

Dimitri Gielis

Bringing your Oracle Database alive with APEX



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Dimitri Gielis

- ❖ Founder & CEO of APEX R&D
- ❖ 20+ years of Oracle Experience (OCP & APEX Certified)
- ❖ Oracle ACE Director
- ❖ “APEX Developer of the year 2009” by Oracle Magazine
- ❖ “Oracle Developer Choice award (ORDS)” in 2015
- ❖ Author Expert Oracle APEX
- ❖ Presenter at Conferences





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Dimitri Gielis Blog (Oracle Application Express - APEX)

I created this Blog to share my knowledge especially in Oracle Application Express (APEX) and my feelings ...

FRIDAY, SEPTEMBER 26, 2014

APEX 4.2.6 patch available

Oracle released [APEX 4.2.6](#) yesterday, it's also available from My Oracle Support as a patch set 19595896.

Here's the table of bug fixes.

Table 6 Bugs Fixed in the Oracle Application Express 4.2.6.00.03 Patch Set

Bug Number	Description
18393429	Importing pre-4.2 application with data loading results in runtime error
18609856	APEX_WEB_SERVICE.CLOBBASE642BLOB converts incorrectly
18658967	Corrupted HTML mail messages are created from APEX_MAIL.SEND
18719750	ORA-01858 during application import
18733989	Errors picking up session with cookie when TOP CALL is not F, SHOW, or ACCEPT
19021052	Oracle Application Express 4.2.4 throwing error while generating check boxes
19313700	Check box fails with ORA-06502 after upgrade from release 4.0 to 4.2.4
19482775	ORA-06502 when importing application containing translations

Applying the patch took less than 7 minutes.

```
Session altered.
...Validating Application Express
...Database user "SYS", database schema "APEX_040200", user# "106" 20:48:40
...Compiled 0 out of 3014 objects considered, 0 failed compilation 20:48:40
...271 packages
...263 package bodies
...452 tables
...11 functions
...16 procedures
...3 sequences
...457 triggers
...1320 indexes
...211 views
...0 libraries
...6 types
...0 type bodies
...0 operators
...0 index types
```

My next public appearances:

- [Oracle Open World: 27-SEP/2-OCT-2014](#)
- [ORCLAPEX-BE Meetup: 19-NOV-2014](#)
- [ODTUG KScope: 21/25-JUN-2015](#)

About Me



[Dimitri Gielis](#)

Passionate about Oracle and especially Oracle Application Express (APEX). Building applications with love @ APEX R&D.

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SATURDAY, AUGUST 05, 2017

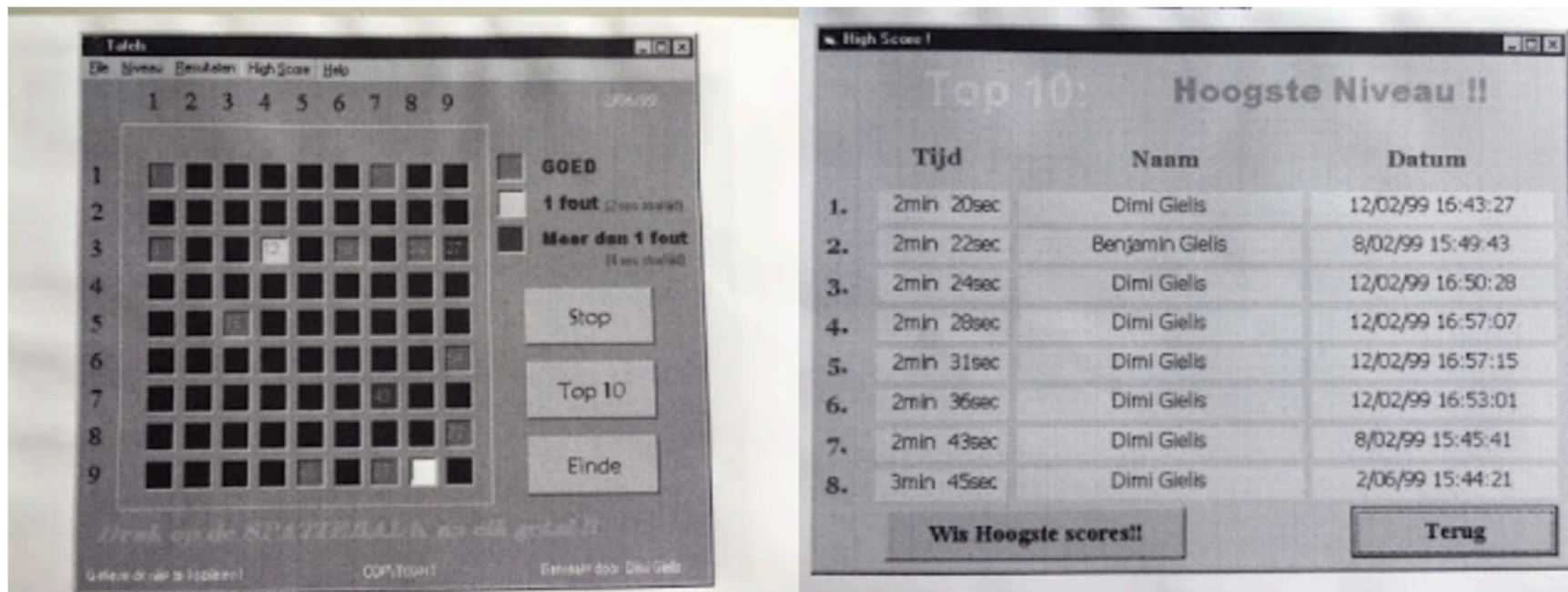
From idea to app or how I do an Oracle APEX project anno 2017

