Volvo Group

HANA Migration status and lessons learnt

**SAP Automotive Forum
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VOLVO

The Volvo Group, which employs about 100,000 people, has production facilities in 18 countries and sales of products in more than 190 markets.

VOLVO

Our vision

Be the most desired and successful transport solution provider in the world

Our mission

Driving prosperity through transport solutions

On the road

In the city

Off road

At sea

WHAT WE DO

Your speaker, in short

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Pascal César
Enterprise Architect SAP and Business Intelligence
Volvo Group IT

Pascal currently holds the position of Enterprise Architect Business Intelligence and SAP, Corporate Process & IT at Volvo Group Headquarter, based in Lyon and Gothenburg.

He has more than 15 years of experience in large ERP international project/program holding different senior positions such us Enterprise Architect, Solution Architect, Project manager, Business Consultant and line manager.

Pascal has held various positions with Volvo Group:

2015 – …

Enterprise Architect Business Intelligence and SAP	Volvo AB Corporate Process & IT

2014 – 2015

Enterprise Architect ERP, Integration and support processes	Volvo AB Corporate Process & IT

2012 – 2014

Head Enterprise Architect for the Supply Chain Management and Support Processes	Volvo Information Technology

2010 – 2012

Enterprise Architect for the Aftermarket processes	Volvo Information Technology

2005 - 2009

Business Consultant in Global SAP Solution Center	Volvo Information Technology

2001 – 2005

ERP Solution Center Manager	Volvo Information Technology

1998 – 2001

Consultant / Senior Consultant SAP Finance	Renault Trucks

Pascal joined Renault Trucks in 1989 and started his career in the IT business holding different position in the Dealer and Customer Relationship Management domains.

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HANA at Volvo – Current status

- HANA migration program running since 2014, 42 productive SAP systems at Volvo, 3 Database in use (HANA, ORACLE & DB2):

  - 8 systems now already on HANA (1 SCM, 4 ECC, 2 BW, 1 MII)

  - 5 systems still on Oracle (1 SCM,1 CRM, 1 BW and 2 ECC)

  - The others are using DB2

- 2016 : 2 New HANA migration projects launched

  - 1 BW

  - 1 SCM-SPP: prior to project a POC has been done with SAP SE

HANA at Volvo – Lessons learnt from migration projects - General

- Custom code optimization and tests are the main drivers for project duration & costs. Prioritization of efforts often required depending on number of objects to be corrected (can vary a lot between systems)

- Migration projects driving significant one time cost (functional and integration tests effort). Payback time depends on complexity

- Most of our projects are also integrating an upgrade to the latest release or EHP performed on the fly during the migration: one way to optimize test efforts and costs

- No big problems found during migration to HANA, however first projects were underestimated affecting both timeline and project costs

- Still some amounts of pilot notes required to solve some functional problems and also improve performance. Some issues with new HANA optimized transactions

- Important to keep in sync with support packs and Java / HANA releases to avoid pitfalls already solved by SAP

HANA at Volvo – Lessons learnt from migration projects - Technical

- Many SAP tools to be combined for the code optimization phase (SAT/ATC, SCI, SQLM/SQLMD, SWLT). Static checks + Runtime monitoring

- BW migrations requires specific activities (Dual stack ABAP / JAVA split, new authorization concept when coming from older BW releases, Infocube remodeling activities)

- SAP « DMO Migration » approach working well, SAP performing the migrations as work package and MaxAttention helping with services like Volume Tests Optimization, Go-live checks and support

- Double maintenance on 2 chains (Old chain + New HANA chain), driving efforts and "double" runtime costs but giving also easy fallback plans around go-live

- Data center integration challenges of high-end HP CS500 scale-out / CS900 HANA appliances, and to operate new technology components (failover issues, learning curve for basis teams)

HANA at Volvo – Lessons learnt from migration projects - Outcome

- Significant cost savings on runtime costs achieved when migrating from ORACLE/AIX to HANA/LINUX:

