



IFC - Central Bank of Armenia Workshop on *"External Sector Statistics"*

Dilijan, Armenia, 11-12 June 2018

Changes in the IT landscape of the Deutsche Bundesbank's external sector statistics¹

Joachim Hösch and Jens Walter,

Deutsche Bundesbank

¹ This paper was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

Changes in the IT Landscape of the Deutsche Bundesbank's External Sector Statistics

Author: Joachim Hösch, Jens Walter

Abstract

In the past, the Deutsche Bundesbank's IT systems have been undergoing an incremental evolution of applications and data bases. To better fulfil new statistical requirements of users which increasingly call for integrated and consistent data the Bundesbank has launched a project to overhaul the existing external sector statistics' IT infrastructure and to create an integrated and automated system. This project is being implemented on a step-by-step basis since 2011.

The paper provides an overview on the key building blocks of the new IT-system based on a suite of integrated but modular software systems for master data, analysis, report processing and communication. The new harmonized IT infrastructure will facilitate integrated analyses for transactions & stocks, streamline statistical work processes and increase automation, and will therefore also reduce time-to-publication in the end.

Background

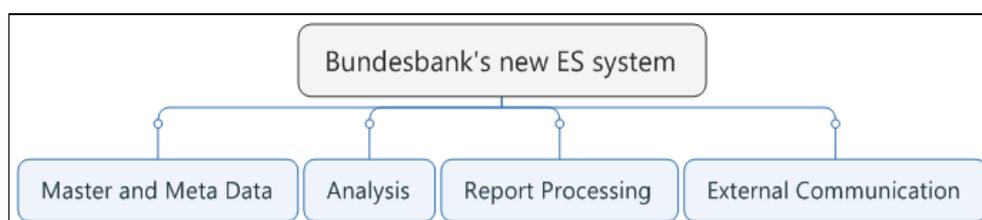
The Deutsche Bundesbank's IT systems for the production of external statistics have been undergoing an incremental evolution in terms of their applications and databases. In the past, the prevailing stovepipe view on external statistics resulted in the development of single-purpose IT solutions using different IT standards for the production of Balance of Payments (BOP), Foreign Direct Investment (FDI) and International Investment Position (IIP) statistics, to name just a few. An IT landscape, which has continued to evolve over a number of decades, exhibits a high degree of complexity, even when it comes to making minor changes. The implementation of conceptual changes, such as the requirement to link transactional microdata to stock data, becomes a very challenging task. A growing technical backlog has therefore emerged in the shape of maintenance-intensive systems, a lack of documentation and a declining number of staff members knowing how to work with the complicated historically grown systems.

However, over the past decade, the integrated view on external statistics has become more and more common and has emerged as the new standard for reporting requirements. Progress in the field of information technology has made enhanced solutions possible. Integrated data models have been developed, which conceptually combine various data sources, thereby streamlining the production process.

Given the new data requirements and the improved IT solutions, the Bundesbank has launched a project to overhaul the existing external sector statistics' IT infrastructure and to create an integrated and automated system. This project is being implemented on a step-by-step basis since 2011.

The strategy for the Bundesbank's new External Sector Statistics (ESS) system

In order to cope with changing international reporting requirements and to develop a harmonised IT infrastructure, an integrated and modular software system was implemented. It comprises the following functionalities:



The chosen modules allow standard software components to be used that are highly customisable and able to accommodate future requirements. This reflects the Division's policy to reduce the in-house IT development of single-purpose IT solutions. It is also intended to be the nucleus of a streamlined statistical work process that exploits automation, thereby reducing time to publication.

By moving towards standard software – in this case with a modern, fast and robust client-server architecture – and having an MS Office (Excel) integration as a GUI, the system’s primary usage for analytical and methodical work is well supported. New users have also emerged, who use the system for the Data Quality Management (DQM) process for reporting data. This extended usage is feasible since the new system provides online calculated aggregates, which can instantaneously be drilled-down to the reporting unit, thus allowing flexible analyses.

The use of standard software produced excellent results by taking advantage of user-friendly GUIs that are well established on the market. An intuitive GUI proved to be an ongoing success factor in reducing user training efforts, maximizing the user experience and creating momentum to move from previous DQM approaches with other less integrated and flexible systems towards this new setup.

With the possibility to slice-and-dice in a cube-like body of information, users are able to dive into smaller parts of data or to examine it from different viewpoints. This increases the understanding of the data and enables compilers to receive new information. The greater flexibility also increases the capability to respond to new information needs, such as versioning the data to reproduce previous publication versions for DQM purposes.

Drill down example in SALZA

• Drill down from an highly aggregated data level to related reporters and report items

• Other reporting options are likewise available (e.g. branches of the reporters)

Joachim Hösch, S 21-5
May 9, 2018
Seite 9

Apart from the reporting flexibility, the SALZA project focuses on implementing system-integrated trend and estimation procedures, which means that it automates publication preparatory work and primary and secondary cell suppression as well. Since its implementation, SALZA has become the basis for SDMX (Statistical Data and Metadata eXchange) time series creation and for national and international publication commitments.

