# Chapter 2:
Enterprise Systems (ES)

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Evolution of Enterprise Systems

- Enterprise systems have evolved from stand-alone systems to distributed systems.
- ES include *hardware*, *software*, and a *database*.
- Stages of ES evolution:-
1) Stand-Alone Mainframe Systems
2) Client-Server Architecture
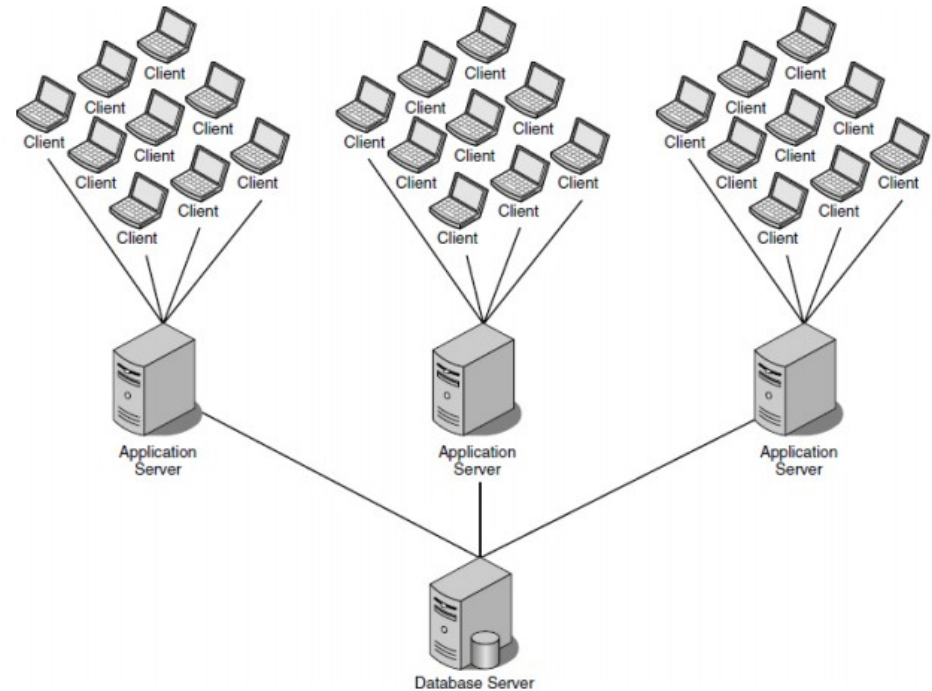3) Service-Oriented Architecture
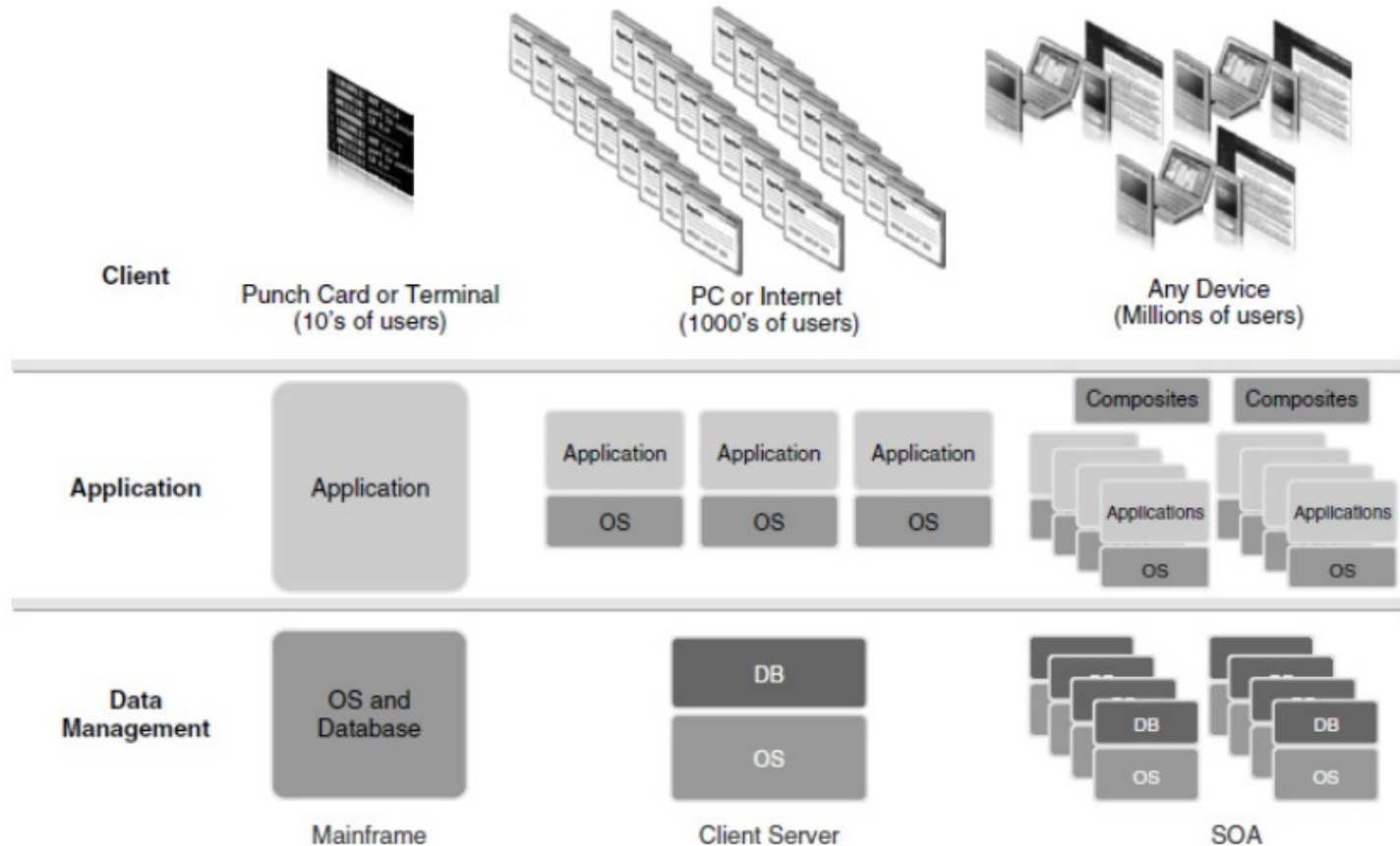
Stage 1: Mainframe Systems

