitor the operation of public and private schools were awarded, unfortunately, with the abolition of the Ministry of Public Instruction and Fine Arts given by the Constituent Congress. The presence of various factors such as the existence of scattered rural settlements throughout the territory, the chronic lack of budgetary resources, heterogeneity in the ways each state and municipality attending their duties and a highly reduced magisterial plant, exacerbated this situation. The creation of the Ministry of Public Education (SEP), in September 1921, was a decisive event as say Iturriaga[10], to change this situation, facilitated the concurrent action of the federal government directly throughout the country. With this, it was possible to balance a little uneven attention afforded to state and local education services. José Vasconcelos, the first holder of this institution, made a new educational system to meet the needs of education and academic training of all social sectors. One of the most important contributions of management Vasconcelos was rural education: elementary schools and some rural normal schools were created, and cultural and technical missions, educational groups, professionals who addressed various rural locations to train teachers and work were formed in favor of the community.

3.5.Education in the modern era in Mexico

Basic education in the Mexico said Lopez [11] has several transformations in its time responding to specific contexts and needs. One of the most important (prior to 1992) was to achieve universal primary education, an educational policy characterized by focused coverage, based on the principles of the Free Mexican Constitution, such as secularism, and democratic basic education and the right of all individuals to receive education.

Then in May 1992 the National Agreement for the Modernization of Basic Education (NAMBE) is carried out a redistribution of the functions of the federal government and state governments in relation to the operation of services of preschool primary and secondary, which mostly happen to be administered by the state governments, besides obtaining powers to meet the construction, rehabilitation and equipping of schools. The Federation for his part, agreed to transfer sufficient resources of state governments for the management of primary schools. In 1993, in addition to the decentralization process triggered by the signing of NAMBE, the obligation for the State to

provide secondary education through the amendment of Article 3rd set. Constitutional, and in 2002 the reform becomes compulsory preschool education are made. With these reforms, educational policies in Mexico focused on the coverage, which to date have made significant progress, as well as indicators of efficiency, failure, and dropout rates in basic education.

However, the globalization of the education and the knowledge economy, revealed a new approach to evaluate the progress of education, quality of education, measured by student learning, which focuses indicator of education policy today, finally the last update that protects in the constitutional primary public education in Mexico in the Clause 3., Fraction I to VIII, which gives the following, according to the Cámara de Diputados del H. Congreso de la Unión (2010). Article 3 of the Constitution of the Mexican United States says the letter as follows: "Everyone has the right to an education. The State-Federation, States, Federal District and Municipalities, provide preschool and secondary education, primary, preschool, and school, primary secondary made compulsory basic education. The education provided by the state tend to develop harmoniously all the faculties of man and promote him, at once, the love of country and an awareness of international solidarity, independence, and justice, "Fractions I to VIII".

4.Context of the local public administration

This section presents what administrative and the operational processes that were investigated and are in the process of modernization, which are the mainstay of the local public administration in Mexico. According to the Chamber of Deputies of Mexico, the municipal utilities are those which by law must provide the municipality and they regulated under the provisions of Article 115 of the General Constitution of the Republic. In Section III reads: The Municipalities with the assistance of the states, where necessary. They will establish local laws; they will be responsible for the following public services.
1.Drinking Water, Sewerage, Drainage and Wastewater
2.Street lighting, Cleans and waste disposal
3.Markets and supply centers
4.Pantheons, Trail
5.Streets, parks, gardens, parks, and recreation
6.Transit Public Safety and
7.Beautification and maintenance of the villages, cities and works of social interest
8.Social assistance in the field of competence
9.Employment

4.1.Classification of municipally public services

According to Serra [12], public services can be qualified in four categories:
•Internationals public services
•Federals public services
•States public services
•Municipally public services

5.Context of the technological modernization

It is important to note context of current technological modernization and trends incorporation process, evolution, etc. to have a reference parameter and to successfully achieve

the goal of modernizing the processes. According to Gaston & Naser[13] the United Nations has defined a framework of e-government development in four maturity levels, which serve as a reference for countries to define their own models:
a)Emergency level: The country is committed to develop e-government, providing information on a single track (government to citizens).
b)Improved level: communication from one to two-way interaction with the public through email, downloadable forms, applications, audio, video and filing is extended.
c)Transactional level: The State offers complete and secure transactions such as payment of taxes and fines, registration, obtaining permits, licenses, and certificates, among others.
d)Connected level: Information, data and knowledge are transferred between organisms, for instant access to state services in an integrated manner and with a citizen-centered approach.

