

Dynamic Assessment of Business KPIs: Optimizing Territorial Management Through a Dashboard

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Abstract

At ETECSA's Sancti Spíritus Territorial Division Center, dispersed statistical data on key indicators —distributed across monthly/yearly databases— hampers comprehensive analysis and decision-making. To address this limitation, an Excel dashboard was developed to centralize and unify this information into a single file, which can be updated monthly. This tool consolidates preliminary, monthly, and cumulative indicator values, enabling dynamic visualization via interactive period-segmented charts. The Dashboard generates accurate, real-time reports, to evaluate performance against annual business objectives; streamlines management decision-making by managerial decisions by unifying ETECSA's KPIs; and supports the Territorial Director in monitoring results through integrated data from Network Operations, Sales, Logistics & Services, Human Resources, and Investments. The solution is implemented using Microsoft Excel in its advanced version, leveraging dynamic links

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between databases, VBA (Visual Basic for Applications) macros to automate update and validation processes, and interactive charts configured to reflect monthly trends and historical comparisons. All the information processed ranges from divisional to national levels, ensuring consistency in reporting. This project not only optimized data management but also deepened the company's mastery of Excel as a Business Intelligence tool, proving its potential to transform operational processes into strategic ones.

Keywords: Dashboard, KPIs, VBA, Business Intelligence

Introduction

In contemporary business management, the real-time monitoring of Key Performance Indicators (KPIs) has become a keystone for strategic decision-making. Nevertheless, various organizational units within the Empresa de Telecomunicaciones de Cuba S.A., ETECSA's territorial divisions, face specific challenges: the presence of multiple non-integrated information systems, disparate data collection formats, and the absence of automated mechanisms for temporal comparative analysis. This significantly hinders performance assessment and the timely detection of deviations. This paper introduces an interactive Dashboard engineered to streamline the assessment of business KPIs within the territorial division which allows executives to monitor the achievement of objectives through dynamic graphical visualizations, monthly as well as accumulated and speed up the evaluation process of institutional performance.

The primary objectives of this research were to develop a tool that centralizes and automates the analysis of KPIs based on their compliance, in addition to facilitating the graphical display of the indicator performance in monthly and cumulative periods; as well as, optimizing the performance evaluation process of the executives and managers in the Territorial Division.

Recent research has highlighted the value of Dashboards in Business Management. Authors such as Few (2006) and Eckerson (2010) laid the foundations for the design of effective control panels, while more recent studies by Terreros (2023) and Pérez (2025) have

shown their impact on improving decision-making agility. However, few papers address specific solutions for territorial management, where data heterogeneity and the need for local contextualization represent unique challenges.

This research is justified by three key factors: the need to unify criteria in the analysis of KPIs dispersed in multiple sources, the demand for accessible tools that automate the generation of reports for executives, as well as the lack of purpose-built solutions to the territorial scale, where indicators require historical benchmarking and georeferencing.

This paper has influence on the field of operational Business Intelligence by proposing a scalable solution, developed with widely accessible technologies (advanced Excel + VBA), which combines analytical rigor with utility for managerial environments. The results show how the integration of interactive displays and business logic can effectively transform raw data into data-driven recommendations, bridging the gap between information and strategy.

Materials and Methods

The implemented methodology was based on the use of Microsoft Office Excel, leveraging its advanced data management and analysis capabilities through the use of VBA — Visual Basic for Applications — for process automation, Alexander and Kusleika (2022). This approach allowed to establish dynamic connections with multiple data sources generated by Network Operations, Commercial, Logistics and Services, Human Capital and Investments departments. It also allows standardizing and consolidating the key indicators aligned with ETECSA's annual Business Objectives, as well as developing an automated updating system that guarantees the information integrity and timeliness. The choice of this tool is justified by its widespread use in corporate environments, its scalability to process significant volumes of operational data, and its ability to generate customized outputs through advanced programming, which makes it a cost-effective solution for the strategic management of indicators.

The design of the dashboard is conceived from the needs demanded by the Territorial Division executives, who required a visual way to analyze the performance of their key indicators after months. To achieve this, a system was developed that displays the information in easy-to-understand graphs (Figure 1), which allow to quickly identify trends, compare results and detect possible problems. Each area of the organization has its own customized dashboard, connected directly to its databases in Excel. This enabled to gather all the information that reaches the Territorial Management Center in a consistent and orderly format, facilitating joint analysis without losing the specific perspective of each department.