- In the early days of ES, hardware typically consisted of **large, expensive** mainframe computers.

- Software includes **specialized operating system** software, **custom applications** that provide capabilities needed to complete specific tasks etc.

- Early **databases** were extremely complex and difficult to manage.

- They had to use a terminal that was physically connected to the mainframe to input commands to the system using punch cards.

- Drawbacks of the mainframe architecture are its limited scalability, unable to be easily used by other companies etc.

- The early ES has packaged applications instead of proprietary applications, the concept being pioneered by SAP in 1972,

Stage 2: Client-Server Architecture

- Three components or layers are called the presentation layer, application layer, and data layer .

- The shift to the three-tier client server dramatically reduced the costs of acquiring, implementing, and using an ES while significantly increasing the scalability of the systems.

Stage 3: Service-Oriented Architecture

- Web-enabled their three-tier applications so that users could access the systems through a Web browser.

- By using Web services, companies could now integrate several client-server applications and create an enterprise mashup , or composite applications.

- Companies such as SAP have invested billions of dollars to service-enable their core ES so that these systems can be exposed and connected to an infinite number of composite applications and third-party ES.
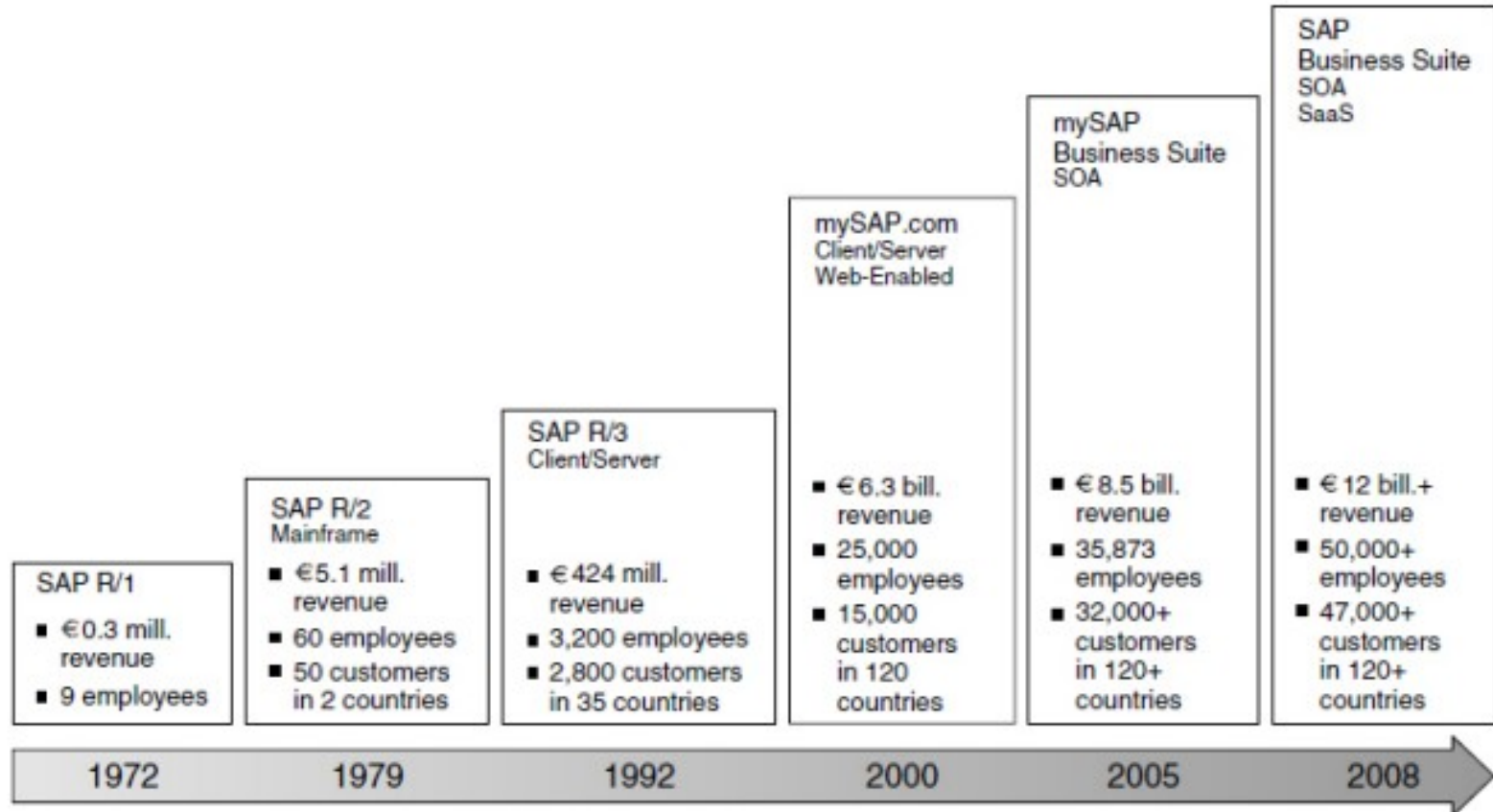
Types Of Enterprise Systems

