



The SAP Digital Configuration Lifecycle Customer Co-Innovation Council

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About the Speakers

Johann Dornbach

- Vice President, Digital R&D and Engineering, Configure and Variant Configuration, SAP SE
- Global responsibility for development and delivery of Product Configuration in SAP Hybris, and Variant Configuration and Classification in SAP S/4HANA

Steve Schneider

- Sr. Consulting Product Data Analyst, Steelcase Inc.
- 41 years employment at Steelcase, 26 years in Product Configuration Space
- Riding Motorcycles since 1970

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Key Outcomes/Objectives

1. Understand how the AVC can improve your business and drive profits
2. Understand how influence can impact development
3. Understand the capabilities of the new Advanced Variant Configuration Engine (AVC)

Agenda

- Motivation
- What is the Customer Con-Innovation Council
- An Overview of the AVC
- Customer success story using the AVC

Motivation



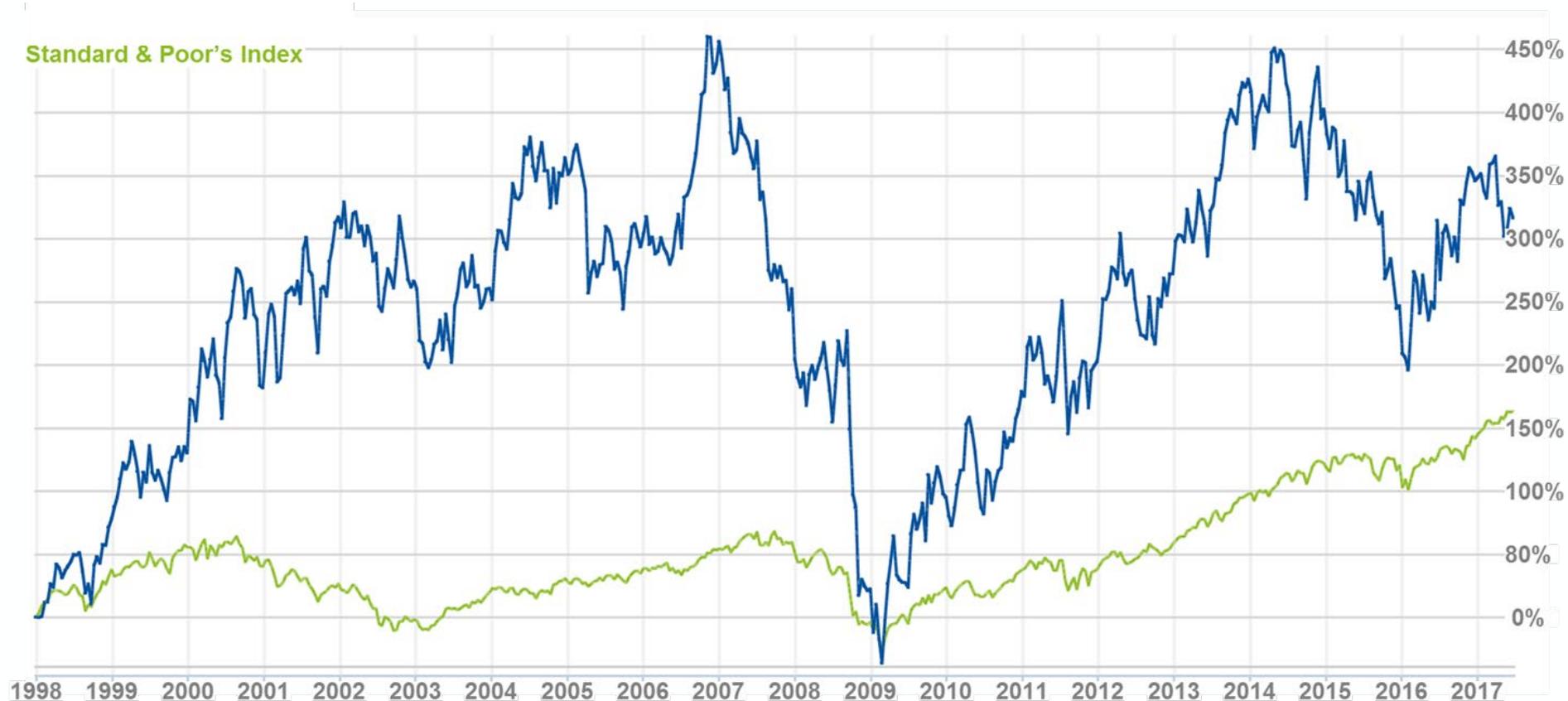
84% of the most innovative companies offer customizable products and services, but less than 20% have an online product configurator.