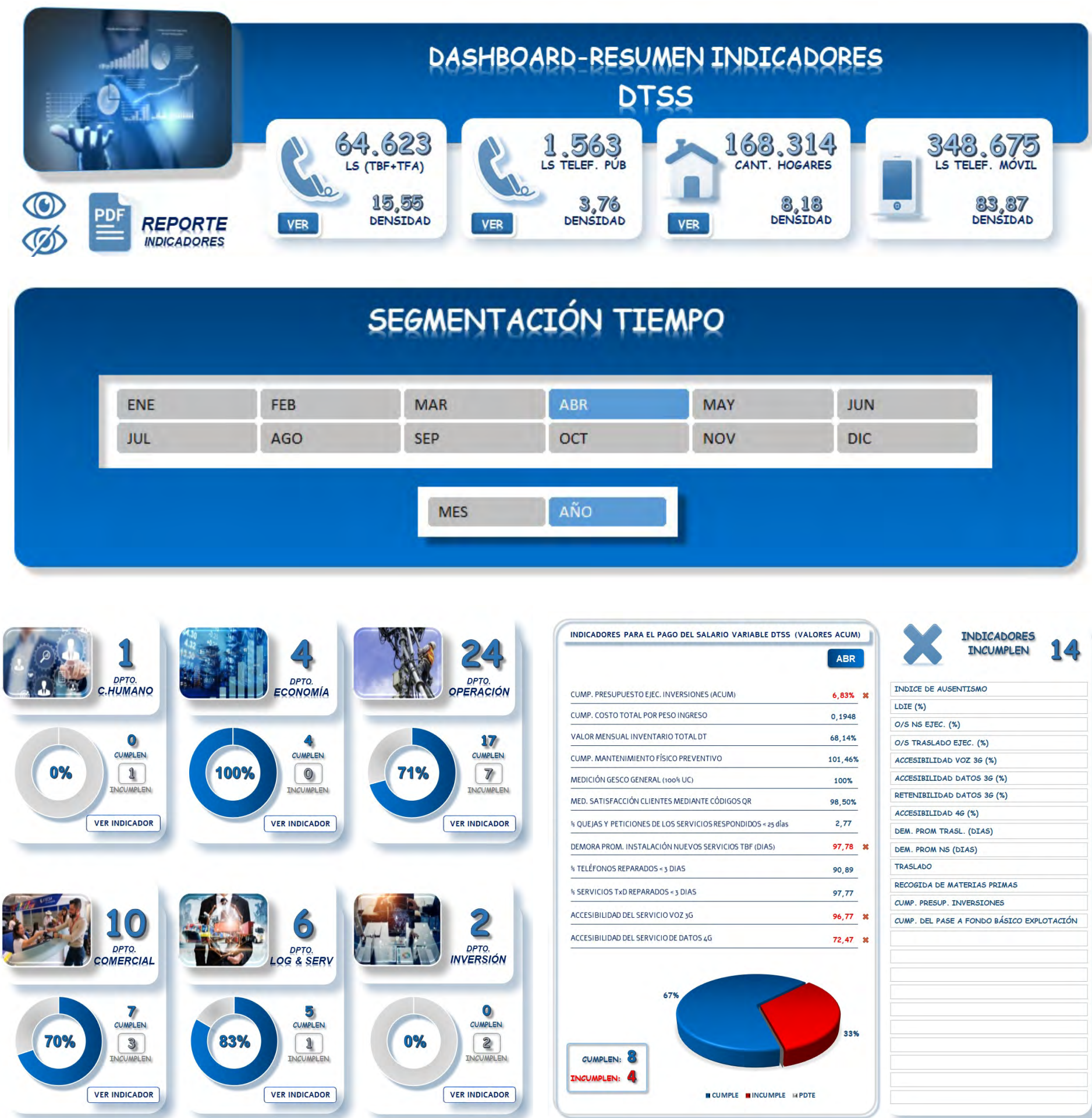


Figure 1. Business KPIs Management Dashboard Interface – ETECSA

For a better understanding, the main Dashboard is organized in functional sections, starting with a module that has all organizational units reporting information to the Management Center. For each unit, the total figures of analyzed indicators and the percentage of compliancecalculatedusingtheformula: $\% \text{Compliance} = (\text{Current Value} / \text{Planned Target} \times 100$, applicable for both monthly and cumulative analysis, are shown. Indicator values that fail to meet their targets are highlighted by graphical visualizations detailing the frequency of monthly non-compliance. This functionality was implemented through VBA programming that automates data update, generates the graphs dynamically and ensures consistency of calculations.

