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AVEVA Operator Training Simulator

AVEVA Dynamic Simulation 2022

Nov 2021

15:45

Model	Stream wit conductance	Ability to connect two pressure nodes with a stream object by adding a conductance to the object
	Advanced Header option	New header option to automatically switch to the most appropriate algorithm during execution to improve robustness
	Enhancements for Compressors	More accurate solution for compressors treating fluids with different molecular weights
GUI	Ribbon Bar	Modern graphical user interface using ribbon bar instead of menu and tool bar
	Dark and Light themes	The user can switch between dark and light themes
Platform	Tool to Import Intelligent P&IDs	Create a dynamic simulation from intelligent P&IDs exported in DEXPI format
	Learning Monitoring Tool	New tool for evaluating the trainee performance by monitoring variables and actions
	Support 64bit for all components	Drop of 32bit and adoption of 64bit for all components for better usage of the machine memory
Thermo	Robust VLLE	New Open-FORM Vapor-Liquid-Liquid Equilibrium for improved robustness
	Super-Linear Flash algorithm	Combined with VLLE it provides the ideal balance between accuracy and performance

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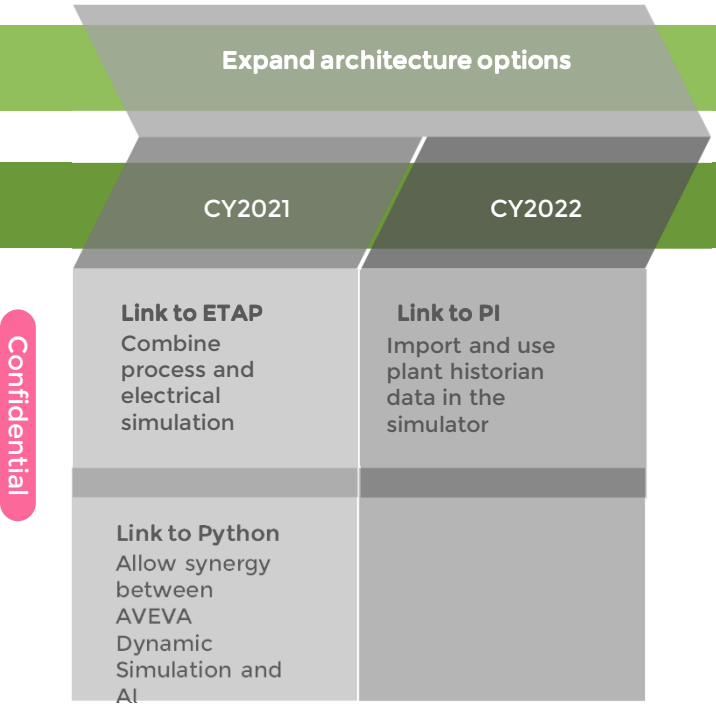
AVEVA Operator Training Simulator Roadmap Highlights



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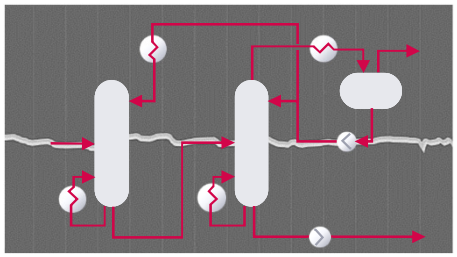
AVEVA Dynamic Simulation to train AI advisor

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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For which use case would you apply artificial intelligence to dynamic simulation and / or operator training?

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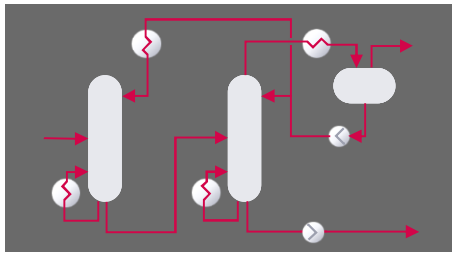
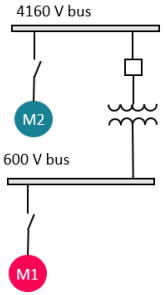
Process and Electrical simulation with AVEVA Dynamic Simulation and ETAP

