EDP: Providing Power Generation Fleet Wide Real-Time Awareness and Key Decision Support via PI AF

Rui Batista

Agenda

- EDP
- Business Challenge
- Implementation Details
- Business Impact
- Conclusion

SKIPPER

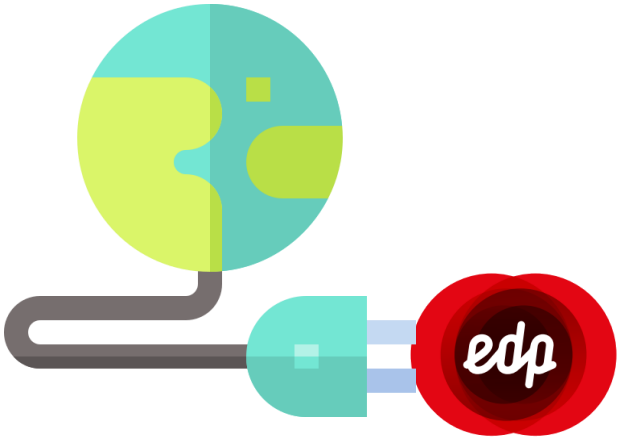
ALL DATA ON BOARD

App Skipper

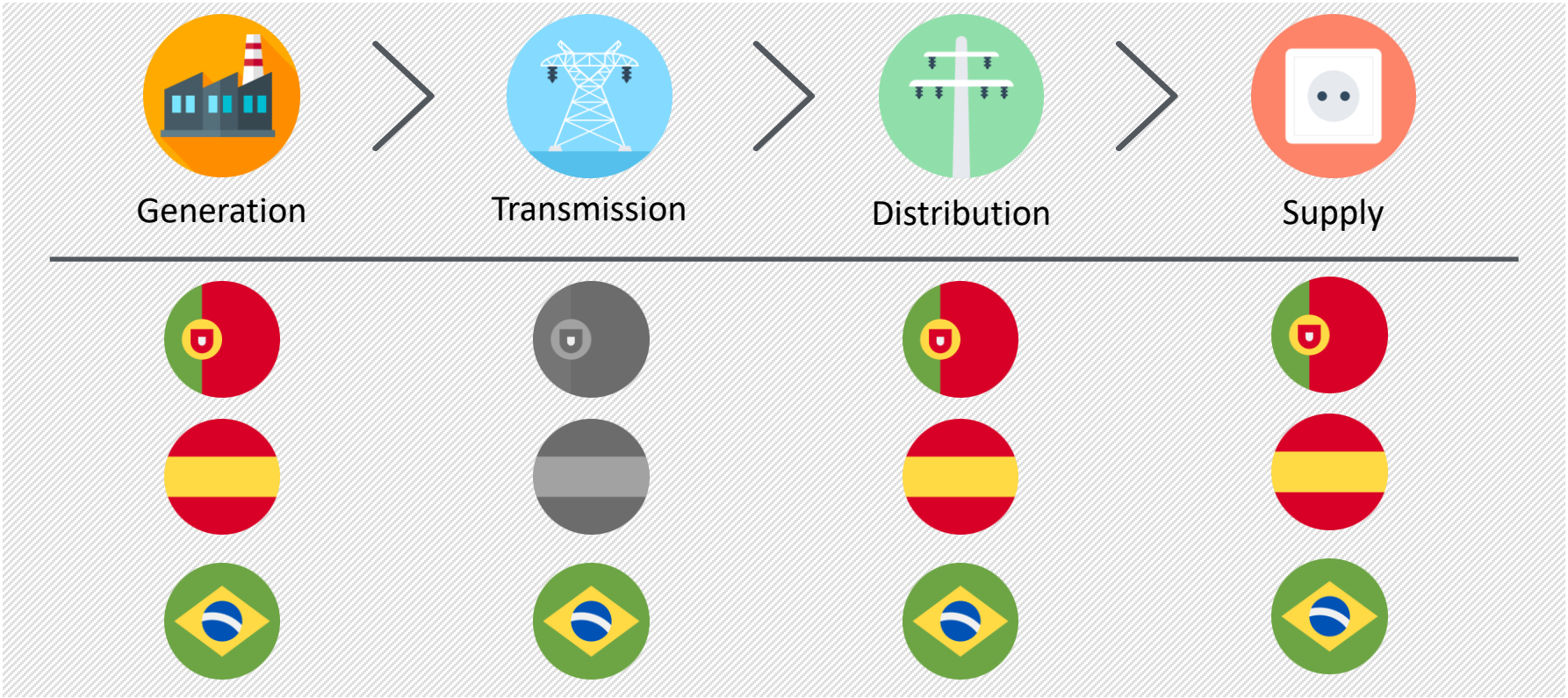
Providing Power Generation Fleet Wide Real-Time Awareness and Key Decision Support via PI AF

EDP Worldwide

- Present in 16 countries
- ≈12.000 employees of 44 nationalities
- > 11.000.000 Costumers
- ≈ 27 GW Installed Capacity
- > 10 GW Wind Farms



EDP



EDP Produção

Responsible for the generation of hydro and thermal energy in Portugal.