In this same section, the functionality of visualizing customized control dashboard for each department was implemented (See Indicators), adapted to the specific characteristics of their indicators. The data can be displayed in both graphical and tabular formatting, depending on analysis needs. All dashboards are interconnected through data segmentation based on Excel's dynamic tables and advanced functions, which include the use of dynamic ranges to optimizeinformationprocessing. Thistechnicalsolutionwasdesigned to ensure smooth performance, even when handling the high volume of data generated in the year, ensuring an efficient user experience on all workstations.

The main Dashboard includes another section dedicated to the key indicators for the performance evaluation of executives. The values use Excel conditional formatting, which automatically highlights in red and with an alert icon those that do not meet the established objectives. The information is complemented by a pie chart that visually displays the percentage of compliance or non-compliance and a detailed table that quantifies the exact number of indicators met and not met. This design allows for immediate identification of problem areas, combining the clarity of the graphical visualization with precision of tabulated data.

TheDashboardincludesasectionthatautomaticallydisplaysallthe indicators that have not met their targets. The most useful thing is for this information to be updated automatically: by changing the month

or year option (cumulative) in the time segmentation, the numbers and list of indicators with problems instantly change. This enables to easily see if there are indicators that are repeated every month or if they are one-off situations, helping to better focus improvement efforts.

In the upper section of the main Dashboard, interactive buttons are used to display the density values of four key services: Fixed Basic Telephone (hereinafter, TBF, for its acronym in Spanish), Public Telephony (hereinafter, TP, for its acronym in Spanish), Nauta Hogar (hereinafter, NH, for its acronym in Spanish), and mobile service. For the first three services, the buttons display, through forms developed with VBA, detailed tables that break down the data by telecommunications centers.

In addition, a specific function is added to display in a customized way all the indicators related to each telecommunications center, extracting data from the control dashboard. This function allows specific analyses to be performed faster, generate automated PDF reports using macros and optimize the working time of executives, specialists and technicians by facilitating access to accurate and segmented data.

Results and discussion

The traditional method used to carry out the monthly closing report of the KPIs in the Territorial Division, relies on the manual update of multiple Excel databases and their consolidation into a single PDF file with tables and graphs, which has significant limitations. Among them are the lack of historical visibility, since the graphs do not display the cumulative annual progress broken down by months; the dispersion of information into different sheets, which makes it difficult and delays data location; and the inability to customize reports for specific telecommunications centers when executives require particular analyses. These restrictions impact on the efficiency of the process and the quality of strategic decision-making.

With the implementation of an interactive Dashboard for the dynamic assessment of corporate KPIs in territorial management, it

allows obtaining a comprehensive view of the performance of the different organizational units in the Territorial Division (Figures 2 and 3). This tool facilitates immediate monitoring of key indicators, centralizing information and reducing reporting times compared to the traditional method. In addition, it allows the early identification of deviations, which makes it possible to quickly detect negative trends, allowing to respond to methodological areas with timely and customized interventions. The availability of updated and visually intuitive information increases data-based decision-making, strengthening territorial management and improving key indicators.



Figure 2. Customized Dashboard for KPIs Management in the Commercial Area



Figure 3. Customized Dashboard for KPIs Management in the Network Operation Area

The obtained results show that the dynamic assessment of KPIs through a Dashboard represents an effective tool for territorial management in the business context, particularly in environments where speed and accuracy in decision-making are crucial. The ability to display key indicator performance enables executives to identify problems, assess the impact of implemented initiatives, and adjust strategies in an agile way.

Furthermore, data centralization and accessibility foster more collaborative management, promoting the alignment of objectives and initiatives across the different organizational units. The reduction in reporting and analysis times contributes to greater operational efficiency, optimizing resources and enhancing user satisfaction. The dynamic assessment of KPIs through Dashboards

not only improves territorial management, but also boosts the data-driven decision-making culture, a key element for competitiveness in today's business environment.

Conclusions

The implementation of this interactive tool allows the executives from the Territorial Division to conduct an exhaustive analysis of business indicators. This results in a better understanding of the organization's performance throughout the year.

It allows to graphically display the indicator performance on a monthly and cumulative basis, facilitating the identification of trends, anomalies and opportunities for improvement, thus contributing to more informed and timely decision-making.

The tool provides executives with a solid basis on which underpin continuous improvement strategies by providing up-to-date and accurate data on indicator compliance. This helps foster a culture of constant evaluation and process adjustment in the Territorial Division.

Furthermore, the use of this tool allows a better alignment between the strategic objectives and operational actions of the Territorial Division, ensuring that all organization levels work in synergy towards achieving optimal results.

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