

# VTL integration in a SDMX lifecycle solution for dissemination Statistical Data

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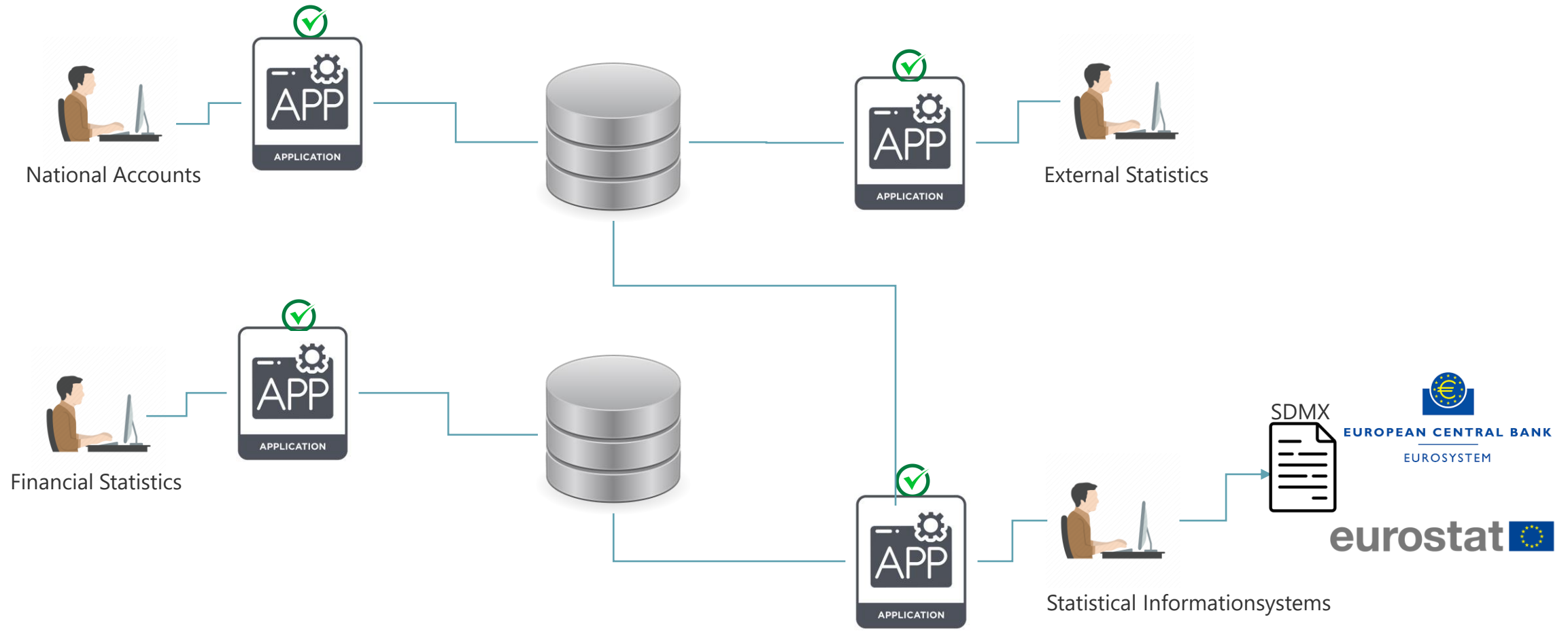


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- VTL Suite Integration overview