- Enterprise resource planning (ERP) systems
- Best-of-breed applications
- Niche applications

Types Of Data In Es

- Transaction Data

- Master Data

- Organizational Data

SAP OVERVIEW

SAP R/1
- € 0.3 mill. revenue
- 9 employees

SAP R/2
Mainframe
- € 5.1 mill. revenue
- 60 employees
- 50 customers in 2 countries

SAP R/3
Client/Server
- € 424 mill. revenue
- 3,200 employees
- 2,800 customers in 35 countries

mySAP.com
Client/Server
Web-Enabled
- € 6.3 bill. revenue
- 25,000 employees
- 15,000 customers in 120 countries

mySAP
Business Suite
SOA
- € 8.5 bill. revenue
- 35,873 employees
- 32,000+ customers in 120+ countries

SAP
Business Suite
SOA
SaaS
- € 12 bill.+ revenue
- 50,000+ employees
- 47,000+ customers in 120+ countries

| 1972 | 1979 | 1992 | 2000 | 2005 | 2008 |

SAP ERP

End-User Service Delivery							
Analytics	Financial Analytics			Operations Analytics		Workforce Analytics	
Financials	Financial Supply Chain Management		Treasury	Financial Accounting	Management Accounting	Corporate Governance	
Human Capital Management	Talent Management			Workforce Process Management		Workforce Deployment	
Procurement and Logistics Execution	Procurement		Inventory and Warehouse Management	Inbound and Outbound Logistics		Transportation Management	
Product Development and Manufacturing	Production Planning		Manufacturing Execution	Product Development		Life-Cycle Data Management	
Sales and Service	Sales Order Management		Aftermarket Sales and Service		Professional-Service Delivery		
Corporate Services	Real Estate Management	Enterprise Asset Management	Project and Portfolio Management	Travel Management	Environment, Health, and Safety Compliance Mgmt.	Quality Management	Global Trade Services

