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Management Control of Infrastructure Projects in the Public Entities of the Colombian Department of La Guajira

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Abstract

Objectives: To analyze the control model in the management of infrastructure projects in municipalities and public entities of the department of La Guajira, Colombia. **Materials and Methods:** The research was descriptive, non-experimental and transactional. The population was composed of supervisors, directors of municipal governments and the government of the department of La Guajira. For the collection of data, we used the technique of observation through the application and questionnaires as research tools. The Cronbach's alpha, and the reliability was 0.87. The treatments were analyzed by means of descriptive statistics. **Findings**: It is concluded that almost always supervisors and managers of these public entities (municipalities and governance) do consider the dimensions: state of the control of the management of the project, characteristics of the projects, requirements for the control of project management, and the model for the control project management. This is confirmed by the indicators' behavior of standards at strategic points. In addition, it is envisioned that the checklist and information on the application are below the average of the dimension, in the same way, priority was given to the management of infrastructure projects as level indicators of financial progress. **Application / Improvements:** Considering the phases of the model of control in project management executed, generates indicators that describe the rules for the verification of the information on your application.

Keywords: Infrastructure, Infrastructure projects and model for the control of project management Project Management.

1. Introduction

To reduce poverty, increase growth and the attainment of the objectives of sustainable development in developing countries, it is important to improve infrastructure. The objective is to ensure the quality of life of the population, economy and balance the connection with other regional centers[1]. Public investment in infrastructure is seen as a line of economic growth in the different regions of the country. This explains what the best way is to implement public investment that has an impact at the local, national and promotes socio-economic inclusion. The importance of a public works project and the performance of the professionals of the construction is measured by its contribution to the satisfaction of basic needs and improve the quality of life of people, resource management, energy saving, reduction of pollution and elimination of waste, among other aspects from the sustainability related to or to the real needs of the population[2].

The infrastructure in Colombia is lagging behind other nations; the implementation costs are relatively

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high, the weaknesses listed the fragility in ports, hospitals, education, roads and high taxes. This places lead to a disadvantage in terms of competitiveness, since it prevents you from attracting investment from other countries[3,4]. For the design of public infrastructure projects, it is necessary to define indicators of sustainability, such as: accessibility (transport of people, goods and services), availability of resources (water, energy and information), distribution (functional, territorial, social and cultural rights); Quality (water, air, soil, ability to debug, ecosystems) and savings (water, energy, resources, waste)[5]. According to the Super intendancy of Industry and Commerce in the country, public works are the set of actions, projects, construction and equipment, which contribute to the development of transport infrastructure (roads or paths, ports, railways and airports), hydraulic (dams, sewage treatment plants), urban (public lighting and parks), and buildings of social interest (schools and hospitals). They are part of the public works and are intended to benefit in its various programs to the population, both urban and rural[6,7].

The implementation of a public work involves the establishment of programs for the monitoring, supervision and audits carried out by specialists, whose main function is to integrate and review the annual programs of public works and their budgets[6]. Regarding the importance of public infrastructure works, there is little clarity in relation to access, quality and funding requirements for these services, a fact that is reflected in the rural areas of the department of La Guajira (Colombia), where there is no adequate planning for the implementation of projects, which has led to unfinished works affecting the expectations of the inhabitants of the different towns.

The World Economic Forum in the year 2013 marked that in the infrastructure area, Colombia lacks management and land use planning. In public works projects particularly, the size of the contracts executed with the opacity that characterizes the adjudication processes and the poor oversight by the public offices leads to favor corruption[8]. Consequently, the public entities in the Colombian department of La Guajira should strengthen the project management control of infrastructure projects to ensure their implementation, optimize resources and provide the well-being of society. The control of management requires an effective organizational structure and a manager with experience to manage and maintain a proper motivational climate[9]. In this order of ideas, the management control is a mechanism for obtaining results that serve for decision-making and promotes a systematic process of control, thus guaranteeing the development of the project[10].

The control of the project management is a tool which allows you to obtain the necessary information, reliable and well-timed for strategic and operational decisions; in such way, is the process that measures the permanent and efficient use of resources in order to achieve the objectives set[1,9]. Therefore, the management control is a mechanism for obtaining results which serves as a tool in decision-making, guiding to more effective and detailed processes which allows the control to be carried out in a systematic way and give the expected results of the project[10]. The infrastructure projects have several features that lead to the systematic development. These are conceived as a process designed to transform an idea into a finished product, i.e., that the project would be defined by a goal to achieve at a time and with a given budget[9]. Among the features that describe the projects, it is established that structured and finite elements are interrelated and have a purpose[11]. To formulate a project is necessary to apply techniques and verify the economic, financial, institutional, legal, environmental, political and organizational effects of resourcesallocation[12]. This foregoing follows variables such as population growth, income levels and rates of public services[9]; and involves a series of steps or phases that are considered in the outcome of the activities[10]. Each phase ends with a verifiable and supported product or result in the feasibility study or detailed design[13]. The stages are monitored, in such a way that confirms the effectiveness of the model, and otherwise it

Table 1. Institution, managers and supervisors object of study

Institution	Managers	Supervisors	Total
Municipal hall of Riohacha	10	5	15
Municipal hall of Maicao	7	3	10
Municipal hall of Uribia	6	4	10
Governance of La Guajira	10	6	16
Total	**33**	**18**	**51**

is appropriate to suspend or modify them. In conclusion the model should describe the activities that support each phase with a product[10, 13].

