QAD Enterprise Applications
Enterprise Edition

Training Guide

Customization

70-3243A
QAD 2010 Enterprise Edition
November 2011

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QAD Inc.
100 Innovation Place
Santa Barbara, California 93108
Phone (805) 566-6000
http://www.qad.com

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About This Course

Course Description

This course is designed to teach Enterprise Edition customization concepts and practice. It consists of the following modules:

- Browse Customizations
- Customization using QAD Application Features and Functions UI Design Mode
- Non-intrusive Customization of Enterprise Financials
- Non-intrusive Customization: Supporting Tools
- Integration with Enterprise Financials: Back End

Course Objectives

By the end of this class, students will:

- Understand non-intrusive development
- Understand the impact on development
- Know how to perform customizations using QAD application features and functions
- Know how to customize component-based QAD applications

Audience

This training is for developers/designers with Progress 4GL experience who want to learn non-intrusive customization techniques for component-based programs and functions (typically the new Financials functions).

Prerequisites

Students are expected to have an intermediate understanding of Progress (OpenEdge 10). Completion of the following online classes (available on the Learning Portal) is required prior to attending this class:

- Introduction to Java and Tomcat for QAD Enterprise Edition
- Introduction to Georgia SoftWorks Telnet Server for QAD Enterprise Edition
- Introduction to Supported Operating Systems – QAD Enterprise Edition
- Introduction to the QAD .NET UI – QAD Enterprise Edition
- Introduction to the QAD Interoperability (QXtend) – QAD Enterprise Edition
- Introduction to the QAD Interoperability (EDI eCommerce) – QAD Enterprise Edition
- QAD Application Architecture – QAD Enterprise Edition

Virtual Environment Information

The hands-on exercises in this book should be used with the QAD 2010 Enterprise Edition training environment specified by your instructor.

QAD Web Resources

From QAD's main site, you can access QAD's Learning or Support sites.

