

TIA Portal

Your gateway to automation
in the Digital Enterprise

Totally Integrated Automation (TIA)

Customer requirements regarding automation



"For me, industrial energy efficiency is the key to the energy revolution. We have to measure, record and analyze large volumes of data. That requires innovative technology."

Stefan Vömel

Quintec Automatisierungs- und Datentechnik GmbH



"As operators, we're looking for a high degree of transparency and speed in troubleshooting so that we can boost our plant efficiency accordingly."

Sebastian Ritter

Pfleiderer Holzwerkstoffe GmbH

"The digital factory is really important to us. We want to continue to progress towards virtual commissioning, but we also want to bring the topic of simulation of the overall factory to the fore"

Dr. Michael Niemeyer

Audi AG, Site Neckarsulm



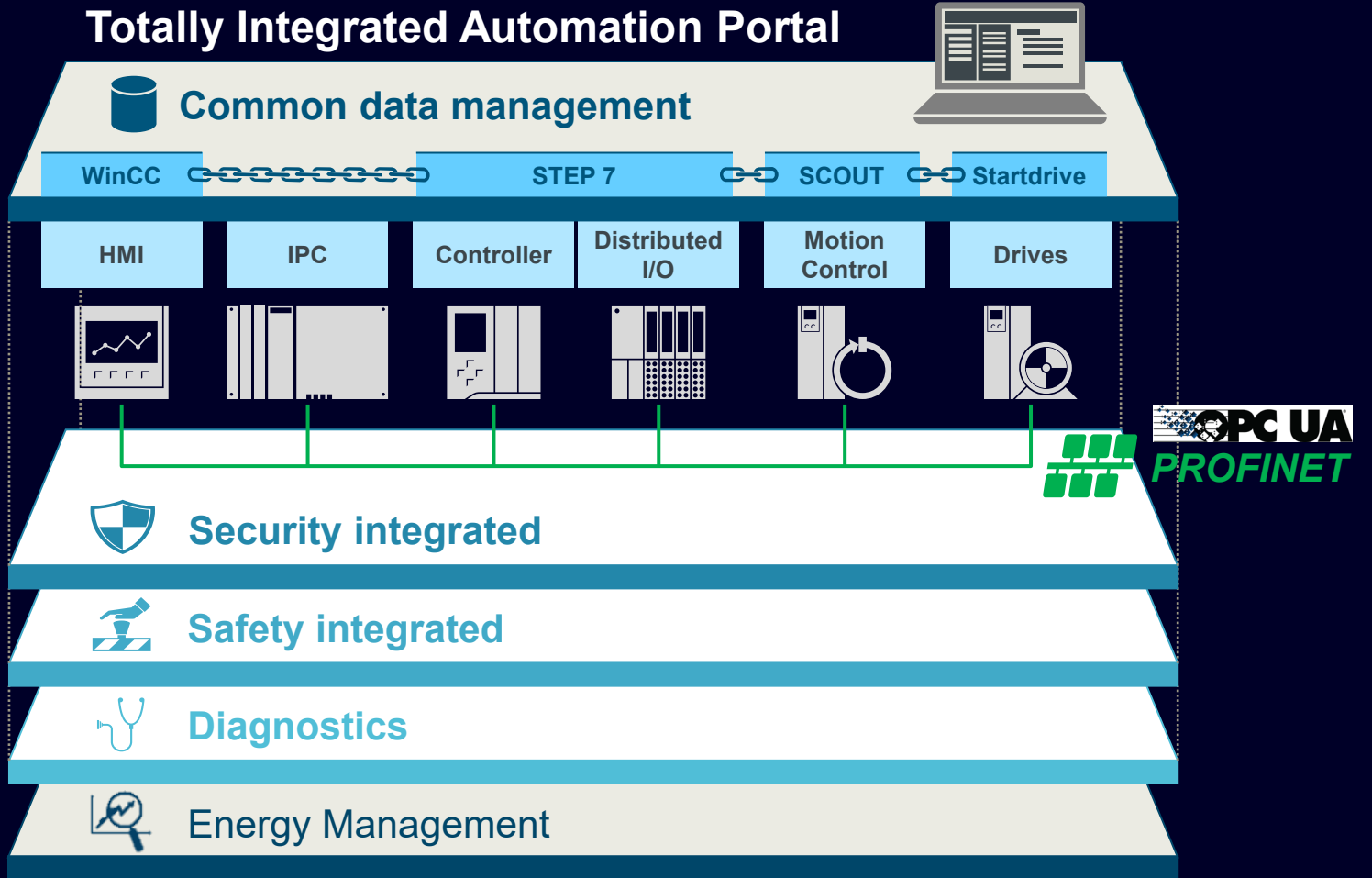
Totally Integrated Automation Portal (TIA Portal)

