

City of Atlanta



Continuous Auditing Framework

An Oracle SOD Example

Wednesday, September 1st 2010
10:00 am – 12:00 pm

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Session Objectives

- What is Continuous Auditing and why is it important?
- The SOD Matrix.
- Tools used to develop an in-house solution for testing SOD
- Automation criteria, challenges, benefits, sacrifices and skills sets needed
- What's Next



Dollar, Dollar Bills Ya'll

\$18,000,000.00



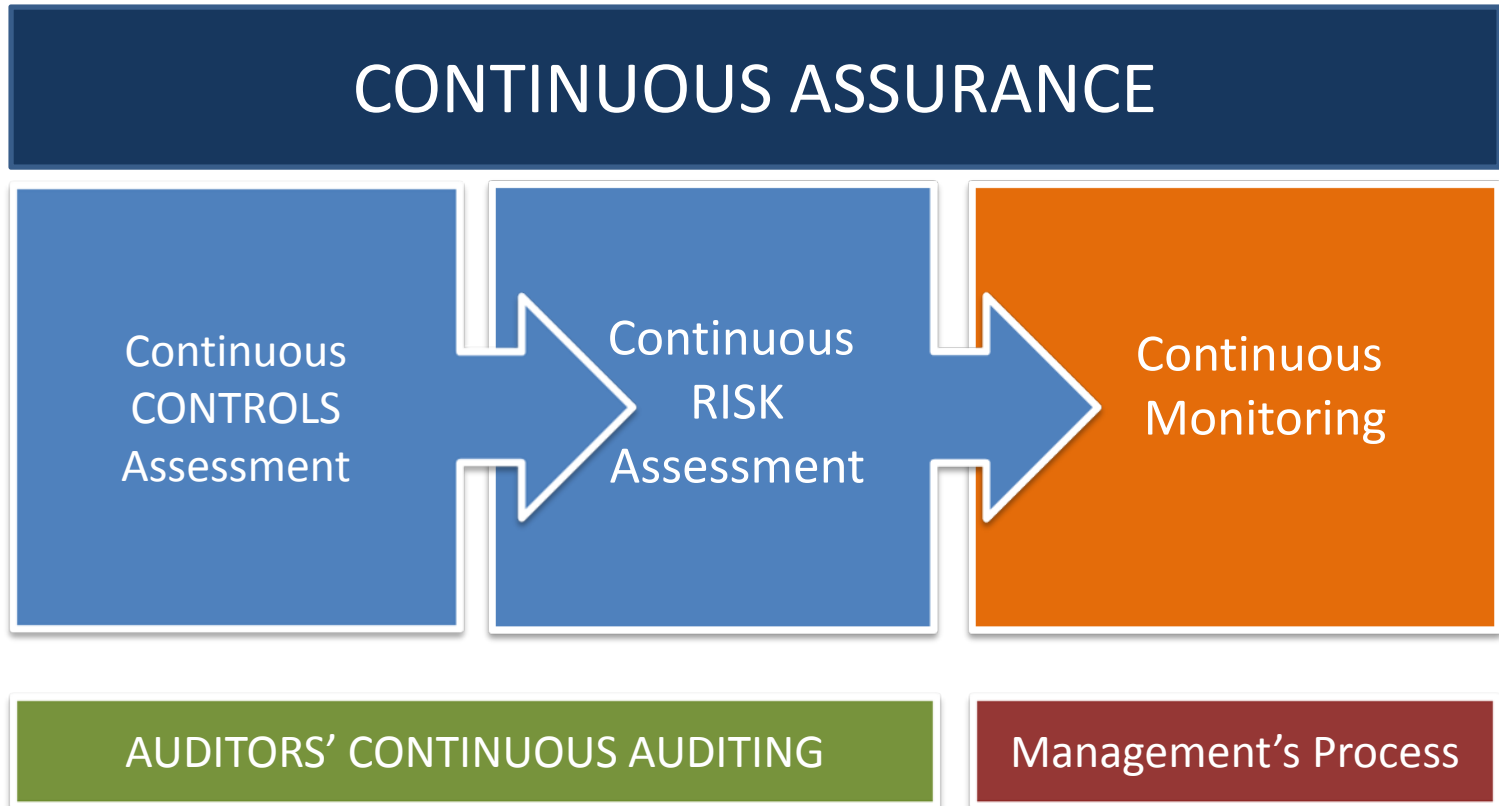


Continuous Auditing

- Model, framework, method
- Increased frequency
- Technology driven / automation
- Overall audit integration
- Allows for less time

