

# Chapter 3

## **Materials and Methods**



### 3.1 Materials and Research Methods

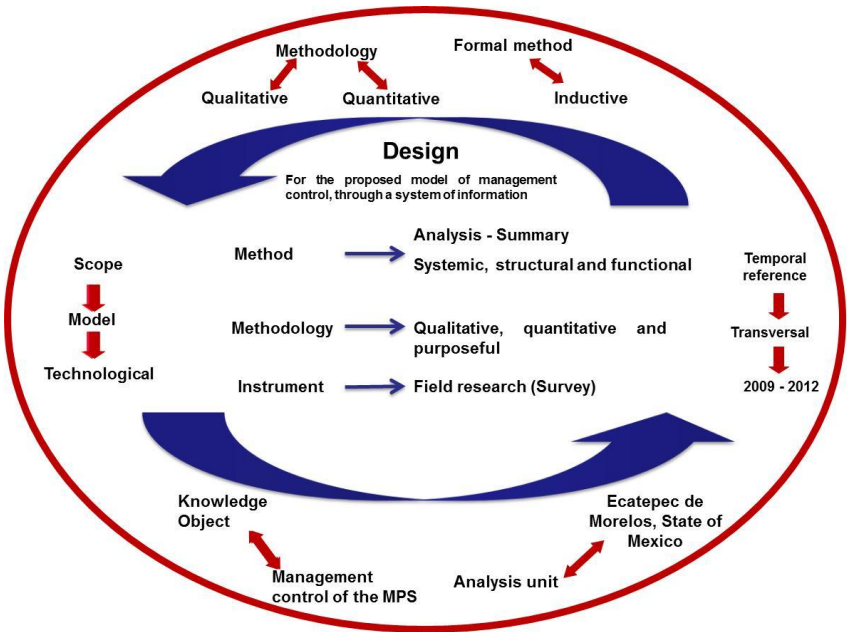
For the characteristics of this research it covers the following types of research: descriptive, explanatory, field research and purposeful. Due to the above, this research is considered descriptive, according to Fernandez, Narez & Garcia (2008) because the major points are about the current model using an information system.

Explanatory research: it is the responsible for searching the reason of the facts by establishing cause-effect relationships. Therefore, the research will also explanatory, as it aims to analyze and conclude on some management control of public services in the municipality of Ecatepec de Morelos, State of Mexico. To evaluate, analyze and measure changes in the degree of management control of public services.

It is including field research, in which the main technique employed is the survey. The survey according Hernández Fernández & Baptista (1997), is a technique for acquiring information of sociological interest, using a questionnaire previously developed. From the above, in this research is field research is used, as surveys and observations made in the various departments of the municipality where the municipal utility is provided in order to obtain information and results. Finally, propositive investigation, which Del Rincon, Arnal, Latorre, & Sans (1995) indicate that part of a diagnosis, establishing goals and strategies are designed to achieve. In this sense, this research focused on a result of gathering information and field research diagnosis as well as the submission of a proposal to achieve the objective.

### 3.2 Scientific Research Methodology

The methodology of scientific research provides methods and procedures to conduct scientific-research activity with quality. The methods are the access to sources, hence the importance of their selection and use. From the above it follows Figure 3 presents the strategy of the present investigation.



*Figure 3 Strategy of the research.*

Source: Adapted from Andrade (2000), the research strategy. Working Papers, National Polytechnic Institute.

This research was conducted using mixed research as qualitative and quantitative methodology, which characterized the phenomenon being under investigation, so that, is inserted in full knowledge that corresponds to its nature.

Says Rodriguez, Gil & Garcia (1996) that the purpose of qualitative research is to understand and interpret reality, as it is understood by the subjects

participating in the contexts studied, but in this context is not only interested researcher. The results are to be shared, communicated. This result contributes to scientific knowledge about the kind of realities. In the analysis conducted in this study, techniques of documentary research as surveys were used to obtain the information of users of municipal utility citizens. In this sense, it is argued that qualitative research emphasizes the internal validity of the phenomenon under study and the methods used to closely match what the actors do and express. The collection of information is due to an observation of most of the data obtained and they favor a personal and product experience of empirical research perspective. This is the case of this research, as quantifiable data on the benefits / costs involved in this proposal are presented.

Moreover notes Briones (2002), that quantitative research is directly based on the explanatory paradigm, in which quantitative or quantifiably to describe or try to explain the phenomena studied in the ways that this is possible is, preferably used in information logic level structure in which are the current social sciences. In addition to qualitative and quantitative research, the following research methods are distinguished.

Method of analysis and synthesis, according to Fernandez, Narez & Garcia (2008) indicate the following: analysis and synthesis. Analysis: it is a theoretical process by which a complex whole is broken down into its various parts and qualities. The analysis allows mental division of all their multiple relationships and components.

Synthesis mentally establishes the connection between the parties and allows previously analyzed be discover essential relations and general characteristics between them. The synthesis, reproduce the results previously obtained in the analysis, enables the systematization of knowledge.

Due to the above, within this research it used the method of analysis-synthesis, as will investigate and prepare fieldwork, which will analyze and describe the factors that influence the management control of municipal utilities will be used each one of the department that provide such services.

Functional Structure Systemic, Its action, evidence the interplay of ideas, connecting concepts, systems and recommendations, together with the methodologies and strategies, becomes thereby an important pathway for the explanation of the research object.

Therefore, this research will make use of structural systemic functional method. We study each of the department that make up the municipal utilities, the relationship between them, so that from this study were analyzed and concluded the factors affecting the management control of such services in the municipality of Ecatepec de Morelos, State of Mexico.

On the other hand, the inductive method which Castillo de la Peña (2010) suggests, it is the reasoning that from knowledge of the characters needed or necessary connection of the objects of a class is also used, it follows universal conclusion about the objects of that class. From the above, in this research we study the various departments that integrate municipal utilities and from this data to serve as a reference in other states and municipalities, on the subject of municipal public services that are analyzed.