

Oracle Application Express (APEX): Overview

Presenter's Name

Presenter's Title

Organization, Division or Business Unit

Month 00, 2019

Data – The World's Most Valuable Resource

Data driven organizations are **23 times** more likely to acquire customers, **6x as likely** to retain those customers, and **19x as likely** to be profitable as a result.³



Uber is Worth 70X More Than Hertz – Uber is 52% corporate transport market share compared to rental cars total of 33% in Q4/16¹



“Information has replaced technology as the central and **most critical asset** to be managed by organizations. As a result, business leaders must shift to using the value of information as basis for new planning & funding models.”

- Doug Laney, Research Vice President, Gartner⁴



\$430B Advantage to Data Driven Organizations²

Source:
1. wolfstreet.com
2. IDC
3. McKinsey Global Institute
4. Gartner

Managing Data in Spreadsheets Is Challenging



Data Validation – Manual and error prone



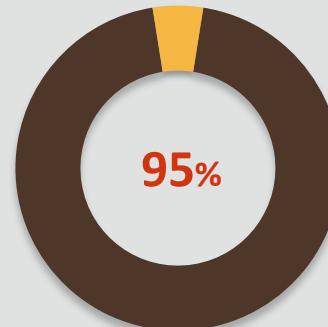
Data Integrity – Cannot guarantee accuracy
of data in multi-user environment



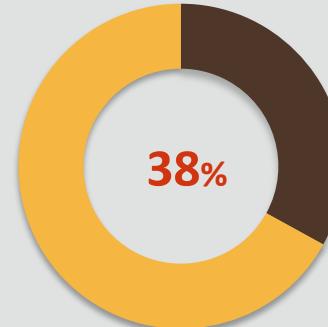
Data Security – Cell locking is ineffective



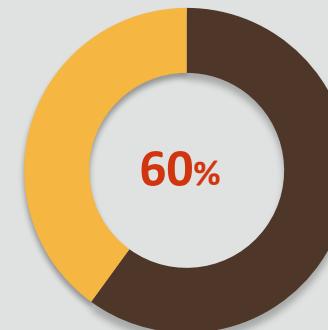
Data Sharing – Excel is sluggish and hard to share



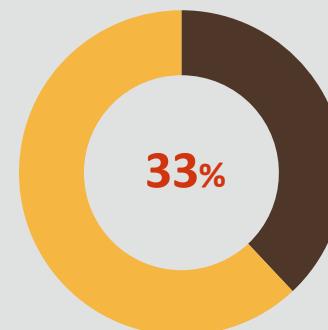
Error Prone
Manual Involvement



Outdated / Data Silo

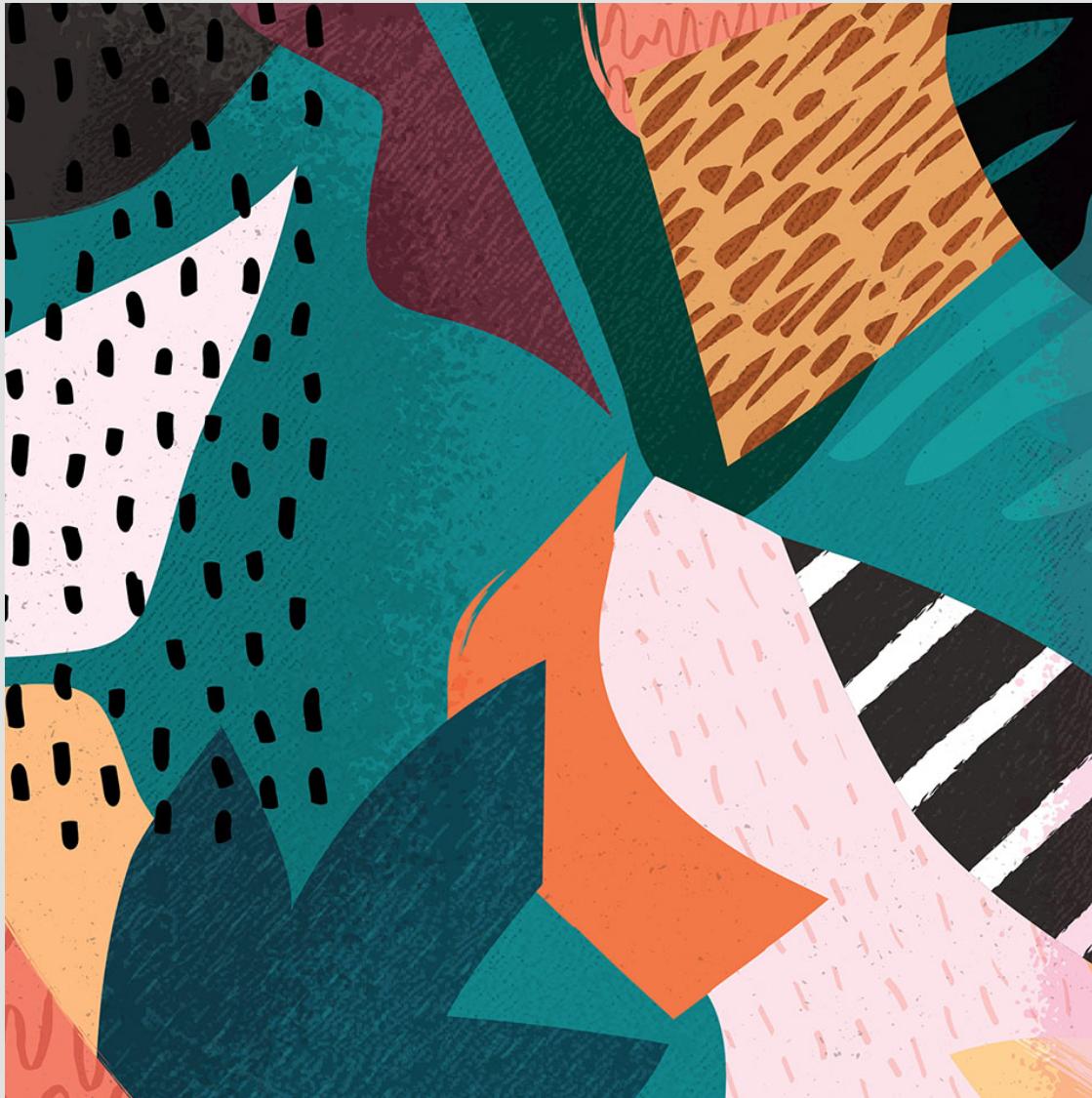


Ineffective Data Redaction



Too Slow and Too
Hard to Share

Source: Oracle Internal Survey



Demonstration

Introduction



What Is Oracle APEX?



A low-code development platform that enables you to build scalable and secure enterprise apps with world-class features that can be deployed anywhere.

ā'pěks
(#orclapex)

Oracle APEX

Database-centric web application development framework



Develop desktop and
mobile web apps

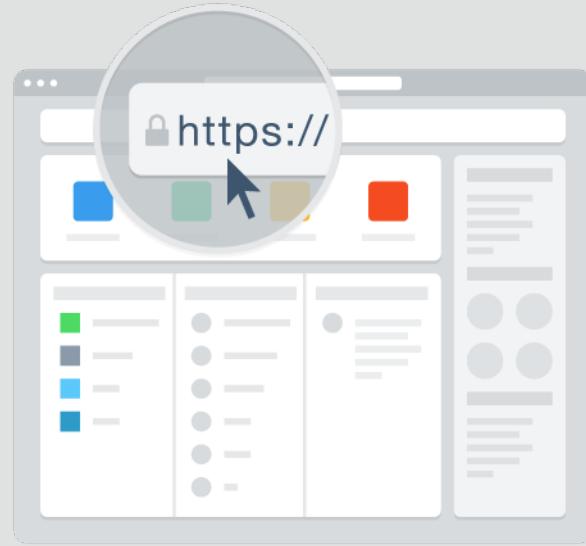


Visualize and
maintain
database data



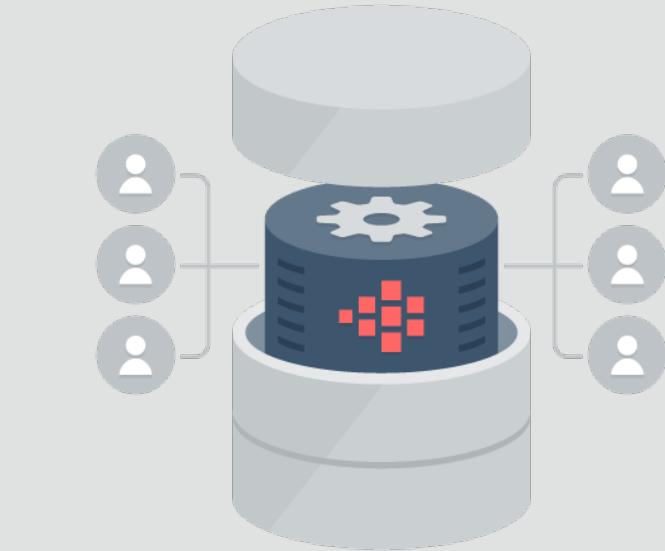
Leverage SQL Skills
and database
capabilities

Distinguishing Characteristics



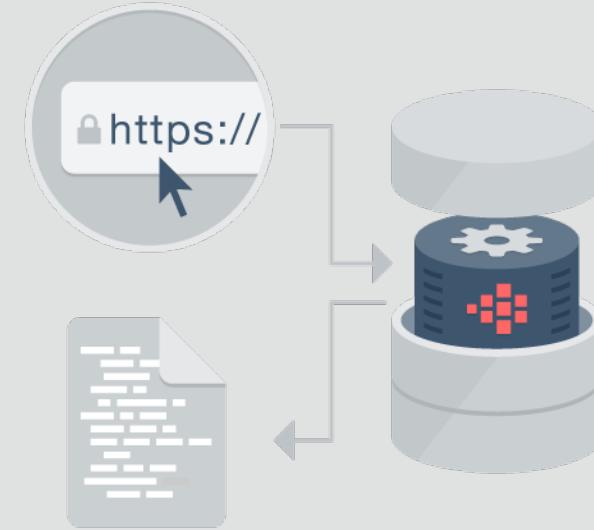
App Development IDE is a web browser.

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

Rapidly develop, customize, and deliver

Pre-built controls for security, authentication, database interaction, validation, session management and more...

