



Anwendungsentwicklung in der Datenbank PL/SQL, Java und Co.

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@RobbieDatabee



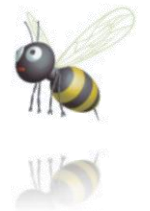
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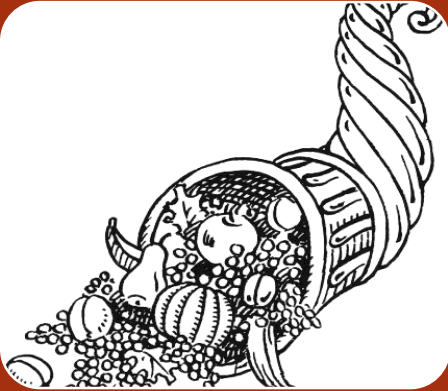


ORACLE
ACE



What's in Store for you?

Slides available for
Download



What to expect:

Overview

Food for thought



Not included:

PL/SQL Tutorial

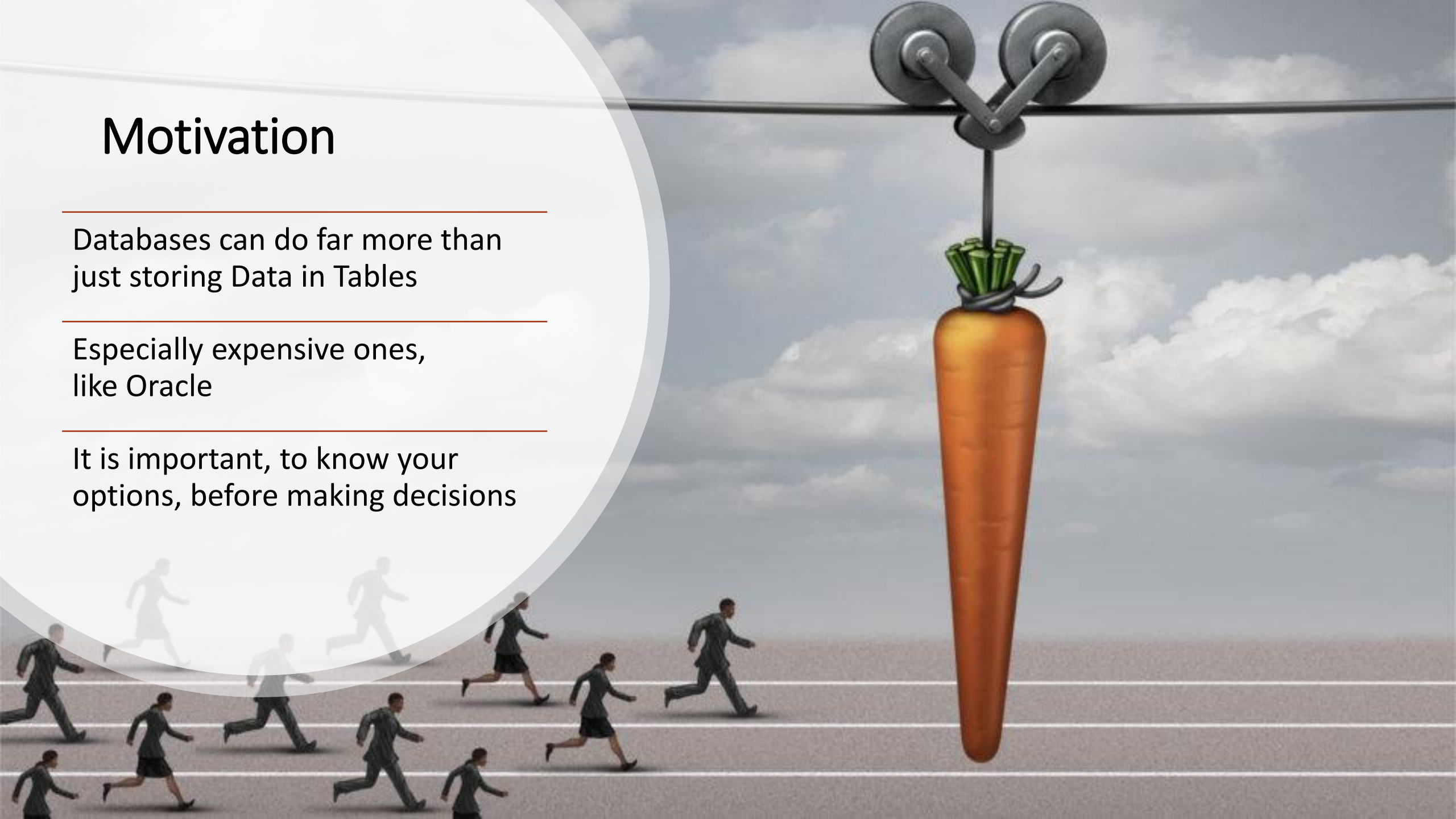
Code examples

Motivation

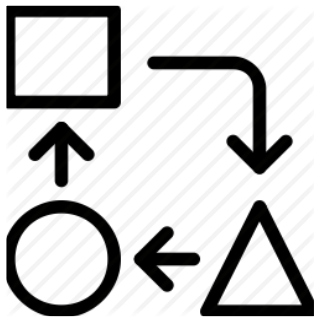
Databases can do far more than just storing Data in Tables

Especially expensive ones, like Oracle

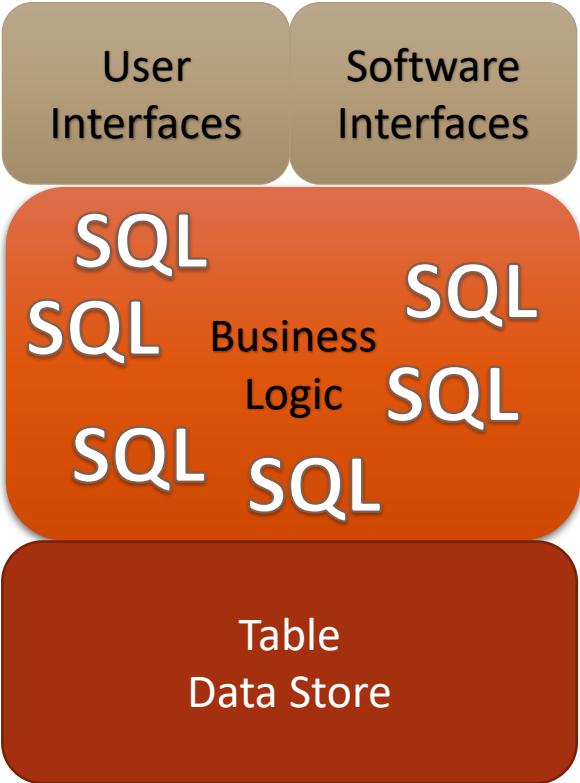
It is important, to know your options, before making decisions



Where to put the Business Logic?

