

Conquer



Testing

with Tosca Testsuite

Wolfgang Platz, Founder and CPO

With their „Smarter, Faster, Simpler“ release strategy, SAP reacts to the megatrends of data- and people-driven IT. SAP customers benefit from the higher innovation pace (time-to-market), as well as the new **SAP Fiori** interface and **SAP HANA** data-backend. On the other hand, shorter release cycles of Upgrade-, Support- and Enhancement Packages increase the need for testing, which is further necessitated by an increasingly tight compliance regulatory.


Compared to custom software, packaged apps have a higher share of testing in their overall cost structure (> 50%). Today's typical SAP test case has been built intuitively by a SAP Key User and is executed manually, which drives testing budgets to the limit and delays deployments. In order to meet the demand for speed and quality, customers need to improve their SAP test strategy by doing the following:

92%

of SAP testing budgets are allocated by functional testing¹

83%

see limited key user resources as their biggest testing challenge

- 1 Introduce risk-based testing
- 2 Build the most effective test cases – apply test design methodology
- 3 Solve the test data issue
- 4 Automate SAP internal tests
- 5 Automate tests of E2E business processes going beyond 

¹... IT OnlineMagazin, March 16th, 2015

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Introduce risk-based testing

The importance of different SAP transactions/business processes (BP) widens significantly and accommodates the **80:20 rule**: customers have 20% most relevant transactions/BPs which they do 80% of their business with. Obviously, these transactions/BPs need to always work, thus justifying priority in testing budget and schedule.

With Tosca, customers can import the **SAP Solution Manager's** BPML, enter the functional structure of their SAP system via XLS, or directly into Tosca Testsuite. The gathered **Tosca BPML** items will be enriched by risk-weights according to Tricentis' unique rapid risk assignment procedure. As a result, customers receive a list of BPML items prioritized by their business risk contribution. This list is the starting point for further test case generation and execution.

80:20

80% of your relevant business is done by 20% of the transactions

+ Webinar: Innovate faster with the risk management engine

The screenshot displays the Tosca Commander interface. On the left, a tree view shows the project structure for 'SAP Demo Project', including Organizational Units, Master Data, and Business Scenarios. The main area shows a table of Business Processes with the following columns: Name, Weight, Coverage Specified (%), and Execution State (%). The Execution State is represented by a stacked bar chart where green indicates 100% execution and red indicates a lower percentage.

Name	Weight	Coverage Specified (%)	Execution State (%)
Business Processes		96	76
Test Execution Spring Release 2014	1		20
Account Processing in ERP	64	100	100
Billing in ERP	128	100	100
Delivery Processing in ERP	128	100	100
Standard Sales Order Processing in ERP	1024	95	69
Create standard sales order	1024	100	90
Create cash sales order (optional)	512	80	80
Create rush sales order (optional)	128	100	50
Select inquiry, quotation or contract	64	100	67
Determine business partner	16	100	100
Create order items	16	100	100
Create returnable packaging items (optional)	16	80	80
Determine material batches (optional)	32	100	100
Check availability, schedule order, and create require	32	100	100
Determine prices and conditions	64	100	100
Determine and maintain texts	64	100	100
Check foreign trade data	32	100	100
Perform credit check	32	100	100
Determine and process message output	16	100	100
Monitor returnable packaging stock (optional)	64	100	100

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**Build the most effective test cases –
apply test design methodology**

*On average, pre-Tosca SAP customers achieve < 40% risk coverage while encountering > 50% redundancy in test – with Tosca they **increase risk coverage to 85%+** and eliminate redundancies.*

