

www.int4.com

Int4 IFTT

Codeless test automation for SAP systems integration

Who we are?

- We are authors of 6 SAP Press books about SAP PO, AIF, BRFPlus and SAP S/4HANA.
- Michał Krawczyk and Eng Swee Yeoh are recognized SAP Mentors. They prepared 150+ blogs in SCN portal.
- Int4 consultants host sessions on major SAP community events around the world (SAP Teched, SAP Inside Track).
- We delivered unique solution for automated testing of SAP integration.

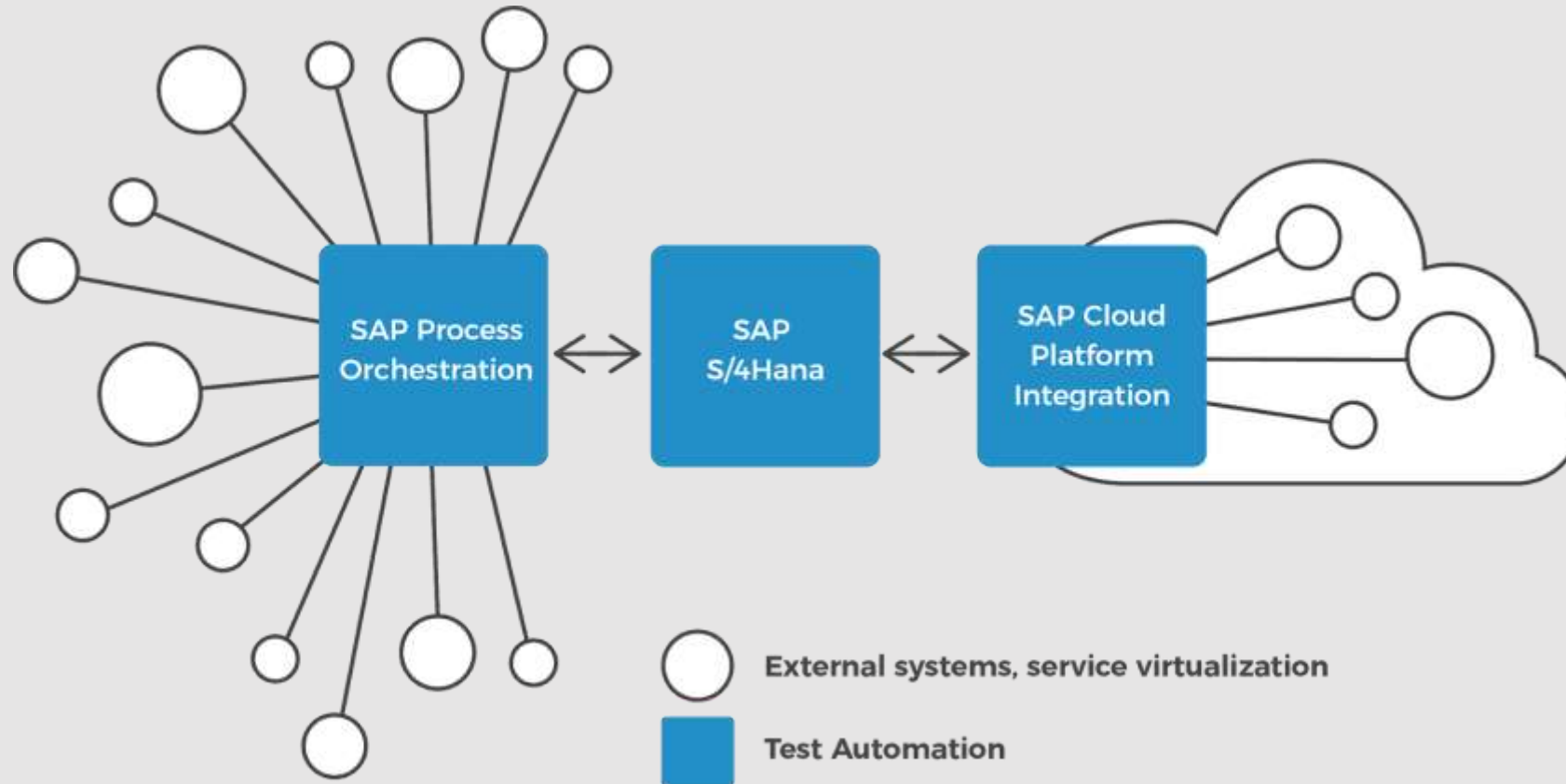


Int4 – probably the most prolific company in the world in sharing knowledge SAP integration



Testing of the integration scenario in SAP middleware and backend, virtualization

Scope



Introduction



Key words

SAP integration

Regression testing

Functional testing

Continuous testing

Test Driven Development



Use cases

- Regular system maintenance / DevOps
- SAP PO/CPI/C4C Patching, Upgrades or implementing Service Packs
- Integration platform migration projects
- S/4HANA conversions
- Rollouts



Reduce the
costs of solving
defects by 30%



Increase
testing speed
by 100x



Adopt the
business
needs fast



Increase confidence
in the system and
changes

Codeless test automation for SAP systems integration

Tests i.a. SAP Process Orchestration (SAP PO), SAP Cloud Platform Integration (SAP CPI) and backend interface implementation in SAP S/4HANA.

Key features

- Script less approach based on existing documents - Repeater
- Service virtualization. Do not involve 3rd party resources in testing. No additional hardware required
- Validation both of the SAP PI/PO/CPI and SAP S/4HANA backend
- Business and process oriented
- SAP certified add-on for SAP Solution Manager
- Easy to use: [Virtualize and Automate Your SAP Testing Using Int4 IFTT](#) course on openSAP university



