OCT 2021

AVEVA Operator Training Simulator

Americas Advisory Group Meeting

Andrea Macri - Product Manager - Unified Learning and Dynamic Simulation

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AVEVA Dynamic Simulation 2022

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AVEVA Dynamic Simulation 2021

Mar 2022

Stream with conductance

Advanced Header option

Enhancements for Compressors

Enhanced Cryogenic Exchanger

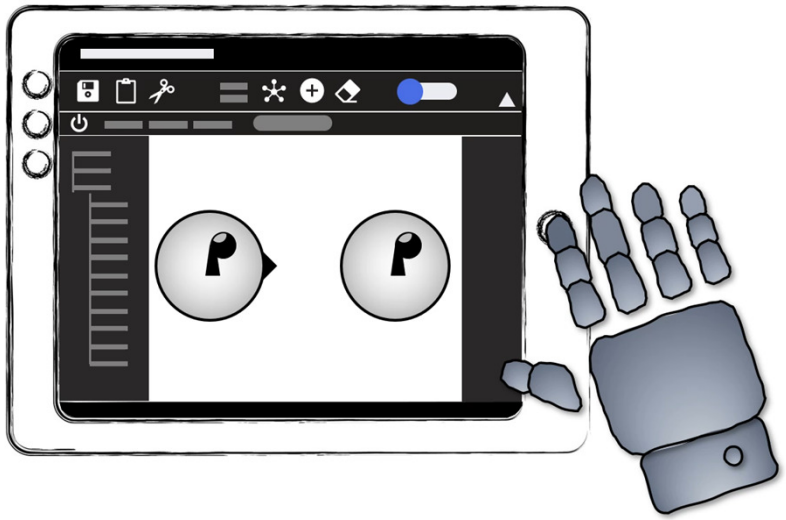
Modernized GUI - Ribbon bar and Dark & Light themes

Tool to Import Intelligent P&IDs

Learning Monitoring Tool

Support 64bit for all components

Fast and Robust VLLE



- Ability to connect two pressure nodes with a stream by adding a conductance to the object
- Save time while building the model
- Make your flowsheet more like the P&ID

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- New header option to automatically switch to the most **appropriate algorithm** during execution
- Improved **robustness**
- **Save time** while building the model as less options are required

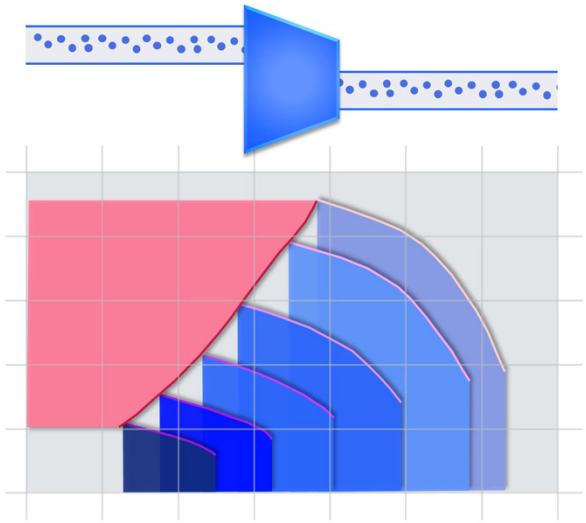
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- **More accurate** solution for centrifugal compressors treating gas with varying molecular weights
- Performance curves and surge line are automatically **adjusted** based on inlet properties
- **Already validated** in new LNG projects

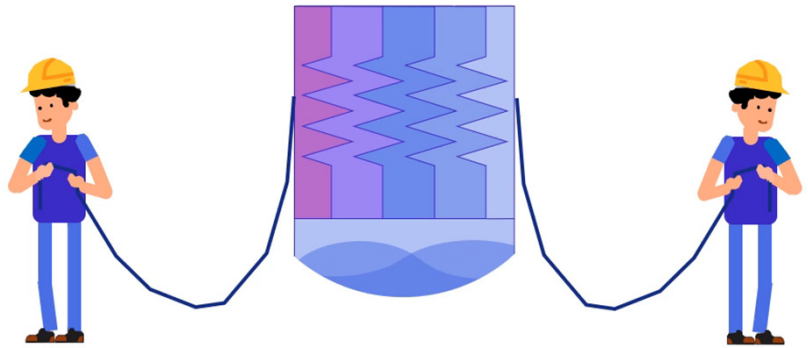
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- **More accurate** solution for cryogenic exchanger object
- Enhanced **robustness** for compressible calculations