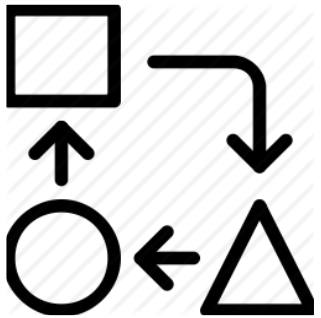


Most Business Apps are Data-Centric



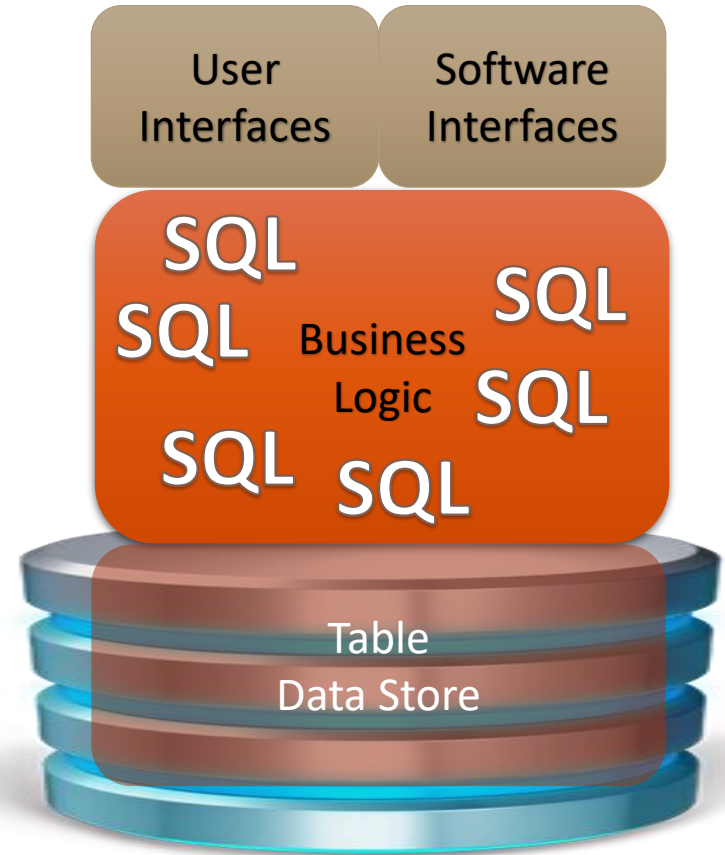
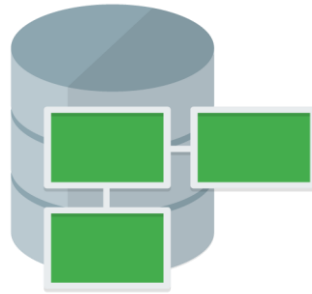
Application Layers

Where to put the Business Logic?



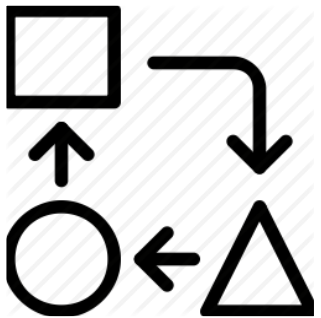
Most Business Apps are Data-Centric

Business Logic is all about Data



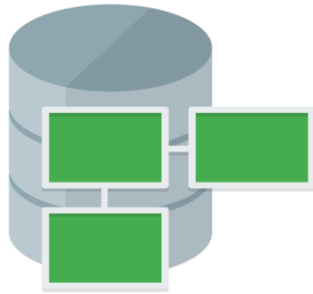
DBMS = Persistence Layer
"NoPL/SQL"

Where to put the Business Logic?

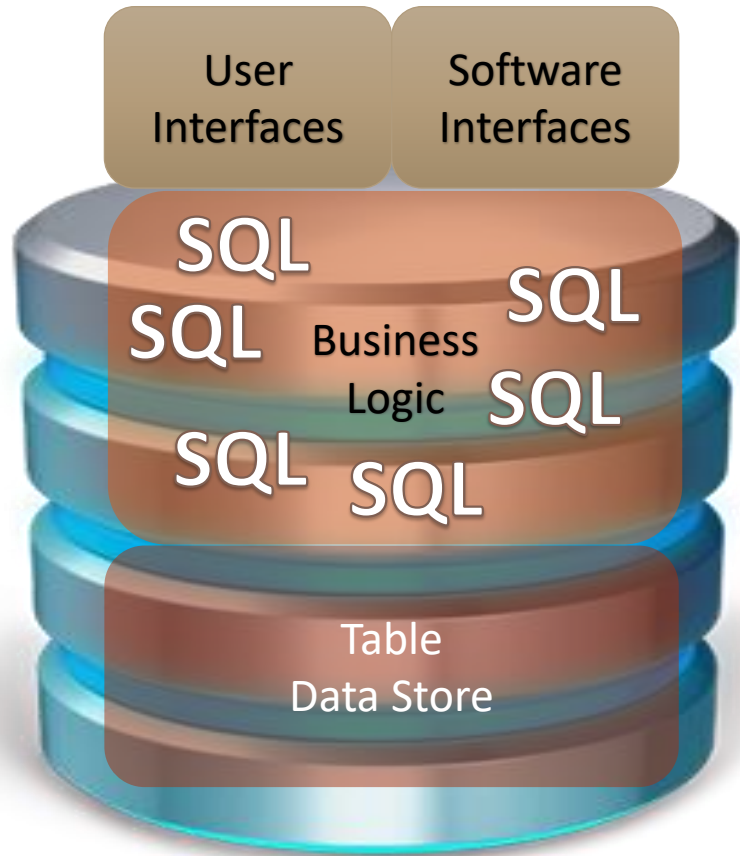


Most Business Apps are Data-Centric

Business Logic is all about Data



It belongs as close as possible to the data



DBMS = Processing Engine "SmartDB"