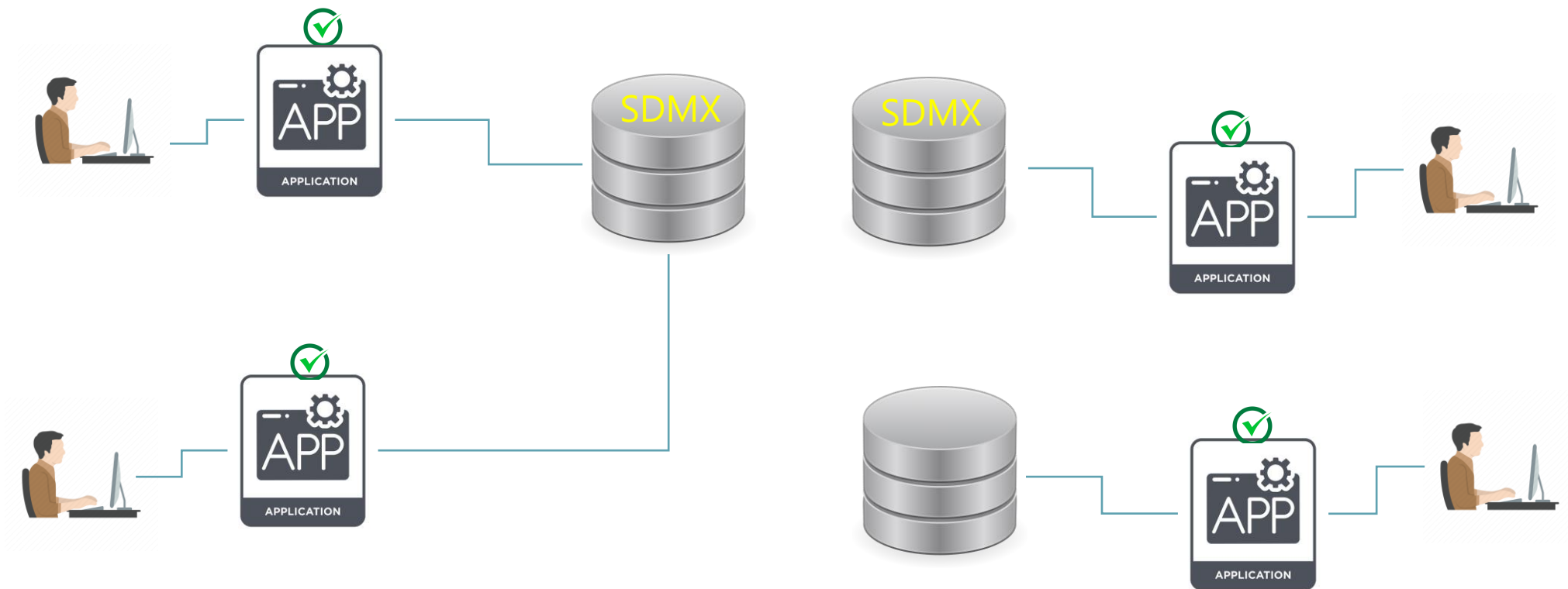


# Current state

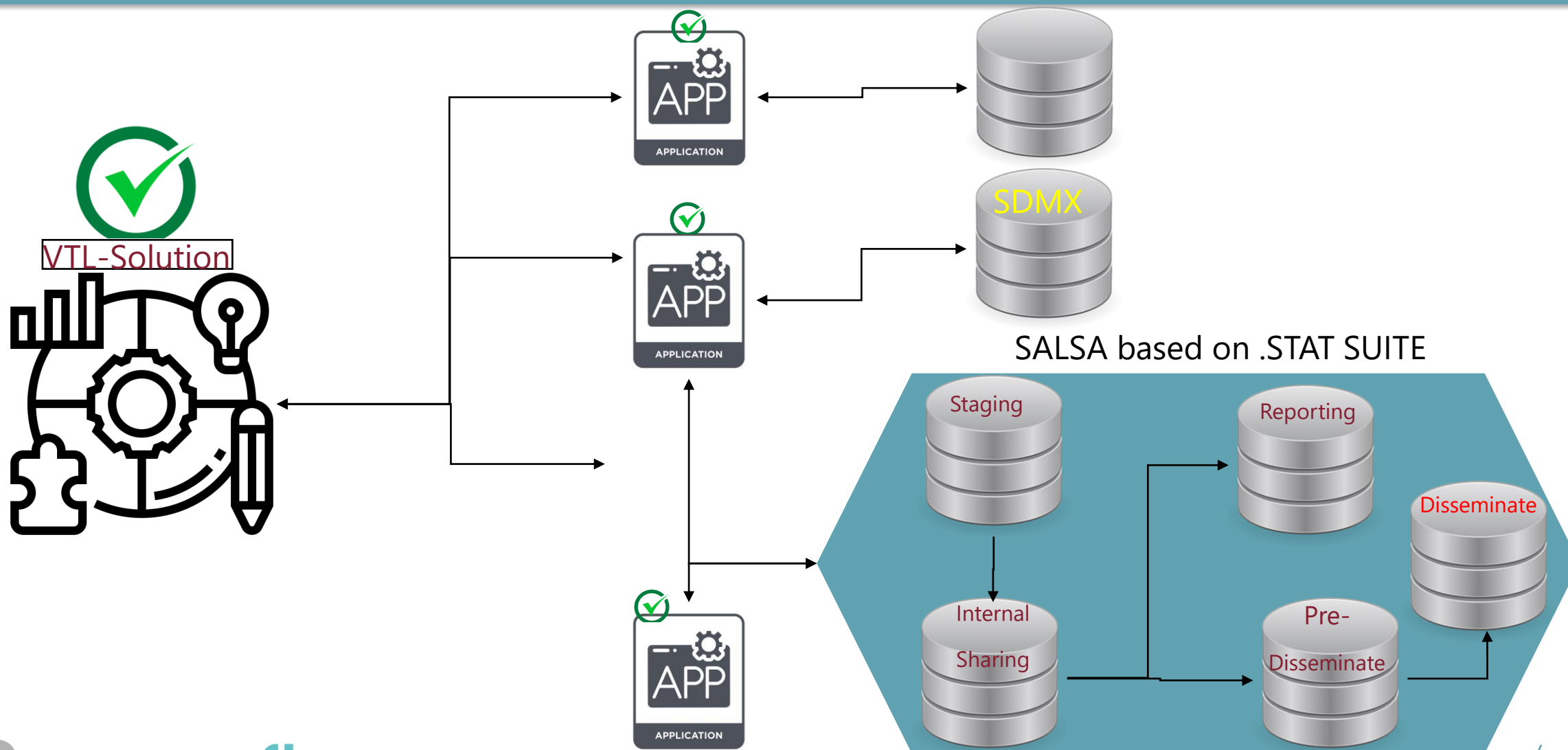




# Evolution in Statistical Department

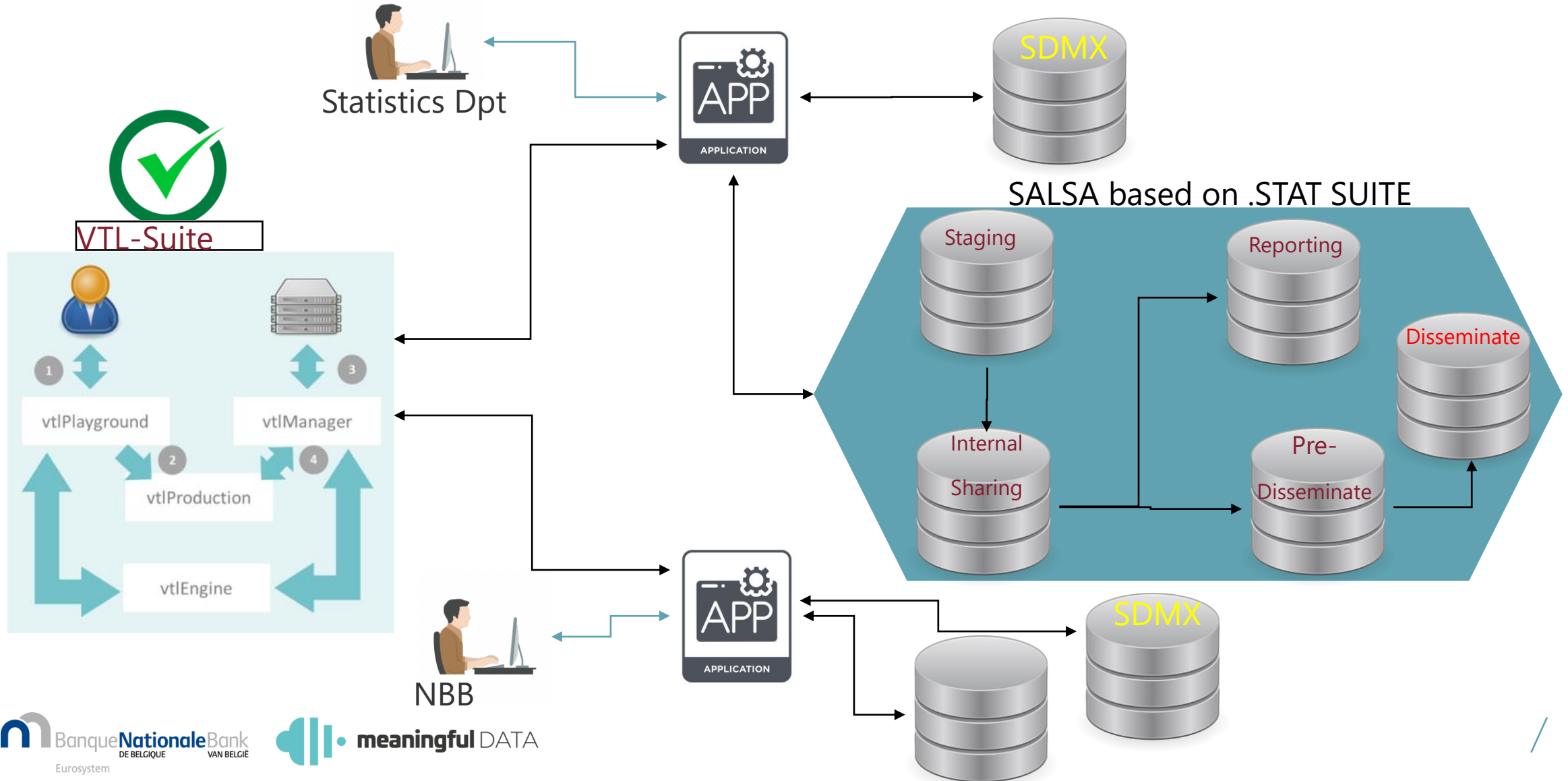


# Solution department Statistics





# Full NBB Solution





# Advantages



1 Centralized system for Validation & Transformation of Data



Full SDMX based solution

Early validation possible if data is SDMX compliant



Use of VTL-standard/language



Reusable & shareable scripts

# Example Balance of Payments

04 BPM6\_VALIDATION\_RULES\_v1.11.xlsx - Excel

Van Hecke Frederik

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Applicable dataset	Type of rules	Applicable dimension	Acronym	Rule	Description of the left hand side of the equation
RASS	Validation	Other	ORG	$\% .S121.S1XA=\% .S121.S1X+\% B.S121.S121+1C.S121.S121$	Other national monetary authorities, BIS, IMF, and other international organizations
QIIP	Validation	Currency	CURR	$T = EUR + USD + X4$	Currency breakdown of debt securities
QIIP, QBOP (net), MBOP (net)	Validation	Functional Category	FUNC	$T=D+P+O+F+R$	All functional categories