SAP

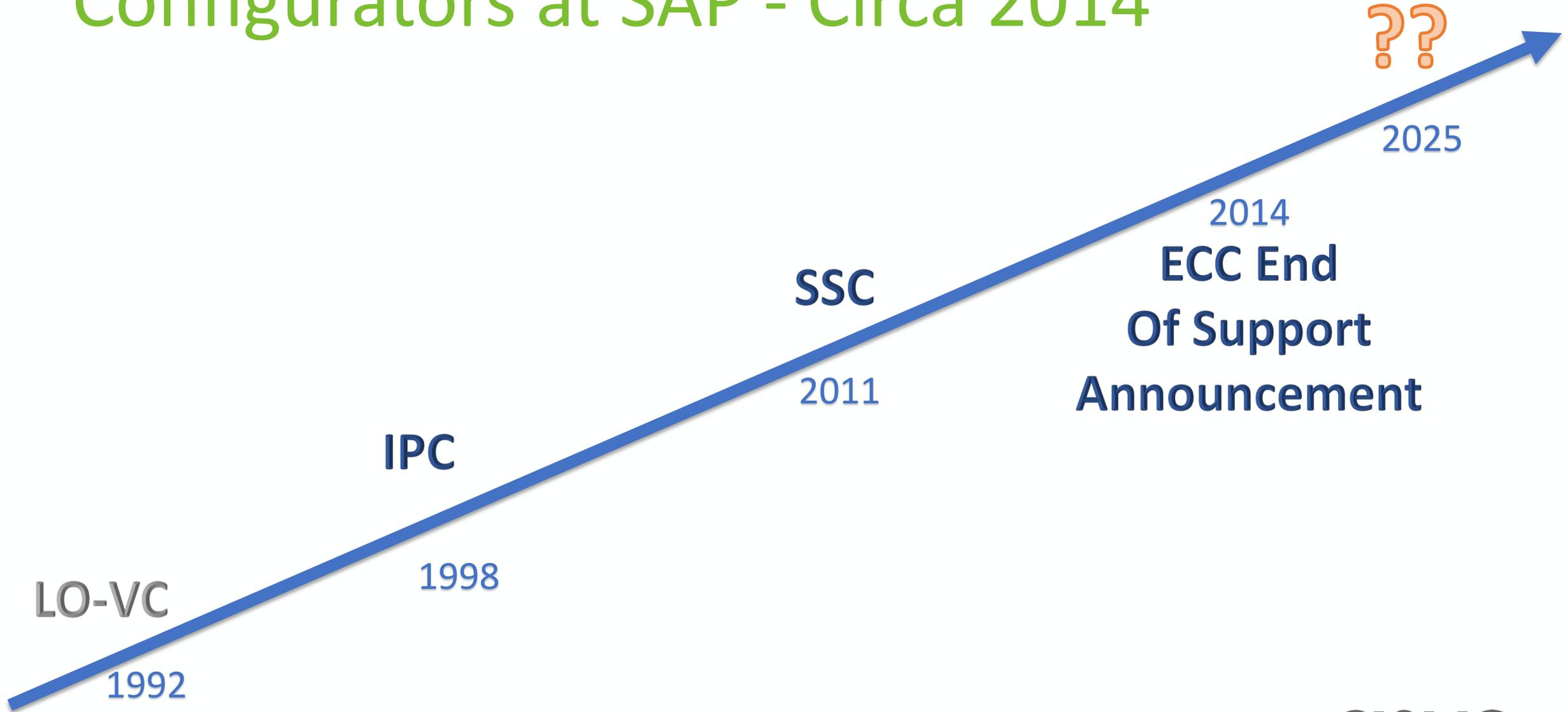
ASUG

Stock price change when using Configurator

Consequent focus on **Customer Needs** and flexible **Make to Order** manufacturing moves the company to the next level.