One for all... The proven basis for innovative solutions

+ One common database

+ Consistent and unified operator concept

+ Common, central services



TIA Portal

Even more than an engineering framework



Work open, virtual and networked!
Digital workflow with TIA Portal



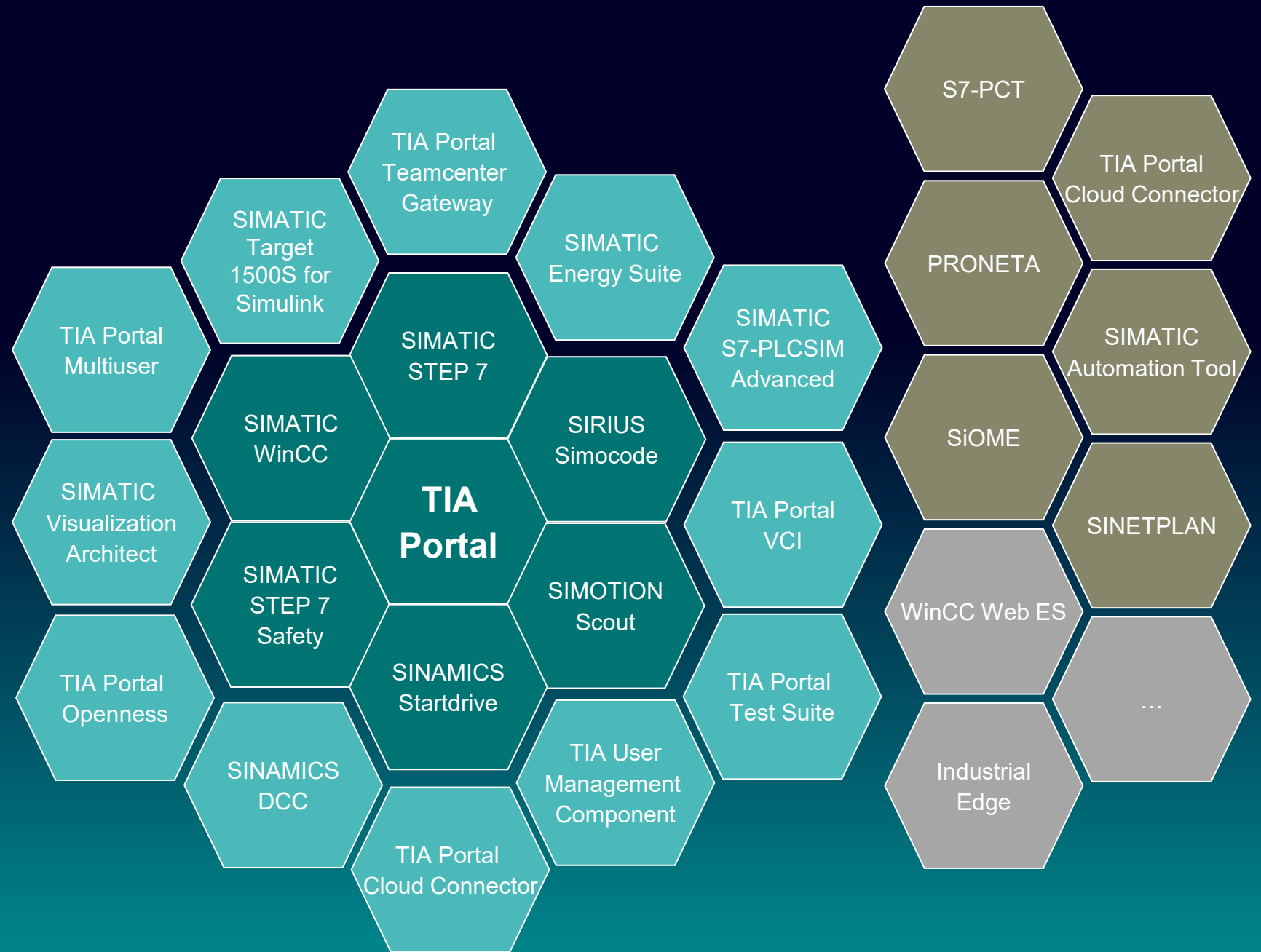
Reduce your time to market!
Integrated engineering with TIA Portal



Increase your productivity!
Transparent operation with TIA Portal

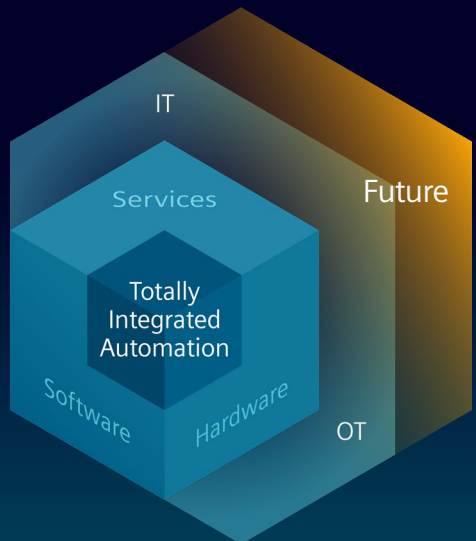
Your gateway to automation in the Digital Enterprise

OUR EXISTING TIA PORTAL ECOSYSTEM FOR MAXIMUM FLEXIBILITY



TIA Portal campaign in TIA – Integration³

Future-proof to enter new dimensions



Networked workflows wherever and whenever needed

- TIA¹: TIA Portal V17 and TIA Portal Cloud for different needs and maximum flexibility (subscription); Variety of different TIA Portal options, e.g. Multiuser addressing working in teams, PLCSIM Adv. and Test Suite for testing and simulation scenarios
- TIA²: TIA Use Cases for OT/IT Integration based on OPC UA and involving Security measures in connectivity / TIA Use Case Continuous Integration, a SW development workflow inspired by IT and app development
- TIA³: IT-like engineering

Benefits

- Addressing individualized requirements
- Efficient engineering by standardization
- Increase flexibility in your everyday work while maintaining total data consistency, regardless of the terminal used



Our offering

- TIA Portal and options
- TIA Portal Cloud incl. options
- Standardization
- TIA Use Case Continuous Integration
- TIA Use Case Data processing for OT-IT integration

TIA Portal V17

Positioning of highlights in Gateway to automation storyline

TIA Portal V17

TIA Portal Test Suite

TIA Portal Version Control Interface (VCI)

TIA Portal Openness

TIA Add-Ins

TIA Portal Cloud

Security by Default / TLS + Wizard

Adv. Motion Control (S7-1518T/TF)

SIMATIC S7-1500R/H (incl. Safety)

Multiuser Engineering & UMAC

Additional editors (CEM & CFC)

WinCC Unified Unified + View of Things

SIMATIC OPC UA S7-1200 (Server + Comp. Specs)

OPC UA A&C / Online diagnosis / Companion Specs

SIMATIC Energy Suite

Central User Management - UMC

ProDiag



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Transparent operation with TIA Portal

