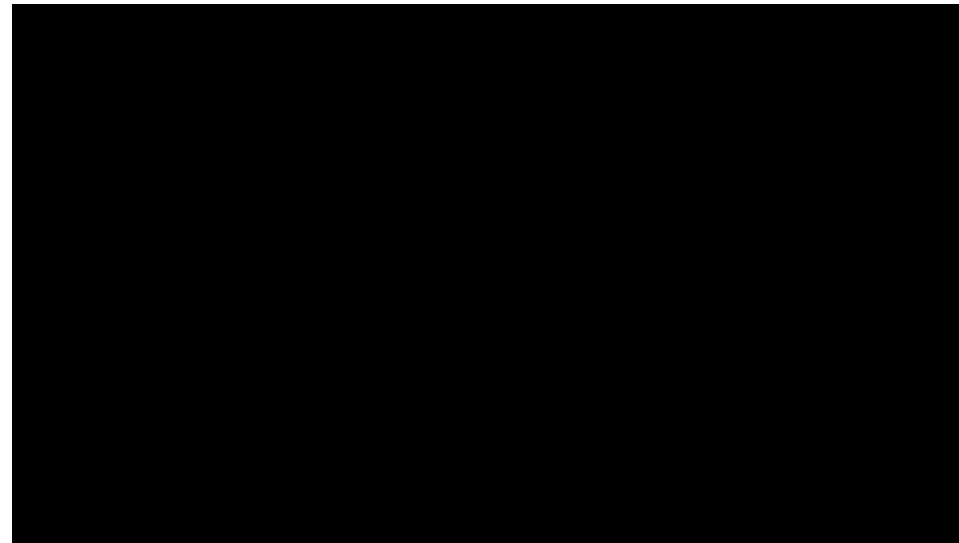


Prelude ...





ODTUG Kscope15



HOLLYWOOD, FLORIDA • JUNE 21-25



ENJOY!!!!

APEX Interactive Reports DEEP DIVE

Karen Cannell

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ODTUG

TH TECHNOLOGY



Do you have a problem with
Low T **echnology?**

ODTUGear

About Me ...

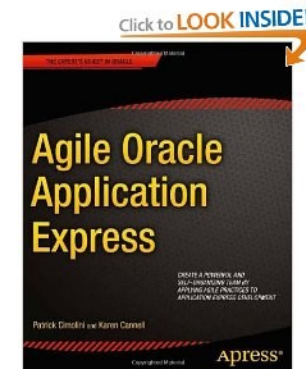
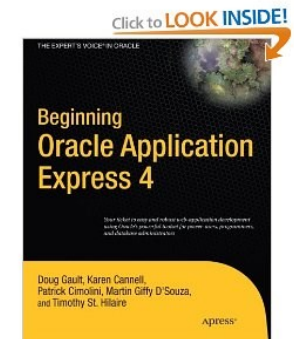
Karen Cannell ~ Consultant, **TH TECHNOLOGY**

- Mechanical/SW Engineer - Analyzed, designed, developed, converted, upgraded, enhanced legacy & database applications for 25+ years
- Building APEX applications for government, medical, engineering industries since HTMLDB
- Leveraging the Oracle 10g, 11g, 12c suite of tools
- Oracle Ace Associate  
- Editor **ODTUG** Technical Journal

Send ODTUG Technical Journal Content!

We Have Books ...

- **Expert Oracle Application Express, APress 2015 Report Printing**
- **Beginning Application Express 4.2, APress, 2013**
- **Agile Oracle Application Express APress, 2012**



About You ...

- New to APEX?
- APEX Experience?
- APEX Versions?
- IR Habits?
- IR Customizations?

New Stuff or Old?
APEX5 Ready?

NOTE TO EARLY SLIDE DOWNLOADERS

- Many of these slides **HAVE CHANGED** as APEX 5 is Live and I find more neat stuff to add for you every day.
- Please download the updated slides from the Kscope15 site or email kcannell@thtechnology.com

Agenda

- **APEX 5 IR New Features**
 - Inside and Out
- **Caveats:**
 - Limitations and Workarounds
- **Changes**
 - IR CSS and JS Changes

APEX IR 30-second Intro

- Introduced in APEX 3.1
- Instead of Classic Reports
 - One –Way Upgrade
- Search Bar
- Activity Menu
 - Select, Filter, Aggregate, Highlight, Chart, Break, Sort, Compute, Flashback, Download, Save Report, **Group By, Pivot**
-  User Control,  Developer Effort

Developer *and* User Team

For maximum value:

Know Your Users
“*though APEX IR give the end user great power to format and arrange reports to their needs, the **developer needs to be aware of end user needs** to prepare and deliver the appropriate APEX IR query to support them.*”

Know What Your Users Do

Agenda

- **APEX 5.0 New Features**
 - Inside and Out

APEX 5.0 New Features

- Appearance, Usability and Accessibility
 - Accessible
 - Menus Updated, Font Icons
 - Modal Dialogs
- **Action Menu**
 - **Group By** Enhancements column Limit increase
 - **Pivot**
 - **Subscription** – End is now End *Date*
- Manage Saved Reports and Subscriptions at Application Level

APEX 5.0 New Features, cont'd

- “Multiple Interactive Reports”
More than One IR Per Page!

to do this one ...

Things Have Changed



Things Look Different ...

- Page Designer
- Usability, Appearance, Accessibility
 - Menus
 - Modal Dialogs
 - Icons

Rendering

- Page 4: Interactive Report - Real Data
 - Pre-Rendering
 - Regions
 - Breadcrumb
 - Breadcrumb
 - Attributes
 - Content Body
 - Interactive Report Test - Real Small Data Set**
 - Columns
 - Attributes
 - Dynamic Actions
 - New
 - Highlight Sigma Grade Values
 - Highlight Outliers
 - True
 - Execute JavaScript Code
 - Execute JavaScript Code
 - False
- Post-Rendering

