

AVEVA PI WORLD

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# Secret Ingredient in Tereos

Digital Transformation Journey

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• OUR INSTALLATIONS

## AROUND THE WORLD

PRESENT IN

**17**  
**COUNTRIES**

**46**

INDUSTRIAL UNITS  
IN 11 COUNTRIES

### LATIN AMERICA

- 8 industrial units
- 1 R&D center
- Country Brazil

### EUROPE

- 32 industrial units
- 2 R&D centers
- Countries: Germany, France, Belgium, Spain, Italy, Czech Republic, Romania, United Kingdom and Switzerland

### ASIA

- 1 industrial units
- 1 R&D center
- Countries: India, Indonesia, Singapore and Vietnam

### AFRICA AND INDIAN OCEAN

- 5 industrial units
- 1 R&D centers
- Countries: Kenya, Reunion Island (FR), Mozambique and Tanzania

# The stages of our development

1950

FRANCE

1996

EUROPE

2000

AFRICA  
INDIAN OCEAN  
BRAZIL

2012

ASIC



## RAW MATERIAL



Corn



Beet



Potato



Cassava



Alfalfa



Sugar cane



Wheat

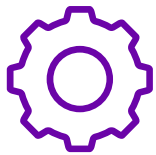
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## Tereos Digital Transformation



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# How AVEVA improved our operations



## Challenge

- Isolated and difficult to access data (information silos) Lack of historical data



## Solution

- Data centralization and standardization with asset structure architecture

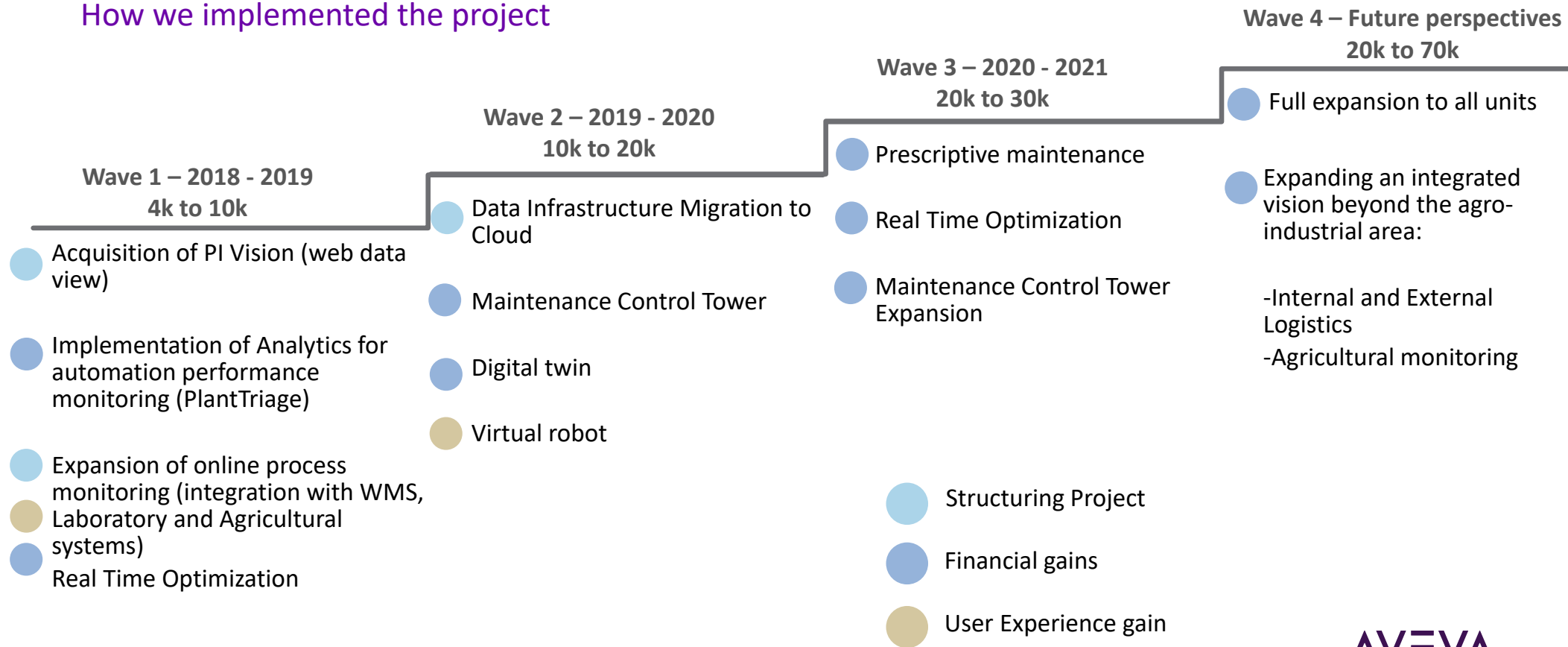


## Benefits

- Easy access to data enabling data-based decisions
- Integrated view of TSEB units