15:59

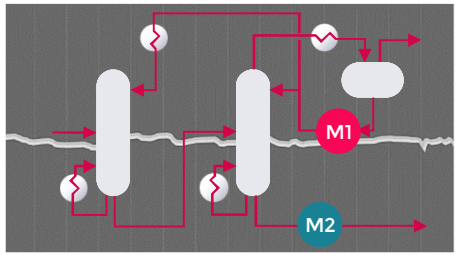
Process Simulation



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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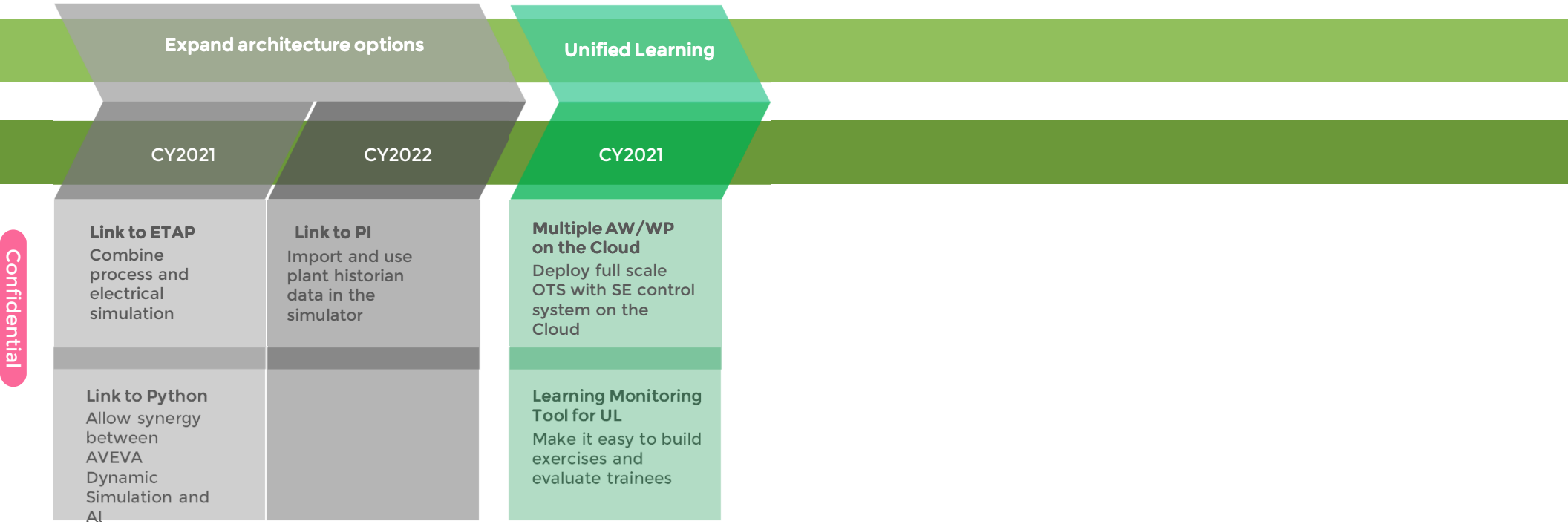
AVEVA Operator Training Simulator Roadmap Highlights



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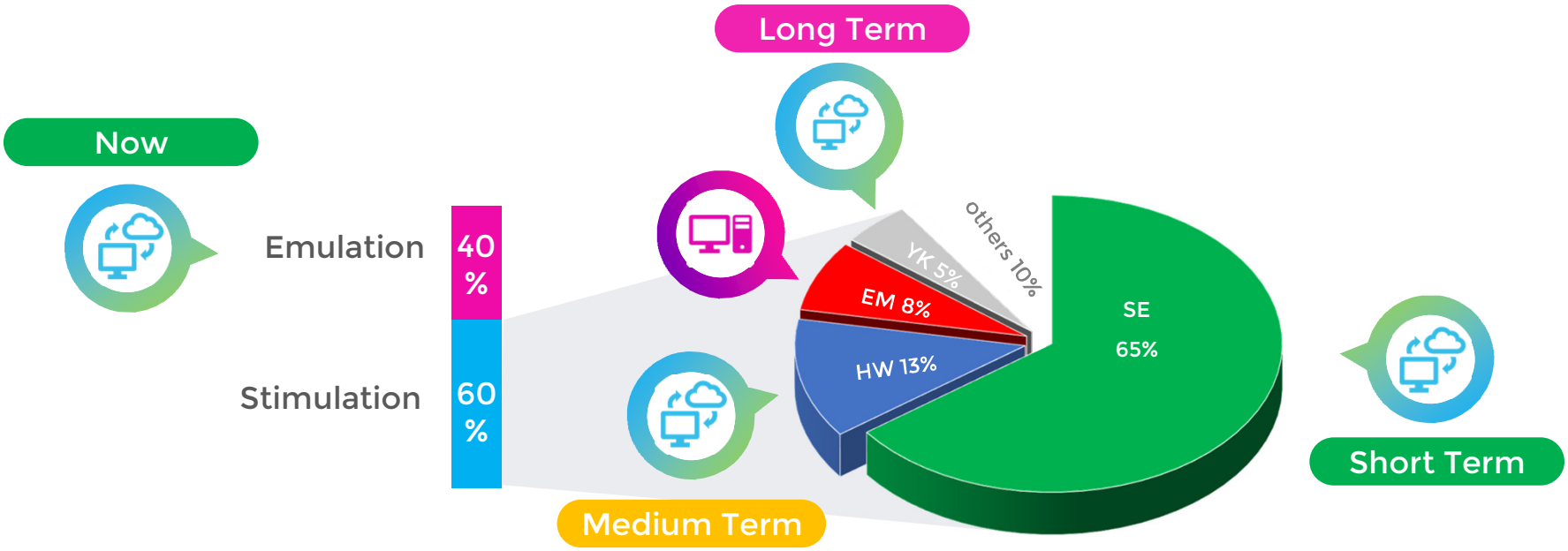
16:05