Go from prototype to production in minutes



Develop

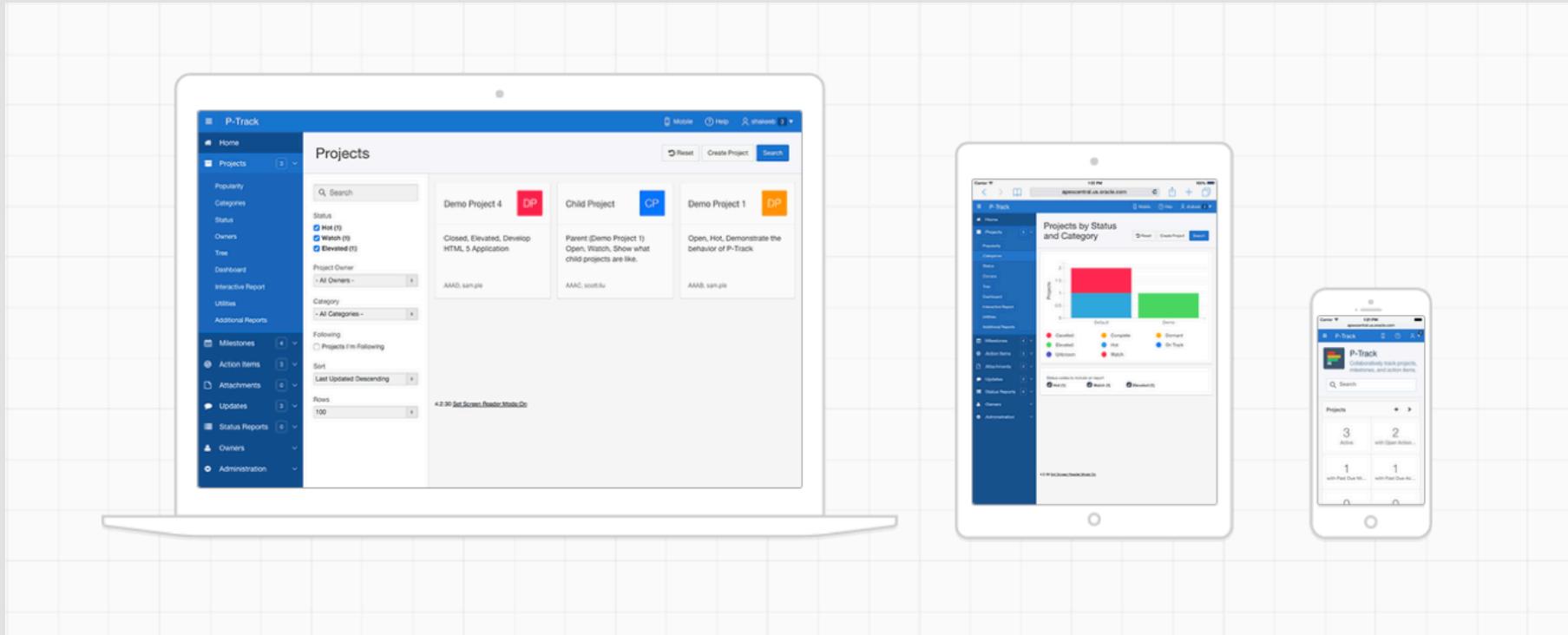


Customize



Deliver

User Interface for Any Device



Modern, intuitive, accessible UI for any device
fully customizable and responsive apps

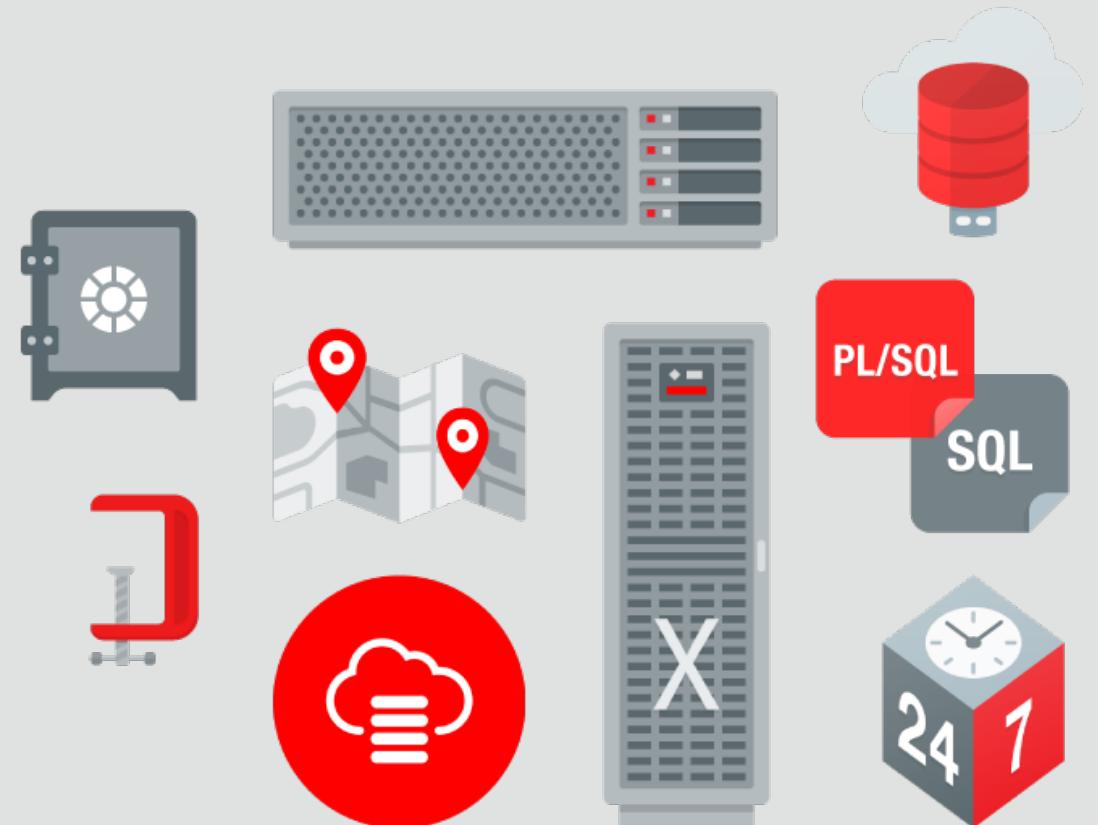
No-Cost Feature of the Oracle Database

- No-cost **fully supported** feature

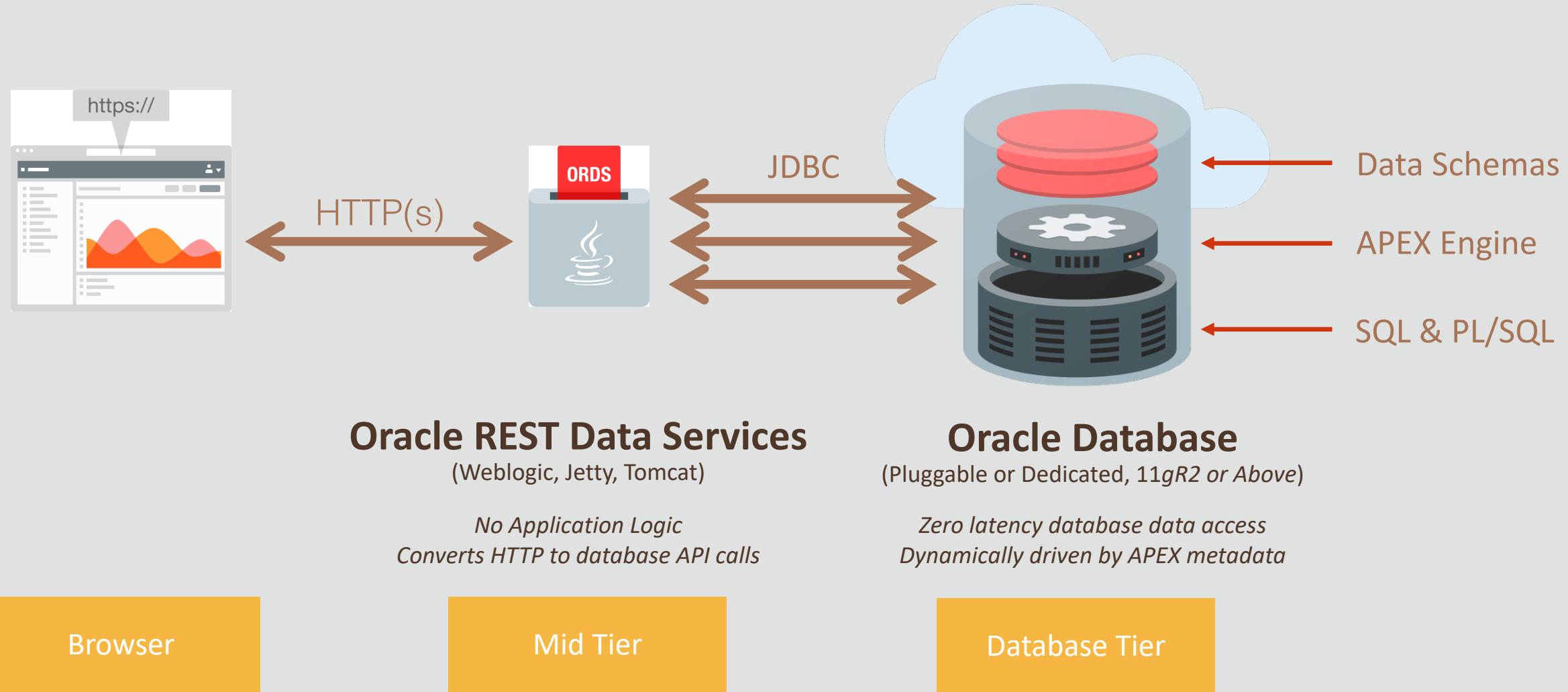
- Any number of apps, developers & end-users
- Specialized Oracle Support Team
- Versions: 11gR2, 12c, 18c, 19c
- All DB editions: XE, SE2, EE

- Easy to install on-premises

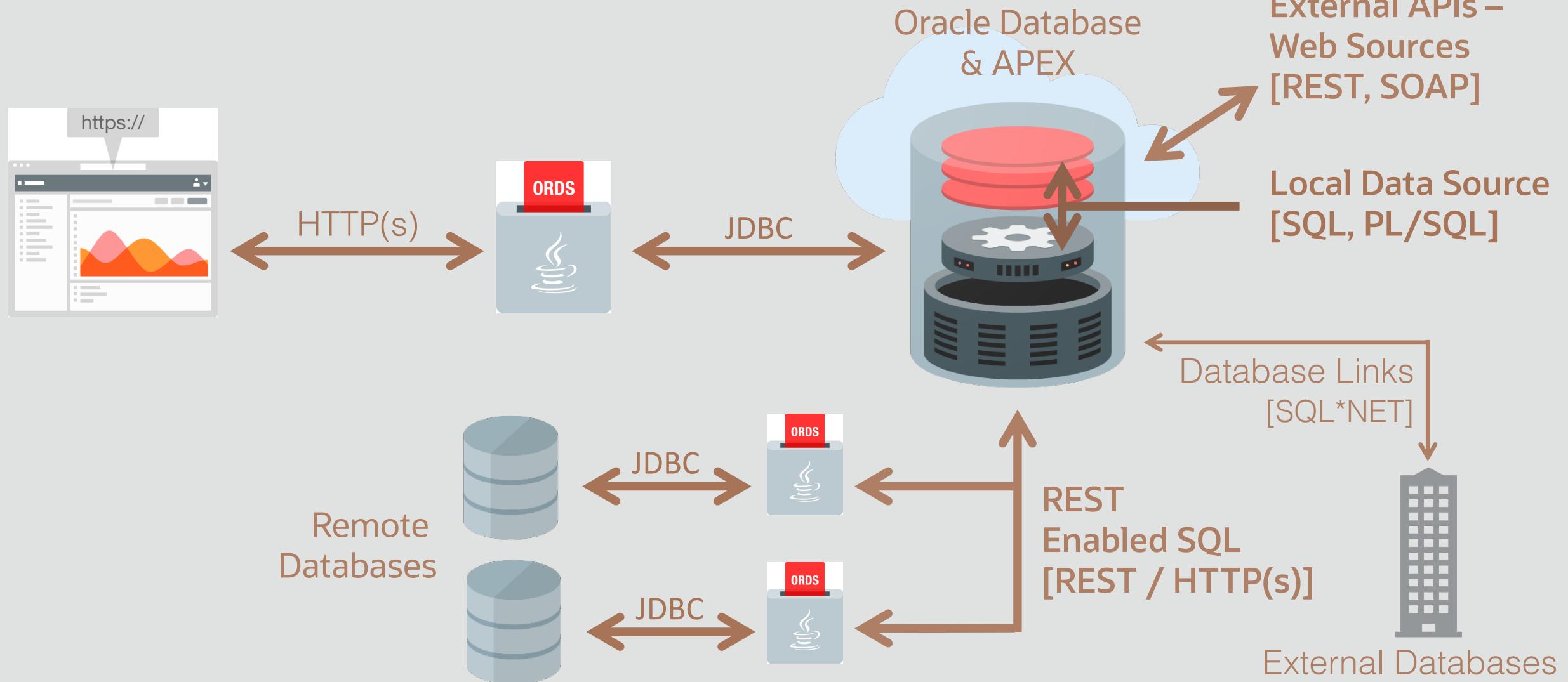
- Included by default with all editions of Oracle database
- Download latest release from <https://apex.oracle.com/otn>



APEX Architecture



APEX Data Sources





Oracle
APEX



Oracle
Autonomous
Database

Included with New Always Free Service

Oracle Autonomous Database



OLTP = Autonomous Transaction Processing (ATP)



Analytics = Autonomous Data Warehouse (ADW)