  – First systems migrated from ORACLE/AIX to HANA driving significant cost savings (between 20 to 50%)

  – Migrations from DB2/LINUX do not drive significant additional cost savings

- Significant improvement on performance and DB size demonstrated:

  – Performance improvements seen in all areas (at least 30%)

  – Biggest improvements in BW solutions, reports running 5 to 100x faster, loads also much faster enabling to release system earlier for users every morning

  – DB size shrinking by 30 to 80%

- Enabler for next steps : HANA LIVE (under deployment) MRP LIVE (under assessment)

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HANA at Volvo – Lessons learnt
Runtime cost impacts and benefits

- HANA migrations driving significant runtime cost decrease, various factors impacting decrease (DB volumes, AIX/Oracle or Linux/DB2, size of appliance, Database planned growth…).

  Some examples:

  – BW RTC decreased by 58%, DB costs decreased by 71%

  – APO RTC decreased by 7% (small system), DB costs decreased by 20%

  – ECC (Production Controlling) RTC decreased by 22%, DB costs decreased by 50%

  – ECC (Manufacturing) RTC decreased by 35%

HANA at Volvo – Lessons learnt
Performance impacts and benefits

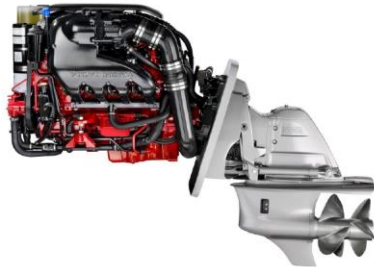- ECC (Production Controlling) on HANA (SAP Early Watch Alert report)

  – DB size decreased by 79%

  – Average response time for dialog tasks improved by 26%

  – Average response time for DB requests improved by 50 to 80%

| PTP	Avg Nov 2014	Avg Mar 2015	Change in %
Active Users (>400 steps)	66	72	9
Avg. Response Time in Dialog Task (ms)	1076	799	-26
Max. Dialog Steps per Hour	3902	2947	-24
Avg. Response Time at Peak Dialog Hour (ms)	373	719	93
Avg. Response Time in RFC Task (ms)	1024	674	-34
Max. Number of RFCs per Hour	41517	45493	10
Avg. RFC Response Time at Peak Hour (ms)	559	337	-40
Avg. DB Request Time in Dialog Task (ms)	678	117	-83
Avg. DB Request Time for RFC (ms)	187	78	-59
Avg. DB Request Time in Update Task (ms)	330	155	-53
DB Size	2966	627	-79

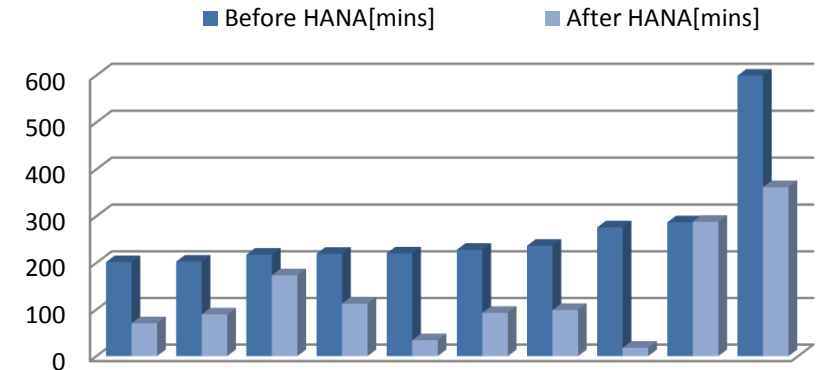# HANA at Volvo – Lessons learnt Performance impacts and benefits

- BW on HANA: Significant performance improvement reported

  - DB size went down from ~ 3 TB to ~650GB (78%)

