AVEVAWORLD





DIGITAL TRANSFORMATION IN ENGINEERING: INTEGRATING AVEVA UNIFIED ENGINEERING AND AI FOR MULTIDISCIPLINARY PROJECTS

AVEVAWORLD2025

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AP Consultoria e Projetos





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AI IMPLEMENTATION RESULTS FOR PIPE SUPPORT

ENGINEERING | BRAZIL

INTEGRATING AVEVA UNIFIED ENGINEERING AND AI FOR MULTIDISCIPLINARY PROJECTS

Challenge

- Reduced hardware and infrastructure costs
- Facilitates integration between project disciplines
- Facilitates real-time visibility of projects
- Project quality and agility
- Al development

Solution

 Integrating AVEVA Unified Engineering and AI into AVEVA UE for pipe support optimization

Results

- 53% Time savings converting in PCM and 56% in reduction hardware cost
- 60% faster documentation and 20% less rework on document corrections in Process Simulation
- 34% hardware cost reduction and 53% Time savings converting in E3D
- +90% Reduction in the time spent analyzing the type and position of the support
- 60% Reduction of time in stress analysis review
- 20% Reduction in support modeling time

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ABOUT US PRESENTER



Civil Engineer graduated from the Federal University of Bahia (UFBA) and postgraduate from COPPEAD/UFRJ and the University of San Diego. Director of Engineering at AP Consultoria e Projetos and also Director of ABEMI (Brazilian Association of Industrial Engineering). In 2022, he was responsible for creating the ABEMI Talks roundtable series.



CONSULTORIA



Director, Tech Support, Americas for AVEVA. Specializes in engineering software, project management, and customer support and success. Responsible for managing the support of hundreds of customers in Latin America, leading a high-performance team in major projects using AVEVA solutions under the engineering portfolio, and acting as site leader for the AVEVA office in Rio de Janeiro.



ABOUT US AP CONSULTORIA E PROJETOS

"To be protagonists in the digital transformation journey and in the path to sustainability for our clients"

32 TH

YEARS

Brazilian Company

Headquarters in Salvador/BA, Brazil

Project Experience

Founded in 1993, with over 90 contracts executed

SULIORIA

Multidisciplinary Engineering

Process, Mechanical, Piping, Electric, Instrumentation, Automation, Civil, **Telecommunications and Laser Scanner**



Areas of Activity

Oil & Gas, Energy, Petrochemicals, Infrastructure, Mining, Ports and Terminals, Pulp and Paper, Metallurgy and Steel.



Innovative Company

Winner of the innovation award in Brazil in 2021, 2023 and 2024

AVEVA Partnership

Over 12 years of partnership collaboration with AVEVA

AVEVA UNIEED ENGINEERING: SAAS SOLUTION WITHIN CONNECT



CONSULTORIA E PROJETOS











24-hour technical support availability

Guarantee of operation

Version update

Less dependence on IT







Secure environment for storing and accessing project data

User access control

Backup



Reduction in investment

Hardware cost reduction

Reducing server costs

Less IT dependency

Secure

\$









Sharing Information

Greater transparency for customers

Real-time project monitoring

Platform usage reports and graphs

Remote access platform







AVEVA Diagrams & Engineering

Integration and data sharing

Facilitate the visualization of information

Real-time collaboration









Point Cloud Manager Online

53% Time savings converting

Cloud storage enables easy collaboration

56% Hardware cost reduction









Process Simulation

Integration: Simulator data with AVEVA design automation tools



60% faster documentation

20% less rework on document corrections





E3D Design UE

34% hardware cost reduction

12% less rework due to outages

Automatic synchronization of data







AVEVA UNIFIED ENGINEERING: SAAS SOLUTION WITHIN CONNECT WORKFLOW





- **DOCUMENTS**
- **DATA SHEET**
- **BILL OF MATERIALS**





CONSULTORIA E PROJETOS

ABOUT THE PILOT PROJECT DETAILS ABOUT THE BASE PROJECT

Objective:

Implementation of a new natural gas outlet in Amazonas, serving:

- New Thermoelectric Plant (825,000 m³/day)
- Operational flexibility for the local distributor (2,375,000 m³/day in contingencies)





ABOUT THE PILOT PROJECT WORKFLOW

AVEVA DIAGRAMS











AVEVA PROCESS SIMULATION

AVEVA POINT CLOUD MANAGER



ABOUT THE PILOT PROJECT WORKFLOW



CONSULTORIA E PROJETOS

ABOUT THE PILOT PROJECT WORKFLOW

AVEVA ENGINEERING



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DATA SHEET AP CONSULTORIA E PROJETOS

ALINTO AVEVA UE FOR **PPESUPPORT** OPTINIZATION







Defining the type of support and the number of supports for beginners is a manual and iterative process, influenced by the experience of the designer who performs the modeling and the engineer who performs the stress analysis.