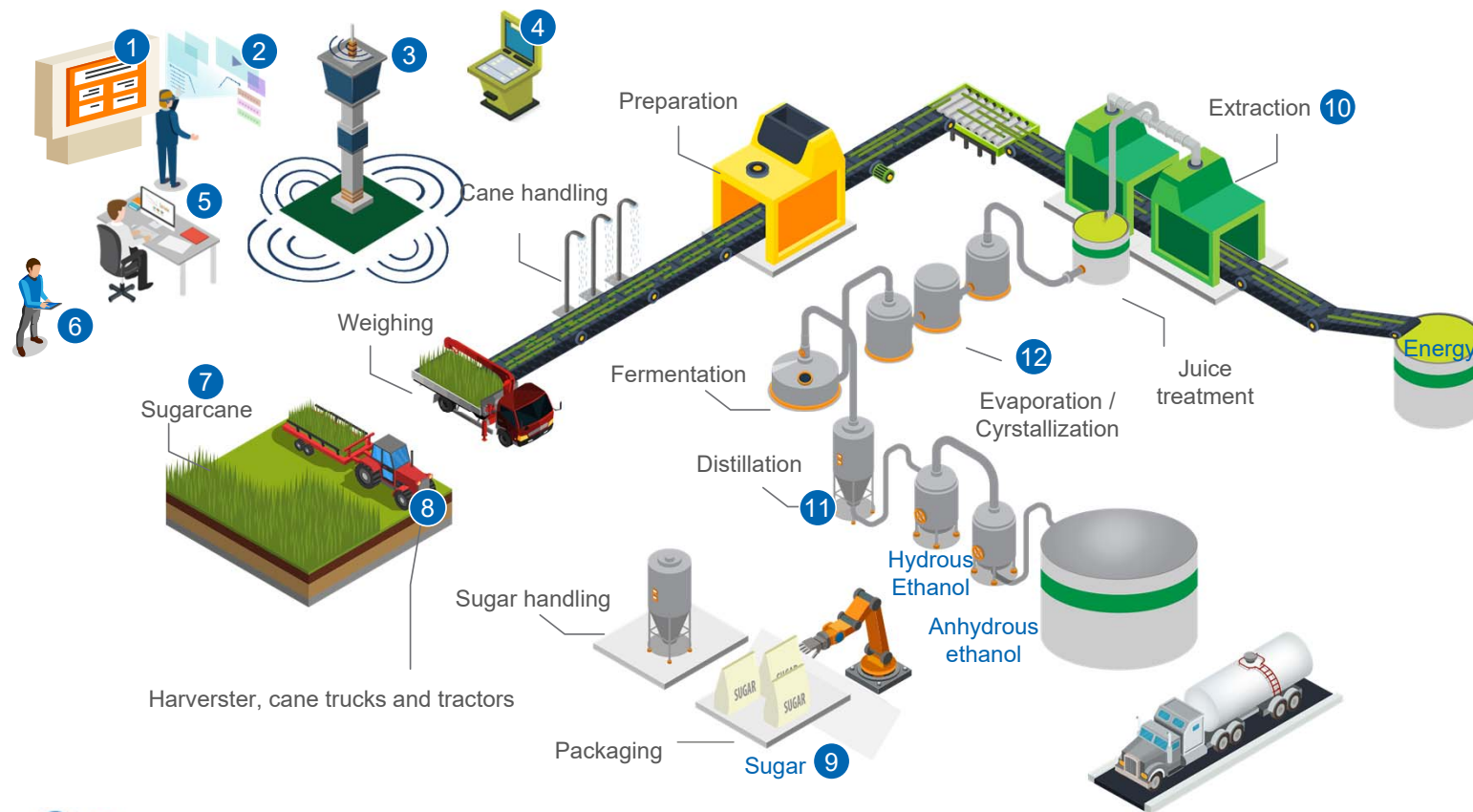
# Implementation Roadmap

## How we implemented the project





# PI System is being used in several areas



- 1 Corporate integrated vision
- 2 Digital Twin
- 3 Maintenance Control Tower
- 4 PI System performance monitoring
- 5 Analytics – Control Loop Performance Monitoring
- 6 Bot – Telegram Notifications
- 7 Quality monitoring
- 8 Monitoring of harvesters, tractor and sugarcane trucks
- 9 Production Monitoring
- 10 Optimization in Real Time
- 11 APC performance monitoring
- 12 Evaporation/crystallization performance monitoring

# Case 1 – Integrated Vision

Secret ingredient to democratize access to information at different levels

## Top management



- Corporate view of the performance of industrial units.



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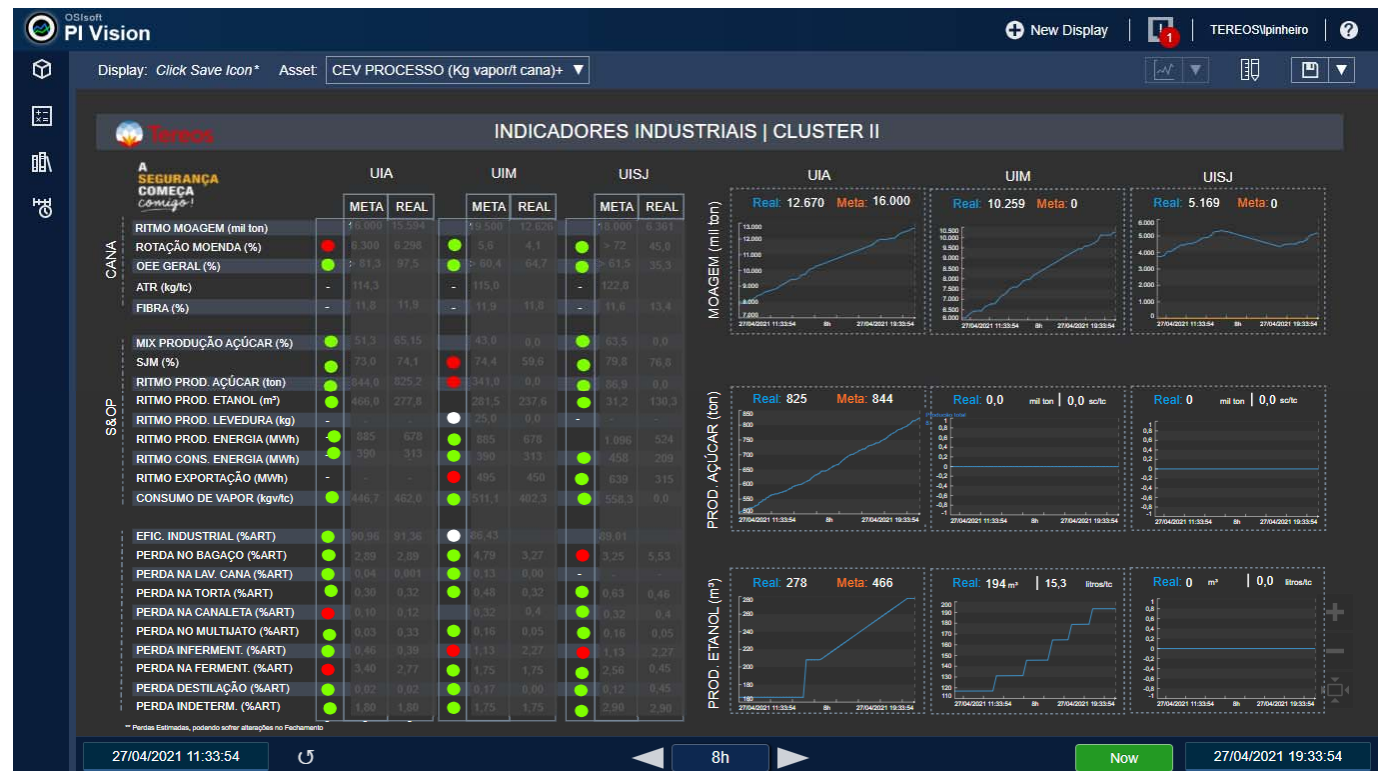
# Case 1 – Integrated Vision

Secret ingredient to democratize access to information at different levels

## Cluster



- Corporate view of clusters



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# Case 1 – Integrated Vision