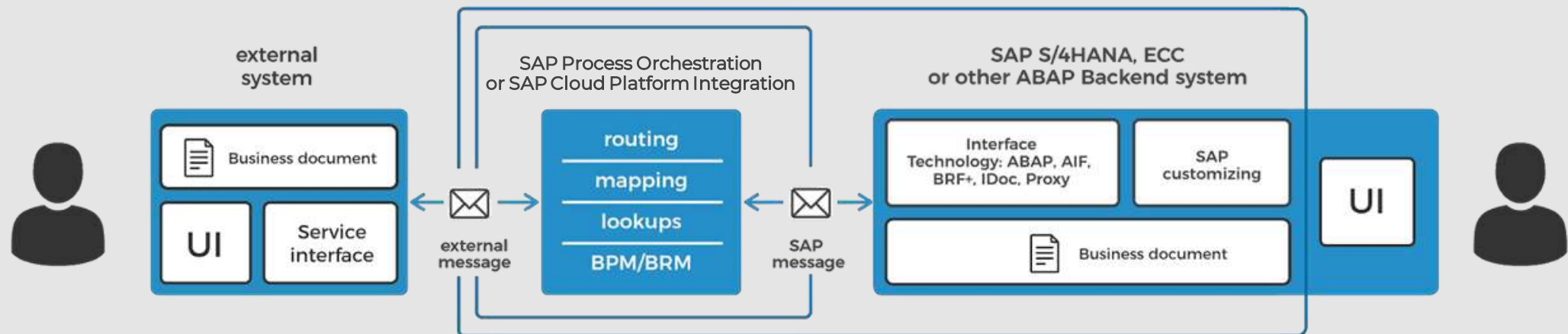
Customers



Testing of SAP middleware and backend, virtualization

Interface components

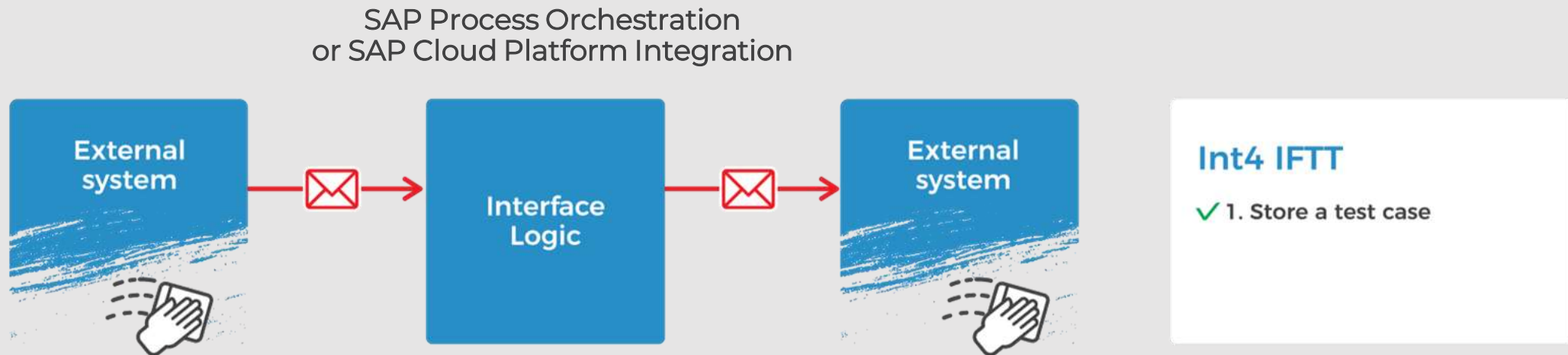
SAP application interfaces are complex interfaces combining various technology solutions and have a high degree of re-use that increases in the integration pipeline from left to the right;



Test execution is based on service virtualization without access to external systems

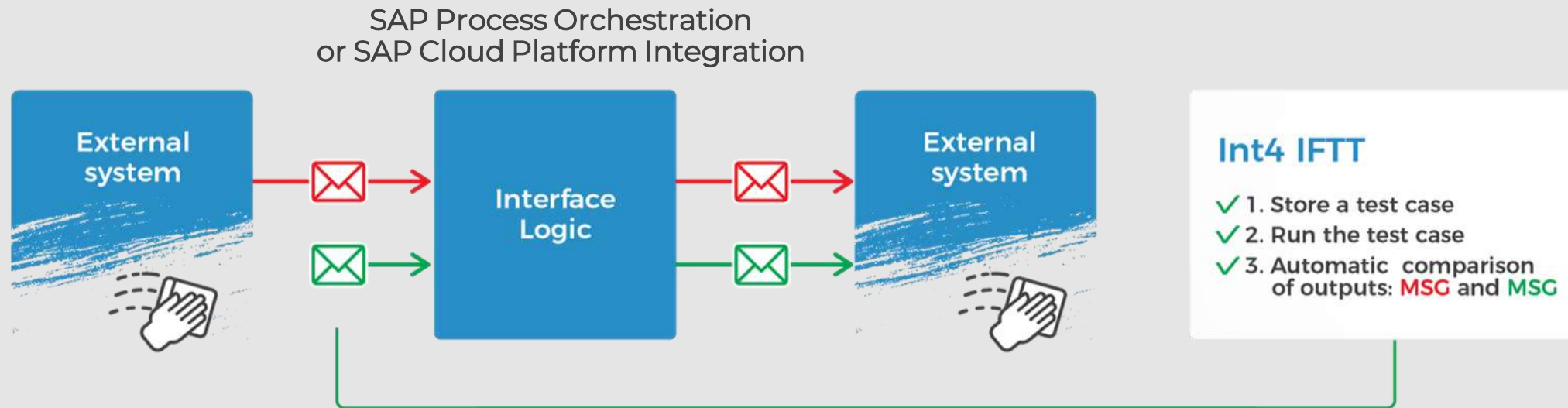
Automatic end-to-end execution in SAP Landscape

Test execution flow



Automatic end-to-end execution in SAP Landscape

Test execution flow

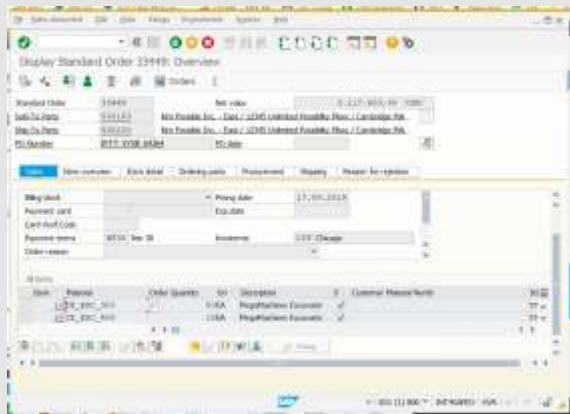


Demo #1

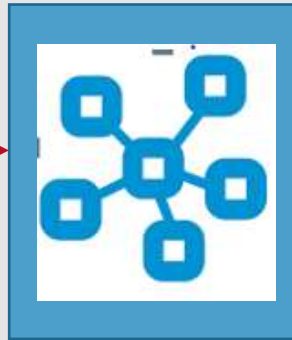


Sales order confirmation interface

SAP S/4HANA



SAP PO



1 - 1



1 - 1



1 - n



Receiver: DEMO_EDT_T
Operation Mapping: OM_ORDERS05_TO_ORDERS96A_
Service Interface: SI_INBOUND_EDT_EDIFACT_ORDERS
Namespace: http://int4.com:PurchaseOrderAcknowledgement

Receiver: DEMO_SYSTEM_B
Operation Mapping: OM_ORDRSP_ORDERS05_out_to_DocumentOrderResponse_inb
Service Interface: SI_INBOUND_SALES_ORDERCONF
Namespace: http://int4.com:PurchaseOrderAcknowledgement

Validation based on messages

XML message format

INT4 IFTT Test Execution Report

Test run name: Test run 21.08.2017 09:35:51
Executed on: 21.08.2017 at: 09:35:51
Executed by: MLUBCZYNSKI

286: Sales Order from system D - Confirmation (Webshop Sales Order)
Object: Sales Order Confirmation (PI GUKO) (SALES_ORDER_CONF_2)
Test Case Status: **Failed**

Messages:
Outbound message ID: Z1062947-8E54-71e7-8a58-00000069c71a\OUTBOUND:6932

XML Comparison Results:

Diff	Baseline	Actual
✖	<?xml version="1.0" encoding="UTF-8" ?><DocumentOrderResponse xmlns="http://sap.com/Purchasing/edifact/edifactconf" ><OrderResponseHeader><CustomerID>SAP</CustomerID><OrderDate>20170821</OrderDate><OrderNumber>00000000000000000000</OrderNumber><OrderResponseDate>20170821</OrderResponseDate><OrderResponseNumber>00000000000000000000</OrderResponseNumber><ResponseID>SAP order number 00000000000000000000</ResponseID><ResponseType>29</ResponseType><OrderResponseHeader><OrderResponseLine><Line><LineItem><Item>Z00000</Item><ItemNumber>000</ItemNumber><ItemNumber>00000000000000000000</ItemNumber><OrderCurrency>EUR</OrderCurrency><OrderItemQuantity>10</OrderItemQuantity><OrderItemPrice>5.20</OrderItemPrice><OrderResponsePC>SAP</OrderResponsePC></LineItem></OrderResponseLine></OrderResponseHeader></DocumentOrderResponse>	<?xml version="1.0" encoding="UTF-8" ?><DocumentOrderResponse xmlns="http://sap.com/Purchasing/edifact/edifactconf" ><OrderResponseHeader><CustomerID>SAP</CustomerID><OrderDate>20170821</OrderDate><OrderNumber>00000000000000000000</OrderNumber><OrderResponseDate>20170821</OrderResponseDate><OrderResponseNumber>00000000000000000000</OrderResponseNumber><ResponseID>SAP order number 00000000000000000000</ResponseID><ResponseType>29</ResponseType><OrderResponseHeader><OrderResponseLine><Line><LineItem><Item>Z00000</Item><ItemNumber>000</ItemNumber><ItemNumber>00000000000000000000</ItemNumber><OrderCurrency>EUR</OrderCurrency><OrderItemQuantity>10</OrderItemQuantity><OrderItemPrice>5.20</OrderItemPrice><OrderResponsePC>SAP</OrderResponsePC></LineItem></OrderResponseLine></OrderResponseHeader></DocumentOrderResponse>
	WARNING	
✖	<OrderResponseHeader><CustomerID>SAP</CustomerID><OrderDate>20170821</OrderDate><OrderNumber>00000000000000000000</OrderNumber><OrderResponseDate>20170821</OrderResponseDate><OrderResponseNumber>00000000000000000000</OrderResponseNumber><ResponseID>SAP order number 00000000000000000000</ResponseID><ResponseType>29</ResponseType><OrderResponseHeader><OrderResponseLine><Line><LineItem><Item>Z00000</Item><ItemNumber>000</ItemNumber><ItemNumber>00000000000000000000</ItemNumber><OrderCurrency>EUR</OrderCurrency><OrderItemQuantity>10</OrderItemQuantity><OrderItemPrice>5.20</OrderItemPrice><OrderResponsePC>SAP</OrderResponsePC></LineItem></OrderResponseLine></OrderResponseHeader></DocumentOrderResponse>	<OrderResponseHeader><CustomerID>SAP</CustomerID><OrderDate>20170821</OrderDate><OrderNumber>00000000000000000000</OrderNumber><OrderResponseDate>20170821</OrderResponseDate><OrderResponseNumber>00000000000000000000</OrderResponseNumber><ResponseID>SAP order number 00000000000000000000</ResponseID><ResponseType>29</ResponseType><OrderResponseHeader><OrderResponseLine><Line><LineItem><Item>Z00000</Item><ItemNumber>000</ItemNumber><ItemNumber>00000000000000000000</ItemNumber><OrderCurrency>EUR</OrderCurrency><OrderItemQuantity>10</OrderItemQuantity><OrderItemPrice>5.20</OrderItemPrice><OrderResponsePC>SAP</OrderResponsePC></LineItem></OrderResponseLine></OrderResponseHeader></DocumentOrderResponse>
	ERROR	
	CORRECT	

EDIFACT / flat message format

INT4 IFTT Test Execution Report

Test run name: Test run 19.10.2017 09:21:07
Executed on: 19.10.2017 at: 09:21:07
Executed by: MLUBCZYNSKI

326: Outbound EDIFACT Eancom Sales Order Confirmation (Edifact France)
Object: B2B Edifact Confirmation (B2B_EDIFACT_CONF)
Test Case Status: **Passed**

Messages:
Outbound message ID: e9f0f66d-b4ae-11e7-b121-00000069c71a\OUTBOUND:6932

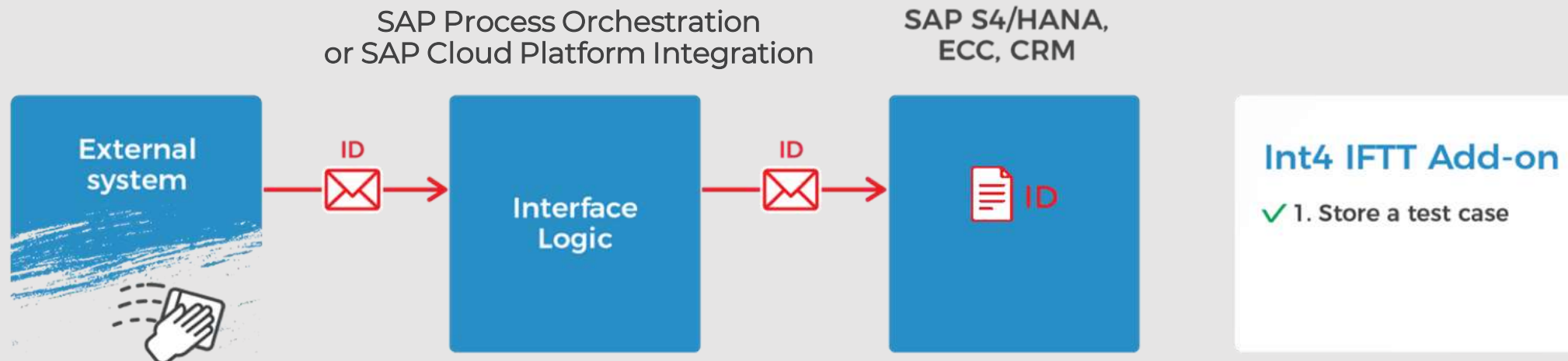
Variables:
Customer order number: DOCE203

File Comparison Results

Line	Status	Content
1	✓	UNB+UNOC:3+SENDER+RECEIVER+170823:1111+0000000000107040*
1	✓	UNB+UNOC:3+SENDER+RECEIVER+171019:0921+0000000000147049*
2	✓	UNH+1+ORDERS:D:96A:UN:EAN008*
2	✓	UNH+1+ORDERS:D:96A:UN:EAN008*
3	✓	BGM+220+DOCE203:9*
3	✓	BGM+220+TESTED11660:9*
4	✓	DTM+2:20170823:102*
4	✓	DTM+2:20171019:102*
5	✓	DTM+4:20170823:102*
5	✓	DTM+4:20171019:102*
6	✓	REF+ON:DOCE203*
6	✓	REF+ON:TESTED11660*
7	✓	DTM+171:00000000:102*
7	✓	DTM+171:00000000:102*
8	✓	CUX+2:EUR:9*
8	✓	CUX+2:EUR:9*

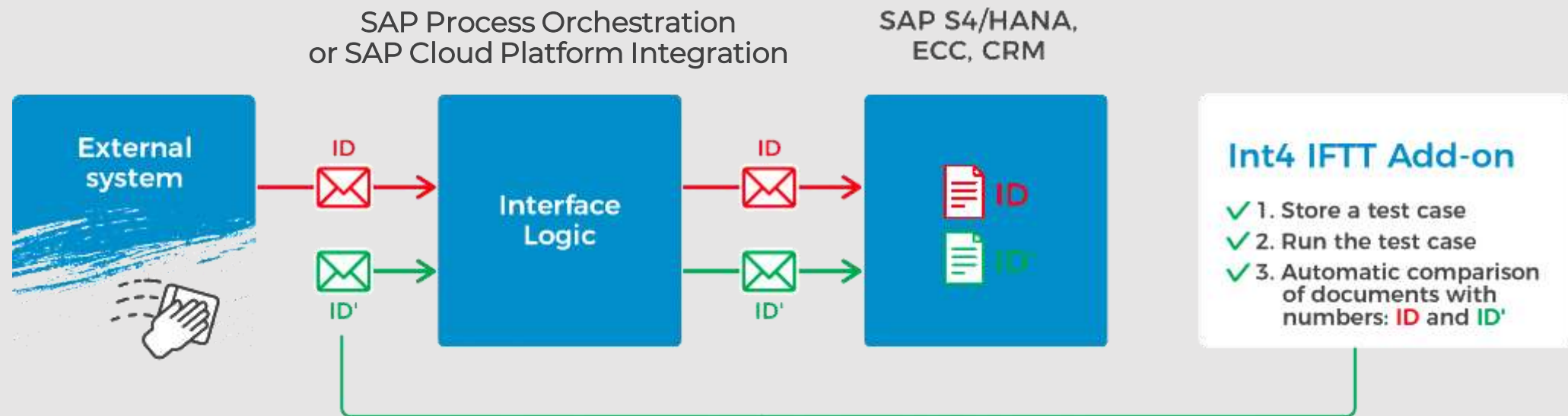
Automatic end-to-end execution in SAP Landscape