TIA Portal

Product overview Engineering and Runtime options

	SIMATIC STEP 7	SIMATIC WinCC	SIMATIC WinCC Unified	SINAMICS Startdrive	SIMOTION SCOUT TIA	SIRIUS SIRIUS ES
Engineering options	TIA Portal Multiuser Engineering					
	TIA Portal Teamcenter Gateway					
	TIA Portal Cloud Connector					
	TIA User Management Component					
	SIMATIC Energy Suite ES					
	TIA Portal Test Suite					
	SIMATIC S7-PLCSIM Advanced					
	SIMATIC STEP 7 Safety					
	SIMATIC ODK 1500S					
	SIMATIC Target™ for Simulink®		SiVArc		SINAMICS DCC	
SIMATIC STEP 7 CFC						
Runtime options	SIMATIC ProDiag		Unified RT Options			
	SIMATIC Energy Suite RT / S7-EE-Monitor					
	SIMATIC OPC UA		WinCC/WebUX ¹⁾			
	Safe Kinematics					
	SIMATIC Robot Library					
	SIMATIC STEP 7 CFC					

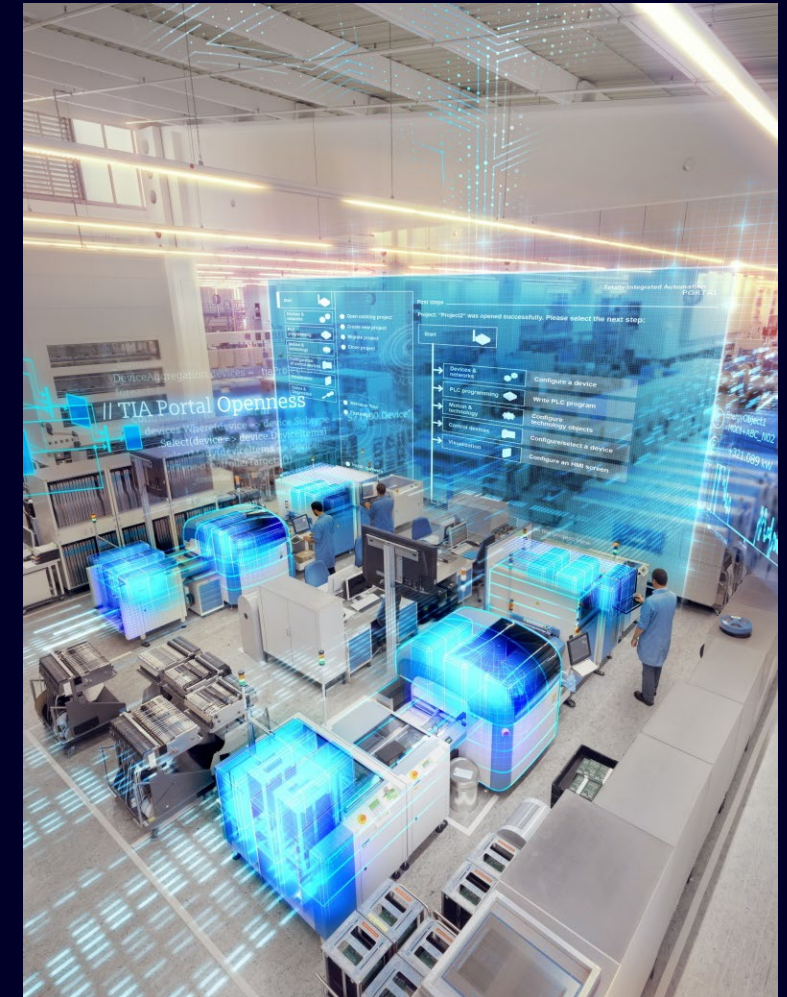
Available in TIA Portal Cloud
 DVD Download
 1) Component of WinCC Runtime Professional



TIA Portal V17

Digital Workflow with TIA Portal

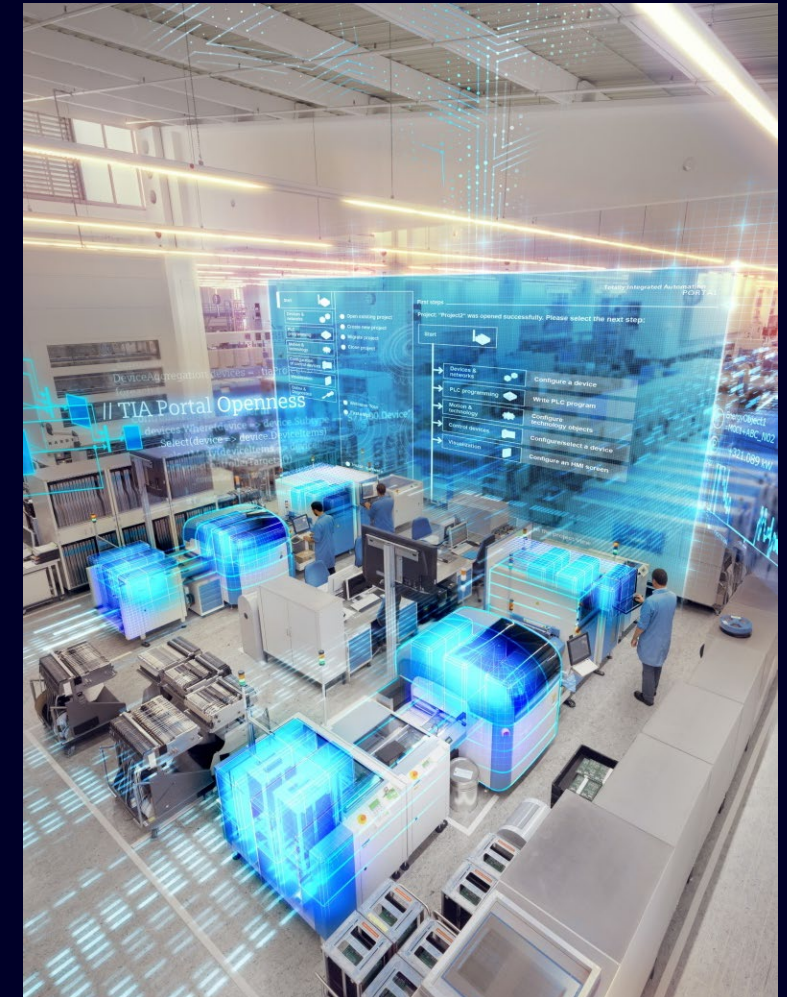
Feature / Function	Benefit
Optimized development of standards <ul style="list-style-type: none">• more flexible library types• Support of nested (F-) data types• Extension of the Openness API	<ul style="list-style-type: none">• More flexible use of own standardized library types with own responsibility• Automated library checks
Enhancements for TIA Portal Openness <ul style="list-style-type: none">• Extensions of the Openness API for multi-user projects• Integration of Openness scripts into the TIA Portal interface with TIA Add-Ins	<ul style="list-style-type: none">• Automated execution of engineering tasks with scripts• Full import/export interface for software objects• easy integration and use of Openness scripts with TIA Add-Ins
TIA Portal User Management <ul style="list-style-type: none">• Managing users and user groups in TIA Portal• More detailed user rights for engineering tasks in TIA Portal	<ul style="list-style-type: none">• Simple cross-project administration and maintenance of users User groups in the system• Defined access rights in production