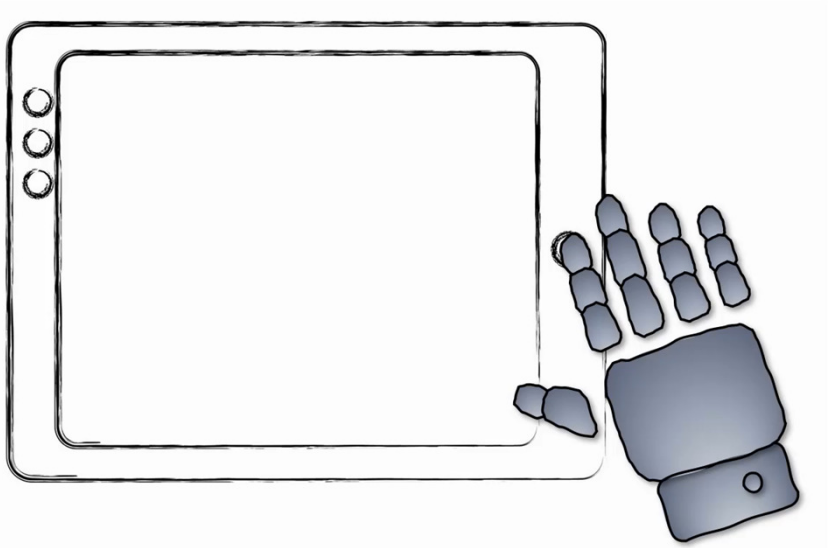
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- Ribbon bar instead of menu and tool bar
- Status bar for easy control of the simulation modes
- The user can switch between dark and light themes
- Quick access taskbar to have all most used buttons easily accessible

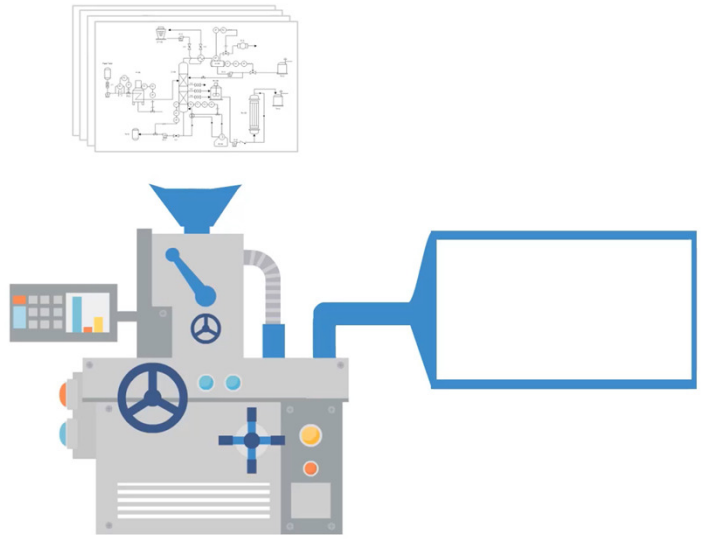
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- Create a dynamic simulation from intelligent P&IDs
- Based on DEXPI format
- The tool uses AVEVA Integration Service to connect with AVEVA Engineering for data transfer