MBOP, QBOP	Consistency	Accounting Entry	ACC	$B=C-D$	Balance (Credits minus Debits)
MBOP, QBOP	Validation	International Accounting Item	IAI	$CA=G+S+H+N1+H2$	Current account
QBOP, QIIP	Validation	Functional Category	FUNC	$D=D1+D2+D3$	Direct Investment
QBOP	Validation	International Accounting Item	IAI	$D2=D21+D29$	Primary income: Taxes on production and imports
QBOP	Validation	International Accounting Item	IAI	$D3=D31+D39$	Primary income: Subsidies
QBOP	Validation	International Accounting Item	IAI	$D4O=D2+D3+D45$	Primary income: Other primary income
MBOP, QBOP	Validation	International Accounting Item	IAI	$D4P=D4S+D4Q = D4S+D41+D44P$	Primary income: Investment income
QBOP	Validation	International Accounting Item	IAI	$D4S=D42S+D43S$	Primary income: Investment income attributable to shareholders, including income on IF, including RIE
QBOP	Validation	International Accounting Item	IAI	$D443=D4431+D4432$	Primary income: Investment fund shares income
QBOP	Validation	International Accounting Item	IAI	$D9=D91+D92+D99$	Capital transfers
ALL BP6 and RASS	Validation	Instrument	STR	$F=F11+F12+FK+FR2$	Total financial assets/liabilities (reserve assets)
