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TOPIC:

IMPLEMENTING A BUSINESS INTELLIGENCE TOOL WITH FREE SOFTWARE FOR THE MUNICIPAL GOVERNMENT OF ANTONIO ANTE (MGAA).

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"Implementing a business Intelligence tool with free software for the Municipal Government of Antonio Ante (MGAA)"

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Summary. *The reason project of this article is the implementing a Business Intelligence tool with free software for the Decentralized Autonomous Municipal Government of Antonio Ante (DAMGAA) through the use of Open Source tools with which it is intended to provide an easy way to access the data and perform an analysis of the same, so it is a support when making important decisions in this institution. This project is focused solely on the module of Collection of the Municipal Administration System existing in that entity, it was performed using the methodology BIEP and free tools like PostgreSQL for the Data Mart implementation and Pentaho platform for carrying the various components belonging to a Business Intelligence (BI) solution.*

Keywords.

Business Intelligence.

1. Introduction.

The rise of information technology today is truly dizzying, characterized by meddling in the social and economic habits of human beings and companies. So it is common and even obligatory as part of its strategy for organizations to have among its most valuable resources computer equipment and computer systems, which help improve their quality of service, expedite the works of its members and therefore, can make your institution a competent company.

The information management in companies is, today, a key tool to survive in a market changing, dynamic and global. Learn to compete with this information is essential to the decision-making, for growth and for the management of a company.

Currently we live in the information society, immersed in a real computer chaos impacting in different ways in groups and in the individuals. Gracias al internet y al desarrollo de los sistemas de información en las empresas, sus directivos pueden acceder a mucha más información, de mejor calidad y con mayor rapidez.

Thanks to BI it can improve decision making and guiding companies towards the attainment of its objectives. However, many managers are faced with the paradox that: increasingly they have more information and less time to analyze; which today has become a real challenge.
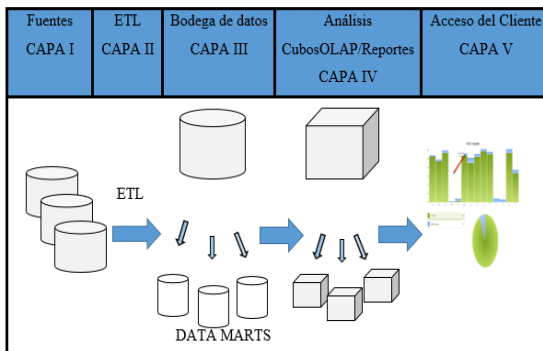
Within of the systems area of the Municipal Government of Antonio Ante (MGAA), they develop computer systems that respond to the community needs and to assist the institution management and administration, currently there are several systems that have been developed during the years, but unfortunately none of these

systems, provides the benefits that a BI solution provides a company, for this reason it has become necessary to implement a business intelligence tool to facilitate access , analysis and reporting of existing data in the Municipal Government of Antonio Ante (MGAA).

2. Business Intellignce

There are different definitions of Business Intelligence that have been created in recent times, but in more technical terms business intelligence is "*a set of concepts and methods to improve the decision process using a support system based on facts*". (Howard Dresner, 1989). On the other hand, the following definition was obtained about the Business Intelligence term: "*BI is an interactive process to to explore and analyze structured information about an area (usually stored in a data "datawarehouse"), to discover trends or patterns, from which derive ideas and draw conclusions. BI process includes the communication of findings and make changes. Las áreas incluyen clientes, proveedores, products, services and competitors.*" (Gartner, 2012).

Below are the elements that involved in a BI solution.

Fig 1: BI elements.
Fuente: Autor

Layer I.- In the source layer are all sources from which they are going to extract data.

Layer II.- The **ETL** process **(Extraction, Transformation and Load)** are the process that help prepare data to structure so that is understandable to decision making and then stored in the data warehouse.

Layer III.- In this layer are **data warehouses** or **datamarts** in which all information extracted from the data sources using ETL processes of layer II is saved.

Layer IV.- This is where the data located in their stores is transformed into information thanks to the creation of **OLAP** cubes, in this layer are performed calculations, queries, planning functions, among others, in large volumes of data.

Layer V.- This layer is dedicated to end customers. Here are the reports that those users need obtain from a data set with which your company has.

3. Materials and Methods

3.1. Materials

The tools used for the development and implementation of this project are open source tools, as shown in the following table.