http://www.qad.com/

Chapter 1

Course Overview

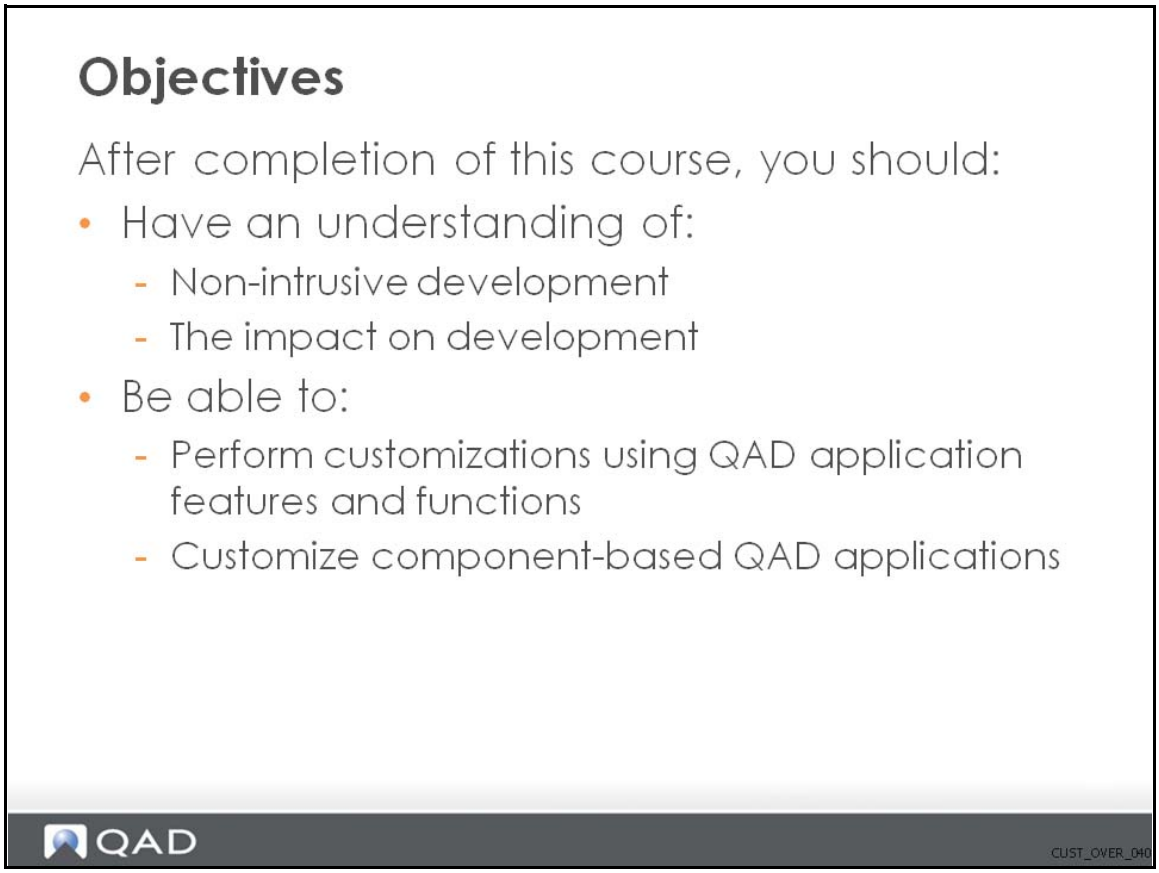
Course Overview



Course Description



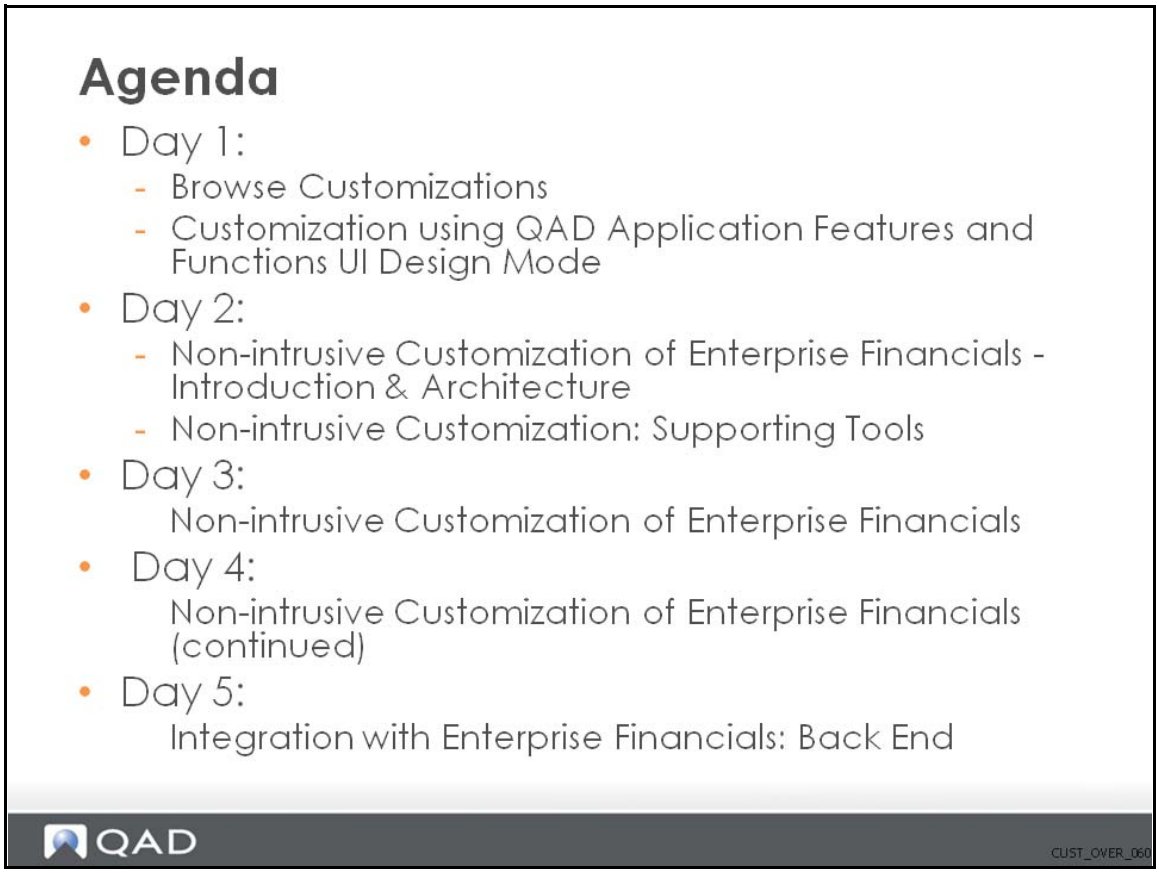
Objectives


Objectives
After completion of this course, you should:
• Have an understanding of:
