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SAP in a Nutshell

Technical University Darmstadt

Dr. Oliver Biermann, msg systems ag

TECHNISCHE
UNIVERSITÄT
DARMSTADT

Oliver Biermann

- Study and Ph.D. in Chemistry, Dortmund and Mainz
- 1991: Start of Professional Life at Bayer AG, Leverkusen, Dep. of Information Management
- Later positions as Head of SAP Operation at UCB, Belgium and at Merck Darmstadt
- Since 2013 with msg systems ag
    - Business scope: pharmaceutical industry
    - Project work for mainly large clients, 99% SAP rollout projects
- Responsibilities: Consulting , Sales, Project Management
- Office in Eschborn

Objective/Agenda

You should get a grasp of

- **SAP as a Company**

  – History

  – Competitors and Customers

  – Figures

- **SAP applications for Enterprise Resource Planning**
- **SAP system landscapes and architectures**

Objective/Agenda

You should get a grasp of

- **SAP as a Company**
- **SAP applications for Enterprise Resource Planning**
  - Application Landscape (Controlling, Material Management, Customer, Suppliers, Orders)
- **SAP system landscapes and architectures**

Objective/Agenda

You should get a grasp of

- **SAP as a Company**
- **SAP applications for Enterprise Resource Planning**
- **SAP system landscapes and architectures**
  - Large companies and SAP

SAP as a Company

SAP is leading in enterprise applications by revenue for software and software service.

Based on market capitalization, they are the world's third largest software manufacturer.

- More than 291,000 customers in 190 countries.
- More than 74,500 employees in 130 countries.
- A 43-year history of innovation and growth.
- Annual revenue (IFRS) of € 17 billion €.

1. http://www.sap.com/corporate-de/about/our-company/index.html

History Milestones: The early years

1972	Foundation of the Company "SAP Systemanalyse und Programmentwicklung" by former IBM-employees in Weinheim/Mannheim.	
1973	SAP completes its first software product for financial accounting, called RF.	
	This is the base system which is extended with other modules and will later be called SAP R/1 More clients are acquired from pharmaceutical industries, and tobacco company.	

History Milestones: The early years

1975	Exension and additional modules for purchasing, inventory management, and invoice verification. **Integration of material management with financial accounting.**
1979	SAP R/2 development starts after a technology shift from IBM to Siemens mainframe hardware.
1980	SAP moves into its first own facility in Walldorf.
1981	SAP R/2 achieves high level of stability. Customer base of 200.

History Milestones: The R/2 era

1982	Companies 10th birthday with 250 customers, 100 employees creating 24 DM million in revenue.
1986	Human Ressource module ready for market.
1987	Emerging standards in software production are a reason why SAP begins developing its next software generation: SAP R/3.
1990	1700 employee, 500 DM million revenue
1991	First R/3 pilot: client/server concept, GUI, support for servers of various manufacturers 2700 employee 700 DM million revenue 2200 customers

History Milestones: The R/3 era

1992	SAP brings SAP R/3 to the general public SAP augments its partner strategy with independent consulting firms to support customers in implementing the new R/3 system.
1997	Customers, such as Deutsche Post AG, Daimler-Benz, and General Motors, implement SAP R/3 and join a community with Coca-Cola, Burger King, Deutsche Telekom, … Release 4.0 of R/3 released.
1999	mySAP.com Re-orientation combines e-commerce solutions with SAP's existing ERP applications on the basis of interface and web technologies.
2001	Amongst other acquisitions SAP takes over TopTier, a Israel company for portal solutions, founded by Shai Agassi. mySAP.com becomes the architecture to integrate a wide variety of IT systems.

History Milestones: The "real-time" era

2003 2004	mySAP.com, mySAP evolves into **SAP NetWeaver**
2010	Acquisition of SyBase to boost mobile data use and wireless information management
2011	SAP in-memory computing starts (SAP HANA platform)
2012 -- 2014	Acquisition of cloud-based technology companies: • ARIBA (procurement goods&services) • Successfactors (human resource) • Fieldglass (contingent labor work) and • Concur (travel expenses)

2015

SAP strategy has focus on becoming a cloud company powered by SAP HANA

Additionally integrate products out of various acquisitions like Ariba, Concur, Fieldglass

- SAP HANA with 6,400 licenses in Q1/2015 (ramp up from 1,000 in Q4/2012), corresponds to 800,000 end-users, Real-time taken serious now
- (Other)cloud based solutions outside the classical SAP ERP portfolio

50
Millionen Bankkonten
verwalten SAP-Kunden weltweit.

32.000
Automotoren werden täglich von SAP-Kunden hergestellt.

107
Länder nutzen SAP-Software zum operativen
Betrieb ihrer Streitkräfte.

24
Branchenlösungen
entwickelt die SAP.

4
**Millionen Tonnen
Chemikalien** werden mit
Hilfe von SAP-Lösungen
täglich produziert.

2.200.000
Tonnen Schokolade verarbeiten SAP-Kunden
jährlich. 65 Prozent der weltweiten Schokolade wird
damit mithilfe des Softwareanbieters erzeugt.

