



COLLABORATE19

TECHNOLOGY AND APPLICATIONS FORUM
FOR THE ORACLE COMMUNITY

Vote Early, Vote Often: From Napkin to Canvassing Application in a Single Weekend

Session ID:

116

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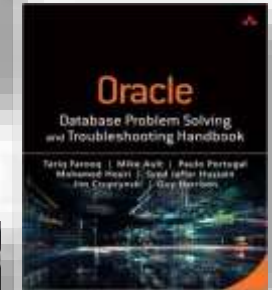
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My Credentials

- 35+ years of database-centric IT experience
- Oracle DBA since 2001
- Oracle 9i, 10g, 11g, 12c OCP[®]
- Oracle ACE Director
- 100+ articles on databasejournal.com and IOUG SELECT
- Co-author of 4 Oracle books
- Oracle-centric blog ([Generally, It Depends](http://jimczuprynski.wordpress.com))
- Regular speaker at Oracle OpenWorld, IOUG COLLABORATE, KSCOPE, and Regional OUGs

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- Check out my blog: <http://jimczuprynski.wordpress.com>
- Follow me on Twitter: @JimTheWhyGuy
- Connect with me on LinkedIn: Jim Czuprynski



Our Agenda

- Vote Early, Vote Often: Finding the Grain Among the Chaff
- Leveraging Oracle Database 18c for Security, Scalability, and Flexibility
- Building a Data Model In Minutes Instead of Hours
- Napkin, Meet APEX: Fleshing Out Application Basic Components
- Deploying a Desktop Application
- Deploying a Mobile Canvassing Application
- Future Research and Experimentation



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**Vote Early, Vote Often:
Finding the Grain Among
the Chaff**

Use Case: Managing Canvassing in US Congressional Campaign



- Understand where potential voters live
 - Gerrymandered district stretches **several dozen miles** across five different counties and 56 municipalities
 - Incumbent opponent won district **handily** in last five elections

- Figure out how to best deploy a growing multitude of volunteers

- Volunteers range in age from *just able to vote* to *JFK Democrats*
- Everyone is *not* suited to canvassing!



- Capture results of phone banking, text banking, and canvassing
 - Record successful voter **commitment** to candidate
 - Identify possible **new** volunteers and contributors
 - Determine which messages **resonate** (retain!) ... as well as which ones **fall flat** (discard!)



Timelines, Concerns and Restrictions



- **Extremely short** development windows
 - Primary ended in April 2018, but canvassing extends only six months
 - Should candidate lose, the application can be discarded shortly after November 2018 election ends



- **Data retention** concerns
 - Data analysis will extend briefly should candidate lose
 - Data will be valuable for 2020 race should candidate win



- **Security** concerns
 - One of the hottest congressional races in 2018
 - Opponent is incumbent with heavy outside funding
 - Opposition is experienced at “going negative”

Got a Napkin? Then Let's Build This Thing!

My first attempts at data modeling and requirements gathering ...

... including minor issues, like what computing environment and security concerns ...



... and defining the first draft of the data entry UI requirements



What could possibly go wrong?



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Leveraging Oracle Database 18c for Security, Scalability, and Flexibility

- Perfect for the Cloud
- Perfect for Oracle 18c
- Perfect for SmartDB

Realization: Perfect for the Cloud!



- Relatively **simple** data model and small data volume (<500M rows)
- Short development time frames demand **quick orchestration** for compute and storage
- Complex **n-dimensional analytics** may be required
 - Past voting record vs. strength of party affiliation vs. impact of current government initiatives vs. ...
 - Determine “flippability” of voter before canvassing starts
- Security is a *must* ... so **encryption is crucial!**
 - Most voter data is publicly available ... but contributor and volunteer information as well as canvassing results are *proprietary*
 - Removes concerns about on-premises development and data storage
 - Eliminates risk of penetration by rival campaign

Realization: Perfect for Oracle 18c!

- Tight integration with Oracle Public Cloud features
 - Multitenant offers quick **replication** via PDB
 - Developers stay **busy** ... and so do users!
 - Simple to **orchestrate** more CPU, memory, and storage if needed via either REST calls or web-based API
- Complex *n*-dimensional analytics can leverage:
 - Database In-Memory features like **columnar storage** and **In-Memory External Tables**
 - Analytic Views for **rollups** among various hierarchies
- Requires limited resources for managing security and continuity
 - Leverage new 18c **security features** (e.g. passwordless schema)
 - **PDB-level** backup and recovery using Secure Oracle Backup
 - Guaranteed **end-to-end protection** from “sniffing” and other hijinks



Realization: Perfect for SmartDB!