Report processing and External Communication approach

As a counterpart to SALZA, the planned report processing system SIMBA will provide an integrated platform and front-end system for report processing for all external statistics’ micro data. This will be a major improvement as various processing programs and databases are currently in use for the various ESS.

Apart from centralisation into a single database and a single front-end system, the current manual processing of each reporting line will change in favour of a system-supported data validation process by means of automated plausibility checks. Thus, staff can concentrate on invalid and implausible reports detected by the system using a dashboard approach.

Such dashboard web UIs are a well-known standard for tracking and monitoring transactional data – in this case reports – in real time. Its primary metric will consist of a simple traffic light system, which visualises reports that need correction (marked in red), followed by reports that may need correction or are valid statistical outliers (marked in yellow), and finally flawless and plausible reports that need no attention at all (marked in green). This will save time due to a reduced overall number of reports needing attention and increase the efficiency and productivity of human resources thanks to automation.

Meldenummer	Meldepflichtiger	Branche	Transaktionen	Z10	Bestände Z5	Bestände K3/K4				
00002382	Süddeutsche Versicherung AG	6510	203 (12) 18 (3) 5	56	6	2	12	3	25	3
00005468	SIMBA IT-Solutions GmbH	1300	901 (17) 13 (1) 4				3 (1)	1 (1)	3	1
00007654	Reiser KGaA	1200	112 (8) 26 (2) 4							
00009811	Mietigel GmbH & Co. KG	1000	516 14 3	2			4	2		
00015463	Cyberdyne Productions SE	2800	1119 11	7		1	32	1	1	16
00018467	Kinwara Sportsinnovation AG	1400	836 2 2				42	3		
00022239	Bankhaus Sonnenborn - Hot Assets KG	6419	967 8	21	2		27	4	2	21
00024687	Seitenschmelz Kosmetik KG	2000	407 7				12		1	
00031871	Böllstoff Brauerei GmbH	1100	122 3				13			
00052384	Fiedel Instrumentenbau GmbH	1600	28 1				6			
00063125	Weingut Schluckspecht KG	0100	79							
00084665	Kuwentmann Schifffahrts GmbH	5000	132 3	8			54	6		
00091123	Scharf Optik GmbH & Co KG	2675	101	13	3	1				
00146233	Hartenberger Verkehrs GmbH	8480	56 4							
00198883	Einrod & Sturz KGaA	3090	12 4							
00245682	Kaiserwetter Technolgie AG	2700	241 11	17			16	2		
00215491	Charlie-Bravo International SE	3030	1184 15				51			36
00373323	Salto Martale e.V.	9310	16	16						
00442468	Gemeinnützige Wohnungsbau GmbH	6801	5							

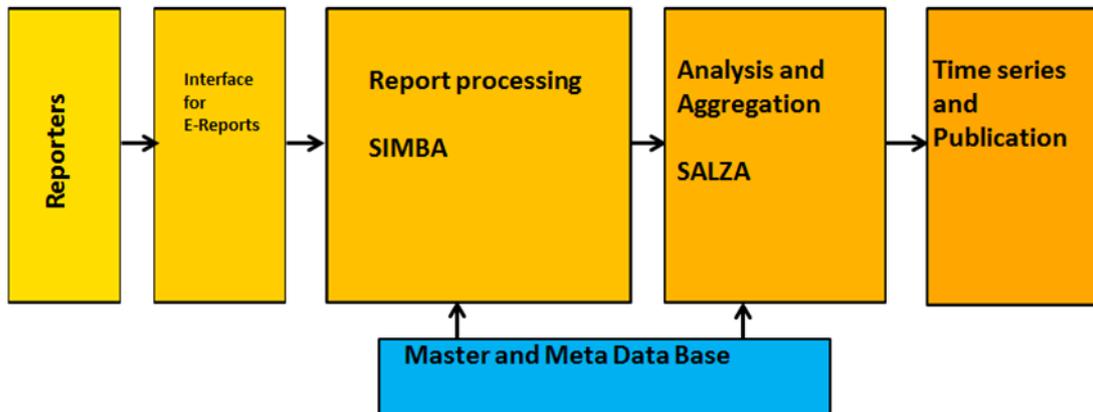
To allow full control of the DQM process, the first step needs to be to build a plausibility – engine-like – technical infrastructure. This is to be followed in a second step by a GUI offering intuitive technology for super users. The GUI should ideally allow technologically affine statisticians to maintain plausibility checks in natural language – irrespective of IT support.