40.000.000
Fässer Öl werden von SAP-Anwendern täglich produziert.
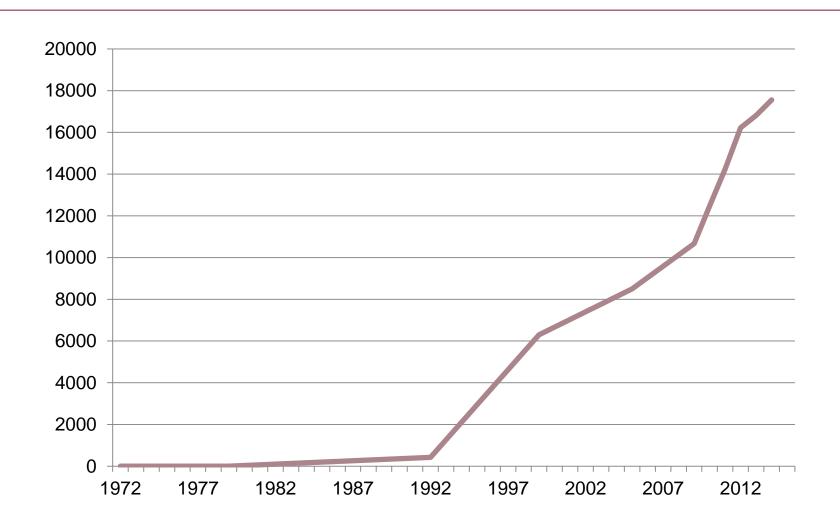
150.000.000.000
Liter Bier werden jährlich von SAP-Kunden produziert.
Das sind 75 Prozent der weltweiten Produktion.

2,5
Milliarden Stromrechnungen
pro Jahr verarbeiten SAP-Kunden.
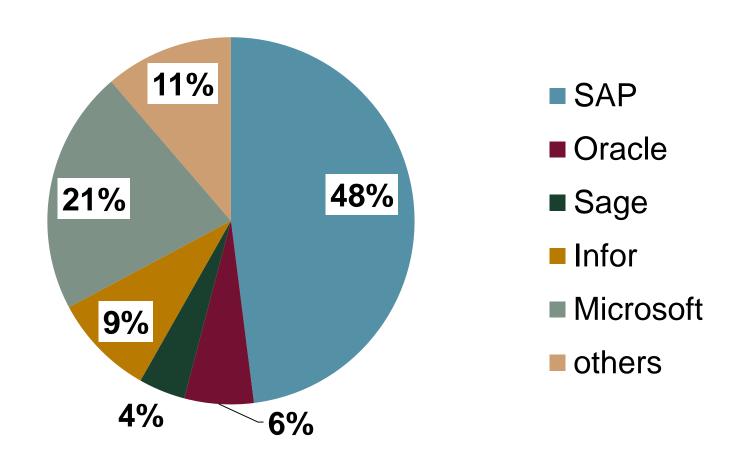
Global Revenue over time (Mio EUR)
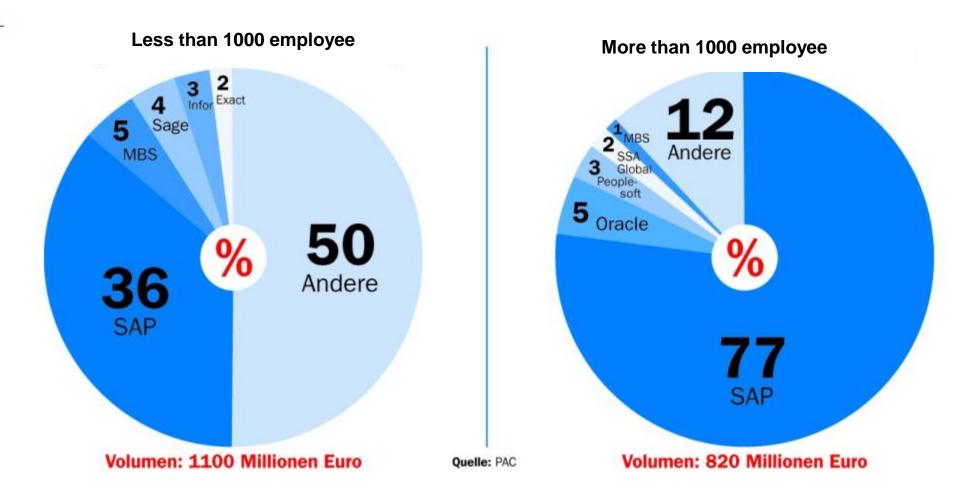
German Market Share (2011, 50+ companies)

Pie chart:
- SAP — 48%
- Oracle — 6%
- Sage — 4%
- Infor — 9%
- Microsoft — 21%
- others — 11%

1. http://www.industrieanzeiger.de/c/document_library/get_file?uuid=89d246e8-6bc1-4923-8721-28fb506a70cc&groupId=12503, Aufgerufen am 2015-05-01
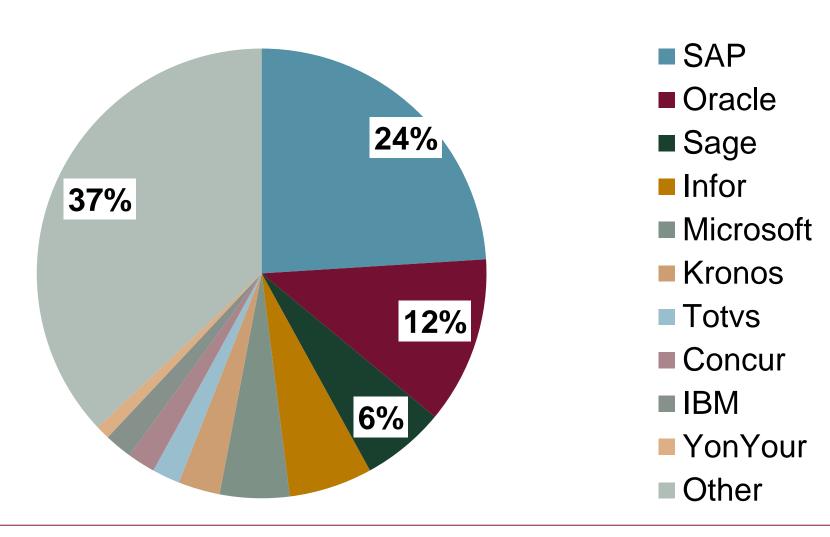
Market share by client's size

