ERP Architecture through 3 eras

- **Mainframe**
  - ABAP R/2
- **Client/server**
  - 3-Tier Client/Server R/3 Basis
- **Int. business processes**
- **Adaptable business**
- **Enterprise Services Architecture**
  - SAP NetWeaver
  - mySAP Business Suite, SAP xApps
  - SAP NetWeaver: Integration and Application Platform for Lower TCO

Business Requirements

Technology Advances
SAP Business Suite

Lifecyle Data, Project, Quality, and Asset Management

Purchasing

Inventory/Warehouse Management, Manufacturing, Transportation

Inter-business Integration
NetWeaver

Foundational technology platform for SAP systems. Primary role: integration in four dimensions.

NetWeaver “fridge” illustrating “PIPA”

NetWeaver enables the Enterprise Services Architecture (ESA)—a bundle of ERP functionality that deploys business functionality while enforcing business rules.

Classes of data within Enterprise Information System

**Organizational Data**—represents entities that compose an organization’s structure and their relationships with one another.

**Master Data**—relatively fixed data that is shared across and among business processes.

**Transaction Data**—data resulting from executing business process steps. Based on ‘facts’ related to the actual process (situational data).
### Mapping our organization to ERP Organizational data

<table>
<thead>
<tr>
<th>Our Structure</th>
<th>SAP ERP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conglomerate</td>
<td>Client</td>
</tr>
<tr>
<td>Company</td>
<td>Subsidiary</td>
</tr>
<tr>
<td>Factory</td>
<td>Distribution Center</td>
</tr>
<tr>
<td>Sales Structure</td>
<td>Sales Organization</td>
</tr>
<tr>
<td>Product Line</td>
<td>Division</td>
</tr>
<tr>
<td>Warehouse Storage Room</td>
<td>Storage Location</td>
</tr>
</tbody>
</table>

### Mapping ERPsim to ERP Organizational data

<table>
<thead>
<tr>
<th>Our Structure</th>
<th>SAP ERP</th>
</tr>
</thead>
<tbody>
<tr>
<td>German Muesli Inc.</td>
<td>Client</td>
</tr>
<tr>
<td>Berlin Muesli</td>
<td>Company Code</td>
</tr>
<tr>
<td>Berlin Plant</td>
<td>Plant</td>
</tr>
<tr>
<td>Berlin Sales</td>
<td>Sales Organization</td>
</tr>
<tr>
<td>Dry cereal</td>
<td>Division</td>
</tr>
<tr>
<td>Finished Goods Storage</td>
<td>Storage Location</td>
</tr>
<tr>
<td>Raw Materials Storage</td>
<td></td>
</tr>
</tbody>
</table>
**Key Organizational Elements**

**Client:** self-contained unit in an SAP system with separate master records and complete set of database tables.

- Root of the organizational hierarchy. Highest organizational element.
- All related companies contained in the same client.
- Generally one client per SAP production instance.
- Master data is created at the client level.
- Some configuration and data elements can span across multiple clients within the same database. Most cannot.

**Company Code:** a distinct legal entity contained within an ERP system.

- “Distinct legal entity”—keeps its own books, reports its operations independently. **Central element of financial accounting.**
- Accounts are managed by company code.
- Business transactions are carried out at the company code level.
- Company codes do not span country borders.
- Client may contain 1 or more company codes.
- A company code can be in only 1 client.
- For a client to be ‘live’ it must contain one active company code.
### Key Organizational Elements—sales

**Sales Organization:** central organizational element controlling terms of sale to customer.

**Distribution Channel:** mechanism through which goods and/or services reach the customer.

**Division:** logical groupings of related products.

**Sales Area:** a *unique* combination of a sales organization, distribution channel, and division.

![Diagram of Berlin Sales with Dry cereal and Wholesale categories on one side, and Berlin Sales with Cooked cereal and Wholesale categories on the other side.]

### Key Organizational Elements—logistics

**Plant:** location where goods or services are produced, maintained, or distributed.

- Central organization element in logistics.
- Each plant belongs to only 1 company code.
- A company code may have multiple plants.