Additional features are planned for the future which allow secure communication with the reporting units and send out reminders regarding missing reports. A further automation of plausibility checks is also envisaged, which will result in the auto-correction of data, ideally using a machine learning approach.

Target structure

The projects SALZA and SIMBA implement the desired target structure from the first submission of a report all the way through to the final publication of the data. The new IT infrastructure guarantees a fully digitalised process for the automated processing, integration and analysis of quality assured primary and secondary statistical data, complemented by an online publication of the data with a user option for customised data requests.

Target structure of the ES IT system





Irving Fisher Committee on
Central Bank Statistics

BANK FOR INTERNATIONAL SETTLEMENTS

IFC - Central Bank of Armenia Workshop on *“External Sector Statistics”*

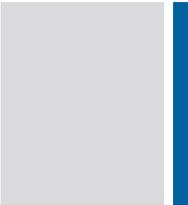
Dilijan, Armenia, 11-12 June 2018

Changes in the IT landscape of the Deutsche Bundesbank’s external sector statistics¹

Joachim Hösch and Jens Walter,

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Changes in the IT landscape for External Sector Statistics of the Deutsche Bundesbank

Background

- Since the 70s, rapid increase of self-contained technical applications and data bases which exist side-by-side
- These isolated solutions made an integrated view on the data difficult (e.g. transactions & stocks)
- Furthermore, the multitude of industry standards (like IMS, DB2, MS & Oracle for DBs) complicated the daily work and led to ..
- **Growing technical backlog**, e.g. lack of documentation, maintenance intensive systems, declining number of staff members knowing to work with the old systems etc.



need for replacement and redesign

Strategy for the Bundesbank's "new" External sector (ES) IT- system

- Development of an integrated, modular software system for:
 - Master and Meta Data
 - Analysis
 - Report Processing and
 - Communication

- In order to create a harmonized IT infrastructure that:
 - Allows integrated analyses for transactions & stocks
 - Streamlines statistical work processes and increases automation
 - Reduces Time-to-Publication
 - Leverages emerging technologies by using industry standards

- The new ES IT-system has been developed in various sub-steps

Starting point: Centralized Master and Meta data base

- In 2011, we started with the development of a centralized master and meta data base with following key features:
 - Harmonization of all reporter master data into one single reference data set (golden copy)
 - Keeping master data and meta data in same data base
 - Centralization of data updates (and creation) through a workflow process by dedicated staff
 - Creation of an interface to allow other applications online access to the master data
 - Full data historization
 - Not only keeping track of changes, but being able to analyze which information was valid at each point-in-time.
 - Existing data must not be deleted (also not in case of reporter liquidation) or overwritten (also not in case of reporter mergers & acquisitions), but new rows can be created in the data base for changes of existing data.

Starting point: Centralized Master and Meta data base

Example: Master Data view

Kontakt |

DEUTSCHE BUNDESBANK AWMuS Anwendung - AWDV Meta- und Stammdaten 02.00.0076 :: PRODUKTIONSUMGEBUNG ::

AWMuS

Metadaten Stammdaten - Inländer (ohne privatw. Hh)

Daten

Kombinationen

Wissensstand Check

Stammdaten

Suche Inland

Suche Ausland

Gesamtsuche

Neuanlage

Workflow

Aufträge

Archiv

Infocenter

Metadaten

Stammdaten

Betriebsstatistik

Benutzerdaten

Benutzerdaten anzeigen

System

Stammdatenkonfigurati

TransferCheck AWW-Web

Transfer Salza

Meldenummer: 00777771

Name: TESTKUNDE HV MAINZ

Sitz (juristischer Sitz): Mainz

Branche NACE Rev. 2: 8200 - Erbringung v. ¹ Verweissfeld

Auftragsmodus Gesamtgültigkeit ändern Stammdaten PDF zurück

Allgemein Z4 Z5/5a/5b Z8 Z10 Z11 Z12/13 Z14/15 K3/4 AUSNA Fremdschlüssel Dritteinreicher M&A Meldestellen Kontakte

Postleitzahl *: 55122

Straße: Hegelstr.

Hausnummer: 65

Postfach:

HReg / Ort: Mainz - 55116/55001

HReg / Art:

HReg / Nr.:

Rechtsform *: 3 - Sonstige rechtlich

Branche NACE Rev. 1 *: 7480 - Erbr. sonst.

