

Project Performance Dashboard Warehouse Expansion

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Topics

1. Introduction.
2. Processes.
3. Insights and Conclusion.

1. Introduction

Steps

1. **Data Cleaning:** Performing a data cleaning and preparation process to ensure its consistency and quality before being uploaded to Power BI.
2. **Uploading Tables to Power BI:** Importing the relevant tables into Power BI, organizing and structuring the data to facilitate analysis.
3. **Table Relationships:** Establishing relationships between different tables to ensure efficient and cohesive integration between the data.
4. **Creation of Measures Table:** Developing measures tables using DAX for essential calculations and metrics, optimizing the creation of interactive charts.
5. **Chart Development:** Building interactive visualizations that facilitate data analysis, including performance charts, value comparisons, and key project metrics.
6. **Dashboard Design:** Formatting and structuring the dashboard layout, creating a visually appealing and functional interface for presenting the data.
7. **Analysis and Conclusions:** In-depth analysis of the data presented on the dashboard, extracting valuable insights for decision-making and presenting the final conclusions of the project.

Fontes

The data used in this project was extracted based on the content provided by Professor José Luiz, in a lecture available on his [YouTube](#) channel, Adolfo Pizzarino.

Objective

This project was developed as part of my studies in Business Intelligence (BI) and data analysis, aiming to demonstrate my skills in creating interactive dashboards and analyzing large volumes of data. The Project Performance Dashboard Warehouse Expansion was designed to monitor the progress of a warehouse expansion, optimize processes, and analyse key project metrics such as budget, costs, and team performance using Power BI. The dashboard was designed to meet the needs of managers and stakeholders, providing a clear and detailed real-time view of the project's execution. The analysis includes, but is not limited to:

- **S-Curve:** A budget versus execution analysis (planned vs. actual), allowing efficient tracking of the project's progress over time. This visualization is crucial to identify deviations and forecast project completion trends.
- **Team Performance:** Tracking the productivity and efficiency metrics of the team involved in project execution, enabling operational adjustments to improve performance.

- **Cost and Budget Analysis:** The integration of the dProjeto, fCustos, and fOrcamento tables provides a detailed view of incurred costs compared to the planned budget, helping identify areas of savings or necessary adjustments.

Data

Below are the three main tables used in the project: **dProjeto**, **fCustos** and **fOrcamento**.

Id_Projeto	Descrição	Orçamento	Data Aprovação	Data Conclusão	Data Última Atualização	Status	Gerente Projeto	Equipe
PROJ-001	Expansão de Armazém	221884587	Thursday 2 January 2020	Tuesday 31 December 2024	Friday 21 January 2022	Finalizado	Carlos Silva	Equipe Alpha
PROJ-002	Modernização de Frota	378018481	Thursday 2 January 2020	Tuesday 31 December 2024	Tuesday 2 August 2022	Em andamento	Ana Pereira	Equipe Beta
PROJ-003	Automação de Processos	173342596	Thursday 2 January 2020	Tuesday 31 December 2024	Sunday 22 January 2023	Finalizado	Roberto Souza	Equipe Gamma
PROJ-004	Implementação de ERP	119183227	Wednesday 1 January 2020	Monday 30 December 2024	Tuesday 28 April 2020	Em andamento	Mariana Lima	Equipe Delta
PROJ-005	Otimização de Rotas	31902582	Thursday 2 January 2020	Tuesday 31 December 2024	Tuesday 31 October 2023	Finalizado	João Fernandes	Equipe Epsilon
PROJ-006	Construção de Centro de Distribuição	415717921	Thursday 2 January 2020	Tuesday 31 December 2024	Wednesday 12 February 2020	Finalizado	Renata Alves	Equipe Zeta
PROJ-007	Upgrade de Sistemas	297882691	Thursday 2 January 2020	Tuesday 31 December 2024	Thursday 4 April 2024	Finalizado	Fernando Costa	Equipe Eta
PROJ-008	Treinamento de Equipe	259378356	Wednesday 1 January 2020	Monday 30 December 2024	Sunday 21 June 2020	Em andamento	Patrícia Ribeiro	Equipe Theta
PROJ-009	Instalação de Equipamentos	75333790	Thursday 2 January 2020	Tuesday 31 December 2024	Monday 14 September 2020	Finalizado	José Santos	Equipe Iota
PROJ-010	Melhoria de Infraestrutura	184065199	Thursday 2 January 2020	Tuesday 31 December 2024	Friday 28 February 2020	Em andamento	Luciana Martins	Equipe Kappa