Fully Managed



Includes Oracle APEX at no additional cost

Autonomous

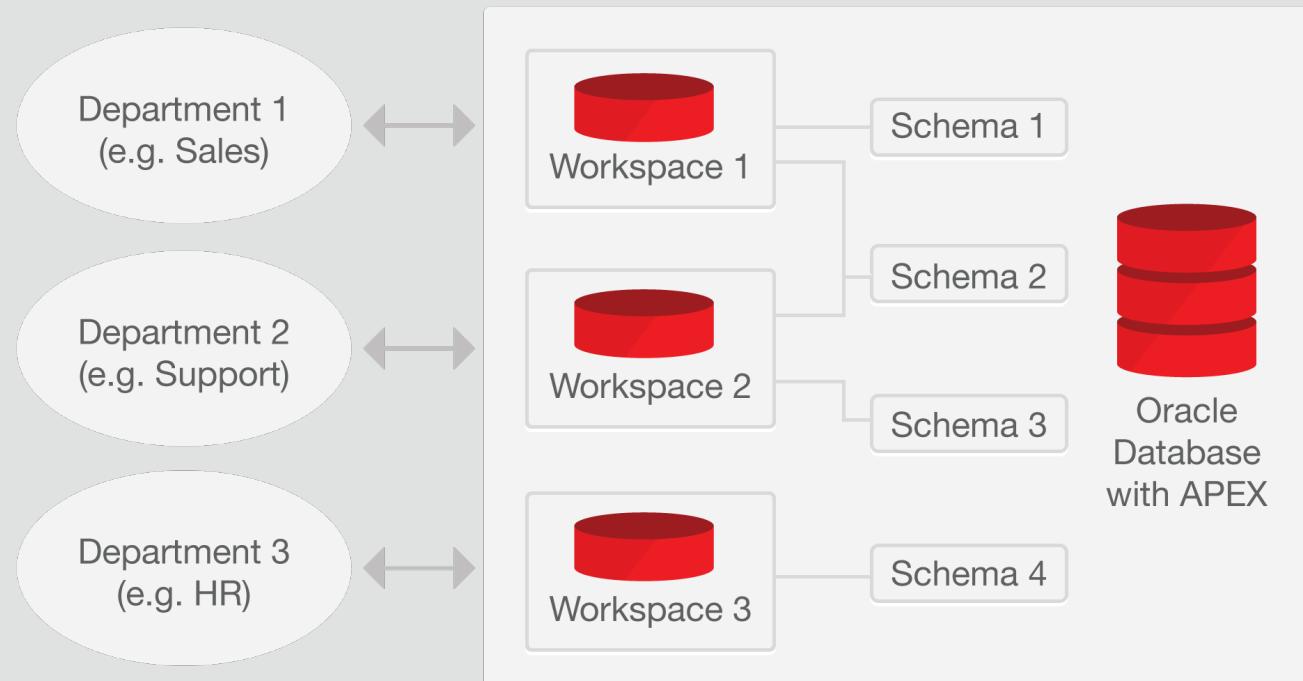
Transaction Processing



Autonomous

Data Warehouse

Single Database Instance / Multiple Workspaces



- Workspaces used to define application definitions / Schemas hold data
- Many-to-many relationship between Workspaces and Schemas
- Instance Administrators manage the environment and schema access
- Departments can request more space, and access to a new schema
- For example, Oracle's internal-only service <http://apex.oraclecorp.com> has over 5,000 Workspaces, covering every line of business in Oracle

Development / Deployment Options



Local

- Install on stand-alone laptops using Oracle Express Edition (XE) or full database version
- Simply upgrade APEX to the required version
- Can work completely disconnected

On-Premise

- Typically run by the IT Department
- IT generally both production operations service, and a service provider
- Departments responsible for application development

Cloud

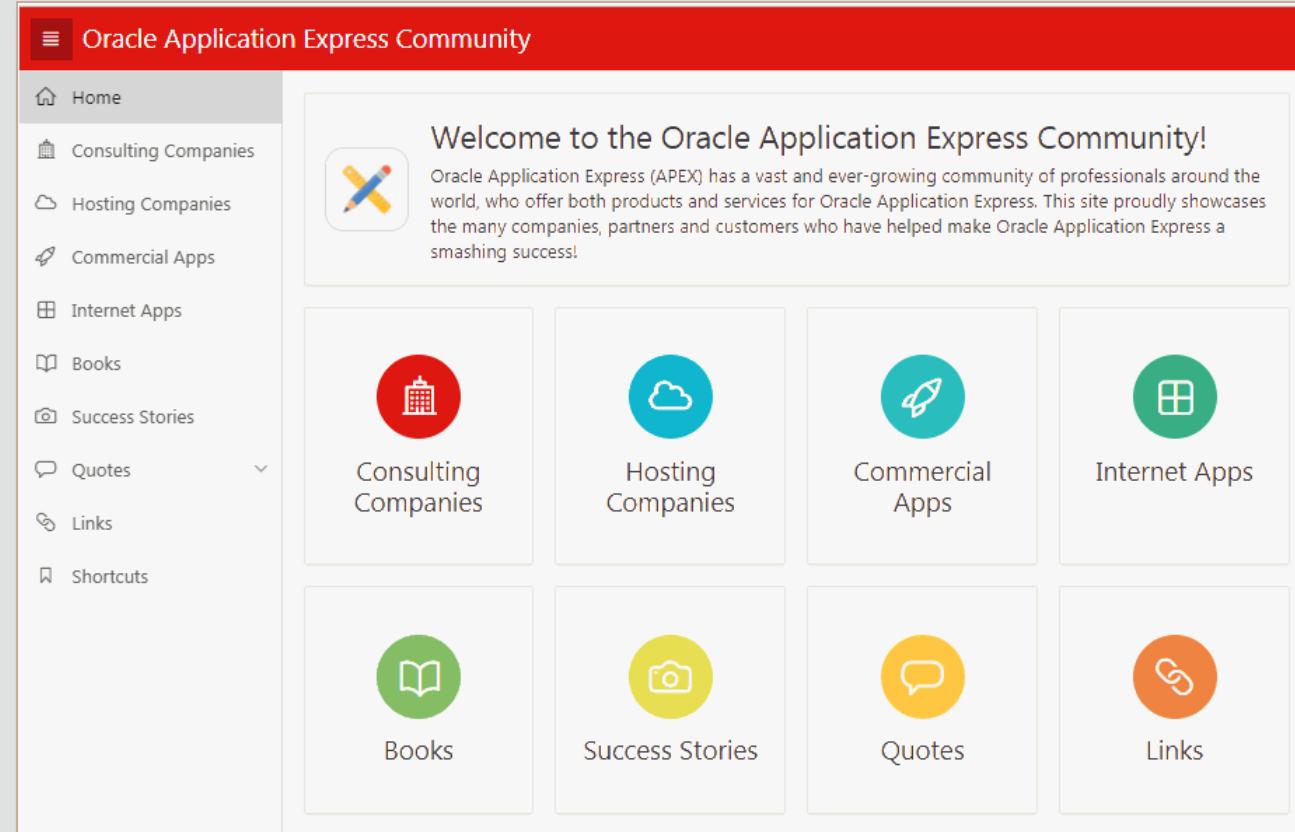
- Deploy Internet applications
- Leveraged for fast application development, user acceptance and training.
- Prototyping & Proof-of-Concept
- Consulting companies develop for deployment on customer premise

Browser based application development framework enables efficient development & deployment

Shoot someone a URL – Check this out – Application Development

Oracle APEX Community

- Over 500,00 developers worldwide
 - Estimated from support requests, downloads, conferences, discussion forum activity
- More than 100 active bloggers
<http://odtug.com/apex>
- <http://apex.oracle.com/community>
Consulting companies, books, success stories, quotes, commercial apps



The screenshot shows the homepage of the Oracle Application Express Community. The header is red with the text "Oracle Application Express Community". On the left is a sidebar with links: Home, Consulting Companies, Hosting Companies, Commercial Apps, Internet Apps, Books, Success Stories, Quotes, Links, and Shortcuts. The main content area has a welcome message: "Welcome to the Oracle Application Express Community! Oracle Application Express (APEX) has a vast and ever-growing community of professionals around the world, who offer both products and services for Oracle Application Express. This site proudly showcases the many companies, partners and customers who have helped make Oracle Application Express a smashing success!" Below the message are four categories: Consulting Companies (red icon), Hosting Companies (blue icon), Commercial Apps (teal icon), and Internet Apps (green icon). At the bottom are four more categories: Books (green icon), Success Stories (yellow icon), Quotes (orange icon), and Links (orange icon).

http://apex.world

Community-authored site providing:

- Plug-ins
- Slack discussion channels
- Twitter feeds
- News
- Jobs
- Conferences
- Meetups

The screenshot shows the homepage of apex.world. At the top, there's a navigation bar with links for Home, Beginners, Post Jobs & Find Developers, Meetings & Trainings, Plug-ins, and Community. Below the navigation, there are three main sections: 1) A Slack interface showing a channel named '#general' with a message from 'maxime_tremblay'. 2) A News section with a search bar and a list of articles, including one from Joel Kallman about Oracle APEX 19.2. 3) A Twitter feed for the account @orclapexworld, which has 1,410 followers. The feed includes tweets from CLOCWISE (@CLOC_WISE) about the final month to submit for ODTUG Kscope20, and from ali saleh (@ali_saleh) about hiding add row buttons in interactive grids.

<http://builtwithapex.com>

- Showcases large diversity of types of applications and different themes
- Launched October, 2016
- > 150 sites published, more being added daily

Built with ā'pěks

Built with APEX is a community driven site geared towards showcasing what others (individuals and businesses alike) have built using [Oracle Application Express](#). If you have developed (or know of) an APEX application, [let us know](#) and we'll be happy to add it to the list. And now [get the logo](#) and put it on your app, so that everyone can see which cool tools you rock!

[Suggest a site](#)

The screenshot shows a grid of 12 APEX application examples, each with a thumbnail, name, and version information:

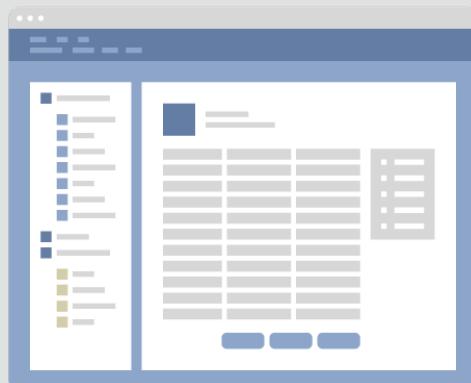
- Talat Smart Hotel
- Online production...
- fabe
- Cooperative Man...
- <http://healtheindia...>
- Oracle Dev Gym
- Nayomi Online
- Oracle Labs
- Iran Football Fedr...
- Rmto Smart card

Each application entry includes a green checkmark icon and a star icon.