- Non-intrusive development
- The impact on development
• Be able to:
- Perform customizations using QAD application features and functions
- Customize component-based QAD applications
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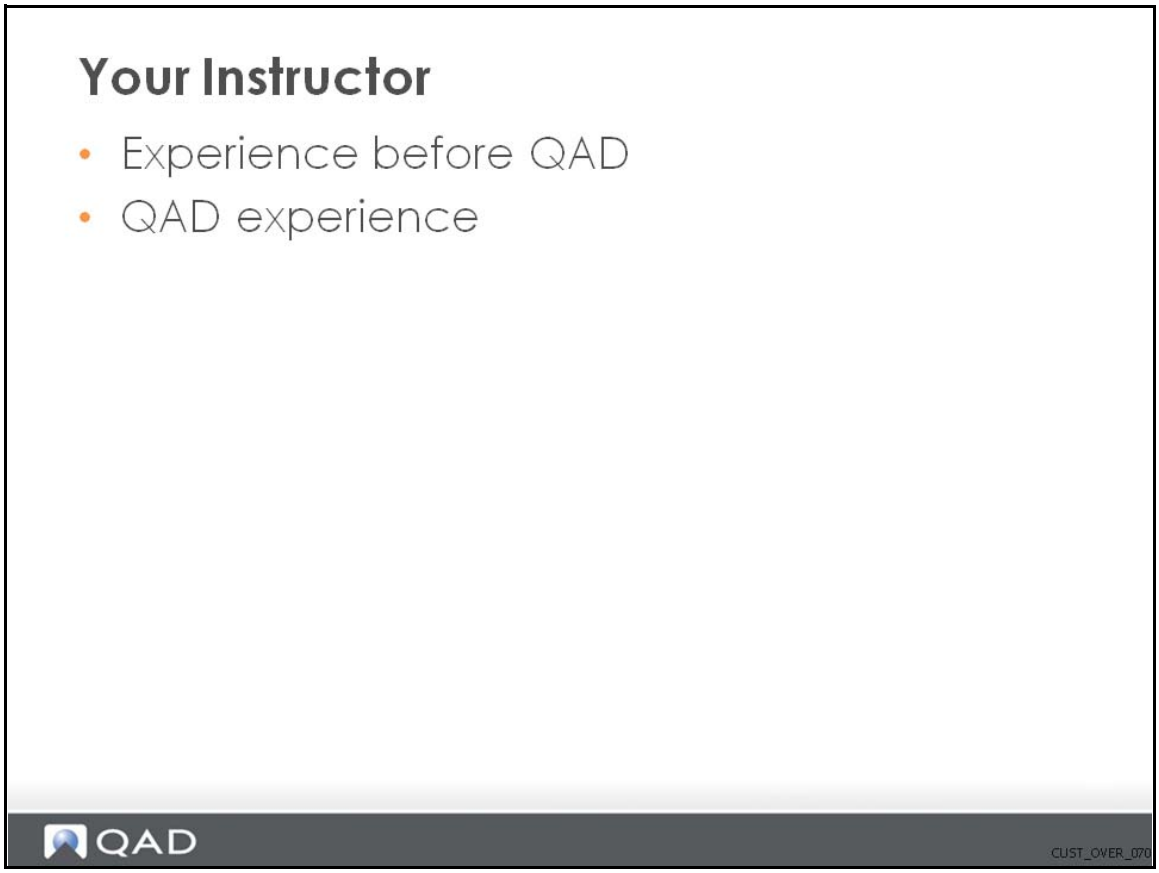
Daily Schedule