67%

suffer from high testing efforts caused by unnecessary test cases

70%

regularly report production errors that should have been caught in test

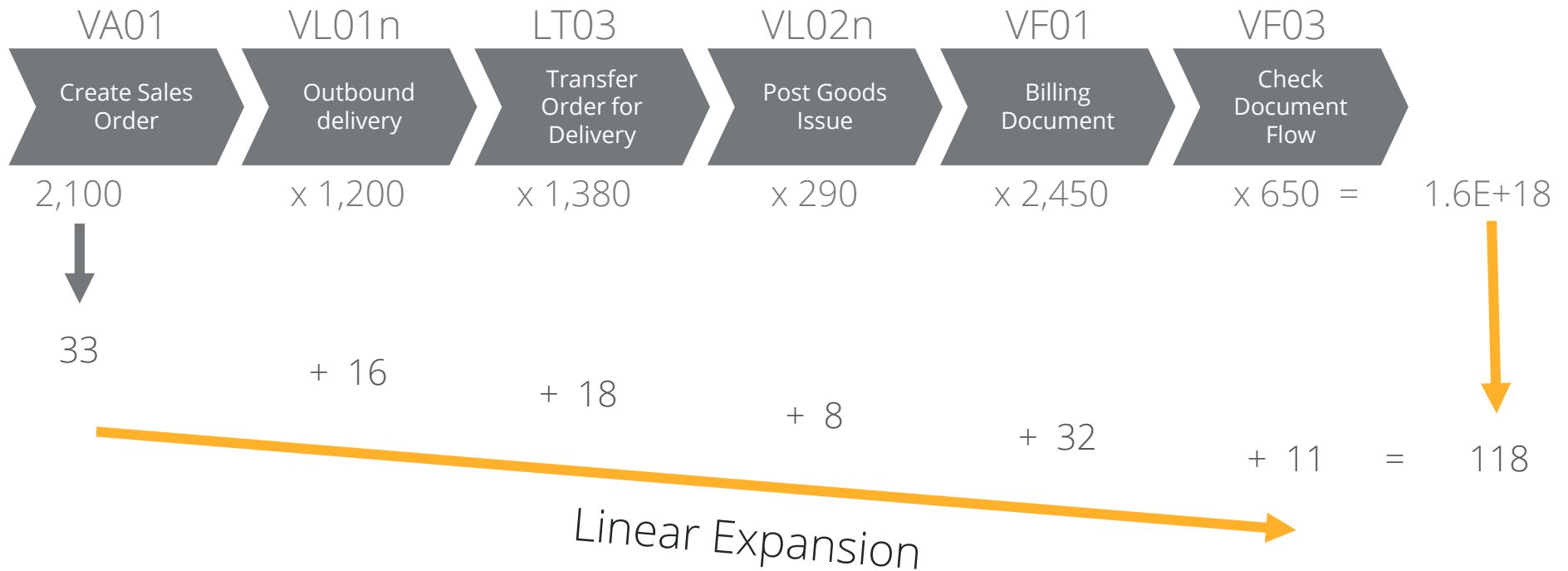
In order to get to highest cost- and time-efficiency in testing, customers need to avoid test case redundancy. Quality must not suffer, so test leaks cannot be tolerated unless the test-subject's importance is negligible. On average, pre-Tosca SAP customers achieve < 40% risk coverage while encountering > 50% redundancy in test – with Tosca Testsuite they **increase risk coverage to 85+ %** and eliminate redundancies.

Based on broad project expertise, Tricentis developed **Linear ExpansionSM** as a methodology to generate test

cases. **Linear Expansion is easy to adopt, powerful and ranks test cases based on their impact on overall risk coverage.** Test leaks then become obvious, which is a true paradigm shift: with Tosca test managers cannot only report what they *did* test, but also which tests they decided to omit and why.



With Linear Expansion, customers reduce the numbers of test data combinations without loss of risk coverage. For a complex SAP business process (e.g.: Order To Cash), this will prevent the phenomenon we call *combinatorial explosion*: Instead of ending up with an astronomic amount of cases to test (e.g. 1.6E+18), customers easily achieve the highest risk coverage with a manageable set of test cases (e.g. 118).



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Solve the test data issue

Manual testers spend >50% of their testing time on search or preparing data.