Use Cases



Transform Your Spreadsheets to Web Apps in Minutes



Features

- Drag and Drop an XLS, CSV, XML, or JSON file
- Create table in Autonomous Database
- Upload data into new table
- Create App based on new table



Solutions

- *Single source-of-truth*
- *Send out a URL not a file*
- *Secure, scalable, multi-user app*
- *Extend with Charts, Calendars, Validations, and more*

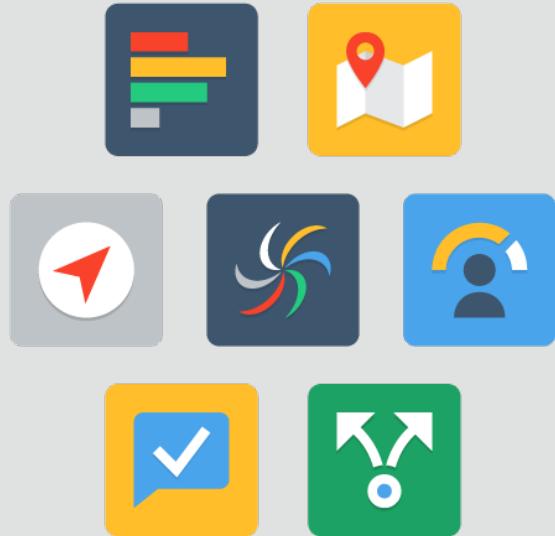
Rapid Application Development

Build new business and productivity apps



Features

- Build apps in days / weeks not months / years
- Use powerful wizards to create fully featured apps
- Easily modify to meet changing requirements
- Rapidly iterate to production-ready app
- Low-code capabilities allow non-IT professionals to also build or help build apps



Solutions

- *Opportunistic*
- *Simplistic, tactical apps to meet immediate need*
- *Webify paper processes*
- *Generally developed by one or two people*

Modernizing Oracle Forms



Features

- APEX is the natural evolution of Forms
- Both based on SQL and PL / SQL
- Re-use DB packages, procedures, functions
- Easily train Forms Developers into developing with APEX



Solutions

- *Proof-of-concept using subset of Forms apps*
- *Organization-wide apps, rather than back-office*
- *External apps for customers / partners*
- *Mobile-first apps*
- *Net new requirements*

Extending Enterprise Systems



Features

- Extend ERPs and other enterprise software
- Provide organization-specific dashboards
- Improved workflows
- Fill gaps



Solutions

- *Meet non-standard requirements*
- *Optimize common business functions*
- *Enhance data capture*
- *Integrate disparate data sources*

See: Extend E-Business Suite using APEX - [Official white paper](#)

Build Large, Enterprise-scale Apps



Features

- Quickly build custom mission-critical apps
- Corporate data reporting and maintenance
- Merge separate data silos
- Build organization-wide self-reporting apps



Solutions

- *Simple deployment*
- *Single installation runs any number of apps*
- *Scale to hundreds of thousands of users*
- *Leverages enterprise features of Oracle Autonomous*

Product Components



Home Page

The screenshot shows the Oracle APEX Home Page. At the top, there is a navigation bar with links for App Builder, SQL Workshop, Team Development, App Gallery, and a search bar. On the right side of the header, there is a user profile for "David".

The main content area features four large icons representing different tools:

- App Builder**: Represented by a screen icon with a blue edit tool icon.
- SQL Workshop**: Represented by a screen icon with a green cloud upload icon.
- Team Development**: Represented by a screen icon with an orange exclamation mark icon.
- App Gallery**: Represented by a screen icon with a red download icon.

Below these icons, there are sections for **Top Apps**, **Top Users**, and **News and Messages**.

Top Apps section:

AP	APEX_CONFERENCE_SESSIONS	4
AC	APEX Community & Partners	2

Top Users section:

	David Peake	1
--	-------------	---

News and Messages section:

+ >

apex.oracle.com has been upgraded to Oracle APEX 19.2. In the event that you are experiencing any upgrade related errors in your application since apex.oracle.com was upgraded, please submit your feedback on the [Oracle APEX Discussion Forum](#)

System Message

On the right side of the page, there is a sidebar with the following information:

220	718
Applications	Tables
10	0
Productivity Apps	Features

Comprehensive Development IDE, Web Application Development, and SQL Database Development

App Builder

The screenshot displays the Oracle APEX App Builder interface. The top navigation bar includes links for ORACLE APEX, App Builder, SQL Workshop, Team Development, and App Gallery, along with search and user profile icons.

The main area features four quick access icons: Create (with a plus sign), Import (with an upward arrow), Dashboard (with a clock icon), and Workspace Utilities (with a wrench icon). To the right is an "About" section describing the App Builder's purpose and a "Learn More ..." link. Below this is a "Recent" section showing a single item: "18360 RAYMOND".

The central part of the interface shows a grid of application cards. Each card contains a small icon, the application name, and a count of items. The applications listed are:

- TI Timesheets, 1.0 (181)
- SO SOUG 622
- EM Employees 766
- TO TORONTO 1128
- OC OOW 2019 Call for Papers 9177
- CT Customer Tracker 2877
- EV Events, 1.0 12044
- CD CLOUD Demo Employees 10923
- MA Master-Detail-Detail 10892
- HT How To Create a Master-Detail PDF Report 16525
- MAP_DEMOS 18139
- RA RAYMOND 18360
- TM Team Meeting 20682

To the right of the application grid is a detailed view of the "Application 2055" page. This page includes a toolbar with various icons, a main content area titled "Application 2055 - Demonstration - Projects", and a sidebar with the following sections:

- Application Home**: Describes the page for running, editing, or deleting applications. It includes a "Create Page" button and a "Learn More ..." link.
- Tasks**
- Delete this Application**
- Copy this Application**
- Recently Edited Pages**: Lists "6. Project Task" and "10000. Administration".

Below the sidebar are five small icons labeled "Run Application", "Supporting Objects", "Shared Components", "Utilities", and "Export / Import". At the bottom are five numbered links: "0 - Global Page - Desktop", "1 - Home", "2 - Dashboard", "3 - Projects", "4 - Milestones", and "5 - Tasks".

Integrated Development Environment (IDE) with Application Development Graphical "Page Designer"
Features tight SQL and PL/SQL integration

App Builder - Page Designer

The screenshot shows the Oracle APEX App Builder - Page Designer interface. The top navigation bar includes tabs for ORACLE APEX, App Builder, SQL Workshop, Team Development, and App Gallery, along with search and user profile icons.

The main workspace displays the 'Page Designer' for 'Application 2055'. The left sidebar shows the page structure for 'Page 6: Project Task', including regions like Pre-Rendering, Content Body (with a 'Project Task' item), and Dialog Footer.

The central area shows the 'Project Task' dialog configuration. The 'Layout' tab is selected, displaying the dialog header and content body. The content body contains fields for P6_PROJECT_ID, P6_MILESTONE_ID, P6_NAME, P6_DESCRIPTION, P6_ASSIGNEE, P6_START_DATE, and P6_END_DATE.

The right panel contains configuration sections for the dialog:

- Identification:** Name: Project Task, Page Alias: Project Task, Title: Project Task, Page Group: - Select -
- Appearance:** User Interface: Desktop, Page Mode: Modal Dialog, Dialog Template: Theme Default, Template Options: Use Template Defaults, CSS Classes, Media Type
- Dialog:** Width, Height, Maximum Width, Attributes

At the bottom, there are tabs for Regions, Items, and Buttons, along with icons for Breadcrumb, Calendar, Chart, Classic Report, Column Toggle Report, and Faceted Search.

App Builder - Page Designer

- Multiple trees to view the page components
- Visualization of the page within the Grid Layout, and associated Gallery, allowing you to drag and drop components
- Update multiple attributes without leaving the page in the Property Editor
- Advanced Code Editor for defining SQL, HTML, CSS and text sections
- Highly configurable user interface:
 - Customize and refine view of page specific to current focus
 - Slideable panels
 - Drag and drop tabs

App Builder – Code Editor

Available for maintaining SQL, PL/SQL, JavaScript, HTML, CSS, and large text sections

- Syntax Highlighting
- Undo / Redo
- Find/Replace
- Auto completion
- Code validation
- Used in Page Designer, Component View and SQL Workshop



The screenshot shows a modal window titled "Code Editor - SQL Query". The window contains an SQL query with syntax highlighting for keywords (e.g., SELECT, FROM, WHERE) and identifiers. The query retrieves monthly sales, monthly orders, and total products from the "demo_orders" table. It uses PL/SQL constructs like dynamic SQL and session variables (:APP_ID, :APP_SESSION, :P1_THIS_MONTH) to generate URLs. The code editor interface includes standard toolbar icons for copy, paste, search, and refresh, along with a settings gear icon. At the bottom right are "Cancel" and "OK" buttons.

```
1 select
2   'Monthly Sales' as label,
3   '$'||trim(to_char(nvl(sum(o.order_total),0),'999G999G999G999G990')) as value,
4   'f?p='||:APP_ID||':4'||:APP_SESSION||'::::4,RIR:IRGTE_ORDER_DATE'||:P1_THIS_MONTH as url
5 from demo_orders o
6 where order_timestamp >= to_date(to_char(sysdate,'YYYYMM')||'01','YYYYMMDD')
7 union all
8 select
9   'Monthly Orders' as label,
10  trim(to_char(count(distinct o.order_id),'999G999G999G999G990')) as value,
11  'f?p='||:APP_ID||':4'||:APP_SESSION||'::::4,RIR:IRGTE_ORDER_DATE'||:P1_THIS_MONTH as url
12 from demo_orders o
13 where order_timestamp >= to_date(to_char(sysdate,'YYYYMM')||'01','YYYYMMDD')
14 union all
15 select 'Total Products' as label,
16   trim(to_char(count(distinct n.product_name),'999G999G999G999G990')) as value.
```

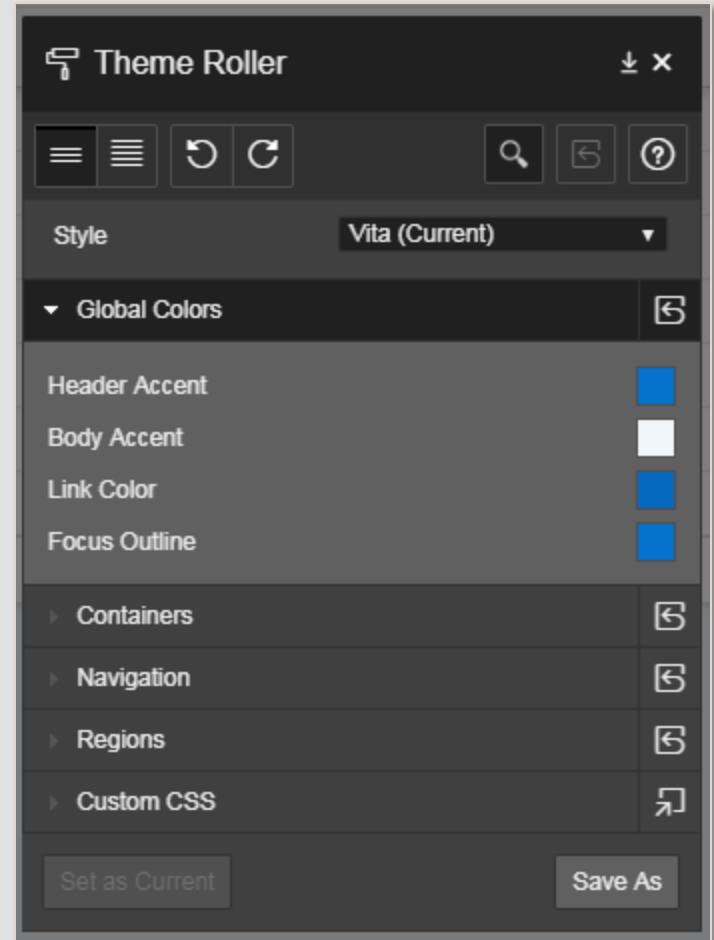
App Builder - Universal Theme

- Default theme for Oracle APEX applications
- Uses responsive HTML5 templates
- Grid-layout for HTML forms
- Modern flat-look
- Ships with a variety of pre-built theme styles
- jQuery Mobile Apps can be transitioned to Universal Theme

App Builder - Universal Theme

Theme Styles and Theme Roller

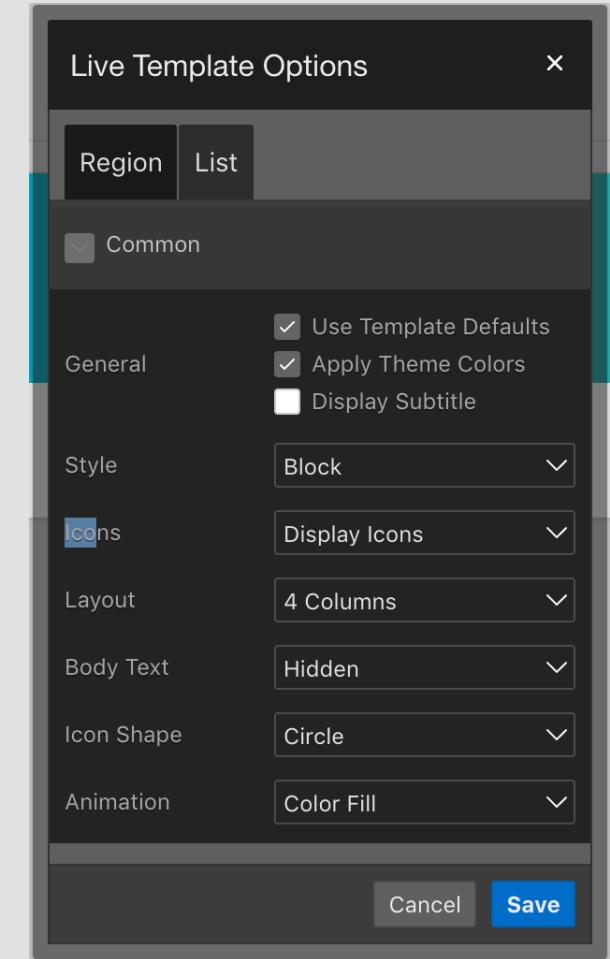
- Theme Styles provide a variety of different color schemes and styles for a single theme
- Defined as CSS file that is included in addition to the theme's base CSS file
- Universal Theme includes several pre-built styles
- Additional styles can be easily generated using the built-in Theme Roller utility



App Builder - Universal Theme

Template Options

- Declarative CSS modifiers for HTML5 templates
- Enables developers to declaratively apply styles like borders, padding, icons, colors, size, etc.
- Uses easy-to-understand, descriptive names
- Available for most template types:
 - Page, Region, Report, Breadcrumb, List, Item, Button
- Significantly reduces the number of required templates for a theme



SQL Workshop

The screenshot shows the Oracle APEX interface with the SQL Workshop tab selected. The top navigation bar includes links for ORACLE APEX, App Builder, SQL Workshop (selected), Team Development, and App Gallery, along with a search bar.