62 Hydro Power Plants

≈6 GW Installed Capacity

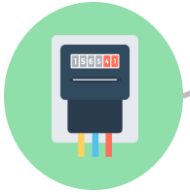
4 Thermal Power Plants

≈3 GW Installed Capacity

Operational Data

Financial Indicators

SKIPPER
ALL DATA ON BOARD



Energy Meters

Exploration Indicators

Maintenance Indicators


edp
dig

SKIPPER
ALL DATA ON BOARD

edp

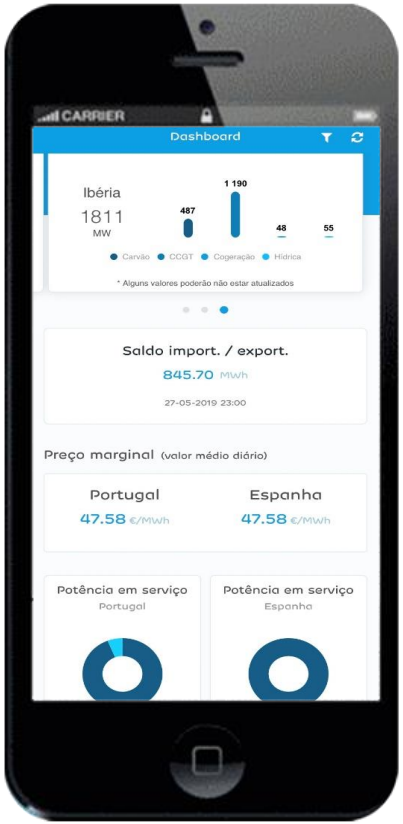
Business Challenge

- ≈400.000 PI TAGS
- RELATIONAL DBs

- How to Aggregate?
- How to Consolidate?
- How to Analyze?

- Insights
- Information on Demand

Skipper App



- Easy and Mobile Access
- Intuitive navigation
- Single Platform
- Multiple Business Indicators
- Real Time and Historical Data
- Overview of the business

Implementation Details

PI System Architecture

PI Data Archive + Relational DBs

The raw data

PI Asset Framework

To structure and organize the data

PI Asset Analytics

To create and manage the more complex calculations

PI Web API

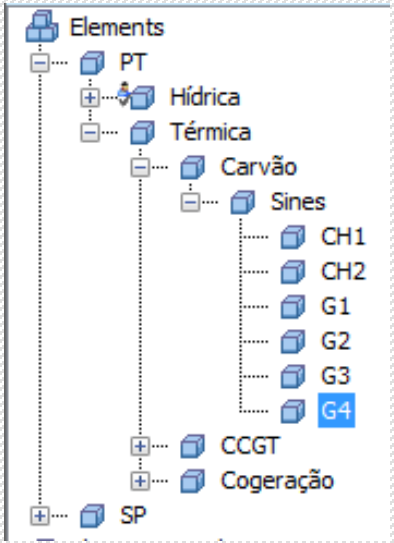
The RESTful Interface that sends the data to the Front-End

Outsystems

The App

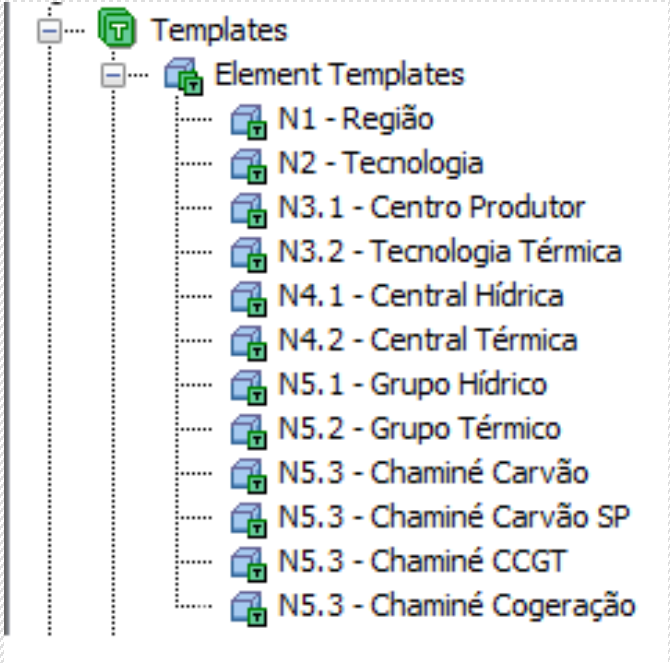
PI Asset Framework

- **Tree structure based on Asset Hierarchy**
- Each hierarchichal element has a Template
- Substitution parameters are used for easy attribute construction



