h_da

HOCHSCHULE DARMSTADT
UNIVERSITY OF APPLIED SCIENCES

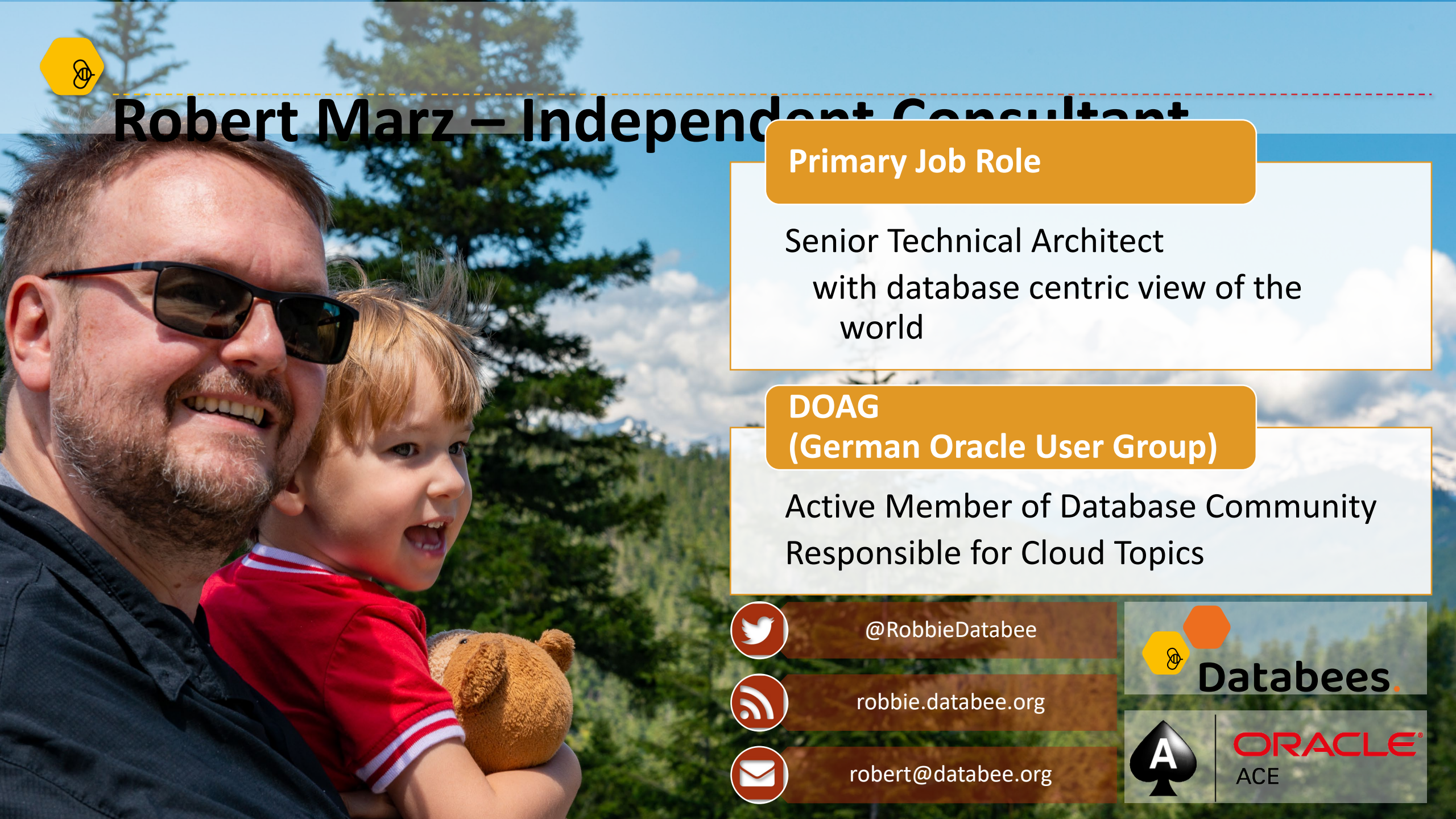
fbi

FACHBEREICH INFORMATIK

App Dev and the Oracle Database
PL/SQL, Java & Co.