TIA Portal V17

Integrated Engineering with TIA Portal

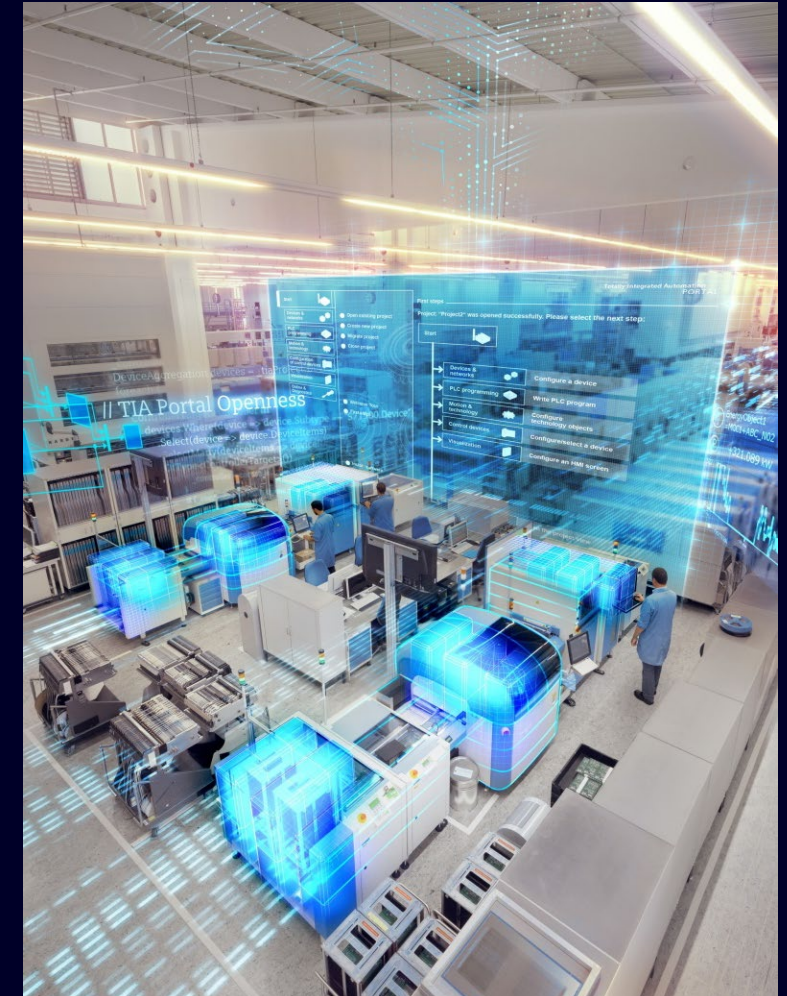
Feature / Function	Benefit
<p>Support of S7-1500HF PLCs</p> <ul style="list-style-type: none"> • SIMATIC S7-1500R/H for fail-safe high-availability applications • Support of PROFIsafe I/O and fail-safe PLC/PLC communication 	<ul style="list-style-type: none"> • Seamless portfolio extension of the S7-1500 to include fail-safe applications • Programming like normal safety applications • Implementation of applications for specific industries
<p>New editor Cause-Effect-Matrix (CEM)</p> <ul style="list-style-type: none"> • Efficient and easy to learn project planning language (S7-1200/S7-1500) • Graphical diagnosis in online mode 	<ul style="list-style-type: none"> • Enhancement of existing IEC programming languages for efficient project planning of action and reaction • Simplified diagnosis of situations thanks to a cause and effect display
<p>Support of Continuous Function Charts (CFC)</p> <ul style="list-style-type: none"> • Graphical programming and wiring of blocks and signals for S7-1500 • Hierarchical structuring of charts • Migration of TDC applications to TIA Portal 	<ul style="list-style-type: none"> • Additional editor for structured programming of SIMATIC S7-1500 • Simplified project planning of signal wiring • Creation and (further) use of CFC libraries in TIA Portal