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Less than 1000 employee

5 MBS
4 Sage
3 Infor
2 Exact
36 SAP
50 Andere
%
Volumen: 1100 Millionen Euro

Quelle: PAC

More than 1000 employee

1 MBS
2 SSA Global
3 People-soft
5 Oracle
12 Andere
77 SAP
%
Volumen: 820 Millionen Euro
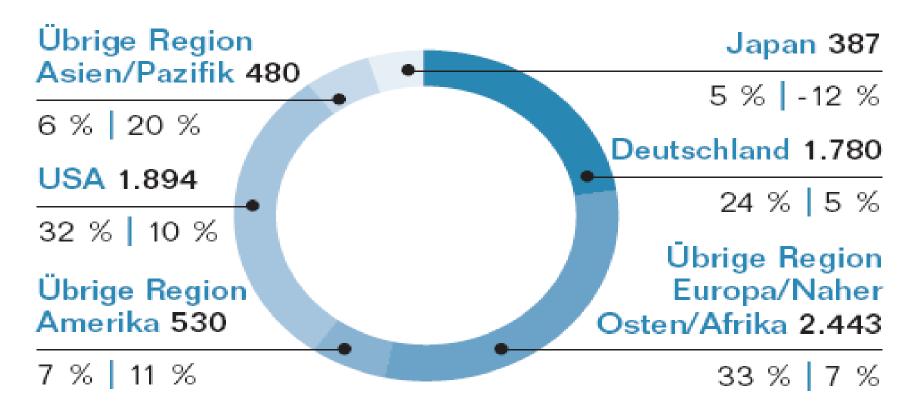
Global Market Share 2013

- ■ SAP
- ■ Oracle
- ■ Sage
- ■ Infor
- ■ Microsoft
- ■ Kronos
- ■ Totvs
- ■ Concur
- ■ IBM
- ■ YonYour
- ■ Other

24%

12%

6%

37%

Revenue 2004 by country/region
in Mio. EUR | Percent | change to 2003

Übrige Region Asien/Pazifik 480
6 % | 20 %

USA 1.894
32 % | 10 %

Übrige Region Amerika 530
7 % | 11 %

Japan 387
5 % | -12 %

Deutschland 1.780
24 % | 5 %

Übrige Region Europa/Naher Osten/Afrika 2.443
33 % | 7 %

Revenue 2011 by country/region
in Mio. EUR

USA	Germany
3,699	2,347
Rest of Americas	Rest of EMEA
1,392	4,644
Rest of APJ	Japan
1,499	652

Growth realized abroad

Revenue by Region in € millions				
	2004	**2011**	**Growth Rate**	
GERMANY	1780	2347	567	32%
Rest EMEA	2443	4644	2201	90%
USA	1894	3699	1805	95%
Rest Americas	530	1392	862	163%
APJ	480	1499	1019	212%

Summary

- About 43yr history
- Extreme grow, starting from Europe, now most of revenue abroad, e.g. in Asia Pacific
- Something happened ~1992
- trends towards cloud services and hosted solutions like SAP HANA

SAP Applications (mainly ERP)

Definition ERP

- Integrated package of different business applications, usually bundled within one system.

- "real-time" as promoted key feature.

- Often with a module based architecture

- Covers most aspects of business administration and management (e.g. Finances, Sales, Procurement, Production, Human Resource, …)

- Integration of business processes (often via central database)

- possibilities for analysis and controlling

Usual Design Features

- Transactional, Based on (relational) Database

Workplaces

Price   Transport Routes

Inspection Plans   Chart of Accounts

Stock

Material   Certificates

BOMS   Staff

Deliveries

Inventory   Business Partner

Workplans

Bins   Validity Ranges

RMDB

Screen Shot Transaction – Sales Order

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Terminauftrag 1 ändern: Übersicht

🔄 ✅ | 🔲 | 🗗 🖨 | 🗗 🖋 | ▦ Aufträge

Terminauftrag	1	Nettowert	4,00	EUR
Auftraggeber	1	msg Kunde / Dammtorwall 7-9 / 22523 Hamburg	📄	
Warenempfänger	1	msg Kunde / Dammtorwall 7-9 / 22523 Hamburg		
Bestellnummer	Test123	Bestelldatum	16.03.2015	🔍

Verkauf	Positionsübersicht	Positionsdetail	Besteller	Beschaffung	Versand	Absagegrund

Wunschlieferdat	T 16.03.2015	AusliefWerk	
☐ Komplettlief.		Gesamtgewicht	4 KG
Liefersperre	▼	Volumen	0,000
Fakturasperre	▼	Preisdatum	16.03.2015
Zahlungskarte		Gültig bis	
Kart.verif.code			
Zahlungsbed	0001 sofort zahlbar ohne...	Incoterms	DDP Geliefert, Verzollt
Auftragsgrund	▼		

Alle Positionen

Pos	Material	Auftragsmenge	ME	E	Bezeichnung	Ptyp	GG...	Üb.Pos	L	1.Datum	W...	KArt	Betrag	Wä...	Nettopreis	pro
10	29	2	ST	☑	Kochtopf	TAN		0	T	16.03.2015	2000	PR00	2,00	EUR	2,00	
				☐					T	16.03.2015						
				☐					T	16.03.2015						
				☐					T	16.03.2015						
				☐					T	16.03.2015						
				☐					T	16.03.2015						

◀ ▶ ▢

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Sales Order – Link...

Terminauftrag 1 ändern: Üb...

Terminauftrag	1
Auftraggeber	1
Warenempfänger	1
Bestellnummer	Test123

Table KNA1 - Kundenstamm

Tabelle:	KNA1			
Angezeigte Felder: 13 von 181		Feststehende Führungsspalten: [2]		

	MANDT	KUNNR	LAND1	NAME1	ORT01
☐	719	0000000001	DE	msg Kunde	Hamburg
☐	719	0000000002	DE	Werk 1000	Ismaning
☐	719	0000000003	DE	Werk 2000	Ismaning

Verkauf | Positionsübersicht | Posit...