Grid Layout Messages Page Search Help

Grid Layout Messages Page Search Help

Interactive Report - Real Data

Header

Page Level Tabs

Icon Nav Bar

Breadcrumb

Breadcrumb

Items

Region Content

Sub Regions

Content Body

Interactive Report Test - Real Small Data Set

Items

Region Content

Right of Interactive Report Search Bar

Sub Regions

Footer

Gallery

Regions Items Buttons

Breadcrumb Calendar Calendar (Template) Chart

Property Editor - Region

Footer Text

Condition

Read Only

Type - Select -

Security

Authorization Scheme - Select -

Configuration

Build Option - Select -

Server Cache

Caching Disabled

Customization

Customizable Not Customizable By End Us





Comments

Comments Plain Interactive Report built in APEX 5.0 EA 2.0

Audit Information

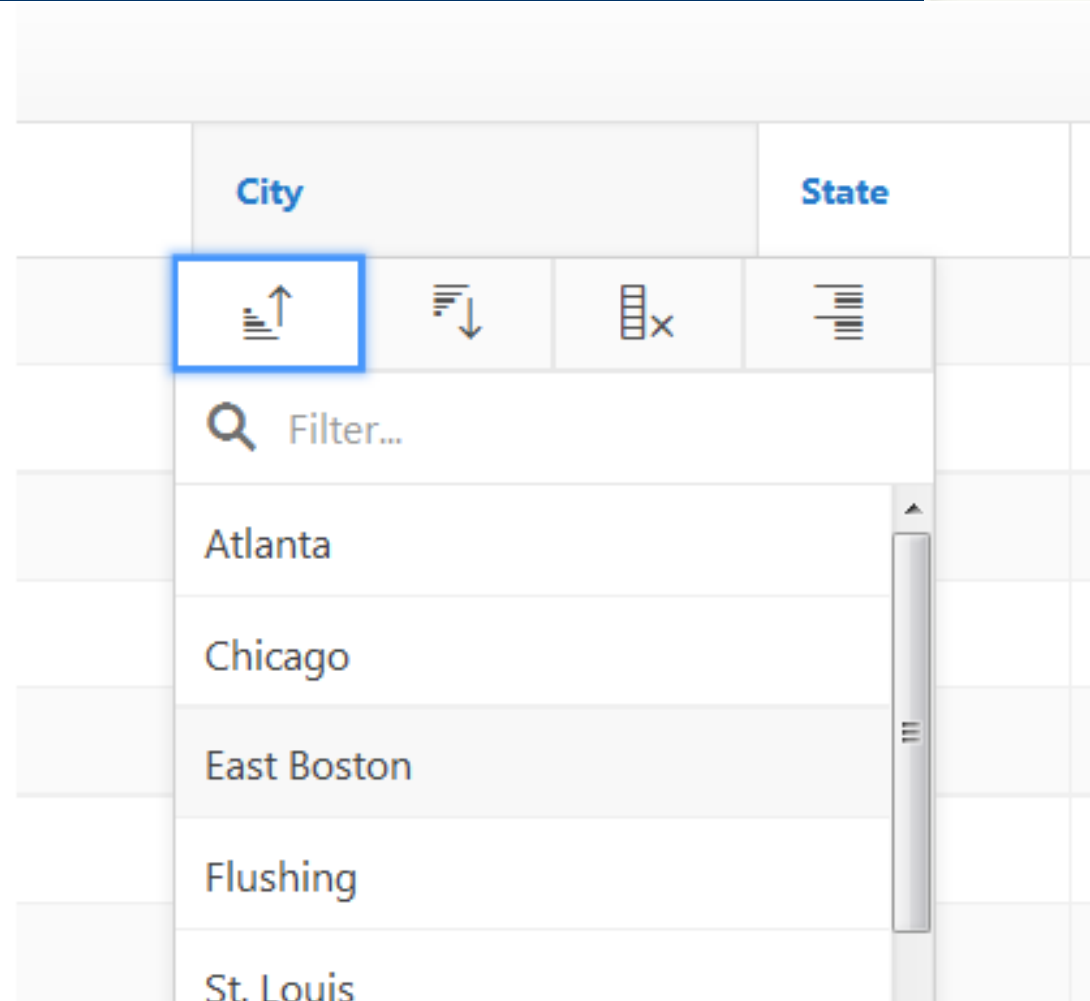
Column Heading Menu

 APEX 4.2

	City	State	ZIP Code	
	   			R
	<input type="text"/>			
ay	Atlanta			R
	Chicago			
	East Boston			
I Blvd.	Flushing			
	St. Louis			
	Sterling			R
	Windsor Locks			
	Chicago	IL	60666	

Column Heading Menu on *Click*

- APEX 5
- Accessible by Tab



City	State
Atlanta	
Chicago	
East Boston	
Flushing	
St. Louis	

Developer - Report Attributes

- Selective End User Features
 - Per Report
 - Per Column

Search Bar

Include Search Bar

Search Field
 Finder Drop Down
 Rows Per Page Selector
 Actions Menu

Include in Actions Menu:

Select Columns Filter Sort Control Break Highlight
 Compute Aggregate Chart Flashback Save Report
 Reset Help Download

Button Template

Finder Image

Actions Menu Image

Search Button Label

Maximum Rows Per Page

Page Designer - Report Attributes

Property Editor - Attributes

The screenshot displays the Oracle Application Express Page Designer interface. On the left, a tree view shows the page structure under 'Rendering' > 'Demo Customers' > 'Regions' > 'Content Body' > 'DEMO_CUSTOMERS' > 'Attributes'. The 'Attributes' property is selected. The main area shows the 'Property Editor - Attributes' dialog with a '▼ Actions Menu' section. This section contains several properties, each with 'Yes' and 'No' radio buttons:

- Include Actions Menu: Yes (selected), No
- Filter: Yes (selected), No
- Select Columns: Yes (selected), No
- Rows Per Page: Yes (selected), No
- Sort: Yes (selected), No
- Control Break: Yes (selected), No

Below the 'Actions Menu' section, there are several rows of 'Yes' and 'No' radio buttons, likely for other report attributes. The top of the page shows the Oracle Application Express logo and the user 'karen'.

<= APEX 4.2 Action Menu

My Orders

Search Bar

Rows 15 Go

Control Summary

Link to Single Row

Action Menu

Order #	Customer Name	Order Month	Order
7	LaGuardia, Fiorello	February 2009	
3	Hartsfield, William	March 2009	
1	Dulles, John	March 2009	
4	Logan, Edward	March 2009	
2	Hartsfield, William	March 2009	
10	Bradley, Eugene	February 2009	
9	Lambert, Albert	February 2009	
6	O'Hare, Edward "Butch"	February 2009	
8	Lambert, Albert	February 2009	
5	Logan, Edward	March 2009	

- Select Columns
- Filter
- Sort
- Control Break
- Highlight
- Compute
- Aggregate
- Chart
- Flashback
- Save Report
- Reset
- Help
- Download

APEX 5+ Action Menu

Go 1. Primary Report Rows 15 Actions

Reset Report Enter New Order

Customer Name	Sales Rep	Order Items	Order Total	Order Date	Order Month
Bradley, Eugene	DEMO	3	\$870.00	/2014	June 2014
Hartsfield, William	DEMO	3	\$730.00		June 2014
OHare, Frank	DEMO	4	\$1,060.00		June 2014
Logan, Edward	DEMO	7	\$905.00		June 2014
Logan, Edward	DEMO	4	\$1,515.00		May 2014
Lambert, Albert	DEMO	5	\$950.00		May 2014
LaGuardia, Fiorello	DEMO	5	\$1,090.00	5/13	May 2014
Hartsfield, William	DEMO	5	\$1,640.00	5/11/2014	May 2014

- Select Columns
- Filter
- Format**
 - Sort
 - Control Break
 - Highlight
 - Compute
 - Aggregate
 - Chart
 - Group By
 - Pivot
- Flashback
- Save Report
- Reset
- Help
- Download
- Subscription

Modal Dialogs

- Pulldown Dialogs are now Modal
- “Improved Usability”
- Better Appearance
- Improved Accessibility
- Column Headings
 - Click vs. Mouseover

Things ARE Different ...

- Action Menu Enhancements
 - GROUP BY
 - PIVOT
- New CSS Classes, ID's
- New JavaScript / jQuery

Let's Look at New Features First ...

GROUP BY

- Up to 8 Columns (up from 3)
- APEX 3 – Build Your Own
- APEX 4 - 3 Column Group By
- APEX 5 – 8 Column Group By
- GROUP BY is Single View, Fixed Report
 - Other IR Features Disabled
 - GROUP BY *or* Main Report *or* Chart *or* Pivot
 - Download Behavior

Pivot

Old Way

	Closed		On-Hold		Open		Pending	
Dname	Cost	Budget	Cost	Budget	Cost	Budget	Cost	Budget
ACCOUNTING	650	1,200	9,500	7,000	-	-	-	-
RESEARCH	3,400	1,800	8,000	7,000	-	-	-	-
SALES	100	200	-	-	300	500	-	-
-	4,700	5,000	6,250	10,550	27,250	53,800	0	43,300
	8,850	8,200	23,750	24,550	27,550	54,300	0	43,300

- Download Behavior
- Other IR Options Disabled

Traditional Pivot Query

```
SELECT
  agency,
  area_code,
  year,
  MAX ( CASE WHEN miy = '01' THEN sum_costs ELSE NULL END) jan_costs,
  MAX ( CASE WHEN miy = '02' THEN sum_costs ELSE NULL END) feb_costs,
  MAX ( CASE WHEN miy = '03' THEN sum_costs ELSE NULL END) mar_costs,
  MAX ( CASE WHEN miy = '04' THEN sum_costs ELSE NULL END) apr_costs,
  MAX ( CASE WHEN miy = '05' THEN sum_costs ELSE NULL END) may_costs,
  MAX ( CASE WHEN miy = '06' THEN sum_costs ELSE NULL END) jun_costs,
  MAX ( CASE WHEN miy = '07' THEN sum_costs ELSE NULL END) jul_costs,
  MAX ( CASE WHEN miy = '08' THEN sum_costs ELSE NULL END) aug_costs,
  MAX ( CASE WHEN miy = '09' THEN sum_costs ELSE NULL END) sep_costs,
  MAX ( CASE WHEN miy = '10' THEN sum_costs ELSE NULL END) oct_costs,
  MAX ( CASE WHEN miy = '11' THEN sum_costs ELSE NULL END) nov_costs,
  MAX ( CASE WHEN miy = '12' THEN sum_costs ELSE NULL END) dec_costs,
  MAX ( CASE WHEN miy = '00' THEN sum_costs ELSE NULL END) unk_costs,
  MAX( sum_costs) yr_costs
FROM
  ( SELECT ...
    FROM ...
    WHERE
    GROUP BY ROLLUP ( ... )
  )
```

Traditional Pivot Query

```
SELECT
  agency,
  area_code,
  year,
  MAX ( CASE WHEN miy = '01' THEN sum_costs ELSE NULL END)
    jan_costs,
  MAX ( CASE WHEN miy = '02' THEN sum_costs ELSE NULL END)
    feb_costs,
  MAX ( CASE WHEN miy = '03' THEN sum_costs ELSE NULL END)
    mar_costs,
  MAX ( CASE WHEN miy = '04' THEN sum_costs ELSE NULL END)
    apr_costs,
  MAX ( CASE WHEN miy = '05' THEN sum_costs ELSE NULL END)
    may_costs,
```

Known Columns Only

... ..