  - Reporting: 5 to 100x faster

  - Loading of the cubes: up to 48x faster, 5x average

  - Data available couple hours earlier everyday for Asian time zone

Top loading improvements

■ Before HANA[mins]   ■ After HANA[mins]

| 300 |
| 250 |
| 200 |
| 150 |
| 100 |
| 50 |
| 0 |
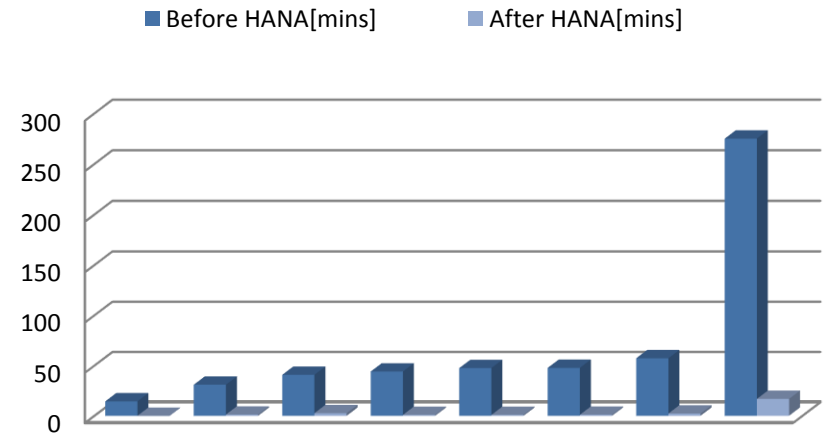
10 Longest Process Chains

■ Before HANA[mins]   ■ After HANA[mins]

| 600 |
| 500 |
| 400 |
| 300 |
| 200 |
| 100 |
| 0 |

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HANA at Volvo – Lessons learnt Performance impacts and benefits

- APO on HANA (small system / few users) (SAP Early Watch Alert report)

  – DB size decreased by 29%

  – Average response time for dialog tasks improved by 37%

Area	Indicators	Oracle	HANA	Change in %
System Performance	Active Users (>400 steps)	5	10	100%
	Avg. Availability per Week	100%	100%	0%
	Avg. Response Time in Dialog Task	502	317	-37%
	Max. Dialog Steps per Hour	302	213	-29%
	Avg. Response Time at Peak Dialog Hour	508	271	-47%
	Max. Number of RFCs per Hour	37	956	2484%
Hardware Capacity	Max. CPU Utilization on DB Server	52%	5%	-90%
Database Performance	Avg. DB Request Time in Dialog Task	47	39	-17%
	Avg. DB Request Time for RFC	110	16	-85%
	Avg. DB Request Time in Update Task	263	73	-72%
Database Space Management	DB Size	77,51	54,9	-29%

HANA at Volvo – Lessons learnt
Performance impacts and benefits

- SPP HANA Proof of Concept

SPP
Monthly
Planning job

Monthly Job duration:
- 55% duration decrease
- 4,5h decrease

Runtime cost reduction estimates: 35% (from ORACLE / AIX to Linux / HANA)
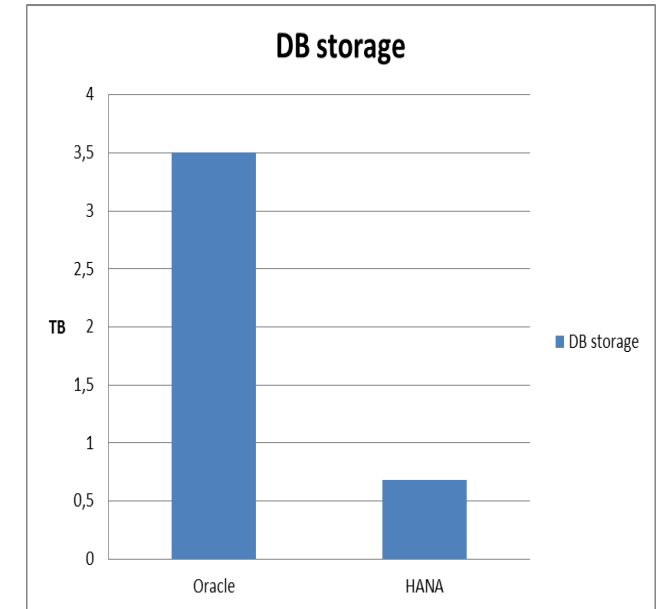
Database footprint:
- From 3.5 TB to 0.68 TB
- 80% decrease