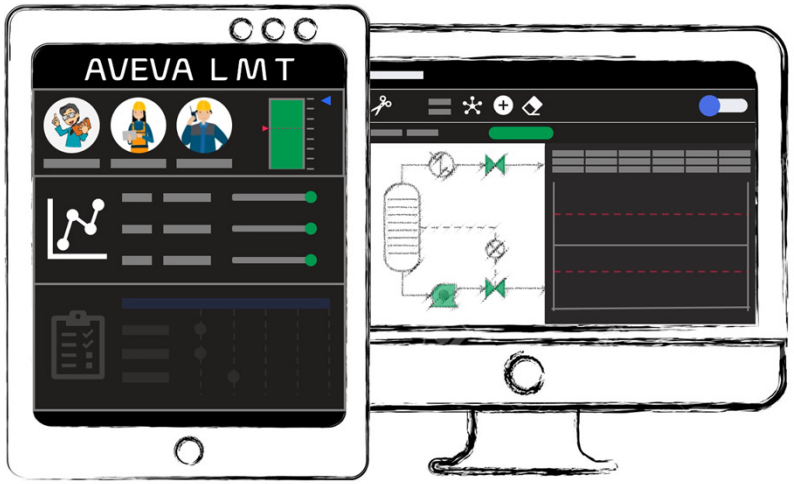
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- New scoring tool for the trainees
- The score is based on process key indicators and adherence to an operating procedure
- Fully integrated with AVEVA Unified Learning LMS
- Available also for on-premise installations

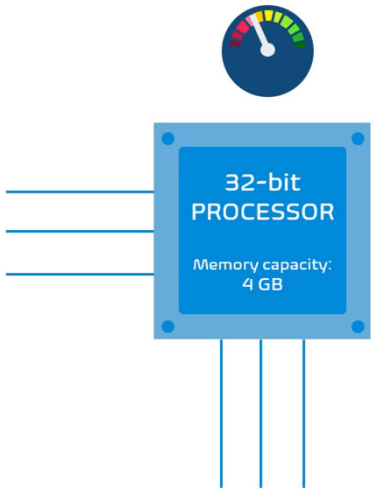
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- Drop of 32-bit and adoption of 64-bit for all components
- The amount of data which can be transferred is doubled

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- New Open-FORM Vapor-Liquid-Liquid Equilibrium for improved robustness
- Combined with VLLE, Super-Linear Local Flash (SPFL) provides the ideal balance between accuracy and performance

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AVEVA Dynamic Simulation Roadmap

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AVEVA Dynamic Simulation Roadmap

Coming Next

- Containerization to run multiple instances on the Cloud
- Multi-threading calculations for improved performance
- Patches will not require installation
- Expand Undo/Redo to support “Excel Macro recording” like functionality
- Enhancement for scenarios (IF conditions, loops, save status in IC)
- StramSend / StreamReceive to send flow from a pressure node to a flow device
- Plant data import including data reconciliation
- Data driven surrogate AI ML model capability

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Operator Training Simulator Roadmap

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AVEVA Operator Training Simulator Roadmap Highlights

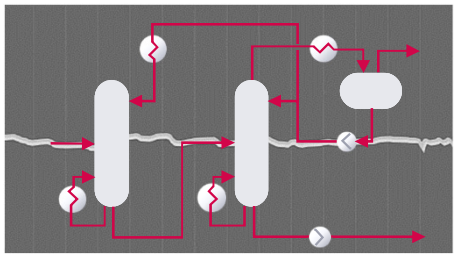


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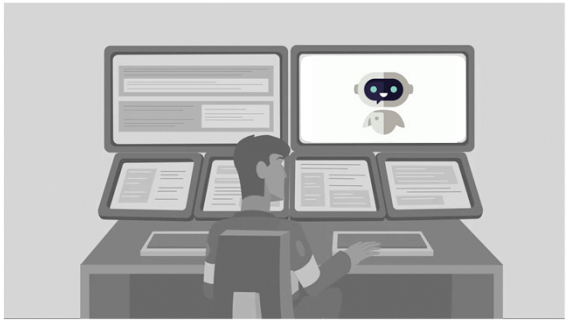
AVEVA Dynamic Simulation to train AI advisor

Dynamic Simulation



Artificial Intelligence

Online Advisor



- AVEVA dynamic simulator is used to train an artificial intelligence agent to identify the optimal trajectory between two operating conditions.
- The AI agent tries thousands of different operations using parallel sessions of the simulator on the Cloud to identify the one which can be completed in less time, with less alarms and with lower emissions.
- PRiSM TRANSIENT model trained as a surrogate on the best run will give an operator a real-time view of when their actual actions deviate from the best possible.
- This could translate into higher production, safer operations, and lower environment impact.