Pivot Tables – Known Columns

- Known Columns and Column Names

ex: Project by **Status**

Budget by **Month**

vs

- Unknown Columns and Column Names

ex: Project by Year

Status by Project

<Data> by Year

Standard APEX IR Needs Column Names

Pivot Queries

- Traditional SQL
 - MAX (CASE or DECODE ...)
 - CASE to filter values into columns
 - MAX to flatten the results
 - Need Known Columns

- 11g PIVOT and UNPIVOT

- PIVOT
- PIVOT ... XML

<http://www.oracle.com/technology/pub/articles/oracle-database-11g-top-features/11g-pivot.html>

Pivot Query Options, cont'd

- PIVOT PL/SQL Package - Kyte
 - In Expert One on One
- Dynamic SQL Pivoting - AMIS Solution
 - TYPE, TYPE BODY
 - Pipelined Table Function

<http://technology.amis.nl/blog/1207/dynamic-sql-pivoting-stealing-antons-thunder>

PIVOT - The APEX 5 Easy Way

Dname	Closed		On-Hold		Open		Pending	
	Cost	Budget	Cost	Budget	Cost	Budget	Cost	Budget
ACCOUNTING	650	1,200	9,500	7,000	-	-	-	-
RESEARCH	3,400	1,800	8,000	7,000	-	-	-	-
SALES	100	200	-	-	300	500	-	-
-	4,700	5,000	6,250	10,550	27,250	53,800	0	43,300
	8,850	8,200	23,750	24,550	27,550	54,300	0	43,300

Subscription – Pre APEX 5.0

“End” is a Repeat Count

The screenshot shows the 'Add Subscription' form in Oracle APEX 5.0. The form includes the following fields and controls:

- Search bar with a 'Go' button.
- Reports dropdown menu set to '1. Primary Report'.
- 'Actions' dropdown menu.
- 'Add Subscription' section with the following fields:
 - Email Address:
 - Subject: Primary Report
 - Frequency: Daily
 - Starting From: 27-MAY-14
 - Ending: - No End Date - (dropdown menu is open, showing a list of numbers from 1 to 19, with a red arrow pointing to the number 8)
 - Day: Day (dropdown menu)
- 'Apply' button.

Subscription, Download → Email

Do You Really Want Users Emailing Data?

Consider:

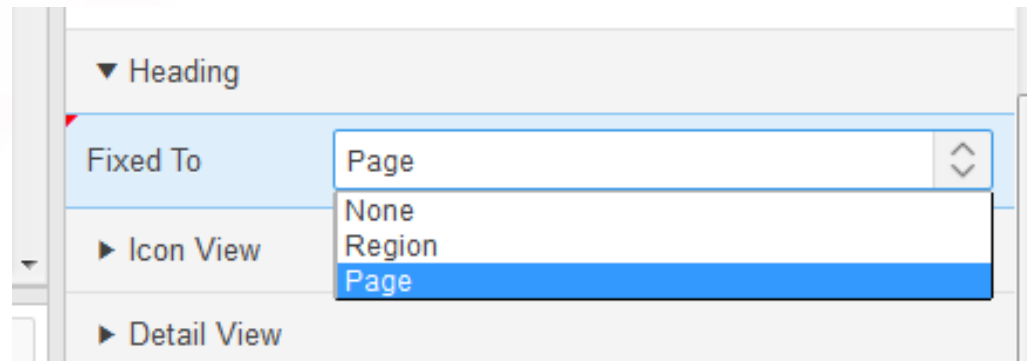
- Email Filters
- Tracking
- Limit Report Data
- Disable Subscription
- Disable Download → Email

Manage at Application Level

- Administration for Saved Reports, Subscriptions Now at Application Level
- Used to Be Each Interactive Report Page

Floating Column Headers

● Heading Attribute



- Page – Aligns Multiple IR Headers Together w Top of Page
- Region – “Sticks” w/in Region Scroll
- None – Headers Scroll off the page
- Universal Theme Only

Floating Column Headers

🌐 Yeah!

MULTI-IR PROJECTS

Department	Cost	Budget	Balance	Empno	Empname	Job	Mgr	Hiredate	Sal	Comm	Dept
OPERATIONS	\$23,100.00	\$20,300.00	-\$2,800.00	7566	JONES	MANAGER	7566	02-APR-81	2975	-	
RESEARCH	\$7,350.00	\$24,400.00	\$17,050.00	7369	SCOTT	ANALYST	7566	09-DEC-82	3000	-	
SALES	\$16,200.00	\$14,750.00	-\$1,450.00	7902	FORD	ANALYST	7566	03-DEC-81	3000	-	
				7369	SMITH	CLERK	7902	17-DEC-80	800	-	
				7499	ALLEN	SALESMAN	7698	20-FEB-81	1600	300	
				7521	WARD	SALESMAN	7698	22-FEB-81	1250	500	
				7654	MARTIN	SALESMAN	7698	28-SEP-81	1250	1400	

1 - 4

1 - 10

May Have Header Alignment Problems

Multiple Interactive Reports

Oracle Application Express 5.0

Oracle Application Express 5.0 will focus on both new features and enhancements to existing functionality to improve developer productivity and is planned to incorporate the following:

- Page Designer - New page definition IDE which incorporates tree controls, drag and drop layout editor, and a property editor.
- Multiple Interactive Reports – Allow any number of Interactive Reports to be defined on a single page.
- Modal Dialog - Enhance the ability to declaratively define modal dialogs.
- Navigation Lists - Ability to define hierarchical lists for navigation, with pull-down menus and sub-menus, instead of being constrained by

● “Any Number” of IR Per Page!

Thank you! ...

Refresher Course

- Underused IR Features:
 - IR_<COLUMN_NAME>
 - CIR – Clear IR (clear all)
 - RIR – Reset IR (to default settings)

Reference IR Columns and Filter Values

● IREQ_<column_alias>	Equals
● IR_<column_alias>	Equals
● IRLT_<column_alias>	<
● IRLTE_<column_alias>	<=
● IRGT_<column_alias>	>
● IRGTE_<column_alias>	>=
● IRLIKE_<column_alias>	vSQL LIKE
● IRN_<column_alias>	NULL
● IRNN_<column_alias>	v NOT NULL
● IRC_<column_alias>	Contains
● IRNC_<column_alias>	Not Contains

No BETWEEN, IN, NOT IN

Pre APEX 5 – IR%_COLUMN

Single IR On the Page:

- Reference IR Column Name

IR_COLUMN_NAME

- Create and use IR filter options:

IR%_COLUMN_NAME

Multi IR: – IR%**[STATIC_ID]**_COLUMN

Multiple IRs On the Page:

- Reference IR [Static ID]Column Name

IR[STATIC_ID] _COLUMN_NAME

- Create and use IR filter options:

IR%[STATIC_ID]**_COLUMN_NAME**

Assign IR STATIC_ID

The screenshot displays the Oracle APEX Interactive Report configuration interface. On the left, a tree view shows the report structure, including 'Page 5: Multi-IR Projects', 'Pre-Rendering', 'Regions', 'Breadcrumb Bar', 'Content Body', and 'Multi-IR Projects' (selected). The 'Multi-IR Projects' region is expanded, showing columns like ID, ROW_VERSION_NUMBER, PROJECT, TASK_NAME, START_DATE, END_DATE, STATUS, ASSIGNED_TO, COST, BUDGET, and DNAME. The main workspace shows a preview of the report layout with regions like ITEMS, REGION CONTENT, SUB REGIONS, and buttons for navigation. A red box highlights the text 'Give each IR a STATIC_ID' with an arrow pointing to the 'Static ID' field in the 'Advanced' section of the configuration panel on the right. The 'Static ID' field contains the value 'IRBASE|'. Other settings in the 'Advanced' section include 'Region Image', 'Image Tag Attributes', 'Region Display Selector' (Yes/No), and 'Exclude Title from Translation' (Yes/No). The 'Header and Footer' section is also visible at the bottom of the configuration panel.