- **Oracle REST Data Services (ORDS)** works well for developers
 - **Simple** to use, deploy, and monitor
 - Developers can **concentrate on UI**, instead of mastering complex SQL
 - **DBA retains control** of shared code base
- **Edition-Based Redefinition (EBR)** makes it possible for two versions of production application reside simultaneously in same DB
- **Security**
 - **Two-phase authentication** for staffers deployed “in the field”
 - **Code-Based Access Control (CBAC)** best practices supports excellent application security





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- SQL Data Modeler
- DataGenerator

Building and Populating a Data Model In Minutes Instead of Hours

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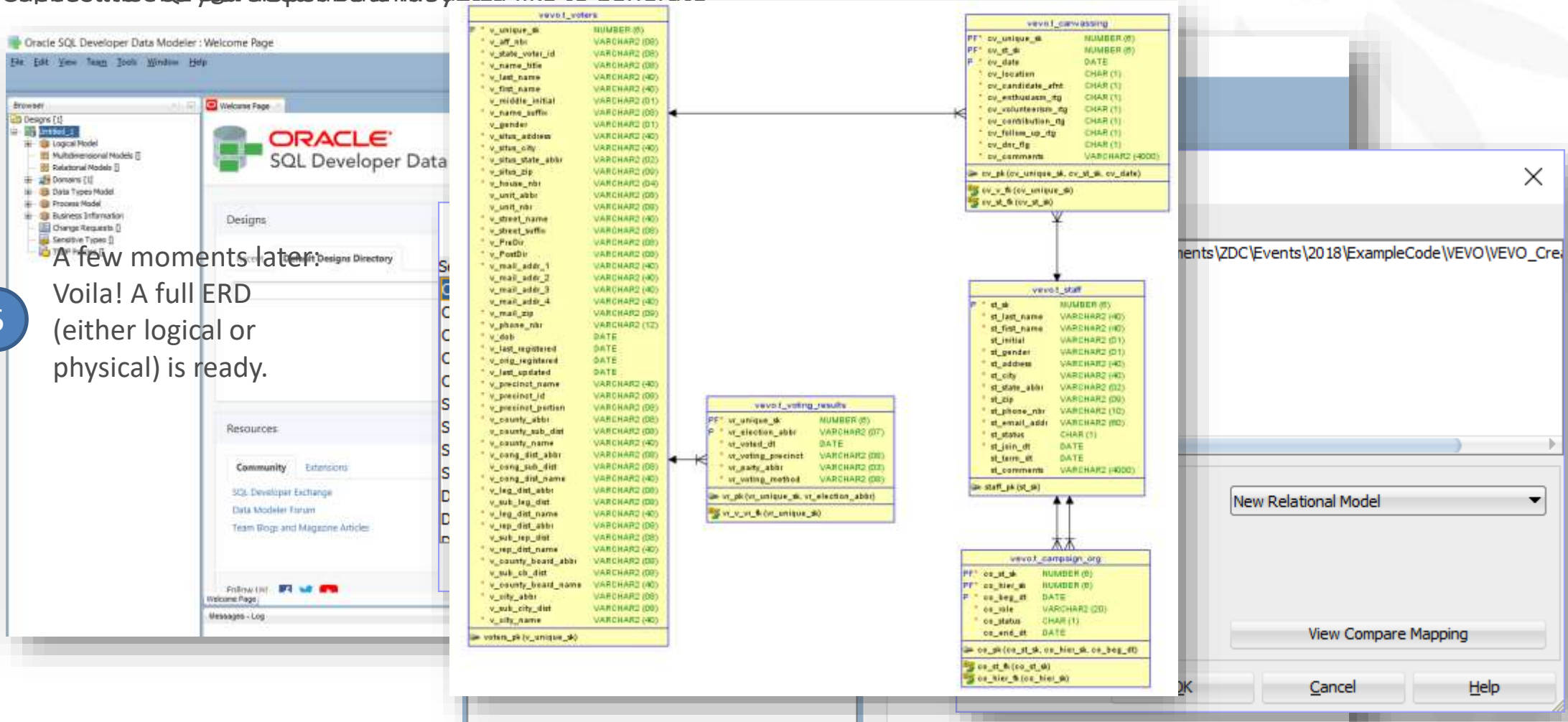
A Brief Project Task List

Task	Method
Build Entity Relationship Diagram (ERD)	SQL Developer Data Modeler
Provision Oracle 18c database	Oracle Cloud Infrastructure
Create database schema	SQL*Plus and SQL Developer
Generate test data	DataGenerator utility
Load test data	SQL Developer and SQL*Loader
Set up application development environment	Application Express (APEX)
Copy sample applications	Application Express (APEX)
Build desktop application	Application Express (APEX)
Build mobile application	Application Express (APEX)

Data Modeling With SQL Developer Data Modeler

4 Pick the desired database and release. **Note:** It's not just for Oracle databases!!
Compose the SQL Developer Data Modeler to generate

A few moments later:
5 Voila! A full ERD
(either logical or
physical) is ready.