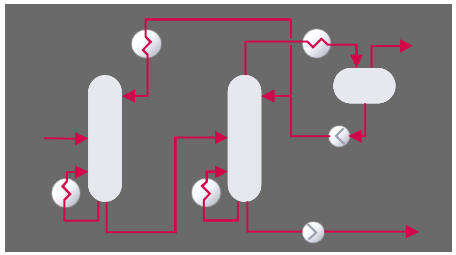
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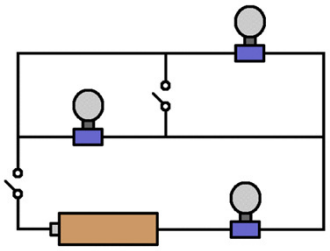
Process and Electrical simulation with AVEVA Dynamic Simulation and ETAP

15:59

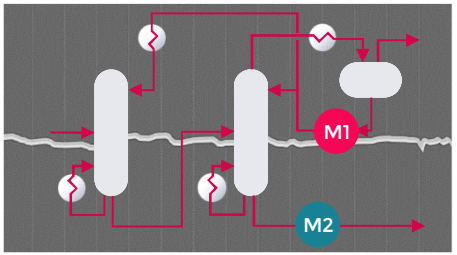
Process Simulation



Electrical Simulation



Process & Electrical Simulation



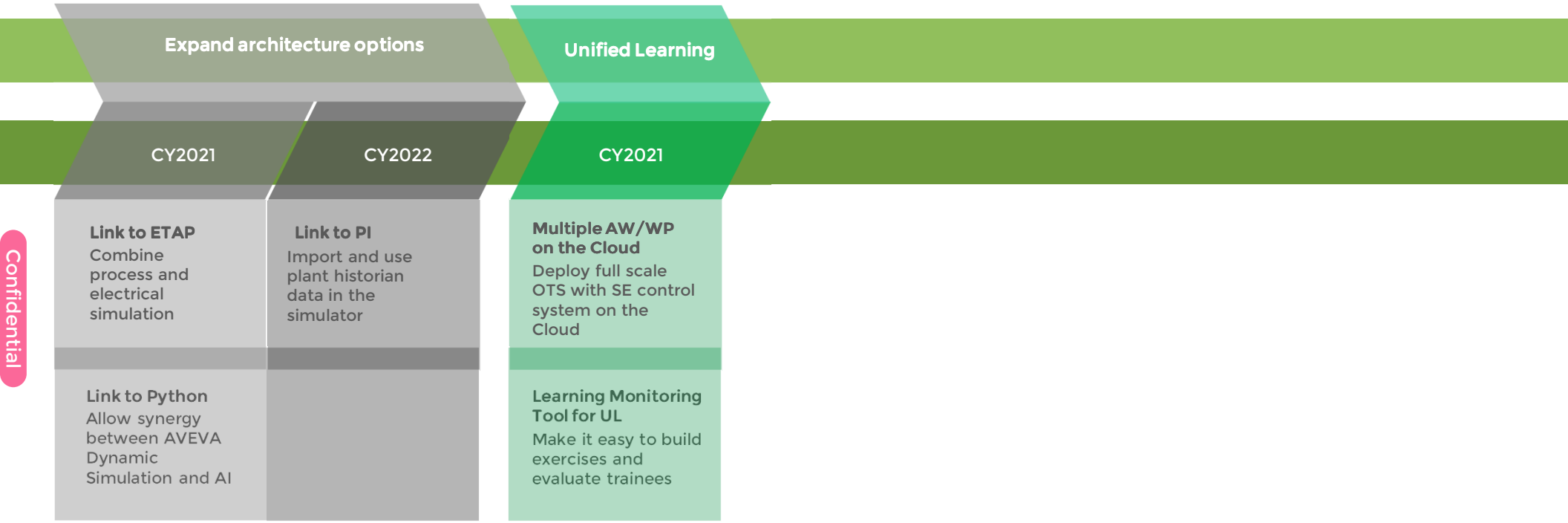
- Combine both process and electrical dynamic simulations using AVEVA Dynamic Simulation and Schneider Electric ETAP.
- During FEED, a highly accurate dynamic process model can provide the process energy consumption requirements. When connected to a design quality electrical model, the engineer can optimize the E-House by quickly iterating on many potential configurations.
- Co-simulation can reduce the time for an energy management study and validate the study results quickly, with demonstratable dynamic results.