Data	Valor	Descricao do Item	Id_Projeto	Classificação	Fornecedor
Thursday 2 January 2020	€1,803,015	Serviços de Terceirização	PROJ-001	Serviço	Fornecedor 123
Friday 21 February 2020	€2,564,586	Aquisição de Software	PROJ-001	Serviço	Fornecedor PQR
Monday 13 April 2020	€3,049,151	Serviços de Auditoria	PROJ-001	Serviço	Fornecedor YZA
Wednesday 8 July 2020	€852,189	Serviços de Marketing	PROJ-001	Serviço	Fornecedor HIJ
Wednesday 16 September 2020	€2,592,635	Compra de Móveis	PROJ-001	Serviço	Fornecedor ZAB
Thursday 22 October 2020	€1,106,913	Compra de Equipamentos de Segurança	PROJ-001	Serviço	Fornecedor CDE
Wednesday 4 November 2020	€1,311,900	Compra de Ferramentas	PROJ-001	Serviço	Fornecedor NOP
Tuesday 12 January 2021	€2,777,638	Compra de Veículos	PROJ-001	Serviço	Fornecedor STU
Saturday 6 March 2021	€1,838,658	Compra de Materiais de Construção	PROJ-001	Serviço	Fornecedor QRS
Sunday 9 May 2021	€1,739,896	Locação de Equipamentos	PROJ-001	Serviço	Fornecedor XYZ
Saturday 12 June 2021	€2,053,052	Serviços de Marketing	PROJ-001	Serviço	Fornecedor PQR

Id_Projeto	Descrição	Data	Valor
PROJ-001	Despesa de Expansão de Armazém no mês 1/2020	Saturday 18 January 2020	€2,081,021
PROJ-001	Despesa de Expansão de Armazém no mês 2/2020	Saturday 1 February 2020	€4,352,533
PROJ-001	Despesa de Expansão de Armazém no mês 3/2020	Thursday 19 March 2020	€3,159,907
PROJ-001	Despesa de Expansão de Armazém no mês 4/2020	Wednesday 8 April 2020	€2,544,414
PROJ-001	Despesa de Expansão de Armazém no mês 5/2020	Saturday 9 May 2020	€1,907,186
PROJ-001	Despesa de Expansão de Armazém no mês 6/2020	Thursday 25 June 2020	€3,792,026
PROJ-001	Despesa de Expansão de Armazém no mês 7/2020	Tuesday 7 July 2020	€1,222,364
PROJ-001	Despesa de Expansão de Armazém no mês 8/2020	Tuesday 4 August 2020	€3,411,028
PROJ-001	Despesa de Expansão de Armazém no mês 9/2020	Saturday 12 September 2020	€4,022,335
PROJ-001	Despesa de Expansão de Armazém no mês 10/2020	Monday 12 October 2020	€1,304,048

