Specialized DB Architectures

Mapping of complex data type to conventional DBS in additional layer

Special DBMS for each data type, managed by admin. component

All data managed in one extended DBMS

**Additional Layer Architecture**
- Record oriented data
- Text data
- Design data
- Image data
- Conventional DBS

**Combination**
- User interfaces
- Admin. component
- Conventional database
- Text database
- Design database
- Image database
- Components available several times

**Extension**
- User interfaces
- Non-standard application
- Special DBS for each data type, managed by admin. component
- All data managed in one extended DBMS
Several applications access common (shared) memory.
## Specialized DB Architectures

<table>
<thead>
<tr>
<th></th>
<th>Vertical Extension (Additional Layer)</th>
<th>Combination</th>
<th>Horizontal Extension</th>
<th>Separated User Interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Effort</strong></td>
<td>average, depends on support of complex data types in DBMS</td>
<td>much effort required for administrative component</td>
<td>High development effort (all layers affected)</td>
<td>low on server side, but high effort for interfaces</td>
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<td><strong>Redundancy</strong></td>
<td>only on the logical layer</td>
<td>high redundancy as data is managed in different DBs</td>
<td>less redundancy due to integrated data types</td>
<td>less redundancy due to central storage</td>
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<tr>
<td><strong>Modifiability</strong></td>
<td>bad (only one UI), depends also on support of DBMS</td>
<td>good, admin layer provides additional abstraction for data independence</td>
<td>dependencies between data types might cause problems</td>
<td>good (separated Application Interfaces)</td>
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<td><strong>Distribution</strong></td>
<td>distribution of middle layer or DB requires additional effort, but each layer can be distributed</td>
<td>good, each DB can be on a separate machine, but administration component is bottleneck</td>
<td>bad, data management of different types very tightly connected</td>
<td>difficult, server has to be distributed (requires distributed DBS)</td>
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