Give each IR a
STATIC_ID

Static ID |IRBASE|

Assign Column Link Attributes

The screenshot displays the Oracle APEX Page Designer interface for 'Application 11839'. The main workspace shows a grid layout with regions like 'ITEMS', 'REGION CONTENT', and 'SUB REGIONS'. A red box labeled 'Column Link Attributes' points to the 'Link' section in the right-hand 'Column' configuration panel. This panel is circled in red and contains the following settings:

- Alignment: [Icons]
- Group: - Select -
- Appearance: [Icons]
- Format Mask: [Field]
- Link: [Section Header]
- Target: Page 5
- Link Text: #DNAME#
- Link Attributes: [Field]
- Column Filter: [Section Header]
- Type: Default Based on Column Type
- Enable Users To: [Section Header]
- Hide: Yes No
- Sort: Yes No
- Filter: Yes No
- Highlight: Yes No
- Control Break: Yes No
- Aggregate: Yes No

The left-hand 'Rendering' tree shows the hierarchy: Page 5: Multi-IR Projects > Regions > Breadcrumb Bar > Breadcrumb > Attributes. The 'Multi-IR Projects' column is selected, and its 'DNAME' attribute is highlighted in the left pane.

Assign Column Link Attributes

- Not Easy To Find in Page Designer ...
- Click on Target ...

Format Mask

▼ Link

Target

Link Text

Link Attributes

▼ Column Filter

Type

▼ Enable Users To

Assign Column Link Attributes

- Link Target is a Modal Popup

Link Builder - Target

▼ Target

Type

Page

▼ Set Items

Name	Value
<input type="text" value="IREQ[IR_TWO]_DEPTNO"/>	<input type="text" value="#DEPTNO#"/>
<input type="text" value="IREQ[IR_THREE]_DEPTNO"/>	<input type="text" value="#DEPTNO#"/>
<input type="text"/>	<input type="text"/>

▼ Clear Session State

Clear Cache

Reset Pagination Yes No

► Advanced

Reference IR Columns and Filter Values

- IREQ[STATIC_ID]_<column_alias> Equals
- IR[STATIC_ID]_<column_alias> Equals
- IRLT[STATIC_ID]_<column_alias> <
- IRLTE[STATIC_ID]_<column_alias> <=
- IRGT[STATIC_ID]_<column_alias> >
- IRGTE[STATIC_ID]_<column_alias> >=
- IRLIKE[STATIC_ID]_<column_alias> SQL LIKE
- IRN[STATIC_ID]_<column_alias> NULL
- IRNN[STATIC_ID]_<column_alias> NOT NULL
- IRC[STATIC_ID]_<column_alias> Contains
- IRNC[STATIC_ID]_<column_alias> Not Contains

No BETWEEN, IN, NOT IN

Developer Features – CIR and RIR

To Clear or Reset ONE or a specific IR on a page:

- ~~CIR[STATIC_ID] and RIR[STATIC_ID]~~

~~Do Not Work~~

- Use IR[STATIC_ID] in REQUEST to Indicate IR to CIR or RIR:

f?p=MYAPP:100:&SESSION.:IR[STATIC_ID]:NO:CIR



Multi IR Demo – “The Dashboard”

Home ▼

Home → Multi IR

Q ▼ Go Actions ▼

Deptno	Dname	Loc
10	ACCOUNTING	NEW YORK
20	RESEARCH	DALLAS
30	SALES	CHICAGO
40	OPERATIONS	BOSTON

1 - 4

Q ▼ Go Actions ▼

☰ Deptno = 20

Empno	Ename	Job	Mgr	Hiredate	Sal	Comm	Deptno
7369	SMITH	CLERK	7902	17-DEC-80	800	-	20
7566	JONES	MANAGER	7839	02-APR-81	2975	-	20
7788	SCOTT	ANALYST	7566	09-DEC-82	3000	-	20
7876	ADAMS	CLERK	7788	12-JAN-83	1100	-	20
7902	FORD	ANALYST	7566	03-DEC-81	3000	-	20

1 - 5

Q ▼ Go Actions ▼

☰ Deptno = 20

Project	Task name	Start date	End date	Status	Assigned to	Cost	Budget	Manager
Maintain Support Systems	HR software upgrades	23-APR-14	18-JUN-14	On-Hold	Pam King	8000	7000	7902
APEX Environment Configuration	Determine Web listener configuration(s)	24-APR-14	24-APR-14	Closed	James Cassidy	100	100	7566
Email Integration	Complete plan	30-APR-14	05-JUN-14	Closed	Mark Nile	3000	1500	7566
APEX Environment Configuration	Configure Workspace provisioning	02-MAY-14	02-MAY-14	Closed	John Watson	200	100	7566
APEX Environment Configuration	Create pilot workspace	02-MAY-14	02-MAY-14	Closed	John Watson	100	100	7902

1 - 5

Imagine ...

- Using IREQ[**STATIC_ID**]**_COLUMN** to **Link/Jump/Drill Between IRs** on the Same Page ...

Link Builder - Target ✕

▼ Target

Type ⌵

Page ⬆

▼ Set Items

Name		Value		
IREQ[IR_TWO]_DEPTNO	⬆	#DEPTNO#	⬆	✕
IREQ[IR_THREE]_DEPTNO	⬆	#DEPTNO#	⬆	✕
<input type="text"/>	⬆	<input type="text"/>	⬆	

▼ Clear Session State

Clear Cache ⬆

Reset
Pagination

▶ Advanced

Imagine ...

- Passing IREQ[**STATIC_ID**]**_COLUMN** to **Control a Set of IRs** on the Same Page

Use The Right Tool



Agenda: Caveats



- Limitations ... How To Deal w Them

Limitations

- One Size Fits All Features
- Minor & Less-Known Limitations
 - Still have 32K row limit
 - Charts: 1000 element limit
 - Filters: Commas, SYSDATE, Bugs w/GTE Links
 - Aggregates: Not BI
 - Chart, Group By, Pivot
 - Are “Single View”
 - Other IR Functions Disabled or Limited on these Views

Too Much?

- “One-Size-Fits-All”

Really ?

- Developer Can Enable/Disable
 - *per IR (as of APEX 5)*
 - *per Column*
- Developer Can Add Condition on Link Column
- Conditional Pages

Pre APEX 5, Need multiple IRs on multiple pages for more complex authorizations

APEX IR: Too Much?

● *Use The Settings*

● Declaratively Turn Off Features

● Disable Control Summary (Settings)

● `display:none;`

● On `a-IRR-controlPanel` or specific `a-IRR-<element>`

● Provide Manually-created RESET or CLEAR buttons

● (Future) API or Declarative Setting?

APEX IR: Not Enough?

- *Extend the Toolbar (Widget)*
- Outside the Toolbox
- Provide Manually-created Custom Buttons
- Provide Custom Actions
- Plugins
- Whatever You Can Code ...

**Unless You Use Standard API,
Not Supported**

Limitations – Developers & Users

- 32K Row Limit
- Search Bar All-Column Not DATE-Savvy
- Aggregate Behavior
 - IR is NOT BI Savvy

Know Your Users

Limitations – Dynamic DATE filter

- SYSDATE as Filter Value
 - Use “Is in the last” w/ large value - User
 - Build a Specific URL Filter and Link Column - Dev
 - Build SQL Report to look like a Menu
 - Ex: Bonus Eligible Date
 - Build Derived Column – Dev
 - Ex: CASE WHEN <condition> THEN

‘Yes’

ELSE

‘No’

END overdue

Know Your Users

Aggregate Behavior – Not BI

Original Report Display

Region: West

State	County	City	Population
CA	Orange County	Irvine	100
CA	Orange County	Orange	200
CA	Los Angeles	Hollywood	300
CA	Los Angeles	Universal City	400
Sum			1,000

Know Your Users

Use Group By

Intended Result

Actual APEX IR Result

Region: West

State	County	Population	State	County	Population
CA	Orange County	300	CA	Orange County	100
CA	Los Angeles	700	CA	Orange County	200
Sum		1,000	CA	Los Angeles	300
			CA	Los Angeles	400
			Sum		1,000

Limitations – Developers & Users

Charts

- Chart *or* Data Set (*or* Group By *or* Pivot)
- Charting Limits
 - 1000 elements Vert, Horiz., Line; 2D Pie
 - Aggregate then chart?
- Chart Labels
 - Vertical Bart Chart may not Display All Labels
- Chart Education!