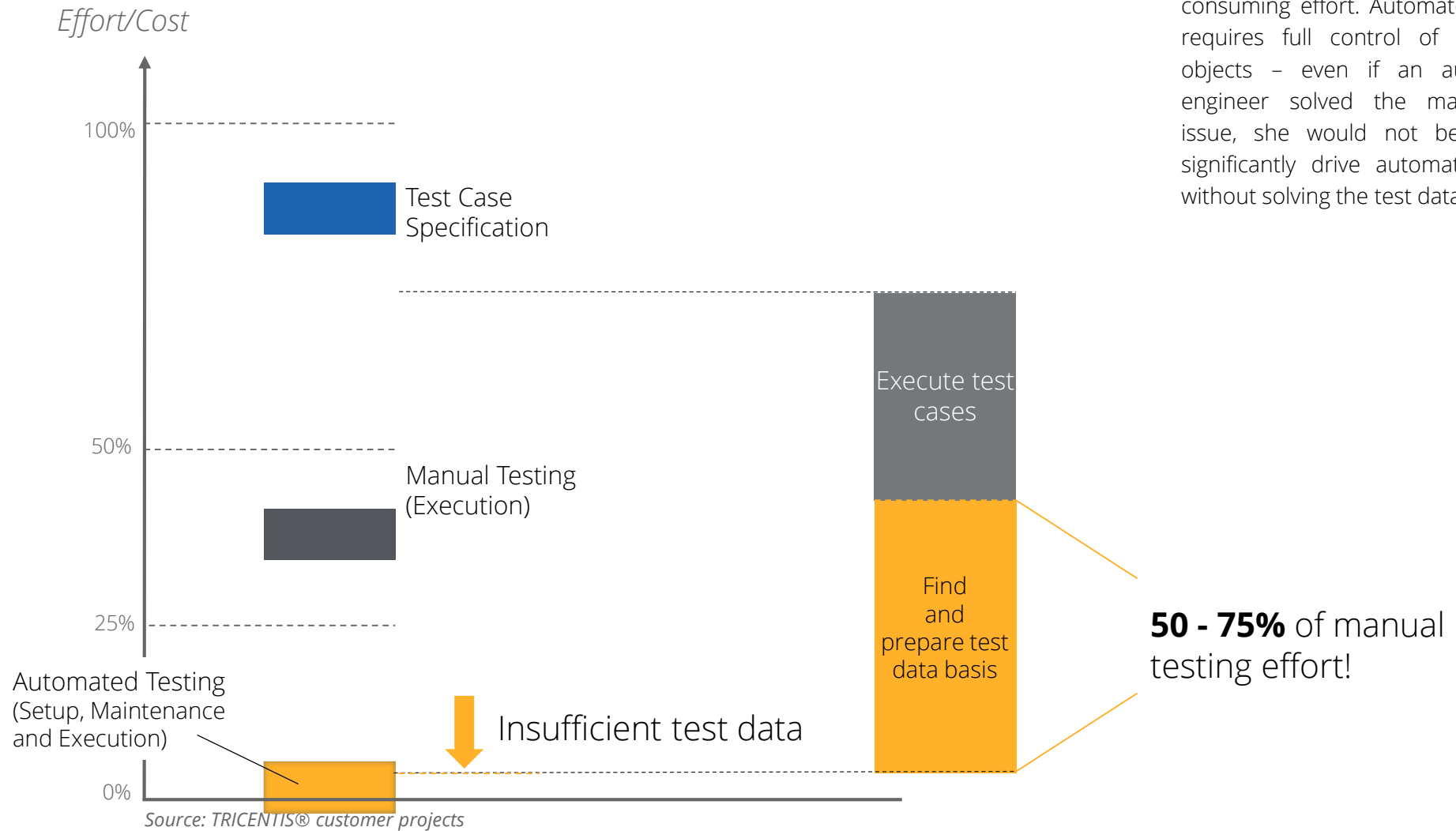
Due to the complexity of business processes in SAP, testers require data objects (debtors/creditors, their accounts, material stock in warehouses, order configurations, etc.) in certain states to meet the testing needs. Without having these data objects prepared in the SAP systems, test cases will fail or cannot be run at all. During execution, tests per se will change the objects' state, so that any repetition will likely require alternate, fresh data objects.