Shared Service Delivery

SAP NetWeaver

SAP Application Suite
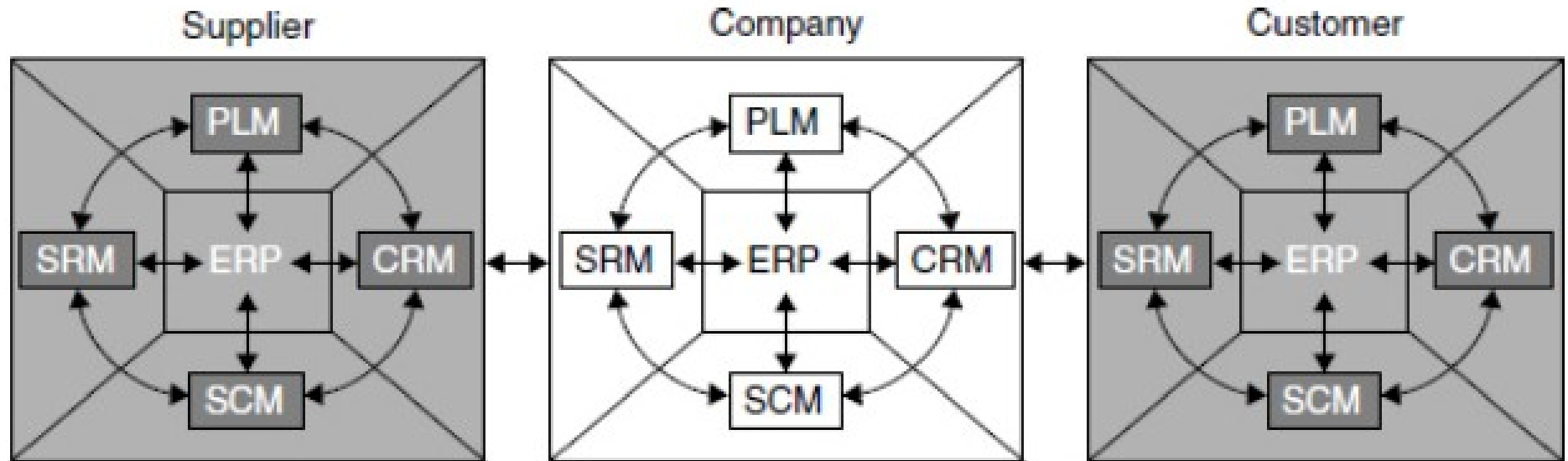
SAP SCM

Demand & Supply Planning	Demand Planning & Forecasting	Safety Stock Planning	Supply Network Planning	Distribution Planning	Service Parts Planning
Procurement	Strategic Sourcing		Purchase Order Processing		Invoicing
Manufacturing	Production Planning & Detailed Scheduling		Manufacturing Visibility & Execution & Collaboration		MRP based Detailed Scheduling
Warehousing	Inbound Processing & Receipt Confirmation	Outbound Processing	Cross Docking	Warehousing & Storage	Physical Inventory
Order Fulfillment	Sales Order Processing		Billing		Service Parts Order Fulfillment
Transportation	Freight Management	Planning & Dispatching	Rating & Billing & Settlement	Driver & Asset Management	Network Collaboration
Real World Awareness	Supply Chain Event Management		Auto ID / RFID and Sensor Integration		
Supply Chain Visibility	Strategic Supply Chain Design	Supply Chain Analytics	Supply Chain Risk Management	Sales & Operations Planning	
Supply Network Collaboration	Supplier Collaboration		Customer Collaboration		Outsourced Manufacturing
Supply Chain Management with Duet	Demand Planning in MS Excel				

SAP NetWeaver

SAP SRM

Purchasing Governance	Global Spend Analysis		Category Management		Compliance Management		
Sourcing	Central Sourcing Hub		RFx / Auctioning		Bid Evaluation & Awarding		
Contract Management	Legal Contract Repository	Contract Authoring	Contract Negotiation		Contract Execution	Contract Monitoring	
Collaborative Procurement	Self-Service Procurement		Services Procurement	Direct / Plan-Driven Procurement		Catalog Content Management	
Supplier Collaboration	Web-based Supplier Interaction		Direct Document Exchange		Supplier Network		
Supply Base Management	Supplier Identification & Onboarding		Supplier Development & Performance Management		Supplier Portfolio Management		

SAP NetWeaver

SAP PLM

Product Management	Product Strategy and Planning	Product Portfolio Management	Innovation Management	Requirements Management	Market Launch Management	SAP NetWeaver
Product Development and Collaboration	Engineering, R&D Collaboration	Supplier Collaboration	Manufacturing Collaboration	Service and Maintenance Collaboration	Product Quality Management	Product Change Management
Product Data Management	Product Master and Structure Management	Specification and Recipe Management	Service and Maintenance Structure Management	Visualization and Publications	Configuration Management
PLM Foundation	Product Compliance	Product Intelligence	Product Costing	Tool and Workgroup Integration	Project and Resource Management	Document Management

SAP CRM

Marketing			Marketing Resource Management	Segmentation & List Management	Campaign Management	Real-Time Offer Management	Lead Management		
Sales	Web Channel	Interaction Center	Partner Channel Management	Sales Planning & Forecasting / Sales Performance Management / Territory Management	Accounts & Contacts / Opportunity Management	Quotation & Order Management	Pricing & Contracts	Incentive & Commission Management	Time & Travel
Service			Service Order Management / Service Contract Management	Complaints & Returns / In-House Repair / Case Management	Installed Based Management	Warranty Management	Resource Planning	Business Communication Management	Trade Promotion Management

Bibliography

- Jeffery & R. Simha, Essentials of Business Process and Information Systems