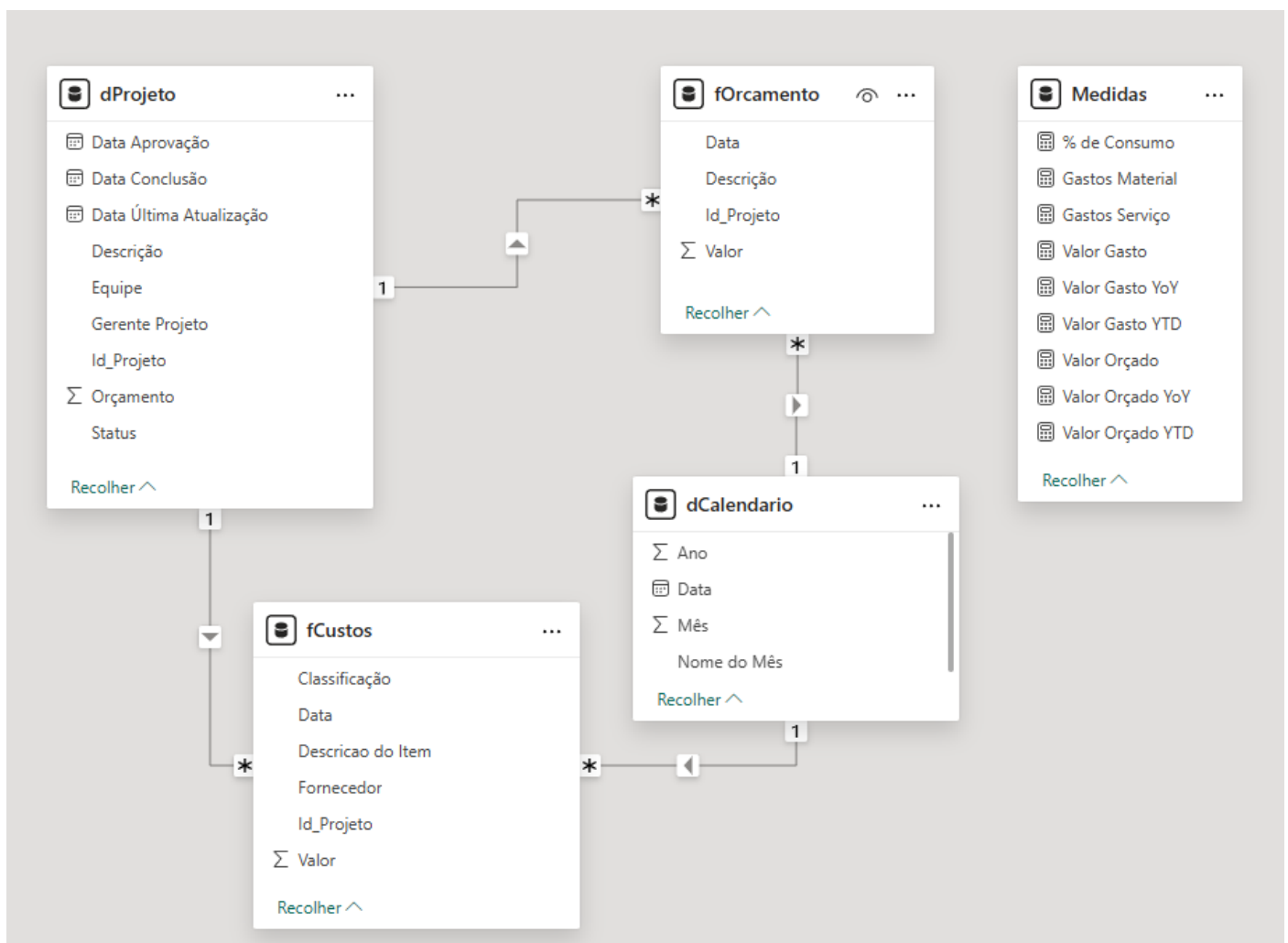
The screenshots provided represent only a portion of the table. The complete table, with all detailed data, will be available in the GitHub repository.

2. Processes

Table Relationships

Below is the relationship diagram between the tables used in the project. This relationship was essential to ensure data integrity and proper integration between different data sources. The connection between the **dProjeto**, **fCustos**, and **fOrçamento** tables ensures that analysis and visualizations are performed seamlessly, enabling the calculation of metrics, data comparisons, and the creation of dynamic dashboards.

The screenshot below illustrates how the tables are interconnected in Power BI, ensuring efficient modeling for data analysis.