According to community statistics, manual testers of SAP systems spend >50% of their testing time on searching or preparing data in their SAP system before they can execute their tests. This additional effort burdens

budgets and accounts for a significant delay in test execution.

This is where Tosca Testsuite's **Test Data Management (TDM)** steps in to easily and quickly generate required SAP data objects. TDM is a **stateful** test data machine, tracking state changes of data objects. Since manual and automated test cases in Tosca Testsuite may refer to their data not via hard coded Ids but dynamically, Tosca will select the appropriate SAP data object accordingly, removing the effort from the manual tester or the automation expert.

Having the right SAP data objects in place is mandatory for the success of both manual and automated testing. In manual testing, searching and preparing data is a huge, time-consuming effort. Automated testing requires full control of SAP data objects – even if an automation engineer solved the maintenance issue, she would not be able to significantly drive automation rates without solving the test data issue.



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Automate  internal tests



List of SAP Transactions

1.	VA01	Create Sales Order
2.	VL01n	Create Delivery Note for Sales Order
3.	LT03	Create Transfer Order for Delivery
4.	VL02n	Change Outbound Delivery
5.	VF01	Create Billing Document
6.	VF03	Display Billing Document

Name	Value
Order To Cash Process	
VA01 Create Sales Order	
Initial Screen	
Start VA01	
Create Sales Order: Initial Screen	
Order Type	OR
Sales Organization	1000
Distribution Channel	12
Division	00
Sales Office	1010
Sales Group	110
Specify Standard Order	
Standard Order: Sold-To party	
Sold-to party	1175
Standard Order: Sales data and po...	
Position: Material	
All Positions	
Action	M-09
Column	Material
Row	#1
Position: Quantity	
Save and check results	
VL01n Create Delivery Note for Sales Or...	
LT03 Create Transport Order for Delivery	
VL02n Change Outbound Delivery	
VF01 Create Billing Document	
VF03 Display Billing Document, Baselin...	

Source: Automated Tosca Test Case, Order2Cash

62%

see missing test automation as a critical issue in SAP testing

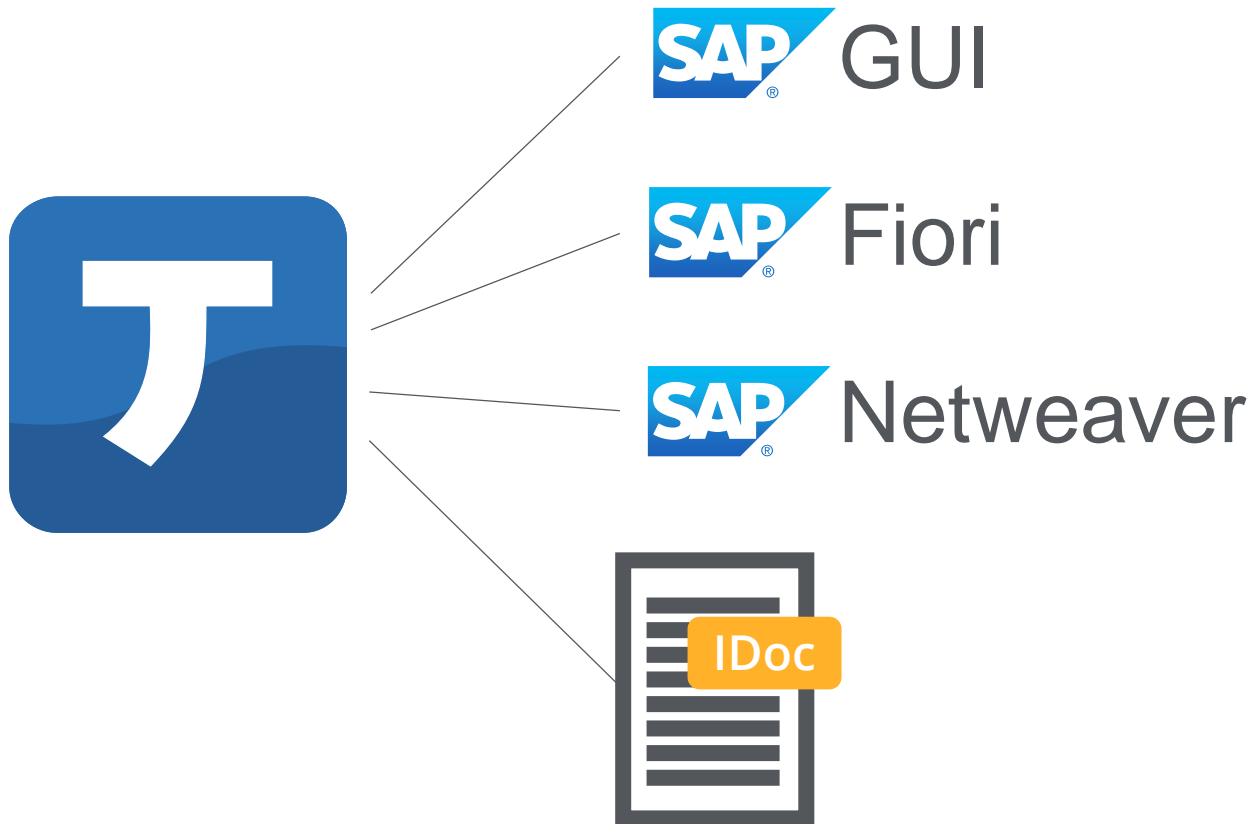
Pre-Tosca customers envision test automation as a technical discipline: test automation is either done via record/replay of (technical) scripts or via exhaustive technical frameworks, requiring advanced programming skills. Especially in SAP, where testing is mainly driven by business testers with no programming skills, automation via technical scripts excludes most of the manual testers. Tosca's **Model Based Test Automation** (MBTA) depicts test cases in easy to understand business language, aiding non-technical testers in achieving productive test automation. In addition, MBTA leads to a great reduction of maintenance efforts in test automation.

