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

COLLABORATE19
TECHNOLOGY AND APPLICATIONS FORUM
FOR THE ORACLE COMMUNITY

**Session ID:**

**116**

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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**)
- Regular speaker at Oracle OpenWorld, IOUG COLLABORATE, KSCOPE, and Regional OUGs

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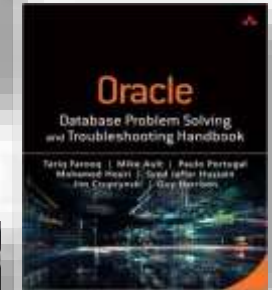
## Our Agenda

- 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

**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!

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

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

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# 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 18*c*!

- 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 storag**e 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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**Building and Populating a Data Model
In Minutes Instead of Hours**

- SQL Data Modeler
- DataGenerator

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# A Brief Project Task List

| Task | Method |
|---|---|
| Build Entity Relationship Diagram (ERD) | SQL Developer Data Modeler |
| Provision Oracle 18*c* 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

Pick the desired database and release. **Note:** It's not just for Oracle databases!!

**4** Choose the type of object that you'd like to generate

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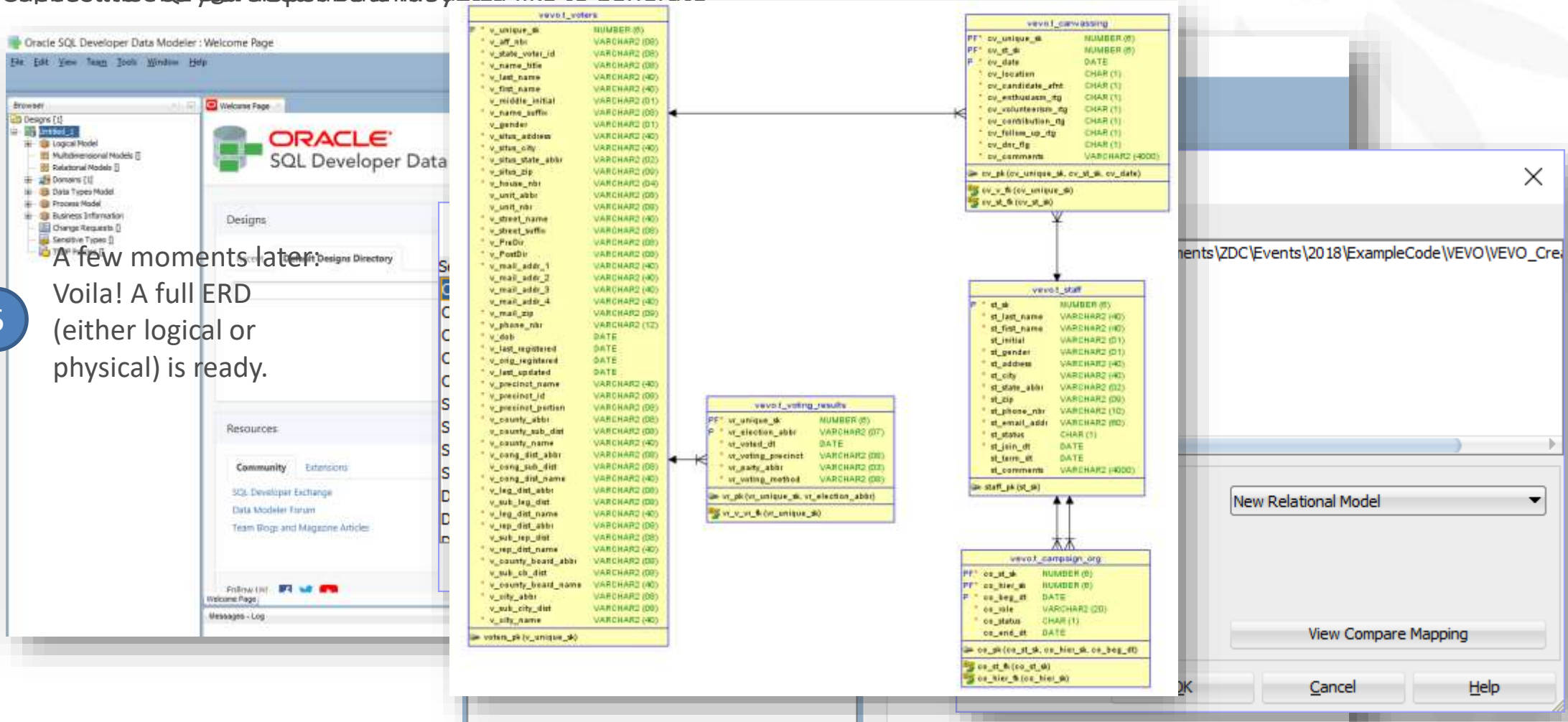


Download SQL Developer Data Modeler [here](#) to get started.

# Setting Up an APEX Development Environment

**4**



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

```
$> sqlldr vevo/vev            kip=1
$> sqlldr vevo/vev            G.ctl  skip=1
$> sqlldr vevo/vev
```

```xml
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
```
'datagen">

```
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;
/
```

Data Import Wizard - Step 1 of 5

Restore State

Help    < Back    Next >    Finish    Cancel

<Start>16</Start>
<End>275000</End>
. . .

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

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# 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

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

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

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

... as well as individual achievements!

# 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 random list of voters to canvass …

**3** …and then the canvasser records detailed information about the voter's proclivities towards the candidate and campaign.

# 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/adfns_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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