**Storage location:** place within a plant where goods are stored.

- Each plant must have at least one storage location.
- Each storage location belongs to only 1 plant.
- (A storage location code may be the same in multiple plants.)
Key Organizational Elements—procurement

**Purchasing Organization**: part of organization responsible for procuring materials and services.
- Negotiates purchases, sets pricing conditions, engages in strategic purchase planning, sets contracts.
- Can be assigned to client, company code, or plant, or a combination of these.

**Purchasing Group**: responsible for actual buying execution.
- Team or individual.
- Not directly associated with an organizational entity.
- Assigned to a material on the material master.

Master Data Characteristics

Master data is created centrally and shared among applications and processes.
- Example: customer master contains all information defining relationship between a company and a customer.

Master data is segmented into views.
- Each view is assigned to organizational elements.
- This mapping determines which aspect of master data is used in processes. Example:
  - Data at client level is shared among all company codes.
  - Financial accounting data is company code specific.
  - Sales data is specific to a sales area.
The Material Master

**Material Master:** segmented into 12 views.

- Basic data: shared client-wide.
- Other views’ data may differ among organizational entities.

<table>
<thead>
<tr>
<th>Material Master</th>
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</thead>
<tbody>
<tr>
<td>Basic Data</td>
<td>Storage Data</td>
</tr>
<tr>
<td>MRP Data</td>
<td>Warehouse Management Data</td>
</tr>
<tr>
<td>Plant Data</td>
<td>Purchasing Data</td>
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<tr>
<td>Financial Accounting Data</td>
<td>Sales Data</td>
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<td></td>
<td>Work Scheduling Data</td>
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<td>Quality Management Data</td>
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<td>Forecasting Data</td>
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<tr>
<td></td>
<td>Classification Data</td>
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</tbody>
</table>

Material Types and Groups

**Material types** classify materials based on company usage and determine which views are populated.

**Determines:**
- Views that appear in the material master record.
- What material number is assigned.
- What procurement types are allowed (in house or external).
- How general ledger accounts are updated. (Cost or asset)

Materials may be combined into **Material Groups** to ease planning.
Transaction Data

- Organizational Data: • Client • Company Code • Plant • Storage Location
- Master Data: • Customer • Vendor • Material
- Situational Data: • Who? • How much? • When? • Where?

Documents

Transaction data recorded in documents.

Document principle: created documents can never be deleted.

Sample document types:
- Financial accounting (FI) documents: financial impact of business process steps.
- Management accounting or Controlling (CO) documents: financial (particularly cost) impact of business process steps.
- Material documents: records materials movements.
Sales Order document

Header section
- Sold-to Party
- Ship-to Party
- Company Code
- Sales Organization
- Distribution Channel
- Division
- P.O. Date
- P.O. Number

Detail/line item section
- Items ordered
- Plant
- Storage Location
- Item quantity

Customer Master Data

Organizational Data

Situational Data

Material Master Data

Organizational Data

Situational Data

Two dimensions of data handling within ERP

**Transaction processing:** capture and store detailed information about business process steps.
- **Online Transaction Processing (OLTP)**
  - Primary role of ERP systems.
  - **Reporting** focus: lists (work and online) and reports

**Analytic processing:** aggregated/summary information used to provide process insights.
- **Online Analytic Processing (OLAP)**
  - Secondary feature of ERP systems
  - Reporting based on information structures captured during transaction processing.
Data handling within SAP ERP

Transaction Processing Focus

Business Processes → Transaction data → OLTP Environment → Lists and Reports

Data aggregated (homogenization and cleaning) and summarized

Analytics Focus

OLAP Environment → Analysis Tools/Information Systems

Information Structure Details

Working with information structures is done within Information Systems.

Logistics Information Systems (LIS), Financial Information Systems (FIS), Human Resources Information Systems (HRIS), etc.

Information structure components

- Characteristics: objects on which data is collected.
- Key figures: measures (quantities, etc.) associated with characteristics.
- Period definition: time period of activity.

Two types of information structures: standard and user-defined.

Two types of analysis: standard and flexible.
Further analytic support

In-depth analytics requires use of separate system: Business Intelligence (BI) / Business Warehouse (BW).

SAP ERP
Other SAP
Non-SAP
XML
Other

SAP BI/BW
Business Explorer

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