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RESEARCH ARTICLE

ANALYSIS OF INDICATORS THROUGH MICRO DATA IN AN EDUCATIONAL DATABASE

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Abstract

The present study addressed the analysis of the database of the Option Educational Center, a company that operates in the Educational segment, tied to the application of the Power BI Tool, with the objective of having greater clarity and objectivity of the information belonging to the company and also implementing improvements in the decision-making process of said company based on safe and concrete data. As methodology were used the analysis of Documents and unstructured interview, through these instruments were collected information about the working method, the tools used in the internal processes of analysis and the treatment that the data received to become reliable information, with the use of these instruments it was possible to make a qualitative analysis of this study, making it possible to visualize the problem of the company and propose improvement solutions. The results obtained were satisfactory, since after the analysis of the micro data together with the use of the Power BI tool provided increased productivity in the analysis of indicators, greater speed in obtaining the information, which are determining factors to address the problem of agility in the decision-making process and enable the definitions of strategies to be established by the company, because they help in the recognition of the scenario in which the organization is located.

Introduction:-

The present study focuses on enabling, through the analysis of the database and the use of a BI tool, focusing on the best use of the information acquired to assist in decision making and devise strategies to address the problem of academic evasion. The Option Educational Center, which has been working in the Teaching segment for 5 years, has its Headquarters in the city of Goiânia, offering courses in Early Childhood, Elementary, Middle and Undergraduate Courses in the morning and afternoon shifts, seeks to outline strategies to remain competitive, attractive and combat the withdrawal of students, which by factors such as unemployment, frequencies and methodology, they end up escaping from the Institution.

Because The Option Educational Center does not have an effective mechanism to analyze performance indicators such as: frequency, number of students enrolled, locked enrollments, among others, the agility of the decision-making process is compromised, there is no adequate and clear measurement for defining planning and execution of actions aimed at remedying deficiencies such as the evasion of students and others that may arise, endangering even the survival of the organization. Many seek to train themselves and, in addition to experience, they intend to have a

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greater knowledge to fill the opportunities offered in the labor market, which is one of the main variables that influence the increase in the number of available schools, the number of vacancies offered and potential clients seeking training.

Therefore, this research will answer the following problem: How to assist the analysis of data for decision making in order to combat academic evasion using a Business Intelligence tool, the use of a tool will bring users (Educational Center Option) the ease of interpreting the database and its available microdata, shows in a macro way the information, giving greater agility in decisions and enables continuous improvement, since for the institution it is interesting that there is only a minimum portion of academic evasion to keep in continuous growth.

Theoretical Reference

The present study is the analysis of a database of a company in the educational segment. Will be shown tools that can be used in the creation and development of indicators that helped the organization in question in decision making, performing a data analysis tied to a Business Intelligence tool, after several analyses and study on BI tools we arrived at a tool called POWER BI that was developed by Microsoft, able to connect with the most different datasources, Power BI is a solution that delivers highly intuitive and dynamic reports and dashboards, which greatly shortens data analysis time and speeds up decision-making that will be based on consistent information.

Banco De Dados

An analysis will be done in an interrelated database where your data is organized in order to allow application systems to store new data, find stored data, change its content, and delete undesirable data through precise manipulation and localization methods, the database in question has about 7,000 tables. Database today is considered as a set of software associated with a file system that provides service to application systems through a standardized interface. (FEITOSA, 2013, p.14)

SQL (Structured Query Language)

We will use the database programming language, known as SQL (Structured Query Language) and some of its variations or extensions. The SQL language is a standard programming language for databases, which is not common in programming languages. SQL is a declarative language, in which , what matters in processing, is the result; as it is in what runs it does not matter. This language is based on algebra and relational calculus and has a very simple syntax; it is a language called "friendly", very flexible and that allows not only the manipulation of data, but also the definition of the structure of the data and also of rules and integrity restrictions. (CARDOSO, CARDOSO, 2017, p.11,12)

Power BI (2.90.782.0 64-bit (February 2021))

The tool that we will use for the development of the Dashboard is POWER BI, so it will be possible to analyze the data and create the most varied types of Dashboard, with the help of the tool it is possible to make dashboards available in the desktop version and for mobile access, the tool is able to connect the most diverse data sources, visualization of metrics in real time, unification of data stored in the cloud or in an on-premises environment.