Combined with Tosca's Test Data Management (TDM), customers can reach the highest possible automation rates (**Extreme Automation**).

The transition from manual into automated test cases is an easy prospect with Tosca Testsuite: Since test cases are kept in plain English, they look structurally equal. Converting manual into automated test cases comes easy: manual test steps just need to be linked to SAP screen modules by **Drag&Drop**.

“Especially for technical changes such as release changes (SPS, EhP-Update), business departments’ willingness to test is close to zero. They've got just extra work, without noticing any benefits. Without automation you simply do not get this done.”

SAP Operations Manager, CCC, leading Austria retail company



When talking test automation, customers think of **SAP GUI**, **SAP Netweaver** or even the new **SAP Fiori** as the interfaces to deal with. Tosca covers them all – but goes beyond: **IDocs** play a central role in SAP to SAP and SAP to non-SAP communication, thus being a valuable entry point for data input or verification. With **Tosca Testsuite**, both the generation and the verification of IDocs can be automated through business readable test cases.

Accelerator Packages

SAP is packaged software, which is customized to meet specific requirements. In order to get to the specific test focus, test sequences in SAP may tightly follow the standard for the majority of invoked SAP transaction codes. In order to accelerate customers' call for extreme automation, Tricentis' has come up with industry specific SAP Accelerator Packages.

We constantly extend these pre-defined packages. Please reach out to our sales to find out about the latest.