Secret ingredient to democratize access to information at different levels

## Process Management



- KPIs for each process area



# Case 1 – Integrated Vision

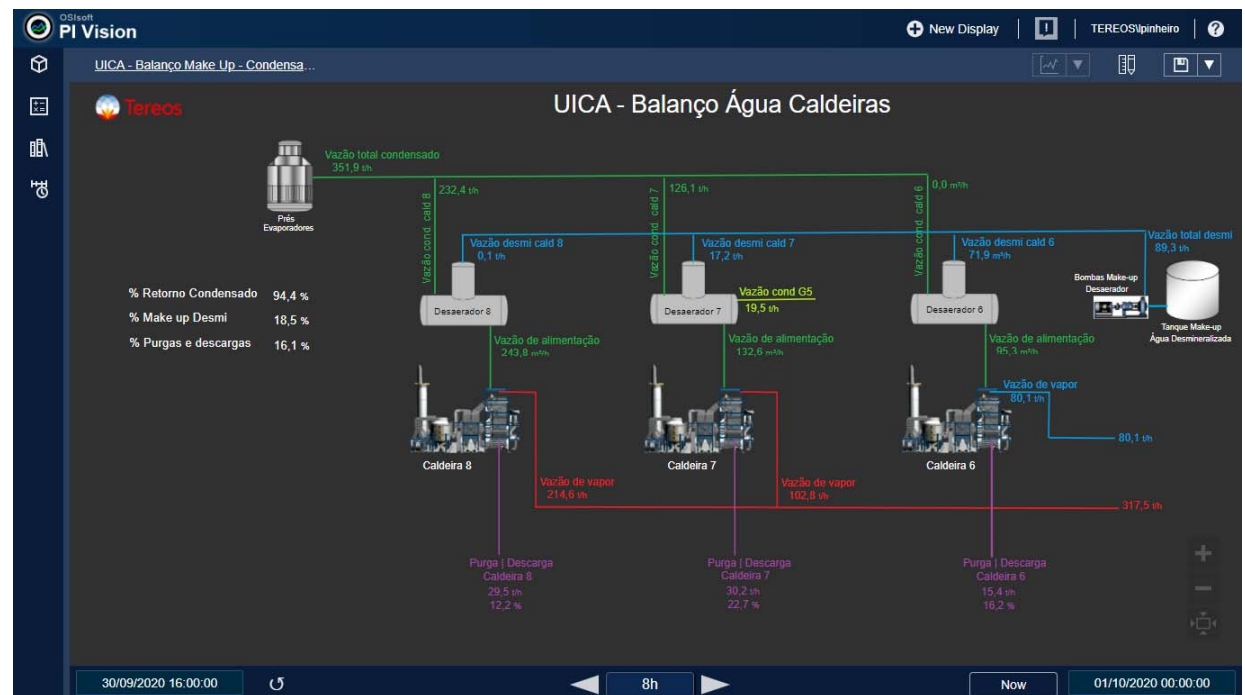
Secret ingredient to democratize access to information at different levels



## Operation

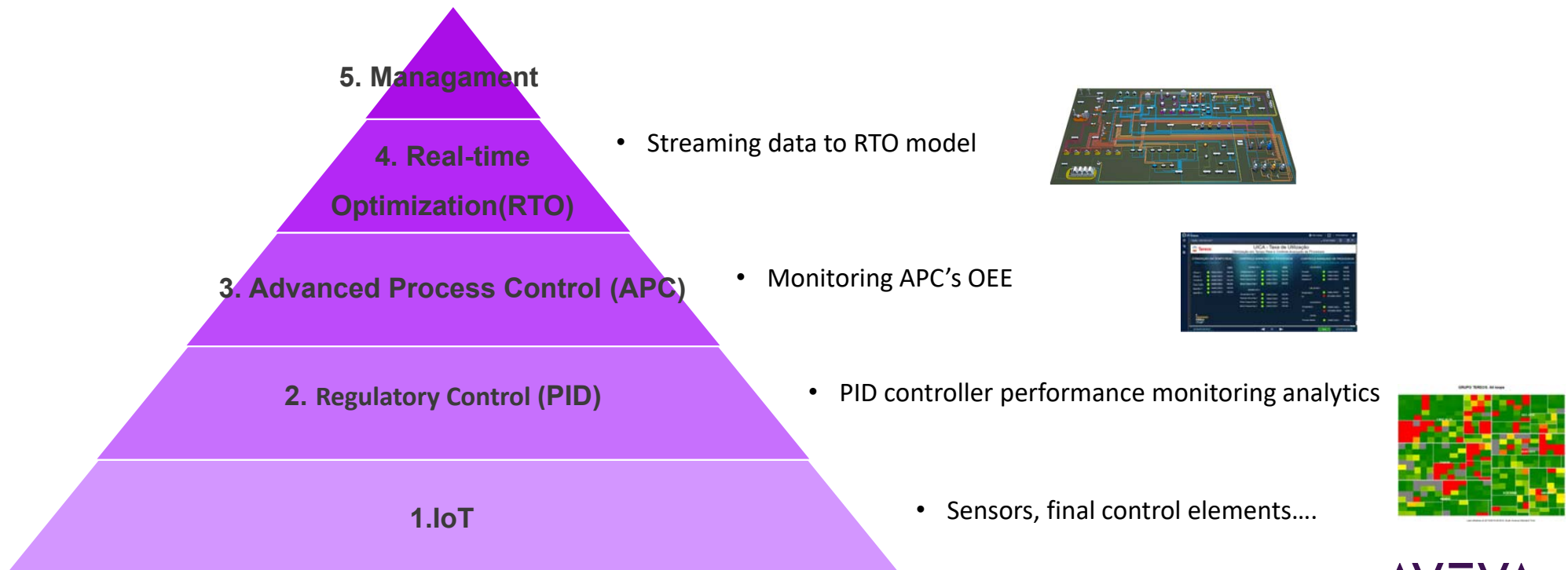


- Shift reports PI Data Link
- Routine management
- Automation performance monitoring
- Sugar production comparison per shift