Robert Marz

Databees.



Robert Marz – Independent Consultant

Primary Job Role

Senior Technical Architect

with database centric view of the world

DOAG (German Oracle User Group)

Active Member of Database Community

Responsible for Cloud Topics

@RobbieDatabee

robbie.databee.org

robert@databee.org

Databees.

ORACLE ACE

500+ Technical Experts Helping Peers Globally

ORACLE ACE PROGRAM


ORACLE ACE Director


ORACLE ACE


ORACLE ACE Associate

---

bit.ly/OracleACEProgram

Nominate yourself or someone you know: **acenomination.oracle.com**

What's in Store for you?

Slides available for Download

What to expect:

Overview

Food for thought

Not included:

PL/SQL Tutorial

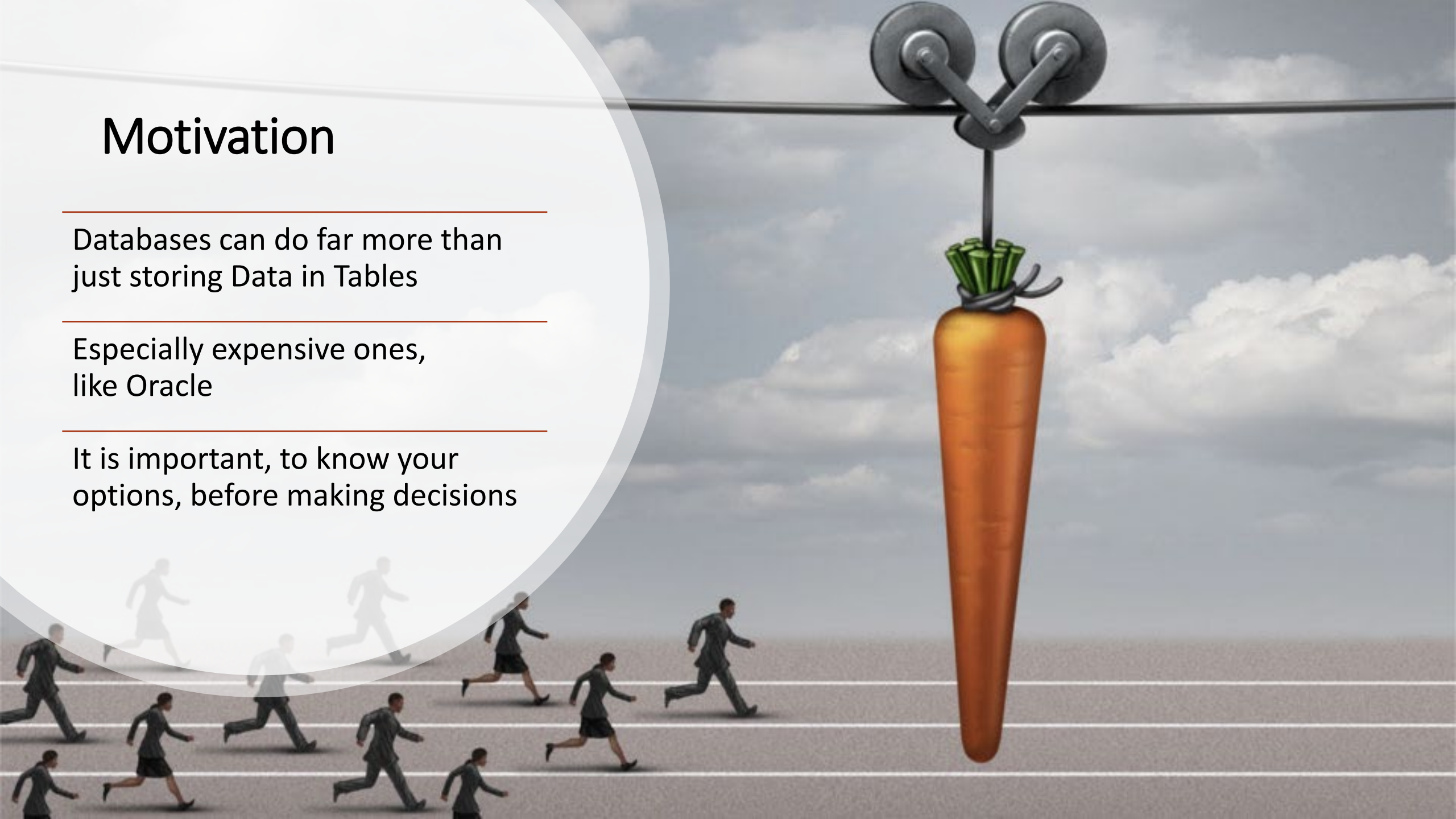
Code examples

Motivation

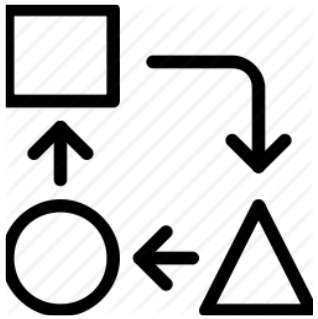
Databases can do far more than just storing Data in Tables

Especially expensive ones, like Oracle

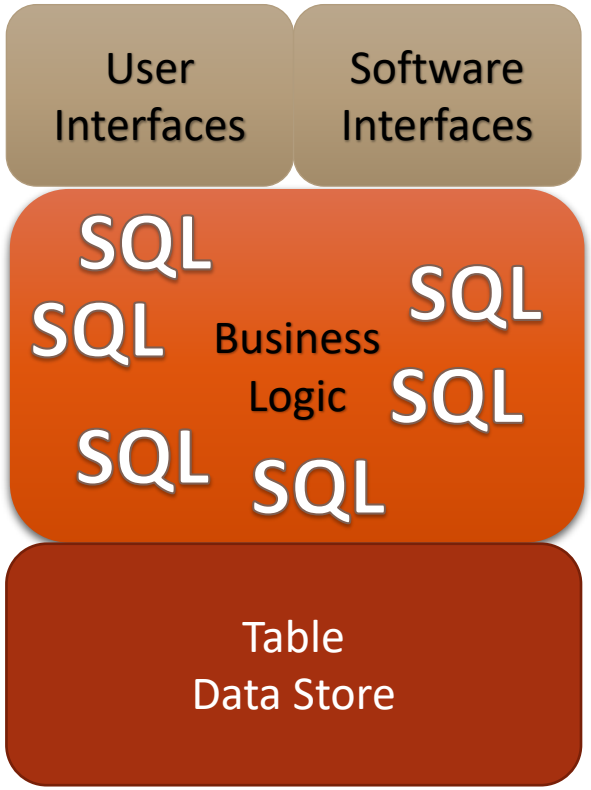
It is important, to know your options, before making decisions



Where to put the Business Logic?