Inbound test execution flow



Automatic end-to-end execution in SAP Landscape

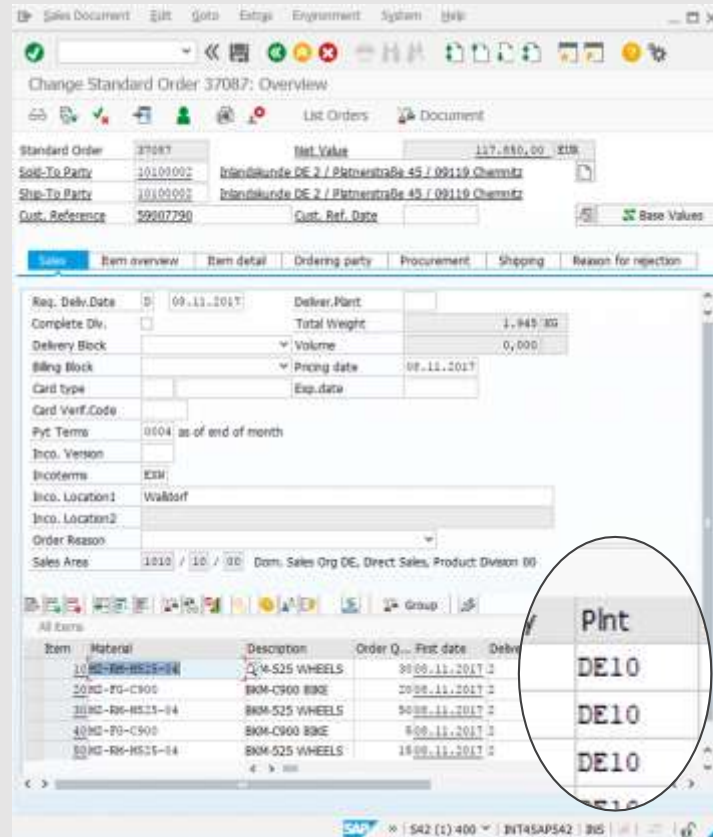
Inbound test execution flow



Automatic end-to-end execution in SAP Landscape

Validation of documents not interface messages

Reference document:



Change Standard Order 37087: Overview

Standard Order: 37087 Net Value: 117,880.00 EUR

Sold-To Party: 10100002 Islandkünde DE 2 / Platzstraße 45 / 09119 Chemnitz

Ship-To Party: 10100002 Islandkünde DE 2 / Platzstraße 45 / 09119 Chemnitz

Cust. Reference: 59907790 Cust. Ref. Date:

Req. Delv. Date: 09.11.2017 Deliver Plant:

Complete Delv. ☐ Total Weight: 1,949 KG

Delivery Block ☐ Volume: 0,000

Billing Block ☐ Pricing date: 08.11.2017

Card type ☐ Exp. date:

Card Verif. Code:

Pym Terms: 0004 as of end of month

Inco. Version:

Incoterm: EXW

Inco. Location1: Waldorf

Inco. Location2:

Order Reason:

Sales Area: 1010 / 10 / 00 Dom. Sales Org DE, Direct Sales, Product Division 00

Item	Material	Description	Order Q...	First date	Delivery
10	MZ-RH-HS25-04	BKM-S25 WHEELS	30	09.11.2017	3
20	MZ-PD-C900	BKM-C900 BIKE	20	09.11.2017	3
30	MZ-RH-HS25-04	BKM-S25 WHEELS	30	09.11.2017	3
40	MZ-PD-C900	BKM-C900 BIKE	20	09.11.2017	3
50	MZ-RH-HS25-04	BKM-S25 WHEELS	30	09.11.2017	3

Plnt

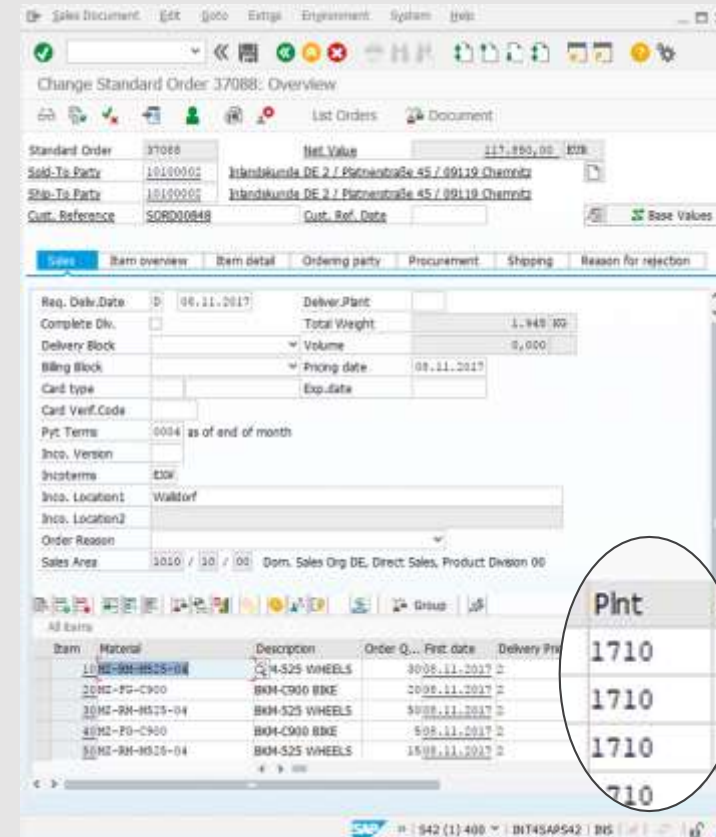
DE10

DE10

DE10

≠

Current document:



Change Standard Order 37088: Overview

Standard Order: 37088 Net Value: 117,880.00 EUR

Sold-To Party: 10100002 Islandkünde DE 2 / Platzstraße 45 / 09119 Chemnitz

Ship-To Party: 10100002 Islandkünde DE 2 / Platzstraße 45 / 09119 Chemnitz

Cust. Reference: 50801048 Cust. Ref. Date:

Req. Delv. Date: 08.11.2017 Deliver Plant:

Complete Delv. ☐ Total Weight: 1,949 KG

Delivery Block ☐ Volume: 0,000

Billing Block ☐ Pricing date: 08.11.2017

Card type ☐ Exp. date:

Card Verif. Code:

Pym Terms: 0004 as of end of month

Inco. Version:

Incoterm: EXW

Inco. Location1: Waldorf

Inco. Location2:

Order Reason:

Sales Area: 1010 / 10 / 00 Dom. Sales Org DE, Direct Sales, Product Division 00

Item	Material	Description	Order Q...	First date	Delivery
10	MZ-RH-HS25-04	BKM-S25 WHEELS	30	08.11.2017	3
20	MZ-PD-C900	BKM-C900 BIKE	20	08.11.2017	3
30	MZ-RH-HS25-04	BKM-S25 WHEELS	30	08.11.2017	3
40	MZ-PD-C900	BKM-C900 BIKE	20	08.11.2017	3
50	MZ-RH-HS25-04	BKM-S25 WHEELS	30	08.11.2017	3

Plnt

1710

1710

1710

1710

Automatic end-to-end execution in SAP Landscape

System Help

IFTT Test Results Report

Input Test Message

Message ID: 127a8e11-af73-1ed9-b99e-da6a7108a299
Sender Party: Party_IDI
Sender: DEMO_EDIT
Service Interface: EDI_SPLIT
Service Interface Namespace: EDI_SPLIT

Variables

Name	Reference values	Current values
Purchase Order	DD04395	DD04632
SAP Sales Order Number	0000032519	0000033591