TIA Portal V17

Transparent Operation with TIA Portal

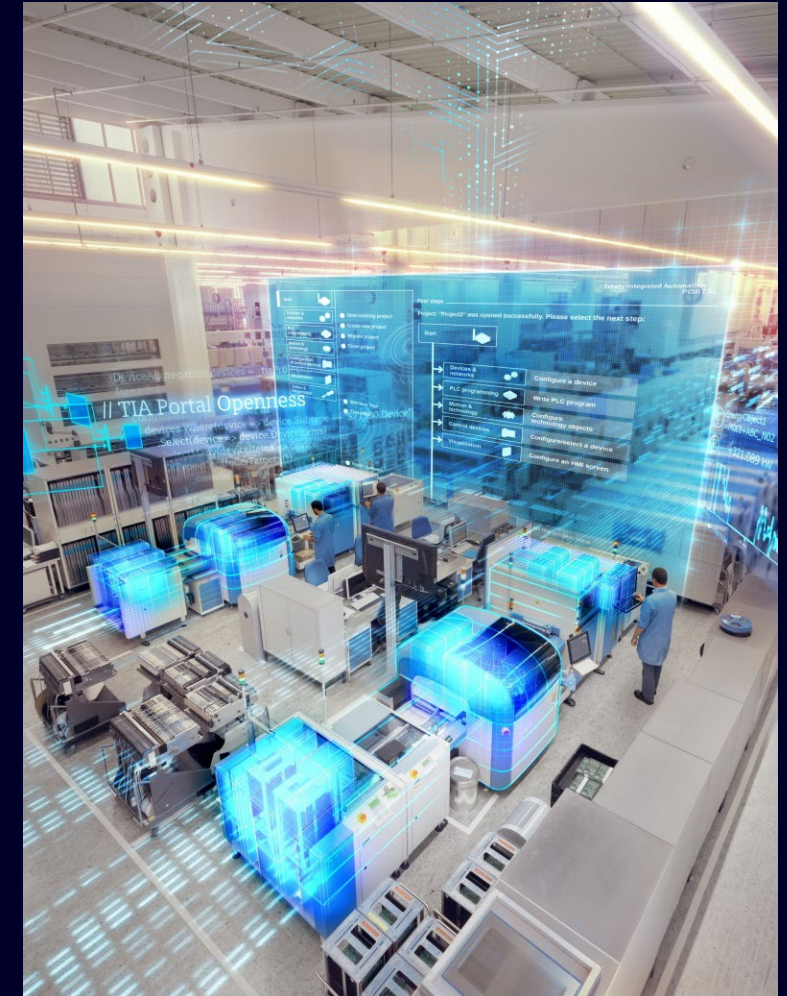
Feature / Function	Benefit
<p>Open communication with OPC UA:</p> <ul style="list-style-type: none">• S7-1500 OPC UA Server with Alarms & Conditions• Certificate management with GDS• OPC UA Client: Compact blocks	<ul style="list-style-type: none">• Integration of messages and alarms in standardized machines and plant concepts with OPC UA• Increased security through management and transfer of access certificates• Simplified programming of OPC UA client applications in the controller
<p>Basic visualizations with Unified View of Things</p> <ul style="list-style-type: none">• Creation of the basic visualization with WinCC Unified• Use as web visualization on SIMATIC web servers• Access to visualization with any browser	<ul style="list-style-type: none">• Creation and use of web-based basic visualizations without HTML knowledge• Seamless integration into the controller and HMI project planning• Access to visualization without additional hardware or installation of tools



TIA Portal V17

Security with TIA Portal

Feature / Function	Benefit
<p>Secure communication:</p> <ul style="list-style-type: none">• TLS-based protection of communication to PG/HMI (TLS V1.3)• Introduction of individual security keys and certificates• Security Wizard	<ul style="list-style-type: none">• Integration of the latest security mechanisms• Increased security thanks to management and transfer of own certificates• Easy configuration of security settings through user-friendly wizard
<p>Extended rights management in TIA Portal</p> <ul style="list-style-type: none">• User Management & Access Control (UMAC)• Central User Management (UMC)	<ul style="list-style-type: none">• Extended definitions of user rights in engineering• Support of Single Sign-on and SIMATIC Logon protocols
<p>Secure communication with OPC UA</p> <ul style="list-style-type: none">• Certificate management with GDS	<ul style="list-style-type: none">• Increased security thanks to access certificate management and transfer