5.1.Incorporation process of the Information and Communications Technology

The incorporations process according to Montaño[14] is recommending the next:
1.Preparing the environment. The preparation of the environment involves two preliminary events, one to define the scenario where the change will take place (organizational culture) and another to define the strategic management process through the creation of a unit responsible
2.Sensitization of Innovation. The initial phase of this process includes the socialization of current issues
3.Exploration Technology Resources. The exploration phase of technological resources may be called "Directed Test Phase"
4.Exploration Educational Resource. The focus of this phase is focused on the development of training, which incorporates the active participation of stakeholders (administrative, operational and citizens)
5.Generating proposals or prototypes. This phase is to establish ICT proposals that involve project work, collecting resources and with technological training, previously evaluated in the previous stages, allowing reuse and adaptation, through specific projects
6.Feedback. This phase is aimed at the interaction between ICT and operators of the same incentive to make suggestions for improvement or technology upgrades

5.2.Benefit of the e- government

According to Garson [15], a useful way to present these benefits understands them as results of certain actions and e-government initiatives. In this sense, the contributions can be summarized as follows: improving the quality of public services, efficiency and productivity in government processes and operations, transparency and accountability, citizen participation, regulatory framework to support e-government.

5.3.Tendencies of e – government

According to Gaston & Naser [13], the trends on the issues that are currently being developed with more force in developed countries and probably touches in Latin America in the short term, with the advantage of incorporating the lessons and adaptations. Is presented below:
1. Disaster Recovery
2. Cloud computing

3. Civic Engagement
4. Indicators of e-government
5. Open government.

6. Proposal to deploy the organizational structure in coordination with the implementation of digital government in local governments

For the deployment of the organizational structure of the proposal in coordination with the implementation of the digital government of local governments, it is suggested to start with modifications / adjustments to the federal, state, and local regulatory framework so that it allows the incorporation of a controlled and coordinated way of organizational structure emphasizing the use, development and implementation of information technology and services (see Illustration 1)
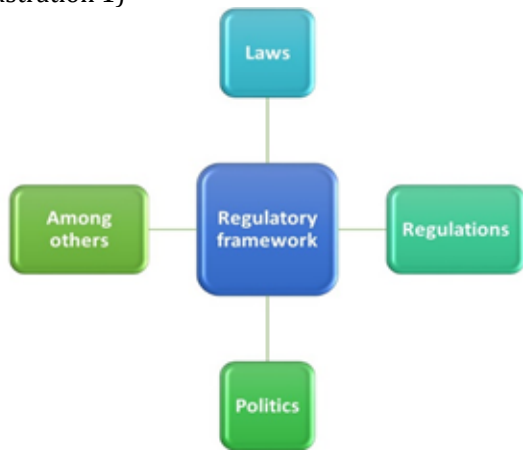

Illustration 1. Modification / adaptation of the regulatory framework
Source: Own (2020)

Later identify the internal and external dimensions of digital government, as well as the actors involved from the following blocks: Citizens, companies, employees, and government. Once they have been identified, solutions must be proposed that are directed and consistent with the regulatory framework that permits their operation, as well as their implementation according to local plans, programs, and policies (See Illustration 2).
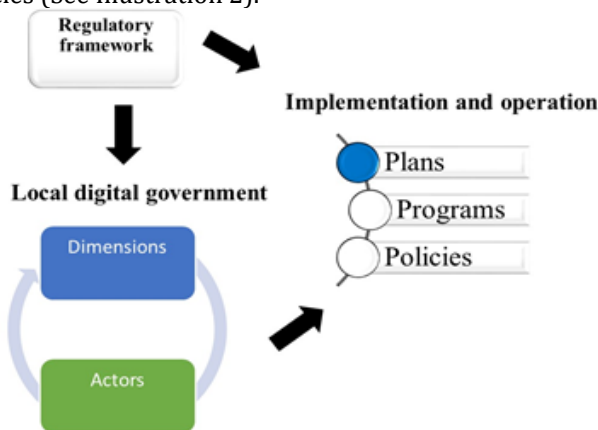

Illustration 2. Identification, action, operation, and implementation
Source: Own (2020)

Once the implementation has been carried out, it is suggested in parallel to guarantee the transition between the phases of digital government, so as not to hinder the operation, on the contrary, optimize the processes, eliminate duplication of functions, and if it is necessary to reengineer processes that go hand in hand with these phases, this brings therefore the adaptation of the normative framework that allows to apply the re-engineering of processes.