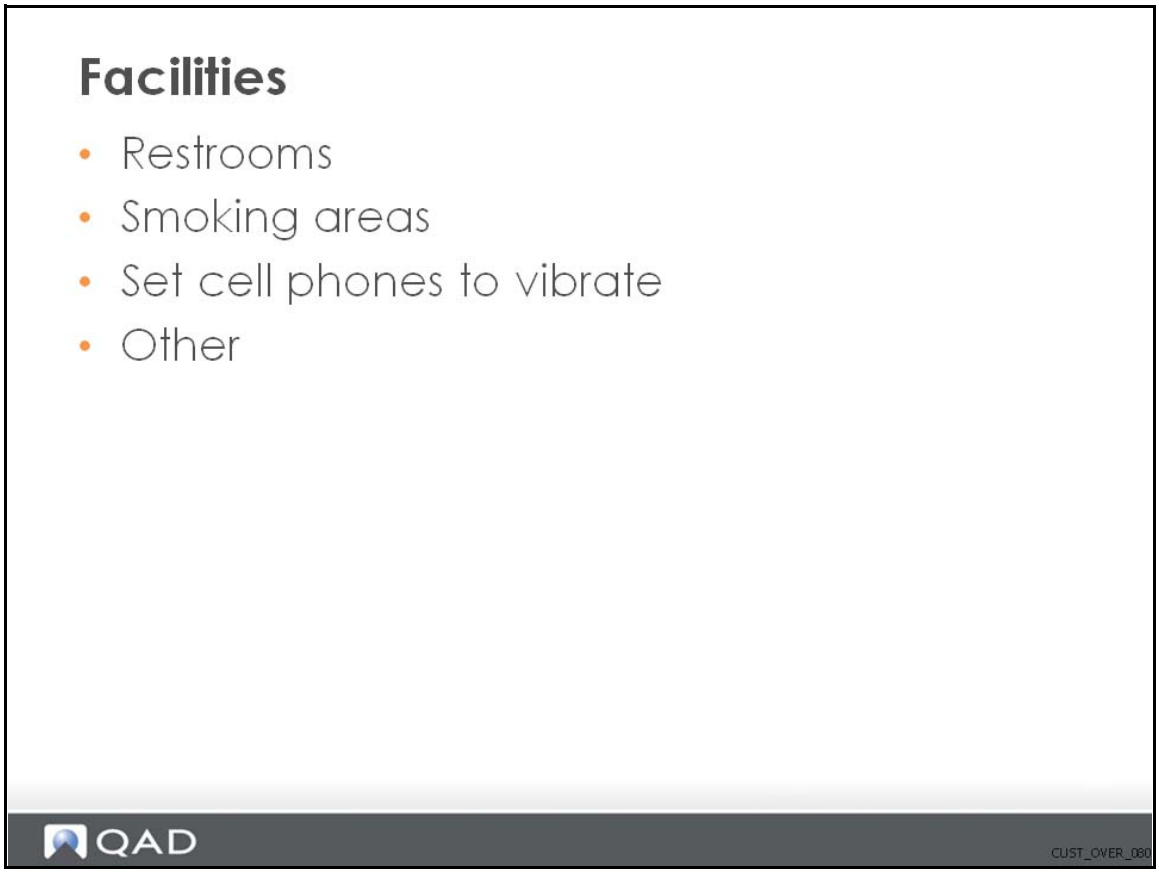
Agenda


Agenda
Day 1:
Browse Customizations
Customization using QAD Application Features and Functions UI Design Mode
Day 2:
Non-intrusive Customization of Enterprise Financials - Introduction & Architecture
Non-intrusive Customization: Supporting Tools
Day 3:
Non-intrusive Customization of Enterprise Financials
Day 4:
Non-intrusive Customization of Enterprise Financials (continued)
Day 5:
Integration with Enterprise Financials: Back End
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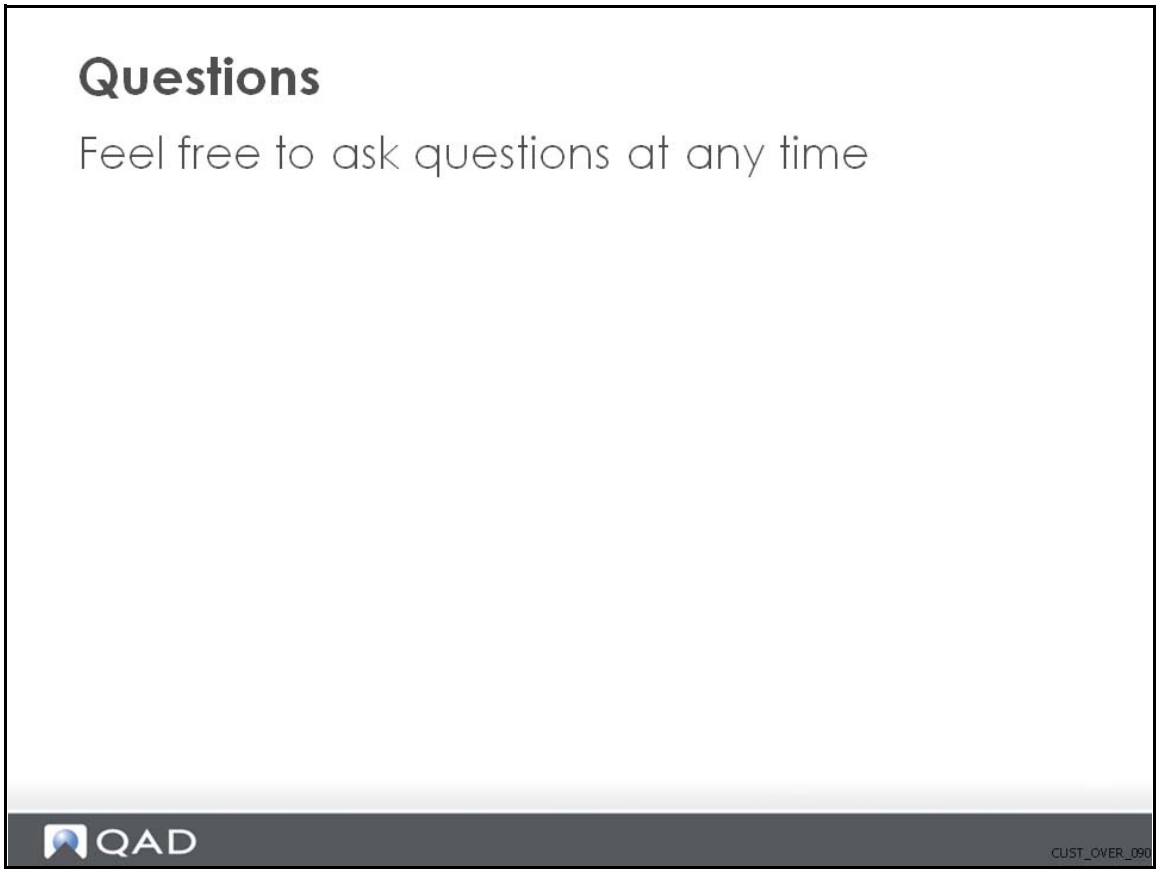
Your Instructor