Configurators at SAP - Circa 2014



The Customer Co-Innovation Council

Co-Innovation Customer Council



Steelcase

KRONES

GREENHECK

LP

KAESER
COMPRESSORS

CENTURY*

REXNORD

Lam
RESEARCH

TRILUX
SIMPLY YOUR LIGHT

swisscom

Dräger

vocera

ARBURG

Johnson
Controls

KONE

TRUMPF

WACKER
NEUSON
mit 1. Platz!

klöckner pentaplast

MHZ
LICHT. RAHM. GIBER.

hp

Rockwell
Automation

thyssenkrupp

SONNY'S
The CarWash Factory

eLogic

MR

CROWN

HEROSE

cbs

United
Technologies

NORD
DRIVESYSTEMS

T.CON

JOHN DEERE

GRUNDFOS

EGGER

HAWORTH*

Customer Council organized by
Kevin Meyer (Haworth) and Nicole Krull (Herose)

ASUG

What We Do

Bi Weekly Webinars



Homework

Overview Page for the Modeler

Standard
Not Filtered

Locked Sales Order Items
Sales Order Items With Locked Configuration
19 of 19
[View All](#)

My Recent Simulations 5 of 16

VCH_GP_PRICE_1010_CB99800001... VCH Test material	Released
VCH_GP_PRICE_1010_CB99800001... VCH Test material	Incomplete
VCH_GP_PRICE_1010_CB99800001... VCH Test material	Released

Changed VC Objects
Last 7 days

Characteristics	2
Classes	3
Constraints	5
Dependencies	8
Profiles	1

Quick Links

- Simulate Configuration Models
- Variant Configuration Modeling
- Manage Classes
- Manage Characteristics
- My Favorite Configurations

Locked VC Objects
Current Status

Characteristics	9
Classes	5
Constraints	7
Dependencies	12
Profiles	10

My Recently Changed Dependencies 5 of 37

YL_TEST01	
YL_TEST01	Precondition
Trigger visibility AVC_DEMO_PROC_SCRE...	Procedure
Set Value AN_CAGR_1_SET_VALUE	Procedure
Set Value from AN_CHAR_1 AN_CHAR_2_SET_VALUE	Procedure

Workshops

Design Thinking Methods & Paper Mockups

Discover (0) - Design (1) - Develop (2)

Ideate, Prototype, Validate, Implement, Test, Synthesize, Scope, Research, Deploy

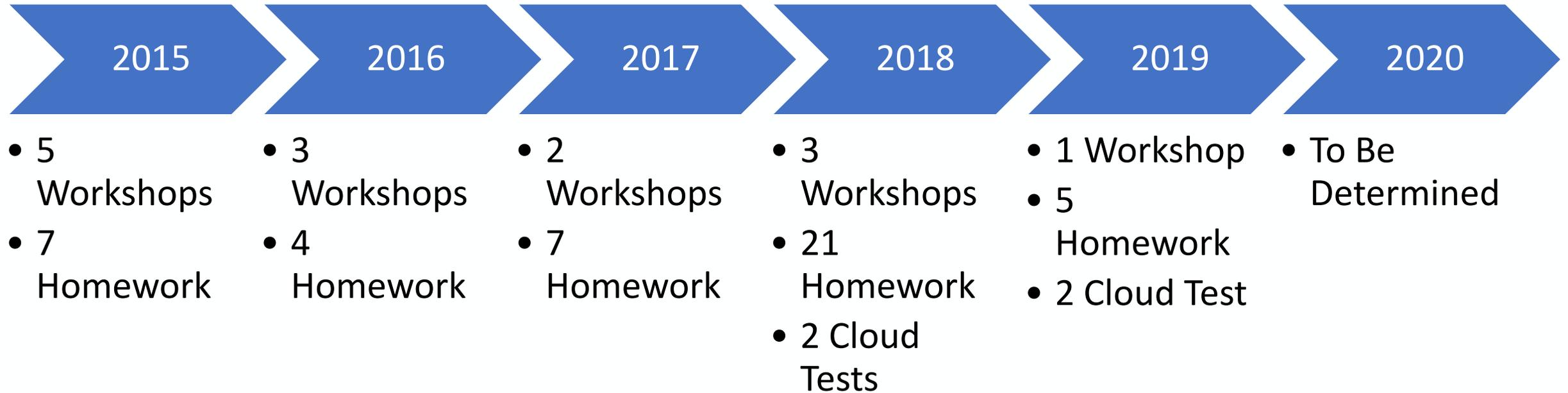
Ideas created by groups of key users from different industries