Subsequently, when carrying out the planning, implementation, and start-up of the phases of digital government, the indicators of digital government are designed along with those suggested by the United Nations (2016), which will enable immediate assessments to be made. Above all make improvements and make symmetric measurements with other municipality of the state, and these with the federal ones, to learn, share, know, value and in this way, it is appropriate to implement the solutions that are given between these governmental actors, according to Illustration 3.
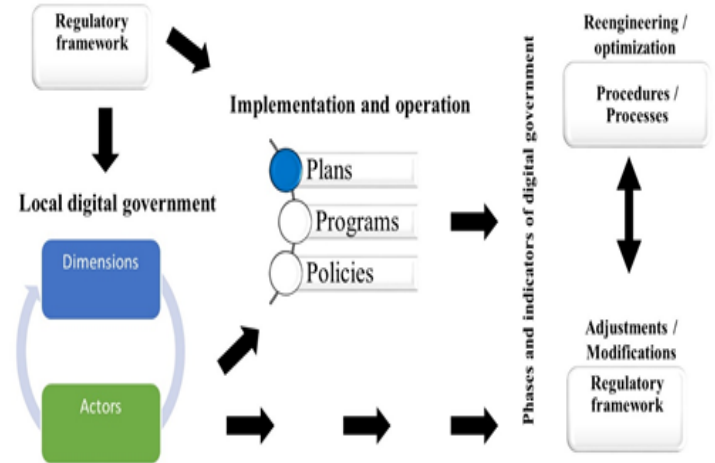

Illustration 3. Integration of the phases and indicators of digital government
Source: Own (2020)

This suggestion of the deployment of local digital government and its context indicated in Illustration 4, must be in a gradual way in order to guarantee success, permanence and evolution over time, which will endure and improve in the long term, independently of the term of governmental.

Finally, it is proposed that phases of the organizational structure be gradually integrated into the deployment to ensure the implementation of digital government, its planning, organization, and long-term implementation.

The research was conducted in the municipalities of Ecatepec, Coacalco, Tecámac and Nezahualcóyotl in the State of Mexico, Municipality of Querétaro, Querétaro State, Town of Pachuca, Hidalgo, and Miguel Hidalgo in Mexico City. In this investigation were detected and diagnosed different factors impeding the modernization of administrative and operational processes, among the most important are highlighted educational levels and continuous technology training. By one side, the authorities have the responsibility to give the attention for the citizens and by other side, the citizens to receive the services. And something very important the feedback that should exist between these actors, including processes was modernized to encourage their successful incorporation, development, and retention in the short, medium, and long term. The results were

daunting, educational levels low, and as such an opportunity for significant improvement, because it requires urgent increase educational levels. According to the INEGI (2010), at the national level only 18.36% of citizens older than 18 years, have baccalaureate and higher education completed or in process, which means that the remaining 81.37% have not completed baccalaureate and higher education, indicated in the Illustration 5.

This indicates that a higher level of studies is likely to bring more great ideas and feedback objectively about technological modernization from the point of view of citizens and from the point of view of the authorities' greater studies could ensure technological modernization, its incorporation, development, and retention, in addition to providing feedback to the citizen. Moreover, the continuous technology training is no stranger to the technological modernization of the processes indicated.

The author recommended, continuously train a municipal authorities and citizens, aided by higher level institutions to guide plans and training courses. To generate an objective criterion about the analysis of the population aged 18 years and over, according to Illustration 6, It show the size of the population of that age that have baccalaureate or higher education, completed or in process, according to Illustration 6. Finally, it shows the population that has access, according to the Illustration 6.

As seen in Illustration 7 and 8, while is lower the educational gap, greater scope of technology, in the case of Miguel Hidalgo delegation, Pachuca and Queretaro, they already have significant advances in technological modernization, the creation of information systems, while in other municipalities are in the process of technological modernization, but it requires more education to continue with such modernization, still do not have information systems are aided social networks for technological modernization of their processes.