Facilities


Facilities
Restrooms
Smoking areas
Set cell phones to vibrate
Other
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Questions


Questions
Feel free to ask questions at any time
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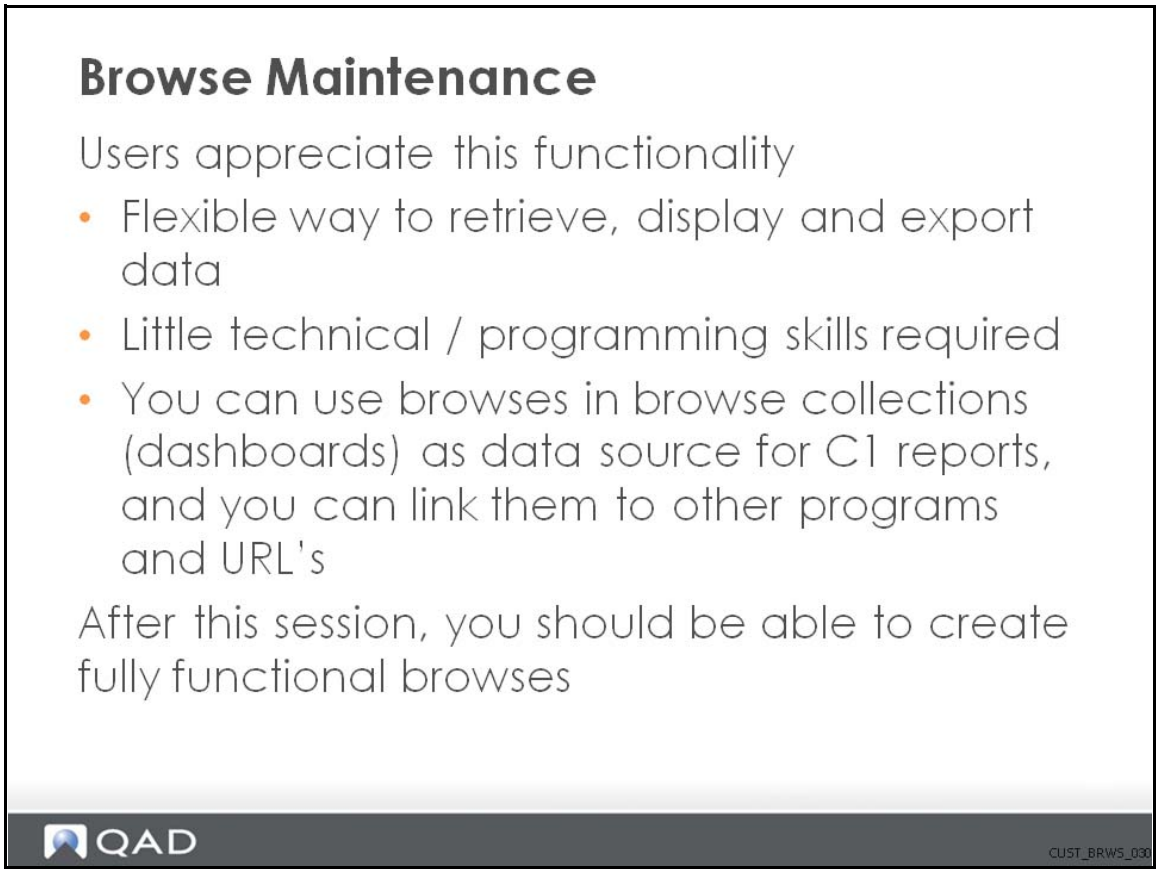
Chapter 2