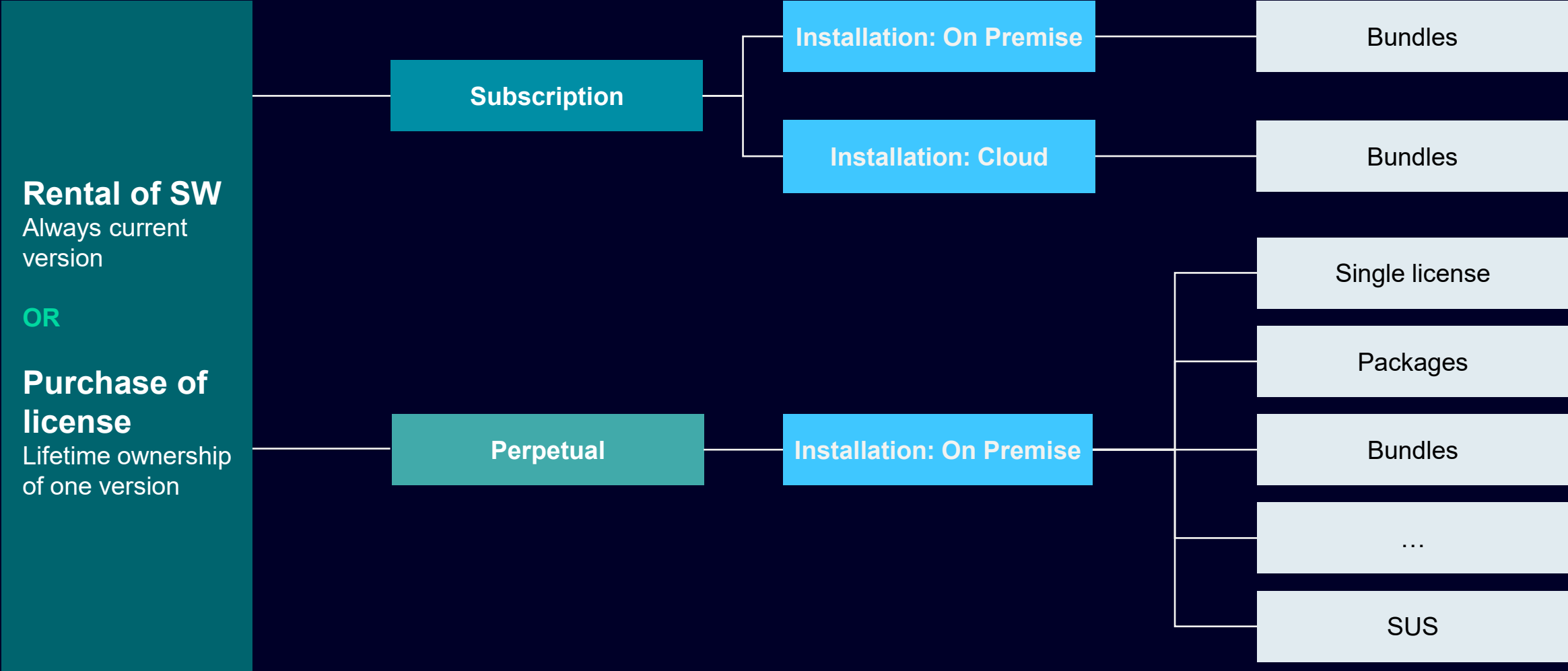


TIA Portal V17

New payment and licensing models

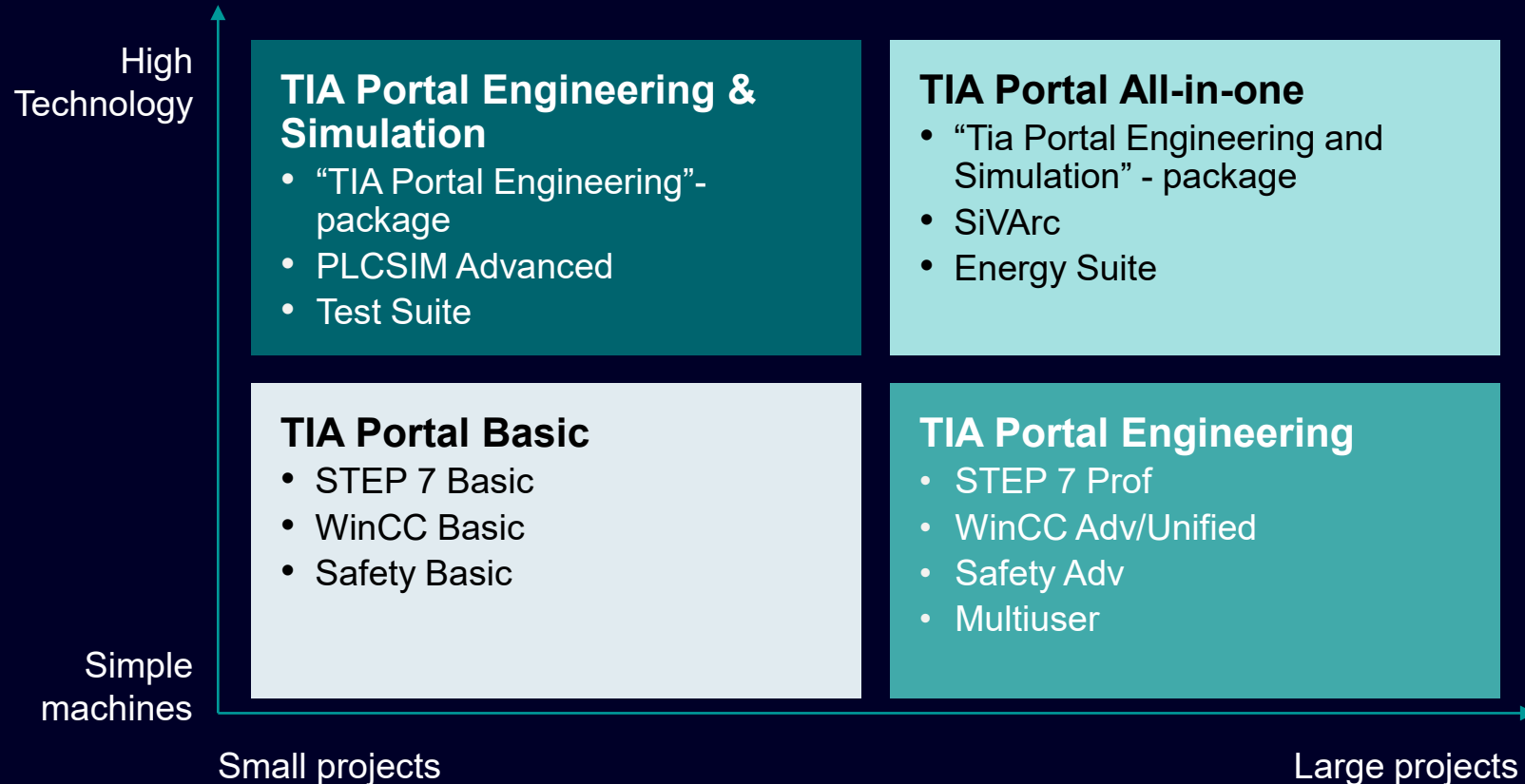
Flexible, demand oriented software usage and cost management

New payment and licensing models available for TIA Portal V17 and TIA Portal Cloud



Introduction of Subscription packages with TIA Portal V17 (TIA Portal V17 – on premise)