65%-80%

speed-up in test automation through
Accelerator packages

1KE8 1KEK 2KEU 2KEV 6KEA 7KE1 7KE2 ABAON ABAVN ABGF ABGL ABMA ABNE ABSO ABT1N ABUMN ABZON AFAB AFAR AFBP AL08 AL11 AR01 AS01 AS02 AS03 AS05 AS06 AS11 AW01N BD87 C223 CA01 CA02 CA03 CA11 CA12 CA13 CA60 CA70 CA75 CA80 CA85 CA90 CA96 CADO CAPS CAT2 CAT3 CAT4 CATS_DA CC01 CC02 CC03 CC04 CC05 CC07 CJ01 CJ02 CJ03 CJ06 CJ07 CJ11 CJ12 CJ13 CJ20 CJ20N CJ22 CJ26 CJ29 CJ2A CJ2D CJ30 CJ31 CJ37 CJ38 CJ40 CJ41 CJ42 CJ43 CJ44 CJ45 CJ46 CJ74 CJ76 CJ7E CJ7G CJ88 CJ8G CJ93 CJ9B CJ9BS CJ9C CJ9CS CJ9E CJ9F CJ9FS CJB1 CJB2 CJ13 CJ14 CJ15 CJ1A CJR2 CJR3 CK11N CK13N CK24 CK33 CK40N CK44 CKR1 CL01 CL02 CL03 CL04 CL20N CL24N CL30N CL31 CL6AN CL6C CM01 CM02 CM03 CM04 CM05 CM07 CM22 CM25 CM27 CM31 CM51 CM52 CM55 CMOD CN01 CN02 CN03 CN08 CN21 CN22 CN23 CN25 CN27 CN28 CN29 CN41 CN42N CN43N CN47N CN48N CN52N CN60 CNR3 CNS40 CO01 CO01S CO02 CO02S CO03 CO04 CO06 CO07 CO08 CO09 CO11 CO11N CO12 CO13 CO14 CO15 CO16N CO27 CO40 CO41 CO43 CO46 CO48 CO88 COGI COHV COMAC COOIS CR01 CR02 CR03 CR05 CR06 CR07 CR08 CR09 CR10 CR12 CR13 CR22 CR60 CRAH CRAV CS01 CS02 CS03 CS05 CS06 CS07 CS08 CS09 CS11 CS12 CS13 CS14 CS15 CS20 CS21 CS40 CS41 CS42 CS61 CS62 CS63 CS73 CS74 CS75 CS76 CS80 CS82 CS92 CSK2 CSK3 CSMB CSPB CT12 CV01N CV02N CV03N CV04N CV16 F.03 F.08 F.13 F.14 F.15 F.19 F.21 F.23 F.27 F.31 F.41 F.42 F.51 F.52 F.56 F.80 F.81 F-02 F-03 F-04 F-05 F110 F110S F150 F-20 F-21 F-22 F-27 F-28 F-29 F-30 F-32 F-33 F-37 F-39 F-41 F-42 F-43 F-44 F-47 F-48 F-49 F-51 F-52 F-53 F-54 F-56 F-62 F-63 F-92 FB00 FB01 FB02 FB03 FB04 FB05 FB08 FB09 FB09D FB11 FB12 FB1D FB1K FB1S FB50 FB60 FBA1 FBA2 FBA3 FBA6 FBA8 FBB1 FBCJ FBD1 FBD2 FBD3 FBD5 FBD9 FBE3 FBKP FBL1N FBL2N FBL3N FBL4N FBL5N FBN1 FBR2 FBRA FBV0 FBV1 FBV2 FBV3 FBVB FBZ0 FBZ1 FBZ2 FBZ8 FD03 FD10N FD11 FD32 FD33 FEBP FF.5 FF.6 FF_5 FF_6 FG16 FIO1 FIO2 FIO3 FIO6 FILE FK03 FK10N FS00 FS04 FSP0 FSP4 FV50 FV60 IA02 IA03 IA09 IB51 IB52 IE01 IE02 IE03 IE07 IE08 IE10 IH06 IH08 IH09 IK01 IL01 IL02 IL03 IL07 IQ01 IQ02 IQ03 IQ04 IQ08 IQ09 IQS2 IQS23 IQS3 IR01 IR02 IR03 IW23 IW29 IW30 IW31 IW32 IW33 IW34 IW36 IW37N IW3M IW40 IW41 IW42 IW43 IW44 IW45 IW47 IW48 IW51 IW52 IW53 IW55 IW56 IW58 IW59 IW66 IW68 IW69 IW72 IW73 KA01 KA02 KA03 KA04 KA23 KABL KAH1 KAH2 KAH3 KAK2 KB21N KB31N KB33N KB41N KB44N KB65 KB66 KBH3 KCH1 KCH2 KCH3 KCH5N KCH6N KE21N KE24 KE27 KE30 KE32 KE42 KE51 KE52 KE53 KES1 KEU5 KEU8 KEU9 KEUB KGI2 KK01 KK02 KK03 KKA0 KKA3 KKA9 KKAK KKA0 KKAX KKF2 KKF3 KKS2 KL02 KL03 KLH3 KO01 KO02 KO03 KO04 KO12 KO13 KO88 KO8G KO9E KO9G KOB1 KOB2 KOB3 KOB4 KOC4 KOH2 KOH3 KOK3 KOK4 KOK5 KP04 KP06 KP07 KP26 KP27 KP46 KP47 KP90 KPF6 KPF7 KPSI KS01 KS02 KS03 KS12 KS13 KSB1 KSB2 KSBP KSBT KSH1 KSH2 KSH3 KSS4 KSU5 KSUB KSV5 KSWB LB02 LB03 LB10 LB11 LI11N LI20 LI21 LL01 LM01 LM02 LM03 LM07 LQ02 LRF1 LS03N LS04 LS06 LS23 LS24 LS26 LS27 LT01 LT03 LT04 LT05 LT06 LT09 LT10 LT11 LT12 LT15 LT21 LT22 LT23 LT24 LT27 LT31 LU04 LX02 LX03 LX04 LX12 LX16 LX25 MB01 MB02 MB03 MB11 MB1A MB1B MB1C MB21 MB22 MB23 MB25 MB26 MB31 MB51 MB52 MB58 MB5B MB90 MBLB MC.1 MC.9 MC94 MCBA MCBE MD02 MD03 MD04 MD05 MD06 MD07 MD11 MD12 MD13 MD14 MD15 MD16 MD43 MD47 MD50 MD61 MD62 MDVP ME01 ME03 ME11 ME12 ME13 ME1L ME1M ME21N ME22N ME23N ME28 ME29N ME2J ME2K ME2L ME2M ME2N ME2O ME2W ME31 ME31K ME32K ME33 ME33K ME3L ME3M ME41 ME42 ME43 ME47 ME51N ME52N ME53N ME54N ME55 ME56 ME57 ME58 ME59N ME5A ME5J ME5K ME80FN ME80RN ME81N ME91 ME91F ME92 ME92F ME9F ME9K MEK1 MEKP MF60 MF63 MI01 MI03 MI04 MI05 MI07 MI08 MI10 MI20 MI21 MI22 MI24 MI31 MIDO MIGO MIGO_GI MIR4 MIRO MK01 MK02 MK03 MKVZ MM01 MM02 MM03 MM04 MM06 MM19 MM60 MMBE MMSC MN04 MN05 MR51 MR8M MRBR MRKO MSC1N QA03 QA11 QA32 QC51 QC53 QC55 QE01 QE51N QI01 QI02 QI03 QM01 QM02 QM03 QM10 QM11 QM12 QM13 QM15 QP01 QP02 QVM3 VA01 VA02 VA03 VA05 VA21 VA22 VA23 VA25 VA41 VA42 VA43 VA88 VB01 VB02 VB11 VB12 VC/2 VD01 VD02 VD03 VD05 VD51 VD52 VD53 VF01 VF02 VF03 VF04 VF05 VF11 VF31 VK11 VK12 VK13 VK14 VKM1 VL01N VL01NO VL02N VL03N VL04 VL06 VL06F VL06O VL09 VL10A VL10B VLSP VT01N VT02N VT03N VV31 VV32 WE02 WE05 WE09 WE20 XD01 XD02 XD03 XD99 XK01 XK02 XK03