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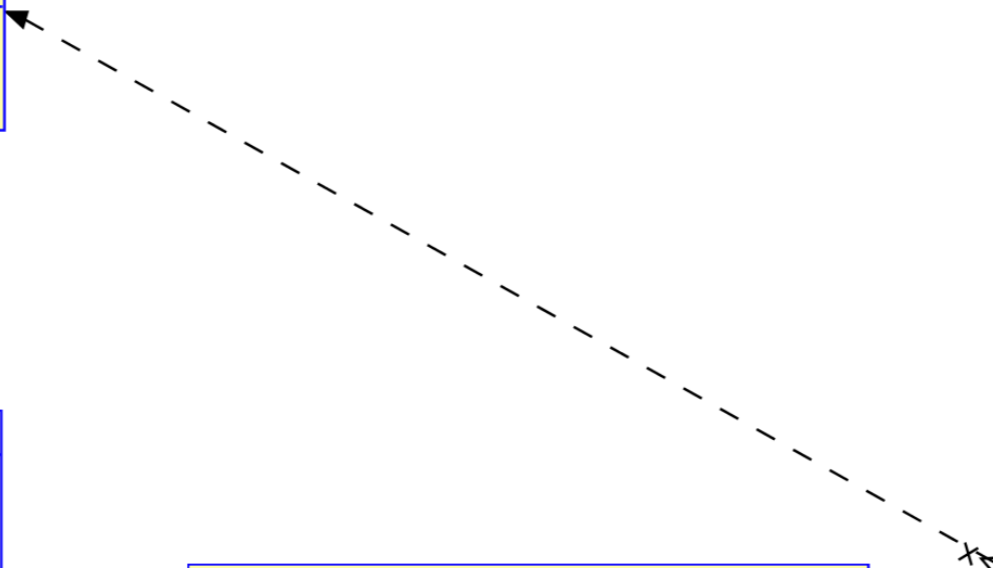




DO -
YOU -
WANT -
EAST -

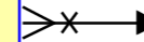
MULTIPLICATION_TABLE.MTL_USER		
P *	ID	NUMBER
F	ROLE_ID	NUMBER
U *	EMAIL	VARCHAR2 (255 CHAR)
	PASSWORD	VARCHAR2 (255 CHAR)
	VERIFICATION_CODE	VARCHAR2 (255 CHAR)
*	CREATED	DATE
*	CREATED_BY	VARCHAR2 (255 CHAR)
*	UPDATED	DATE
*	UPDATED_BY	VARCHAR2 (255 CHAR)
MTL_USER_EMAIL_UNQ (EMAIL) MTL_USER_ID_PK (ID)		
MTL_USER_ROLE_ID_FK (ROLE_ID)		
MTL_USER_EMAIL_UNQ (EMAIL) MTL_USER_I1 (ROLE_ID) MTL_USER_ID_PK (ID)		

MULTIPLICATION_TABLE.MTL_ROLE		
P *	ID	NUMBER
	NAME	VARCHAR2 (255 CHAR)
*	CREATED	DATE
*	CREATED_BY	VARCHAR2 (255 CHAR)
*	UPDATED	DATE
*	UPDATED_BY	VARCHAR2 (255 CHAR)
MTL_ROLE_ID_PK (ID)		
MTL_ROLE_ID_PK (ID)		



MULTIPLICATION_TABLE.MTL_TEAM		
P *	ID	NUMBER
F	USER_ID	NUMBER
*	NAME	VARCHAR2 (255 CHAR)
	TEMPLATE	BLOB
	TEMPLATE_FILENAME	VARCHAR2 (512 CHAR)
	TEMPLATE_MIMETYPE	VARCHAR2 (512 CHAR)
	TEMPLATE_CHARSET	VARCHAR2 (512 CHAR)
	TEMPLATE_LASTUPD	DATE
	PREFERENCES	VARCHAR2 (4000 CHAR)
*	CREATED	DATE
*	CREATED_BY	VARCHAR2 (255 CHAR)
*	UPDATED	DATE
*	UPDATED_BY	VARCHAR2 (255 CHAR)
MTL_TEAM_ID_PK (ID)		
MTL_TEAM_USER_ID_FK (USER_ID)		
MTL_TEAM_I1 (USER_ID) MTL_TEAM_ID_PK (ID)		