SAP Backend Document Validation

Sales Document: Header Data(VBAQ)

Sales Doc. (VBELN)	Doc. cat. (VSTYP)	SalesDocTy (AUART)	Pur. Order (BESTNR)	PO date (BSTDR)	Sales org. (VORG)	Distr. Ch. (VTWEG)	Division (SPART)	Sales Grp. (VGRUP)	Sales Off. (VGRUP)	Currency (WABGR)	Net value (NETWR)	Pric. proc. (KALSM)	CO Area (KORGR)	CCodeBil. (BGRS_V)	PO type (BSABQ)	On (BDDAT)	Time (BZET)	Trans. Grp. (TRVOG)	Ord. reason (AUGRU)	Telephone (TELF1)	Sold-to pt. (KUNNR)
0000032519	C	TA	DD04395	00.00.0000	3000	10	00	311	3010	USD	1.142.990,30	RVC305	2000	3000	DFUE	14.08.2019	20:18:21	0			00000500100
0000033591	C	TA	DD04632	00.00.0000	3000	10	00	311	3010	USD	1.142.990,30	RVC305	2000	3000	DFUE	02.10.2019	09:27:26	0			00000500100

Sales Document: Item Data(VBAP)

Item (POSNR)	Material (MATNR)	MatInternd. (MATWA)	Mat. Group (MATKL)	Desc. (ARXTG)	Order qty. (QMENG)	Req.DlvQty. (LSMENG)	Cum.cf.qty. (KBMENG)	Item cat. (PSTYP)	Plant (WERKS)	Net price (NETPR)	Currency (WABGR)	Rebilling (RGRBL)	High. exchm. (UEPOS)	Alt.to itm. (GRPOS)	Prod.hier. (PRODH)	Target Unit (ZEME)	ConvFactor (UMZU)	ConvFactor (UMZU)	Unit (MEINS)	Division (SPART)	Bus. Area (CUMER)	MaxPartQty (ANTLF)	Sales unit (VBUKE)	Ship Point (VSTTL)	Tax class (TAX)
000010	CE_EXC_100	CE_EXC_100	002	MegaMachines Excavator Model 100	10,000	10,000	0,000	TAC	3000	47.500,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	
000010	CE_EXC_100	CE_EXC_100	002	MegaMachines Excavator Model 100	10,000	10,000	0,000	TAC	3000	47.500,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	
000020	CE_EXC_300	CE_EXC_300	002	MegaMachines Excavator Model 300	10,000	10,000	0,000	TAC	3000	65.100,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	
000020	CE_EXC_300	CE_EXC_300	002	MegaMachines Excavator Model 300	10,000	10,000	0,000	TAC	3000	65.100,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	
000030	CE_EXC_CLAMP	CE_EXC_CLAMP	001	Excavator Clamping Jaw	10,000	10,000	0,000	TAN	3000	1.699,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	
000030	CE_EXC_CLAMP	CE_EXC_CLAMP	001	Excavator Clamping Jaw	10,000	10,000	0,000	TAN	3000	1.699,00	USD	A	000000	000000		EA	1	1	EA	00	9900	9	EA	3000	

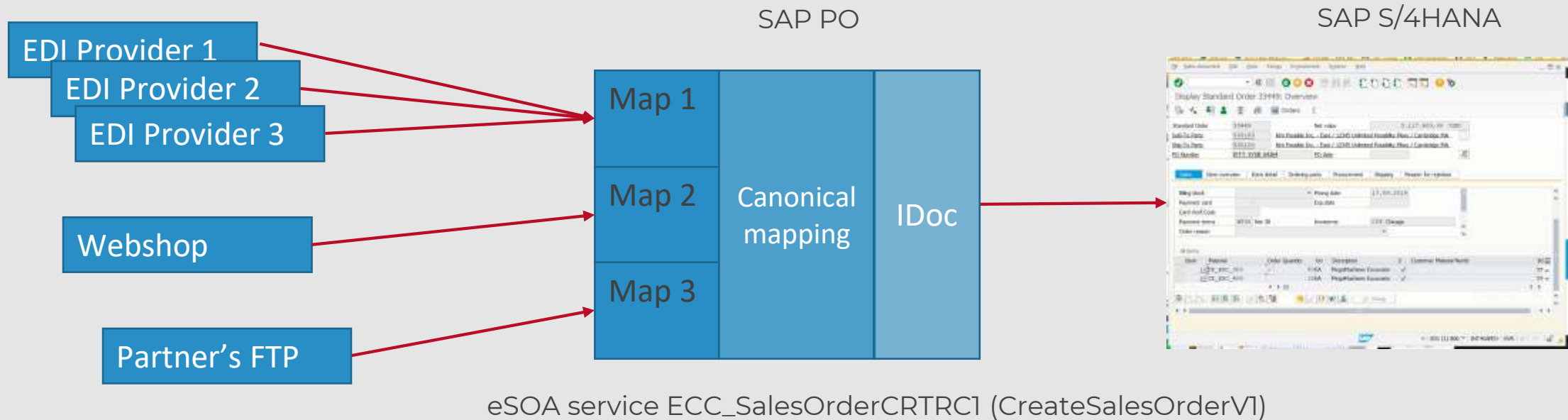
>> | SD1 (1) 001 | int4sapm | INS |

- Comparison of defined fields in documents
- Thousands of documents validated in minutes

Demo #2



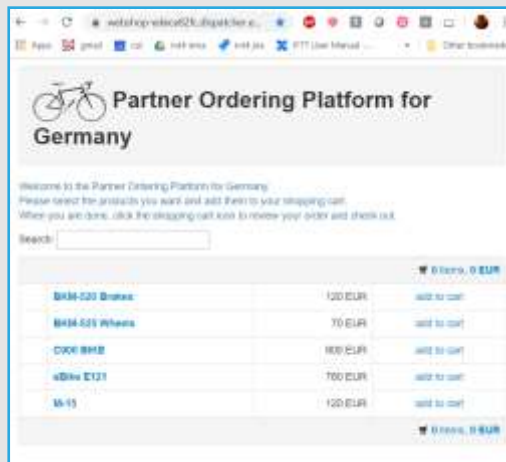
Sales order creation interface



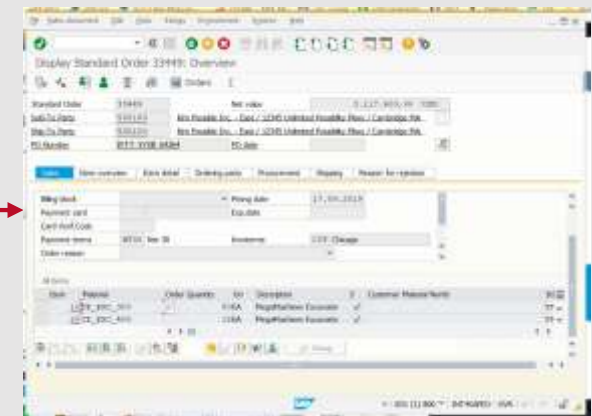
Demo #3



Sales order creation interface



SAP CPI



eSOA service ECC_SalesOrderCRTRC1 (CreateSalesOrderVI)