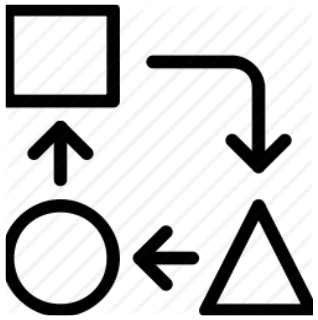


Most Business Apps are Data-Centric



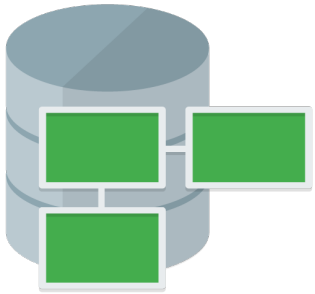
Application Layers

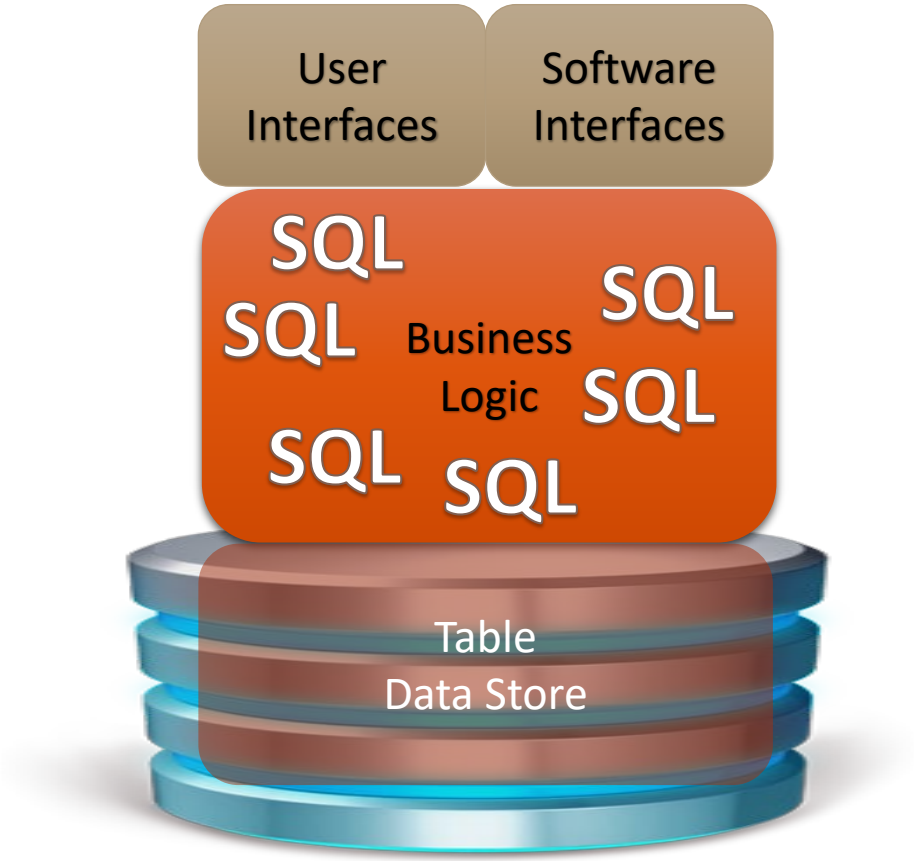
Where to put the Business Logic?



Most Business Apps are Data-Centric

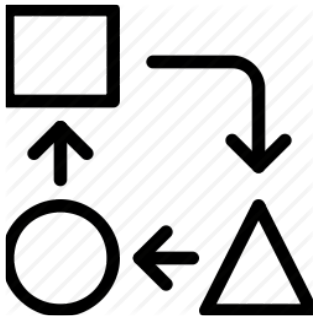
Business Logic is all about Data





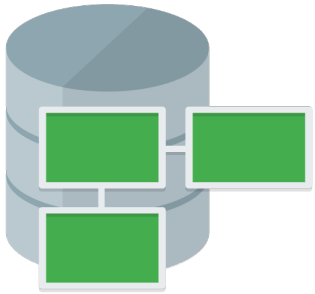
DBMS = Persistence Layer
"NoPL/SQL"

Where to put the Business Logic?