Bundesland *: 31 - Rheinland-Pfalz

Notizfeld (allgemein): SV von Frankfurt 12/03

Klassifizierung:

Klassifizierung K3:

Klassifizierung K4:

Internet:

Tel. (allgemein): 06131 377-0

Fax (allgemein): 06131 377-0

E-Mail: (allgemein):

AMS: 1 - Ja

AMS-Extranet: 1 - Ja

Land (AMI):

Wirtschaftszweig (AMI):

ZBB-Extranet: - Nein

ZBU-Extranet: - Nein

ehem. Meldenummer:

UCI-Nummer:

Insolvenz/Liquidation: - Nein

Z4 Abgabe an R 14: - Nein

Branchenbeschr. AMS:

AW-Prüfungen:

Aliasname:

Sektor ESA2010 *: S.14 - Private

UCI - Land:

Zweckgesellschaften:

Bilanzierung nach:

SPE:

Jens Walter, Joachim Hösch
6/21/2018
Slide 5

Approach for Analysis

Previous system ZABDB	New system SALZA
Mainframe based	SAP BI-Server based
No micro data	Aggregated micro data per reporting unit
No GUI (Graphical User Interface)	MS Excel GUI (BEx-Analyzer) and Web Browser GUI (SAP Front End)
Performance limit reached with the changeover to BPM6	Broad OLAP/ BI functionality
No real OLAP/ BI functionality	Real-time data (updates on a daily basis)
	Versioning of data (stand-alone snapshots)
	Broad and flexible methods of analysis
	Drill down capability to the reporter
	Primary and secondary cell suppression (protection of confidentiality)

Old ZABDB

vs.

New SALZA

```

ZA03          Zeit: 10:11:32  Datum: 12/09/17  Anwender: S2504JM
              Anzeigen von Bausteinen und Aggregaten  Blättern: . . . .
TERMIN $ 201201 - 201212 SAPO A IAX0551 LAND . LLL - ... BRANCHE . . . . .
(oder BEREICH . . . . . ERG.ART . . . . . )      BRA2 . . . . .

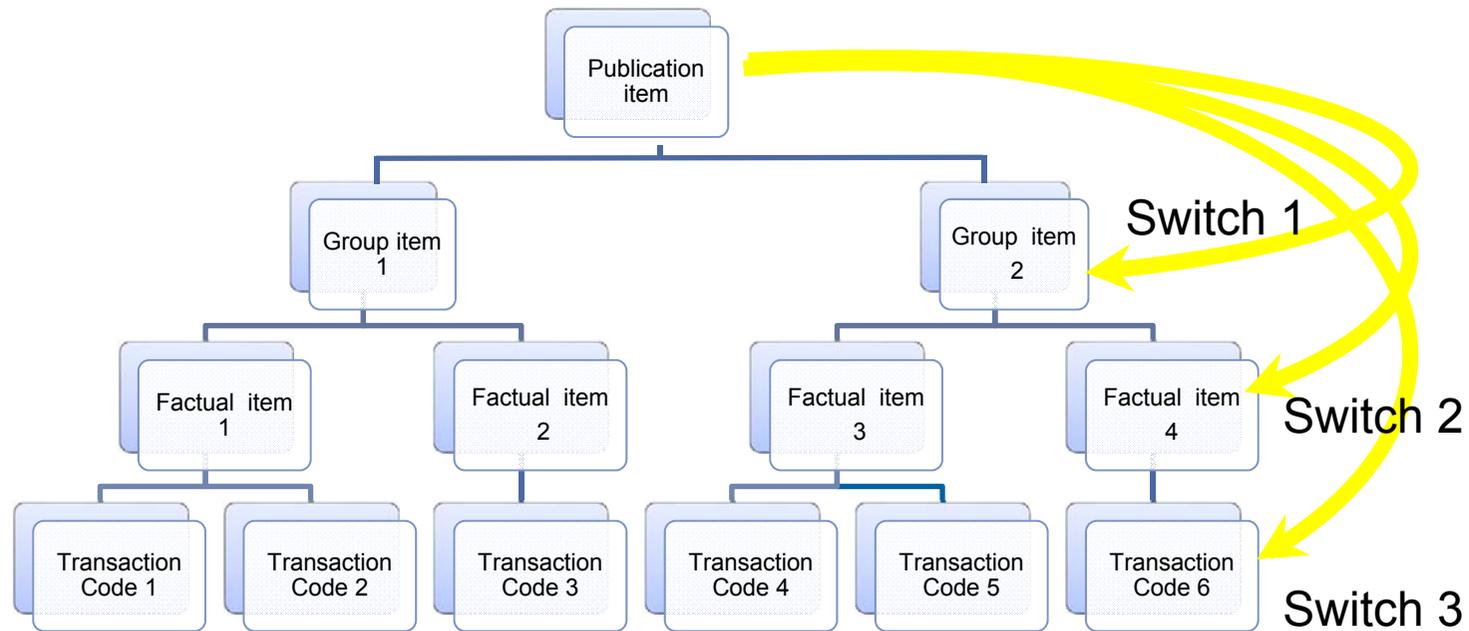
Zeile|  TERMIN |   SAPO |  LAND |  BRA |  BRA2 |  BETRAG in Tsd |
1 | 2012 J | 1301900 | LLL | | | 805.622 EUR |
2 | 2012 J | 1302900 | LLL | | | 2.430.782 EUR |
3 | 2012 J | 3102270 | LLL | | | -1.084.612 EUR |
4 | 2012 J | 3108030 | LLL | | | 808.871 EUR |
5 | 2012 J | 3108070 | LLL | | | 532.032 EUR |
6 | 2012 J | 3108090 | LLL | | | -2.432 EUR |
7 | 2012 J | 3302270 | LLL | | | 3.449.409 EUR |
8 | 2012 J | 8101070 | LLL | | | 1.743.377 EUR |
9 | 2012 J | 8101080 | LLL | | | 131.802 EUR |
10 | 2012 J | 8101081 | LLL | | | 3.600.475 EUR |

11 ZA02 0:  TERMIN: 201212  MASKE: 901 LAN: LLL BRA:  BRA2:  S2504JM1
12 Wichtige Posten der Zahlungsbilanz (fob/fob; Ursprungslandkonzept)
13
14 Land:  Alle Länder          Stand: 12.09.2017
15 Branche:                   Zeit:  Dezember 2012
16
17
in Mio Euro          Einnahmen    Ausgaben    Saldo
-----
Leistungsbilanz          123.611    103.203    20.408
Warenhandel (fob/fob)    76.618     64.778    11.840
Außenhandel (fob/cif)    78.217     65.992    12.225
Ergänzungen, Transit, und NWG    - 1.599    - 1.214    - 386
Ergänzungen (ohne Transit, und NWG)    - 3.229    - 1.730    - 1.499
Unsichtbare Leistungstransaktionen    46.993    38.425    8.568
Dienstleistungen        20.944    18.738    2.206
dar. Transportleistungen    3.348     4.181    - 832
dar. Reiseverkehr        2.371     2.694    - 323
dar. Geistiges Eigentum (ab 2013)    1.140     497     643
dar. EDV- und Informationsdienstl.    2.873    1.651    1.223
dar. Sonst. unternehmensb. Dienstl.    1.423    1.112    311
dar. Forschung & Entwicklung    7.491     7.712    - 222
Primäreinkommen         22.116    10.468    11.648
Sekundäreinkommen        3.933     9.219    - 5.286
ZUGRIFF PER AGGREGATS-TABELLE
    
```