Thick Database

#ThickDB

Hide the Database away

Client-side code only
invokes Database
Procedures

Don't let App access
Tables directly

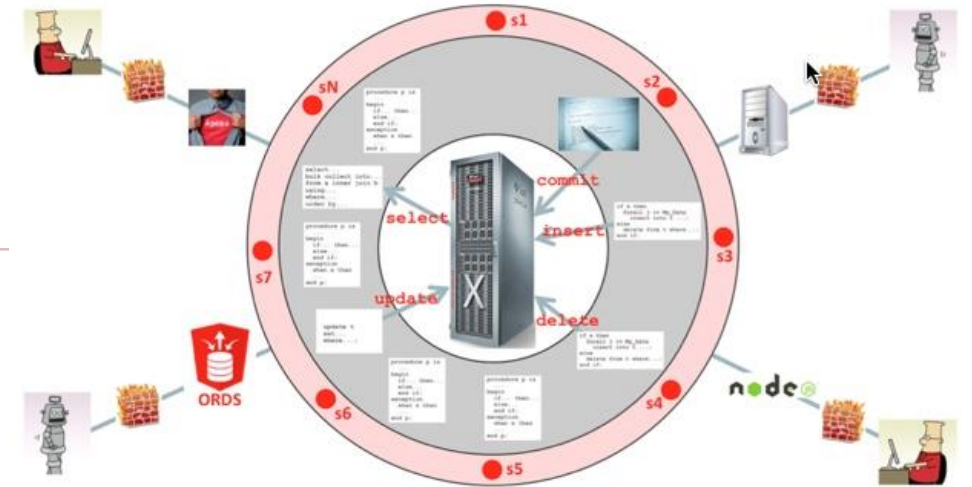


Figure 2. The thick database paradigm.

No select
No insert
No update
No delete
No commit
No rollback

#SmartDB

Evolution of #ThickDB

Use the Database as Processing Engine, not only as Persistence Layer

Protect your Data with a #HardShell API

Makes your Apps faster and more secure

Oracle RDBMS Programming Languages (1/2)

SQL

Querying Data
Manipulating Data

SQL
is **not** for

writing programs

Oracle RDBMS Programming Languages (2/2)

Business Logic

- Is usually complex
- Involves multiple tables
- Has to cover edge cases

Programming Languages

- Flow control
 - If – then – else / Loops / Case
- Execute SQL
 - Seamless with Exception Handling
- Run
 - inside the Database Engine



Java in the Database



JVM inside RDBMS
since Oracle 8i

Java Release is
always behind

Never really
integrated

Session Management

JDBC-Connection

Loading and compiling sources is cumbersome

PL/SQL Wrappers needed

Beneficial in some very special Usecases

JavaScript & Co

The JVM can also execute other Languages

JSR-223

Just load the library



JavaScript is included in JVM 1.8

Nashorn



**Just because you can,
doesn't mean you should!**



PL/SQL: Procedural Mother Language

PL/SQL
since Oracle 7

Heavily used by
Oracle

Internal Functions

API for Options

Seamless SQL
Integration

Call SQL right away

Cursors, Bulk Processing, ...

Easy to learn

Same datatypes as SQL

Plus Boolean, record, type, collections, ...