Browse Customizations

Browse Customizations



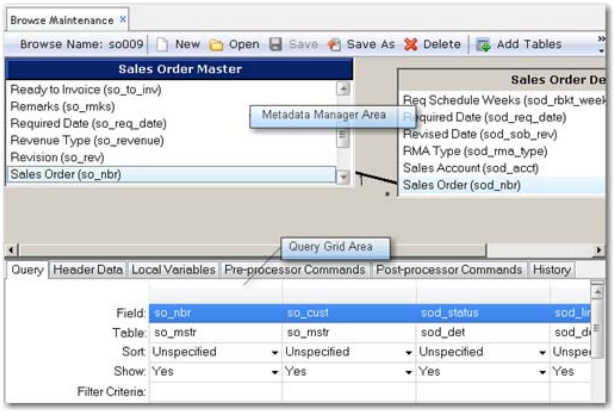
Browse Maintenance



Browse Maintenance 2

Browse Maintenance

- Design tool for creating, editing, duplicating and deleting browses
- .NET UI program
- Import and export browses
- Run stand-alone
- Run as a lookup on custom fields



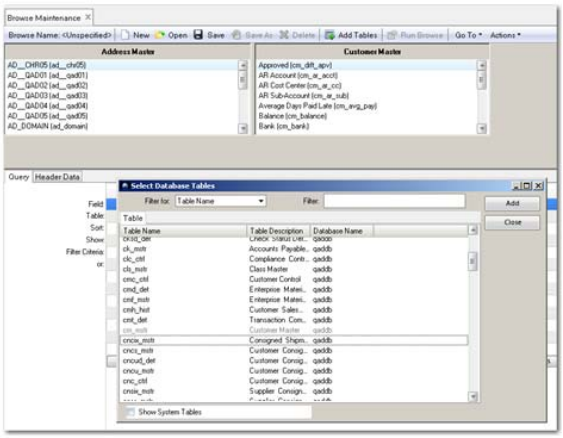
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CUST_BRWS_040

Creating a Browse

Creating a Browse

- Add left and right tables
- Include or exclude system tables
- Can include up to 30 tables in a new browse
- Tables defined in `client-session.xml`
- Restricted tables are not displayed



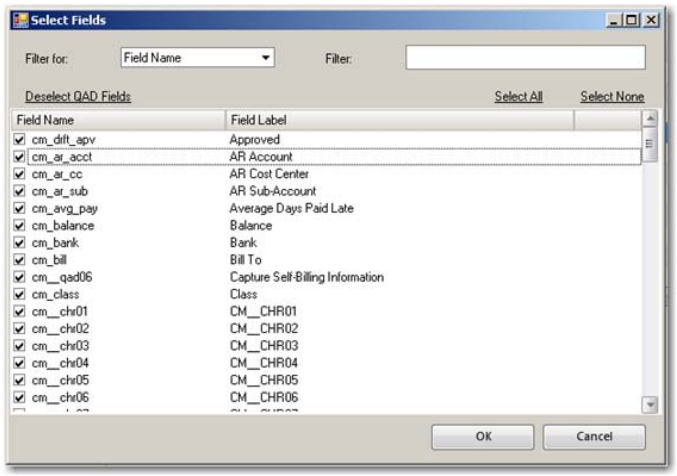
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Selecting Fields

Selecting Fields

- Right-click Table Area
- Select or deselect custom QAD fields



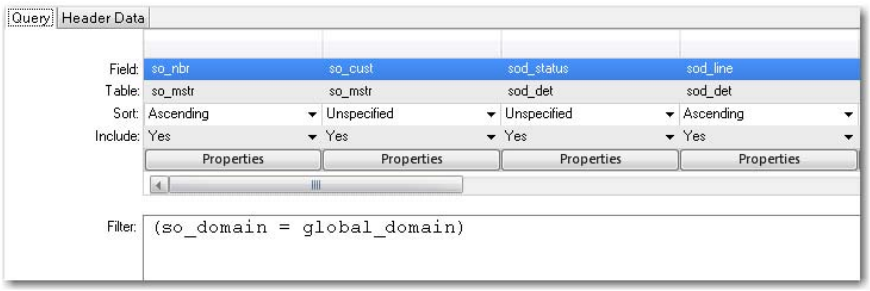
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Using the Query Tab

