

OPTIMIZING AND ENHANCING COMPONENT RELIABILITY ON A CENTRALIZED PHOTOVOLTAIC POWER PLANT WITH DATA MONITORING



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Introduction

- ▶ Brazil has been increasing photovoltaic power Generation capacity year by year, resulting in a demand for huge projects
- ▶ Large scale solar projects need constant monitoring, and might deal with massive number of data points
- ▶ For more than 1M data points, it's imperative to have an outstanding data monitoring structure
- ▶ A solid asset framework implementation based on a hierarchical structure and templates is necessary
- ▶ The structure needs to accurately describe the plant in order to be replicable, and enhance analysis and monitoring

Plant Characteristics

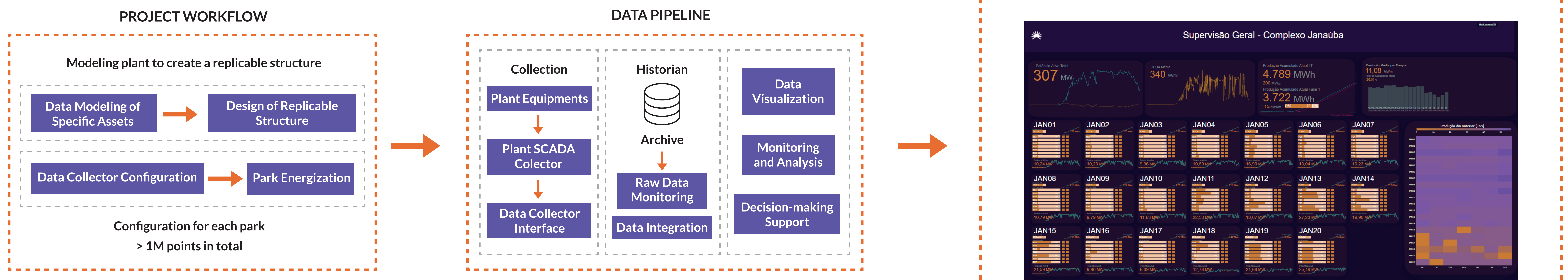
1.8 GWp/1.0 GWac centralized photovoltaic power generation plant

Plant Equipment	Quantity
Substations	1
Park	20
Circuit	60
Transformer Station	140
Inverter	5628
Tracker	>25k
PV Modules	>2M
Weather Meter Station	60