7.Discussion

After presenting the results, the following proposal in which references to the importance of continuing education and technological training, as well as other factors that are relevant according to the author to ensure technological modernization, promote their evolution and permanence short, medium, and long term. Having identified the factors that impede the successful implementation of information systems, the proposed solution is presented below to assist in this implementation.
•Initiation / Preparing the environment / Creation of indicators
•Initiation. Continue to search for administrative and operational processes that may be aided by information technology.
•Preparing the environment. Define the environment or place where the incorporation of information system is done correctly and lead through a department or responsible leadership
•Creation of indicators. From the initiation and preparation of the environment, create indicators that can measure certain technological and administrative / operational procedures to detect deviations and propose corrective measures. Contagion / Sensitization of innovation / Development of

indicators.
•Contagion. Promote the use of information systems to assist in the operational and administrative activities of public education.
•Sensitization of innovation. Behold the socialization of current topics that is awareness among the objectives sought with the use and implementation of information systems.
•Development of indicators. Continue the development of indicators to detect deviations and corrective measures.
•Control / Exploring of technological resources / Measurement or the indicators.
•Control. This phase is critical to assess and identify omissions and errors in systematized processes, find the source and fix the problem.
•Exploring of technological resources. This phase should seek technologies that meet the needs of improvement opportunities, and currently have various alternatives of technologies as tools for the systematization of administrative and operational processes, at this stage should be find the advantages and disadvantages of each technology to select the ideal.
•Measurement or the indicators. Once in the earlier stages were designed the indicators, in this is proposed to start with the step of measuring of results, ie detect possible deviations and propose strategic measures. Without losing sight of the main objective. Integration / Exploration of educational resources / Measuring of the Results
•Integration. Call for an interaction between the actors of the administrative or operational process in which information systems are integrated in order to increase system functionality and improving operation.
•Exploration of educational resources. This phase is one of the most important as it has to do with the training of the people involved that make use of technology, they must train and prepare for the use of such technology to efficiently and effectively use this, in order to avoid underutilization. In addition to encouraging the creation of new ideas for improving the use of technology. Moreover, administrative authorities and citizens must join efforts to promote the gradual increase in the educational level of the population in order to technologically modernize administrative and operational processes of the municipal government.
•Measuring of the Results. Continue with the detection of deviations or errors in the operation of the system or to identify improvements in procedures, depending on the indicators previously designed. Information Management / Generating proposals and prototypes / Certifications and technological developments and increased functionality
•Information Management. Suggest new indicators that can assist in decision making and present strategies to continuously improve the efficiency of the system and the processes involved in it.
•Generating proposals and prototypes. This phase aims to create proposals for the systematization of administrative and operational processes in public primary education. To ensure satisfactory implementation and in ongoing evolution.
•Certifications and technological developments and increased functionality. At this stage it is suggested that once it has made the creation, evaluation, and implementation of strategies to improve opportunities for improvement from

the indicators, begins with the certification process of the processes, in addition to providing technological developments with new versions, updates, and moreover, facilitate increased functionality within the information system, to continue the process of incorporation, development and improvement of the information systems. Maturity / Feedback / Certifications, technological developments, and increased functionality

•Maturity. It is important that the proposals can serve as support for education authorities at any level. Besides innovating with improvements in the system or creation of new information technologies, which aid them in continuous improvement of school management.

•Feedback. This part is from the point of view of the author, a central part and the interaction required between information systems and the operators thereof, to make suggestions for technology upgrades. [16,17,18,19]

•Certifications, technological developments, and increased functionality. Is suggesting further evaluation and implementation of strategies to improve opportunities for improvement based on the indicators. Start with the certification process and ultimately foster increased functionality within the information system.