Broad Tool support

IDEs

Editor Syntax Highlighting

Debugger / Profiler

PL/SQL: Overview

PL/SQL

Syntax is ADA based

Pascal

PL/1

ALGOL

3rd Generation Language

Mainly procedural

Object Oriented programming possible (sort of)

Case Insensitive

No need for ALL CAPS Keywords

Compiler included in
RDBMS engine

Produces Byte-Code

Source Code is stored, too

Can Wrapped (Obfuscated)

RDBMS tracks
Dependencies

Automatic Invalidation & Recompile

PL/SQL: Organizing Code

Anonymous Block

AdHoc Execution
from SQL Scripts

Stored Functions

Return values

Can be called
from SQL

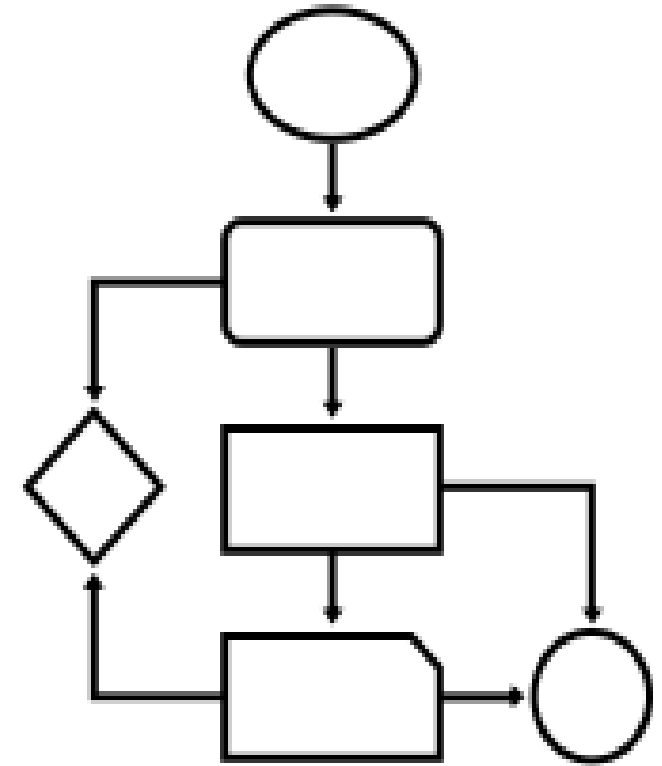
Stored Procedures

Logic Grouping

Packages

Specification and
Body separated

Package Spec
won't invalidate



Smart Backend for Frontend Developers: JSON



Oracle deals with JSON Documents natively

JSON is stored in Varchar2 or CLOB Columns

SQL-Functions

JSON_TABLE Operator

Extended PL/SQL Support since 12cR2

Smart Backend for Frontend Developers: REST



Oracle Rest Data Services
(ORDS)

Simple REST-enable

Tables, Views

PL/SQL

Build Custom REST API

Document

Swagger

For free

No additional License fees

Oracle REST Data Services ORDS

Java

Evolved from APEX Listener

Deploy in Application Server

- Tomcat
- Glassfish (deprecated)
- WebLogic

Standalone mode

- Brings own http-server
- Supported for production use



Links

Installation

- Install ORDS in less than 5 Minutes by Colm Divilly (@cdivilly): <http://blog.cdivilly.com/2015/03/11/install-ords-3.0.0/>

Official Homepage

- <http://www.oracle.com/technetwork/developer-tools/rest-data-services/overview/index.html>

Documentation

- https://docs.oracle.com/cd/E56351_01/doc.30/e56293/develop.htm

Video

- Oracle REST Data Services by Oracle Database Development Tools: <https://www.youtube.com/watch?v=8XlbFRm-c6w>



<https://www.odtug.com/page/code-talk-series>

REST DB Links Access Databases in the Cloud using ORDS, REST & JSON

Thursday, May 17, 2018 | 18:00 – 19:00 CEST
Chris Saxon, Oracle Corporation and Robert Marz, its people

Co-sponsored by:



Oracle APEX: LowCode App Development



Oracle Application
Express

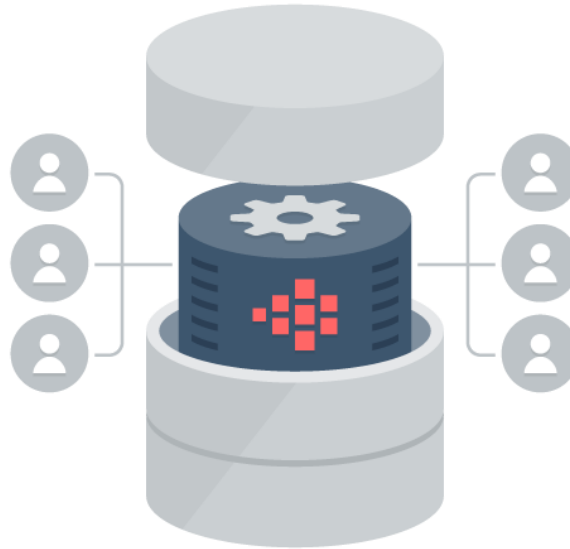
Database-centric web
application development
framework



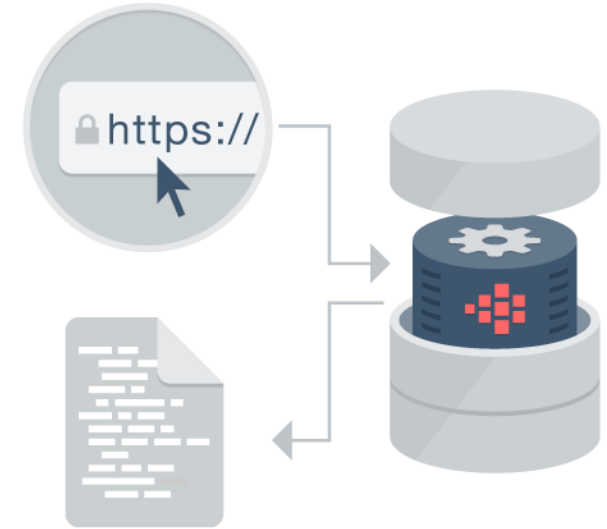
Oracle APEX: Overview



App Development IDE is a web browser.
No client software needed