Download SQL Developer Data Modeler [here](#) to get started.

Setting Up an APEX Development Environment

4

can build them APEX like you prefer for VEVO development

can set the VEVO instance up for development

The screenshot displays the Oracle APEX workspace creation interface. The main area shows a grid of application tiles. A red box highlights four specific applications: 'Sample Master Detail' (ID 101), 'Sample Reporting' (ID 102), 'Sample Charts' (ID 103), and 'Sample REST Services' (ID 104). The interface includes a search bar at the top, navigation tabs, and a 'Create Workspace' button at the bottom right.

See the [VEVO article series](#) on IOUG SELECT for detailed information on how to configure an initial APEX development environment and include sample applications for faster learning.

Generating Test Data Via DataGenerator Utility

5

Build DataGenerator control file for specific tables and columns to generate random data

Build DataGenerator control file for specific tables and columns to generate random data

```
$> sqlldr vevo/vevo
$> sqlldr vevo/vevo
$> sqlldr vevo/vevo
```

```
SQL> ALTER TABLE vevo.t_staff
ADD CONSTRAINT staff_pk
PRIMARY KEY (st_sk)
USING INDEX (
CREATE INDEX vevo.staff_pk_idx
ON vevo.t_staff (st_sk)
TABLESPACE vevo_idx
);
. . .
BEGIN
DBMS_STATS.GATHER_SCHEMA_STATS('VEVO');
END;
/
```

```
kip=1
G.ct1 skip=1
```

See the [VEVO article series](#) on IOUG SELECT and the detailed [documentation](#) for DataGenerator for complete information on how to generate and load these test data.



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Napkin, Meet APEX: Fleshing Out Basic Desktop and Mobile Applications

VEVO: Deploying A Basic Desktop Application

Campaign organizers needed to see:



- Canvassing **progress**, including:
 - Which canvassers have approached which specific voters
 - How well the candidate fares among canvassed voters
 - Which canvassers are **struggling**, and which ones are **superlative**



- Their own campaign organization staff's **hierarchy**, including:
 - How well each volunteer is performing within their assigned role
 - Different viewpoints at each level in the hierarchy



- Canvassing **coverage** within geographic areas
 - Counts of canvassed vs. uncanvassed voters within ZIP Code

VEVO Desktop: Campaign Overviews, Drill-Downs, and Details

Not only does this provide the hierarchical structure of the staff ...

3

Viewing the campaign staff hierarchy and work completed so far. A quick summary report of contacted vs. uncontacted voters in specific locales

... but it also lets a Canvassing Organizer see the combined results of her team ...

... as well as individual achievements!

The screenshot displays the VEVO desktop application interface. On the left, a dark sidebar contains navigation options: 'Home' and 'Campaign Organization'. The main content area is divided into several sections. At the top, there's a 'Campaign Organization' section showing a hierarchical tree structure with names like 'Barnes, Charles', 'Champion, Priscilla', 'Anderson, James', and 'Clark, Chris'. Below this is a 'Progress Report: Campaign Organizer' section featuring a table with columns for 'Volunteer Id', 'Volunteer Name', and 'Voters Canvassed'. A 'Download' link is positioned below the table. To the right, a 'Volunteer Canvassing Progress' section shows a more detailed table with columns for 'Volunteer Id', 'Volunteer Name', 'Voters Canvassed', 'Avg Affinity', 'Avg Enthusiasm', 'Avg Volunteerism', 'Avg Contributionism', and 'Avg Followup'. Another 'Download' link is present below this table. The bottom right corner of the interface shows '1 - 1'.