MULTIPLICATION_TABLE.MTL_PLAYER_TEAM		
P *	ID	NUMBER
F *	PLAYER_ID	NUMBER
F *	TEAM_ID	NUMBER
*	CREATED	DATE
*	CREATED_BY	VARCHAR2 (255 CHAR)
*	UPDATED	DATE
*	UPDATED_BY	VARCHAR2 (255 CHAR)
MTL_PLAYER_TEAM_ID_PK (ID)		
MTL_PLAYER_TEAM_PLAYER_ID_FK (PLAYER_ID) MTL_PLAYER_TEAM_TEAM_ID_FK (TEAM_ID)		
MTL_PLAYER_TEAM_I1 (PLAYER_ID) MTL_PLAYER_TEAM_I2 (TEAM_ID) MTL_PLAYER_TEAM_ID_PK (ID)		



MULTIPLICATION_TABLE.MTL_PLAYER		
P *	ID	NUMBER
F	USER_ID	NUMBER
*	NAME	VARCHAR2 (255 CHAR)
	IMAGE	BLOB
	IMAGE_FILENAME	VARCHAR2 (512 CHAR)
	IMAGE_MIMETYPE	VARCHAR2 (512 CHAR)
	IMAGE_CHARSET	VARCHAR2 (512 CHAR)
	IMAGE_LASTUPD	DATE
*	ACTIVE	VARCHAR2 (1 CHAR)
*	CREATED	DATE
*	CREATED_BY	VARCHAR2 (255 CHAR)
*	UPDATED	DATE
*	UPDATED_BY	VARCHAR2 (255 CHAR)
MTL_PLAYER_ID_PK (ID)		
MTL_PLAYER_USER_ID_FK (USER_ID)		
MTL_PLAYER_I1 (USER_ID) MTL_PLAYER_ID_PK (ID)		



A person with short, layered blonde hair is shown in profile, looking downwards. They are wearing a dark, possibly black, jacket or top. The background is dark with out-of-focus blue and yellow lights, creating a bokeh effect. The overall mood is moody and artistic.

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Oracle APEX

Database-centric web application development framework



Develop desktop and mobile web apps



Visualize and maintain database data



Leverage SQL Skills and database capabilities

Oracle APEX

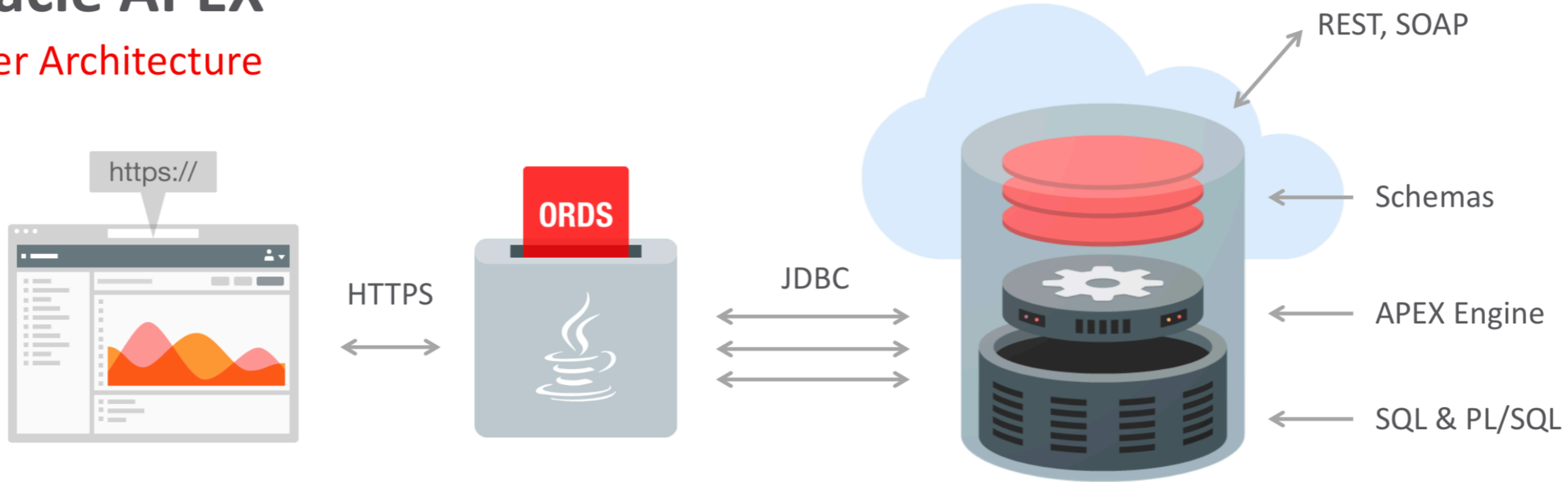
No cost feature of the Oracle Database

- No-cost fully supported feature
 - Any number of apps, developers & end-users
 - Specialized Oracle Support Team
 - 11gR2, 12c, 18c
 - All DB editions: EE, SE2, XE
- Included with Oracle Cloud Services
 - Exadata Express Service
 - Database as a Service
 - No cost evaluation <http://apex.oracle.com>
- Easy to install
 - Included by default with all editions of Oracle database
 - Download latest release from <https://apex.oracle.com/otn>



Oracle APEX

3 Tier Architecture



Oracle REST Data Services

(Weblogic, Jetty, Tomcat)