Wunschlieferdat	T 16.03.2015	AusliefWerk	
☐ Komplettlief.		Gesamtgewicht	
Liefersperre			
Fakturasperre			
Zahlungskarte			
Kart.verif.code			
Zahlungsbed	0001 s...		
Auftragsgrund			

Table VBKD – payment terms

ZBed	Eigene Erläuterung
0001	sofort zahlbar ohne Abzug
0002	innerhalb von 14 Tagen 2 % Skonto
	innerhalb von 30 Tagen ohne Abzug
0003	innerhalb von 14 Tagen 3 % Skonto
	innerhalb von 20 Tagen 2 % Skonto
	innerhalb von 30 Tagen ohne Abzug
0004	sofort zahlbar ohne Abzug
	Basisdatum am Ende des Monats
0005	sofort zahlbar ohne Abzug
	Basisdatum am 10. des Folgemonats

Alle Positionen

Pos	Material	Auftragsmenge	...	Art	Betrag	Wä...	Nettopreis	pro
10	29			R00	2,00	EUR	2,00	

Sales Order – Linked Transactions

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Terminauftrag 1 ändern: Übersicht

🗗 ✖ | 🔄 | 🗐 👤 | 🗗 ⚙ | 📊 Aufträge

Terminauftrag	1		Nettowert	4,00	EUR	📄
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Verkauf	Positionsübersicht	Positionsdetail	Besteller	Beschaffung	Versand	Absagegrund

Wunschlieferdat	T	16.03.2015	AusliefWerk		
☐ Komplettlief.			Gesamtgewicht	4	KG
Liefersperre		▼	Volumen	0,000	
Fakturasperre		▼	Preisdatum	16.03.2015	
Zahlungskarte			Gültig bis		
Kart.verif.code					
Zahlungsbed	0001	sofort zahlbar ohne …	Incoterms	DDP	Geliefert, Verzollt
Auftragsgrund					

Material

Alle Positionen

Pos	Material	Auftra...	
10	29		

Tabelle:	MARA				
Angezeigte Felder: 22 von 218		Feststehende Führungsspalten: 2		Listbre	

MANDT	MATNR	ERSDA	ERNAM	LAEDA	AENAM	VPS
719	00000000000000002	26.11.2014	STRICKEH	26.11.2014	STRICKEH	KDL
719	00000000000000011	16.02.2015	STRICKEH	04.05.2015	STRICKEH	KLD
719	00000000000000013	16.02.2015	STRICKEH	28.04.2015	STRICKEH	KLB
719	00000000000000014	16.02.2015	STRICKEH	19.02.2015	STRICKEH	KLB
719	00000000000000015	16.02.2015	STRICKEH	19.02.2015	STRICKEH	KLB
719	00000000000000016	16.02.2015	STRICKEH	19.02.2015	STRICKEH	KLB
719	00000000000000017	16.02.2015	STRICKEH	19.02.2015	STRICKEH	KLB

Screen Shot

Delivery Block / Customizing

Terminaufti
Auftraggeb
Warenempf
Bestellnumr

Verka

Komplettlie
Liefersperr
Ges.Statu

Alle Pos

Pos
1

Lieferungen: Sperrgründe/-Umfang

LS	Liefersperrebezeichn	SpAuf	SpBed	SpDrk	Sp.LiVor	Sperr	Sperr
01	Kreditlimit	☐	✔	☐	☐	✔	✔
02	Politische Gründe	☐	☐	☐	☐	☐	☐
03	Engpaßmaterial	☐	☐	☐	☐	☐	☐
04	Exportpapiere fehlen	☐	☐	☐	☐	☐	☐
05	Kostenl.Lief.prüfen	☐	☐	☐	☐	☐	☐
06	Kein Druck	☐	☐	✔	☐	☐	☐
07	Mengenänderung	☐	☐	☐	☐	☐	☐
08	Kanban-Lieferung	✔	☐	☐	✔	☐	☐
09	JIT-Lieferung (PAB)	✔	☐	☐	✔	☐	☐

Liefersperre	Absa

Engpaßmaterial
Exportpapiere fehlen
JIT-Lieferung (PAB)
Kanban-Lieferung
Kein Druck
Kostenl.Lief.prüfen
Kreditlimit
Mengenänderung
Politische Gründe

Definition ERP - Benefits

- **Allows the integration along the value-added chain**

- **Allows decision making along all hierarchies**

SAP ERP Solution Map and Applications

- SAP ERP (or ECC) is the core component of SAPs software

- The functionality is ordered into modules such as MM for Material Management, SD for Sales and Distribution or FI for Finance, …

- These modules are called within different business processes (often called end-to-end processes)

End-User Service Delivery				
Analytics	Strategic Enterprise Management	Financial Analytics	Operations Analytics	Workforce Analytics
Financials	Financial Supply Chain Management	Financial Accounting	Management Accounting	Corporate Governance
Human Capital Management	Talent Management	Workforce Process Management		Workforce Deployment
Procurement and Logistics Execution	Procurement	Supplier Collaboration	Inventory and Warehouse Management	Inbound and Outbound Logistics	Transportation Management
Product Development and Manufacturing	Production Planning	Manufacturing Execution	Enterprise Asset Management	Product Development	Life-Cycle Data Management
Sales and Service	Sales Order Management	Aftermarket Sales and Service	Professional-Service Delivery	Foreign-Trade Management	Incentive and Commission Management
Corporate Services	Real Estate Management	Project Portfolio Management	Travel Management	Environment, Health and Safety	Quality Management
SAP NetWeaver	People Integration	Information Integration	Process Integration	Application Platform