The implementation of the proposed phases, at the suggestion of the author may vary, as this is adaptable to every situation, the importance lies in analyzing the needs and aim to be the incorporation of information systems, and of course its evolution and stay short, medium, and long term, presented below in Illustration 9, the proposal.
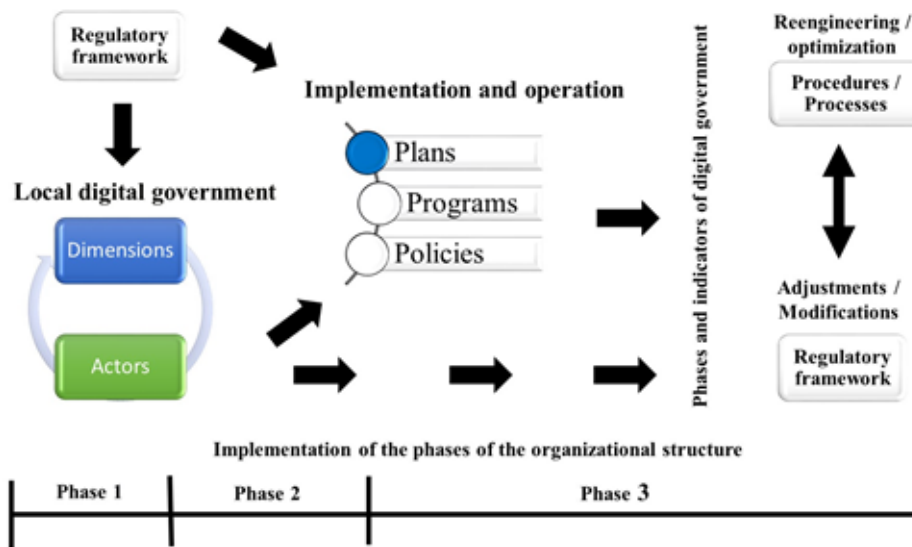

Illustration 4. Incorporation of the proposed organizational structure for the deployment of digital government
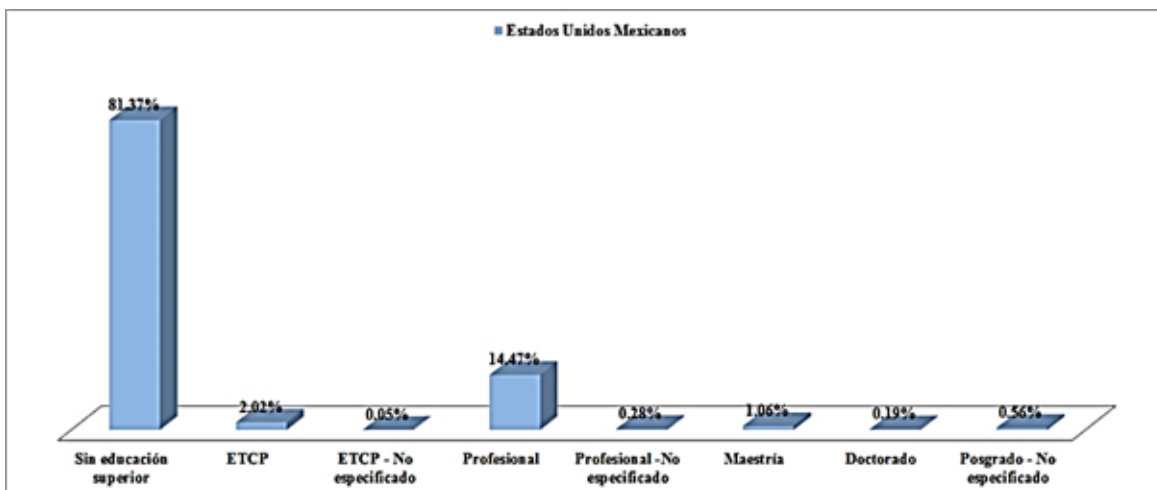**Source: Own (2020)**

