

## Productive local development based on information and communication technologies

Desarrollo local productivo basado en tecnologías de la información y comunicación

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### ABSTRACT

This research is based on the need to implement process management with the support of ICT's as an instrument for the determination of strategies that help the realization of continuous improvement; for this, the objective is to determine a procedure to determine the processes for the good management of the Decentralized Autonomous Government of the canton of Quevedo and that with the support of ICT's guarantees an improvement in its management system. We began by designing a procedure according to the characteristics of the cantonal GAD, applied sequentially and with the support of technological tools that facilitated the exchange of information and thus determine the processes. This study involved a literature review, then contrasted with information from experts and the application in the GAD of Quevedo based on scientific research techniques which led us to successfully conclude the work.

**Keywords:** Administration, processes, ICT, management, experts.

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## RESUMEN

La presente investigación se basa en la necesidad de implementar la gestión por procesos con apoyo de las TIC's como un instrumento para la determinación de las estrategias que ayuden a la concreción de la mejora continua; Para ello, se plantea como objetivo la determinación de un procedimiento que permita determinar los procesos para la buena gestión del Gobierno Autónomo Descentralizado del cantón Quevedo y que con apoyo de las TIC's garantice una mejora en su sistema de gestión. Se empezó diseñando un procedimiento según las características del GAD cantonal, aplicadas de forma secuencial y con apoyo de herramientas tecnológicas que facilitaron el intercambio de información y de esta manera determinar los procesos. Este estudio conlleva un revisión de literatura, luego se contrasta con la información de expertos y la aplicación en el GAD de Quevedo basada en las técnicas de investigación científica lo que nos llevó a concluir con éxito el trabajo.

**Palabras clave:** Administración, procesos, TIC's, gestión, expertos.

## INTRODUCTION

Nowadays, large enterprise resource planning (ERP) systems and related processes used in industries are becoming increasingly complex and are being studied and researched more and more.

However, the great development of ERP, quite apart from the size of the companies (Wu, 2003) quite apart from the size of the companies, has allowed to find evidence indicating that the implementation projects are still very slow, problematic and difficult processes in their implementation (Bahli, 2007). (Jesus, 2006) The study indicates that some organizations fail to achieve the expected benefits from its use, due to problems that arise in the implementation phase of the system. By virtue of this, it is a priority that the institutions that wish to rely on ERP systems have the knowledge of the factors that allow the success of these projects, as well as the problems that will arise and the factors that can solve them.

(Trujillo Barroso, 2011) refers that one of the projects to which more attention is paid in this type of business interventions is the management by processes characterized by the support of an interrelated system of processes that helps to obtain customer satisfaction.

When reference is made to process management (Sanchez, 2014) it indicates that companies are obliged to adapt and continuously improve in order to meet the multiple requirements of the market. Thus, in addition to offering the market what it wants and when it wants it, organizations must do so efficiently. As a consequence, they continuously apply new management formulas to help them improve, usually by using technology for Management Control as a perspective of the Balanced Scorecard and quality management. However, he (Trujillo Barroso, 2011) states that process management can be analyzed as a way to organize the work, considering that companies are as efficient as their processes are, therefore, most companies and organizations that

have become aware of this, have reacted to the inefficiency represented by departmental organizations, with their niches of power and their excessive inertia to change, enhancing the concept of process, with a common focus and working with a vision of customer target. (Amozarrain, 1999).

Considering the above, this study is oriented to the application of a procedure for process management in the canton of Quevedo. In this way, the viability and validity of the proposed procedure is demonstrated, based on the achievement of the different stages proposed and the use of the necessary technological tools for its subsequent implementation and successful development. (Colmenares, 2008) In his study "*Critical success factors for the implementation of business systems in small and medium-sized enterprises in Venezuela*", he indicates how to determine the critical success factors for the implementation of enterprise resource planning systems in small and medium-sized Venezuelan enterprises. For this purpose, a panel of eight functional consultants - from two organizations dedicated to the sale and support of these systems - identified fifteen factors that contribute to the success in the implementation of ERP systems. The identified factors were ranked according to their degree of importance, using a seven-point Likert scale. The study concludes that there is a mix of technical and managerial factors that impact project success, such as: setting project goals, implementing the system with minimal modifications, the level of technical knowledge of the users, the training provided to the users, and the support of the company's top management for the project.