SAP Paper Mockup with real example data

Test

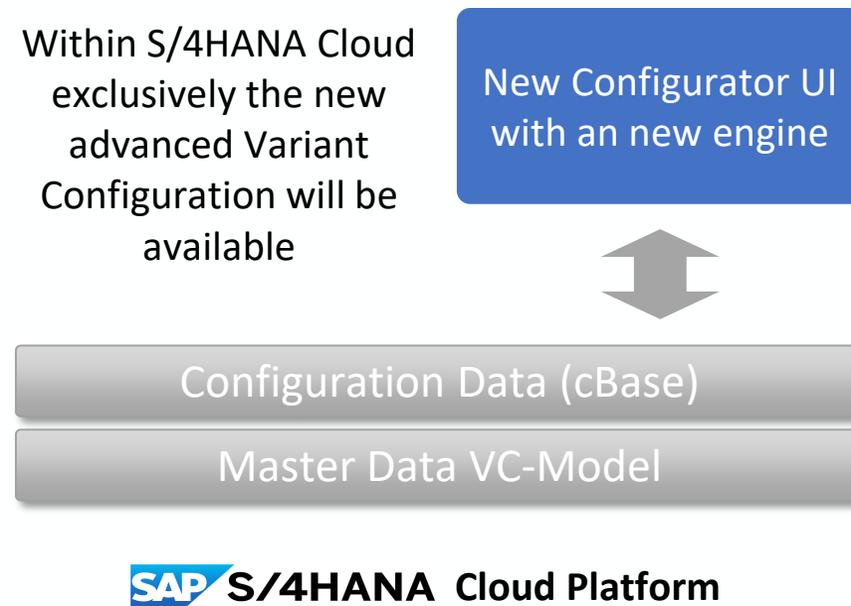
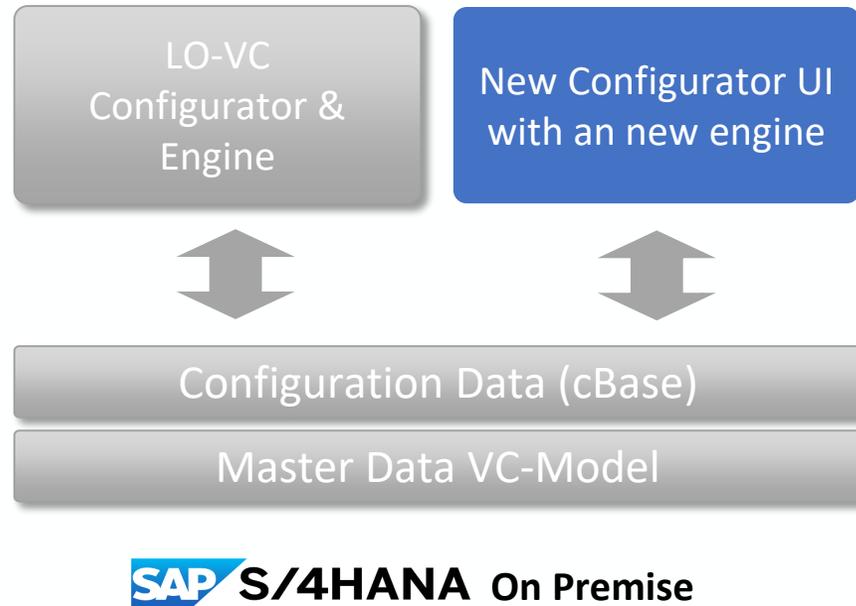
AVC Customer Test CE1905
S/4HANA Idea Configure
Feb 2019

Timeline



LO-VC vs. Advanced Variant Configurator

Co-Existence of both solutions



- The variant configuration will be available within SAP S/4HANA on premise and Cloud
- Immediately usage of known mature variant configuration LO-VC within S/4HANA on premise
- In parallel SAP is building the new advanced Variant Configuration using the same foundation

SAP & Open Source



The open source library Gecode (www.gecode.org)

- Highly-efficient constraint solver developed under the lead of **Prof. Christian Schulte** at **KTH Royal Institute of Technology**
- One of Europe's leading technical and engineering universities
- Comprehensive set of features



“

Gecode really brings all the **qualities** needed for building a **state-of-the-art configuration engine**. Because of its **comprehensive functionality**, its **performance** and **stability**, and its **openness**, it is the perfect ingredient ...