No Application Logic
Converts HTTP to database API calls

Browser

Mid Tier

Oracle Database

(Pluggable or Dedicated, 11g, 12c, 18c)

Zero latency database data access
Dynamically driven by APEX metadata

Database Tier



LIVE  CODING

MILANO LEGENDS



PES
PRO EVOLUTION SOCCER



OFFICIAL
PARTNER



INTER

PES 2018
PRO EVOLUTION SOCCER

GLOBAL FOOTBALL
VIDEO GAME PARTNER

What we will build

- ❖ Teams
 - ❖ Different teams with logos
- ❖ Players
 - ❖ Part of one or more teams
- ❖ Administration
 - ❖ View activity of app

Agenda

- ❖ From idea to Oracle APEX app
- ❖ Create the Oracle Database Objects
- ❖ Build a starter APEX app with Blueprint
- ❖ Enhance the APEX app

From idea to Oracle APEX app

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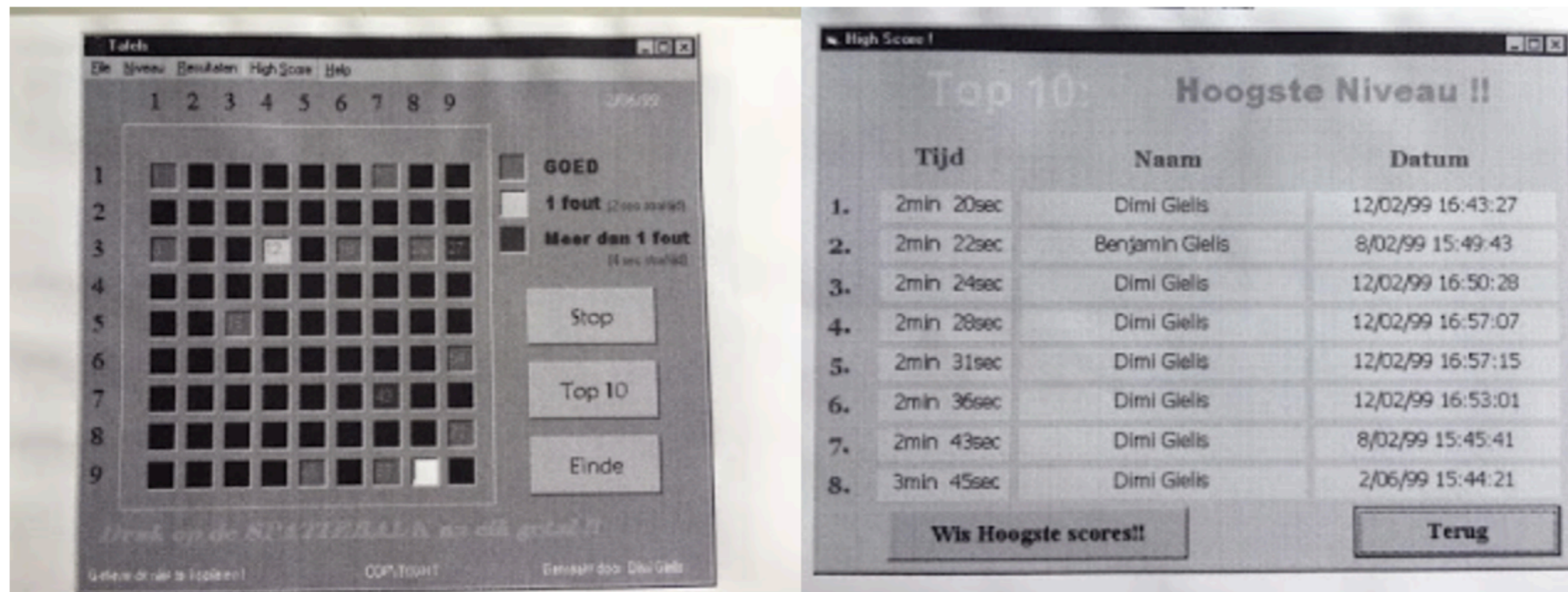
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Printing in Oracle APEX?

Check [APEX Office Print](#).



Multiplication Table - mtable.online

x	1	2	3	4	5	6	7	8	9
1	1								9
2				8	10				
3				12			21	24	
4					20		28		36
5	5					30		40	45
6		12							
7	7								
8				32	40				
9			27		45			72	81

The application helps children (typically between 7 and 11 years old) to automate multiplications between 1 and 10. It also helps their parents to get insight in timings and mistakes of their children's multiplications.

Timeline

No project without deadline, so I've set my go-production date to August 20th, 2017. So I've about 2 weeks, typically one sprint in [our](#) projects.

Following along and feedback

I will [tweet](#), [blog](#) and create some [videos](#) to show my progress. You can follow along and reach me on any of those channels. If you have any questions, tips or remarks during the development, don't hesitate to add a comment. I always welcome new ideas or insights and am happy to go in more detail if something is not clear.

