

Database Application Development

Databases Three

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The basic problem

We want to model something in the “real world”.

- Television programmes
- Ski fields
- Job candidates

Databases

- A database is a good choice for storing our model data in many cases.
- Usually, this means a *relational* database.
- Relational databases are well understood and there are plenty of excellent tools available for working on them.
- A properly designed and implemented relational database helps guarantee the consistency and integrity of its data.

Database applications

- Users aren't interested in writing SQL - nor should they be.
- We write database applications that provide our users with access to the database.
- CRUD
 - Create
 - Read
 - Update
 - Delete
- This is one of the main objectives of this paper.

Problem One

There is a fundamental impedance mismatch between relational data modeling and object-oriented programming.

Solution One

Object-Relational Mapping (ORM) libraries help to resolve¹ this difficulty.

¹Or perhaps they merely conceal it.

Problem Two

We often want to have multiple user applications that access the same database.

- This makes problem one harder.
- We want a consistent interface to the data.
- We want modular code.

Problem Three

Is it webscale?²

RDBMSs are difficult to scale up. You can only go so far scaling vertically, and scaling horizontally by clustering or partitioning makes application development even harder.

²<http://www.mongodb-is-web-scale.com>

Solution Two

We can build an integration application between the data store and client applications.

Solution Three

Alternative database types

- Document stores
- Key-value stores
- Column-family stores
- Graph databases

These are commonly referred to collectively as *NoSQL* databases.