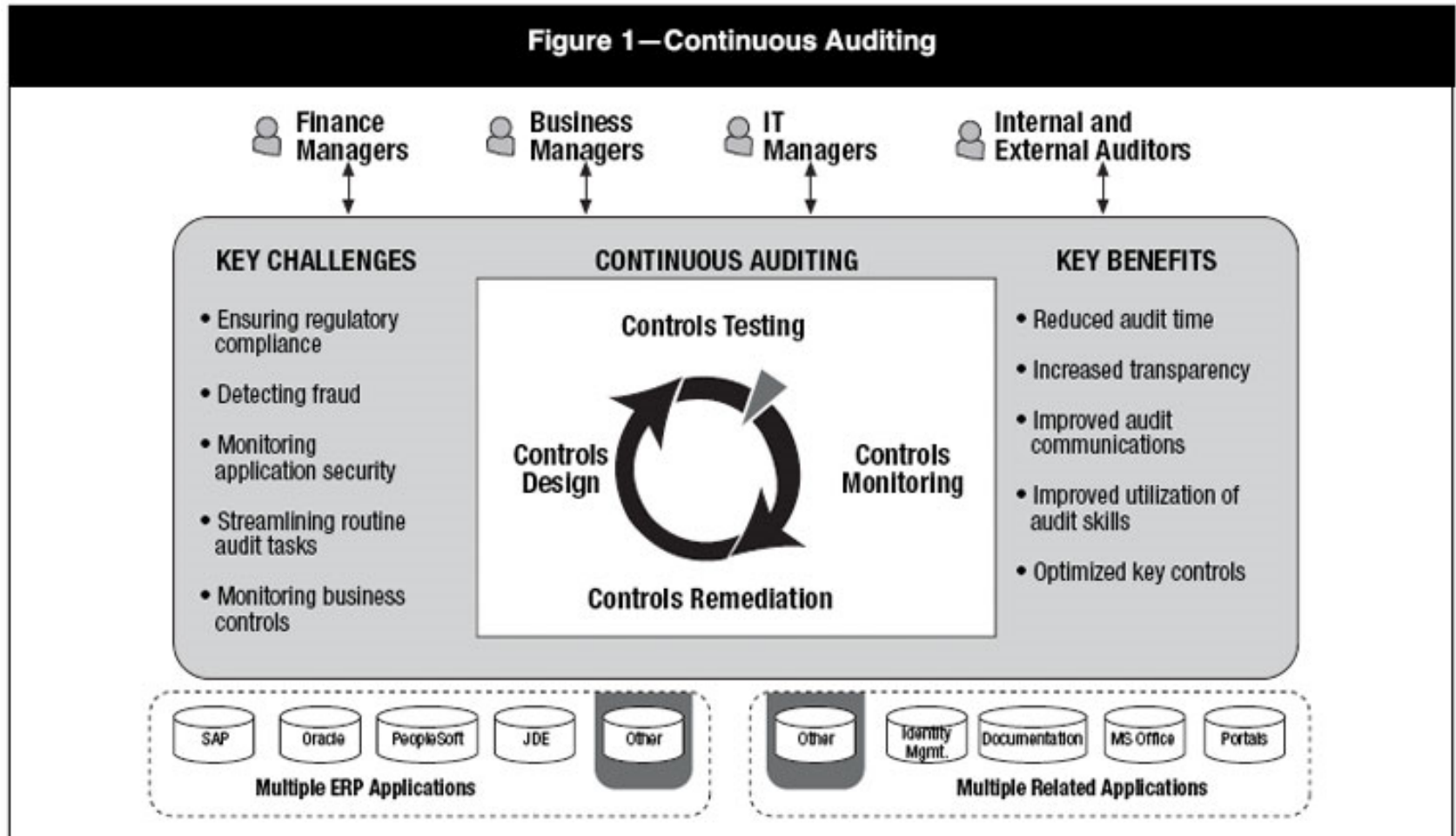


Continuous Auditing continued





Continuous Auditing continued



SOD Matrix





SOD Matrix

ORACLE SEGREGATION OF DUTIES MATRIX prepared by: Damien Berahzer reviewed by: Gerald Schaefer		Enter Journal Entries	Post Journal Entries	Create and Change Vendors	Create Vendor Invoices	Initiate Accrual Write Offs	Create and Change PO	Receive Goods or Services	Enter Inventory Count	Merge Vendors	Receive Goods	Enter Cash Receipts	Maintain Customer Credit Limits	Create Customer Records	Hire Employees	Enter Invoices
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Enter Journal Entries	1		x									x				x
Post Journal Entries	2	x														x
Create and Change Vendors	3															
Create Vendor Invoices	4															
Initiate Accrual Write Offs	5															
Create and Change PO	6															x
Receive Goods or Services	7															
Enter Inventory Count	8															
Merge Vendors	9															
Receive Goods	10															
Enter Cash Receipts	11	x														
Maintain Customer Credit Limits	12															
Create Customer Records	13															
Hire Employees	14															
Enter Invoices	15	x	x													



Track the risk associated with the SOD Conflict

- Open and Close Periods versus Import Journals
 - This allows access to open and close journal periods and enter journals via the import journals feature. There is a risk that a previous period could be opened and journal entries made. Opening and closing periods should be given to a limited number of users.