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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What would be your preference for performing engineering activities / control checkout (changes to database, logic and HMI) using the Cloud OTS post-delivery? SINGLE ANSWER

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ⓘ Start presenting to display the poll results on this slide.

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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Which score data would you like to be retained at the end of the session?

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The following functionalities are considered in our roadmap for the new Learning Monitoring Tool, but we need your help in prioritizing them. Can you help us ranking them (drag up and down the items) in order of importance?

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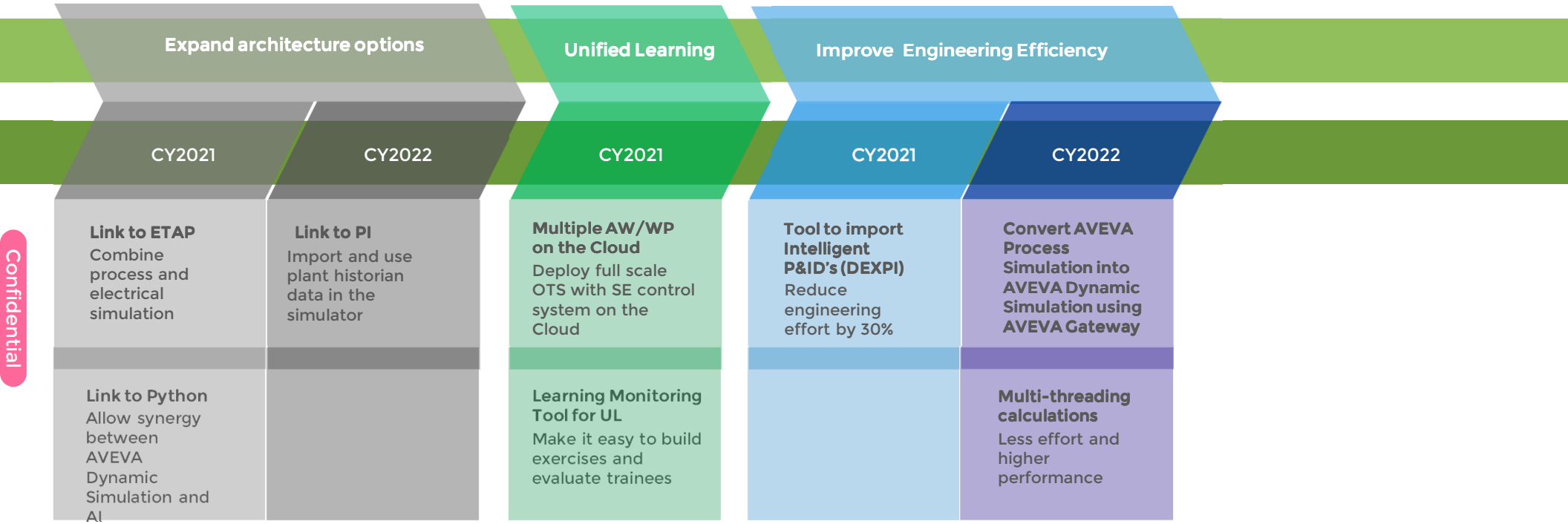
AVEVA Operator Training Simulator Roadmap Highlights