Importance of **Piping Modeling**



Challenges in **Defining Supports**

Stress Analysis



Impacts on Schedule





Stress Analysis

Defining the type of support and the number of supports for beginners is a manual and iterative process, influenced by the experience of the designer who performs the modeling and the engineer who performs the stress analysis.



Importance of Piping Modeling • Time spent defining support often exceeds the planned time

 Delays at this stage jeopardize the project's overall schedule and efficiency 200

Challenges in Defining Supports



Impacts on Schedule





Stress Analysis

Defining the type of support and the number of supports for beginners is a manual and iterative process, influenced by the experience of the designer who performs the modeling and the engineer who performs the stress analysis.



Challenges in Defining Supports A critical step in industrial projects

 It requires specialized technical knowledge, high precision and careful planning



Importance of Piping Modeling



Impacts on Schedule





Stress Analysis

analysis.



Impacts on Schedule

• Manual and iterative process influenced by the experience of the designer and the flexibility engineer

 Complex systems (rotating) equipment, high pressure and temperature) require multiple revisions



Importance of **Piping Modeling**

Defining the type of support and the number of supports for beginners is a manual and iterative process, influenced by the experience of the designer who performs the modeling and the engineer who performs the stress



Challenges in **Defining Supports**



WORKFLOW AND CHALLENGES FOR PIPESUPPORT



WORKFLOW AND CHALLENGES FOR PIPE SUPPORT **WORKFLOW FOR SUPPORTING PIPELINES**

INITIAL MODELING

Performed in E3D software by the piping team.

INITIAL DEFINITION OF SUPPORTS

Preliminary determination using PROPIPE, considering diameter and operational conditions of the line.



STRESS ANALYSIS

Indication of critical points (locks and guides) based on operational parameters and final validation with CAESAR software.



REVIEWS AND IMPACT

Adjustments and new analyses until compliance is achieved, causing impacts on the Civil and Instrumentation disciplines due to the need for readjustments in the project.





STRESS ANALYSIS IN CAESAR





DEVELOPMENT OFARTIFICIAL





DEVELOPMENT OF ARTIFICIAL INTELLIGENCE THE SOLUTION: MACHINE LEARNING IN E3D

Stress Analysis

To mitigate the challenges mentioned, we propose the development of a Machine Learning solution that, integrated with E3D, will provide automatic recommendations for defining supports. This AI will be trained with historical data from previous projects, taking into account:

OPERATING PARAMETERS

0 —

Temperature, pressure, weight, fluid and distance between supports

REVISION HISTORY

As machine learning increases its learning, it will reduce the need for rework



STANDARDIZATION OF SOLUTIONS

Recommendation of appropriate supports based on already validated standards









MULTIDISCIPLINARY IMPACT

Anticipating structural interferences reduces rework, improves accuracy, and saves time.





DEVELOPMENT OF ARTIFICIAL INTELLIGENCE THE SOLUTION: MACHINE LEARNING IN E3D



QUANTITY Predict the quantities of supports for the selected project or line



LOCATION Predict the location of supports for the selected project or line

3





TYPE

Predict the type of support for the selected project or line



ALMPLEMENTATION RESULTS FOR PIPE SUPPORT



AI INTO AVEVA UE FOR PIPE SUPPORT OPTIMIZATION RESULTS ACHIEVED

\$

Cost reduction

Reduction in project execution time, directly impacting cost reduction

Project reliability

Greater reliability in determining supports prior to stress analysis

Data-driven decisions

Provides objective insights to support decision-making.



Greater Accuracy

Recommendations based on historical analysis and technical standards significantly reduce the margin of error and generate savings in dedicated engineering hours.

Interdisciplinary integration

Minimizes interference between teams (civil and instrumentation), providing quickly consolidated information.



AI INTO AVEVA UE FOR PIPE SUPPORT OPTIMIZATION RESULTS ACHIEVED

Reduction in support modeling time

60%

35%

20%

Reduction in project time

+90%



Reduction of time in stress analysis review

Reduction in the time spent analyzing the type and position of the support



AI INTO AVEVA UE FOR PIPE SUPPORT OPTIMIZATION RESULTS ACHIEVED



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PILOT PROJECT RESULT:

74 PIPES

4 MINUTES



AI INTO AVEVA UE FOR PIPE SUPPORT OPTIMIZATION DEMO



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Thank For Your Attention

Any Questions?



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