”



Dr. Conrad Drescher is a research and development expert in SAP's team, and has researched constraint satisfaction problems at the [University of Oxford](http://www.ox.ac.uk)

Performance Comparison

Compute **more precise** characteristic value restrictions **faster**

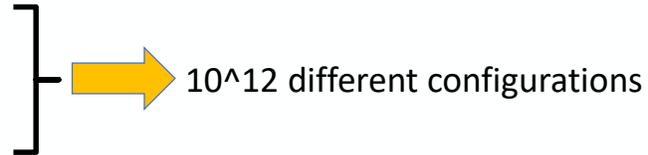
Classical Configuration Benchmark – Renault Mégane

Single level configuration model, purely table-based:

~ 100 characteristics

~ 400 values

~ 100 variant tables containing 200.000 lines



- **Comparison of backend times**

- Roundtrip after setting a value is up to **13 times faster** in Advanced Variant Configuration compared to classical Variant Configuration (LO-VC)

AVC in Action

Configuration for IMC02_70000 24.08.2018

Legend Icons... Test Fullscreen On/Off Explode Model Check Model Reload Model More ▾

Object	Description	Status	Ove...
IMC02_70000	IMC 70000 Multi-Level		
IMC02_70000		■	
300 IMC02_M_GEN	General Technical Data		
300 IMC02_S_GEN	General Sales Data		
3 01			
Routing, 50007343, 01	IMC 70000 Multi-Level		

Constraint Net: IMC02_DN_SALES
Constraint: IMC02_CT_SLA_RESTRICT

Basic Data Editor Descriptions Change Overview

* Sales dependency:
* Determine available Service Level Agreements

OBJECTS:
(300)IMC02_S_GEN
WHERE COUNTRY = VBPA_WE_LAND1;
SLA_CTY = IMC01_SLA_COUNTRY_SPECIFIC;
REGION = IMC01_REGION;
SLA = IMC01_SLA.

RESTRICTIONS:
* In case of non country specific defintion of SLA levels
* Get ALLOWED entries from table IMC01_SLA_REGION
Table IMC01_SLA_REGION
(IMC01_REGION = REGION,
IMC01_SLA = SLA) IF SLA_CTY = 'N',

* In case of country specific defintion of SLA levels
* Get FORBIDDEN entries from table IMC01_SLA_COUNTRY
FALSE IF
Table IMC01_SLA_COUNTRY
(IMC01_COUNTRY_KEY = COUNTRY,
IMC01_SLA = SLA)
AND SLA_CTY = 'Y'.

More Mathematical Precision

SAP Simulate Configuration Models

CWG Demo Window
CWG_WINDOW

Open VC Modeling Env. Parameters

Configuration Status: **Incomplete** Date: 04/13/2018 Quantity: 1 Configuration Profile: CWG_WINDOW Plant: Plant 1 DE BOM Application:

Exploded BOM

Product	Qty
CWG_WINDOW	1 PC

Default Group

*Height: Value Range: 80.0 - 120.0

*Width: Value Range: 50.0 - 70.0

*Frame width: Value Range: 2.0 - 5.0

Window area: Value Range: 1,908.32 - 7,914.59

Radius: Value Range: 20.0 - 33.0

Pi: 3.14159265358979

Save Cancel

Watch video here: <https://youtu.be/StobmVAaMZw>

Conflict Handling

The screenshot displays the SAP Simulate Configuration Models interface. The top header shows the SAP logo and the title "Simulate Configuration Models". Below this, the configuration details for "IMC 70000 Multi-Level" are shown, including the status "Released", date "09.10.2018", quantity "1", configuration profile "IMC02_70000", plant "Werk 0001", and BOM application "PP01".

The main area is divided into three panes:

- Configurable Items:** A table listing the product hierarchy. The item "IMC00_MAT_DEMO_INCONSISTENCY" is selected.
- Demo for Inconsistency:** A central pane showing the "Default Group" and a "Provoke inconsistency:" dropdown menu set to "No Inconsistency".
- Inspector:** A right-hand pane displaying detailed information for the selected BOM item, including component name, description, plant, configuration profile, quantity, item number, category, and relevance.

A light blue box at the bottom of the interface contains the text: "Watch video here: <https://youtu.be/FQiF-pe7TUs>".

At the bottom right of the interface, there are "Save" and "Cancel" buttons.

SAP S/4HANA for advanced variant configuration – On Premise (Additional license)

1809 – Recent innovations*

Advanced Variant Configuration

- Support of multi-level scenario
- Integration into SAP Hybris Commerce
- Integration of new configuration along key processes
- Integration of routing with simulation environment
- Support for characteristics of type "decimal" in object dependencies with a high degree of precision
- Improved user experience: Grouping of characteristics; handling of alternative values
- Interactive user selection of material variants during the sales order process
- Overview page for modeler
- Integration of requirement handling

Classification

- Machine-Learning based auto-Classification for documents
- New public interfaces

2019 – Planned innovations*

Advanced Variant Configuration

- Integration of the advanced variant configurator into further processes
- ML based Analytics
- Syntax enhancements
- Variant functions
- Enhanced simulation and trace possibilities
- OEW integration