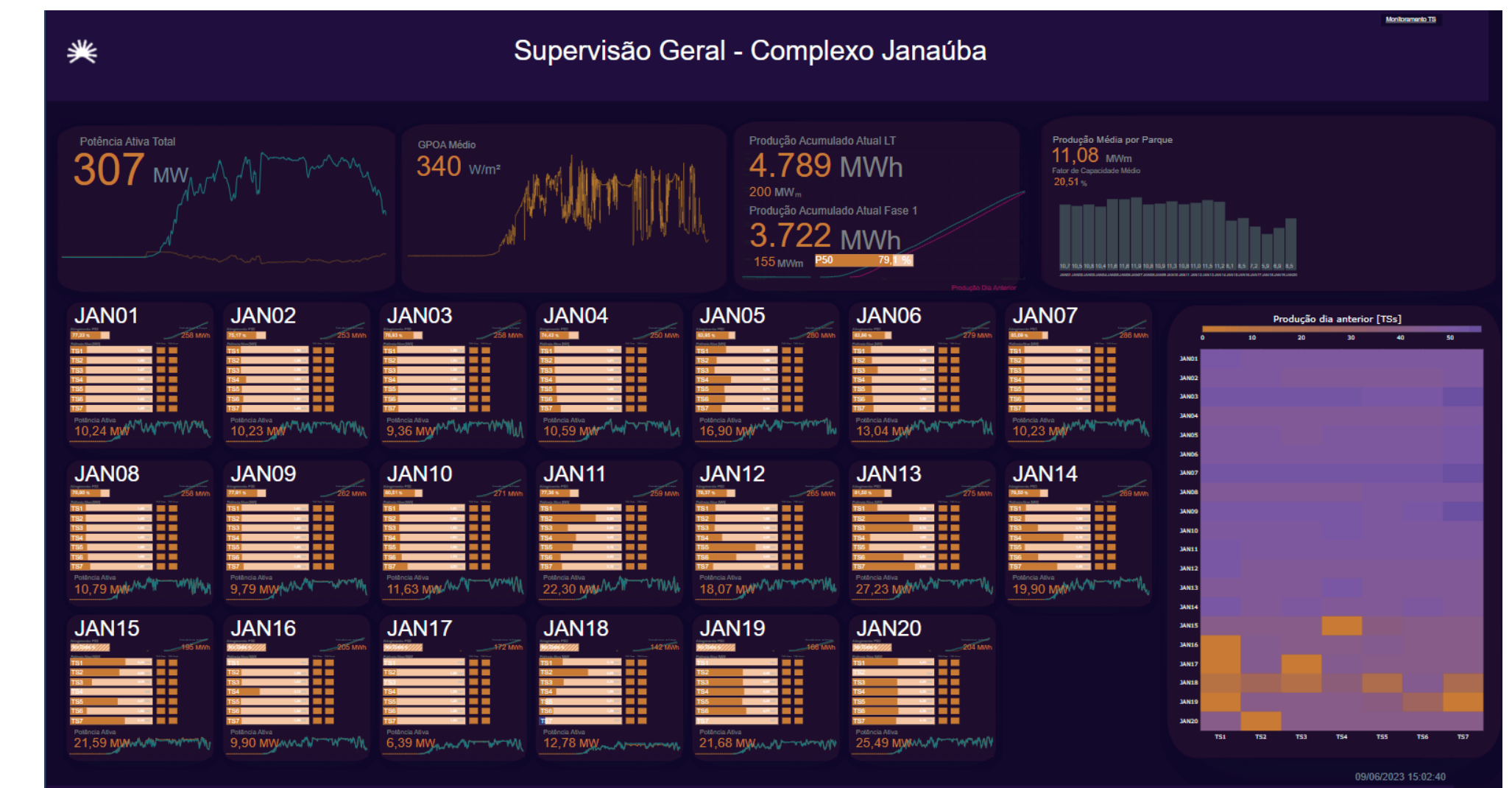
> 1M Data Points



Solution

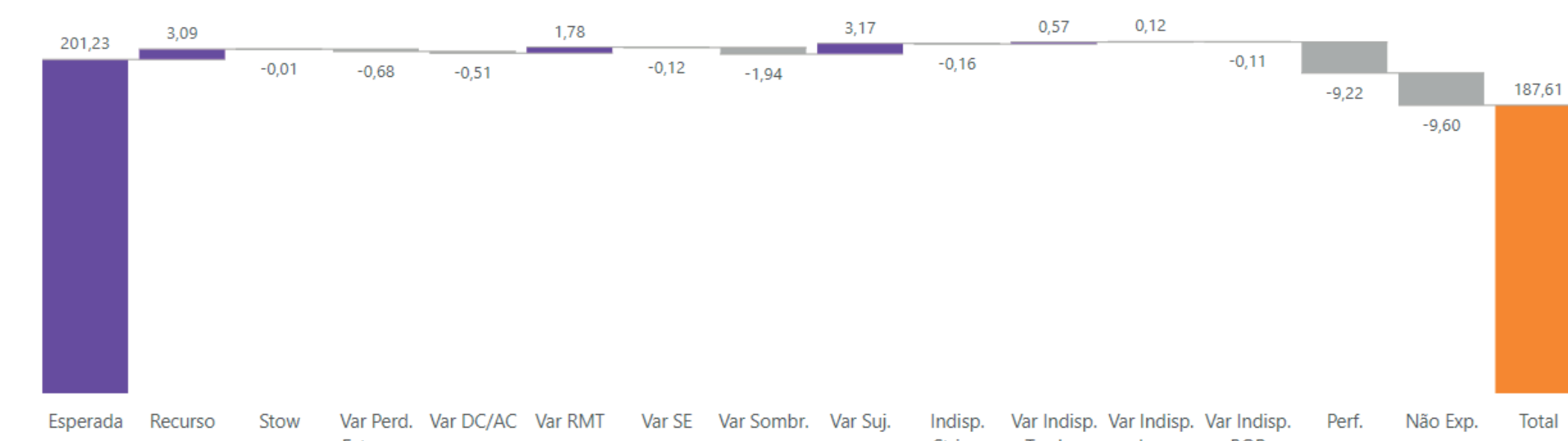


- ▶ Once structured, the data, adjusted with its unit of measure, digital value labels or with several other options, is able to be visualized in the hierarchical structure framework itself or used in external applications, such as dashboards.
- ▶ In addition, the data points can be used in calculations, giving more depth to the data collection, and smart monitoring that uses triggers based on the raw data or the calculations made.



Executive Dashboard - Visualizing whole plant data

Results

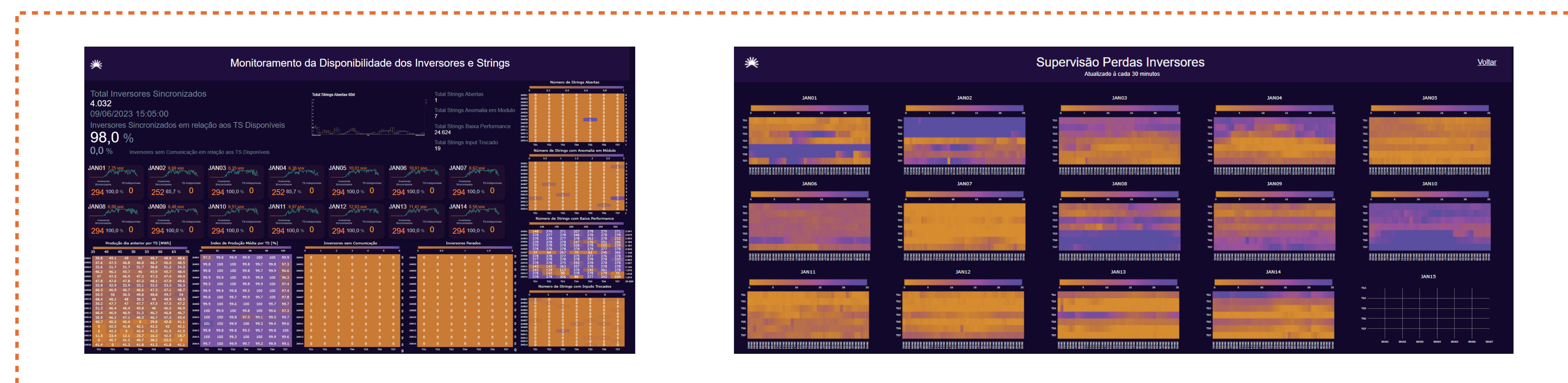


4 GWh
of energy loss avoided due to string failures

25%
increase in maintenance efficiency through the determination of optimal routes based on distance vs. energy loss

10%
recovery of energy lost due to dirt and vegetation through demand-based cleaning methodology

Availability
of data enables more accurate and rapid root cause analyses, anticipating serial failures



Monitoring Losses of Energy and Equipment Failures



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