Automatic end-to-end execution in SAP Landscape

One-time customizing for common validation rules



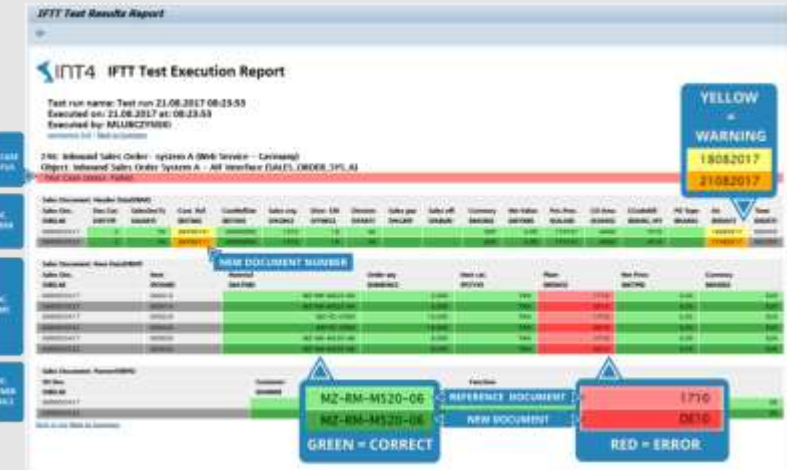
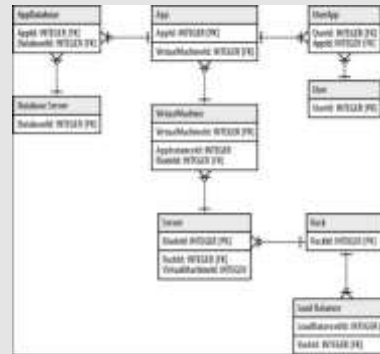
Sales order



Sales order

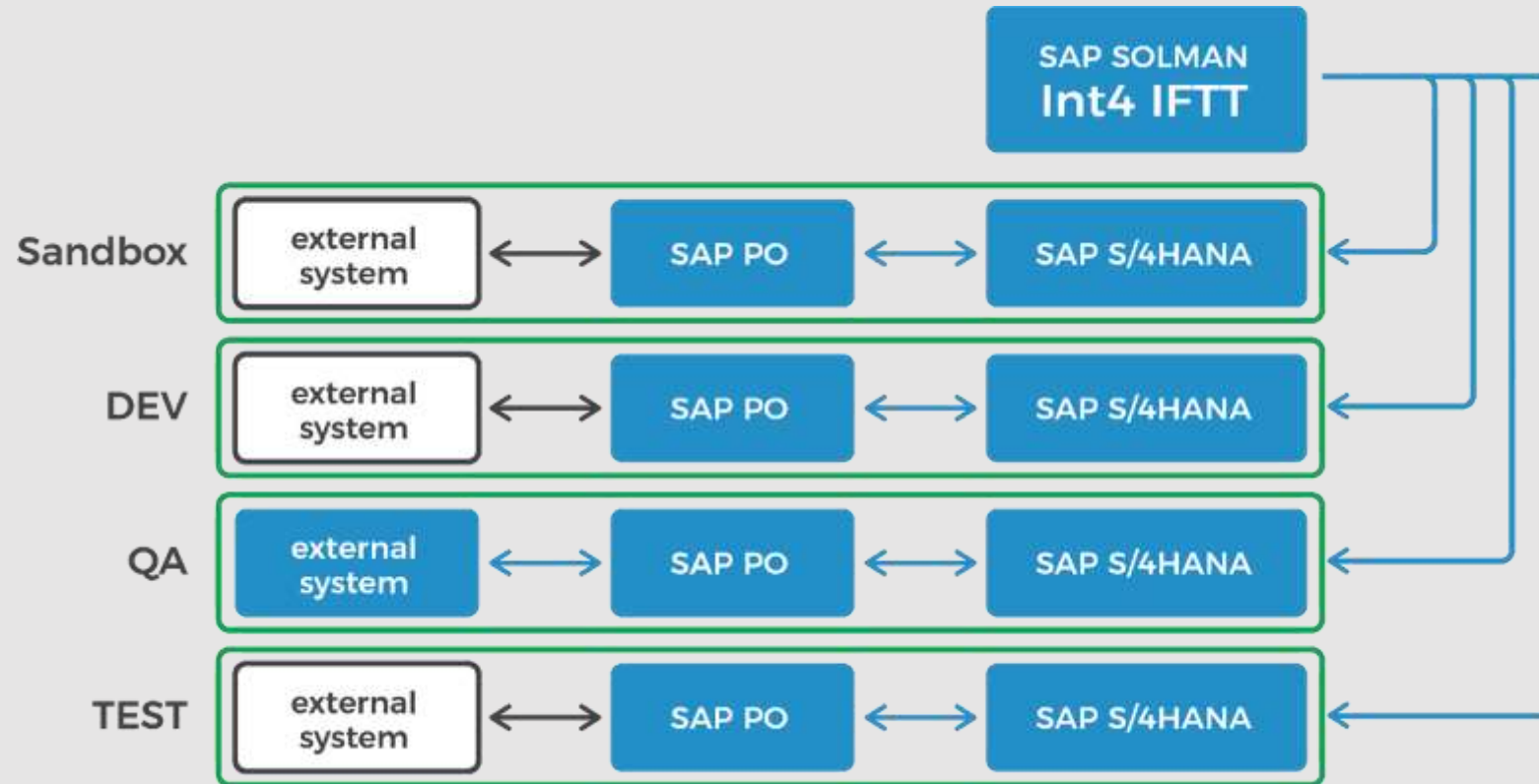


Automation Object
per interface



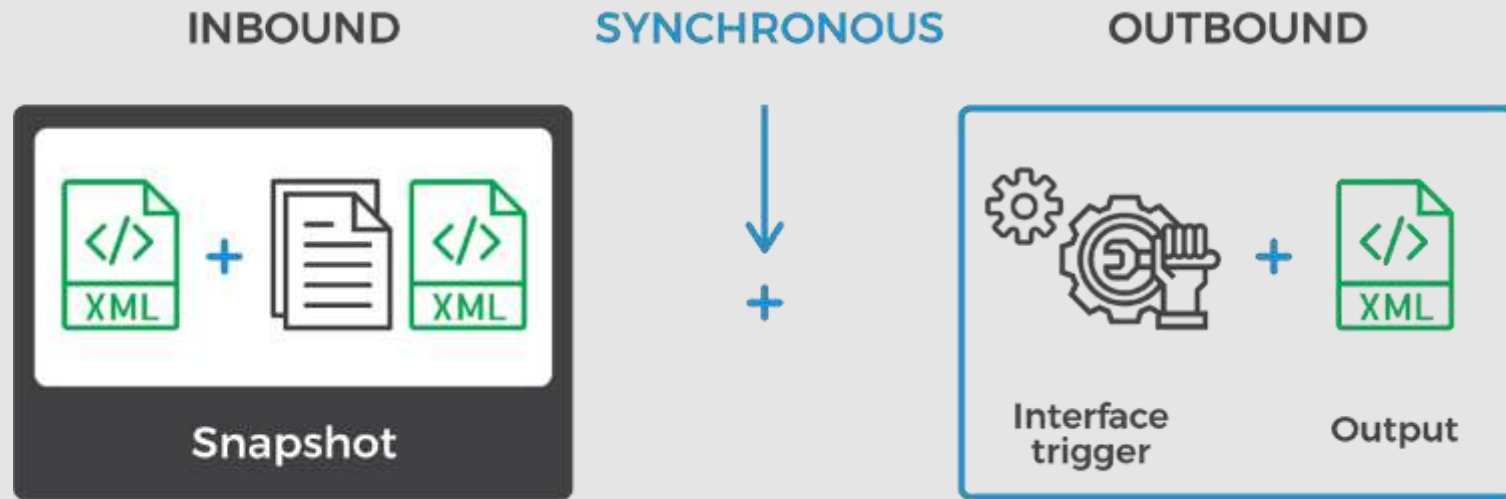
The configuration for each tested interface needs to be done only once. The Automation Object contains the technical elements (like interface name in the SAP PI/PO) and functional validations like the list of fields that need to be checked or substitution rules. As a result test cases can be added very quickly

Shift left: Create test cases on QA or Production and Run them in Dev



Fast test case creation

Test case definition



Users build test cases based on existing messages. It is enough to provide message GUID from the integration platform. There is no need to login to SAP Process Orchestration or SAP Cloud Platform Integration as Int4 IFTT will display processed messages by itself. Test cases might be created based on business document numbers. Int4 IFTT will search for content and find corresponding input messages.