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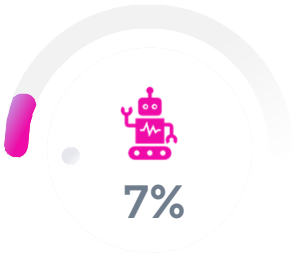
Innovative Initiatives to Improve Engineering Efficiency

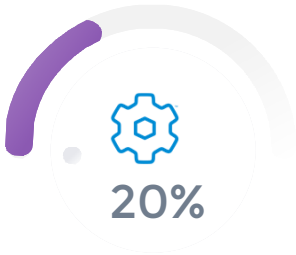
Develop tools and new automated workflows to improve engineering efficiency

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



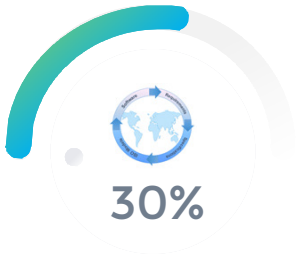
ML for auto-tuning of the dynamic simulation to match H&MB / plant data

Medium Term



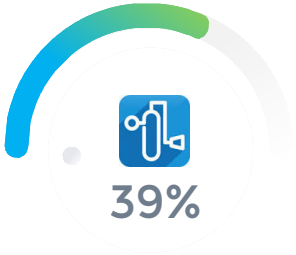
Convert AVEVA Process Simulation to AVEVA Dynamic Simulation using AVEVA Gateway

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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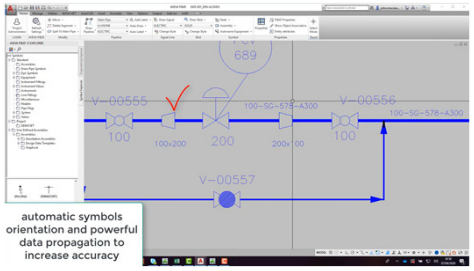
Import Intelligent P&IDs into AVEVA Dynamic Simulation

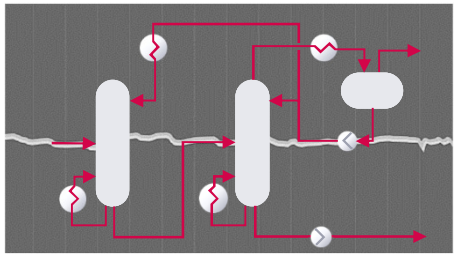
Intelligent P&IDs



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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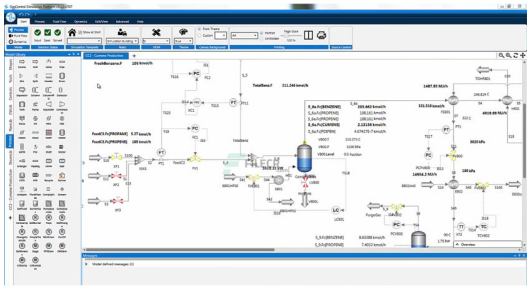
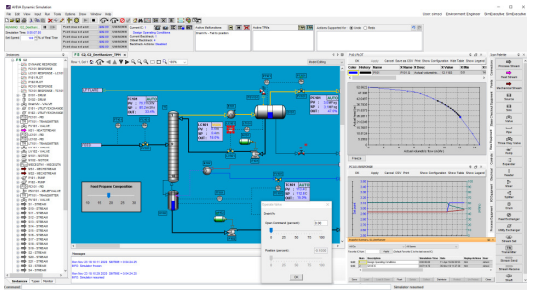
Convert AVEVA Process Simulation into AVEVA Dynamic Simulation to reuse the same model for OTS

AVEVA Process Simulation



AVEVA Gateway

AVEVA Dynamic Simulation



- AVEVA Gateway for Process Simulation converts an AVEVA Process Simulation file into a DEXPI format
- The tool to import Intelligent P&IDs can be expanded to import the DEXPI file extracted from AVEVA Process Simulation
- 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”
- In the longer term we want to develop a direct link to use AVEVA Process Simulation models as engine in an OTS