QBOP, QIIP	Validation	Instrument	STR	$F=F519 +F2+F4+F6+F81+F89$	Total financial assets/liabilities (other investment)
ALL BP6 and RASS	Validation	Instrument	STR	$P.F=P.F5+P.F3$	Total financial assets/liabilities (in PI)
RASS	Validation	Instrument	STR	$F=F71FO+FR9$	Total financial assets/liabilities
RASS/BP6	Validation	Instrument	STR	$F11=F11A+F11B$	Monetary gold
RASS	Validation	Other	OW	$F11z LE F11$	of which: Monetary gold under swap or cash collateral
QBOP, QIIP	Validation	Instrument	STR	$F51 = F511 + F512 + F519$	Equity listed/unlisted
ALL BP6 except MBOP	Validation	Instrument	STR	$F5=F51+F52$	Equity and investment fund shares/units
QBOP	Validation	Instrument	STR	$F5=F5A+F5B$	Equity and investment fund shares/units
QIIP	Validation	Other	STR	$P.F51=P.F511+P.F512$	Equity .listed/unlisted
RASS	Validation	Instrument	STR	$F71=F712A+F712B+F712C+F711A+F71R$	Financial derivatives
QIIP	Validation	Instrument	STR	$FGED=F12+F2+F3+F4+F6+F8+D.FL$	Gross external debt. FL is to be considered as associated with the specific Int. Acc. Item, as it refers to FDI debt.
RASS	Validation	Other	STR	$FN.RT1.RT.FR8=FO.RT1.RT.F29C+FI.RT1.RT.F29C+FO.RT1.RT.F81A+FI.RT1.RT.F81A+FO.RT1.RT.F89+FI.RT1.RT.F89$	Foreign currency loans, securities, and deposits