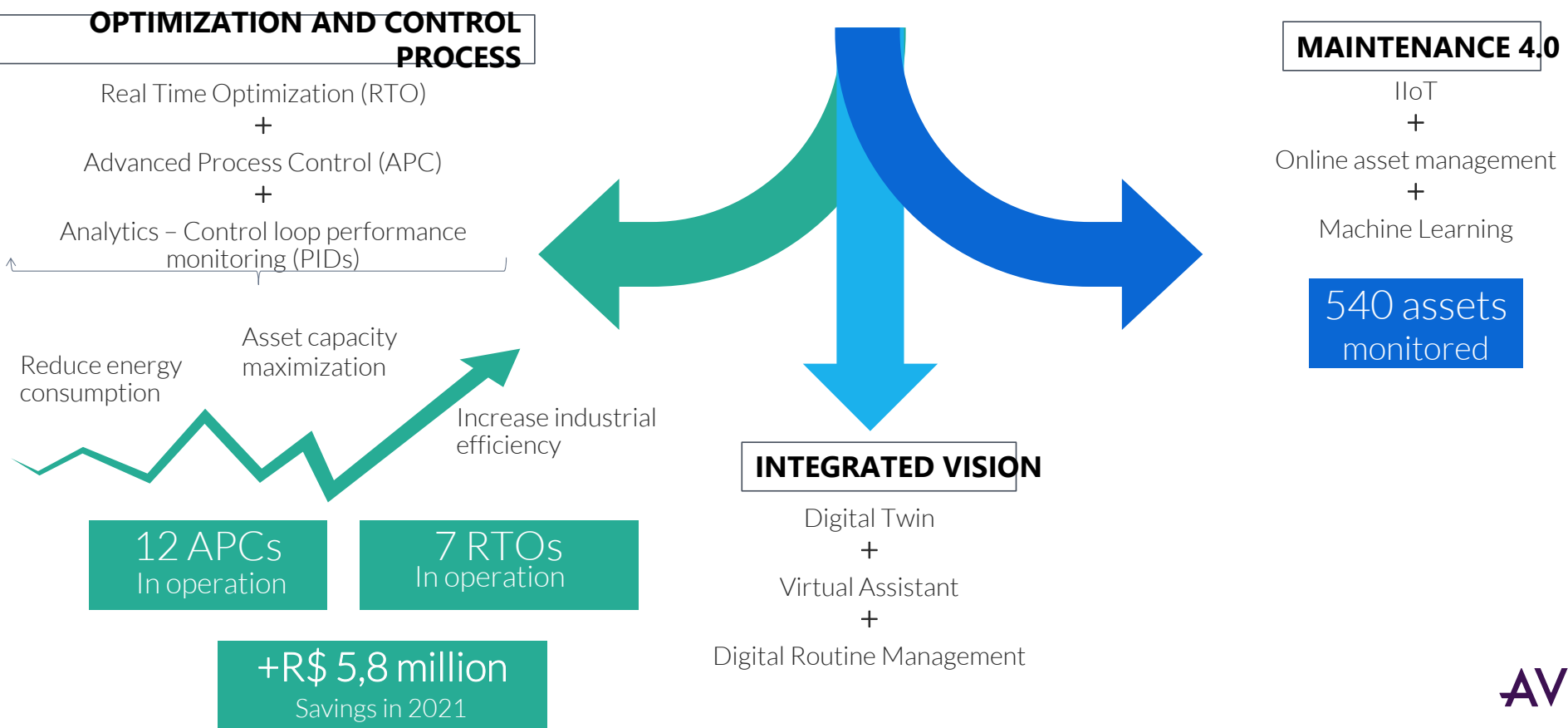
## Case 2 – Corporate network and automation integration

Secret ingredient to maximize use of Analytics and Optimization Systems



## Case 2 – Corporate network and automation integration

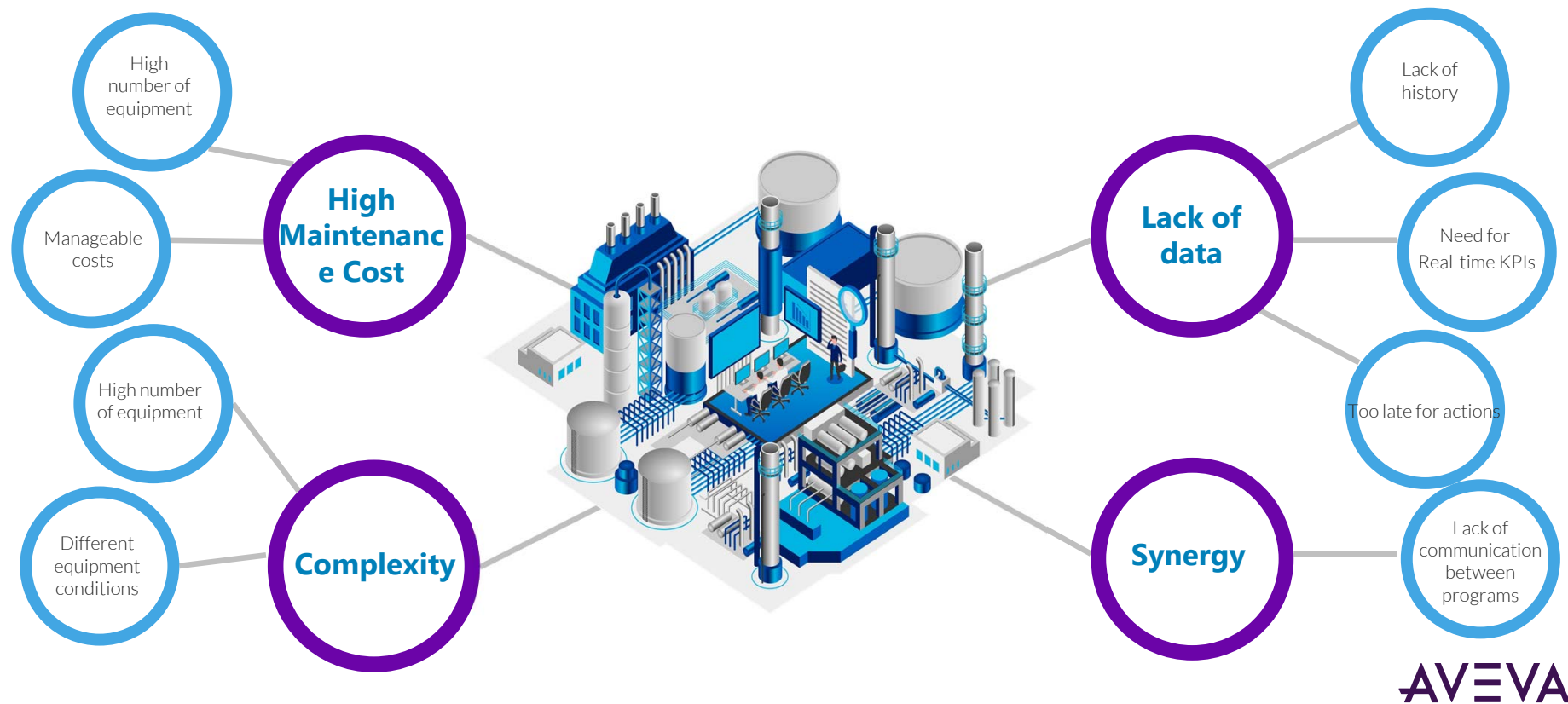
IoT + Real-time data monitoring + Artificial Intelligence