HANA at Volvo – Lessons learnt
Performance impacts and benefits

- ECC (Manufacturing) on HANA (SAP Early Watch Alert report)

  - Average monthly response time was improved by 25%: 1.2 sec to 0.9 Sec

  - Total database size was reduced by 73% (7 TB): 9.7 TB to 2.6 TB

SAP FM Database Growth

Max. available: 5.871TB
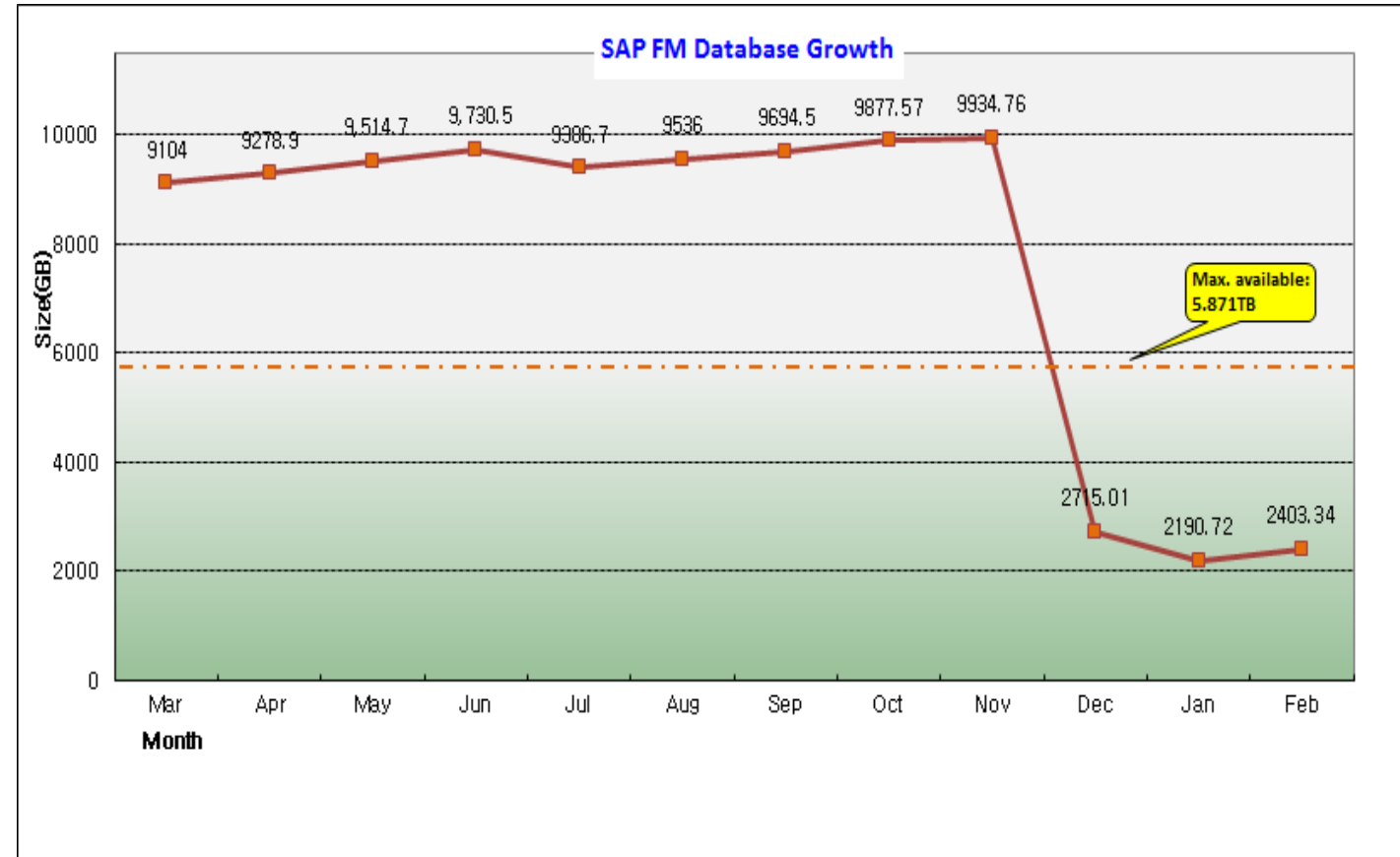
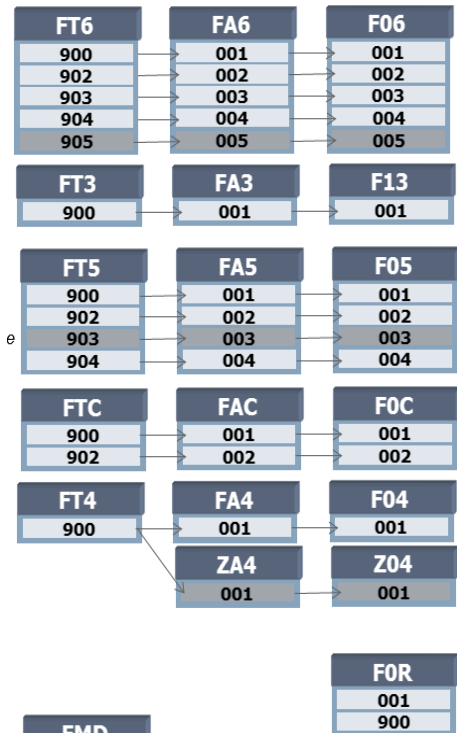# HANA at Volvo – Lessons learnt Finance Landscape Optimization