High level break-down of plan for the following days

- [Create user stories and supporting ERD](#)
- [List of the tools I use and why I use them](#)
- [Set up the development environment](#)
- [Create the Oracle database objects](#)
- [Set up a domain name](#)
- [Set up reverse proxy and https](#)
- [Create a landing page and communicate](#)
- [Build the Oracle APEX application: the framework](#)
- [Refine the APEX app: create custom authentication and authorization scheme](#)
- [Refine the APEX app: adding the game](#)
- [Refine the APEX app: improve the flow and navigation](#)
- [Refine the APEX app: add ability to print results to PDF](#)
- [Set up build process](#)
- [Check security](#)
- [Communicate first version of the app to registered people](#)
- [Check performance](#)
- [Refine the APEX app: add more reports and statistics](#)
- [Check and reply to feedback](#)
- [Set up automated testing](#)
- [A word on debugging](#)
- [Refine the APEX app: making final changes](#)
- [Set up backups](#)
- [Verify documentation and lessons learned](#)
- [Close the loop and Celebrate :\)](#)

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 - ▼ August (8)
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 - [Build the Oracle APEX application: the framework](#)
 - [Set up domain and launch page](#)
 - [Create the Oracle database objects](#)
 - [Set up an APEX development environment](#)
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- ▶ 2016 (10)
 - ▶ 2015 (43)
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 - ▶ 2012 (49)
 - ▶ 2011 (42)
 - ▶ 2010 (93)
 - ▶ 2009 (85)
 - ▶ 2008 (122)