On the other hand (Estrada-Hernández, 2013) states that in the current scientific development, information and communication technologies (ICTs) stand as a set of services, networks, software and devices whose purpose is the continuous improvement of business activity and services as well as the improvement of people's quality of life within an economic and social environment. They constitute the modern way for the intervention of groups with high priority problems for organizational decision making processes. The proposal of a model for the use and integration of ICTs in the business management processes of Cuban entities allows observing those social, cultural and economic contradictions that exist with this interrelation of: technology, processes and results within the business context; evidencing changes in the organizational culture, in the processes, in the services, in the commercial transactions and in the organizational structure and strategy.

(Quispe-Otacoma, 2017) in his study conducted a search of the Information and Communication Technologies used by Small and Medium Commercial Enterprises in the city of Ambato-Ecuador.

On the other hand, (Brown, 1999) in his study explains that the effective management of external consultants is important for the success of an ERP project since they can offer invaluable expertise in the analysis of functional processes and in the configuration of specific modules.

The set of all the processes, with their sub-processes, activities, procedures and necessary resources, are grouped in a system, forming an organizational structure, to

implement a specific management, such as quality management, environmental management or occupational risk prevention management. They are usually based on an internationally recognized standard that is intended to serve as a management tool for process assurance. (Amozarrain, 1999)

## MATERIALS AND METHODS

When reviewing several methodologies and/or stages proposed by different authors in the literature consulted on the subject, as is the case of (Melo, 2010) who applies an organizational analysis methodology that integrates a knowledge management model oriented to bpm, and to the improvement of business processes at all levels of the organization dedicated to the management of exceptional cargo transportation. In another study (Roalcaba, 2008) 1. Identify the risk, classify it and incorporate it into the database. 2. Search for causes. 3. Propose measures for change based on process management. 4. Follow up. The vast majority of studies agree that a process management and improvement project consists of three phases: process analysis, process design and process implementation; (Zaratiegui, 1999); (Amozarrain, 1999); (Rivera, 2002); (Trujillo Barroso, 2011); (Harrington, 1991).

These methodologies coincide with the following elements: 1. Determination and prioritization of processes, in some cases with methods to prioritize them, 2. (Amozarrain, 1999) Measurement and analysis of the processes. 3. Realization of process diagrams. 4. Evaluation, feedback and continuous improvement.

These revised methodologies do not fit the reality of the GAD cantonal de Quevedo, so a proposal was made to update the critical areas of intervention in the government. The procedure is based on the following principles:

- **Flexibility:** The procedure adapts to changes coming from the environment, as well as to those occurring within the GAD, without significant changes in its structure, working methods and procedures.
- **Adequacy:** Processes should be consistent with government functions and strategies.
- **Involvement:** The procedure should promote systematic participation, involving the personnel responsible for the processes.
- **Adaptability:** The processes must be in accordance with the conditions of the country and the municipality in terms of the socioeconomic context.
- **Transparency and feasibility:** The structure and logical consistency of the procedure allows it to meet the objectives for which it was created and allows its brief assimilation.
- **Rationality:** The procedure should be performed at the lowest possible cost.
- **Coherence and relevance:** The possibility that the procedure can be applied in the rest of the cantonal governments of the country.

## **Stage 1. Bases for Process Management in Local Development.**

Here we are going to form the team in charge of process management, this structure implies variation in the way of thinking of managers and workers when structuring it, therefore, the training of employees and workers is a success factor.

### *Phase 1. Strategic Planning Analysis*

This phase is carried out to deepen the key elements of the GAD's strategy such as mission, vision, strategic areas and SWOT analysis to define the processes in correspondence with the basic strategic elements of the GAD and achieve coherence between them.

### *Phase 2. Formation and preparation of the work team*

The staff may be made up of internal GAD personnel, external personnel from advisory firms or mixed, considering the particularities of the governing body and the level of emotional independence of the participants, among other possible factors to consider. (Trujillo Barroso, 2011). A team leader should be determined for each side.