The main workspace contains five icons representing different features:

- Object Browser (grid icon with magnifying glass)
- SQL Commands (grid icon with greater than sign)
- SQL Scripts (grid icon with clipboard)
- Utilities (grid icon with wrench)
- RESTful Services (grid icon with cloud and arrow)

Below these icons, the Object Browser is open, showing a list of tables:

- Tables dropdown menu
- Search bar
- AAA
- AIG_PROJECTS
- AMR_TASKS
- APEX\$ARCHIVE_CONTENTS
- APEX\$ARCHIVE_HEADER
- APEX\$ARCHIVE_HISTORY
- APEX\$ARCHIVE_LOG

To the right, the table editor for "SAMPLE\$PROJECT_TASKS" is displayed:

SAMPLE\$PROJECT_TASKS					
Table	Data	Indexes	Model	Constraints	Grants
	Add Column	Modify Column	Rename Column	Drop Column	Rename
					Copy
					Drop
					Truncate
					Create Lookup Table
					Create App

The table structure for "SAMPLE\$PROJECT_TASKS" is shown:

Column Name	Data Type	Nullable	Default	Primary Key
ID	NUMBER	No	-	1
PROJECT_ID	NUMBER	No	-	-

Browser based maintenance of database objects and data
Designed to meet application developers' needs, especially in hosted environments

SQL Workshop – Quick SQL

The screenshot shows the Oracle APEX interface with the SQL Workshop tab selected. In the 'Quick SQL Shorthand' section, the user has entered:

```
1 departments /insert 4
2   name /nn
3   location
4   country
5 employees /insert 14
6     name /nn vc50
7     email /lower
8     cost_center num
9     date_hired
10    job vc255
11
12 view emp_v departments employees
```

In the 'Oracle SQL Output' section, the generated SQL is:

```
1 -- create tables
2 create table departments (
3   id          number not null constraint department_id_pk primary key,
4   name        varchar2(255) not null,
5   location    varchar2(4000),
6   country     varchar2(4000)
7 )
8 ;
9
10 create table employees (
11   id          number not null constraint employees_id_pk primary key,
12   department_id number,
13   constraint employees_department_id_fk references departments on delete cascade,
14   name        varchar2(50) not null,
15   email       varchar2(255),
16   cost_center number,
17   date_hired date,
18   job         varchar2(255)
19 )
20 ;
21 ;
22 ;
```

Rapidly design and prototype data models using a markdown-like shorthand syntax that expands to standards-based Oracle SQL.

Team Development

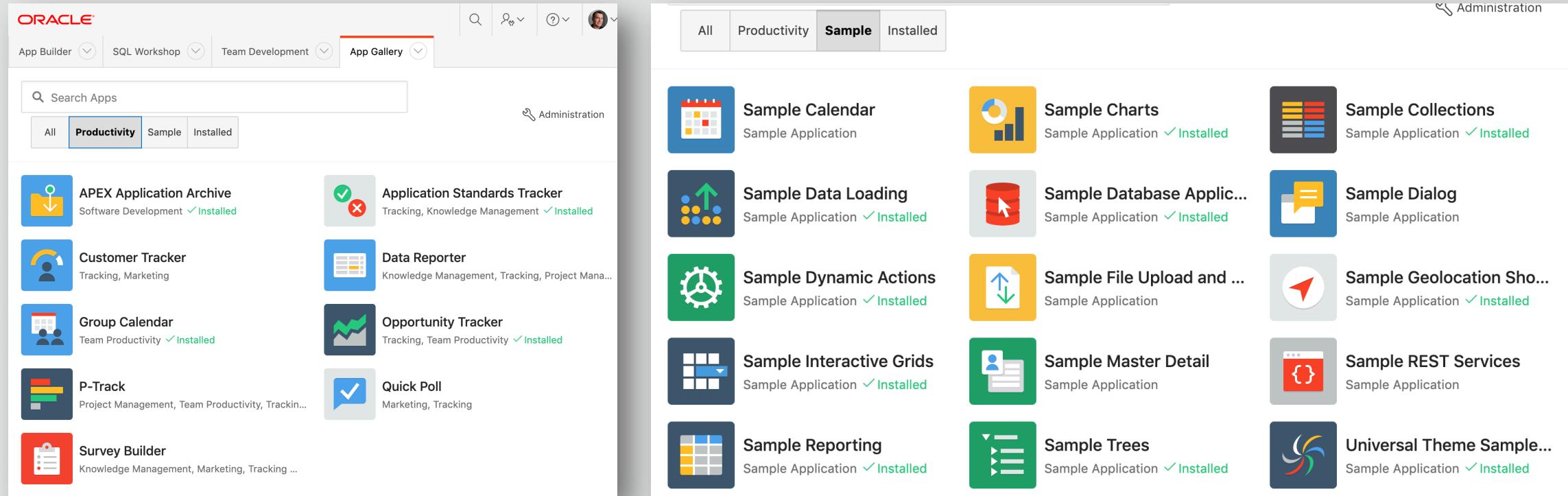
The screenshot shows the Oracle APEX Team Development interface. At the top, there are tabs for ORACLE, App Builder, SQL Workshop, Team Development (which is selected), and App Gallery. Below the tabs, the breadcrumb navigation shows 'Issues \ Issue Details'. There are buttons for a bell icon, 'Jump to ...', and 'New Issue'.

The main content area displays an issue titled 'Team Development in Oracle APEX 19.2!' (Issue #1). It was opened 5 minutes ago by Joel Kallman with 0 comments. The issue body contains a message from Joel Kallman stating: 'Hi there! This is your very first issue! You can create issues to keep track of tasks, features, bugs, and feedback for all of your APEX projects! You can add labels to issues, add assignees, set milestones, and even apply formatting using Markdown shorthand! Below is a quick sample of what you can do with Markdown:'. The sample Markdown includes a section header 'Orionis bellica Stygias partes Solibus an rutilis cornu' and a paragraph of Latin text: 'Lorem markdownum formosae. *Est medio* et illi adunca? Miserum Phaethon, Editus, abrupta colonos; Aeeta annum; facere pruniceum **domat**, discussisque saevo, Tereo. *Quid noctis adhuc, nisi nemo dignos*, aures sonus mentae conspecta?' followed by some code.

To the right of the issue body, there is a sidebar with sections for 'About', 'Assignees', 'Labels', 'Milestones', and 'Notifications'. The 'Labels' section lists several categories: Enhancement Request, Performance Issue, Training Issue, Security, Critical, Moderate Effort, Working On It, and Code Freeze (which is highlighted in yellow). The 'Milestones' section shows a single entry: 'Code Freeze 11/16/2019'.

Team Development has been reimaged as a new and more flexible way to work with colleagues and keep track of tasks, features, bugs and feedback.

App Gallery



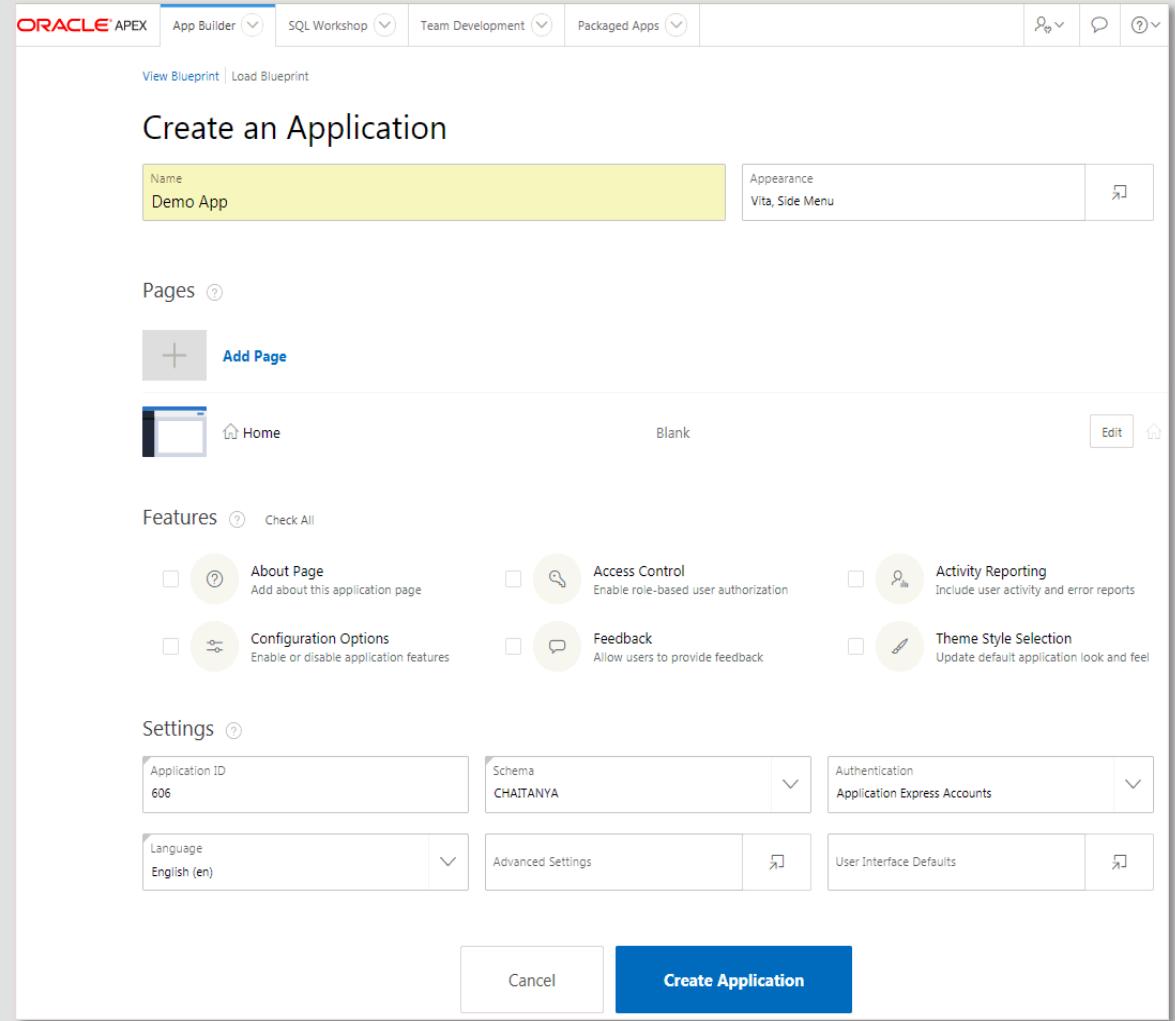
- Robust suite of productivity and sample applications.
- Illustrates best practices and design patterns.
- Template to start customization (e.g. unlock your packaged app).
- Upgraded with every release.