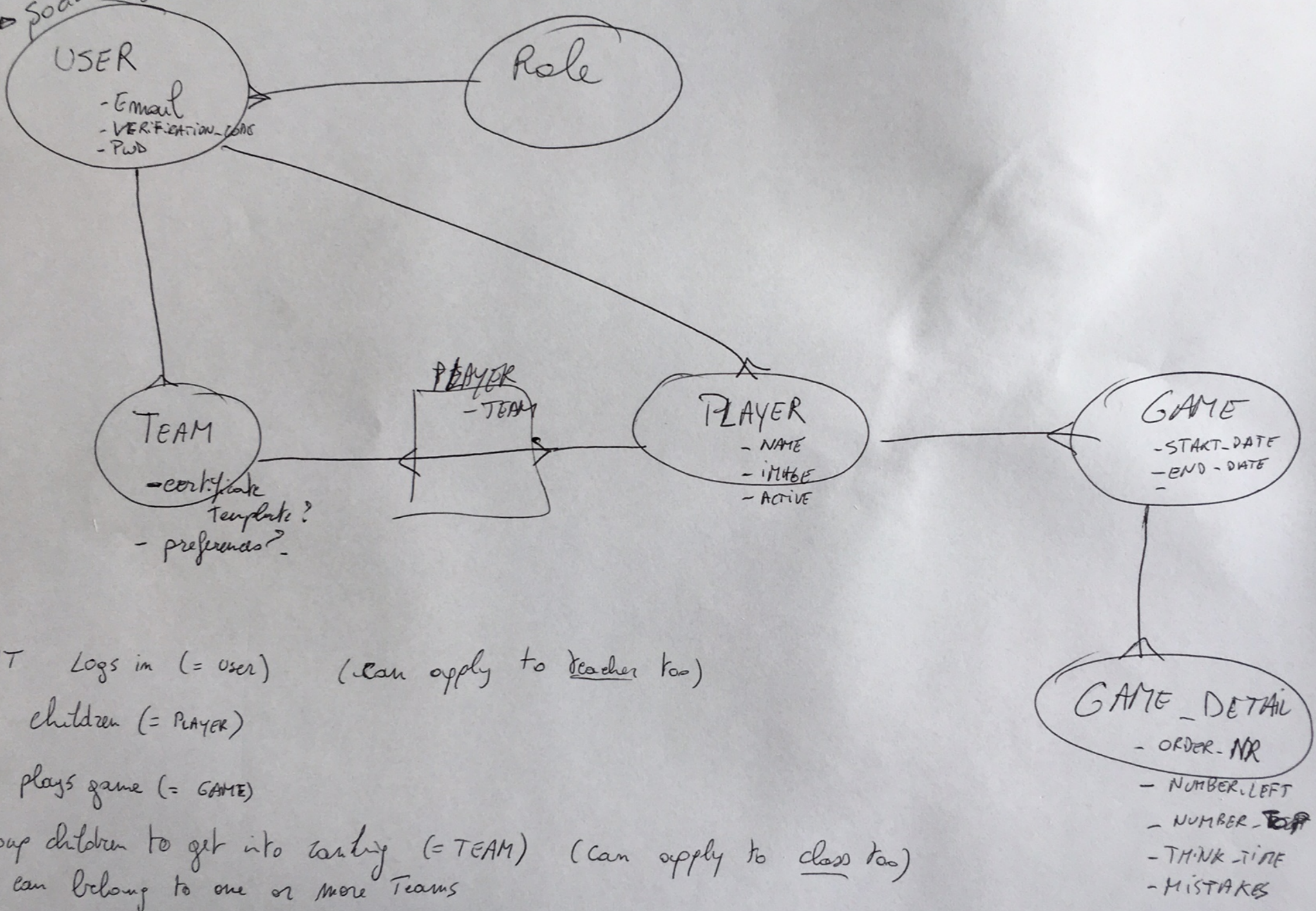
Create the ERD & Database Objects

APEX 5.2

↳ social login: FB/Tw...-

MULTIPLICATION TABLES

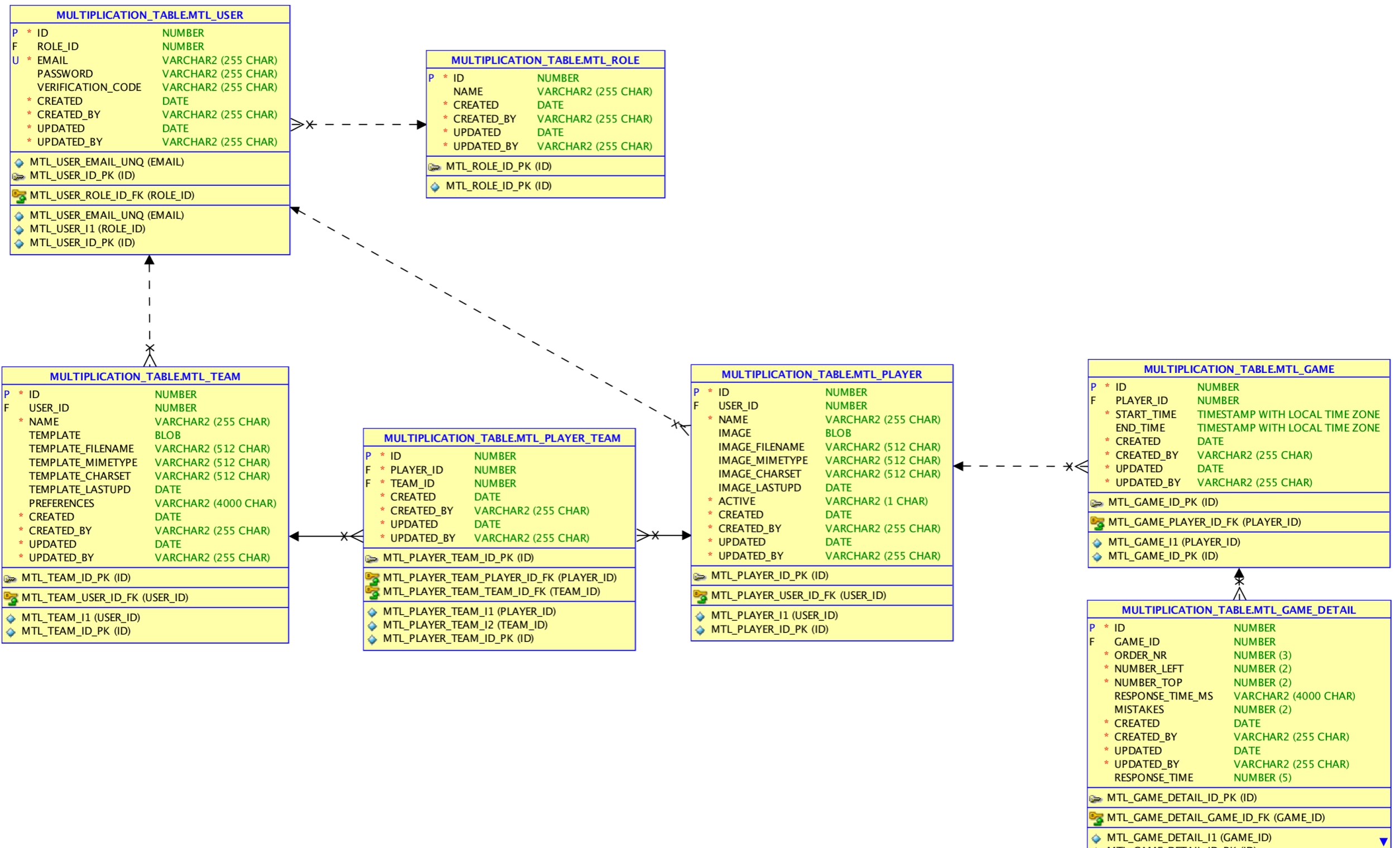
TABLES v1.0 (2)



IDEA

- PARENT Logs in (= user) (can apply to teacher too)
- Creates children (= PLAYER)
- Children plays game (= GAME)
- ~~the~~ Group children to get into teaching (= TEAM) (can apply to class too)
 Child can belong to one or more Teams