Table					
	Berichtsjahr	2017			
	Versionsstatus	Veröffentlicht			
	Datenversion	DKAP	DM	ZUP	Ergebnis
		Transaktion DMEUR	Transaktion DMEUR	Transaktion DMEUR	Transaktion DMEUR
Bestandsart	SALZA-KEY	* 1.000.000 EUR	* 1.000.000 EUR	* 1.000.000 EUR	* 1.000.000 EUR
Einnahmen	DL, Ein	ZSGDXUE51	215.035	3.250	54.574
	DL, Fertigungs-DL, an Werkstoffen anderer Eigentümer	ZSGDHUE11	6.224		6.224
	DL, Instandhaltung u Reparatur, Ein	ZSGDXUE11	8.336		8.336
	DL, TrL, Ein	ZSGDXUE41	51.571	3.250	54.821
	DL, Reiseverk, Ein	ZSGDXUE21			35.251
	DL, Bauleist, Ein	ZSGDXUE11	1.829		1.829
	DL, Vers. u Altersvorsorge, Ein	ZSGDXUE21	1.736		8.288
	DL, FinanzDL, Ein	ZSGDFXUE21	13.314		7.804
	DL, Gebü.f Nutz.geist.Eigent.	ZSGDXUE11	17.795		17.795
	DL, Telekom, EDV u Inform, Ein	ZSGDXUE31	33.036		33.036
	DL, sonst.unt.bez. DL, Ein	ZSGDXUE31	77.855		77.855
	DL, DL f pers. Zwecke, Kultur u Freizeit, Ein	ZSGDXUE21	2.917		2.917
	DL, Reg.waren u -leist, Ein	ZSGDXUE21	423	3.231	3.654
Ausgaben	DL, Aus	ZSGDXUEA51	181.275	26.956	80.744
	DL, FertigungsDL, an Werkstoffen anderer Eigentümer	ZSGDHUE11	5.320		5.320
	DL, Instandhaltung, Reparatur, Aus	ZSGDXUEA11	9.074		9.074
	DL, TrL, Au				
	DL, Reise				
	DL, Bauleis				
	DL, Vers. u				
	DL, Finanz				
	DL, Geb. fr				
	DL, Telekom				
	DL, sonst u				
	DL, DL f pe				
	DL, Reg.w				
Saldo	DL, Saldo				
	DL, Fertigu				
	DL, Instand				
	DL, TrL, Sa				
	DL, Reisev				
	DL, Bauleis				
	DL, Vers. u				
	DL, Finanz				
	DL, Geb. fr				
	DL, Telekom, EDV u Inform, Saldo	ZSGDXUE31	3.250		3.250
	DL, sonst.unt.bez. DL, Saldo	ZSGDXUE31	-1.681		-1.681
	DL, DL f pers. Zwecke, Kultur u Freizeit, Saldo	ZSGDXUE21	1.213		1.213
	DL, Reg.waren u -leist, Saldo	ZSGDXUE21	-1.139	3.231	2.092