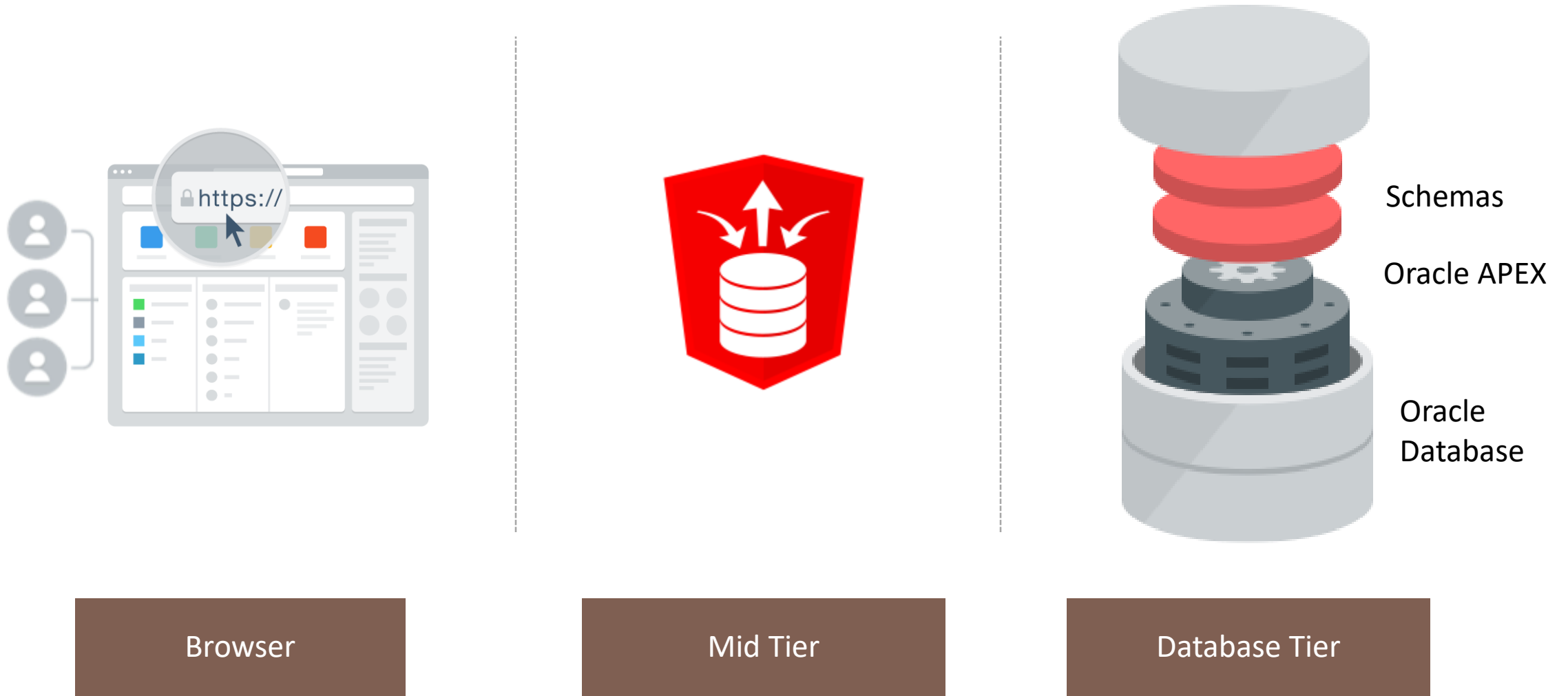


App definitions are stored in the database as meta data.
Declarative – No code generation

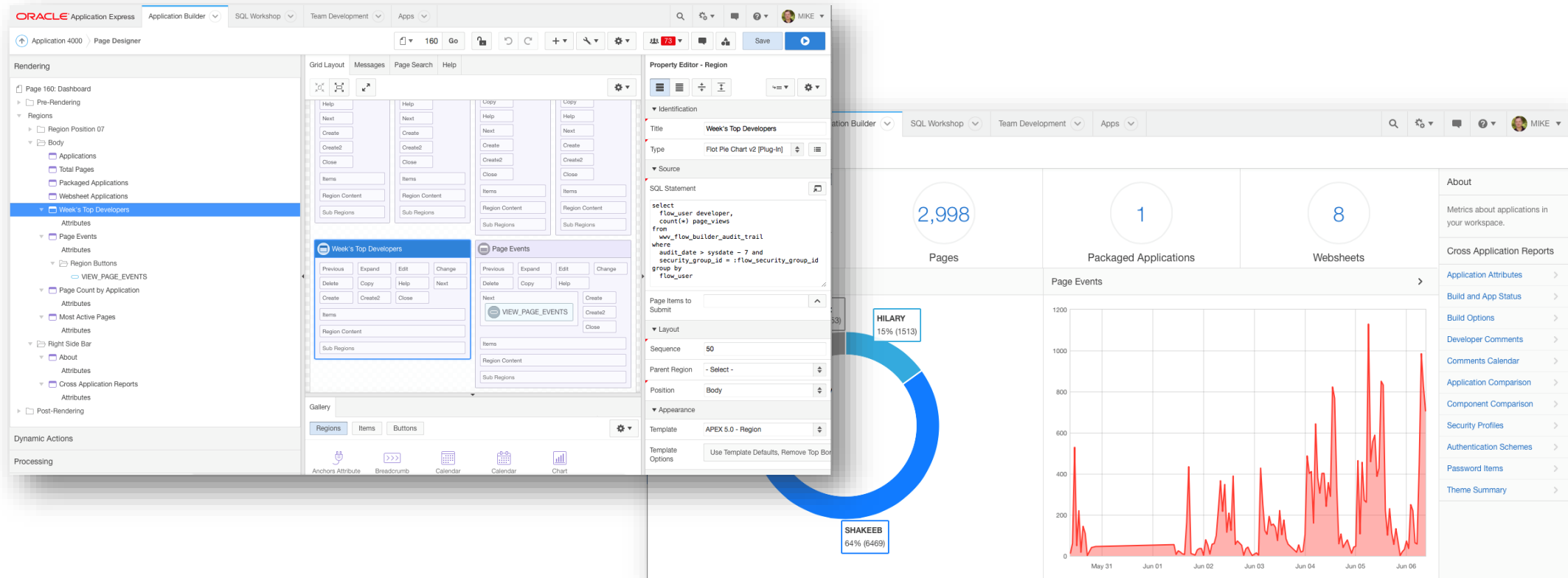


Page generation is efficient with only one request and one response.
Data processing done in the Database