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AVEVA Operator Training Simulator Roadmap Highlights



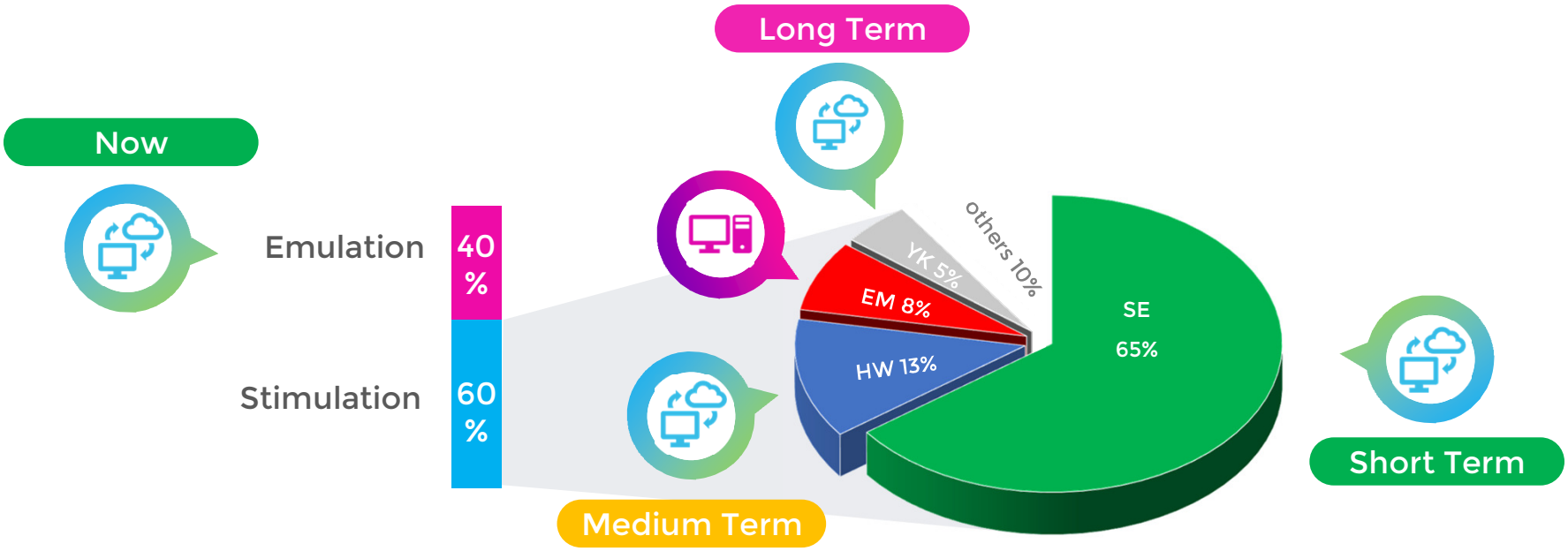
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16:05

Our Strategy for Cloud Deployment

Uplift on-premise OTS to the Cloud



Strategy:

1. Complete the development of Cloud OTS with Schneider Electric controls
2. Deploy partial stimulation solutions for process automation vendors other than SE

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Learning Monitoring Tool

16:13

Problem Statement

Today we have separate tools for trainee performance monitoring:

- Trainee Performance Monitoring
  - Difficult to configure
  - Performance is not optimized
  - Can't track actions
- DYNSIM SCORE
  - Difficult to configure
  - External package
  - Can't track variables