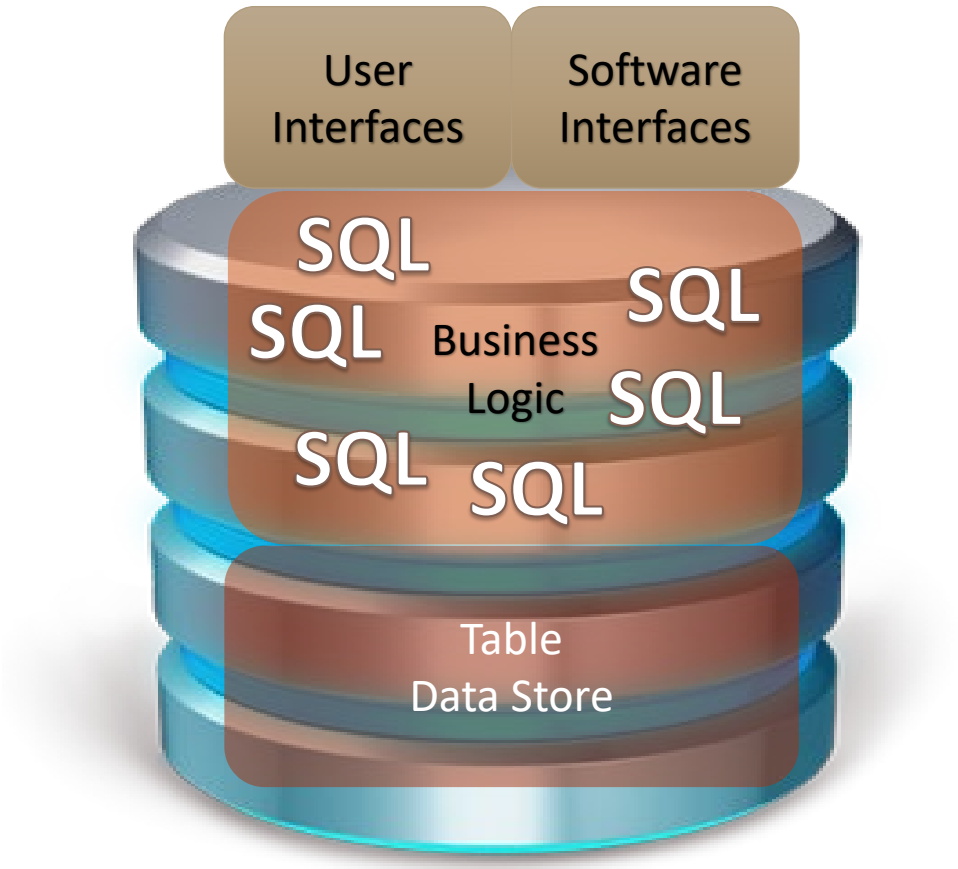


Most Business Apps are Data-Centric

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

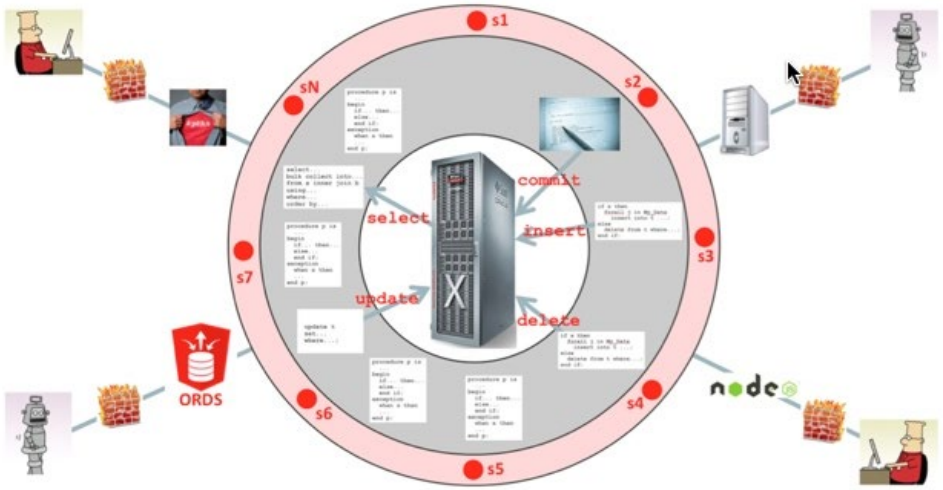


Figure 2. The thick database paradigm.