2. Materials and Methods

This research describes aspects related to the variables of the study on the control of management of infrastructure projects in the public entities of the Department of La Guajira.The data were taken directly from the environment of the subject objects of research without control of variables[14,15]. The design was descriptive transactional, asked us between the variables object of study. The population was integrated by managers and supervisors of the infrastructure projects of public entities of La Guajira, represented by officials of the government departmental and municipal (Table 1). The technique used was the survey and how to instrument a structured questionnaire was applied with a frequency scale of five alternative answers: always, almost always, sometimes, almost never, and never. The construction of the instrument is based on the operationalization of the variables composed of 42 elements that describe the dimensions and indicators based on the Cronbach's alpha coefficient was used to quantify the level of reliability and reliability of the instrument for data collection was 0.87, which indicates that the instrument is highly reliable[16].

3. Results and Discussion

For the analysis and discussion of the variables in this research were presented the results in Table 2, by the application of the instrument to 51 subjects among supervisors and managers of infrastructure projects in the department of La Guajira and the municipalities. Among the studied variables, it was observed for the dimension: Current Situation of management control of projects that the average was 3.94 (High Category).This value is below mean average of the variable which is 4.02; this indicates that almost always, managers and supervisors of public entities of the Government of the Department of la Guajira and towns, consider the current situation of control of the management of their infrastructure projects.

The above indicates that the description of the management of the project should be directed to an analysis, which will allow the development of actions to propose alternative solutions to the problem or need[12]. To obtain these results it was necessary to identify the cause of the problem or need; in the management of project control, it was established that the consequences were derived from the problem. In the future must be considered advan-

Table 2. Variable: Model for the control of infrastructure project management

Variable	Dimensions	Average	Dimension Average
Model for the control of Infrastructure Project management	Current Situation of project management control	3.94	4.02
	Characteristics of the infrastructure projects	4.10	
	Requirements for control of projects	4.06	
	Phases of the model for the control of project management	3.99	
Category Mean of the variable	High: Which means that managers and supervisors of public entities in the department of La Guajira apply a model for the control of Management of Infrastructure Projects.		

Source:[21]

tages, strengths, weaknesses, limitations, weaknesses, threats and ungovernability perceived and expressed in the implementation of the project[12]. Finally, the analysis of the process of project management is to assess the planning, organization, and future perspective facing the project[17]. The analysis of the characteristics of the infrastructure projects described an average of 4.10; this is a high category, which is above the average value of the variable (4.02). In this sense, any infrastructure project involves series of systematic stages that lead to its development. The projects are conceived as a process designed to transform an idea into a finished product. In other words, it is defined by a goal to achieve in a certain time and on a budget. These characteristics in which they find themselves, are finite in time and structured, the elements are inter-related, have a purpose, are designed and operate with well-specified[9].

It requires an effort to achieve a specific goal of a project developed through a series of interrelated tasks, which use resources efficiently in the functions that are carried out considering the degree of uncertainty that may occur[11,12]. The above-mentioned is accompanied with variables such as population growth, income levels and rates of public services. However, the dimension requirements for the control of project management showed an average of 4.06, qualitatively is a result above the average of the variable (4.02). The development of a project is the establishment of stages for its implementation; therefore, it is vital a preliminary estimation of the supply needs, requirements can be human, technical, logistical and financial resources that are needed to carry out the activities[12]. Initially, the project is developed with preliminary definitions where estimates of the time requirements, cost, technology, magnitude are done. The intention of those definitions is to allocate financial resources correctly[9]. In addition, when choosing a project there are certain specific requirements and procedures[18,19]. Therefore, you must consider a preliminary plan that describes the requirements for the implementation with coherence, rationality from the technical point of view, financial viability and legal feasibility. Finally, the average of the dimension phases of the model for project management

control was 3.99; placing it below the mean (4.02). That means almost always the phases of the model for the control of project management are accomplished in public entities in the department of La Guajira, Colombia. The whole process involves a set of phases that are systematically developed in order to achieve the objectives of the project. For the orientation of the fundamentals for project management, PMBOK® is a set of activities of projects logically related that usually culminate with the completion and delivery of the product 19. The phases of the project occur sequentially but can also be overlapped in certain situations. Once this stage is completed, a review of the previous steps is generally carried out, which incorporates information on the benefits of the project and then goes on to the next stage or completion[20].

4. Conclusions

The first dimension refers to the current situation infrastructure project management control and concludes that almost always the supervisors and managers of the mayors and public entities of the Colombian department of La Guajira care about the situation of the management of the infrastructure projects. That is especially true for the financial progress and evaluation/review meetings indicators as they were below the average of the dimension. The second dimension describes the characteristics of the projects and it was concluded that are almost always given the institutional purposes in the development of the infrastructure, this showed that the indicator was above the average of the model; which is represented with 4.10. The third dimension that determines the requirements for the control of the project management, describes its results with an appropriate form for the development or implementation of the project. The indicator registered values below the average of the model (4.06). Finally, the fourth dimension that refers to the phases of the model for the control of the project management concludes that almost always there is evidence that it is necessary to establish rules for the verification of the information since its rating was below the average of the model (3.99), culminating in this way the phases of the project management control.

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