Using the Query Tab

- Add fields to the browse using the Query tab
- Set field Sort and Include properties
- Set field filters
- View and modify field properties



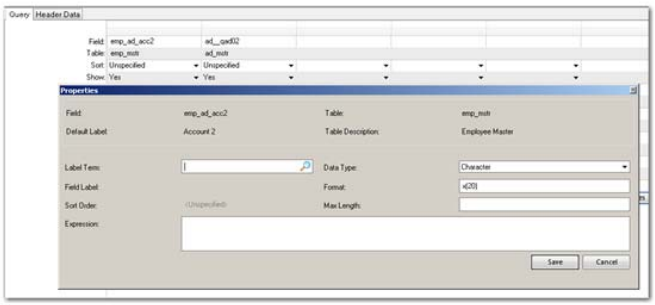
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Field Properties

Field Properties

- Specify a label term from the label master table
- Sort order if column is set to Ascending
- Expressions for local variables
- Data Types for local variables
- Format depends on data type
- Display length



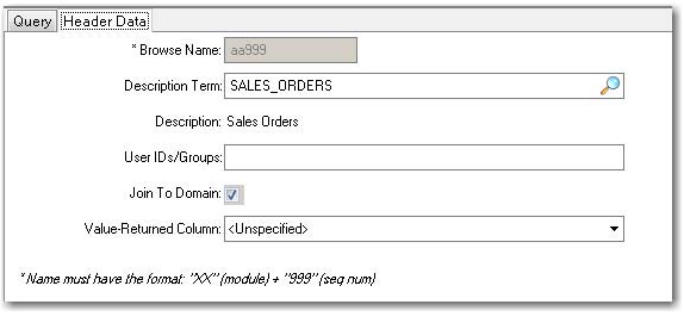
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Header Data Tab

Header Data Tab

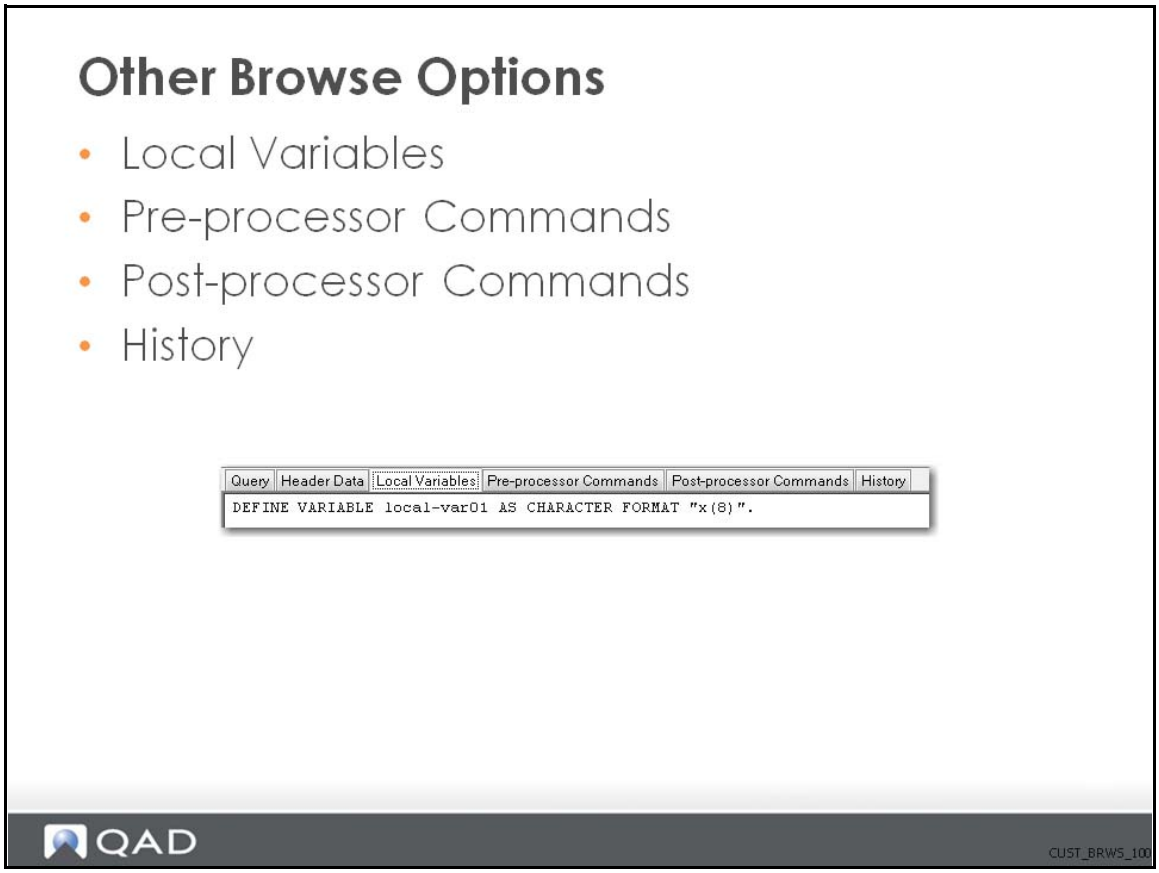
- Name and description for the browse
- Optionally restrict access to the browse
- Join the browse tables to the global domain
- Specify the value returned by double-clicking on a browse row