Microsoft introduced the idea of Self-Service Business Intelligence (BI) in 2009, announcing power pivot for Microsoft Excel 2010. Strangely, at that time, he didn't make big announcements, held conferences or ran a major marketing campaign for it. It all started slowly, with some enthusiastic users adopting the new technology, but the vast majority of people didn't even know it existed. As part of the community of BI professionals, we were very surprised by this approach. At the time, we could clearly see the advantages for users to start adopting Powerpivot as a tool for data collection. (FERRARI, RUSSO, 2016, p.10).

Business Intelligence

In this article we will analyze through the collection of data made in a database of a company of the educational segment, then will be developed several Dashboard through the Power BI tool, the information collected will be monitored and monitored constantly.

The term Business Intelligence emerged in the 80's ingartner gru po and refers to the intelligent process of collection, or ganization, analysis, sharing and monitoring of the data contained in Data Warehouses / Data Mart, generating the most diverse information to support decision making in the environment of the most diverse businesses and segments. (PRIMAK, FÁBIO, 2008, p.1).

Methodology:-

This study has a descriptive and exploratory character, which according to Gil,(2008, p.28) "Descriptive research is, together with exploratory studies, those that social researchers usually carry out concerned with practical performance". Where it was also used as a method of data collection the interview, field research, study of documents and the bibliographic review, in a way that it was possible to raise, analyze andmainly develop the study, which according to Gil (2008, p.50) "Bibliographic research is developed from elaborate material, consisting mainly of books and scientific articles".

According to Prodanov and Freitas (2013, p.14) "Metodologia is the application ofprocedures and techniques that should be observed for the construction of knowledge", given this, the methodology of the work, is basically the collection of data for the production of a given work, such as this, where the objective of the method is to describe what type of research will be applied to the work.

Unstructured Interview

The interview was conducted via google meet application with the Administrative Manager of the educational institution, in this interview was shown by the manager the reports generated manually by school employees, it was explained by the interviewee the need and difficulty in having information regarding the number of students per course, number of students per semester, reports of defaults and comparison of enrolments between school periods.

Even having a historical database of more than 5 years it is not easy to obtain basic information such as: Evolution of the number of students per school year, absenteeism, monitoring of delinquency, profit margin per class, analysis of enrollment of novice students, monitoring of enrollment of veteran students, information that in the conception of academic direction is crucial information and extremely important for the aid and analysis in decision making. The school has become a reference and has been growing with each passing year due to its excellent service in the educational segment.

Documentary Analysis

The document analysis was based on the reports delivered by the institution's manager, these reports served as an initial basis for analysis and understanding of the institution's problem, we obtained access to the company's database. Documentary analysis is a research technique that provides data and information and provides an overview for the study. According to Cellard (2008, p.296) "Documentary analysis favors the observation of the maturation process or evolution of individuals, groups, concepts, knowledge, behaviors, mentalities, practices, among others".

Results:-

After analysis, the existing problem in the company was defined, through this a meeting was held with the person responsible for the technology area of the company to present the proposal for a solution to solve the difficulty encountered. As results to date, we have accepted the proposal that is in progress that initially consists of the development of academic and financial analysis dashboard, in order to manage to leverage the business.

For the development of the Dashboards, several consultations were set up using SQL language, using tables of the Educational, Financial, Accounting and audit log table modules, the information returned as results of the consultations was approved by the client and then transferred to the BI tool used in the present study.

Figure 1:- Query using SQL language.