Automation



Searches for all entries with “write” or “off” in the description field that are greater than a rpede

So easy



Tools

- SQL Plus
 - Data extraction via queries
 - comes with the purchase of Oracle
- MS Access
 - Querying
 - Visual Basic Programming



Automation Steps

- Identify key team members
 - Finance staff
 - IT staff
 - Audit staff
- Start Small
- Build and Test program
- Look for false positives
- Revise, re-perform, reiterate



Team

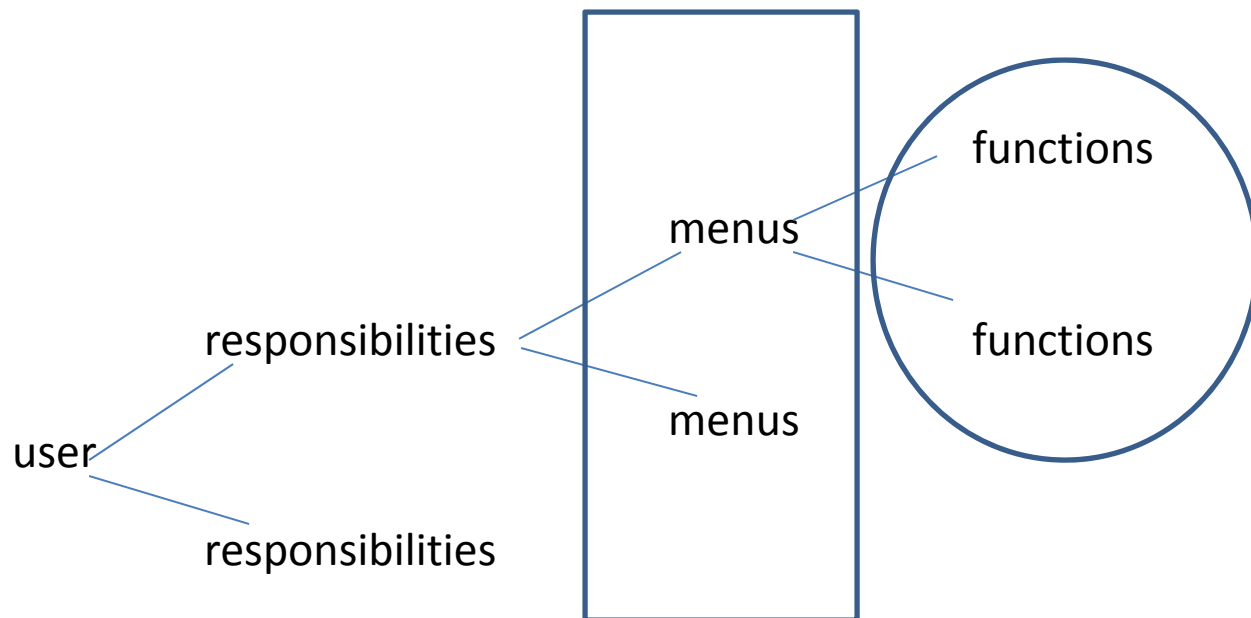
- Finance Staff
 - Assist in identifying SOD
 - Assist in identifying associated risk
- IT Staff
 - Facilitate data access
 - Perform Data Dump
- Audit Staff
 - Create SOD
 - Motivated, Understands Basic Querying, Knowledge of Prgamming

Never: It Can't be done

Yes: What will it take to get it done



Logical Structure





Using SQL Plus

- TNSNAMES.ORA

- defines databases addresses for establishing connections to them
- ORACLE HOME\NETWORK\ADMIN

```
Addressname= (DESCRIPTION=
              (LOAD_BALANCE=YES)
              (ADDRESS_LIST=
                (ADDRESS=(PROTOCOL=tcp)(HOST=hostname1)(PORT=1522))
                (ADDRESS=(PROTOCOL=tcp)(HOST=hostname2)(PORT=1522))
              )
              (CONNECT_DATA=(SERVICE_NAME=<sid>))
            )
```