DAX Functions

In this project, DAX functions were applied to create essential metrics and dynamic analyses aimed at monitoring the performance of the warehouse expansion and comparing planned values with actual values. Below are some of the key formulas used:

- **Spent Value YoY** = `CALCULATE([Spent Value], SAMEPERIODLASTYEAR(dCalendario[Date]))`
- **Consumption %** = `DIVIDE([Spent Value], [Planned Value], 0)`
- **Spent Value YTD** = `CALCULATE([Spent Value], DATESYTD(dCalendario[Date]))`

Creating the Charts: S-Curve, KPIs, and Bar Chart

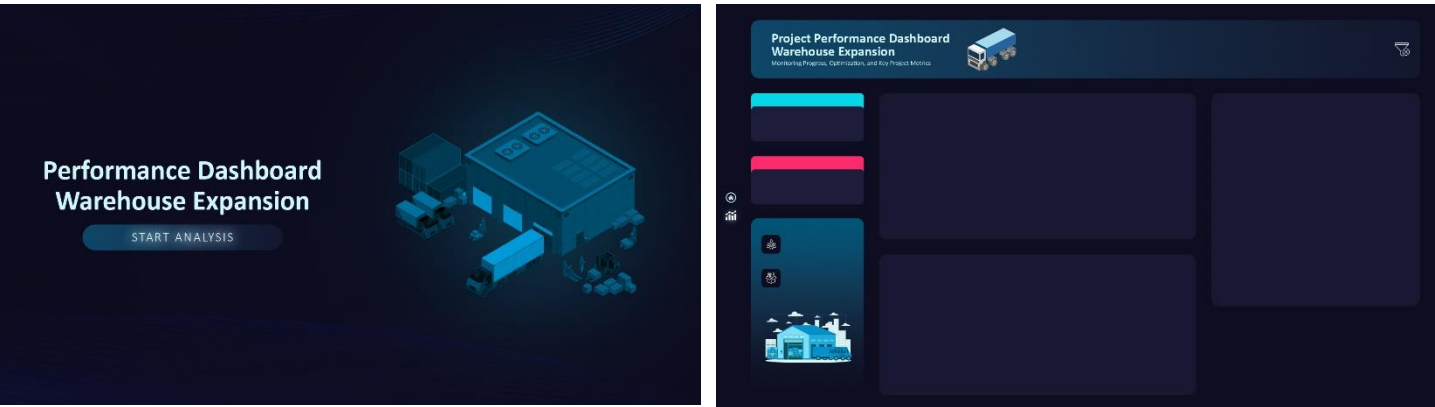
After implementing the DAX formulas, the next step was to create and position the charts on the dashboard. At this stage, the goal was not only to create informative visualizations but also to highlight the most important metrics in a clear and accessible manner. Below are the main charts created:



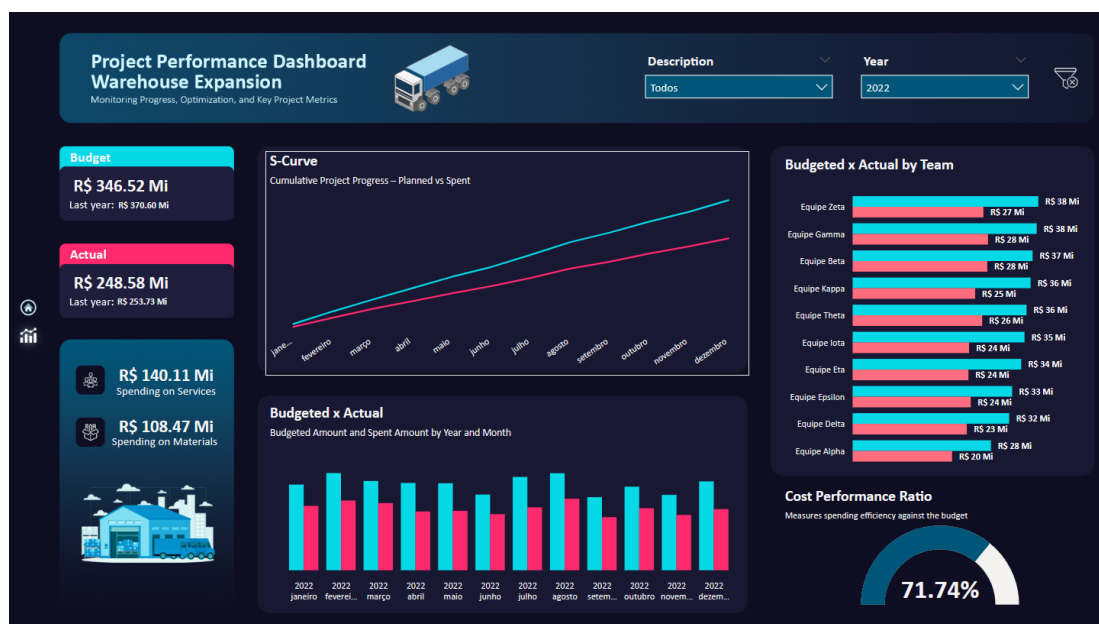
These charts were strategically positioned on the dashboard, with the S-Curve highlighted to facilitate analysis of progress over time, KPIs positioned for a quick view of current performance, and bar charts organized for direct comparisons between costs and budget.