Classification

- Improved user experience: Grouping of characteristics
- Extended search and where-used capabilities for classification and variant configuration

2020 – Product direction*

Advanced Variant Configuration

- Support of multi-level SET scenario
- Enhanced Engineer To Order Process
- Syntax enhancements
- Introduction of a configuration object
- Support of product modeling for Hardware, Electrics, Electronics, Software and Services
- Enhanced ML based Analytics
- ML based support creation of configuration

Classification

- Integration of advanced variant configurator
- Import tool for external class structures e.g. [ecl@ss](#)
- Enhanced mass-change capabilities for classification and variant configuration

2021 – Product vision*

Advanced Variant Configuration

- Separate configuration for sales and manufacturing through loose coupling
- Integrated interactive 3D visualization for configurable products in Engineering, Sales and Production processes
- Test environment supporting systematically tests and analysis of variant configuration models

Classification

- Extended characteristic types: long text, data files, attribute groups

*This is the current state of planning and may be changed by SAP at any time without notice.

SAP S/4HANA for advanced variant configuration – Future Outlook

Planned H1/2019^{1,2}

Advanced Variant Configuration

- Enhanced multi level and single level configuration
- Syntax enhancements
- Enhanced user experience
- Trace enhancement

Classification

- Enhancement of classification search capabilities
- Align the look and feel of the classification SAP Fiori user experience with advanced variant configuration

Planned H2/2019^{1,2}

Advanced Variant Configuration

- Integration of the advanced variant configurator into further processes
- ML based identification of critical combination of options (Production)
- Variant functions / Dependency trace

Classification

- List report search

Planned 2020^{1,2}

Advanced Variant Configuration

- SOAP Services / Integration into SAP Product Configuration
- Support of multi-level SET scenario
- Enterprise Search
- Enhanced Engineer To Order Process
- Introduction of a configuration object
- Support of product modeling for Hardware, Electrics, Electronics, Software and Services
- Enhanced ML based Analytics
- ML based support creation of configuration

Classification

- Integration of advanced variant configurator
- Import tool for external class structures e.g. [edi@ss](#)
- Enhanced mass-change capabilities for classification and variant configuration
- SOAP services
- Extension of SOAP services

1. Potential data protection and privacy features include simplified deletion of personal data, reporting of personal data to an identified data subject, restricted access to personal data, masking of personal data, read access logging to special categories of personal data, change logging of personal data, and consent management mechanisms. 2. This is the current state of planning and may be changed by SAP at any time without notice.

S/4HANA Cloud live customer for Advanced Variant Configuration



First productive cloud customer on S/4HANA for advanced variant configuration

Rollout plan

- Customer is live with SAP S/4HANA Public Cloud
- Customer went live in the UK (Headquarters) and in the USA in Q1.2018, followed by China in October 2018.
- USA and China sell configurable materials which are manufactured in China
- Locations in Finland and Germany will be the next countries planned to go live in early 2019. Both countries will also sell and manufacture configurable materials

Scope of initial go live

- Intercompany Scenario
 - Sales organisation USA creates sales (SD) orders for configurable materials
 - Delivering plant located in China, with intercompany invoice between China and USA
- Configurable products
 - On average 60 characteristics, 40 variant pricing conditions, and 50 dependencies
 - Configuration performed on the first level (single-level configuration on bill of materials)

Project background

- Customer decided to implement Advanced Variant Configuration 5 weeks before go live of S/4HANA Cloud
- Customer's business experts together with SAP Digital Business Services for S/4HANA Cloud ensured a smooth implementation project for Advanced Variant Configuration
- According to the project team, the Advanced Variant Configuration standard development team has been great at providing support



What Is The CWG?

- The **ONLY** international user group for SAP Configuration technology
- **THE** best place to influence SAP on the direction of their Configuration technology
- Multiple forums, technical articles, and blogs to get answers to your pressing business questions about utilizing SAP Configuration technology
- **Two** annual conferences, a spring conference in Europe and a fall conference in the Americas
- Membership is **FREE**, but restricted to SAP employees, customers, and partners which accept, respect and follow our bylaws.
 - <http://www.configuration-workgroup.com/node/1850>

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Presentation Materials

Access the slides from 2019 ASUG Annual Conference here:

<http://info.asug.com/2019-ac-slides>

Q&A

For questions after this session, contact us at johann.dornbach@sap.com and sschneid@steelcase.com.

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