Know Your Users

Limitations – Developers & Users

Search Columns

- Search Drop Down – Max # is 1000 Columns
- Report Attributes List – Max 100 Columns

Volume of Data Returned

- ? ~ 85K Rows?

THINK ... what do users *really* need?

Know Your Users

Limitations – Developers & Users

APEX IR is **NOT** MS Excel !!

- Arrow Up/Down Right/Left Navigation
- Freeze Columns, Freeze Headers
- WYSIWYG Printing
- Download Data Set
- RETRAINING MAY BE REQUIRED
 - ELSE Plug-Ins

Know Your Users

What do users *really* need?

Agenda: Changes



- CSS and JS Changes
- Appearance

APEX 5.0

- Remember ... 2014



APEX 5.0 2015



APEX 5.0 IR 2015

- Changes ...



CSS Changes

- Different Classes
- Different Ids
- **apexir_<element>** ids replaced by **a-irr-<...>** classes and **STATIC_ID_<...>** ids


```
<div class="t-Body-col t-Body-col--main">
<div id="DEPTS" class="t-IRR-region ">
  <h2 class="u-VisuallyHidden">Departments</h2>
  <div id="DEPTS_ir" class="a-IRR-container">
    <div id="DEPTS_worksheet_region" class="a-IRR" aria-live="polite">
      <div id="DEPTS_single_row_view" class="a-IRR-singleRowView"></div>
      <div id="DEPTS_full_view" class="a-IRR-fullView">
        <div id="DEPTS_toolbar" class="a-IRR-toolbar">
        <div id="DEPTS_content" class="a-IRR-content">
          <div id="DEPTS_dialog_js" class="a-IRR-dialogBody" style="display:none">
          </div>
          <style id="DEPTS_worksheet_css" type="text/css">
            <input id="DEPTS_worksheet_id" type="hidden" value="186567292878242260">
            <input id="DEPTS_app_user" type="hidden" value="THTECH">
            <input id="DEPTS_report_id" type="hidden" value="186572956897284285">
            <div id="DEPTS_chart" class="a-IRR-chartView"></div>
            <div id="DEPTS_group_by" class="a-IRR-groupByView"></div>
            <div id="DEPTS_pivot" class="a-IRR-pivotView"></div>
          <div id="DEPTS_data_panel" class="a-IRR-reportView">
            <table id="186567292878242260" class="a-IRR-table" summary="">
              <tbody>
                <tr>
                  <th id="LINK" class="a-IRR-header ">
                  <th id="C186567443293242262" class="a-IRR-header is-active">
                  <th id="C186567586744242262" class="a-IRR-header ">
                </tr>
                <tr>
                  <td headers="LINK">
                  <td headers="C186567443293242262">
                  <td headers="C186567586744242262">NEW YORK</td>
                </tr>
                <tr>
                <tr>
              </tbody>
            </table>
          </div>
        </div>
      </div>
    </div>
  </div>
</div>
```

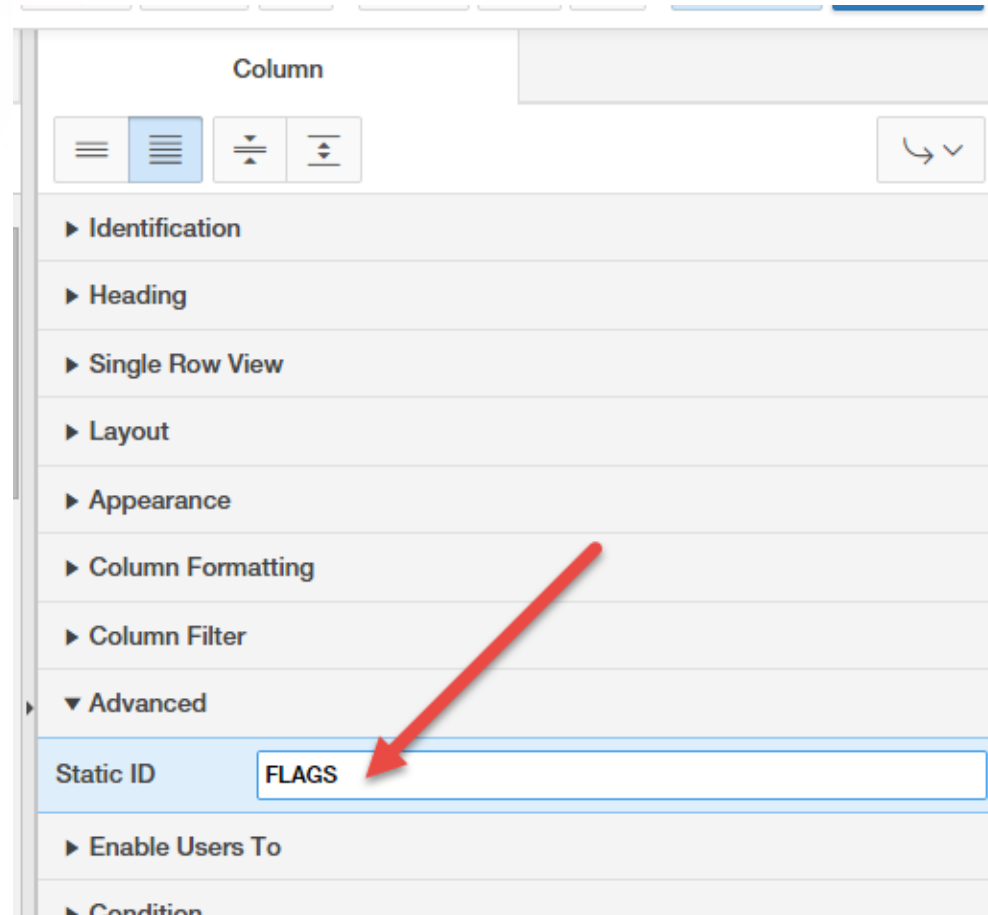
Refactor Example - CSS

- Dynamic Action – APEX 4.2
- Custom jQuery w CSS References

```
var rows = $('table.apexir_WORKSHEET_DATA tbody tr:gt(0)');
rows.each(function(idx) {
  var Flags = $(this).children("td[headers='FLAGS']").text();

  if( Flags == 'Outlier')
  {
    $(this).children("td").css("background-color", "#FCF067");
  }
});
```


STATIC_ID on Column



Refactor Example – APEX 5.0

● Dynamic Action – APEX 5.0 Style

```
var rows = $('table.a-IRR-table tbody tr:gt(0)');
rows.each(function(idx) {
  var Flags = $(this).children("td[headers='FLAGS']").text();

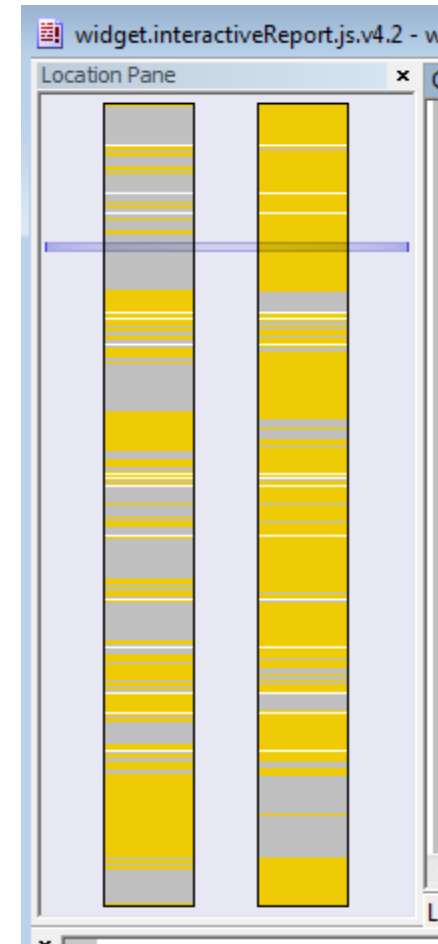
  if( Flags == 'Outlier')
  {
    $(this).children("td").css("background-color","#FCF067");
  }
});
```

JavaScript Changes

- New Code Base
- jQuery UI Widget Factory
widget.interactivereport.js
- No Inline Event Handlers
- No gReport
- No APIs

widget.interactiveReport.js

- Same Name
- Different Contents
- jQuery UI Widget Factory



What !!??