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## Case 3 – Maintenance Control Tower

Secret ingredient to increase our reliability





# Case 3 – Maintenance Control Tower

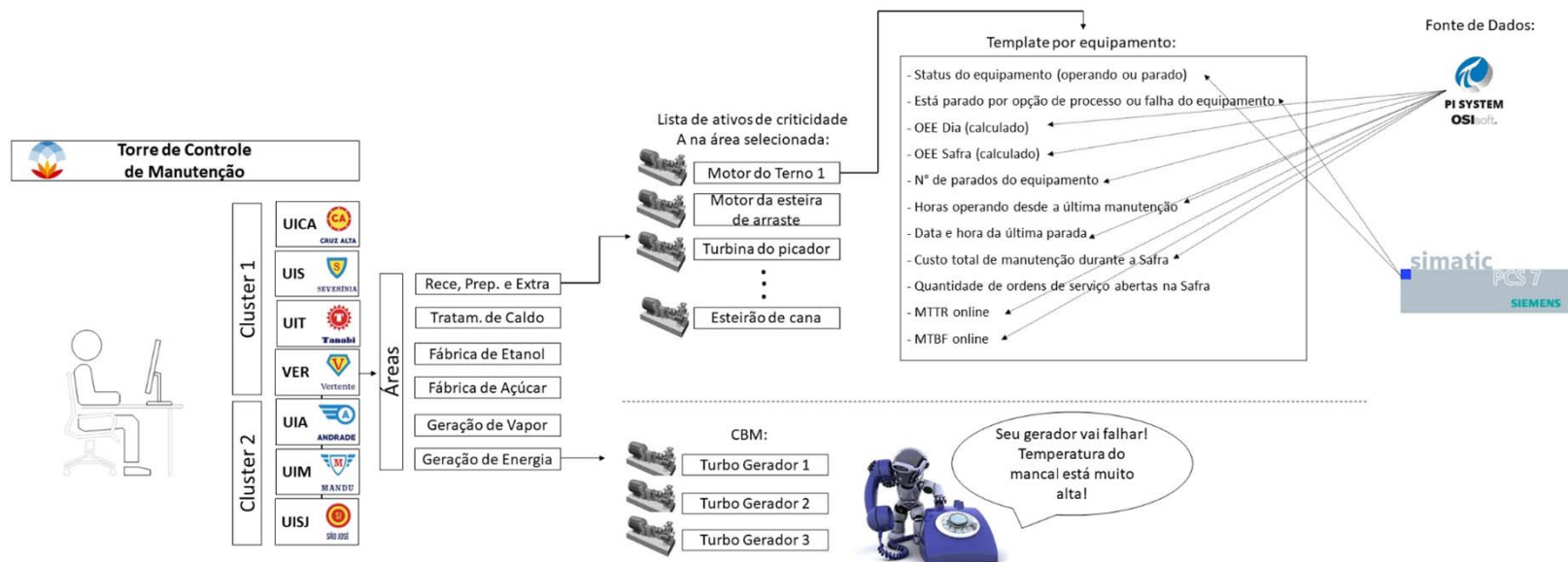
Secret ingredient to increase our reliability