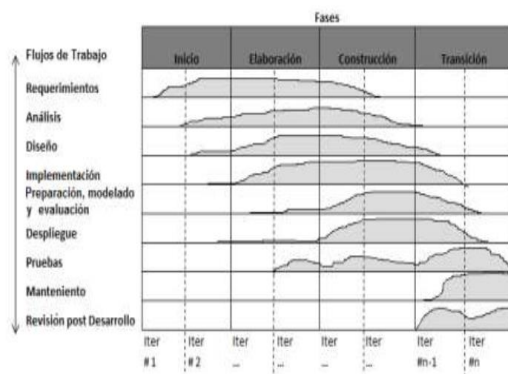**Table 1:** Tool for the implementation of the BI solution.

Herramienta	Descripción
PostgreSQL	Management system relational database object oriented and free, released under bsd license.
Pentaho BI Suite	Pentaho BI Suite is a set of free programs to generate business

intelligence. Released under bsd license. It includes integrated tools to generate reports, data mining, ETL, among others.

Fuente: Autor

3.2. Methodology

For the development of this project was used the methodology called "Business Intelligence Engineering Process (BIEP)" which is composed of two elements: Phases and Workflows.

Fig 2: Phases and Workflows BIEP. **Fuente:** METODOLOGIA PARA EL DESARROLLO DE UN SISTEMA DE INTELIGENCIA DE NEGOCIOS BASADA EN EL PROCESO UNIFICADO, EDWAR JAVIER HERRERA OSORIO, http://www.bdigital.unal.edu.co/4051/

3.2.1. Methodology phase.

INITIAL PHASE: During this phase is defining the project Business Intelligence scope and work plan. Thanks to this phase of the methodology, you can get a clear overview of the project.

ELABORATION PHASE: During the elaboration phase, is intended to perform the project plan and use cases that describe the system functionality.

BUILDING PHASE: During the building phase begins with the project development, implemented all use cases, to achieve get the final product, although this may not be free from defects.

TRANSITION PHASE: During this phase it seeks to implant the project in their operation environment, after reaching the objectives set in the initial phase and the user is satisfied.

4. Resultados

After completing all the designs and implementations of each of the elements that are part of a BI solution, is obtained as result an multidimensional navigate structure, by which the user will can go moving to find or obtain the information to need.

The information is presented to a level of detail in accordance to the user requeriments.
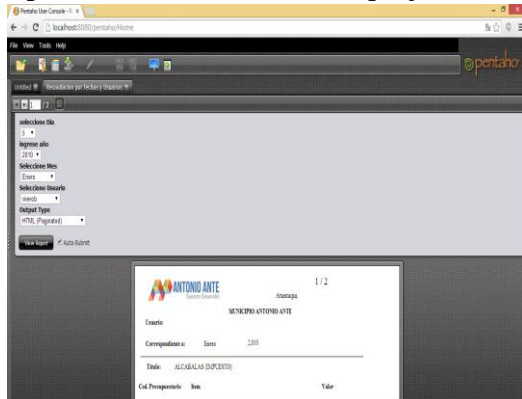
In the figure following it can watch the aforementioned multidimensional structure in the which the user can navigate to find the information to need.

Fig 3: Example of OLAP Cubes. **Fuente:** Autor.

Below you can watch, like example, one of the reports that they have been implemented with this thesis project.

Fig 4: Reports example
Fuente: Autor.

In this reports type, the user has the ease of finding the information you need only using the mouse. In which must choose the user and date in which a broadcast was made of a title and display the information in a model or template previously established in the format it deems necessary like HTML, PDF, EXCEL, among others.

Conclusions

▪ The business intelligence is an valuable tool to enterprises, since all those that implement get a lot of support to his administration thanks to the wealth of information who manage to collect.

▪ With implementation of this thesis project, the municipal government of antonio ante acquired an tool that helps with the transparent management of existing information in the institution.

▪ The Report Generation is fully oriented to stakeholder and how to use is really simple, because you can just use the mouse to obtain the information to need.

Acknowledgements

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Sebastián BENALCÁZAR was born in Atuntaqui, on January 03, 1990. He completed his primary studies at "DOS DE MARZO" school. He finished her Secondary Studies at "Mariano Suarez Veintimilla" technical college in the speciality of Trade and Administration Speciality Informatics. His higher studies were performed at the "Technical del Norte" University in the Engineering Faculty of Applied Science Career in Computer Systems Engineering.