SAP ERP Solution Map and Applications

	End-User Service Delivery			
Analytics	Strategic Enterprise Management	Financial Analytics	Operations Analytics	Workforce Analytics
Financials	Financial Supply Chain Management	Financial Accounting	Management Accounting	Corporate Governance
Human Capital Management	Talent Management	Workforce Process Management		Workforce Deployment
Procurement and Logistics Execution	Procurement / Supplier Collaboration	Inventory and Warehouse Management	Inbound and Outbound Logistics	Transportation Management
Product Development and Manufacturing	Production Planning / Manufacturing Execution	Enterprise Asset Management	Product Development	Life-Cycle Data Management
Sales and Service	Sales Order Management / Aftermarket Sales and Service	Professional-Service Delivery	Foreign-Trade Management	Incentive and Commission Management
Corporate Services	Real Estate Management / Project Portfolio Management	Travel Management	Environment, Health and Safety	Quality Management
SAP NetWeaver	People Integration	Information Integration	Process Integration	Application Platform

Ok SAP – You customer wants to buy a cup of coffee, where to start?

You need to be able to sell coffee.

End-to-End process: Order to Cash

You need to be able to sell coffee.

End-to-End process: Order to Cash

You need to brew coffee

End-to-End process: Plan to Produce

Plan to Produce:	Material Master Data	Demand Forecast	Capacity/Production Planning

Buy Raw Material	Production Order	Release product	Stock Product

You need to brew coffee

End-to-End process: Plan to Produce

Plan to Produce:	Material Master Data	Demand Forecast	Capacity/Production Planning

Purchase to Pay	Production Order	Release product	Stock Product

You need to have beans and hot water

End-to-End process: Purchase to Pay

| Purchase to Pay: | Vendor Master Data | Identify Need | Tender and Quotation |

| Purchasing Order | Receive Material | Stock Product | Pay |

Ok, now you have hot water, you have beans, you can write invoices and you can pay your bills.

Your have defined your business' value-added-chain.

| Order to Cash | Purchase to Pay | Plan to Produce |
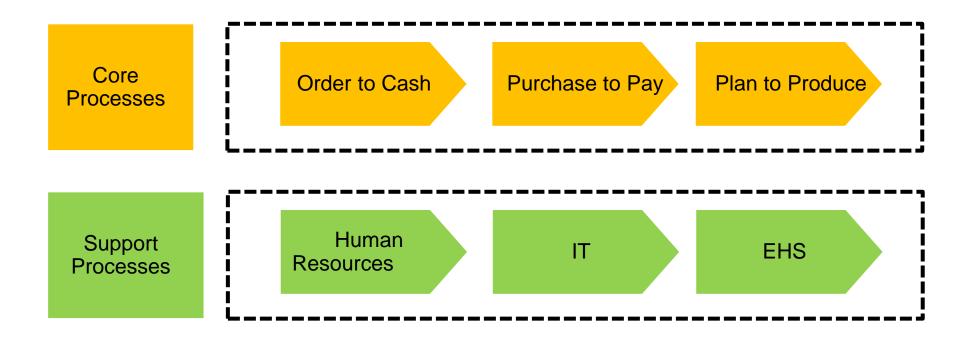
But you still need to hire the barista

Core and Support Processes

Core Processes

Order to Cash → Purchase to Pay → Plan to Produce

Support Processes

Human Resources → IT → EHS
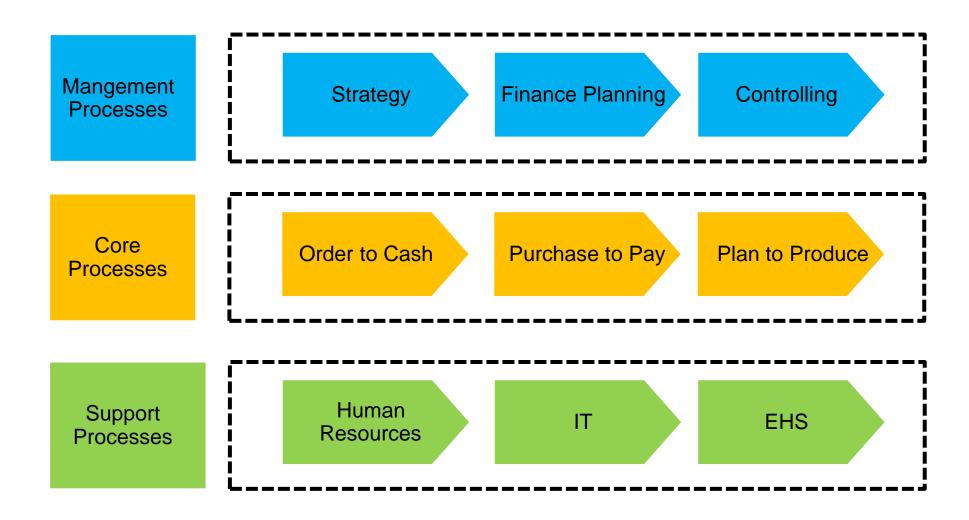
Does your company earn money?

Management Processes on top of it

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Mangement Processes	Strategy → Finance Planning → Controlling
Core Processes	Order to Cash → Purchase to Pay → Plan to Produce
Support Processes	Human Resources → IT → EHS

SAP ERP Solution Map and Applications

	End-User Service Delivery			
Analytics	Strategic Enterprise Management	Financial Analytics	Operations Analytics	Workforce Analytics
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Human Capital Management	Talent Management	Workforce Process Management		Workforce Deployment
Procurement and Logistics Execution	Procurement	Supplier Collaboration	Inventory and Warehouse Management	Inbound and Outbound Logistics	Transportation Management
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Sales and Service	Sales Order Management	Aftermarket Sales and Service	Professional-Service Delivery	Foreign-Trade Management	Incentive and Commission Management
Corporate Services	Real Estate Management	Project Portfolio Management	Travel Management	Environment, Health and Safety	Quality Management
SAP NetWeaver	People Integration	Information Integration	Process Integration	Application Platform