It is difficult for the instructor to create exercises

Integration between these tools and with Unified Learning is a challenge

Solution

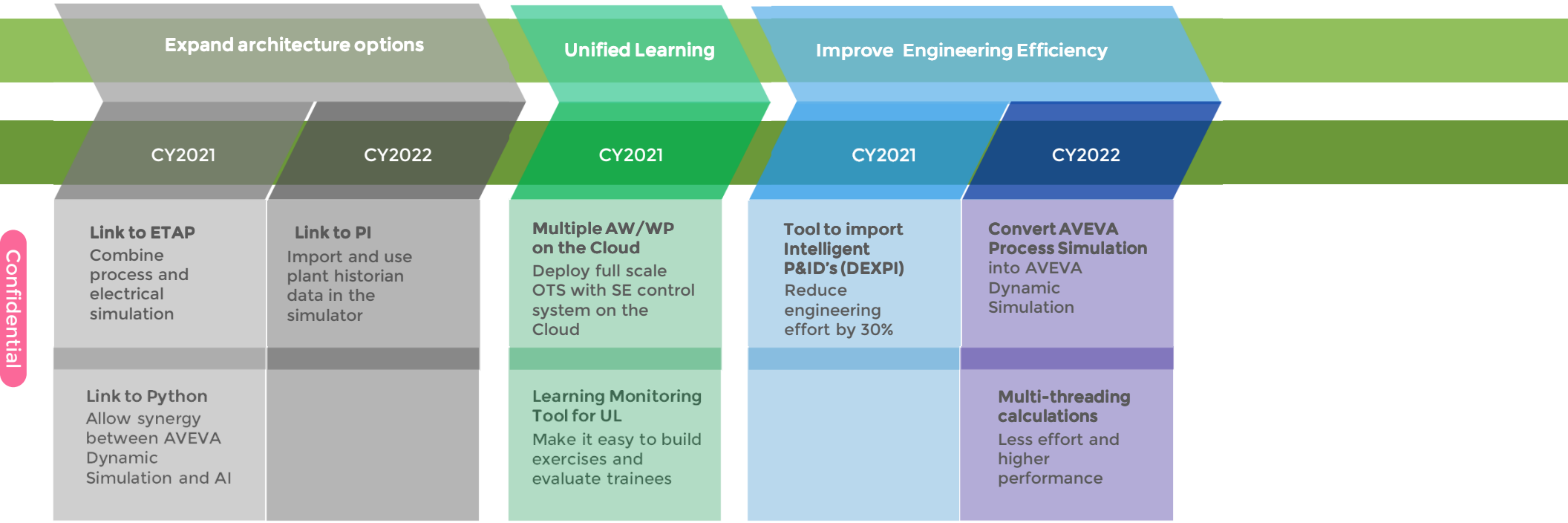
Learning Monitoring Tool is a new package of AVEVA Dynamic Simulation:

- Instructor can easily create exercises from existing templates or from scratch
- It is completely modular:
  - It tracks how variables are behaving
  - It checks that the proper actions are performed by the trainee in right order
  - It will be expanded with more modules in the next versions
- It supports instructor-led and instructor-less training sessions
- It includes a portal for reviewing the results
- It integrates with Unified Learning

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AVEVA Operator Training Simulator Roadmap Highlights



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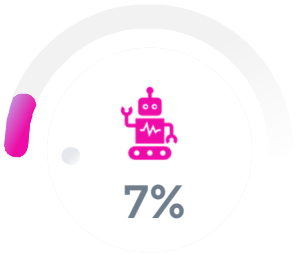
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Innovative Initiatives to Improve Engineering Efficiency

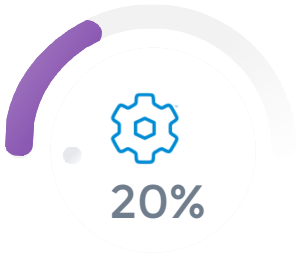
Develop tools and new automated workflows to improve engineering efficiency

Reduction in the n° of hours to execute an OTS project



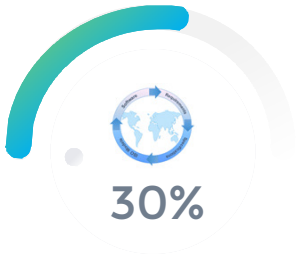
AI for auto-tuning of the dynamic simulation to match H&MB / plant data