FROM
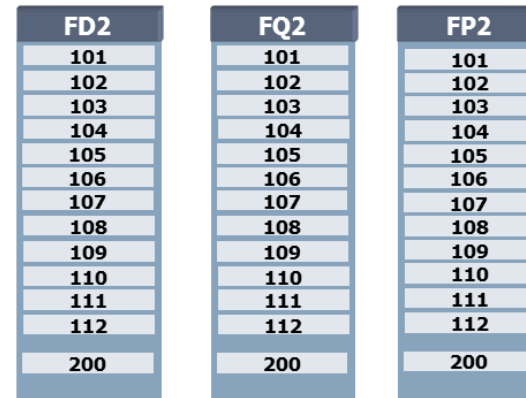- 7 Productive system per regions / Code page
- 13 clients
- ECC 4.7
- DB2

TO
- 1 Productive Global
- 13 clients
- ECC 6.0
- HANA

FROM systems:

FT6	FA6	F06
900	001	001
902	002	002
903	003	003
904	004	004
905	005	005

FT3	FA3	F13
900	001	001

FT5	FA5	F05
900	001	001
902	002	002
903	003	003
904	004	004

FTC	FAC	F0C
900	001	001
902	002	002

FT4	FA4	F04
900	001	001

ZA4	Z04
001	001

F0R
001
900

FMD
900
910

- **Consolidation**
- **HANA migration**
- **Upgrade 4.7 -> 6.0 EHP7**
- **Unicode conversion**

TO systems:

FD2	FQ2	FP2
101	101	101
102	102	102
103	103	103
104	104	104
105	105	105
106	106	106
107	107	107
108	108	108
109	109	109
110	110	110
111	111	111
112	112	112
200	200	200

- Not a pure HANA migration but a large landscape optimization project

- Highly customized and localized application with around 1000 interfaces

- 2 years very expensive project without significant runtime cost savings since solution was operated on DB2

- No fact based feedback around performance improvement yet

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