Query Language Used

- DESC
- SET LINESIZE
- SPOOL/SPOOL OFF
- SELECT



DESC

```
SQL> desc fnd_user;
```

Name	Null?	Type
USER_ID	NOT NULL	NUMBER (15)
USER_NAME	NOT NULL	VARCHAR2 (100)
LAST_UPDATE_DATE	NOT NULL	DATE
LAST_UPDATED_BY	NOT NULL	NUMBER (15)
CREATION_DATE	NOT NULL	DATE
CREATED_BY	NOT NULL	NUMBER (15)
LAST_UPDATE_LOGIN		NUMBER (15)
ENCRYPTED_FOUNDATION_PASSWORD	NOT NULL	VARCHAR2 (100)
ENCRYPTED_USER_PASSWORD	NOT NULL	VARCHAR2 (100)
...		

Alternative data extraction methods

- Other tools such as Toad
- Discoverer
 - Viewer
 - Plus

“Discoverer is an intuitive ad-hoc query, reporting, analysis, and Web-publishing tool that empowers business users at all levels of the organization to gain immediate access to information from data marts, data warehouses, online transaction processing systems and Oracle E-Business Suite.”



Query Example

- SET LINESIZE 500

SPOOL FND_RESPONSIBILITY_TL.txt

```
SELECT APPLICATION_ID,    RESPONSIBILITY_ID,  
LANGUAGE,    RESPONSIBILITY_NAME, DESCRIPTION,  
SOURCE_LANG
```

```
FROM APPS.FND_RESPONSIBILITY_TL;
```

SPOOL OFF

```
FND_RESPONSIBILITY_TL.txt - Notepad  
File Edit Format View Help  
SQL> SELECT APPLICATION_ID, RESPONSIBILITY_ID, LANGUAGE, RESPONSIBILITY_NAME, DESCRIPTION, SOURCE_LANG FROM APPS.FND_RESPONSIBILITY_TL;  
APPLICATION_ID  RESPONSIBILITY_ID  LANG  RESPONSIBILITY_NAME  DESCRIPTION  
-----  
7002            21562  US    Italian AR Localizations  Italian AR L  
7002            21563  US    Italian GL Localizations  Italian GL L  
7002            21564  US    Netherlands GL Localizations  Netherlands  
7002            21565  US    Norwegian AR Localizations  Norwegian AR  
7002            21566  US    Norwegian GL Localizations  Norwegian GL  
7002            21567  US    Polish AR Localizations  Polish AR Lo  
7002            21568  US    Polish GL Localizations  Polish GL Lo  
7002            21569  US    Portuguese GL Localizations  Portuguese G  
7002            21570  US    Spanish GL Localizations  Spanish GL L  
7002            21571  US    Swedish AR Localizations  Swedish AR L  
7002            21572  US    Swedish GL Localizations  Swedish GL_L  
APPLICATION_ID  RESPONSIBILITY_ID  LANG  RESPONSIBILITY_NAME  DESCRIPTION  
-----  
7002            21573  US    Swiss GL Reports  Swiss GL Lo
```



Query Example

```
APPLICATION_ID RESPONSIBILITY_ID LANG RESPONSIBILITY_NAME
-----
396          50705 US COA Supplier Profile Administrator (NOT USED)
396          50706 US COA RFQ Approver
396          50707 US COA Sourcing ET Member
396          50708 US COA Sourcing CT Member
396          50709 US COA DOP Sourcing Buyer Manager
396          50710 US COA Sourcing Functional Manager
8402         50758 US COA PnG Projects Maintenance
242          50778 US COA Auditor Inquiry
201          50779 US COA PSP Functional Manager
200          50819 US COA IE Setup and Administration
800          50858 US COA Manager Self-Service for Testing
```

```
APPLICATION_ID RESPONSIBILITY_ID LANG RESPONSIBILITY_NAME
-----
20003         50978 US CATS Custom Reports
800          51038 US COA HR Dept View
```

1652 rows selected.