Features



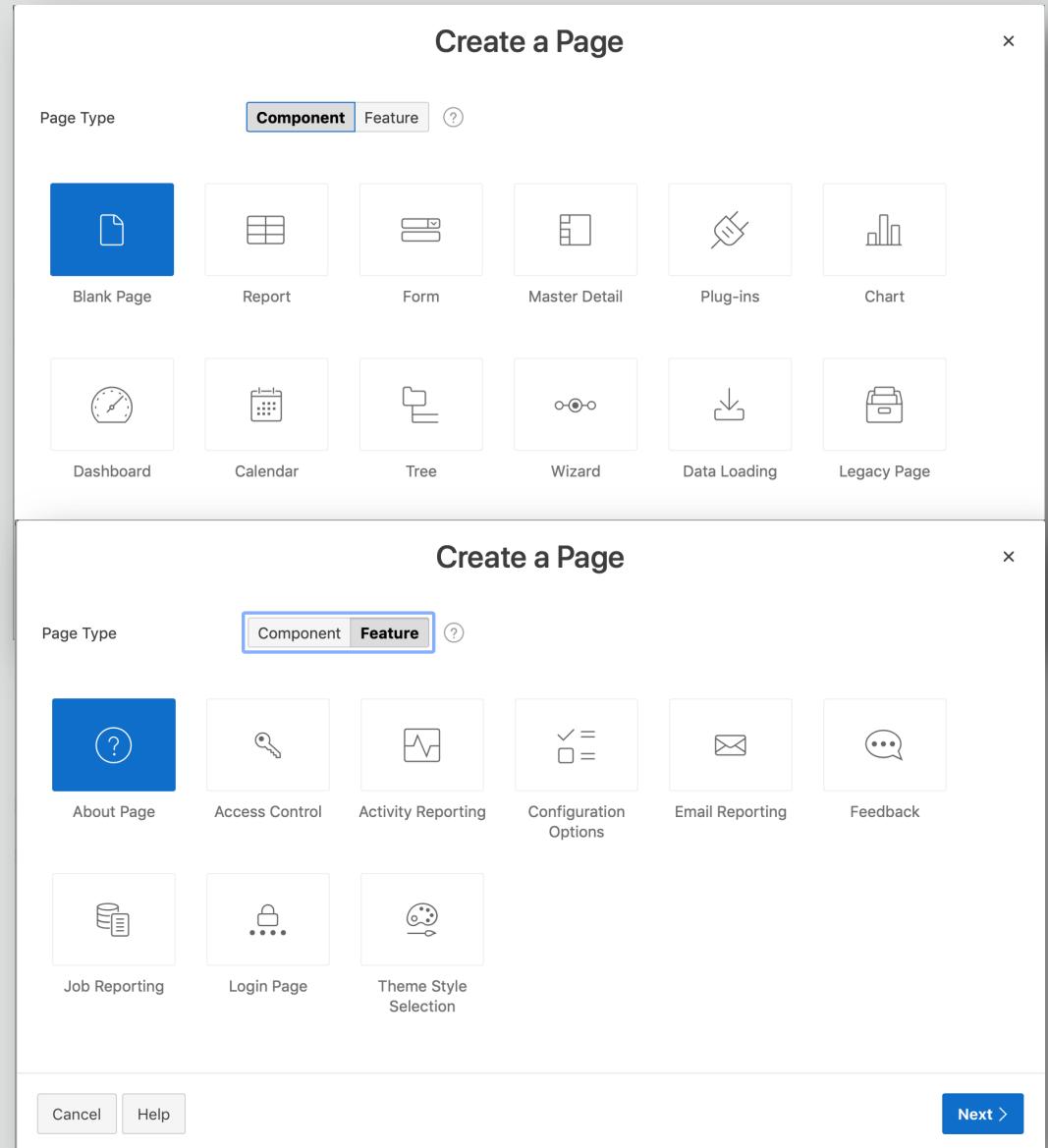
Create Application Wizard

- Simple, modern wizard for creating pages.
- Allows creation of numerous page types including Dashboards, Master-Detail, etc.
- Supports adding common frameworks or "Features" when creating an application such as access control, activity reporting, theme selection, and more
- Customize user interface options such as Theme Style, application icon and page icons



Create Page Wizard

- Simple, modern wizard for creating individual pages in an existing app.
- Allows creation of more advanced pages such as Dashboards, additional Master-Detail page types, List View, mobile first reports, and more.
- Supports adding common frameworks or "Features" to an existing application such as access control, activity reporting, theme selection, and more



Interactive Reports

Powerful Reporting capabilities → End-user customizable

Interactive Report

Project : ACME Web Express Configuration

	Task Name	Start Date	End Date	Status	Assigned To	Cost	Budget	Available Budget
1	Identify server requirements	17-APR-18	18-APR-18	Up	James Cassidy	200	500	300
2	Determine Web listener configuration(s)	19-APR-18	19-APR-18	Down	James Cassidy	500	500	-100
3	Run installation	22-APR-18	22-APR-18	Left	James Cassidy	200	200	0
4	Create pilot workspace	24-APR-18	24-APR-18	Right	James Cassidy	100	100	0
5	Specify security authentication scheme(s)	29-APR-18	29-APR-18	Open	James Cassidy	200	300	100
6	Configure Workspace provisioning	30-APR-18	30-APR-18	Pending	James Cassidy	200	100	-100
7	Select servers for Development, Test, Production	03-MAY-18	05-MAY-18	Up	James Cassidy	200	600	400
						1,700	2,300	

Project : Bug Tracker

	Task Name	Start Date	End Date	Status	Assigned To	Cost	Budget	Available Budget
1	Document quality assurance procedures	03-MAR-18	06-MAR-18	Closed	Myra Sutcliff	3,000	2,000	-1,000
2	Review automated testing tools	07-MAR-18	09-MAR-18	Closed	Myra Sutcliff	750	1,500	750

Faceted Search

- A powerful new way to filter and display your data.
- Faceted Search will make it easier for your users to find the data they want.

Search

Rental Name	Host Name	Neighborhood	Room Type	Price	Minimum Nights
Bright, Modern Garden Unit - 1BR/1B	Holly	Western Addition	Entire home/apt	170	1
Charming room for two	Kevin	Inner Sunset	Private room	99	1
Creative Sanctuary	Philip And Tania	Bernal Heights	Entire home/apt	235	30
A Friendly Room - UCSF/USF - San Francisco	Aaron	Haight Ashbury	Private room	65	32
Friendly Room Apt. Style -UCSF/USF - San Francisco	Aaron	Haight Ashbury	Private room	65	32
Historic Alamo Square Victorian	Rosy	Western Addition	Entire home/apt	475	4
Lovely 2BR flat Great Location	Sandy	Western Addition	Entire home/apt	255	2
Mission Sunshine, with Private Bath	Ivan & Wendy	Mission	Private room	139	1
Artful Potrero Separate Floor with Garden	Gae	Potrero Hill	Private room	135	1

Search... Go

Neighborhood

- Bayview (183)
- Bernal Heights (388)
- Castro/Upper Market (430)
- Chinatown (126)
- Crocker Amazon (41)

Show More

Room Type

- Entire home/apt (4707)
- Private room (2885)
- Shared room (241)

Price

- <50 (275)
- 50 - 120 (2296)
- 120 - 150 (1069)

Interactive Grid

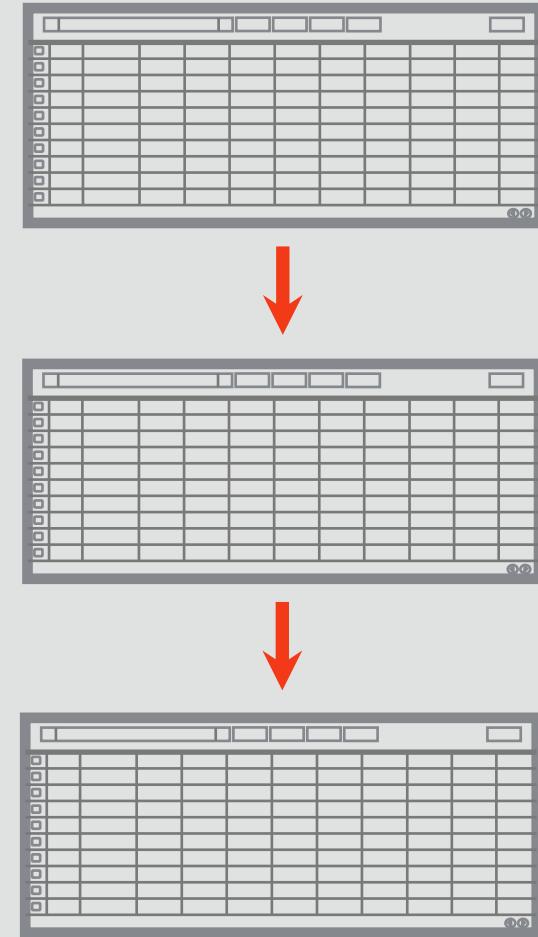
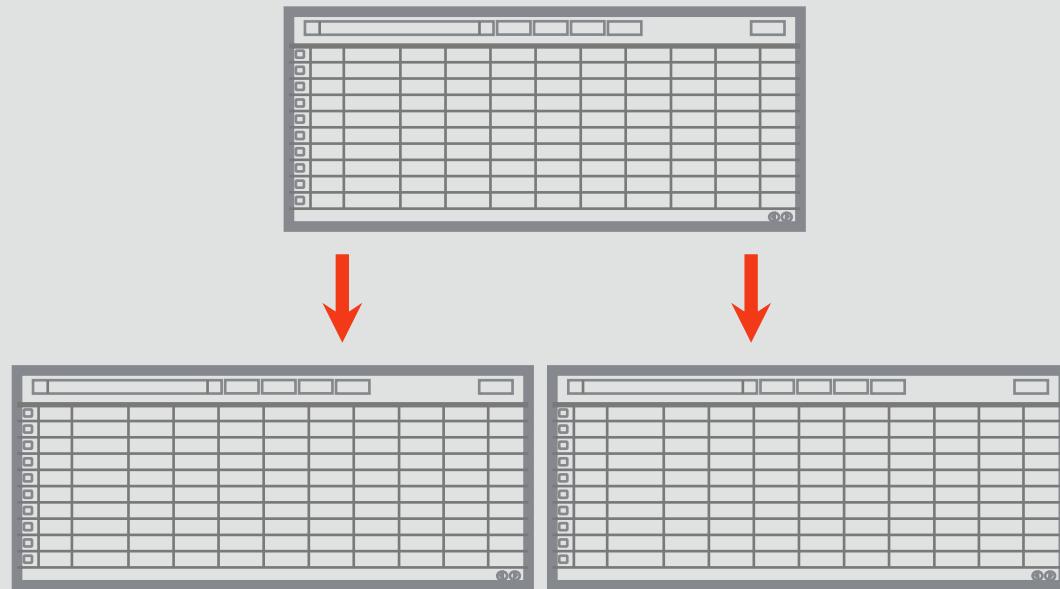
- Modern, rich & interactive multi-row editing component
- Use of existing Item types
- Declarative support for Cascading LOVs and Dynamic Actions
- Upgrade utility for Tabular Forms
- Master Detail / Detail