Preliminary



Summary

Introduction of “Easy-to-use” Subscription packages

Easy entry to the TIA Portal Framework

Packages tailored to needs and applications

Yearly subscription

TIA Portal V17 Continuous Integration

Transparency and efficiency in the development process

Continuous Integration with TIA Portal

3 main parts for transparency and efficiency in development processes

Engineering System

- Multiple programmers work as a team on one TIA Portal project
- Based on a standardized programming guide
- Perfect collaboration and transparency of software changes



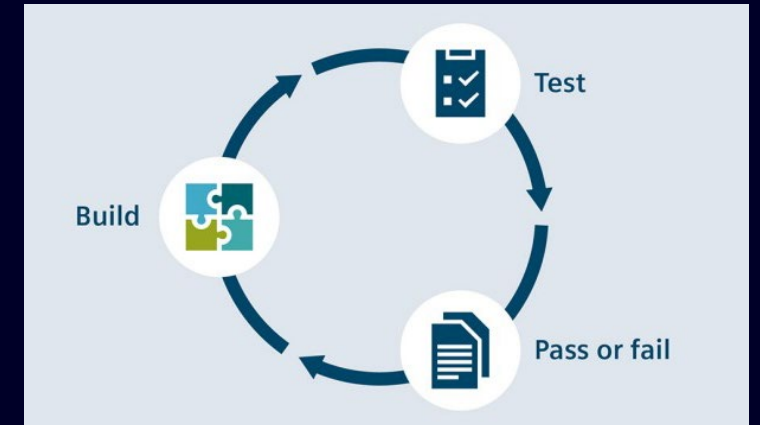
Source Control

- Record changes to software objects and documents
- Coordination of joint access to objects by multiple developers
- simultaneous processing of a project via several development branches



Continuous Integration

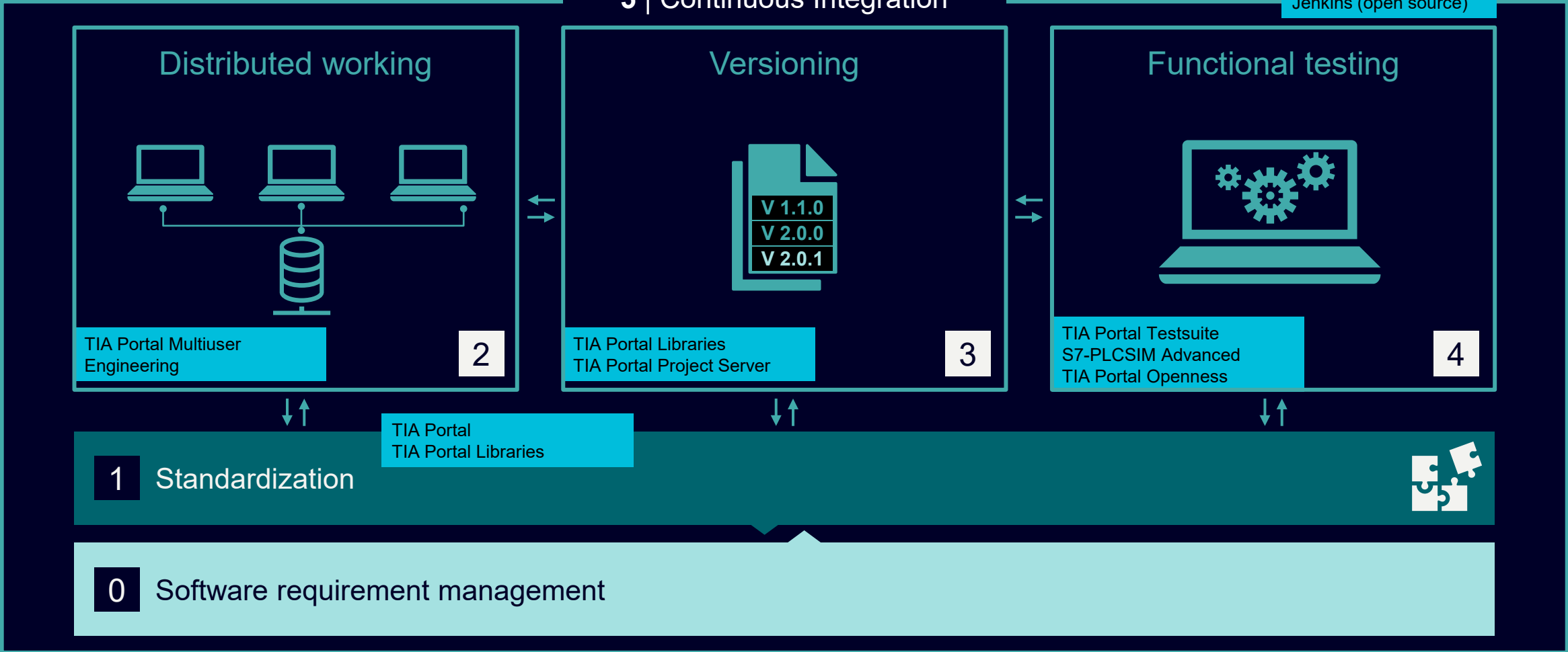
- Automatically generate a build from the individual software modules
- Automatically test the software functions
- Test results as a report to the programmers



Continuous Integration with TIA Portal Solutions with TIA Portal components and options