Oracle APEX: 3-Tier Architecture



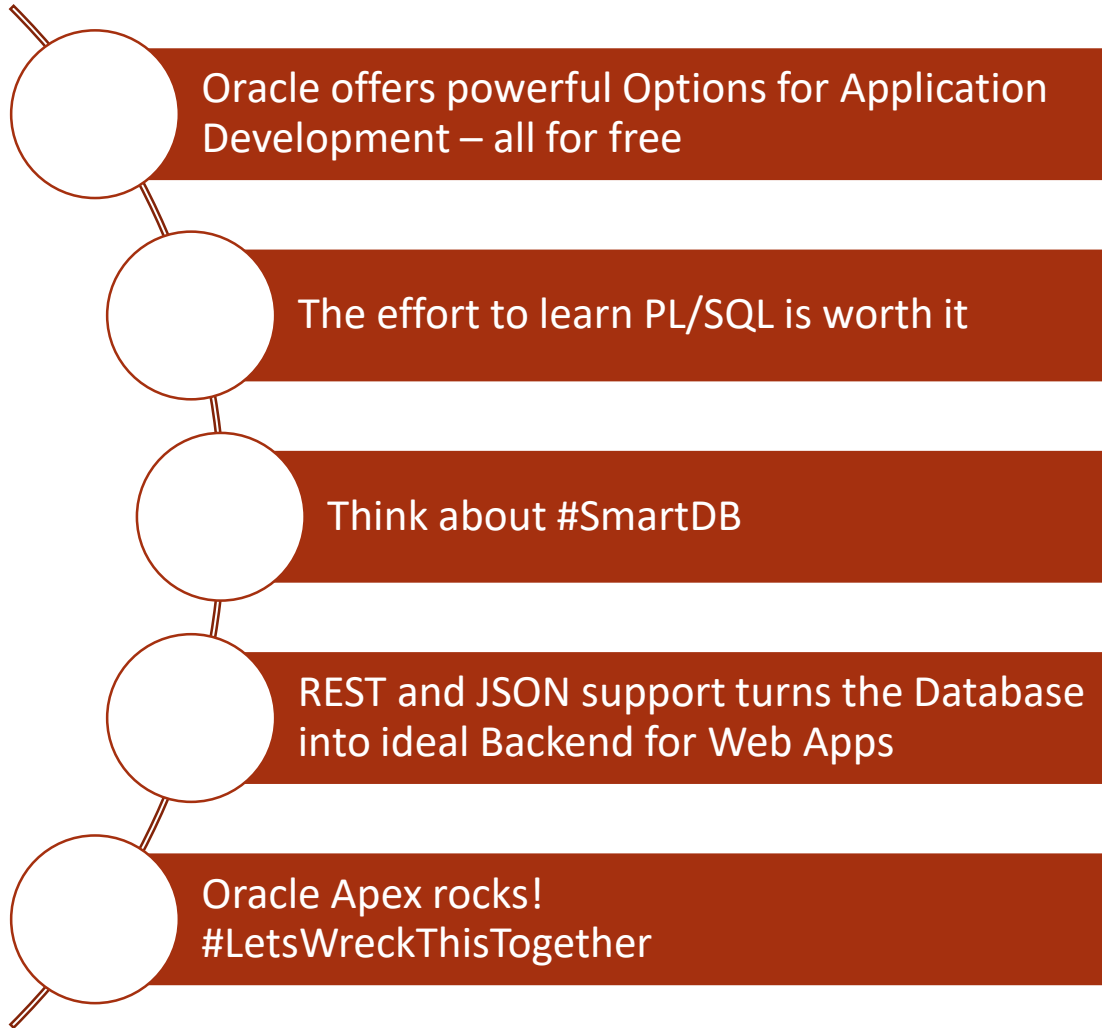
Oracle APEX: Application Builder



Integrated Development Environment (IDE) with Application Development Graphical “Page Designer”

Features tight SQL and PL/SQL integration

Conclusion





Herzlichen Dank für Ihre Aufmerksamkeit

we make the difference
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Questions ?



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