- No gReport
 - No Inline Event Handlers
 - All Private Methods
 - No Supported APIs (yet)
-
- **APIs are Planned for APEX 5.1**
 - **Exactly What TBD**

APEX 4.2 Search Icon

gReport.dialog2

```
<input id="apexir_REGION_ID" type="hidden" value="K237611440000003390" />  
- <div id="apexir_WORKSHEET_REGION" class="apex_worksheet" aria-live="polite">  
  <div id="apexir_DETAIL" class="apex_detail"> </div>  
  - <div id="apexir_REPORT" class="apex_report">  
    - <div id="apexir_TOOLBAR" class="apex_toolbar">  
      - <div id="apexir_TOOLBAR_OPEN" class="apexir_TOOLBAR_OPEN">  
        - <div id="apexir_TOOLBAR_CLOSE" class="apexir_TOOLBAR_CLOSE">  
          - <div class="apexir_COLUMN_SELECTOR">  
            + <a id="apexir_SEARCHDROPROOT" class="apexir_SEARCHICON" title="Se  
              lect columns to  
              search" onclick="gReport.dialog2('SEARCH_COLUMN'); return  
              false;" href="#">  
              <input id="apexir_CURRENT_SEARCH_COLUMN" type="hidden">  
            + <div id="apexir_SEARCHDROP" style="display:none;">  
          </div>
```

APEX 4.2 IR Toolbar Go Button

`gReport.search('SEARCH')`

```
<div class="apexir_SEARCH">  
  <input id="apexir_SEARCH" type="text" onkeydown="if($f_Enter(event)) {gReport.search('SEARCH'); return false;}" value="" maxlength="4000" size="30" title="Search Report">  
  <a id="apexir_btn_SEARCH" class="uButtonIR #BUTTON_CSS_CLASSES#" role="button" href="javascript:gReport.search('SEARCH')">  
</div>  
<div class="apexir_SAVED_REPORTS"> </div>  
<div id="apexir_SEARCH_BAR_OPTIONS"> </div>
```

APEX 5 Toolbar Go Button

No gReport
No Visible Call/Event

```
- <div class="a-IRR-search">  
  <input id="DEMO_IR_column_search_current_column" type="hidden">  
  + <div class="a-IRR-colSelector">  
  + <div class="a-IRR-searchFieldContainer">  
  - <div class="a-IRR-searchButtonContainer">  
    + <button id="DEMO_IR_search_button" class="a-Button a-IRR-button a-IRR-button--search" type="button">  
  </div>  
</div>
```


5.0 Changes - Impact on Existing Code

- Appearance
 - CSS (less of a problem due to Universal Theme)
- PL/SQL
 - Collection Logic, References
- JavaScript
 - Custom Code, References
- Dynamic Actions

**Whatever was Done Non-Standard Will
Need Refactoring!**

Supported vs UnSupported

- Anything that Uses Standard API ...is **Supported**

ex: **apexrefresh** for IR refreshes

```
apex.event.trigger( "#IRStaticID", "apexrefresh" );
```

- Anything Else

gReport.search - Not Supported

Supported RIR and CIR Alts

- `APEX_IR.RESET_REPORT (`
 `p_page_id IN NUMBER,`
 `p_region_id IN NUMBER,`
 `p_report_id IN NUMBER DEFAULT NULL) ;`

and

- `APEX_IR.CLEAR_REPORT (`
 `p_page_id IN NUMBER,`
 `p_region_id IN NUMBER,`
 `p_report_id IN NUMBER DEFAULT NULL) ;`

Safe Harbor?



Understanding the IR Widgets

- **APEX 5.0 Interactive Report Customization, John Snyders**

<http://hardlikesoftware.com/weblog/2015/05/12/apex-5-0-interactive-report-customization/>

- **jQuery UI: How to Use the Widget Factory**

<https://learn.jquery.com/jquery-ui/widget-factory/how-to-use-the-widget-factory/>

Widgets 101

- Widget Options

```
$(selector).widgetName("option");
```

- Get/Set Widget Option

```
$(selector).widgetName("option","optionname");
```

```
$(selector).widgetName("option","optionname",100);
```

- Widget Method

- Parameters

Naming

- IR Widget:
 - Append `_ir` to IR Static ID
`DEPT_IR_ir`
- Menu Widget
 - Append `_actions_menu` to IR Static Id
`DEPT_IR_actions_menu`

Knowing the Names ...

- Refresh an IR:

```
$("#DEMO_IR_ir").interactiveReport("refresh");
```

- Get the Current Rows Per Page:

```
$("#DEMO_IR_ir").interactiveReport("option",  
    "currentRowsPerPage");
```

- Set the Current Rows Per Page:

```
$("#DEMO_IR_ir").interactiveReport("option",  
    "currentRowsPerPage", 50);
```


Knowing the Names ...

- Open Download Dialog

```
$("#DEMO_IR_actions_menu").menu("find",  
    "irDownload").action();
```

... find the irDownload object of the DEMO_IR interactive report actions menu and call its action method.

APEX 5 IR Possible APIs?

- For APEX 5.1 – Discussion of APIs to Close the gReport Gap
- gReport –Like Options
- Public IR Widget Methods
- Setting for Open/Close Settings

Wait for APEX 5.1 to Upgrade/Refactor?

Note:

In earlier APEX versions, there was less declarative JavaScript capability and therefore more developer customizations.

*As APEX advances and incorporates more declarative JavaScript, **it is more important to stay within the standard APIs** when making customizations, to avoid difficulties when upgrading.*

Appearance

Pre APEX 5.0

- Default Appearance is Blah
- Customization via CSS (Hard, Customized)

APEX 5.0

- Appearance is Better
- Customization is Easy!
 - Template Options
 - Template Styles
 - Universal Theme, ThemeRoller

Pre APEX 5: CSS Anatomy of an IR

- Search Bar → apex_finderbar
- Control Panel → apexir_CONTROL_PANEL
- Worksheet → apexir_WORKSHEET
- Column Search → apexir_columnsearch
- All in apex_<version>.css

See ...\\images\\css\\uncompressed for readable version

Do Not Modify the Original!

apexir_WORKSHEET_DATA

```
table.apexir_WORKSHEET_DATA{border:0px
    #ffffff solid;}
table.apexir_WORKSHEET_DATA tfoot tr
    td{background:#efefef;}
table.apexir_WORKSHEET_DATA th{
    background:#4e4e4e;
    font-weight:bold;
    color:#ffffff;
    border-top:1px #ccc solid;
    border-bottom:1px #aaa solid;
    font-size:11px;
    white-space:nowrap;
    vertical-align:center;
    letter-spacing:1;
    background-image:url(..../ws/report_bg.gif);
    background-repeat:repeat-x;
}
```

```
table.apexir_WORKSHEET_DATA td{
    background:#efefef;
    border-top:1px #fff solid;
    border-bottom:1px #ccc solid;
    font-size:8pt;
    padding:3px 9px;
    empty-cells:show !important;
}
```

```
table.apexir_WORKSHEET_DATA th div{
    color:#ffffff;
    font-size:11px;
    letter-spacing:1;
    text-decoration:underline;
    cursor:pointer;
    margin:3px 9px;
}
```

Custom Appearance: Pre APEX 5

- **Copy** IR CSS into a New File: my_custom_IR.css
- Place Custom CSS File **after** apex_#_#.css
- Change as Little as Possible
- Web Developer: Edit CSS for Visual Feedback
 - Try Out Your Settings
- Test Test Test
- Test in all Supported/Used Browsers
- Test in End User Browsers
 - Common User Browser Settings often Different than Developer Settings!
- **TEST TEST TEST**

APEX 5+: CSS Anatomy of an IR

- ~~● Search Bar → /...~~
- ~~● Control Panel →~~
- ~~● Worksheet → a...~~
- ~~● Column Search →~~
- Use **Template Options**
- Create/Upload **Template Styles**

No Need for All That Custom CSS!

APEX 5 IR “Cheat Sheet”

- **apexir_ ... Ids → STATIC_ID_ ...**
- **apex_ classes → a-IRR-...**
- **APEX 5 Adds a Few More**

- **JavaScript widget is revamped**
widget.interactiveReport.min.js
- **The name is the same ... not much else.**
- **No Supported Equivalents (for now)**

The following tables are *for comparison and guideline use only*. The exact IDs, classes and JavaScript functions used will depend on the complete settings and current state of the Interactive

In General:
CSS:
 apexir_ IDs are replaced by corresponding STATIC_ID_<element> IDs where STATIC_ID is the declared or defaulted Static Id of the IR Region. If the developer does not declare a Static Id, APEX
 apex_ classes are replaced by corresponding a-IRR-<element> classes
JavaScript:
 The <JavaScript> is replaced by a new JavaScript widget: widget.interactiveReport.min.js?v=5.0.0.00.20
 The legacy gReport.search/controls/dialog JavaScript functions have been replaced by equivalent (or improved) widget functions.