RASS	Validation	Accounting Entry	ACC	$FN=FI+FO$	Net flows (reserves template)

INFO validation rules MBOP\_VAL MBOP Sign QBOP\_VAL QBOP Sign RASS\_VAL RASS Sign QIIP\_VAL QIIP Sign CHVL\_VAL CHPR\_VAL OTHC\_VAL Net\_Checks Consistency\_Checks QBOP ...

Impo



EUROPEAN CENTRAL BANK  
EUROSYSTEM





# Translating current validations to VTL: The BoP example

## Input: Current validations format

Left Hand Side	Operator	Right Hand Side		
Q:N#:W1:S1:S1:LE:A:FA:_T:F_Z:\$ _T:_X:N:ALL	=	Q:N#:W1:S1:S1:LE:A:FA:D:F_Z:\$ _T:_X:N:ALL	+	Q:N#:W1:S1:S1:LE:A:FA:P:F_Z:\$ _T:M:N:ALL
Q:N#:S1:S1:LE:A:FA:D:F_Z:\$ _T:_X:N:ALL	=	Q:N#:S1:S1:LE:A:FA:D:F5_Z:\$ _T:_X:N:ALL	+	Q:N#:S1:S1:LE:A:FA:D:FL_Z:\$ _T:_X:N:ALL
Q:N#:W1:S1:S1:LE:A:FA:D:F5_Z:\$ _T:_X:N:ALL	=	Q:N#:W1:S1:S1:LE:A:FA:D1:F5_Z:\$ _T:_X:N:ALL	+	Q:N#:W1:S1:S1:LE:A:FA:D2:F5_Z:\$ _T:_X:N:ALL

Translation to VTL: Done in two steps:

1. Automated translation

2. Human streamlining

**Key difference:** VTL validations are semantic. They focus on settling relationships among business concepts (e.g., hierarchies)