Runtime analysis

Downtime analysis

SAP data analysis

Maintenance indicators



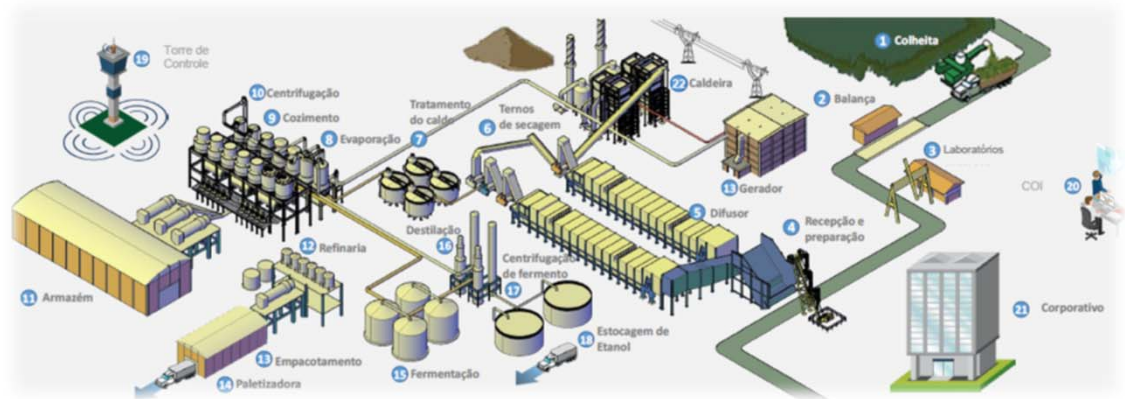
## Case 4 – Notifications via Telegram

Secret Ingredient for more agility in day-to-day

User chooses which variables to update

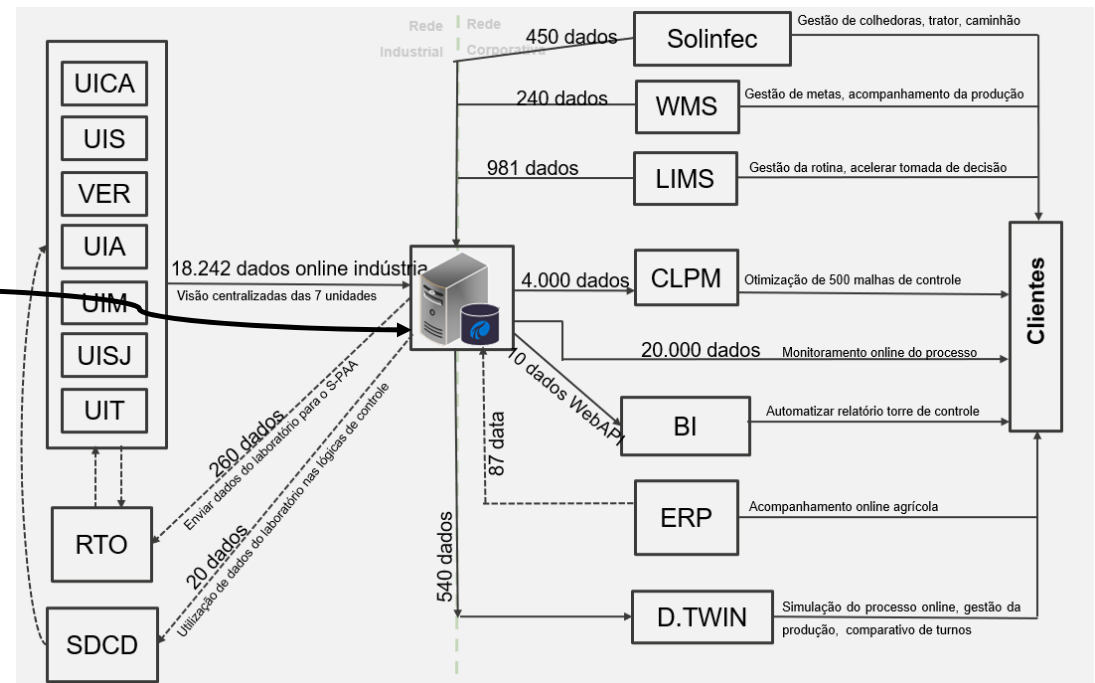
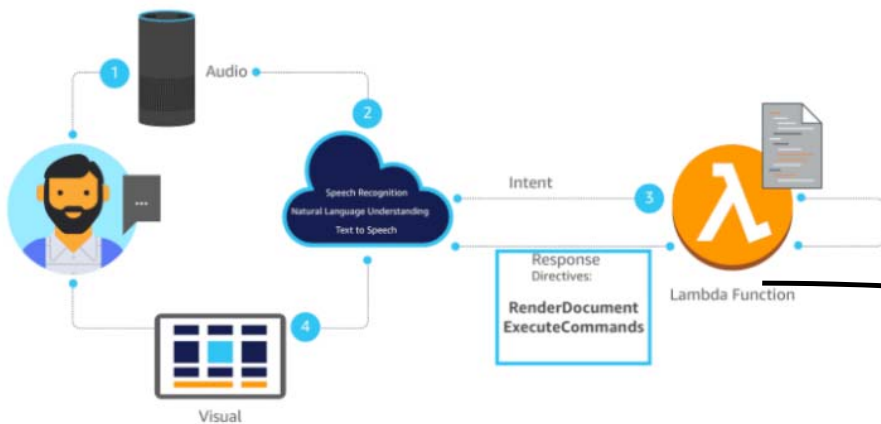
Bot sends real-time notifications

User receives information directly by cell phone



# Case 5 – Virtual Assistant

Secret ingredient for more agility in day-to-day



## Case 5 – Virtual Assistant

### Secret ingredient for more agility in day-to-day

- **Start**

- “Open Virtual Assistant”

- **Safety**

- " What are the golden rules?"

- **Quality**

- " What are good manufacturing practices?"

- **Production**

- " Tell me the production forecast "
- “(ethanol production, sugar production, energy export)”
- " How are the boilers?"
- " How is the real-time optimizer?"

#### **Targets**

- " See variable "
- “See online variable”
- " Consult average "
- "Tell me the last analysis "
- " Tell me the NIR data "

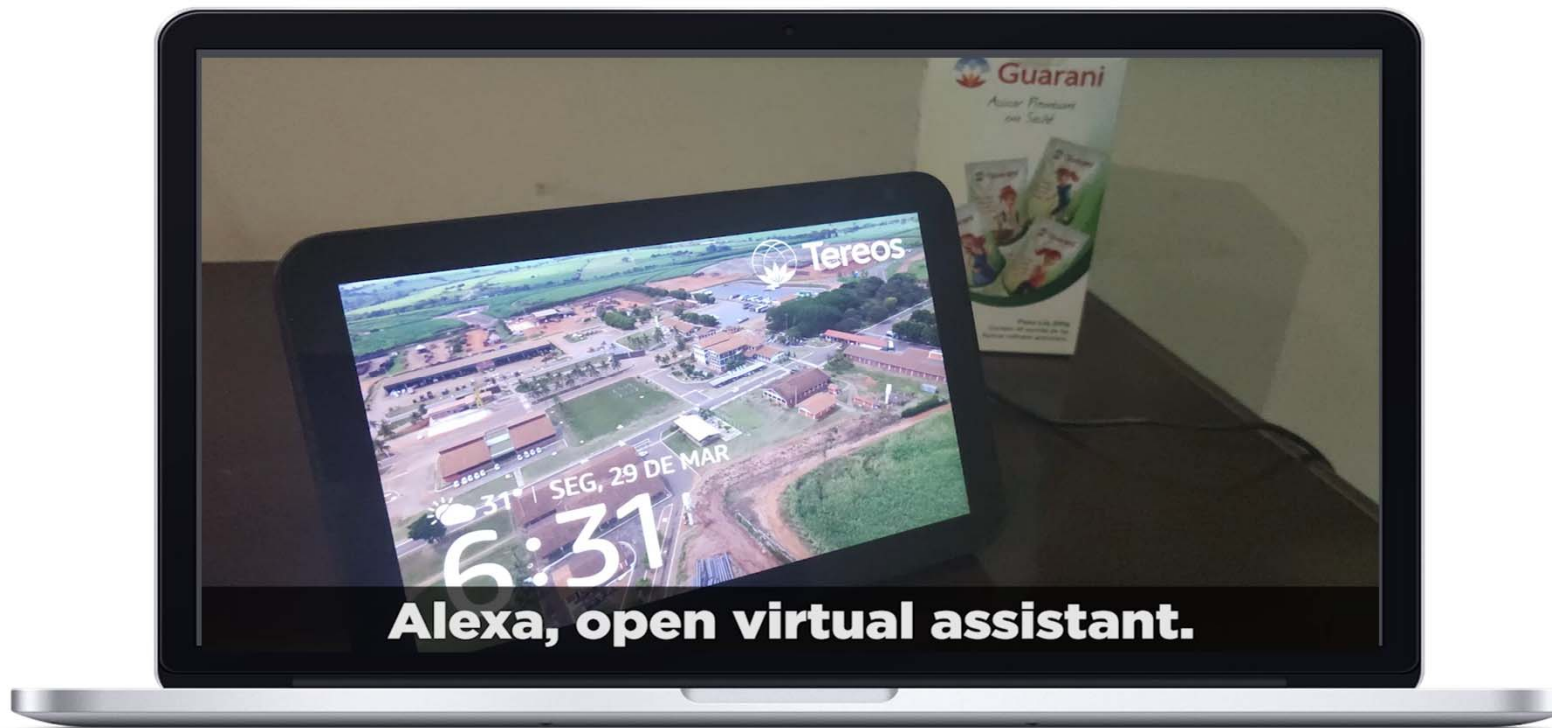
#### **Others**

- " What is the lunch menu?"
- "Coronavirus Tips "
- "Coronavirus symptoms“
- " Tell me what are the Industry 4.0 drivers“