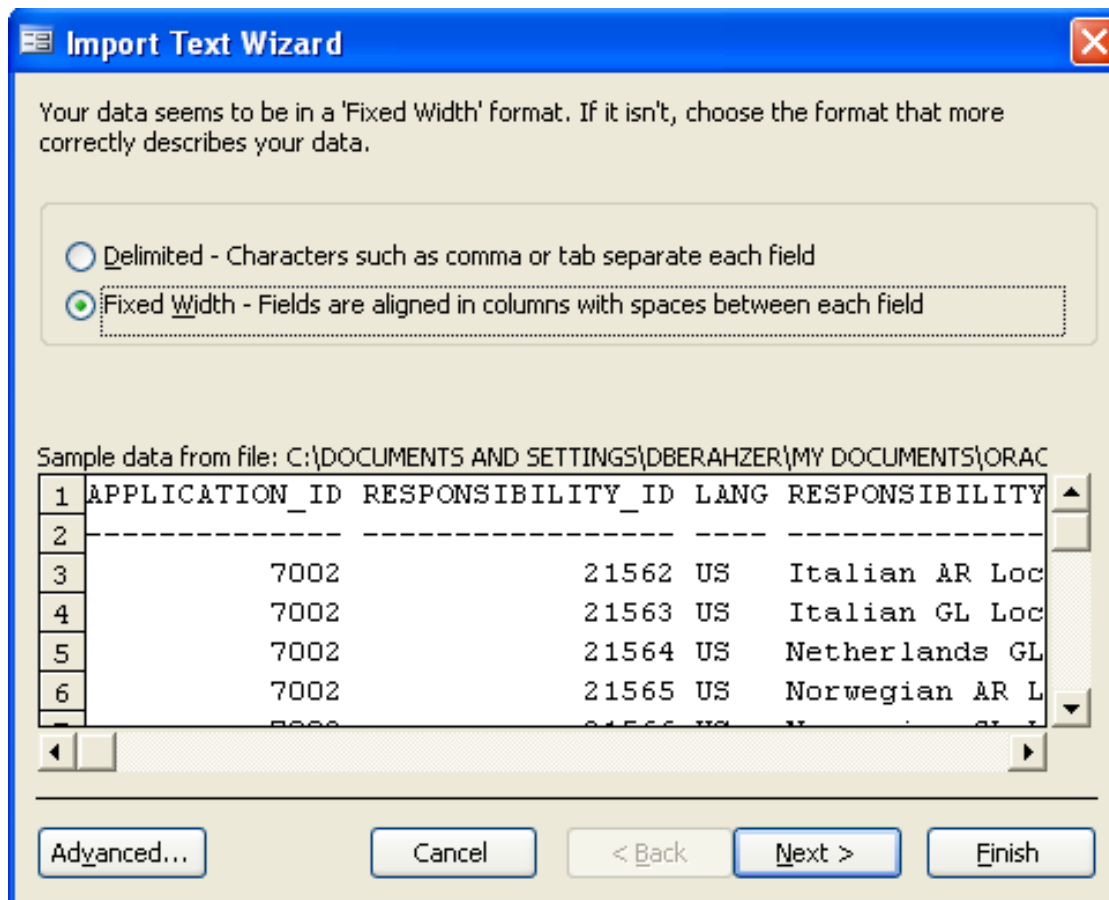
SQL> SPOOL OFF



Access Import

Import Files:

The files created in the SQL Section above need to be imported into MS access. Import these files as Fixed Width Fields





Clean Up the Data

- `DELETE FND_RESPONSIBILITY_TL.*
FROM FND_RESPONSIBILITY_TL
WHERE Application_ID IS NULL OR
Application_ID = "Application_ID" OR
Application_ID LIKE "*-----*";`
- `UPDATE FND_RESPONSIBILITY_TL
SET Application_ID = LTRIM(Application_ID)`



Oracle Tables

- FND_USER
- FND_FORM_FUNCTIONS
- FND_FORM_FUNCTIONS_TL
- FND_MENU_ENTRIES
- FND_RESPONSIBILITY_TL
- FND_RESPONSIBILITY
- FND_APPLICATION



Create Tables with combined data

FND_FORM_FUNCTIONS and the FND_FORFUNCTIONS_TL

Field:	Function_ID	Function_Name	Application_ID	FORM_ID	User_Function_Narr	Description
Table:	FND_FORM_FUNCT	FND_FORM_FUNCT	FND_FORM_FUNCT	FND_FORM_FUNCT	FND_FORM_FUNCT	FND_FORM_FUNCT
Sort:						
Show:	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Criteria:						
or:						