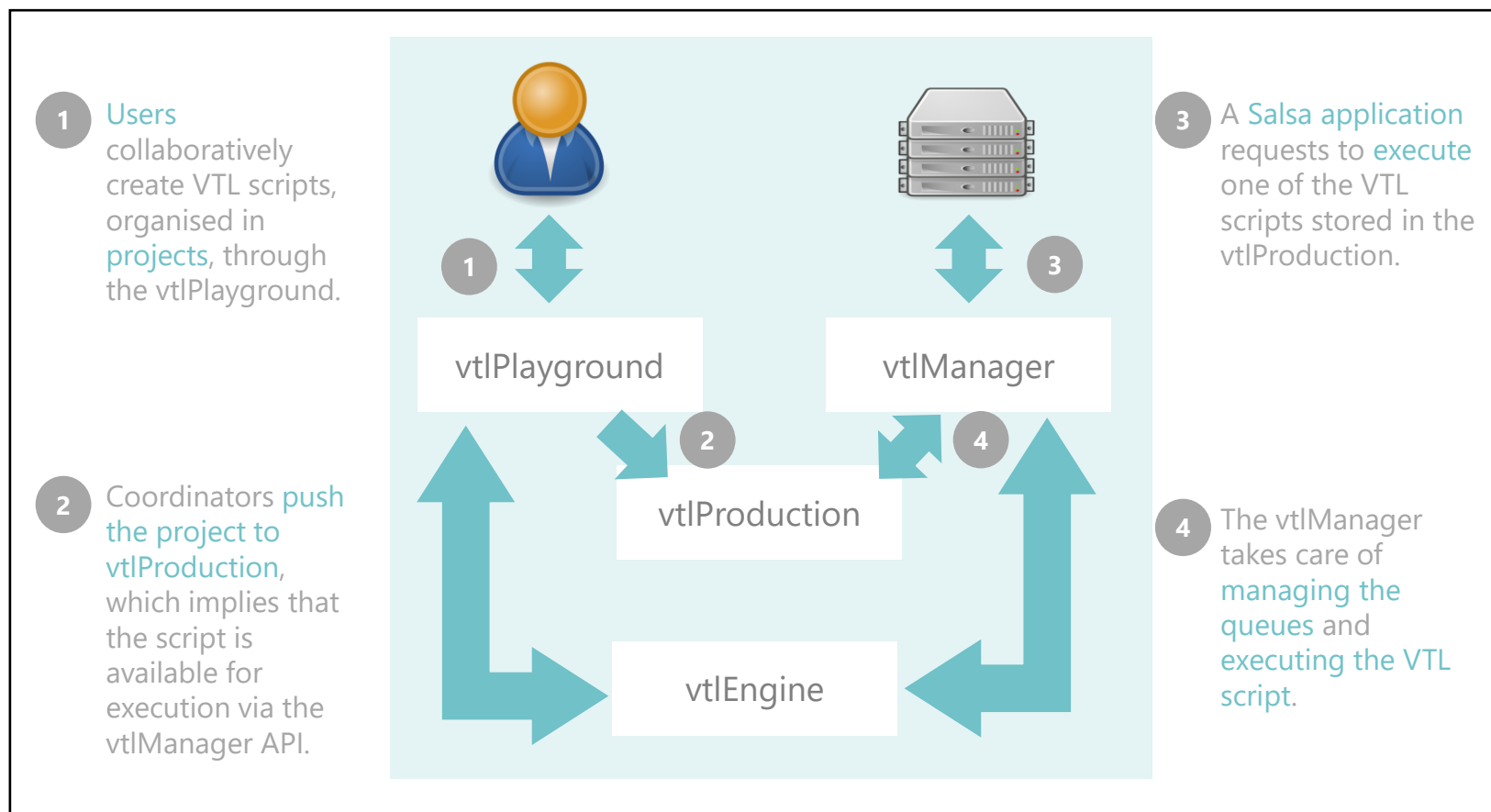
F = F5 + FL applied to INSTR\_ASSET

### Summary results:

	Number original validations covered	Distinct VTL validations
datapoint	1092	961
hierarchical	672	18
other	52	52
	1816	1031

# VTL Suite Integration overview

The VTL Suite provides a **web application** for users to write VTL projects, a **REST API to integrate** with other systems, and a task manager to ensure that several concurrent requests can be handled



Usable for calculation, transformation

SDMX based

Easy to create own validations