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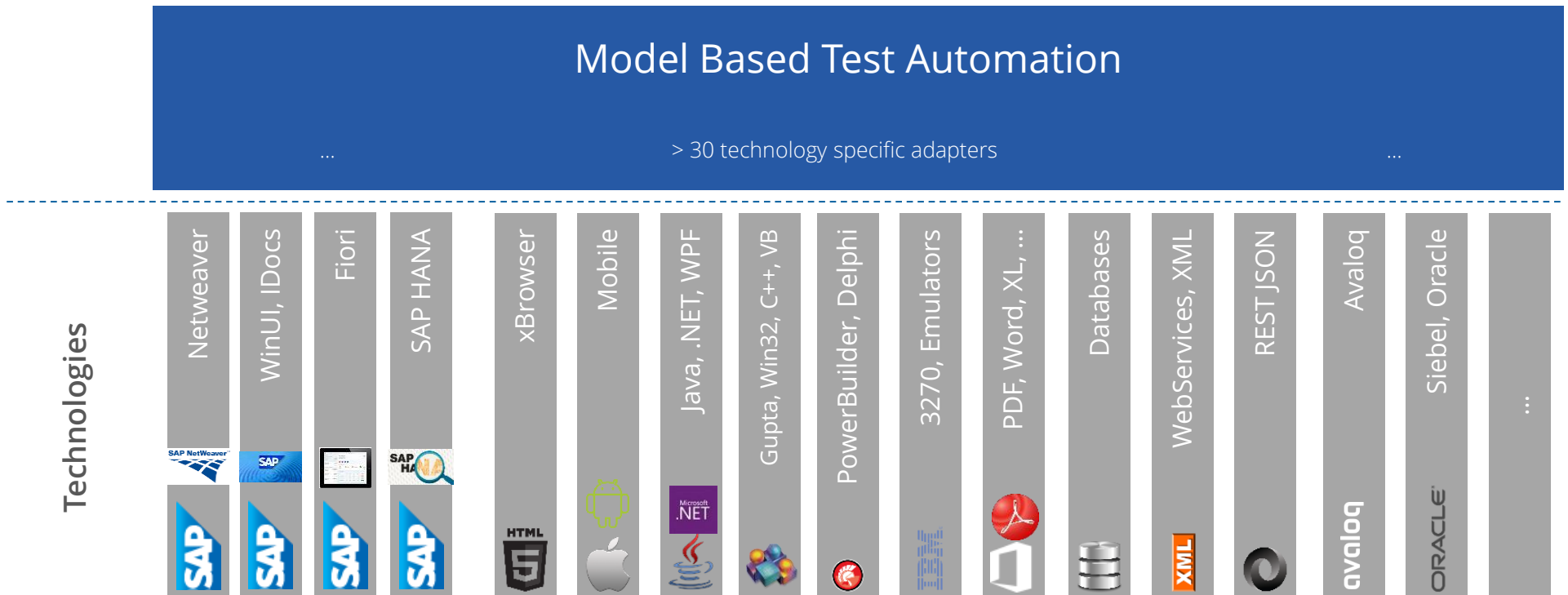
TRICENTIS