Joined Functions Table

Consolidated_Function						
Function_ID	Function_Name	Application_	FORM_ID	User_Function_Name	Description	
1010	AP_APXINWKB_APPROVE	200	54250	Invoice Approve		
1028	AP_APXINWKB_BATCHES	200	54250	Invoice Batches		
1029	AP_APXINWKB_BATCH_S	200	54250	Invoice Batches Summary		
1000	AP_APXINWKB_CANCEL	200	54250	Invoice Cancel		
15102	ARCMCHKINVOICEDPRED			Invoice Data Points Redirect		
25430	FII_EA_AP_INV_DTL			Invoice Detail	Invoice Detail	
12361	POS_INVOICES			Invoice Details	Invoices	
17358	OKS_OKSINVRV	515	58570	Invoice Details	Invoice Details	
7671	ARW_INVOICE_DETAILS			Invoice Display		
24196	FII_AP_INV_DIST_DETAIL			Invoice Distribution Detail	Invoice Distribution Detail	
1005	AP_APXINWKB_DISTRIBU	200	54250	Invoice Distributions		
1072	AP_APXINWKB_PRORATE	200	54250	Invoice Distributions Prorate		
1007	AP_APXINWKB_REVERSE	200	54250	Invoice Distributions Reverse		



Functions to Responsibilities

Responsibilities_Functions : Select Query

Consolidated_Function

- *
- Function_ID
- Function_Name
- Application_ID
- FORM_ID

FND_RESPONSIBILITY_TL

- *
- ID**
- Application_ID
- Responsibility_ID
- Language

Field: Consolidated_Function.* Responsibility_ID Responsibility_Name Description

Table: Consolidated_Function FND_RESPONSIBILITY_TL FND_RESPONSIBILITY_TL FND_RESPONSIBILITY_TL

Sort:

Show:

Criteria:

or:

Field	Table	Field	Table
Consolidated_Function.*	Consolidated_Function	Responsibility_ID	FND_RESPONSIBILITY_TL
		Responsibility_Name	FND_RESPONSIBILITY_TL
		Description	FND_RESPONSIBILITY_TL



Individual Functions

Selected_Functions	
ID	Function_Names
1	Enter Journals
2	Import Journals
3	Suppliers
4	Mass Depreciation Adjustments
5	Payment Batches Confirm
6	Payments
7	Payment Actions
8	Payment Batches
9	Purchase Orders
10	Banks
11	Invoice Batches
12	Invoices
13	Adjustment Screen
14	Adjustment: Approve