Client-side code only invokes Database Procedures

Don‘t let App access Tables directly

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

Smart Database

#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

Programing 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

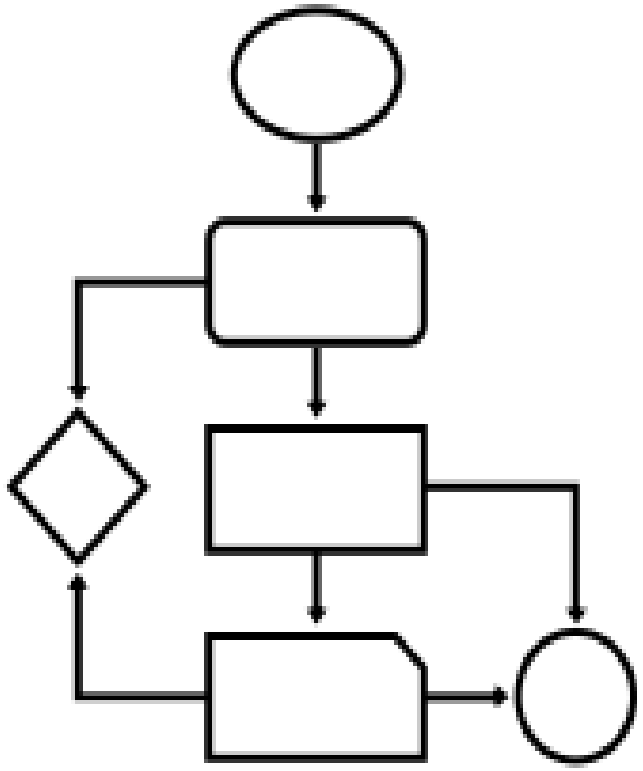
PL/SQL: Overview

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
- Packages
  - Logic Grouping
  - 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

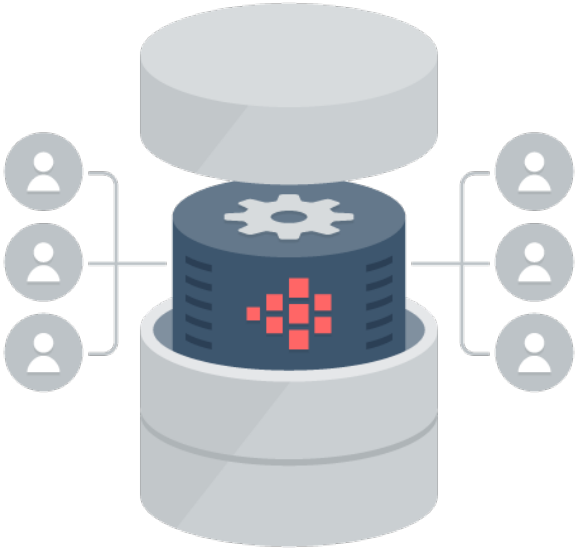
Oracle Application Express

Database-centric web application development framework

Oracle APEX: Overview

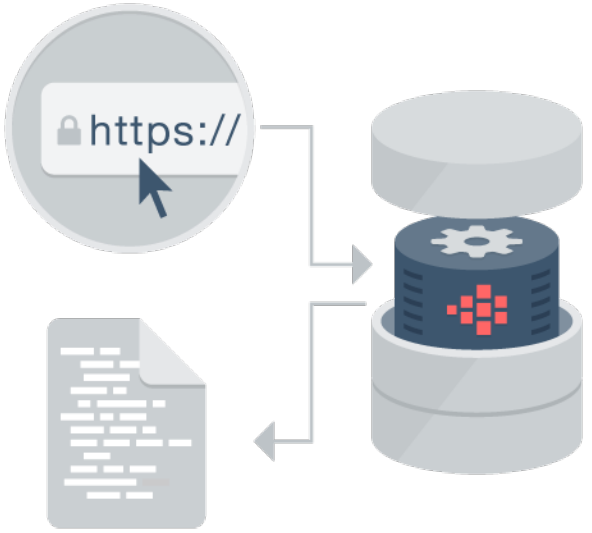
App Development IDE is a web browser.

No client software needed



App definitions are stored in the database as meta data.

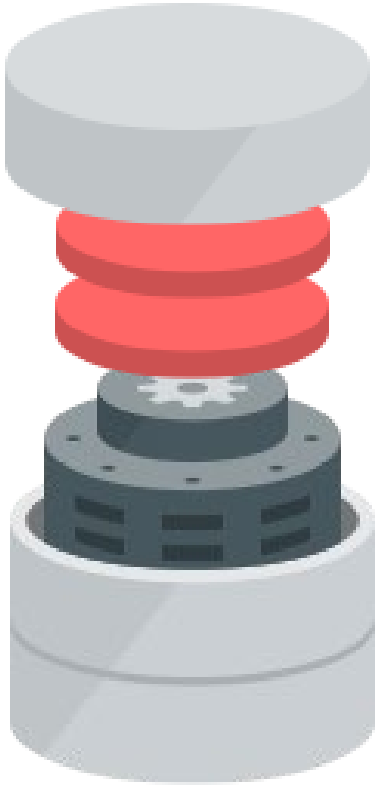
Declarative – No code generation



Page generation is efficient with only one request and one response.