SQL Developer Data Modeler



Quick SQL



AA6R.2

Save

Generate SQL

+ Worksheet Clear

Syntax and Examples

Settings

```
#prefix: mtl, auditcols: true, apex: true
```

```
role
  name

user
  email          /nn /lower /unique
  password       vc(255)
  verification_code vc(255)
```

```
player
  name /nn
  image file
  active vc(1) /cc Y, N /default Y
```

```
game
  start_time tswltz /nn
  end_time tswltz
```

```
game_detail
  order_nr num(3) /nn
  number_left num(2) /nn
  number_top num(2) /nn
  response_time_ms
  mistakes num(2)
```

```
team
  name /nn
  template file
  preferences
```

```
player team
  player id /nn
  team id /nn
```

```
view player_team_vw player team player_team
```

```
1 -- drop objects
2 drop table MTL_ROLE cascade constraints;
3 drop table MTL_USER cascade constraints;
4 drop table MTL_PLAYER cascade constraints;
5 drop table MTL_GAME cascade constraints;
6 drop table MTL_GAME_DETAIL cascade constraints;
7 drop table MTL_TEAM cascade constraints;
8 drop table MTL_PLAYER_TEAM cascade constraints;
9 drop view MTL_PLAYER_TEAM_VW;
10
11 -- create tables
12 create table MTL_ROLE (
13     ID NUMBER GENERATED BY DEFAULT ON NULL AS IDENTITY
14     constraint MTL_ROLE_ID_PK primary key,
15     NAME VARCHAR2(255),
16     CREATED DATE not null,
17     CREATED_BY VARCHAR2(255) not null,
18     UPDATED DATE not null,
19     UPDATED_BY VARCHAR2(255) not null
20 )
21 ;
22
23 create table MTL_USER (
24     ID NUMBER GENERATED BY DEFAULT ON NULL AS IDENTITY
25     constraint MTL_USER_ID_PK primary key,
26     ROLE_ID NUMBER
27     constraint MTL_USER_ROLE_ID_FK
28     references MTL_ROLE on delete cascade,
29     EMAIL VARCHAR2(255)
30     constraint MTL_USER_EMAIL_UNQ unique not null,
31     PASSWORD VARCHAR2(255),
32     VERIFICATION_CODE VARCHAR2(255),
33     CREATED DATE not null,
34     CREATED_BY VARCHAR2(255) not null,
35     UPDATED DATE not null,
36     UPDATED_BY VARCHAR2(255) not null
37 )
38 ;
39
40 create table MTL_PLAYER (
```

Demo

Reverse Engineer ERD to QuickSQL

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FRIDAY, DECEMBER 08, 2017

Reverse engineer existing Oracle tables to Quick SQL

If you didn't hear about [Oracle Quick SQL](#), it's time to read about it as it's something you have without knowing (it's a packaged app in Oracle APEX) and I believe you should start using :)

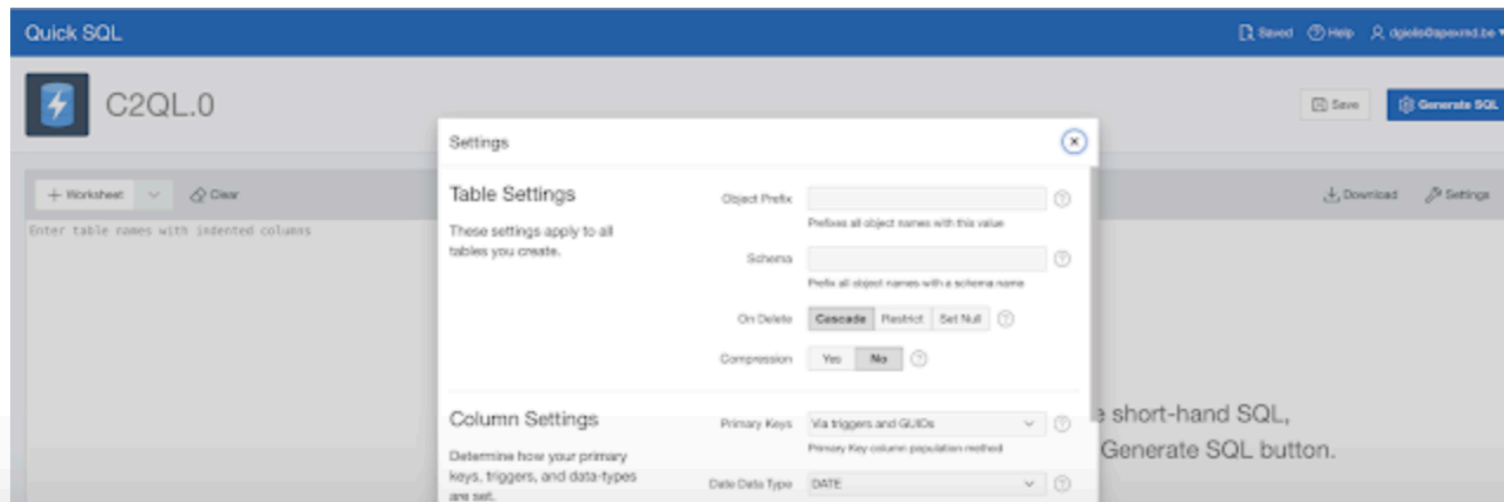
Quick SQL enables you to rapidly design and prototype data models using a markdown-like shorthand syntax that expands to standards-based Oracle SQL. You can easily create master detail relationships, check constraints, and even generate sample data.

In my blog post [Create the Oracle database objects](#) I go over the history how I created database objects and why I think Quick SQL is great and why I use it.

I guess most people typically use Quick SQL at the start of a new project, as it's the quickest way to create your data model and Oracle database objects. That is my primary use case too, but I started to use Quick SQL even on projects where database objects already exist.