## **Stage 2. Selection of key processes for local development management.**

In this stage, the relevant and key processes of the organization are selected and then classified according to their impact.

### *Phase 1. Selection of relevant government processes.*

The relevant local government processes are identified, considering that this must be a global process, with a scope that usually crosses functional boundaries.

### *Phase 2: Selection of key processes.*

Once the list of relevant processes has been identified, it is time to establish priorities in order to select those that are critical for the government and have a direct impact on local development and the quality of life of the people.

### *Phase 3: Classification of key processes.*

In order to understand how decision making will be handled from a strategic point of view in the short and long term, these key processes are classified into two groups:

Ø Key functional processes: These are the ones whose highest score was given to the impact of the processes with the strategic objectives, and to the quality of life of the people.

Ø Key support processes: These are the key processes that are the most important score was awarded to weight.

## **Stage 3. Structuring of the processes.**

The structuring of the processes is carried out. It includes the selection of process managers, the definition of boundaries, the people who will participate in the process, i.e. the Process Team (PT), the definition of performance drivers and the calculation of improvement and management indicators.

### *Phase 1. Formation of the team responsible for the process*

The process owners are selected by the work team, must be government managers and must meet all the requirements established in stage 1, phase 2 of the procedure. However, it is proposed that in addition to these mandatory elements, the process team leaders should have a strong change mentality and should have a detailed knowledge of process-oriented work.

*Phase 2: Define process performance drivers*

The mission and vision of the process will be elaborated to serve as a guide for all its members and to define exactly the *raison d'être* of the team and the process. Team work with members of the process team is used as a technique. (Montes de Oca Recio, 2009)..

*Phase 3. Conformation of the process map*

Different relationships can be established between the processes previously defined in the organization, such as: flow of information, resources, sequence of these, level of authority and power. Hence the need to show the interrelationships between them in the process map.

*Phase 4: Establish indicators*

GAD must apply appropriate methods for process monitoring and control. These methods should demonstrate the ability of the processes to achieve the planned results, among these methods are those related to improvement that take into account the defined objectives and those related to management, which is based on the selection of indicators.

Once the indicators have been defined, they are passed to a panel for management by the process team. The objectives of all the indicators defined in this phase must be specified, so that they are consistent with the strategic objectives of the process and ensure their fulfillment. To assess consistency, the strategic objectives of the processes are broken down into actions to seek consistency between the two.

**Table 1.** Objectives/indicators relationship

		Indicador 1	Indicador 2	Indicador....	Indicador n
Objetivo	Acciones				
	1				
	2				
	.....				
	n				

**Source:** Authors

#### **Stage 4. Supervision and adjustment of processes**

Here the implementation of government processes is monitored with the help of previously defined indicators.

### *Phase I: Monitoring and evaluation of the process*

The information gathered from the indicators is used to monitor the process and evaluate its execution. Each of the key processes is then analyzed and improvement actions are presented to improve its performance.

Finally, all the work must be related to the development of an ERP technological application that allows the total integration of the isolated systems and allows the best development of the processes.

## **RESULTS**

**Mission:** We are a Municipal Government elected by the people of Quevedo with the mandate to change the flawed structures and methods of corruption and vanities, which is understood with transparency in its procedures, integrity in the management of resources, regular accountability and example for present and future generations.

**Vision:** To be the Municipal Government of Quevedo, an example for future administrations for its efficiency, efficacy and effectiveness in meeting the felt needs of the people of Quevedo.

**Strategies:** Work for the people and with the people of Quevedo on the basis of a:

- Technical planning aimed at covering basic needs
- Modern organization that corresponds to a competency model understood, adapted and practiced by all persons involved in the political and administrative structure of the municipal government.
- Management focused on key results set by the mayor in planning and organization
- Coordination among all the work teams integrated in the municipal directorates, sections, municipal companies, agencies and trade organizations that are part of the Municipal Government, where the mayor exercises a 360 degree leadership.
- Discipline and control of compliance with the objectives set within the rules contemplated in the competition model adopted.
- Periodic training and measurement of personnel to maintain the behavior and organizational culture desired by the people of Quevedo.