Employee Details

		Name	Job	Manager	Hire Date	Salary	Commission	On Leave	Notes	Department
		MILLER	Clerk	CLARK	23-JAN-82	1300	200	No	-	ACCOUNTING
		SMITH	Clerk	FORD	17-DEC-80	800	100	No	-	RESEARCH
		ADAMS	Clerk	SCOTT	12-JAN-83	1100	200	Yes	Medical Leave	RESEARCH
<input checked="" type="checkbox"/>	<input type="checkbox"/>	JAMES	Clerk	BLAKE	03-DEC-81	950	300	No	-	SALES
		ALLEN	Salesman	BLAKE	20-FEB-81	1600	300	No	-	SALES
		WARD	Salesman	BLAKE	22-FEB-81	1250	500	No	-	SALES
		MARTIN	Salesman	BLAKE	28-SEP-81	1250	1400	No	-	SALES
		TURNER	Salesman	BLAKE	08-SEP-81	1500	0	No	-	SALES
		KING	President		17-NOV-81	5000	-	No	-	ACCOUNTING
		CLARK	Manager	KING	09-JUN-81	2450	-	No	-	ACCOUNTING
		JONES	Manager	KING	02-APR-81	2975	-	No	-	RESEARCH
		BLAKE	Manager	KING	01-MAY-81	2850	-	No	Lorem ipsum dol...	SALES
		SCOTT	Analyst	JONES	09-DEC-82	3000	-	No	-	RESEARCH
		FORD	Analyst	JONES	03-DEC-81	3000	-	No	-	RESEARCH

Interactive Grid

Master Detail Layout – N-levels wide or deep



Modal Dialogs

Readily switch between normal, modal, and non-modal page mode

- A modal dialog is a stand-alone page, not a region on a page
- Any page can be created as a dialog page
- Supports all the functionality of a regular page, including computations, validations, processes, and branches

Customers

Upload Data Create Customer Reset

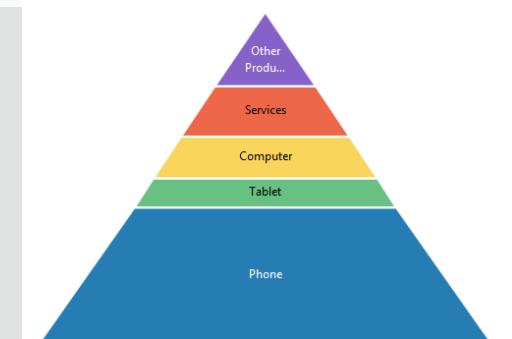
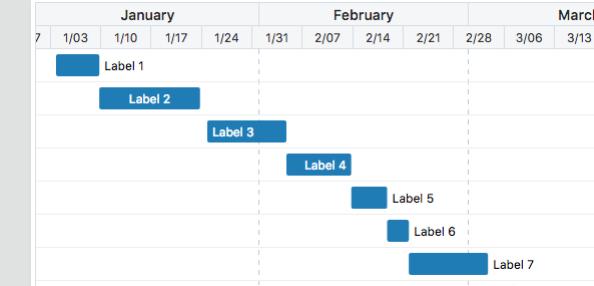
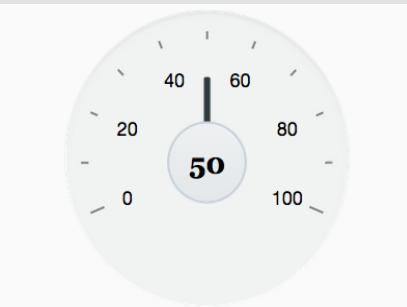
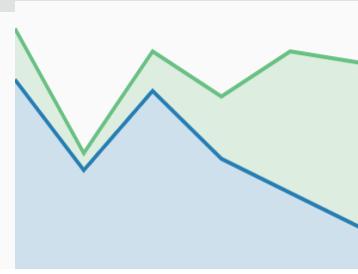
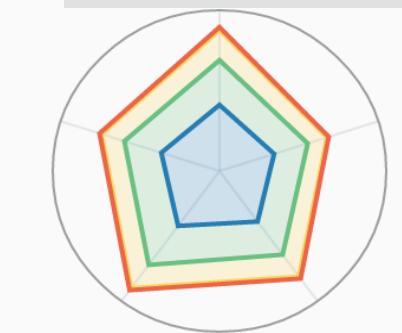
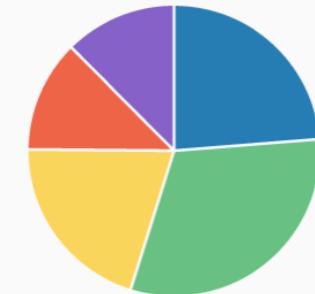
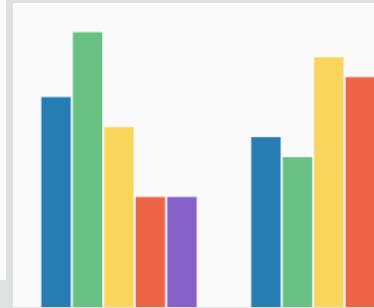
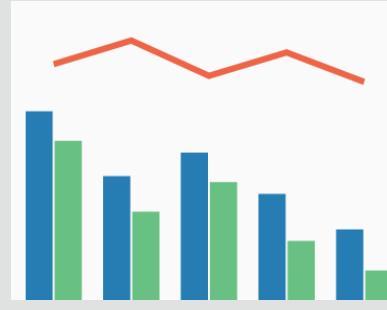
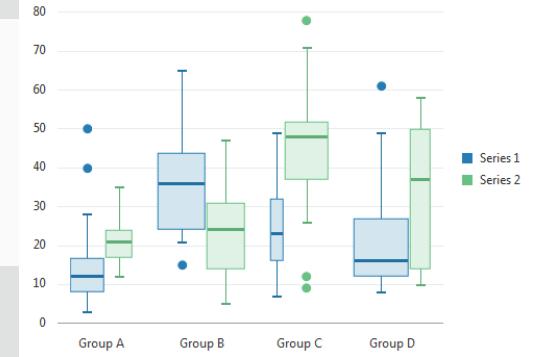
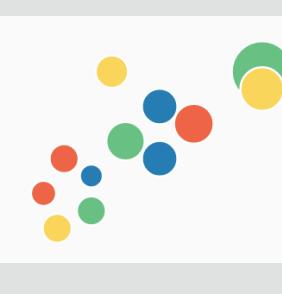
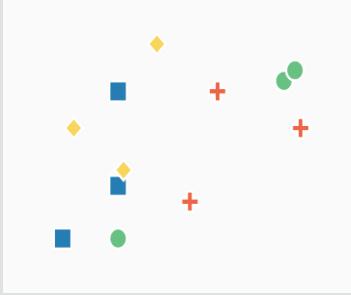
Customer Name	Address	City	State
Dulles, John	Sample Database Application - Customer Details		
Hartsfield, William	* First Name <input type="text" value="John"/>	* Last Name <input type="text" value="Dulles"/>	VA
Logan, Edward	Street Address <input type="text" value="45020 Aviation Drive"/>	Line 2 <input type="text"/>	GA
OHare, Frank	City <input type="text" value="Sterling"/>	* State <input type="text" value="Virginia"/>	MA
LaGuardia, Fiorello	* Zip Code <input type="text" value="20166"/>		IL
Lambert, Albert	* Credit Limit <input type="text" value="1000"/>		NY
Bradley, Eugene	Phone Number <input type="text" value="703-555-2143"/>	Alternate Number <input type="text" value="703-555-8967"/>	MO
	Email <input type="text" value="john.dulles@email.com"/>	URL <input type="text" value="http://www.johndulles.com"/>	CT
	Tags <input type="text"/>		

1 - 7

Cancel Delete Apply Changes

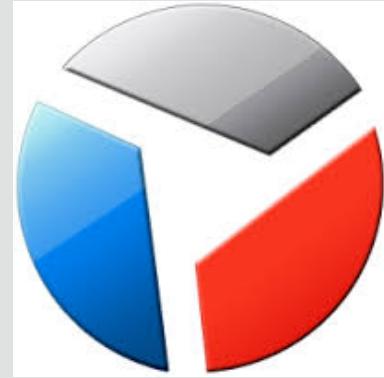
A screenshot of a modal dialog titled "Sample Database Application - Customer Details". The dialog contains fields for First Name (John), Last Name (Dulles), Street Address (45020 Aviation Drive), City (Sterling), Zip Code (20166), Credit Limit (1000), Phone Number (703-555-2143), Alternate Number (703-555-8967), Email (john.dulles@email.com), URL (http://www.johndulles.com), and Tags. The dialog has a close button (X) in the top right corner. At the bottom are buttons for Cancel, Delete, and Apply Changes.

Charting Engine



Charting Engine

Declarative support for Oracle JET Data Visualization Components



- Based on Oracle JET Data Visualization Components
- Oracle JET (JavaScript Extension Toolkit) is open source
- JavaScript-based solution, data being provided in JSON format
- Highly Customizable
 - Using 'JavaScript code' to provide function to be called when chart is initialized
 - Using Dynamic Actions to add interactive behavior
- Built-in Accessibility Support
- Built-in Responsive Design Support

Calendar

Different views, drag and drop capability

Standard Calendars \

Monthly Calendar: Projects

This is a standard Oracle Application Express (APEX) calendar component built using the create calendar region wizard. A Button Bar region was also created and a P31_PROJECTS page item to allow for filtering by project. Click on a calendar event to open a dialog which allows you to change details.

- All Projects -

◀ ▶ today April 2018 month list

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
Train developers on tracking bugs				Review with legal	Plan rollout schedule	
Apply Billing System updates		Complete questionnaire	+2 more	+2 more	+1 more	
8	9	10	11	12	13	14
Identify pilot desktop application		Complete plan	Migrate pilot applications to ACME Web Express	Check software licenses	Plan migration schedule	
15	16	17	18	19	20	21
Create training workspace		Migrate pilot Client Server to ACME Web Express	Collect mission-critical spreadsheets	+1 more	Determine Web listener config	Customize solutions
Identify pilot Client Server applic		+3 more	+3 more	Lock spreadsheets	Post-migration review	
22	23	24	25	26	27	28
Customize solutions		Implement in Production	Create pilot workspace	Conduct project kickoff meeting	Get RFPs for new server	
		Run installation	Plan migration schedule	Train Administrators of Package	Create ACME Web Express appl	
29	30	1	2	3	4	5
Create ACME Web Express applications from spreadsheets				Load current tasks and enhance	Select servers for Development, Test, Production	
Migrate Client Server applications				Test migrated applications	Send links to previous spreadsh	
+2 more	+4 more	+3 more	Plan rollout schedule			