Table 1 - CSS IDs and Classes

APEX 4.2 and below			APEX 5	
ID	Class	JavaScript	ID	Class
apexir_REGION_ID			STATIC_ID_ir	t-IRR-region
apexir_WORKSHEET_REGION	apex_worksheet		STATIC_ID_worksheet_region	a-IRR
			STATIC_ID_single_row_view	a-IRR-singleRowView
apexir_DETAIL	apex_detail		STATIC_ID_full_view	a-IRR-fullView
apexir_REPORT	apex_report			
apexir_TOOLBAR	apex_toolbar		STATIC_ID_toolbar	a-IRR-toolbar
apexir_TOOLBAR_OPEN	apexir_TOOLBAR_OPEN		STATIC_ID_toolbar_controls	a-IRR-controls
apexir_TOOLBAR_CLOSE	apexir_TOOLBAR_CLOSE			
apexir_COLUMN_SELECTOR				
apexir_SEARCHDROPROOT	apexir_SEARCHICON			
apexir_CURRENT_SEARCH_COLUMN				
apexir_SEARCHDROP				
apexir_SEARCH_COLUMN_DROP				
apexir_SEARCH	apexir_SEARCH	gReport.search('SEARCH')		
apexir_btn_SEARCH	<your button class>	gReport.search('SEARCH')	STATIC_ID_Column_search_drop	a-IRR-colSearch
apex	apexir_SAVED_REPORTS			a-IRR-savedReports
				a-IRR-views
apexir_SEARCH_BAR_OPTIONS				
apexir_NUM_ROWS	apexir_ROW_SELECT_LIST	onchange="gReport.search('SEAR	STATIC_ID_row_select	
	apexir_ACTION_MENU			a-IRR-actions
		onclick="gReport.controls.menu		a-Button a-IRR-button a-IRR-
	dhtmlMenuLGBButton	(this,'apexir_ACTIONSMENU',fals	STATIC_ID_actions_buttons	button-actions a-
		e); return false;"		MenuButton
		onmouseover="dhtml_CloseAllS		
		ubMenusL(this)" href="javascrip		
apexir_ACTIONSMENU	dhtmlSubMenu	t:gReport.dialog2('SHOW_COLU	STATIC_ID_column_search_root	a-IRR-colSelector
apexir_FORMAT_MENU	dhtmlSubMenu	MN','COLUMN');"		
apexir_WORKSHEET			STATIC_ID_content	a-IRR-content
apexir_CONTROL_PANEL	drop_panel		STATIC_ID_dialog_js	a-IRR-dialogBody
apexir_WORKSHEET			STATIC_ID_worksheet_id	
			STATIC_ID_worksheet_toolbar	

Customizations: Demo



LEGOJANG.com

Recap:

APEX 5.0 IR Changes

New Features

New CSS

New JavaScript

Caveats

Limitations & Workarounds

Changes

CSS and jQuery Widget

APIs Coming for APEX 5.1 (We Hope)



Resources

- **Manually Refreshing APEX Components**
http://docs.oracle.com/cd/E59726_01/doc.50/e39147/extend_app002.htm#HTMDB30267
- **APEX 5.0 Interactive Report Customization, John Snyders**
<http://hardlikesoftware.com/weblog/2015/05/12/apex-5-0-interactive-report-customization/>
- **jQuery UI: How to Use the Widget Factory**
<https://learn.jquery.com/jquery-ui/widget-factory/how-to-use-the-widget-factory/>

More Resources

- **APEX ThemeRoller How-To**

http://dgielis.blogspot.com/2015/02/apex-50-way-to-use-theme-roller.html?utm_source=feedburner&utm_medium=twitter&utm_campaign=Feed%3A+DimitriGielisBlog+%28Dimitri+Gielis+Blog%29 .

- **AMIS Pivot Implementation for pre APEX 5**

<https://technology.amis.nl/2006/05/24/dynamic-sql-pivoting-stealing-antons-thunder/>

- **APEX 5 IR Papers**

<http://thtechnology.com/APEX5>

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PLEASE FILL OUT YOUR EVALUATIONS

Questions ?

APEX IR DEEP DIVE

APEX 5 Preview

Karen Cannell

kcannell@thtechnology.com

ODTUG

TH TECHNOLOGY

Thank You ~

APEX IR DEEP DIVE

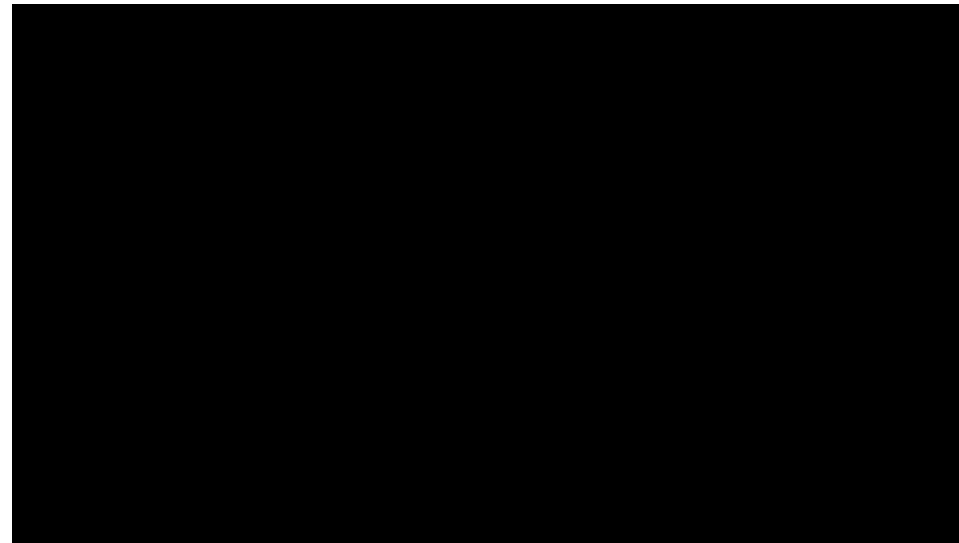
APEX 5 Preview

Please fill out the evaluations!
Karen Cannell

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Nostalgia ...



Ch, Ch, Ch, Ch, Ch, Ch, Ch



Appendix:

- PDF Printing for IRs
- Multiple IR on Single Page, Pre-APEX 5

APEX IR PDF Print OOTB Options

- Print Attributes - Generic Template Only
 - Same Width Columns
 - Basic Header/Footer Settings
- Issues:
 - Equal Column Widths
 - No-Print Columns
 - No Highlighting, Formatting
 - Break Columns?
 - Pivot? Chart? Group By?

APEX IR PDF Print Problem

- Need to Capture As-Is Report Query and Configuration

One Option:

- APEX 4.1: APEX_IR_QUERY
 - Modified SS Version for Sorts, Column Order
 - Modify Your Version for Your Needs
- APEX 4.2 +: APEX_IR Package (w help)
- APEX 5: APEX_IR Package (w help)

PDF Print Options

- Report Query
 - Capture SQL via APEX_IR (or Pre APEX 4.2 Equiv)
- Report Layout
 - XSL-FO Named Column Template
 - Stylus Studio, FO Designer, BI Publisher Desktop, Manual

**This Approach for Fixed Columns Only –
Not True WYSIWYG**

PDF Print Options

Report Query

- Create TYPE to Hold Report Structure
- Create Views w Same Structure as the TYPE
- Create FUNCTION to use Dynamic SQL to Select from View based on APEX_IR_QUERY Output, Return Table Type
- Parameters APP_ID, Page, Session, IR ID, Any IR Parameters

PDF Print Options

Report Query

Edit Source Query

Source Query:

```
(SELECT
  instrument_name,
  test_name,
  reagent,
  units,
  lot_number,
  lab_name,
  inst,
  n,
  TO_CHAR(mean, '999,990.9990') mean,
  TO_CHAR(sd, '999,990.9990') sd,
  TO_CHAR(cv*100, '999,999.0') || '%' cv,
  TO_CHAR(te_percent*100, '99.0') || '%' te_percent,
  TO_CHAR(te_units, '990.90') te_units,
  TO_CHAR(peer_mean, '999,990.9990') peer_mean,
  TO_CHAR(sigma_actual, '999,990.0') sigma_actual,
  TO_CHAR(sigma_bias, '999,990.0') sigma_bias,
  flags,
  TO_CHAR(grade_actual, '990.0') grade_actual,
  TO_CHAR(grade_bias, '990.0') grade_bias,
  te_method,
  pg_uid,
  outlier_flag,
```