Table						
				Einnahmen	Ausgaben	Saldo
				Veröffentlicht	Veröffentlicht	Veröffentlicht
			Versionsstatus			
			Datenversion	* 1.000 EUR	* 1.000	* 1.000
	SALZA-KEY					
	DL, Telekom., EDV- u Inform.-DL, Nachrichten- u Inform	ZSA1105720	DKAP	93.856		
	DL, Telekom., EDV- u Inform.-DL, sonst. EDV-DL, Ein	ZSA1105730	DKAP	16.213.154		
	DL, Telekom., EDV- u Inform.-DL, Speicherung v Inform.	ZSA1105740	DKAP	1.294.500		
	DL, Telekom., EDV- u Inform.-DL, KommunikationsDL, Ein	ZSA1105760	DKAP	3.643.188		
	DL, Telekom., EDV- u Inform.-DL, Nutz. v Computer-SW, Ein	ZSA1106130	DKAP	11.576.845		
	DL, Telekom., EDV- u Inform.-DL, Kauf/Verkauf v	ZSA1106330	DKAP	213.836		
	Gesamtergebnis			33.035.379		

Drill down capability of SALZA



- Switch (1) to previous position
- Switch (2) to the factual item level
- Switch (3) to the reporter level (with transaction codes)

Drill down example in SALZA

41	4.533.796,7	3.856.114,3	3.057.280,5	3.267.510,0	3.269.886,0	2.490.998,0	3.3
90	1.009,0		632,0				
XXX	2.725.969,0	1.374.602,0	1.168.574,0	232.850,0	239.533,0	366.782,0	
11	1,70						
31	1,02			232.850,0	239.533,0	366.782,0	
41	10,77			5.304.097,0	5.417.364,0	5.147.486,0	4,7
90							
XXX	1,03						
11	1,03						
50							
70							
41	-5,29			-1.988.746,0	-2.064.076,0	-1.588.913,0	-1,3
XXX	1,56						
41	4,30			232.850,0	239.533,0	366.782,0	
90				3.057.312,0	3.019.823,0	3.246.740,0	3,1
XXX	2,48						

Einen Navigationsschritt zurück

Zurück zum Anfang

In Formel umwandeln

Eigenschaften...

Query-Eigenschaften...

Kennzahldefinition

Bedingung anlegen

Springen

Dokumente

Query-Dokumente

Melddaten direkte Vorgänger

Melddaten alle Vorgänger

Melddaten Vorgänger SAPO-Ebene

Melddaten Vorgänger Kennzahl Ebene (ZB_Global Zielberich)

Ableitungsregeln direkte Vorgänger

Ableitungsregeln alle Vorgänger

- Drill down from an highly aggregated data level to related reporters and reporting items

- Other reporting options are likewise available (e.g. branches of the reporters)

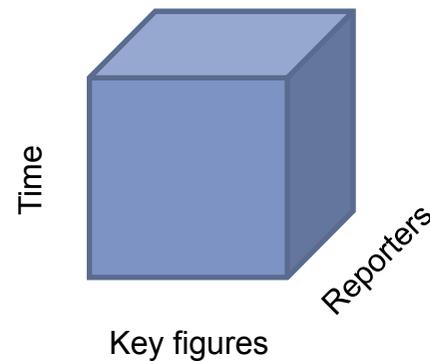
Berichtsmonat	SALZA-KEY	Meldepflichtiger /S	Saldo	Ausgaben	Einnahmen
			* 1.000	* 1.000	* 1.000 EUR
Gesamtergebnis					2.500.835
JAN 2014	ZKA34670	ausländische Emissionszertifikate			170
					40
					1.462
					26.116
					43.360
					37.311
	ZKA35070	inländische Emissionszertifikate			1.625
					24
					63
					20
					727.958
					258.055
					22
					1.090
					31
					67.292
					55.041
	ZKA16170	Nutzung von snst.n Rechten			257
					0
					50
					853
					26

SALZA's achievements

- SALZA creates SDMX time series for national and international publication commitments
- SALZA merges the publication process within a single application
- SALZA makes swift replies to external and internal inquiries possible
- Flexible data analyses
- Standardized reports with MS Excel GUI (first quality check)
- Integrated trend and estimation procedures
- Source and decomposition information for aggregated data
- Slicing and dicing from aggregated data to reporter

Excursus: Slicing and dicing (the OLAP cube and Business Intelligence)