Illustration 5. Population 18 years and over and approved degrees in technical or commercial studies completed and professional school, nationwide.
Source: own (2020), from data presented by INEGI (2010), http://www3.inegi.org.mx/sistemas/TabuladosBasicos/ Default.aspx?c=27302&s=est, accessed 31/07/2012
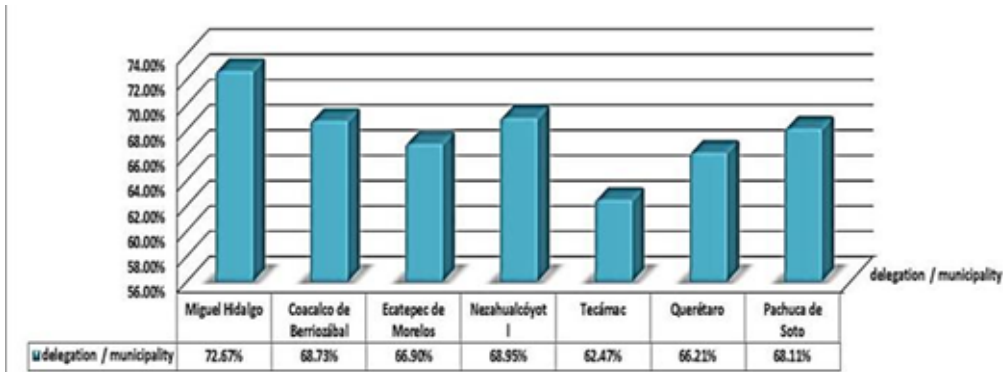
Illustration 6. Population 18 years or more of the municipalities / delegation in study
Source: own (2020), from data presented by INEGI (2010)[16], http://www3.inegi.org.mx/sistemas/TabuladosBasicos/
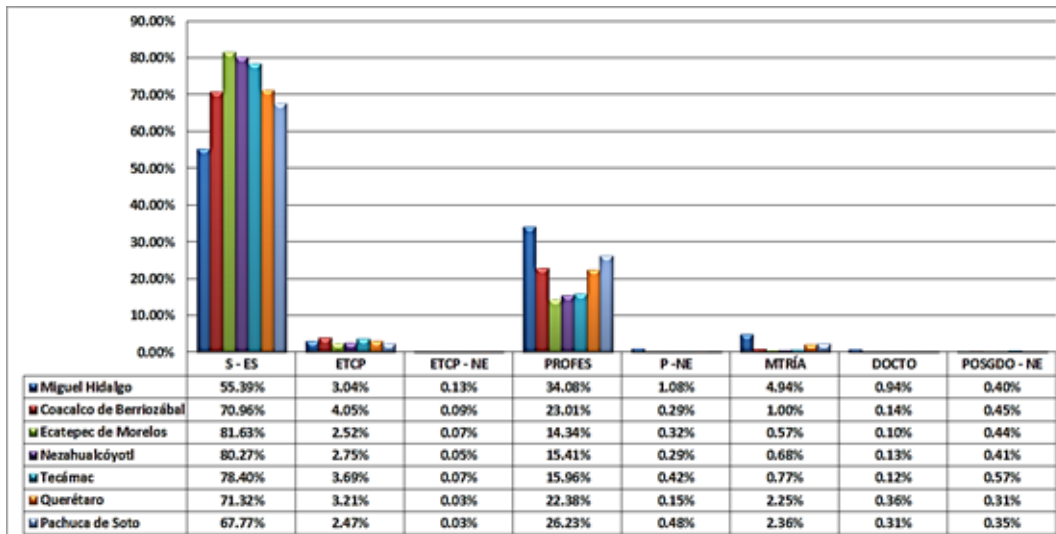**Default.aspx?c=27302&s=est, accessed 31/07/2012**

Illustration 7. Population 18 years and over and approved degrees in technical or commercialstudies completed and
professional of the municipalities / delegation in study.
Source: own (2020), from data presented by INEGI (2010),[16] http://www3.inegi.org.mx/sistemas/TabuladosBasicos/
Default.aspx?c=27302&s=est, accessed 31/07/2012. S-ES. Without higher education; ETCP. Commercial or professional
technical education. ETCP-NE. Commercial or professional technical education - Not Specified; P-NE. Professional - Not
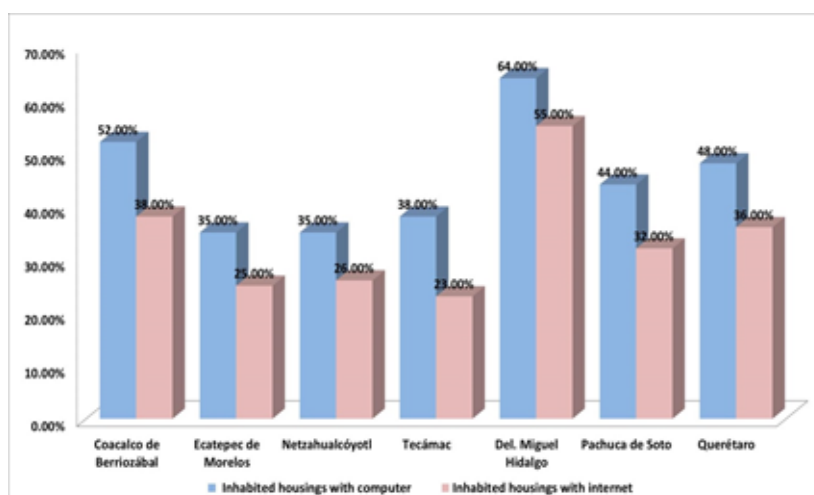**Specified; MTRÍA. Mastery; DOCTO. Doctorate: POSGDO-NE. Postgraduate - Not Specified**