Integration with SAP eCATT & API

Testing business processes



Scenario

[Order to delivery process \(ID:121\)](#)

Total

Passed	Failed	Pass Rate
3	1	75.00 %
3	1	75.00 %

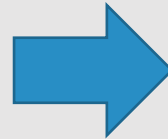
Order to delivery process (ID:121)

Test Case	Version	Interface Type	Object	Predecessor	Result
427: Interface step #1- Receiving Inbound Sales Order - 2 items	1	PI IDOC Inbound	Inbound Sales Order System D		Passed
428: Interface step #2- Sending Sales Order Confirmation to the customer	1	IDoc Outbound	Sales Order IDoc Confirmation	427	Failed
438: Manual step #3- Prepararing outbound Delivery & Picking in Warehouse	1	ECATT Recording	Manual creation of outbound delivery	427	Passed
439: Interface step #4- Sending Shipment Notification to the customer	1	PI Outbound	outbound delivery for retailers	438	Passed

IFTT supports testing whole business flows. The data is passed between messages and manual steps are automated by SAP eCATT recordings.

Data Scrambling





















```
- <Address Type="Shipping">  
  <Name>Ellen Adams</Name>  
  <Street>123 Maple Street</Street>  
  <City>Mill Valley</City>  
  <State>CA</State>  
  <Zip>10999</Zip>  
  <Country>USA</Country>  
</Address>
```



```
- <Address Type="Shipping">  
  <Name>***** is</Name>  
  <Street>***** Street</Street>  
  <City>Mill Valley</City>  
  <State>CA</State>  
  <Zip>10999</Zip>  
  <Country>USA</Country>  
</Address>
```

Supports changing input and output payloads and masking values in SAP S/4HANA database

Test case versioning

<div><div></div></div>											
	Case ID	Description	Interface Type	DocumentNumber	IFTT Obj.	Date	Created At	Ver.	Version descr.	C	User Name
	244	System A - Inbound Sales order	AIF Inbound	12B17D7689C01ED7A0E6324CA5C7C16C	SALES_ORDER_SY...	17.08.2017	09:53:02	1		<input checked="" type="checkbox"/>	MNOWAK
	245	Webservice - Sales Order	AIF Inbound	12B17D7689C01ED7A0E766F9C25F816C	SALES_ORDER_SY...	17.08.2017	11:03:15	1		<input checked="" type="checkbox"/>	MNOWAK
	339	Inbound Sales Order - System	AIF Inbound	12B17D7689C01ED7A1FC8C995444C172	SALES_ORDER_SY...	23.08.2017	09:21:34	1		<input type="checkbox"/>	MNOWAK
	339	Inbound Sales Order - System	AIF Inbound	12B17D7689C01ED7A393EECFD6846176	SALES_ORDER_SY...	29.08.2017	09:51:42	2	CR #100	<input type="checkbox"/>	MNOWAK
	339	Inbound Sales Order - System	AIF Inbound	12B17D7689C01ED7A1FC8C995444C172	SALES_ORDER_SY...	29.08.2017	12:28:36	3		<input checked="" type="checkbox"/>	MNOWAK

- After the change of the business requirements, the existing test cases might not be valid anymore.
- In such case new version of test case can be added.
- The process is semi-automatic and requires minimal effort from the user.
- The previous versions still exist in the system together with their execution history and results.

Building the test strategy

Integration Platform unit testing for SAP Process Orchestration and SAP Cloud Platform Integration

For all interfaces validate output & receivers

Increase test case coverage by selecting business critical/most complex interfaces

DEMO

Thousands of test cases

Simplified end-to-end testing of SAP Landscape (S/4HANA + PI, CPI)

One-face-for-One-interface

Validation of business documents not interface messages

DEMO

100 – 300 Test Cases

Full end-to-end testing combined HP UFT + int4 IFTT

Test full business flows in external and SAP systems where the integration is no longer a gap.

10-30 Test Scripts

Web based results with persistence

- The test results are stored in the Int4 IFTT database and can be retrieved ad-hoc
- Execution statistics are presented in the test results report
- The test results are saved under a permanent URL which can be used as a proof of test completion and linked with any test management system
- The test run execution can be sheduled in background or executed from external tool like HP ALM



SAP GUI Version

IFTT Test Results Report

INT4 IFTT Test Execution Report

Test run name: Test run 16.08.2017 11:08:29
Executed on: 16.08.2017 at: 11:08:29
Executed by: Michal Kowalczewski
[permanent link](#)

Scenario	Passed	Failed	Pass Rate
Netherlands (ID:216)	1	0	100.00 %
Total	1	0	100.00 %

Netherlands (ID:216)

Test Case	Version	Test Type	Object	Predecessor	Result
1596_Sales Order_01	1	PI IDOC Inbound			Passed

[Back to top](#)

Web Version

INT4 IFTT Test Execution Report

Test run name: Test run 16.08.2017 11:08:29
Executed on: 16.08.2017 at: 11:08:29
Executed by: Michal Kowalczewski
[permanent link](#)

Scenario	Passed	Failed	Pass Rate
Netherlands (ID:216)	1	0	100.00 %
Total	1	0	100.00 %

Netherlands (ID:216)

Test Case	Version	Test Type	Object	Predecessor	Result
1596_Sales Order_01	1	PI IDOC Inbound			Passed

[Back to top](#)

Support for SAP PO B2B Adapter (EDIFACT)

INT4 IFTT Test Execution Report

Test run name: Test run 19.10.2017 09:21:07
Executed on: 19.10.2017 at: 09:21:07
Executed by: MLUBCZYNSKI
[permanent link](#) | [Back to Summary](#)

326: Outbound EDIFACT Eancom Sales Order Confirmation (Edifact France)
Object: B2B Edifact Confirmation (B2B_EDIFACT_CONF)
Test Case status: Passed

Messages:
Outbound message ID: e9f0f66d-b4ae-11e7-b121-00000069c71a\OUTBOUND\6932