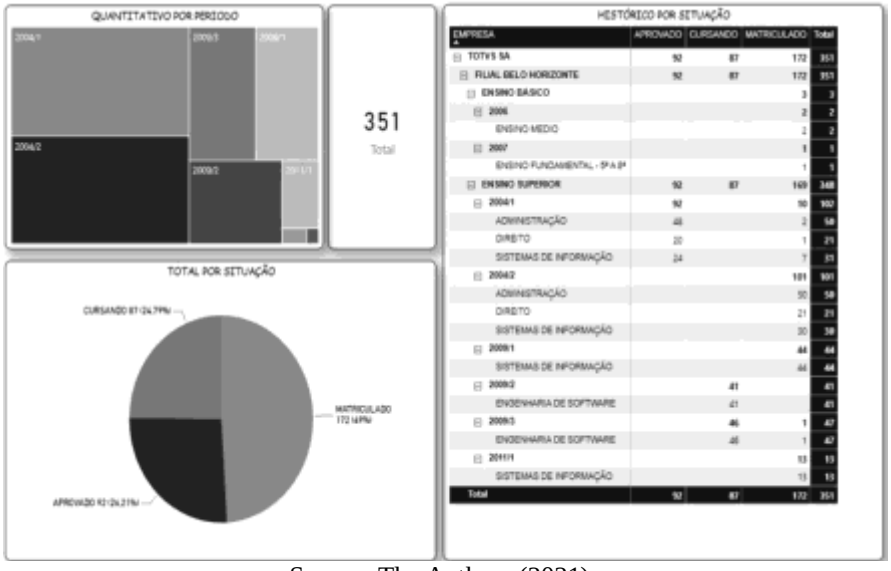
```
SELECT DISTINCT
    UPPER(SC.NOME) CURSO, UPPER(SS.DESCRICAO) STATUS_PERIODO, SP.CODPERLET MÓDULO, UPPER(GC.NOMEFANTASIA) EMPRESA, UPPER(SM.CODTURMA) AS TURMA,
    UPPER(GFILIAL.NOMEFANTASIA) UNIDADE, GFILIAL.CIDADE, GFILIAL.CODMUNICIPIO, SA.RA, UPPER(STIPOCURSO.NOME) NIVELENSINO

FROM SALUNO SA
    INNER JOIN PPESSOA PP ON PP.CODIGO = SA.CODPESSOA
    INNER JOIN SMATRICPL SM ON SM.CODCOLIGADA = SA.CODCOLIGADA AND SM.RA = SA.RA
    INNER JOIN SPLETIVO SP ON SP.CODCOLIGADA = SM.CODCOLIGADA AND SP.IDPERLET = SM.IDPERLET
    INNER JOIN SHABILITACAOFILIAL SH ON SH.CODCOLIGADA = SM.CODCOLIGADA AND SH.IDHABILITACAOFILIAL = SM.IDHABILITACAOFILIAL
    INNER JOIN SCURSO SC ON SC.CODCOLIGADA = SH.CODCOLIGADA AND SC.CODCURSO = SH.CODCURSO
    INNER JOIN SSTATUS SS ON SS.CODCOLIGADA = SM.CODCOLIGADA AND SS.CODSTATUS = SM.CODSTATUS
    INNER JOIN STIPOCURSO ST ON ST.CODCOLIGADA = SH.CODCOLIGADA AND ST.CODTIPOCURSO = SH.CODTIPOCURSO
    INNER JOIN GCOLIGADA GC ON GC.CODCOLIGADA = SH.CODCOLIGADA
    LEFT JOIN GETD GE ON GE.CODETD = PP.ESTADONATAL
    LEFT JOIN GMUNICIPIO GM ON GM.NOMEMUNICIPIO = PP.NATURALIDADE
    LEFT JOIN PCODNACAO PC ON PC.CODCLIENTE = PP.NACIONALIDADE
    INNER JOIN SFILIAL(NOLOCK) ON SFILIAL.CODCOLIGADA = SH.CODCOLIGADA AND SFILIAL.CODFILIAL = SH.CODFILIAL
    INNER JOIN GFILIAL(NOLOCK) ON GFILIAL.CODCOLIGADA = SFILIAL.CODCOLIGADA AND GFILIAL.CODFILIAL = SFILIAL.CODFILIAL
    INNER JOIN STURNO STU (NOLOCK) ON STU.CODCOLIGADA = SH.CODCOLIGADA AND STU.CODTURNO = SH.CODTURNO
    INNER JOIN STIPOCURSO ON STIPOCURSO.CODCOLIGADA=SH.CODCOLIGADA AND STIPOCURSO.CODTIPOCURSO=SH.CODTIPOCURSO

WHERE (UPPER(SS.DESCRICAO) LIKE 'MATR%' OR UPPER(SS.DESCRICAO) LIKE 'CURS%' OR UPPER(SS.DESCRICAO) LIKE 'APROVA%')
```

Source: The Authors (2021)

The Dashboards are being carried out in partnership with the head of the company's technology area, the manager was well satisfied with the solution found, since it was understood the need to have the data quickly and in a more accessible way.