## **Application of the process management procedure in the government of Quevedo.**

### **Stage I. Basis for Process Management in Local Development**

#### *Phase I. Strategic Planning Analysis*

The decentralized autonomous government of Quevedo updated the Development and Land Management Plan of Quevedo in 2019, where the mission, vision and key areas are reviewed, which serve as an informative sample, useful for decision making. Similarly,

with the analysis of strengths, opportunities, weaknesses and threats, the key areas, objectives and different criteria of measures considered for the local development of each territory were determined.

*Phase 2. Formation and preparation of the work team.*

Under the direction of the municipal authorities and with the objective of promoting and managing the institutional and administrative articulation of the Municipal Government to achieve levels of excellence, working groups were formed, which were responsible for the application and execution of the management processes.

**Stage II: Selection of key processes for local development management.**

*Phase 1. Selection of relevant government processes.*

Based on brainstorming, the most relevant processes of the municipal government were determined: governing processes, value-adding processes, deconcentrated processes and enabling processes.

*Phase 2: Selection of key processes.*

In order to select the key processes, a weighted orientation was carried out and represented in matrix 2. According to the calculations made, the key processes were determined as those that obtained 82 or more

**Table 2.** Matrix of Strategic Objective/Process Impact/Quality of Life Impact/Weight, Short-Term Impact (STI), Resources (R).

PROCESSES	STRATEGIC OBJECTIVES	IP	RCV	P		TP
				ICP	R	
Project management for local development.				0		
Preparation of local development actors.						82
Attention to the population.				5	5	
Financing management.				5		
Project formulation and evaluation.						
Innovation management.				5		
Mobilization and participation of local stakeholders.						
Participation and communication.		5			5	

<b>Archiving and document management.</b>	5
<b>Defense and security (internal order).</b>	5

**Source:** Authors

### **Stage III: Structuring of the processes.**

#### *Phase 1. Formation of the team responsible for the process*

The process that obtained the highest score is the formulation and evaluation of projects under the responsibility of the planning director.

#### *Phase 2: Define process performance drivers*

To begin with, the mission, vision and objective of the process must be defined. Mission: To ensure the methodological design of Local Development projects.

Vision: To consolidate the methodological design of projects for Local Development.

Objective: To achieve that at least 80% of the projects are approved.

#### *Phase 3. Conformation of the process map*

The process map was drawn up in accordance with the methodology used and with the help of the technological platform.

The relevant processes are: Defense and security (internal order), Participation and communication, Innovation management, Attention to the population and Archive and document management.

Functional processes: Mobilization and participation of local stakeholders, Project formulation and evaluation, and Project management for local development.

Supporting processes: Financing management and preparation of local development stakeholders

#### *Phase 4: Establish indicators*

The indicators established are shown in Table 3 below.

**Table 3.** Relationship between activities/indicators

<b>Activities</b>	<b>Indicators</b>
<b>Development of the diagnosis</b>	Level of access to information
	Relation of information to objectives
<b>Strategy approach</b>	Knowledge of key categories

	Relationship between defined objectives and development priorities.
<b>Elaboration of the project of Local Development</b>	Coherence of the project with the strategy.
	Economic feasibility of the project
<b>Project approval</b>	% of project compliance

#### **Stage IV: Supervision and adjustment of processes.**

*Phase I: Monitoring and evaluation of the process*

Each process is evaluated on the basis of the indicators proposed.

#### **CONCLUSIONS**

Processes managed with the support of ICT's is the fastest way to adapt flexibly to changes in the current environment. Thanks to the extensive bibliographic exploration related to the topic of study, it was possible to determine the non-existence of a procedure that helps to clearly and precisely determine the processes for management in the GAD of Quevedo.

The proposal presented for the determination of processes in the GAD is based on 4 stages that contain from the bases for the management based on the processes in the Local Development to the monitoring and improvement of these through the use of technology. It is important to consider the use of ICT's as management tools, the ideal is to save time and money, indicating that the management of information and processes supported by ICT's (ERP, simulators, online payments), improve the management of processes in the institutions, obtaining shorter production and service delivery times, and an increase in its value chain. It should be remembered that ICTs are a means and not an end.

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