Medium Term



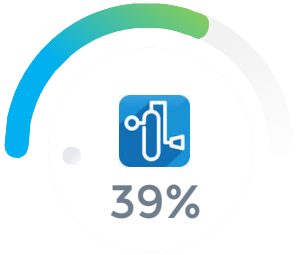
Convert AVEVA Process Simulation to AVEVA Dynamic Simulation

Short Term



Tool to import Intelligent P&IDs through DEXPI

Short Term



Develop an engine link to use directly AVEVA Process Simulation for OTS

Long Term

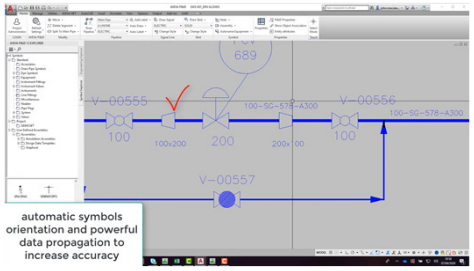
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Import Intelligent P&IDs into AVEVA Dynamic Simulation

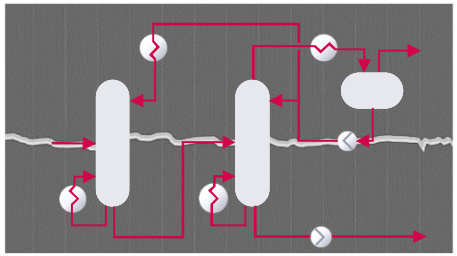
Intelligent P&IDs



DEXPI export



Dynamic Simulation



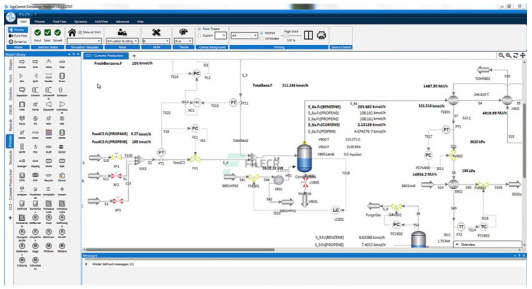
- Export intelligent P&ID's and engineering data into DEXPI format (standard for Data Exchange in the Process Industry)
- DEXPI standard is supported by all major vendors of intelligent P&ID's.
- The DEXPI file is then converted into an equivalent dynamic simulation with all selected process lines and equipment
- This can save up to 50% in the engineering effort to develop a dynamic simulation and up to 30% of the effort for developing an OTS
- It also ensures the correct transfer of design data

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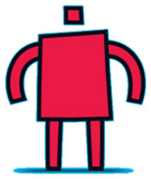
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Convert APS into AVEVA Dynamic Simulation for OTS