Organization and User Experience

Design plays a crucial role in the effectiveness of any dashboard, as it not only makes the data visually appealing but also facilitates understanding and navigation. In the case of the Project Performance Dashboard Warehouse Expansion, the design was carefully planned to ensure a smooth, intuitive user experience focused on data analysis.



In summary, the design of the dashboard not only serves an aesthetic purpose but is essential for creating an organized and enjoyable user experience.



4. Insights and Conclusion

The analysis of the **Project Performance Dashboard Warehouse Expansion** reveals a series of crucial insights that help understand the project's performance in terms of financial execution and team progress. Based on the collected data, I was able to identify key trends, areas for improvement, and causes of deviations that could impact project delivery.

1. Comparison Between Planned, Budgeted, and Actual

Difference between Budgeted and Actual: The difference between what was budgeted and what was actually spent is **R\$ 506.7 million**, representing a **27.9% underrun compared to the budget**. This indicates underspending, suggesting that costs are lower than expected, which could signal savings or efficiency in execution but could also indicate delays.

2. Expense Distribution

- **Services:** The amount spent on services was R\$ 692.99 million.
- **Materials:** The amount spent on materials was R\$ 616.12 million.

These data show how resources are allocated across different project areas, with services representing the larger portion of the expenditures.

3. Trends and Patterns

S-Curve: The S-Curve chart reveals a consistent and growing deviation between planned and actual, indicating that the project's progress is below budget expectations.

Cost Performance: Cost performance stands at **72.10%**, indicating a significant underspend, which could be a sign of inefficiency in schedule execution or failures in resource allocation.

4. Possible Causes of Deviations

- **Conservatism in Budgeting:** There might be a larger safety margin in the budget, resulting in an overestimate of the necessary amount.
- **Delays in Execution:** The work pace may be slower than expected, resulting in less spending.
- **Efficiency Gains or Unforeseen Savings:** Some teams may have managed to reduce costs, but without a budget plan for such savings.
- **Bottlenecks in the Approval Process:** The approval process may be delaying execution, directly impacting expenditures.

5. Strategic Recommendations

- **Critical Review of Budgeting Process:** Assess if the budget is excessively conservative and adjust it according to the project's reality.
- **Implementation of Daily Monitoring System:** Create a daily expense monitoring system to enable quick adjustments and avoid surprises.
- **Creation of Acceleration Committee:** Implement a committee focused on accelerating project progress, especially in critical areas.
- **Action Plans for Teams:** Develop action plans to align team execution with budgeted values, specifically addressing each team's deviations.
- **Review of Approval and Hiring Processes:** Improve hiring and approval processes to ensure faster execution.
- **Setting Intermediate Goals:** Define more specific intermediate goals for budget execution over time, allowing more granular progress analysis.
- **Weekly Deviation Analysis Meetings:** Implement periodic meetings to identify and quickly resolve any significant deviations.
- **Reinforcement of Teams, if Necessary:** Evaluate the need to increase team resources in case of significant under-execution.

Final Conclusion

The project situation requires special attention as the budget execution level of 72.10% may indicate risks regarding the schedule and planned budget. Balancing cost control with the need to deliver the project on time is crucial. By implementing the above recommendations, the project can be optimized to ensure greater efficiency, avoid delays, and align actual execution with the financial and time objectives set.