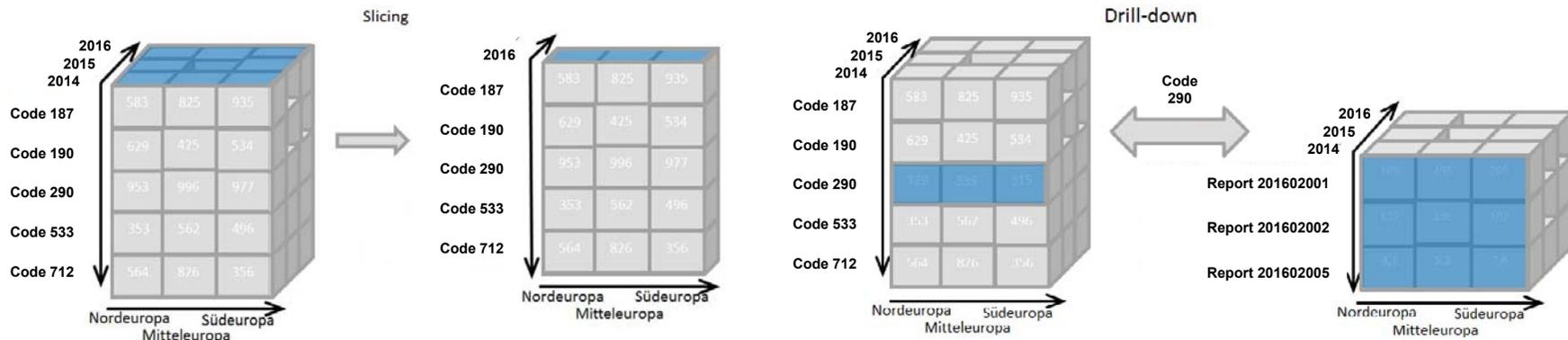
- Online analytical processing (OLAP) enables users to analyze multidimensional data interactively from multiple perspectives
- An OLAP cube refers to an multi-dimensional dataset, not limited to three dimensions technically but often visualized three-dimensional.



- Business intelligence (BI) encompasses a multitude of strategies and technologies for data analysis. OLAP is the technique used for our BI-system

Excursus: The OLAP cube offers three analytical operations

1. Slicing – Creation of a sub cube with one dimension less than before
2. Dicing – Creation of a sub cube with limited values but same dimensions
3. Drill Down and Drill Up – Navigation along the data levels, i.e. from most aggregated (up) to most detailed (down)



New approach for processing survey reports - SIMBA

Current Report Processing	Future Report Processing using the new system SIMBA
In general, manual processing of each reporting line	Focusing on invalid and implausible reports using a dashboard approach
Data validation by staff	Data validation by system (automated plausibility checks)
Various processing programs and data bases per section	Integrated platform and frontend for report processing for all external statistics micro data
Division of labour per reporting form	Focus on all external economic activities of a reporter instead of single reporting forms
	Dynamic crosstab analyses for transactions & stocks
	Plausibility editor to allow power users adding or modifying plausibility checks independent from support of the IT staff
	One face to the reporter – only one Bundesbank employee responsible for one reporting unit

Planned SIMBA dashboard for report processing

SIMBA Dashboard

Anzeigevariante: Klassifizierung:

Zeitraum: 09 / 2016 /

Meldenummer:

Sektor: Plausi: Fehlerkat.:

Branche:

ISIN:

Transaktionen: Bestände Z5: Bestände K3/K4:

Z5a 1 // Pos: 62, 65
Zeitraum: 12/2013 - 12/2014 ✕

Z5a 2 // Pos: 84
Zeitraum: 12/2013 - 12/2014 ✕

Z4 KV // KZA: 262, 289, 789 // BA: 4
Zeitraum: 12/2013 - 12/2014 ✕

K4 // Pos: 37, 38
Zeitraum: 12/2013 ✕

Hinzufügen Speichern Anzeigen

Meldenummer	Meldepflichtiger	Branche	Transaktionen			Z10			Bestände Z5			Bestände K3/K4		
00002382	Süddeutsche Versicherung AG	6510	203 (12)	18 (3)	5	56	6	2	12	3		25	3	
00005468	SIMBA IT-Solutions GmbH	1300	901 (17)	13 (1)	4				3 (1)	1 (1)		3	1	
00007654	Reiser KGaA	1200	112	26	4									
00009811	Mettigel GmbH & Co. KG	1000	516	14	3	2			9	2				
00015463	Cyberdyne Productions SE	2800	119 / 23	11 / 2		7 / 1		1	32 / 4	1	1	16 / 2	2 / 1	1
00018467	Kinvara Sportsinnovation AG	1400	836 / 14	2 / 1	2				42 / 6	3 / 3				
00022239	Bankhaus Sonneborn - Hot Assets KG	6419	967	8		21	2		27	4	2	21	4	
00024687	Seitenscheitel Kosmetik KG	2000	407	7					12		1			
00031871	Bölkstoff Brauerei GmbH	1100	122	3					13					
00052384	Fiedel Instrumentenbau GmbH	1600	28	1					6					
00063125	Weingut Schluckspecht KG	0100	79											
00084665	Kaventsmann Schifffahrts GmbH	5000	132	3		8			54	6				
00099123	Scharf Optik GmbH & Co. KG	2675	101			13	3	1						
00146233	Hartenberger Verkehrs GmbH	8480	56	4										
00198883	Einrad & Sturz KGaA	3090	12		4									
00245682	Kaiserwetter Technologie AG	2700	241	11		17			16	2				
00315489	Charlie-Bravo International SE	3030	1.184	15					51			36		
00373323	Salto Mortale e.V.	9310	16			16								
00442468	Gemeinnützige Wohnungsbau GmbH	6801	5											