Automate tests of E2E business processes going beyond SAP

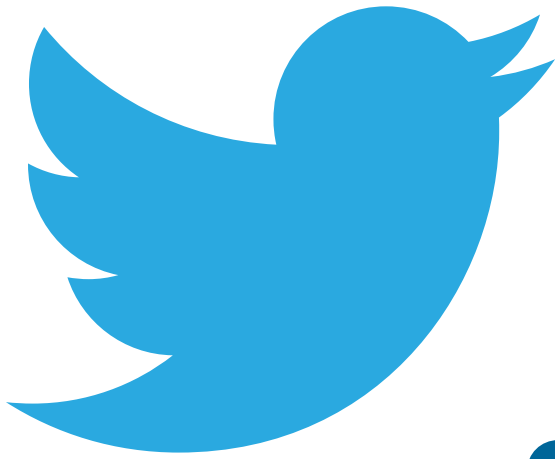
With any enterprise customer, SAP is integrated into a bigger system landscape. End-to-End processes that go beyond SAP are particularly challenging, since they require the automation tool to support a broad variety of different technologies. Tosca Testsuite offers the most comprehensive technology support: in addition to the SAP interfaces we can automate more than 30 different UI and protocol technologies.

76%

have recognized the need for comprehensive tests of their SAP system's integration into the enterprise IT landscape



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