Illustration 8. Inhabited housings with computer and internet.
Source: own (2020), from data presented by INEGI (2010)[16], http://www3.inegi.org.mx/sistemas/TabuladosBasicos/
Default.aspx?c=27302&s=est, accessed 31/07/2012
It is concluded that to higher level of education, greater range of technologies, so it to higher level of education and
constant training, there is a greater probability of success in technological modernization, promotes their successful
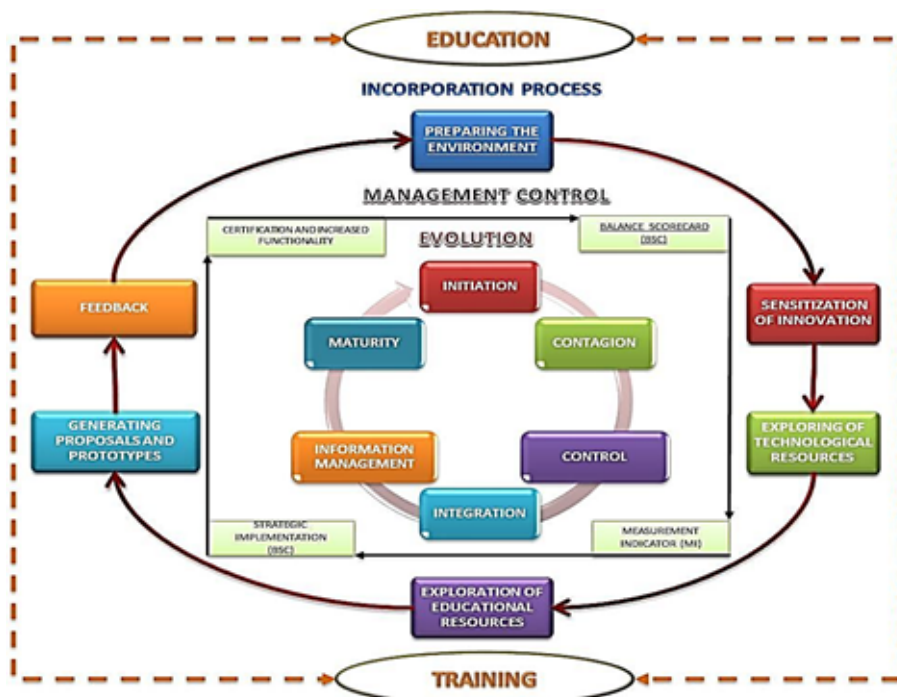**incorporation and evolution in local public administration.**

Illustration 9. Proposal of technological modernization of administrative and operational processes in municipal public administration
Source: own (2020), based on evolution, incorporating information systems, balanced scorecard, and Management ControlofGibson & Nolan [17], Montaño (2008)[14], Kaplan & Norton (2002)[18] e Instituto Nacional de Administración Pública – INAP (1986)[19] respectively.

8.Conclusion

It is important to analyze the context in the implementation of technologies, efforts should be made to facilitate their implementation, permanence, and evolution of the technologies, in this case aims to create the necessary infrastructure to start and propose its successful implementation. The technological modernization, gradually seeks incorporate the use of technologies such as support to facilitate the administrative and operational processes of governments, involving the authorities and citizens, creating a culture of interaction for citizens and municipal authorities with the feedback vital part as well as to support local authorities to continue with the combined efforts. This based on the training and education of the actors involved in these processes, which leads to their use correct and evolution.

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