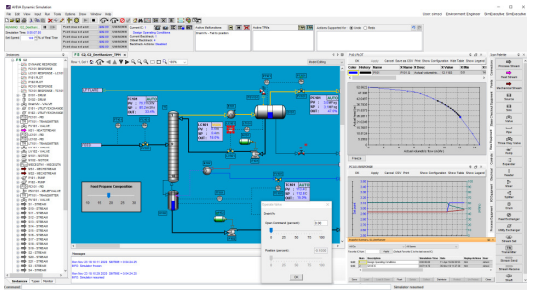
AVEVA Process Simulation



Model Generator



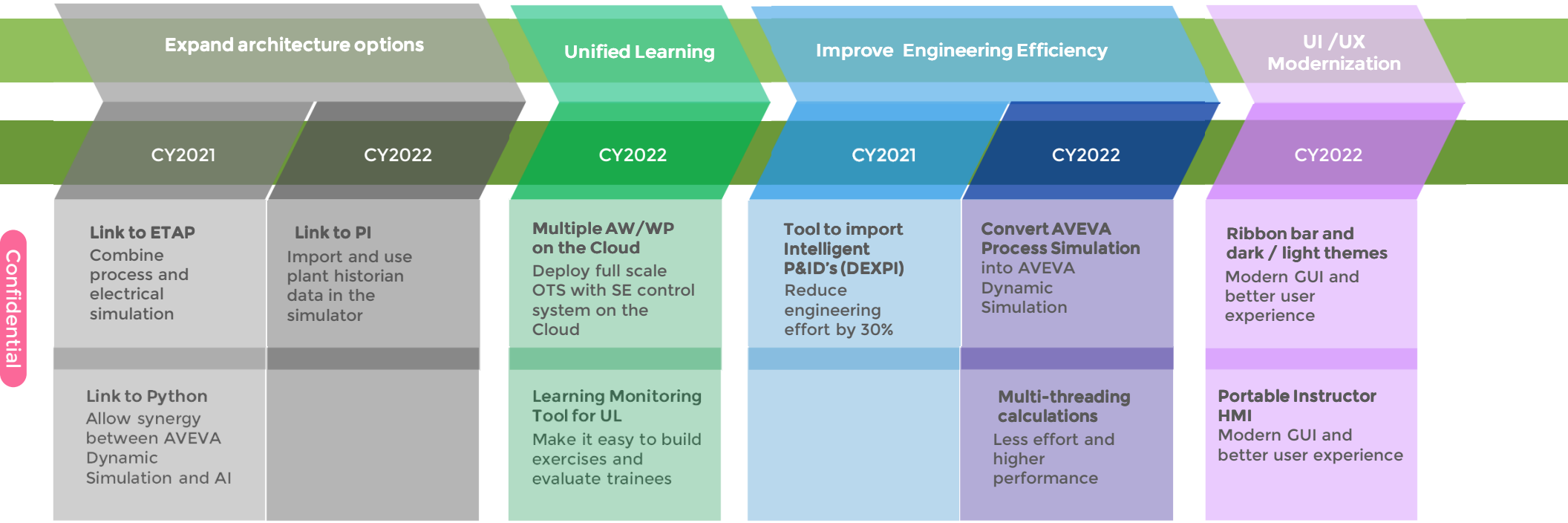
AVEVA Dynamic Simulation



- Converts an AVEVA Process Simulation file into AVEVA Dynamic Simulation
- The tool to import Intelligent P&IDs can be expanded to import an APS file
- This can save up to 20% of the effort for developing an OTS while we are waiting for AVEVA Process Simulation to be “OTS Ready”
- We are also developing a direct link to use AVEVA Process Simulation models as model engine in an OTS

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AVEVA Operator Training Simulator Roadmap Highlights



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Enhancement Requests

Aha Portal Review

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Current status of Ideas from Advisors

Idea name	Idea status	Workspace name	Idea created date	Idea votes
Always On Top function in trend is useful (DYNSIM)	Implemented	Advisory Group Ideas	30 Oct, 2019	6
Show/Modify dynamic values in the Search Window (Dynsim)	Implemented	Advisory Group Ideas	24 Oct, 2019	4
Replace Yellow as default color for trending (Dynsim)	Considered for roadmap	Advisory Group Ideas	29 Oct, 2019	4
Enable spreadsheet calculation within DynSim & PRO II	Implem			4
DCS Database Integration Tools	Imple			4
Improve stream automatic routing in DYNSIM	Subm			3
Dynsim - Retain message monitor text after crash	Imple			2
DYNSIM Feature - Allow users to change Recip Compressor reverse flow conductance factor (KJr)	Imple			2
Dynsim - Flowsheet Folders	Submi			2
Create a Default Trend in TPM Template to Include all Points Used in the TPM	Consi			2

80% of the ideas voted by at least 2 advisors are implemented or under development. We DO care!

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AVEVA is a global leader in industrial software, driving digital transformation and sustainability. By connecting the power of information and artificial intelligence with human insight, AVEVA enables teams to use their data to unlock new value. We call this Performance Intelligence. AVEVA's comprehensive portfolio enables more than 20,000 industrial enterprises to engineer smarter, operate better and drive sustainable efficiency. AVEVA supports customers through a trusted ecosystem that includes 5,500 partners and 5,700 certified developers around the world. The company is headquartered in Cambridge, UK, with over 6,500 employees and 90 offices in over 40 countries.

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