Figure 2 presents information related to the number of students by school period by status and course being reprimanded seated by the matrix that is located in the right corner, the quantity by registration situation is represented by the pie chart located in the lower left corner and the general student quantity and represented by the Treemap chart that is located in the upper left corner, previously an average of 1 to 2 hours was required and the generation of 3 reports to obtain a consolidated information present in the figure below, now the information can be obtained more quickly by accessing only the web page of the tool used for analysis.

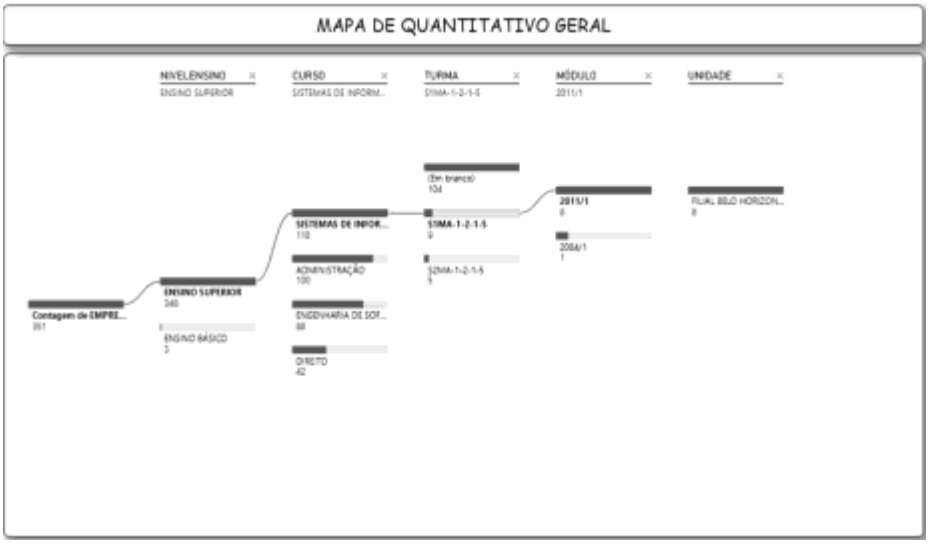
Figure 2:- Number of students by course, status and period.



Source: The Authors (2021).

Figure 3 shows the hierarchical map according to the sequence defined in the initial analysis: Teaching level, Course, Class, Module and Teaching Unit, showing the number of students according to the chosen selection, in this way it is possible to have quantitative information of students quickly and accurately, this report was previously developed through data extraction directly from the school database then using a spreadsheet in Excel, it was identified that for the preparation of the report previously something was needed around 1h, today it was necessary only direct visualization in the dashboard panel developed.

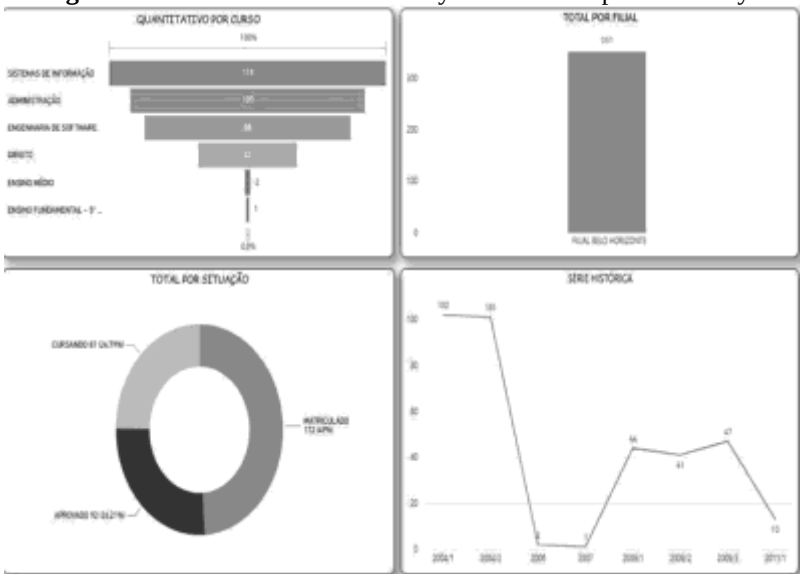
Figure 3:- Hierarchical map of student quantity.