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## Case 5 – Virtual Assistant

Secret ingredient for more agility in day-to-day



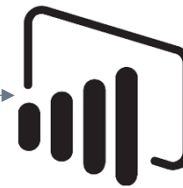
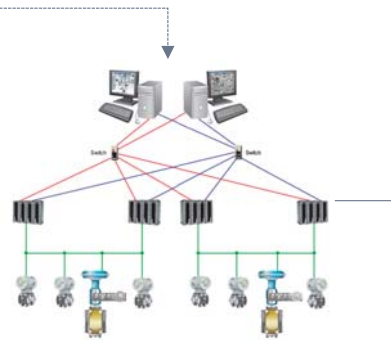
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# Case 6 – Risk Management – Overflow of Tanks

Secret ingredient for safer processes

Risk assessment

Event frames of tanks





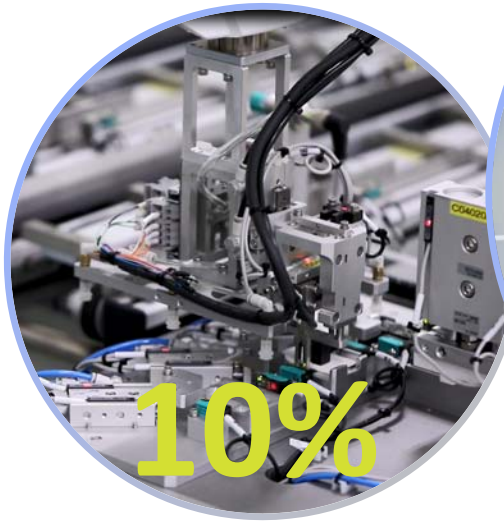


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## Some points are critical for success

- Robust infrastructure and high availability of the PI System is essential
- IT/TA convergence are even more relevant
- Work following the idea of agile methodology
- Managing cultural change is essential
- Learning to be an early adopter, giving yourself the right to make mistakes
- Engaging people starting from the company's leadership

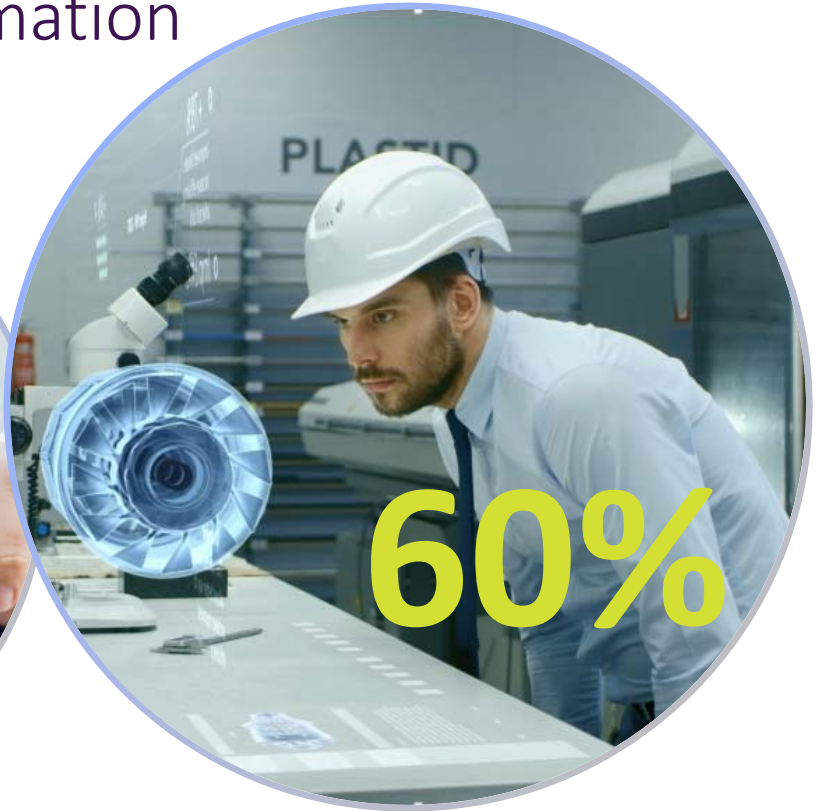
People are the center of our transformation



Technology



Processes and  
operating model



People and Skills

# PI SYSTEM TEREOS

## PROJETOS EM ANDAMENTO, NOVAS INTEGRAÇÕES E PROGRAMA I4.0



### Novo endereço para acesso do PI System

A partir de janeiro/21 o PI System está funcionando em um novo endereço.

Endereço antigo:  
<https://www.pisystem.com/pi/vision>  
 Novo endereço:  
[www.pisystem.com/pi/vision](https://www.pisystem.com/pi/vision)

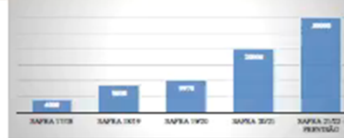
Essa mudança reflete a melhoria cujo objetivo é aumentar a disponibilidade do PI Vision. No final, melhor utilização em proxy remoto que em alguns momentos ocasiona toda memória RAM e o site fica lento. Agora vamos utilizar um recurso de melhoria de carga evitando esses problemas.

### Tela mais utilizada na Safra 20/21

Analisando os logs do PI Vision, segue abaixo as telas mais acessadas na Safra 20/21. Destaca-se em 1º lugar, um número de visualizações, a tela de Produção de Açúcar de Lúcula utilizada para gestão de produção e que permite o acompanhamento de produção por turno. Já em termos de abrangência de unidades acessadas a tela, destaca-se a tela de UTAJ "Carteira de Processos" que foi acessada por 89 unidades diferentes.