EPR and some of it's modules and sub-modules

- FI – Finance
- CO – Controlling
- MM – Material Management
- PP – Production Planning
- PS – Project System
- WM – Warehouse Management
- QM – Quality Management
- SD – Sales and Distribution
- PM – Plant Maintenance

EPR and some of it's modules and sub-modules

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GL- General Ledger
AP- Acconts Payable / Kreditoren
AR- Accounts Receivable / Debitoren
AA – Assest Accounting
SL – Special Ledger
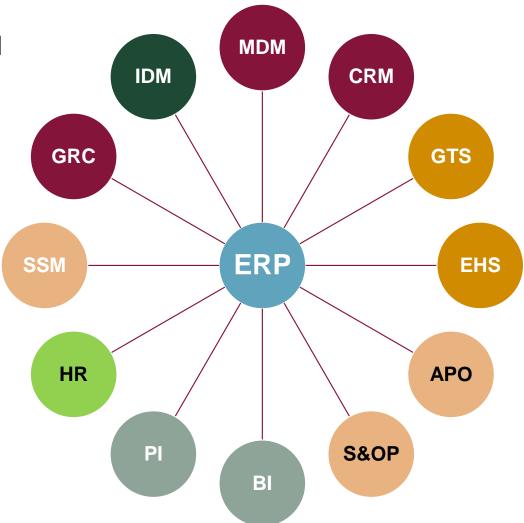
SD
CO
FI
ERP
MM
M
PP

FI-GL
FI-AP
FI-AR
RI-AA
FI-SL

EPR and some of it's modules is not enough

Systems/Modules around ERP
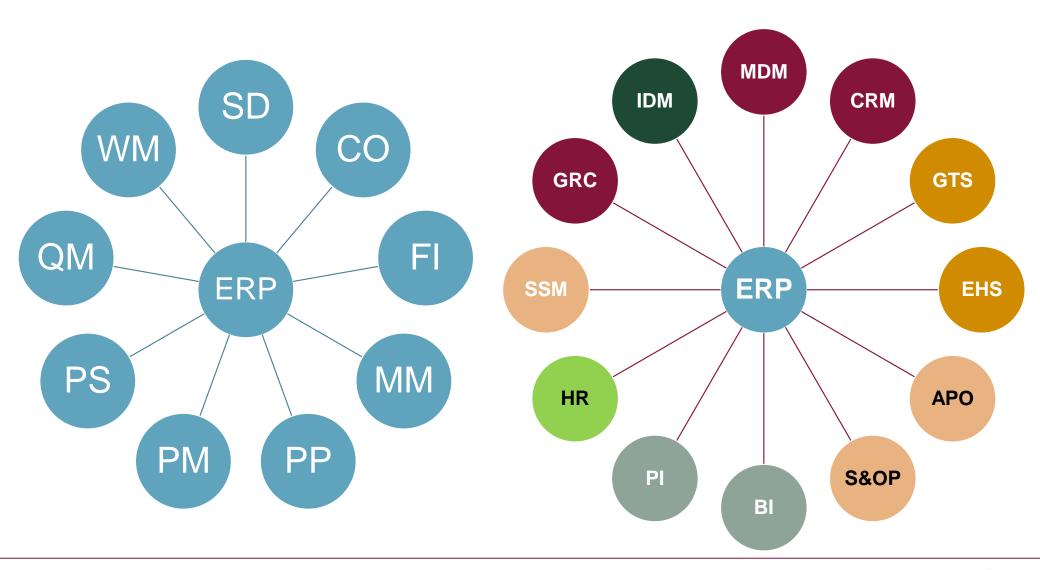
Sample: The delivery

If you plan to deliver something to a customer – say coffee again

First of all you need to have your master data ready:

Your materials:

- Water, beans, milk

Your equipment:

- Mill, coffee maker

Your Customers:

- Name, address

MDM

SAP CRM

Your sales team wants to have a holistic view about your customers:

- What did they order in the past?
- Loyalty points?
- Favorite product,
- Did he pay all this bills in the past, open invoices?
- Telephone integration, fast identification of customers.

- Is the product available to promise?

- **Generate a proposal/offer and create the sales order in SAP ERP**

CRM

ERP
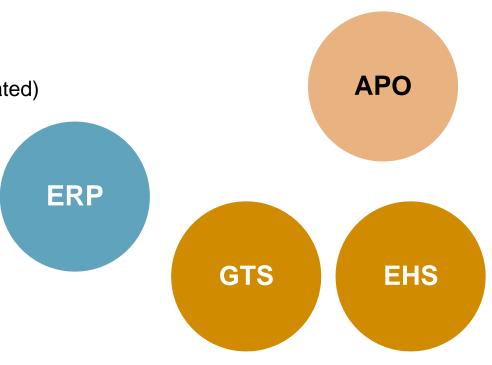
- EPR receives the sales order and promised delivery date

- Stock is checked and/or
- Production is started (production order created)

- Prod order executed
- Raw Material consumed
- Delivery is created in ERP
- Delivery is checked

- Product commissioned
- And Delivery is set to outbound.

APO

ERP

GTS   **EHS**

Other SAP Systems

Advanced Planning and Optimization	Global Trade Services	Environment, Health & Safety
• Demand Planning – takes into account details like safety stock, marketing initiatives, current sales and sales forecast • Available-to-Promise checks production and distribution/delivery times and thresholds. • Sourcing lead times	• Import and Export Compliance • Check of customers, countries against boycott lists and embargos • License checks • Automates customs declarations	• Safety Data Sheets creation and distribution • Occupational Health • Dangerous Goods Declarations

SAP ERP

- Product commissioned

- And Delivery is set to outbound.