Data processing done in the Database

Oracle APEX: 3-Tier Architecture



Schemas

Oracle APEX

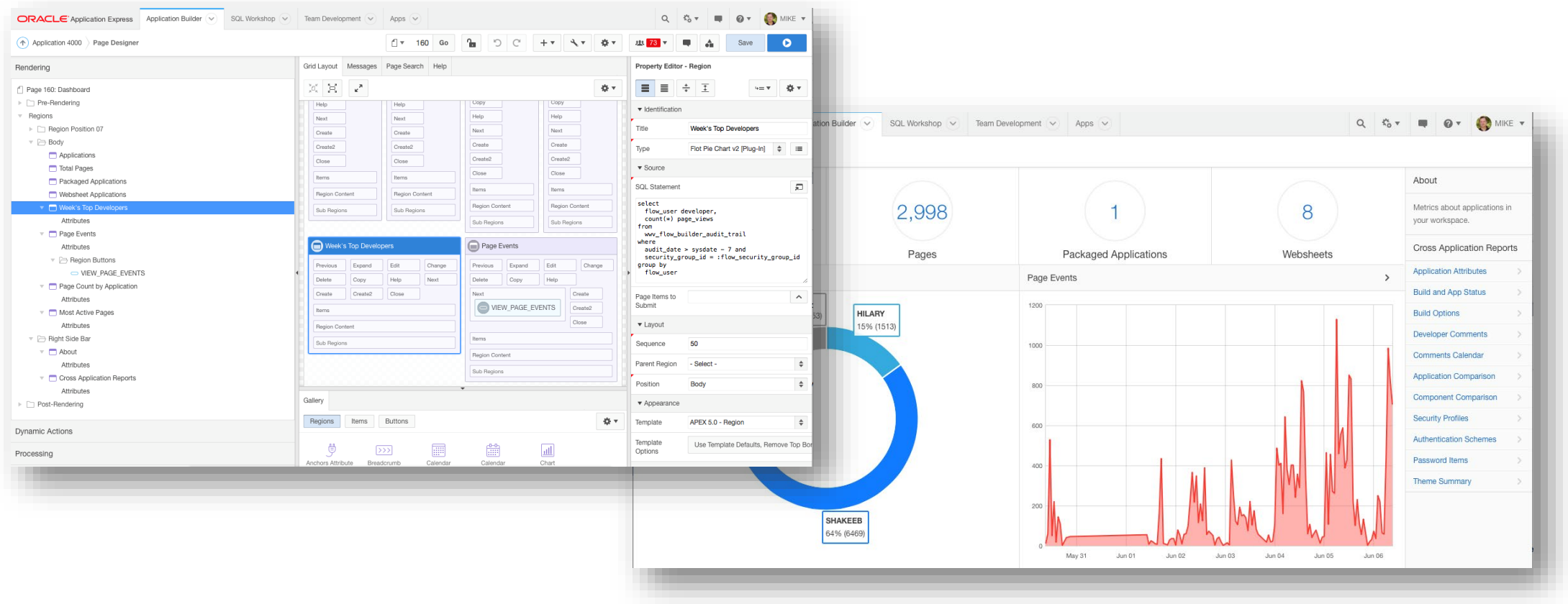
Oracle Database

Browser

Mid Tier

Database Tier

Oracle APEX: Application Builder



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

Features tight SQL and PL/SQL integration

Conclusion

- Oracle offers powerful Options for Application Development – all for free
- The effort to learn PL/SQL is worth it
- Think about #SmartDB
- REST and JSON support turns the Database into ideal Backend for Web Apps
- Oracle Apex rocks!
  #LetsWreckThisTogether