PDF Print

● Function Returns Table Type

```
ROW_NUMBER( ) OVER (PARTITION BY pg_uid  
ORDER BY APEX_IR_QUERY.IR_QUERY_SORT(:APP_ID, :APP_PAGE, :APP_SESSION), me  
FROM TABLE( GET_IR_QRY('THTECH',  
:APP_ID,  
:APP_PAGE,  
:APP_SESSION)  
) ORDER BY o_rn));
```

PDF Print Options

Report Layout

```

<?xml version='1.0'?>
<xsl:stylesheet version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform" xmlns:s="http://www.stylusstudio.com/xquery">
  <xsl:template match="/">
    <fo:root xmlns:fo="http://www.w3.org/1999/XSL/Format">
      <fo:layout-master-set>
        <fo:simple-page-master master-name="default-page" page-height="8.5in" page-width="11in"
          margin-left="0.5in" margin-right="0.5in" margin-top="0.25in" margin-bottom="0.25in">
          <fo:region-body margin-top="0.25in" margin-bottom="0.5in"/>
          <fo:region-before extent="1.0in"/>
          <fo:region-after extent="0.3in"/>
        </fo:simple-page-master>
      </fo:layout-master-set>
      <fo:page-sequence master-reference="default-page">
        <fo:static-content flow-name="xsl-region-before" font-size="8pt" font-family="times,serif" color="red" text-align="center">
          <fo:table>
            <fo:table-column column-width="5in"/>
            <fo:table-column column-width="5in"/>
            <fo:table-body>
              <fo:table-row>
                <fo:table-cell>
                  <fo:block text-align="start" color="#006633" font-size="12pt" font-family="times,serif" font-weight="bold">
                    <fo:block><xsl:text> Quest Diagnostics</xsl:text></fo:block>
                  </fo:block>
                </fo:table-cell>
                <fo:table-cell>
                  <fo:block text-align="end" color="black">

```

PDF Print Options

PDF Output Button

- example

Inst Type	Test	Reagent	Units	QC Lot	Laboratory	Inst	N	Mean	SD	CV %	TEa %	TEa Fixed	Peer Mean	#	# w/Bias	Flags	Grade	Grade w/Bias
1			SI D6	5 9			31	27.6580	0.3580	1.3%	15.0%		27.8015	11.6	11.2		98.0	97.4
1			SI D6	5 9			31	27.9450	0.4410	1.6%	15.0%		27.8015	9.5	9.2		97.0	96.3
1			SI D6	5 6			33	45.2940	0.5340	1.2%	15.0%		45.4045	12.7	12.5		98.3	98.1
1			SI D6	5 6			33	45.5150	0.5920	1.3%	15.0%		45.4045	11.5	11.3		98.0	97.7
1			SI D6	5 2			33	66.3300	0.8740	1.3%	15.0%		66.7255	11.4	10.9		97.9	97.2
1			SI D6	5 2			33	67.1210	0.7720	1.2%	15.0%		66.7255	13.0	12.5		98.4	97.8
1				5 9			31	1.0750	0.0190	1.8%	20.0%		1.0795	11.3	11.1		97.9	97.5
1				5 9			31	1.0840	0.0210	1.9%	20.0%		1.0795	10.3	10.1		97.5	97.1
1				5 6			33	2.9180	0.0940	3.2%	20.0%		2.9355	6.2	6.0		93.0	92.1
1				5 6			33	2.9530	0.0720	2.4%	20.0%		2.9355	8.2	8.0		96.0	95.3
1				5 2			33	5.5160	0.1000	1.8%	20.0%		5.5515	11.0	10.7		97.8	97.2
1				5 2			33	5.5870	0.1230	2.2%	20.0%		5.5515	9.1	8.8		96.7	96.1
1			SI D6	5 9			31	11.0480	0.1910	1.7%	15.0%		11.0915	8.7	8.4		96.4	95.9
1			SI D6	5 9			31	11.1350	0.2060	1.9%	15.0%		11.0915	8.1	7.9		95.9	95.3
1			SI D6	5 6			32	29.8910	0.6950	2.3%	15.0%		30.0108	6.5	6.3		93.5	92.7
1			SI D6	5 6			33	30.1270	0.7260	2.4%	15.0%		30.0108	6.2	6.1		93.0	92.3
1			SI D6	5 2			33	55.8610	1.0050	1.8%	15.0%		56.2140	8.3	8.0		96.1	95.2
1			SI D6	5 2			33	56.5670	1.2310	2.2%	15.0%		56.2140	6.9	6.6		94.3	93.2
			SI D6	5 9			24	26.1790	0.2300	.9%	15.0%		27.8108	17.1	10.4	Comments	99.1	90.4
			SI D6	5 9			29	26.3520	0.3540	1.3%	15.0%		27.8108	11.2	7.3	Comments	97.8	88.5
			SI D6	5 9			40	26.4480	0.6620	2.5%	15.0%		27.8108	6.0	4.0	Comments	92.5	79.5
System	RPPT		SI D6	5 9	ALCADA 100L	CXV560	51	26.4700	0.2500	.9%	15.0%		27.8108	15.9	10.8	Consensus	98.9	92.2

PDF Output - Limitations

- Named Columns
- Set Column Order - **Not WYSIWYG**
- **Tedious**
- Future:
 - Edit XSL-FO Template to handle Conditional Column
 - Generate XSL-FO Template On The Fly
 - ALGEN Modification
 - See George Barra for original ALGEN

PDF Output – Other Options

- Plugins
- PL/PDF
- Jasper Reports
- BIRT
- Export to Excel Options
- Node.js output to Word, Excel

**Depends On Your Needs –
Know Your Users**

APEX 5.1 SOD

“PDF Printing – Improve the printing capabilities utilizing the Oracle REST Data Services FOP Support.”

- FOP 1.1 Embedded in APEX REST Services

Pre APEX 5: One IR per Page

- *Need* for > 1 APEX IR ?
- IFF So: **Iframe**

Sample Application

ADMIN [Print](#) [Logout](#)

- Home
- Customers
- Customers & Orders
- Products
- Orders
- Charts
- Admin

Rows

[Create Customer >](#)

Customer Name	Address	City	State	ZIP Code
Bradley, Eugene	Schoephoester Road	Windsor Locks	CT	06096
Dulles, John	45020 Aviation Drive	Sterling	VA	20166
Hartsfield, William	6000 North Terminal Parkway	Atlanta	GA	30320
LaGuardia, Fiorello	Hangar Center, Third Floor	Flushing	NY	11371
Lambert, Albert	10701 Lambert International Blvd.	St. Louis	MO	63145
Logan, Edward	1 Harborside Drive	East Boston	MA	02128
OHare, Edward "Butch"	10000 West OHare	Chicago	IL	60666

“First” IR,
on the
main page

Top Customers	
LaGuardia, Fiorello	\$3,800.00
Hartsfield, William	\$2,598.00
Dulles, John	\$1,200.00
Logan, Edward	\$790.00
Bradley, Eugene	\$500.00
Lambert, Albert	\$490.00
OHare, Edward "Butch"	\$250.00

1 - 7

This is a 2nd IR on the same page!

Rows

Name	Category	Avail?	List Price	Unit	Sales	# Cust	Dt Sold	Img
3.2 GHz Desktop PC	Computer	Y	1200	4	4800	2	24-MAR-2009 02:29PM	
MP3 Player	Audio	Y	199	1	199	1	19-MAR-2009 02:29PM	
Bluetooth Headset	Phones	Y	40	2	80	2	04-MAR-2009 02:29PM	
PDA Cell Phone	Phones	Y	250	3	750	3	09-MAR-2009 02:29PM	

“Second” IR is
in an iframe
(really in
separate app)

Pre APEX 5 > 1 IR: IFRAME

- Create the first IR on the main page
- Create then next IR in separate app
 - Plain Page Template
 - Plain Region – No Template
- Create an HTML Region on main page
- Enter Iframe reference in Region Source

Iframe Source

Source

Region Source

```
<iframe style="overflow:auto;width:100%;height:100%;" frameborder="0"  
src="f?p=108.:1:&SESSION_ID.::::">  
  <p>Your browser does not support iframes.</p>  
</iframe>
```