- Invoice created

- Payment checked

Business Intelligence
• Merging data
• Memory layer to recreate reports from the past
• Large-data capability
• Aggregated multi-company reporting

- Dunning started if payment is late.

- Data Exported to Business Intelligence / Warehouse Systems

Summary

- The central SAP system is the Enterprise Resource Planning (ERP or ECC)
- It has various interacting modules
- And may be enhanced with various additional "special purpose" systems

SAP landscapes and architectures
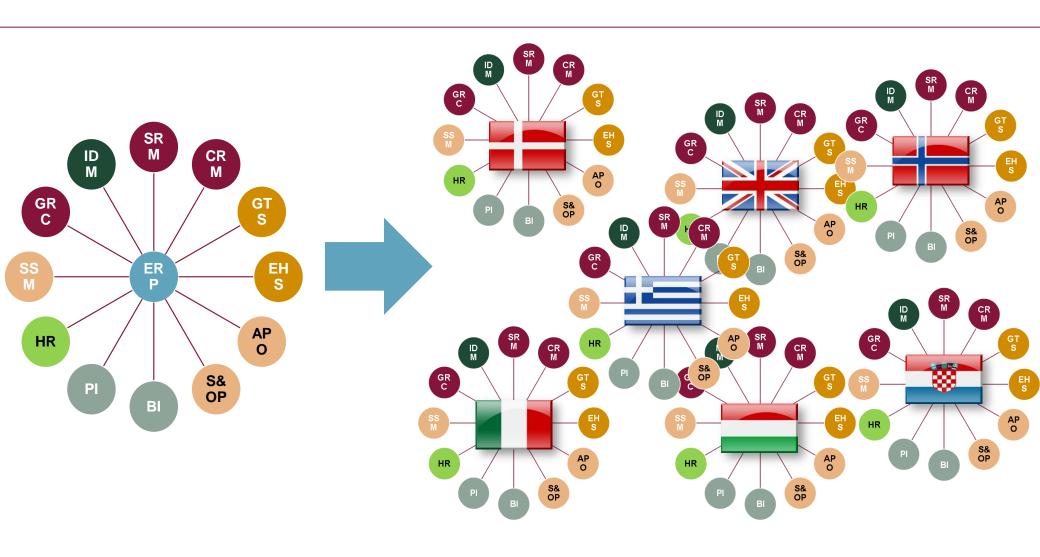
SAP System landscapes

- So far this was the "single business" case
- What about an international group with many companies?
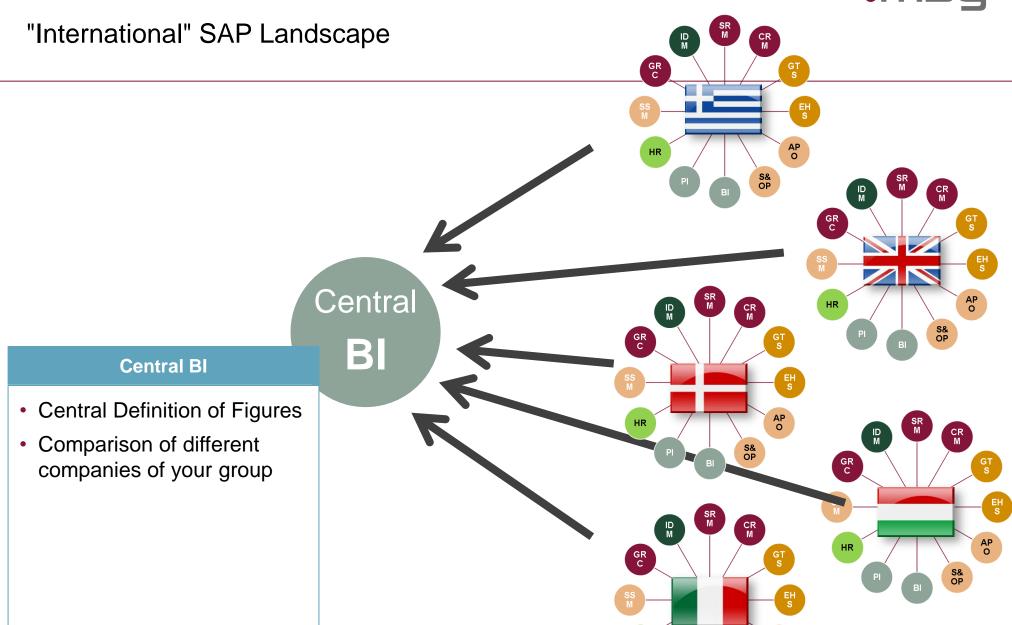
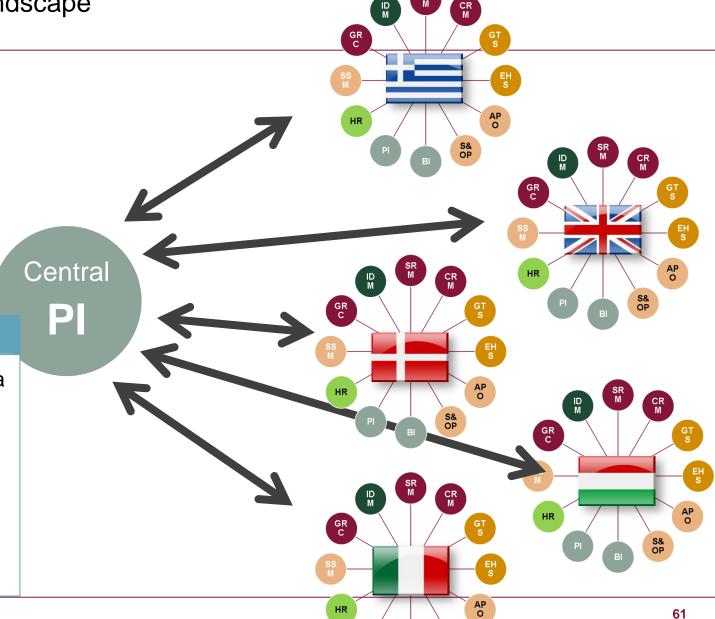- They move from the single ERP to a more complex system landscape:

SAP Landscape

"International" SAP Landscape

Central BI

- Central Definition of Figures
- Comparison of different companies of your group
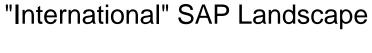
"International" SAP Landscape

Central PI

- Process Integration for Data Exchange
- E.G. Invoices, Material Movements
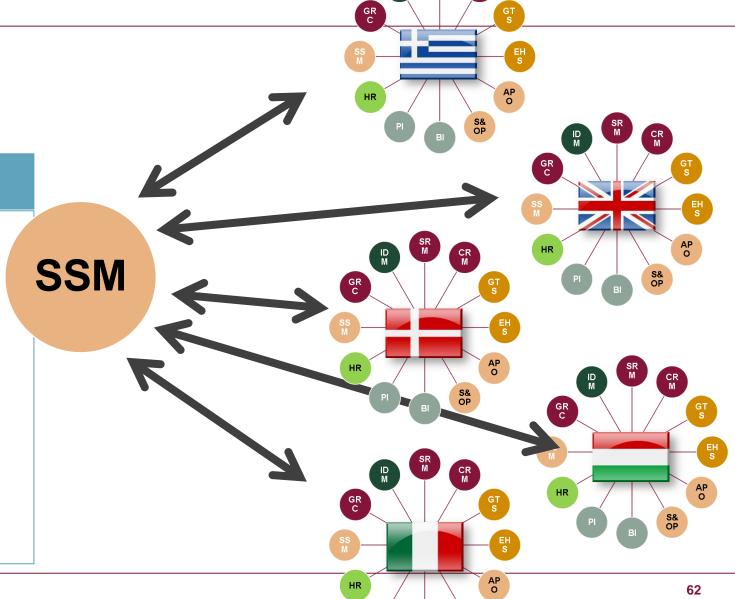
"International" SAP Landscape

SAP Solution Manager

SSM
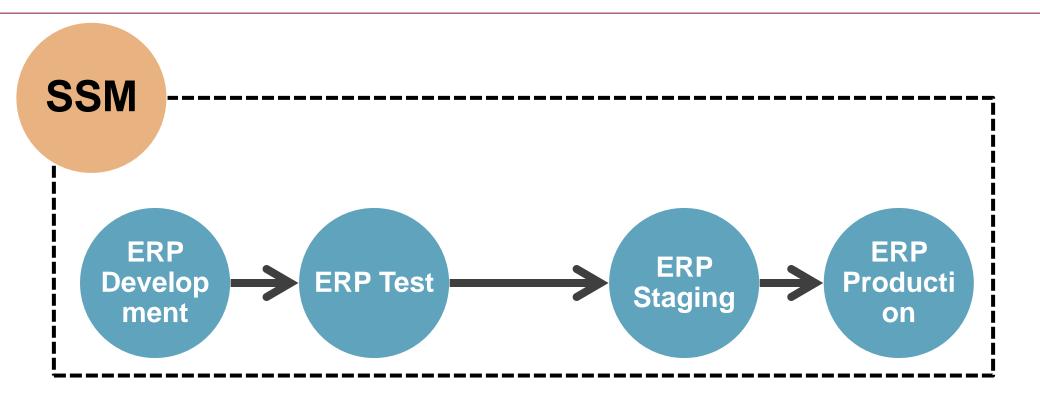
- Central technical management of the overall landscape
- Monitoring
- Distribution of changes/developments
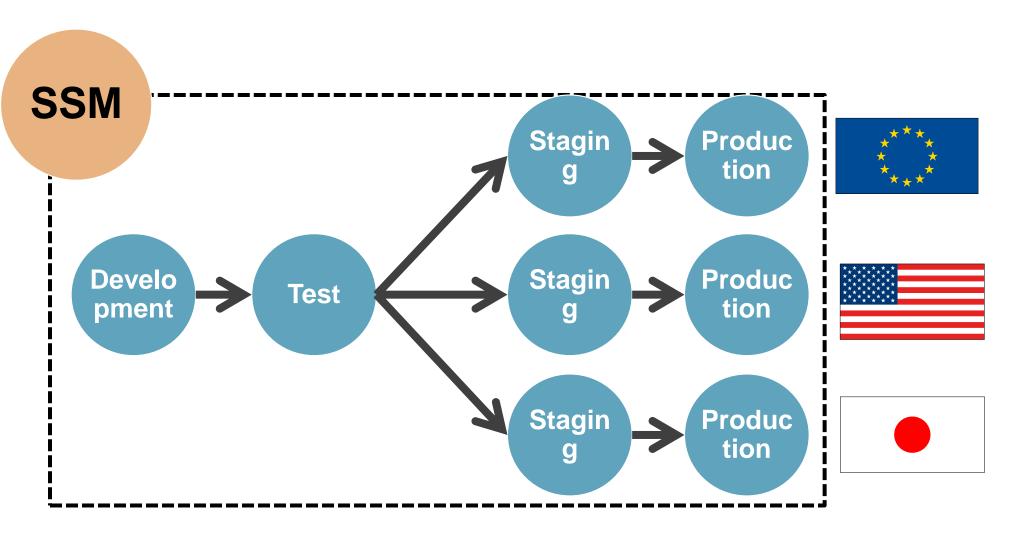- Incident/Test/Problem Management, full ITIL capabilities

SAP Solution Manager – Transport Management/Changes

Summary

- SAP ERP can be used as standalone system

- But is usually complemented with several "expert"-systems for non-transactional tasks

- A typical system landscape may consist out of several (dozen) individual servers

Oliver Biermann
Lead Business Consultant

oliver.biermann@msg-systems.com