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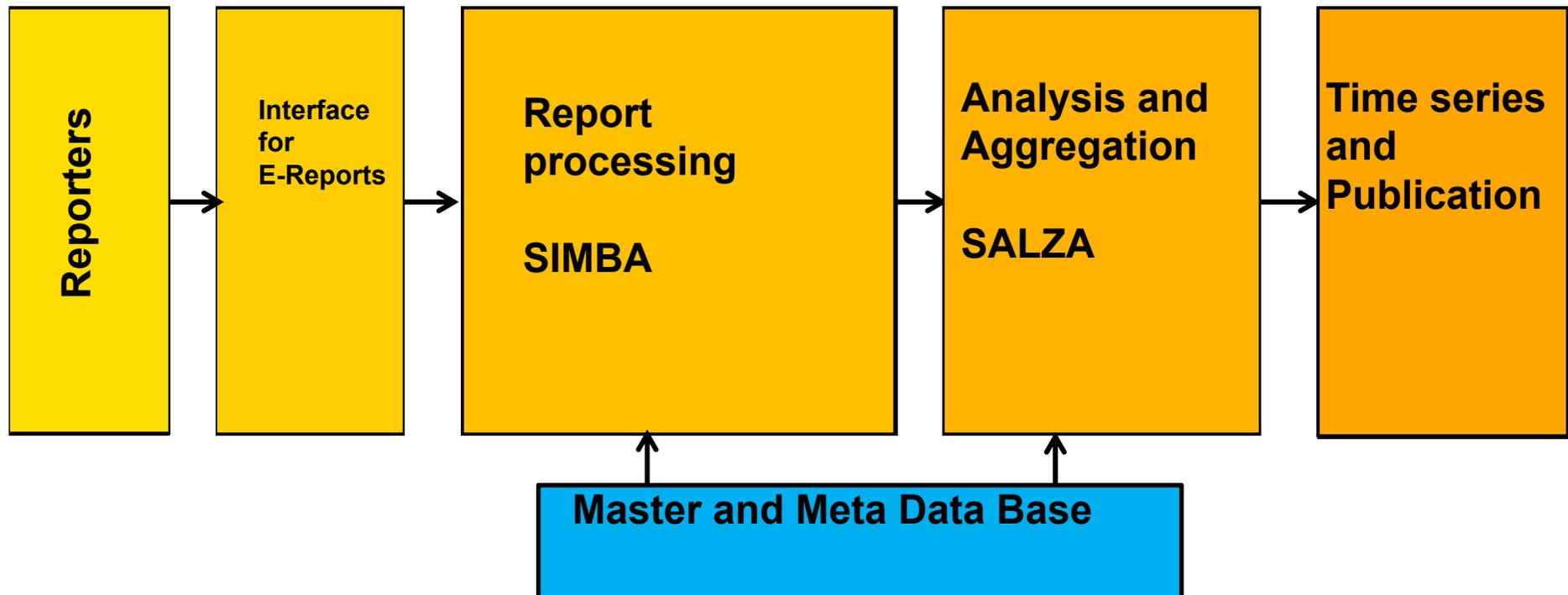
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SIMBA approach and objectives

- Integrated platform and frontend for all BOP micro data
- Improve data consistency and therefore quality by a holistic view of a reporting unit
- Crosstab checks and analyses for transactions & stocks
- Process automation
 - System-supported plausibility checks
 - At a future stage, auto-correction functionality ideally with machine learned data
- Not only a new IT system, but process improvement by implementing traffic lights:
 - Intuitive status visualisation of a report
 - Automated work-in-process (WIP) overviews
 - Automatic processing of flawless and plausible reports
- Future extension of the base system to allow secure communication with reporters and a reminder mechanism for missing reports



Summary: ... and where we want to be.



.. a fully digitized process for the automated processing, integration and analysis of quality-assured primary and secondary statistical data. Online publication of the data supply with the users' option for customized data requests.



Thank you for your attention!

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