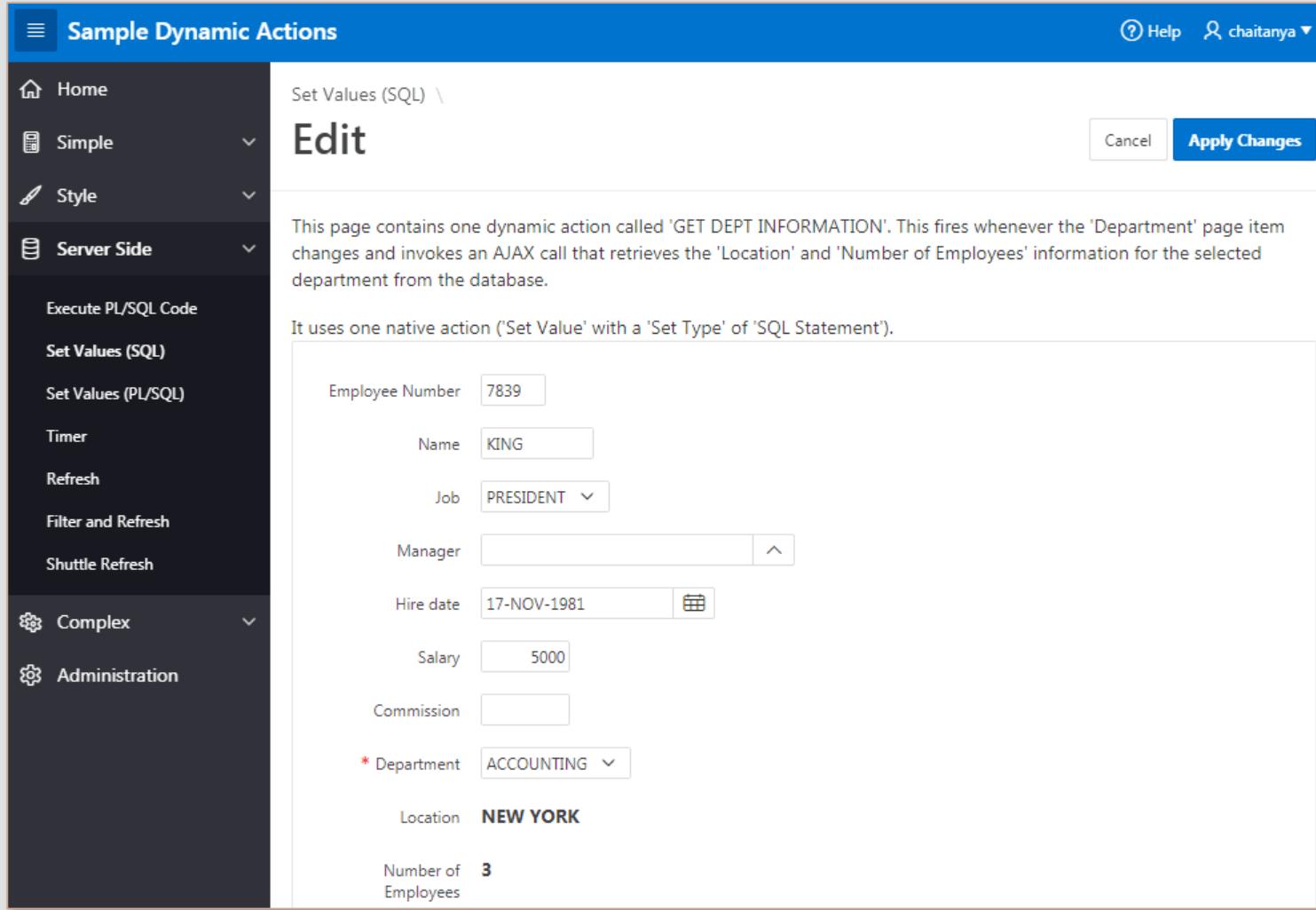
List-based Navigation Menus

- Available as top navigation menu and side menu
- Implemented as standard APEX lists
- Supports multi-level hierarchical menu structures
- Provides accessible pull-down menus
- Alternative to using traditional tabs



Dynamic Actions

Declaratively define rich client-side interactivity without writing JavaScript or AJAX



The screenshot shows the 'Sample Dynamic Actions' application in Oracle APEX. The left sidebar lists various dynamic action categories: Home, Simple, Style, Server Side (selected), Execute PL/SQL Code, Set Values (SQL), Set Values (PL/SQL), Timer, Refresh, Filter and Refresh, Shuttle Refresh, Complex (selected), and Administration.

The main content area is titled 'Edit' and describes a dynamic action named 'GET DEPT INFORMATION'. It states that it fires whenever the 'Department' page item changes and invokes an AJAX call to retrieve department information. It uses one native action ('Set Value' with a 'Set Type' of 'SQL Statement').

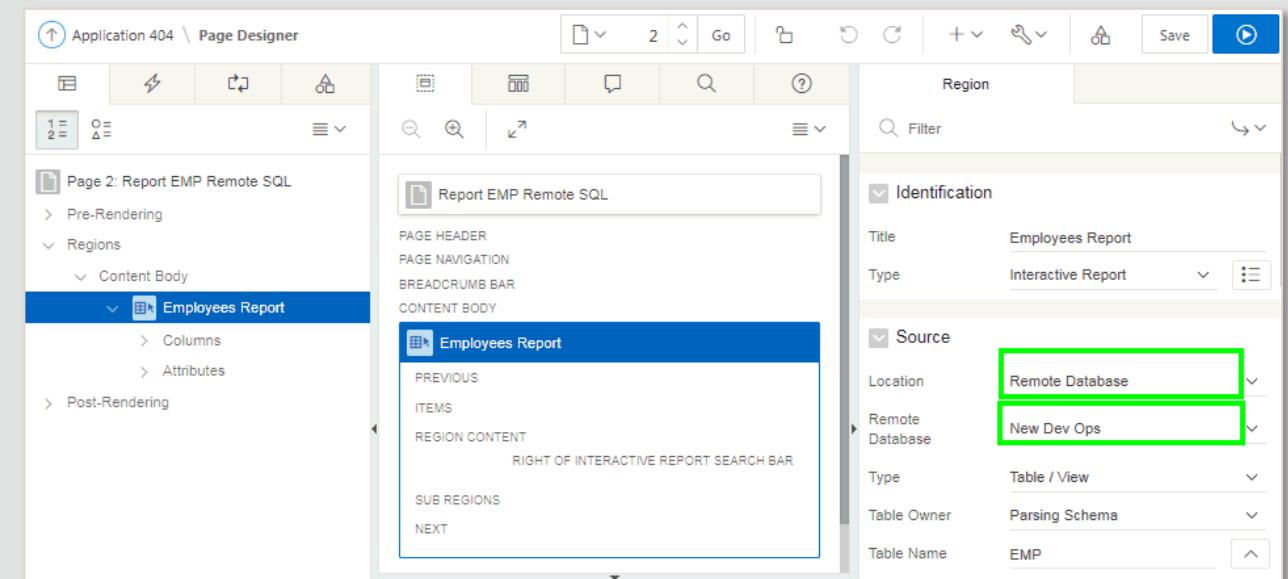
The configuration details show the following fields:

- Employee Number: 7839
- Name: KING
- Job: PRESIDENT
- Manager: (empty)
- Hire date: 17-NOV-1981
- Salary: 5000
- Commission: (empty)
- * Department: ACCOUNTING
- Location: NEW YORK
- Number of Employees: 3

Buttons at the top right include 'Cancel' and 'Apply Changes'.

REST Enabled SQL Support

- Create and maintain References to REST Enabled SQL Instances (Oracle REST Data Services) in Shared Components: A name, Endpoint URL, and Authentication information
- Use a REST Enabled SQL Service and therefore a remote Oracle database as the Data Source for Oracle APEX components like:
 - Classic Reports, Interactive Reports
 - Reflow Report, Toggle Columns Report
 - Tree Region, JET Charts
 - CSS Calendar
 - PL/SQL Process



Consuming External REST APIs

- Web Source Modules are a declarative method to define references to external REST APIs and generic JSON data feeds.
- Web Source Modules store additional metadata about how to parse response data and map it as a virtual table with rows and columns.
- A module can contain one or many Web Source Operations which are the references to a concrete external web service.
- Create and maintain Web Source Modules in Shared Components.

Web Source Module

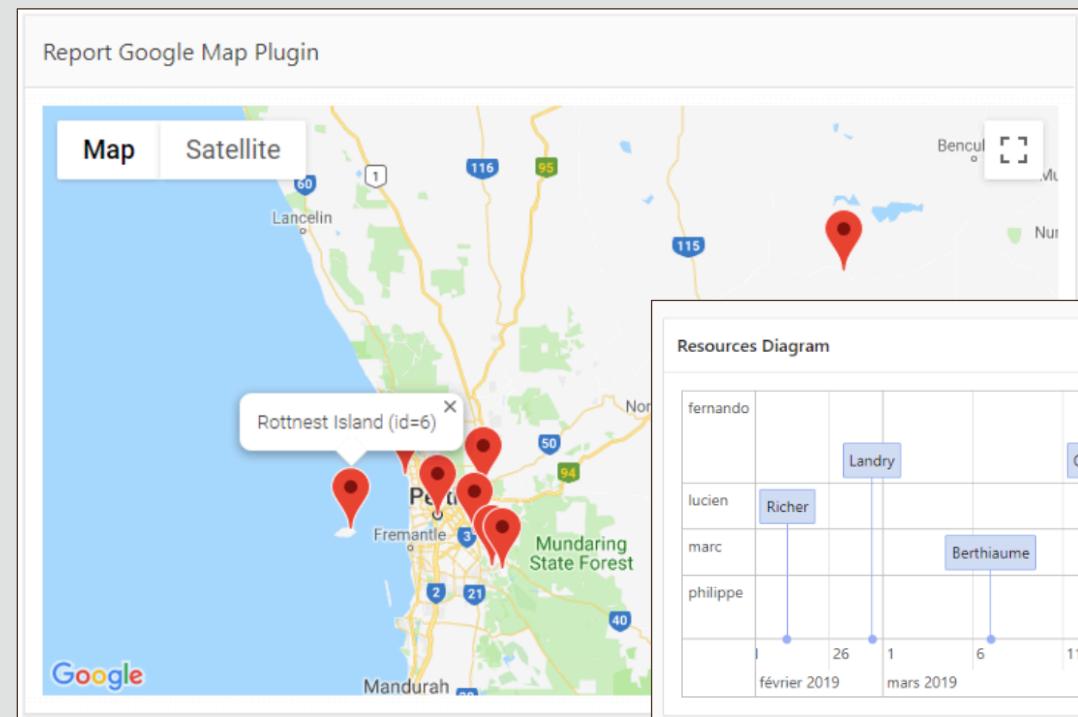
* Name	USGS Earthquake
* Web Source Type	Simple HTTP
* Remote Server	USGS Earthquake
Base URL	https://earthquake.usgs.gov/earthquakes/feed/
* URL Path Prefix	/v1.0/summary/all_day.geojson

Consuming External REST APIs

- Use as data sources for Oracle APEX components such as:
 - Interactive Report, Classic Report
 - JET Chart, CSS Calendar
 - Tree Region, Reflow Report, Toggle Column Report
- Post Processing SQL modifies data before being processed by an Oracle APEX component:
 - Apply SQL functions, aggregations, join to local tables etc.
 - Avoid unnecessary HTTP requests by using **Caching**

Plug-Ins

Extend applications with custom components such as items and regions



A grid of five application components:

- Flow Chart**: A colored flow chart with various nodes and connections. Description: "This example shows a colored flow chart. If you click on the fields, an event will be fired, which can be caught by a dynamic action. In addition, the example shows the different possibilities to set a styling. (Just check the sql)"
- Color Design**: A section titled "AutoRefresh or Disco Chart". Description: "It's disco time... no it's not! It's just a demo of the autorefresh. The load icon can also be disabled." It includes a configuration section with "Sql" and "ConfigJson".
- AutoRefresh or Disco Chart**: A section titled "Organization". Description: "Here is an example for an organization chart. I have created it in 3 different styles to illustrate its capabilities." It includes a configuration section with "Style" dropdowns for "style1", "default", and "style2".
- Organization**: A section titled "Configuration". It contains a search bar with "150126 150476" and a password input field labeled "<<barcode value>>".
- Resources Diagram**: A Gantt chart titled "Resources Diagram" showing tasks for various users from February to April 2019. Tasks include Landry, Charte, Gareau, Boulanger, Fontaine, Beaulieu, Richer, Berthiaume, Bienvenue, Racicot, Blondlot, Allain, and Busque.

<https://apex.world/ords/f?p=100:700>

Summary

Oracle APEX

Summary

- Used by real customers for real applications: Used for both opportunistic and mission critical apps that service tens of thousands of users.
- Well Established Product : First released in 2004
- Most powerful Low Code Application Development Platform: Allows developer to focus on solving the business problem and delivering superior solutions, with less time and effort spent on mundane and repetitive lower-level coding.
- Continually growing: Oracle install base is adopting Oracle APEX for increasing numbers of projects, and is increasingly an approved corporate IT standard.

Oracle APEX

Summary

- Aligned with industry trends: Strong support for HTML5 development frameworks, Modern & responsive CSS3 UI, integrated JavaScript libraries, Browser-based, self-service provisioning, flexible development and deployment including cloud services.
- Consistent with Oracle developers skill set: SQL, PL/SQL, Oracle Database.
Proficiency in the Oracle database easily translates into an ability to develop web applications.

Learn More...

Primary site

APEX Shortcuts

APEX Community

Blogs

APEX on Autonomous

Database Cloud Services

Oracle Learning Library

Oracle APEX Education

<https://apex.oracle.com>

<https://apex.oracle.com/shortcuts>

<https://apex.oracle.com/community>

<https://blogs.oracle.com/apex>

<https://apex.oracle.com/autonomous>

<https://cloud.oracle.com/database>

<https://www.oracle.com/oll>

<https://apex.oracle.com/education>



Thank you

Presenter's Name
Presenter's Title
Organization, Division, or Business Unit