Volunteer Id	Volunteer Name	Voters Canvassed
62	Martinez, Joseph	6185
115	Anderson, James	6181
159	Thompson, Richard	5994

Volunteer Id	Volunteer Name	Voters Canvassed	Avg Affinity	Avg Enthusiasm	Avg Volunteerism	Avg Contributionism	Avg Followup
62	Martinez, Joseph	6185	3	3	.33	.78	.62

MobileVEVO: Deploying A Basic Mobile Application



Canvassers in the field needed:

- A list of voters who haven't ***yet been canvassed***
- ***Details*** about voters while performing canvassing
- A way to record ***voter sentiment*** towards candidacy
- A method to mark off voters ***already contacted***

MobileVEVO: Easy to Build. Easy to Use.

- 1 The canvasser self-assigns ...
- 2 .. and gets assigned a random list of voters to canvass ...
- 3 ... and then the canvasser records detailed information about the voter's proclivities towards the candidate and campaign.

The screenshot displays the MobileVEVO interface. On the left, a sidebar shows the 'MobileVEVO' logo and a list of volunteer names: rodrig, Adams, Gary, Alexander, Ernest, Allen, Kenneth, Alvarez, Teisha, and a 'Load more...' option. The main content area is titled 'MobileVEVO Canvassing Assignments' and features a 'Change Volunteer' button. Below this, the volunteer name 'Rodriguez' is shown above a table of voter assignments.

NGP VAN ID	Precinct ID	Voter Name	Street Address
13604	SG0001	Poetzsch, Ignacio	H2eTo20mPCCY0ryZ0WL1w
29354	GE0001	Dillworth, Glynis	rbYZiEnk0NgN0vUI57sy5Uu
160354	HA0001	Bednarski, Yolando	2thCU12KqIAS7kdC7Pv6QR
163354	SG0001	Morones, Lorraine	DJ3YAILFEB
199104	GE0002	Talamante, Nichole	eQKmn04

On the right, a 'Record Your Canvassing Results' form is shown for the voter 'Poetzsch'. The form includes buttons for 'Record Activity' and 'Cancel'. It contains several fields with radio button options:

- Canvassed On: 2018-11-05
- Location: Telephone
- Candidate Affinity: 1-Very Negative, 2-Negative, 3-Neutral, 4-Positive, 5-Very Positive (5 is selected)
- Enthusiasm Rating: 1-Very Negative, 2-Negative, 3-Neutral, 4-Positive, 5-Very Positive (4 is selected)
- Interested in Volunteering? No (selected), Yes
- Interested in Contributing \$? No, Yes (selected)
- Follow-Up Suggested? No, Yes (selected)
- Do Not Recontact? No Future Contact, OK to Contact (selected)
- Comments: Excited about campaign - enough to consider contributing!

VEVO: Future Research and Experimentation

- An enhanced desktop application
 - **Geographic Information Systems** (GIS) object and methods required for complex analysis within county, ZIP code, and precinct boundaries
 - Deeper analytics into **message penetration trends** and **voter sentiment ratings**
- An improved mobile application
 - **Routing capabilities** for door-to-door canvassing activities
- Security Enhancements
 - Auditing to determine whomever has “touched” **sensitive voter information**

Resources: Data Modeling, Data Generation, and APEX

Leverage these great resources to accelerate your data modeling, database design, and APEX application development repertoire:

- **SQL Developer:**

<http://downloads.oracle.com/SQLDeveloper/>

- **SQL Developer Data Modeler:**

<http://downloads.oracle.com/SQLDeveloperDataModeler/>

- **DataGenerator:**

<https://dominicgiles.com/datagenerator>

- **APEX Documentation (18.2):**

<https://docs.oracle.com/en/database/oracle/application-express/18.2/index.html>

- **Oracle REST Data Services:**

<https://www.oracle.com/database/technologies/appdev/rest.html>

Resources: SmartDB

Leverage these great resources to accelerate your understanding of **#SmartDB** concepts:

- **NoPLSQL and Thick Database Approaches** video:

<https://www.youtube.com/watch?v=8jiJDflpw4Y>

- **Tom Kyte's EBR Article Series:**

Part 1: <http://www.oracle.com/technetwork/testcontent/o10asktom-172777.html>

Part 2: <http://www.oracle.com/technetwork/issue-archive/2010/10-mar/o20asktom-098897.html>

Part 3: <http://www.oracle.com/technetwork/testcontent/o30asktom-082672.html>

- **EBR:**

Oracle Documentation: https://docs.oracle.com/cloud/latest/db112/ADFNS/adfn_editions.htm#ADFNS020

Bryn Llewellyn's White Paper: <http://www.oracle.com/technetwork/database/features/availability/edition-based-redefinition-1-133045.pdf>



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