In the project I'm currently involved in, the datamodel was generated by another tool, but as we iterate through the project, tables change, columns get renamed and added, row version were requested, triggers need to be made Oracle APEX aware...

Now we could do those changes manually, but I thought it made much more sense to create the data model in Quick SQL and use the features that come with Quick SQL. By clicking a checkbox we can include a Row version, Quick SQL generates the triggers automatically in an APEX aware form, we can generate as much sample data as we want by adding /insert and we can use all the other features that come with Quick SQL. For example when you want to include a history table in the future it's just another checkbox to click.



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Make your template in Word, Excel or Powerpoint and print into Word, Excel, Powerpoint, PDF or HTML5. One APEX

Build a starter APEX app with Blueprint

Create an Application

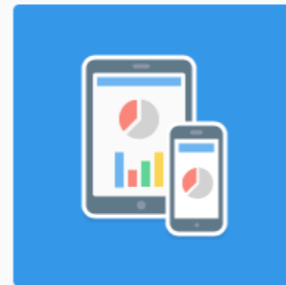
What type of application would you like to create?



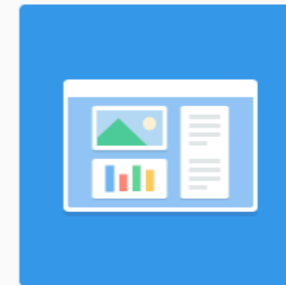
Blueprint



Desktop



Mobile



Websheet

[From a spreadsheet](#) · [Copy an existing application](#)

[▶ About](#)

Cancel

Help

Next >

Demo

Enhance the APEX app

Blueprint as basis

- ❖ Use Blueprint as starting point
- ❖ then enhance...

Different ways to enhance

- ❖ Using different components (Cards, Lists, ...)
- ❖ Use of APEX Plug-ins
- ❖ Using APEX APIs
- ❖ Changing Universal Theme (Theme Roller, Template Options, ...)
- ❖ Custom CSS
- ❖ Including JavaScript

Printing & Exporting



Examples: See AOP in action

	Reports	Features	Backend	Testing
Overview	<ul style="list-style-type: none"> Custom Report (SQL) 	<ul style="list-style-type: none"> AOP Starter Template 	<ul style="list-style-type: none"> Dynamic Print 	<ul style="list-style-type: none"> Process Plug-in
Start	<ul style="list-style-type: none"> Classic Report 	<ul style="list-style-type: none"> Native Office Charts 	<ul style="list-style-type: none"> Mailings: Mail Merge - Labels 	<ul style="list-style-type: none"> Dynamic Action Plug-in
Tour	<ul style="list-style-type: none"> Classic with Totals 	<ul style="list-style-type: none"> JET Charts 	<ul style="list-style-type: none"> Send Print by Email 	<ul style="list-style-type: none"> Table with Templates
Examples	<ul style="list-style-type: none"> Tabular Form 	<ul style="list-style-type: none"> Other Charts (HighCharts, ...) 	<ul style="list-style-type: none"> Send HTML Email 	<ul style="list-style-type: none"> Office Types Word, Excel, Powerpoint
Doc	<ul style="list-style-type: none"> Excel sheet generation 	<ul style="list-style-type: none"> Images 	<ul style="list-style-type: none"> PL/SQL API 	<ul style="list-style-type: none"> HTML, Markdown and Text
More	<ul style="list-style-type: none"> Interactive Report 	<ul style="list-style-type: none"> QR and Barcodes 	<ul style="list-style-type: none"> Scheduled Print 	<ul style="list-style-type: none"> Plug-in Template and Data Types
Support	<ul style="list-style-type: none"> Combo: Classic and IRs 	<ul style="list-style-type: none"> HTML (Rich Text) Editor 	<ul style="list-style-type: none"> Print in Batch 	<ul style="list-style-type: none"> Custom REST call
	<ul style="list-style-type: none"> Interactive Grid 	<ul style="list-style-type: none"> Markdown Editor 	<ul style="list-style-type: none"> Multiple Prints to Zip 	<ul style="list-style-type: none"> Error Testing
	<ul style="list-style-type: none"> Multiple reports (IR, IG, Classic, Custom, Charts) in one PDF 	<ul style="list-style-type: none"> Create template in HTML and output in PDF/Word 	<ul style="list-style-type: none"> Tag Count 	<ul style="list-style-type: none"> AOP Usage
	<ul style="list-style-type: none"> Dashboard (charts with reports) 	<ul style="list-style-type: none"> Inline PDF 	<ul style="list-style-type: none"> Output to Directory on Server 	<ul style="list-style-type: none"> Debugging
	<ul style="list-style-type: none"> More Examples 	<ul style="list-style-type: none"> Print PDF directly to local Printer 	<ul style="list-style-type: none"> Print PDF directly to IP Printer 	<ul style="list-style-type: none"> Automated Tests

Recap

- ❖ From idea to Oracle APEX app
- ❖ Create the Oracle Database Objects
- ❖ Build a starter APEX app with Blueprint
- ❖ Enhance the APEX app

Q&A

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