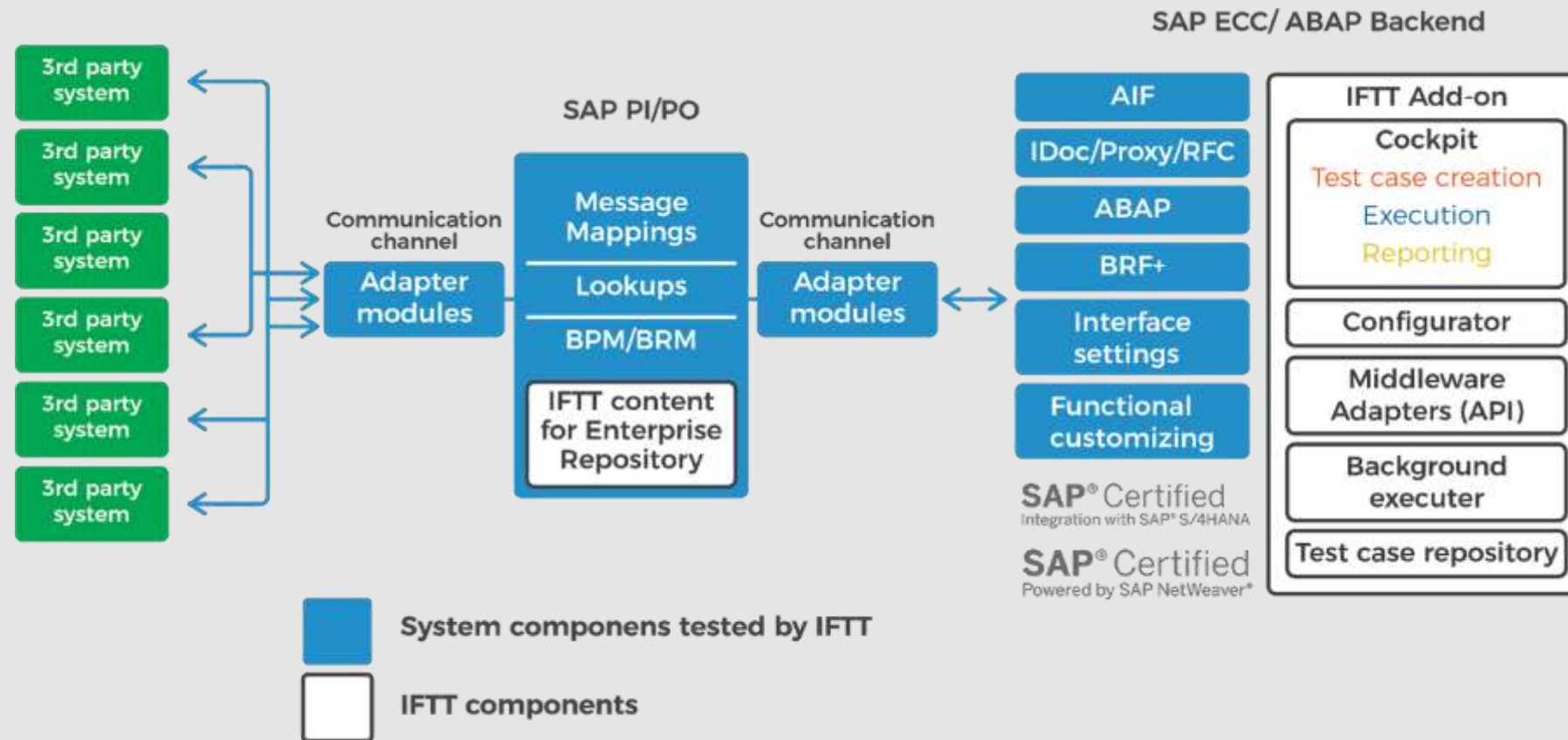
Variables:
Customer order number: DOCE203

File Comparison Results

Line	Status	Content
1	✓	UNB+UNOC:3+SENDER+RECEIVER+170823:0011+000000000107060'
1	✓	UNB+UNOC:3+SENDER+RECEIVER+171019:0923+000000000147042'
2	=	UNH+1+ORDERS:D:96A:UN:EAN008'
2	=	UNH+1+ORDERS:D:96A:UN:EAN008'
3	✓	BGM+220+DOCE201+9'
3	✓	BGM+220+TESTED11660+9'
4	✓	DTM+2:20170823:102'
4	✓	DTM+2:20171019:102'
5	✓	DTM+4:20170823:102'
5	✓	DTM+4:20171019:102'
6	✓	RFF+ON:DOCE201'
6	✓	RFF+ON:TESTED11660'
7	=	DTM+171:00000000:102'
7	=	DTM+171:00000000:102'
8	=	CUX+2:EUR:9'
8	=	CUX+2:EUR:9'

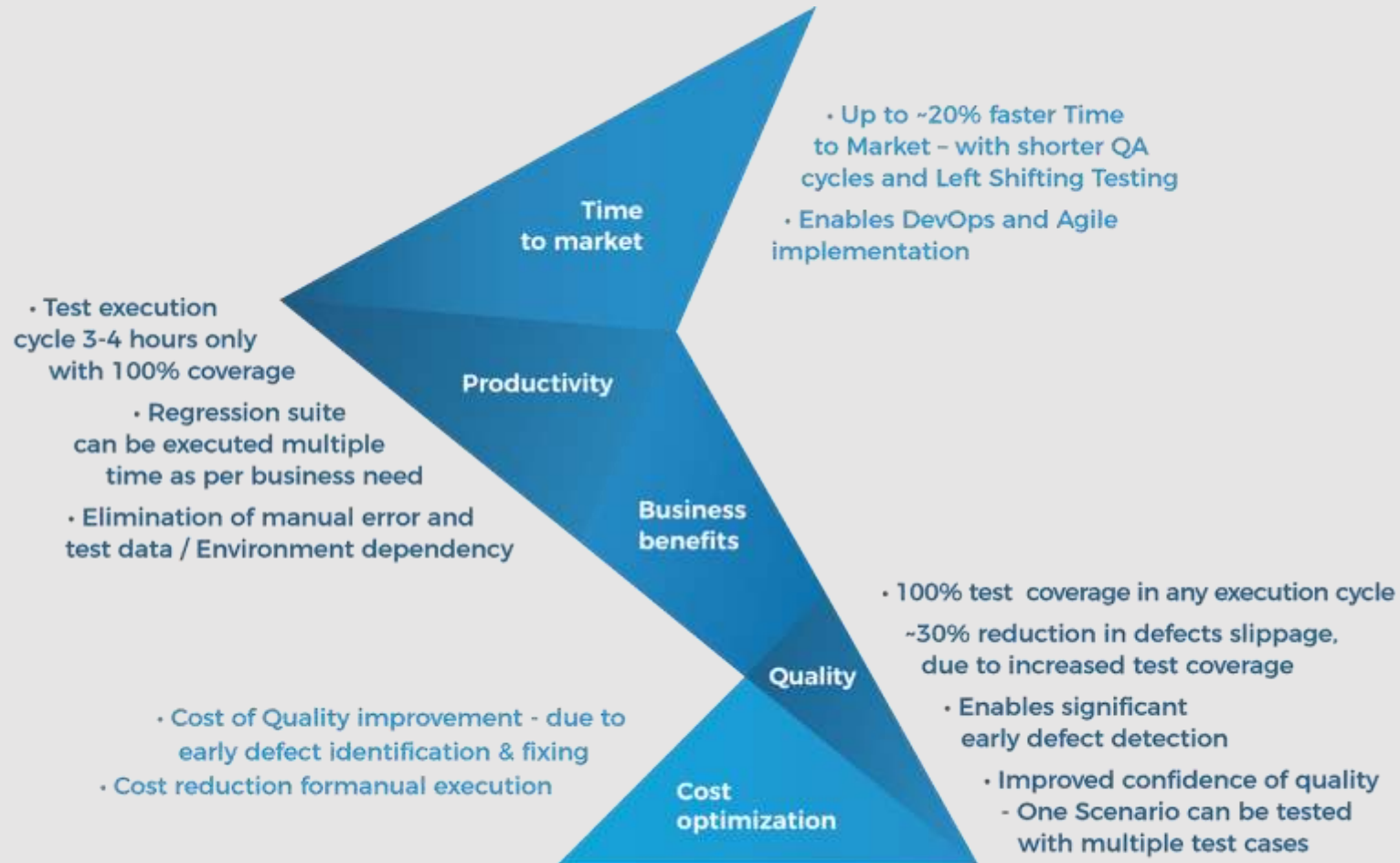
- Support for continuous testing of EDI migration from non-SAP to SAP PI/PO B2B Adapter
- Working directly on the EDIFACT files both in the inbound and outbound direction
- Testing of SAP PI/PO adapter modules and XML to EDIFACT conversion

Open Architecture



Int4 IFTT architecture is open and scalable. It allows developing custom adapters to test non-SAP middlewares. This feature might be useful in migration projects to start continuous testing as early as possible.

Business value to customer



www.int4.com
office@int4.com

Int4 IFTT Product Manager
Michał Kowalczewski
michal.kowalczewski@int4.com
+48 604 996 052



SAP® Certified
Integration with SAP® S/4HANA

SAP® Certified
Powered by SAP NetWeaver®