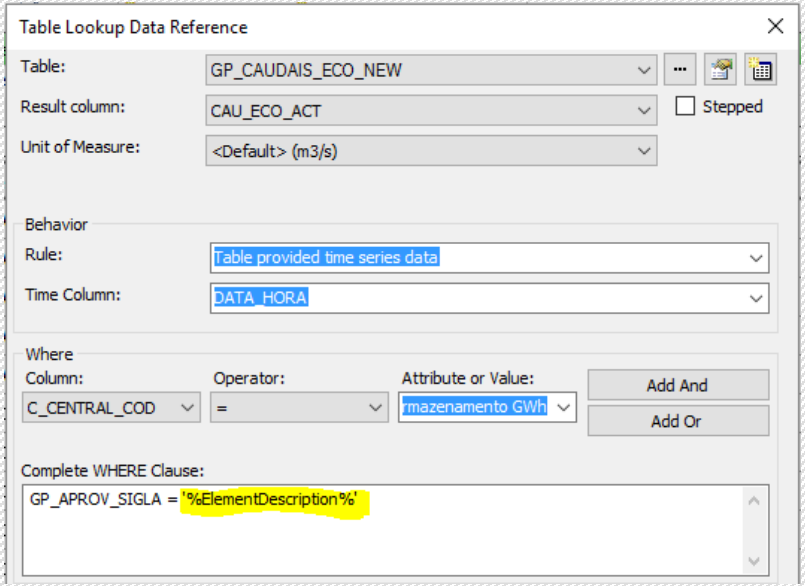
PI Asset Framework

- Tree structure based on Asset Hierarchy
- **Each hierarchichal element has a Template**
- Substitution parameters are used for easy attribute construction



PI Asset Framework

- Tree structure based on Asset Hierarchy
- Each hierarchichal element has a Template
- **Substitution parameters are used for easy attribute construction**



PI Asset Analytics

- Calculate totals based on child nodes
- Calculate accumulated totals

  (Yearly/Monthly/Daily)
- Calculate time specific aggregations

  (Hourly/Daily)

Name	Expression

Mensal	IF (Hour('*')=0 AND Day('*')=1)
	THEN
	TagTot('Potencia Horario','y','*')*24
	ELSE
	TagTot('Potencia Horario',BOM('*'),'*')*24

Anual	IF (Hour('*')=0 AND Day('*')=1 AND Month('*')=1)
	THEN
	TagTot('Potencia Horario','*-1y','*')*24
	ELSE
	TagTot('Potencia Horario',BOM('Jan'),'*')*24

PI Web API

- Flexibility in the data to be retrieved:
  - Current Value
  - Recorded Data
  - Date Interval
- WebID to map the attributes to the variables on the front-end
- Due to its Independence from the client, there is no need to create new infrastructure
- Security hassles free


```
{
  "Timestamp": "2019-08-07T10:56:57.2389526Z",
  "Value": 34.8,
  "UnitsAbbreviation": "%",
  "Good": true,
  "Questionable": false,
  "Substituted": false,
  "Annotated": false
}
```

Business Impact

- Users started to make smarter, data-driven decisions
- Agility & Time savings
- Raised awareness regarding asset management

Conclusion

- A new channel of information and knowledge for everyone in the company
- Not necessary to pass on business knowledge to the app developers
- The implementation didn’t need any new back-end infrastructure

File Search View Go Tools Help

Database | Query Date | Back | Check In | Refresh | New Element | Search Elements

Elements

- Elements
  - PT
  - SP
- Element Searches

Elements

Group by: Category Template

Search

Name	Description	Category	Type	Template
PT			None	N1 - Região
SP			None	N1 - Região

Elements
Event Frames
Library
Unit of Measure
Contacts

2 Elements

POR 18:01

EDP: Providing Power Generation Fleet Wide Real-Time Awareness and Key Decision Support via PI AF

CHALLENGES

- Aggregate and consolidate raw data from different sources
- Less effort and investment possible for the infrastructure

SOLUTION

- Used PI-AF, PI Analytics and PI Web API to create a centralized platform that feeds data to an enterprise app

BENEFITS

- A more data-driven culture in the company
- Faster & more agile key decision support
- Cost savings

> We had all of this dispersed and raw data and dispersed tools to get value from. PI-AF gave us a centralized platform where we can extract the value from all of that data without the headaches and costs of designing a new architecture and implementing new intrastructure.
>
> Rui Batista, Business Analyst @ Data Hub

- Rui Batista
- EDP Gestão e Produção da Energia S.A.
- rui.batista@edp.com

Questions?

Please wait for the **microphone**

State your **name & company**

Please remember to…

Complete Survey!

Navigate to this session in mobile agenda for survey