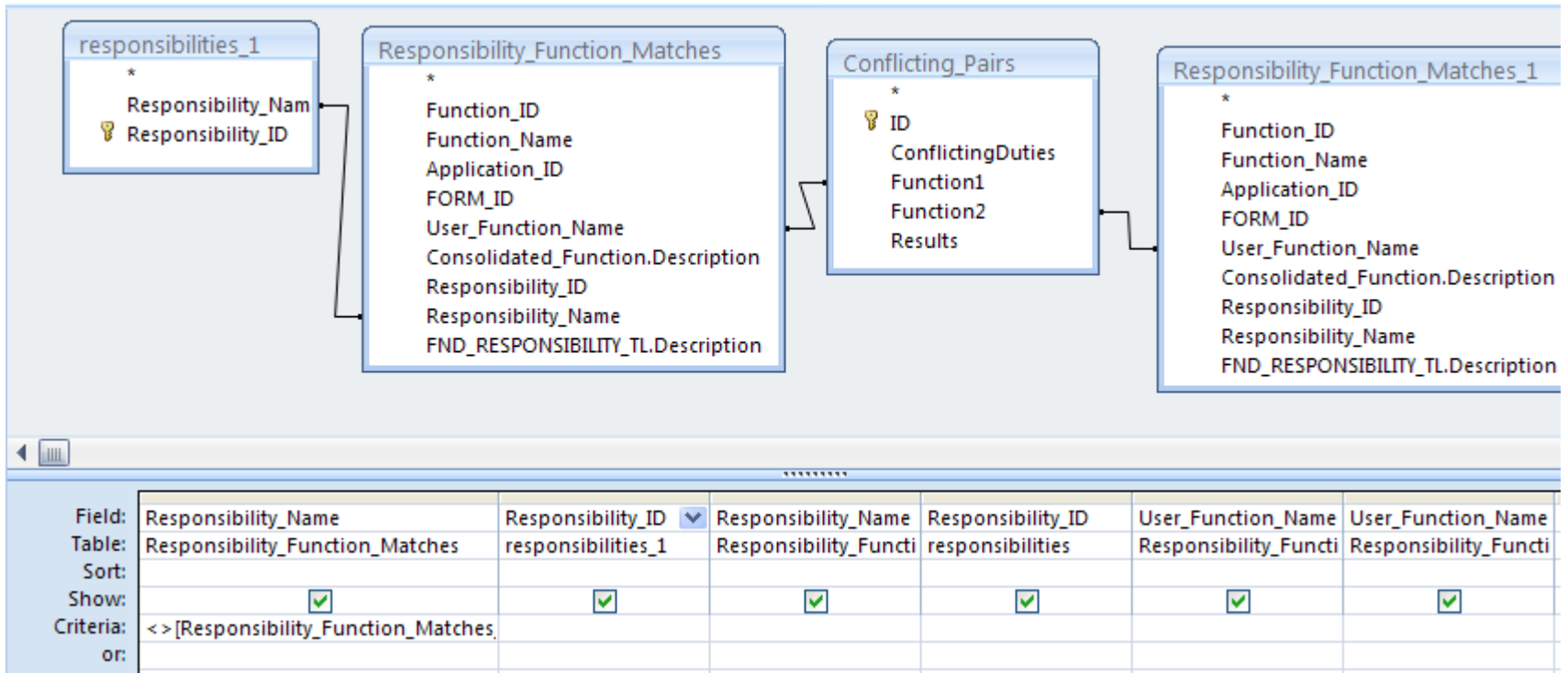


Conflicting Pairs

Conflicting_Pairs			
	ConflictingDuties	Function1	Function2
	AP Invoice Entry and GL Entry	Invoice Actions	Enter Journals
	AP Invoice Entry and GL Entry	Invoice Actions	Import Journals
	AP Invoice Entry and GL Entry	Invoice Approvals	Enter Journals
	AP Invoice Entry and GL Entry	Invoice Approvals	Import Journals
	AP Invoice Entry and GL Entry	Invoice Approve	Enter Journals
	AP Invoice Entry and GL Entry	Invoice Approve	Import Journals
	AP Invoice Entry and GL Entry	Invoice Batches	Enter Journals
	AP Invoice Entry and GL Entry	Invoice Batches	Import Journals
	AP Invoice Entry and GL Entry	Invoices	Enter Journals
	AP Invoice Entry and GL Entry	Invoices	Import Journals
	AP Invoice Entry and Suppliers	Invoice Actions	Suppliers
	AP Invoice Entry and Suppliers	Invoice Approvals	Suppliers
	AP Invoice Entry and Suppliers	Invoice Approve	Suppliers
	AP Invoice Entry and Suppliers	Invoice Batches	Suppliers
	AP Invoice Entry and Suppliers	Invoices	Suppliers
	AP Invoice Entry/Approval and Fixed A	Invoice Approve	Mass Depreciation Adjustments
	AP Invoices and Payments	Invoice Approvals	Payment Batches Confirm
	AP Invoices and Payments	Invoice Approvals	Payment Batches Confirm
	AP Invoices and Payments	Invoice Approvals	Payments
	AP Invoices and Payments	Invoice Approvals	Payments



Conflicting Responsibilities



Conflicting Responsibilities Table

Responsibility_Function_Matches.	resp	Responsibility_Function_Matches_1.	re	Responsibility_Func	Responsibility_Func
COA AR Transactions Super User	28	COA AR Accounting Administration	36	Receipt	AR: Approve Adjustm
COA AR Transactions Super User	28	COA AR Receipts Super User	29	Receipt	AR: Approve Adjustm
COA AR Transactions Super User	28	COA AR Inquiry	39	Receipt	AR: Approve Adjustm
COA AP Manager	15	COA AP Inquiry	152	Payment Batches	Banks
COA AP Manager	15	COA AP Invoice Manager	14	Payment Batches	Banks
COA AP Manager	15	COA AP SuperUser	13	Payment Batches	Banks
COA AP Manager	15	COA FAP Specialist	153	Payment Batches	Banks
COA FAP Specialist	153	COA AP Inquiry	152	Payment Batches Conf	Banks
COA FAP Specialist	153	COA AP Invoice Manager	14	Payment Batches Conf	Banks
COA FAP Specialist	153	COA AP SuperUser	13	Payment Batches Conf	Banks
COA FAP Specialist	153	COA AP Manager	15	Payment Batches Conf	Banks
COA AP Manager	15	COA AP Inquiry	152	Payment Batches Conf	Banks
COA AP Manager	15	COA AP Invoice Manager	14	Payment Batches Conf	Banks
COA AP Manager	15	COA AP SuperUser	13	Payment Batches Conf	Banks
COA AP Manager	15	COA FAP Specialist	153	Payment Batches Conf	Banks
COA AP SuperUser	13	COA AP Inquiry	152	Payments	Banks
COA AP SuperUser	13	COA AP Invoice Manager	14	Payments	Banks
COA AP SuperUser	13	COA FAP Specialist	153	Payments	Banks
COA AP SuperUser	13	COA AP Manager	15	Payments	Banks
COA AP Inquiry	152	COA AP Invoice Manager	14	Payments	Banks
COA AP Inquiry	152	COA AP SuperUser	13	Payments	Banks
COA AP Inquiry	152	COA FAP Specialist	153	Payments	Banks
COA AP Inquiry	152	COA AP Manager	15	Payments	Banks
COA AP SuperUser	13	COA AP Inquiry	152	Payment Batches Conf	Banks
COA AP SuperUser	13	COA AP Invoice Manager	14	Payment Batches Conf	Banks
COA AP SuperUser	13	COA FAP Specialist	153	Payment Batches Conf	Banks
COA AP SuperUser	13	COA AP Manager	15	Payment Batches Conf	Banks