5 | Continuous Integration

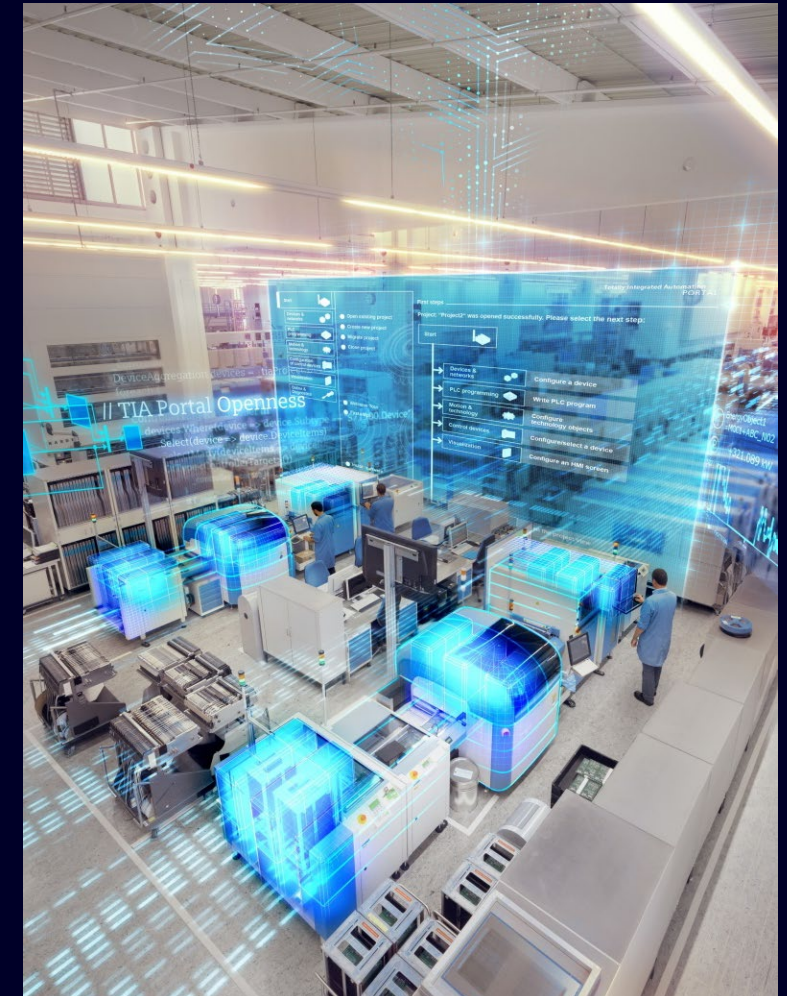
Jenkins (open source)



TIA Portal V17

Continuous Integration with TIA Portal

Feature / Function	Benefit
<p>Working in a team</p> <ul style="list-style-type: none"> • Enhancements for team engineering with multiuser and project server • Addressing multiuser projects via TIA Portal Openness • Team commissioning with PLC synchronization of folders and units 	<ul style="list-style-type: none"> • Efficient teamwork during engineering and commissioning • Automation of engineering tasks with the help of Openness • Generate and check TIA Portal projects thanks to stand-alone tools
<p>Versioning of software objects</p> <ul style="list-style-type: none"> • Integrated versioning of software objects in the TIA Portal project server • Storage of projects and individual software objects in Teamcenter with Teamcenter Gateway 	<ul style="list-style-type: none"> • Free management and versioning of software objects in TIA Portal Project Server • Simplified integration of TIA Portal projects in Teamcenter
<p>Integration of function tests</p> <ul style="list-style-type: none"> • Simulation of the application with extended CPU support in PLCSIM (e.g. S7-1500R/H) • Support of CPU1518HF in PLCSIM Adv. • Application Test and Styleguide Testing with TIA Portal Test Suite 	<ul style="list-style-type: none"> • Guarantee constant software quality through the definition and execution of test cases • Saving engineering and commissioning time through seamless test integration • Support of collaboration in the team



Benefits of Continuous Integration with TIA Portal

Accelerated development process

The continuous cycle of rapid changes and automated function tests reduces the risk of faults.

Lower risk of faults

Automated processes ensure consistency and reduce the time required for engineering. Multiple developers can work on the same project simultaneously.

Increased transparency of processes

Test projects are generated automatically, not manually. Function tests and the testing of programming rules are also automated.

Time savings through automated processes

Version management ensures transparency over changes made by all the developers working on a project and enables traceable workflows.



Totally Integrated Automation
PORTAL

Customer benefits



Reduction of manufacturing complexity and spare part inventory

Modular, harmonized TIA product portfolio

10% less time for engineering

TIA Portal with intuitive operating concept, library concept

Reduction of energy and CO₂ consumption by 17,000 tons

Energy-efficient geared motors, converters with energy recovery, PROFlenergy

Audi AG, Neckarsulm

Efficient Engineering with TIA Portal makes the Audi A8 final assembly future-proof



Development of an innovative and future-oriented automation standard

Project information



AUDI AG |
Automotive

Neckarsulm, Germany

Products used

Previous system	Now
Third-party product	SINAMICS G120D and SIMOGEAR
S7-319F	S7-1500F
	RF600
ET200S	ET200SP
Multi Panel 377	Touch Panel 1500 HMI

Challenges

- 1 Reduction of manufacturing complexity and spare part inventory

Customer benefits

Standardized, modular solution system consisting of hardware and software based on Totally Integrated Automation and TIA Portal

TIA Portal - One tool for all tasks: PLC / I/O / HMI / Switches/Drives / Safety

- 2 Company goal of energy reduction

2% increased efficiency of geared motors-> lower energy costs
reduced variety due to wider application range

SIMOGEAR and SINAMICS G120D with PROFlenergy

Reduction of manufacturing complexity through automation standard based on TIA and TIA Portal



“The introduction of TIA Portal has brought certain advantages: First, faster system access times and second, easier handling of the common data platform in the system. As a result we were able to save about 10 percent of the engineering effort.”

Dr. Michael Niemeyer

Head of Automation Technology at AUDI AG, Neckarsulm

Automation standard based on TIA and TIA Portal

Previously

- Higher management effort caused by separate data management
- Limited diagnostic options

Now with ...

- ✓ 10% less engineering effort
- ✓ Shared data management and data storage
- ✓ Less management effort due to shared data management
- ✓ Increased availability thanks to access times and structure

Disclaimer

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