Source: The Authors (2021)

Figure 4 shows the Funnel chart located in the upper left corner with the scale per course with the highest number of students up to the course with the lowest number of active students according to the filter used, already in the upper right corner we have the graph by bar showing the number of active students per branch of the company, in the lower left corner we can see the pie chart with the number of students by enrollment situation and by last we have the graph by bar in the lower right corner that shows the evolutionary scale of students per semester, all this information is considered extremely important for the analysis of enrollment performance and history of active students of the institution.

Figure 4:- Evolution of enrollment by situation and period history.



Source: The Authors (2021).

Results Discussion:-

According to (SILVA, 2019, p. 79) "the organization needs to have a direction that all decisions should be based on data and information." The handling of the POWER BI tool allows information to be viewed more clearly and objectively, so that its employees become more productive regarding analysis and decision making, no longer depending on complex processes for reporting, which compromises the agility to define strategies aimed at solving problems.

Given the graph generated with the data provided by the basis of the Option Educational Center, it was clearly observed that higher education courses such as: Information Systems, Administration, Software Engineering and Law are the most engagement courses, the company's administrators were thus able to make a decision quickly and practically in increasing the number of classes to meet the demand, which would take much longer to analyse, for example, a dynamic report.

For Silva (2019) it was in evidence that the tool generates productivity in the analysis of professionals who work directly with the Power BI tool, assisting organizations with the management of their data using a single location for their employees to perform functions such as: crossing information and preparing lean and objective reports from data collected for the use of information effectively to solve existing problems or that may arise. The application of this tool facilitated the process in the use of data to have reliable information that is used to solve problems, predict scenarios, quantitative survey, in order to increase the productivity of the analysis of these data, and the applicability can extend to any organization that uses information, based on previous data, for the development of its activities. With the speed in which changes occur, market trends, this research aimed to deal with this instrument that produces more quickly the information to be used in a strategic way to solve the difficulties encountered in the decision-making process to solve problems, also making the organization able to monitor the intensity of the changes in scenery.

The information belonging to any and all organization is fundamental for there to be a good performance in the execution of its activities, however for this information to be in fact reliable to support decisions, the data needs to be centralized and made clear, which generates a security and reduction of errors propagating common sense in its management decisions.

Conclusion:-

This research project carried out through a case study of the Option Educational Center, has provided us with further improvement of the knowledge acquired during our graduation, as well as putting into practice everything that has been passed on to us throughout our aca demicalife. With this, it was possible to evaluate the company in question, to determinethe problem and propose a solution to its Director, sothat it can continue providing its service in order, which consists in the provision of services of early childhood education, elementary school and high school, envisioning to continue growing and expanding in the mercado, and to win over more customers.

It was a challenge to perform the analysis and execute the development of the Dashboards for analysis of those responsible, verifying their problems of analysis and decision making and as a consequence elaborate a proposal for a solution that could solve the problem incontract.

All this was possible through the use of the methods, appropriate tools, among which we can highlight the POWER BI, which allowed us to highlight more clearly the analysis of the data ofthe company. It is worth noting that the proposal of solution formulated by the academics was accepted by the Director.

The results obtained so far consist of the preparation of academic and financial analysis dashboard, which is under a deadline for late September. Therefore, it is worth mentioning that the study provided us with a unique experience, helping us to acquire more knowledge. The results obtained areso satisfactory once the proposal has been accepted and is being executed efficiently and as a consequence will enable the owner to grow his business, as well as increase profitability and competitive advantage over its competitors.

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