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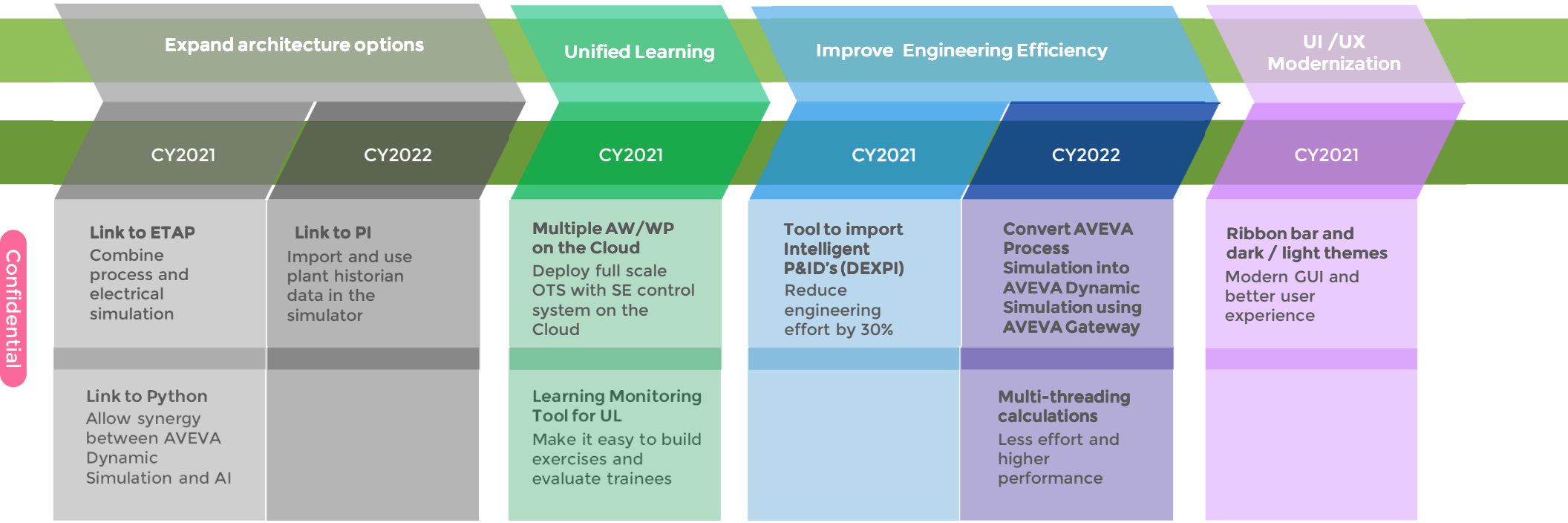

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Current status of Ideas from Advisors

Idea name	Idea status	Idea created date	Idea votes
Always On Top function in trend is useful (DYNSIM)	Implemented	30 Oct, 2019	6
Show/Modify dynamic values in the Search Window (Dynsim)	Implemented	24 Oct, 2019	4
Enable spreadsheet calculation within DynSim & PRO II	Implemented	7 Nov, 2019	4
Replace Yellow as default color for trending (Dynsim)	Planned	29 Oct, 2019	3
DCS Database Integration Tools	Implemented	8 Nov, 2019	3
Dynsim - Retain message monitor text after crash	Implemented	25 Oct, 2019	2
Improve stream automatic routing in DYNSIM	Submitted	7 Nov, 2019	2
DYNSIM Feature - Allow users to change Recip Compressor reverse flow conductance factor (KJr)	Implemented	24 Jun, 2020	2
Dynsim - Flowsheet Folders	Submitted	10 Aug, 2020	2
Large single network dynamic models that integrate fast	Submitted	8 Nov, 2019	1
Add the listed mode objects to the elecsolve engine	Submitted	10 Nov, 2019	1
Remove lower bound on Dynsim time step	Planned	11 Nov, 2019	1
Make Collection Set option (data collection speed) in Trend a Configuration Parameter	Submitted	27 Oct, 2020	1
Create a Default Trend in TPM Template to Include all Points Used in the TPM	Planned	27 Oct, 2020	1

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ABOUT AVEVA

AVEVA is a global leader in engineering and industrial software driving digital transformation across the entire asset and operational life cycle of capital-intensive industries.

The company's engineering, planning and operations, asset performance, and monitoring and control solutions deliver proven results to over 16,000 customers across the globe. Its customers are supported by the largest industrial software ecosystem, including 4,200 partners and 5,700 certified developers. AVEVA is headquartered in Cambridge, UK, with over 4,400 employees at 80 locations in over 40 countries.

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