Tela	Total acessos	Unidades
UACA - Produção de Açúcar	1000	50
UACONSUMO UTAJ_000_2	990	6
USUNIDADE DE PROCESS - UTAJ	706	18
OPERAÇÃO DE MANTEN - REPARAÇÃO	360	75
UACONSUMO UTAJ_000_2	330	25
Info Center Operação - UTAJ	310	13
UACONSUMO UACA 1	281	66
UACONSUMO UTAJ	260	49
UTAJ	210	17
UACONSUMO UTAJ	210	28

### Quantidade de dados sendo armazenados



### PI System Tereos dobra de tamanho na safra 20/21

#### Aumento é para atender iniciativas do Programa I4.0

No primeiro ano do PI System na Tereos, tivemos sucesso para monitorar 4 mil informações que eram exclusivas a dado para o monitoramento do processo. Em 2019, visando o monitoramento das etapas de controle (PID) tivemos que dobrar a capacidade do PI System. Foi quando decidimos implementar uma ferramenta de analytics para monitoramento de performance de 500 controladores PID do grupo.

Agora na Safra 20/21, dobramos novamente a capacidade do PI System atingindo 20 mil informações. Uma das motivações para ampliar foi o projeto TCM - Torre de Controle de Manutenção, que está em operação em 4 unidades do grupo realizando o monitoramento de mais de 300 ativos de criticidade A.

Na Safra 20/21, outro motivo do aumento de informações foi que também tivemos a implantação do Sistema Digital na UACA e UTAJ e o PI System é o sistema que faz a ponte entre o sistema de laboratório e o sistema digital. Nessa safra anual também foi necessário utilizar o PI para realizar o pós-EVTE das iniciativas de Controle Avançado na UACA e UTAJ, sendo tivemos que coletar algumas variáveis relacionadas a performance das colunas de destilação e colunas.



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THANK YOU

謝謝

DZIĘKUJĘ CI NGIYABONGA TEŞEKKÜR EDERIM DANKIE TERIMA KASIH SPASIBO GRAZIE MATUR NUWUN ХВАЛА ВАМ MULȚUMESC PAKMET CIZGE 고맙습니다 GRAZIE شکرا FAAFETAI ESKERRIK ASKO HVALA TEŞEKKÜR EDERIM OBRIGADO MERCI DI OU MÈSI ĎAKUJEM

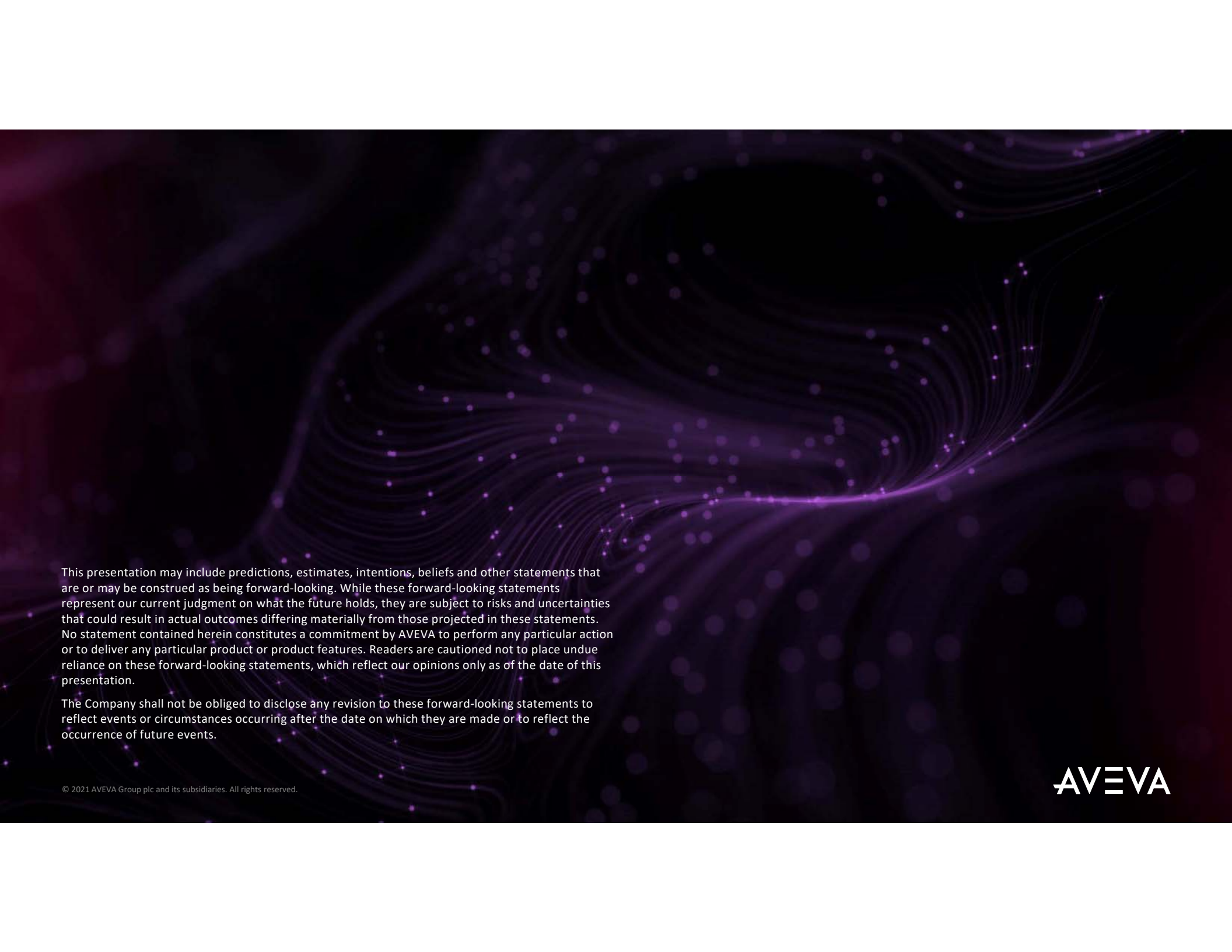
KÖSZÖNÖM GO RAIBH MAITH AGAT БЛАГОДАРЯ GRACIAS ТИ БЛАГОДАРАМ TAK DANKE RAHMAT HATUR NUHUN PAXMAT CAĞA CẢM ƠN BẠN WAZVIITA FALEMINDERIT

TAPADH LEIBH KEA LEBOHA MISAOTRA ANAO WHAKAWHETAI KOE DANKON TANK TAPADH LEAT SALAMAT

ЕΥΧΑΡΙΣΤΩ GRATIAS TIBI MAHALO IĀ 'OE TAKK SKAL DU HA

GRAZZI PAKKA PÉR SIPAS JI WERE TERIMA KASIH UA TSAUG RAU KOJ ТИ БЛАГОДАРАМ СИПОС







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