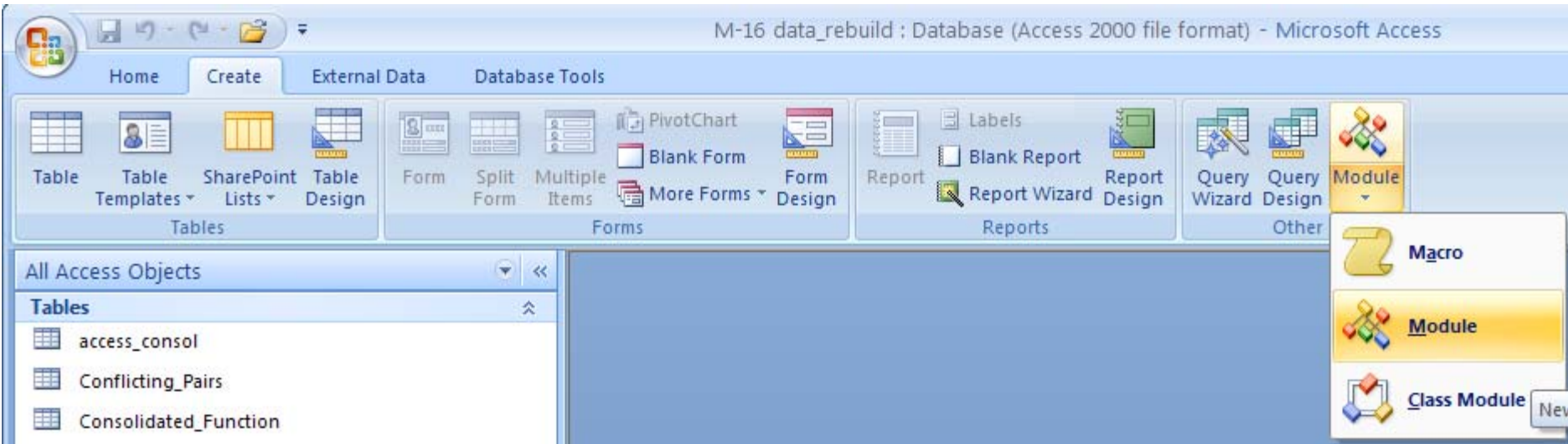


Our User Listing

ID	Employee_Name	Employee_Id	1	2	3	4	5
1	Garfield The Cat	1206					
2	Lebrown Gone	15751				X	
3	Steve Gravey	37387					
4	Keery Uppersteel	49703					
5	Michael Jordeen	259517					
6	Harry Hemper	216264					
7	Drew Bees	4836					
8	Wanda skype	4875					
9	Nanny McTee	62711	X	X	X	X	X
10	Simon Gonwell	178912				X	
11	Kernel Powell	24603					
12	Beyon Say	189290					
13	Denzel Washing	54853					
14	Cheryl Willcox	177100					
15	Sarah Paling	39553	X	X	X	X	X
16	Denise Hopaway	256760					



MS Access Code





MS Access Code

```
M-16 data_rebuild - determine_users_SOD (Code)
(General) Test_Macro
Option Compare Database
'Created by Damien Berahzer
'
'Oracle SOD of duties Automation Testing

Sub Test_Macro()

    Dim db As Database
    Dim qdf As QueryDef
    Dim Lrs As DAO.Recordset
    Dim Conflict_List As String
    Dim ConLis As DAO.Recordset
    Dim LSQL As String
    Dim LGST As String
    Dim Count_variable As String
    Dim Rec_Count As Integer

    '-----Open connection to current Access database-----
    Set db = CurrentDb()

    '-----Determine Number or records to test-----
    Conflict_List = "SELECT responsibilities_1.Responsibility_ID, responsibilities.Respon

    Set ConLis = db.OpenRecordset(Conflict_List)
    'go to last record
    ConLis.MoveLast
    myCount = ConLis.RecordCount
    ConLis.MoveFirst
```



Next Steps

- Test for false positives

Moving Forward

- Use Discoverer
- Re-program