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Other Browse Options



Performance Considerations

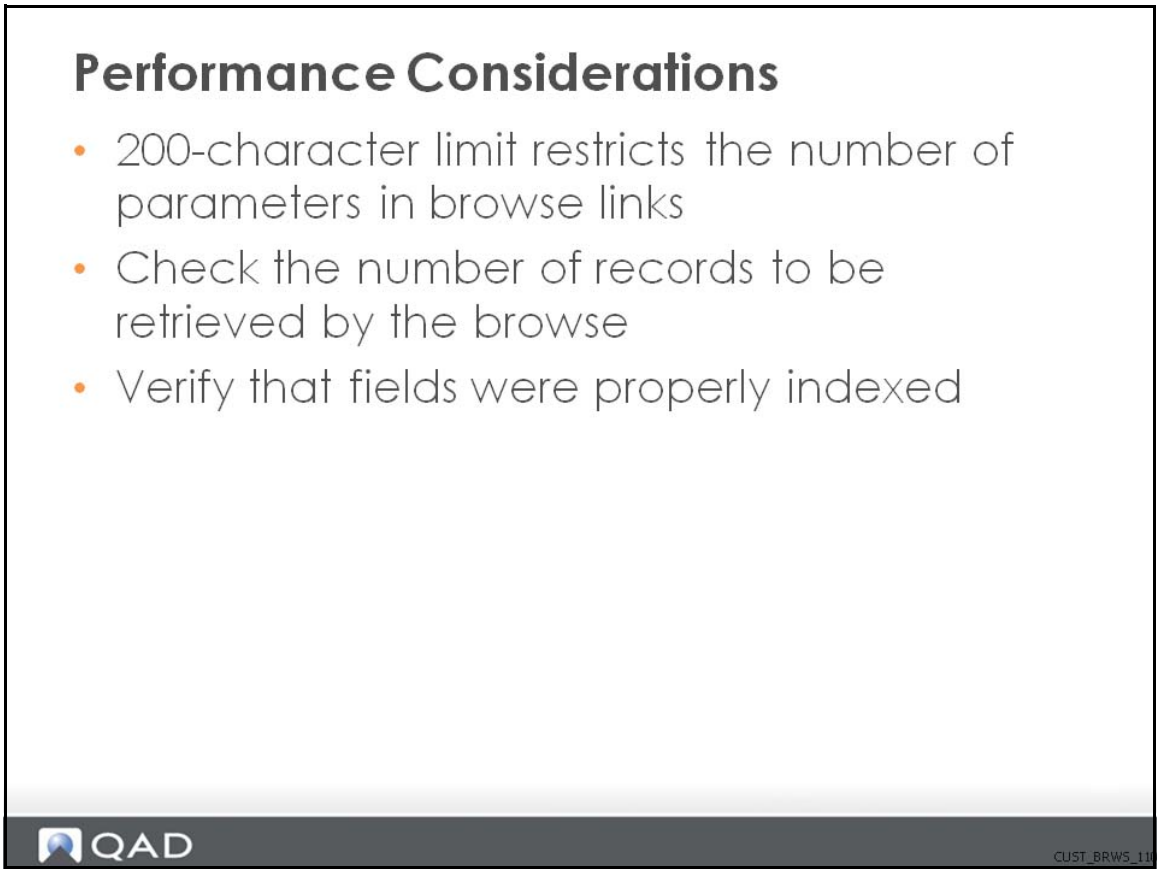
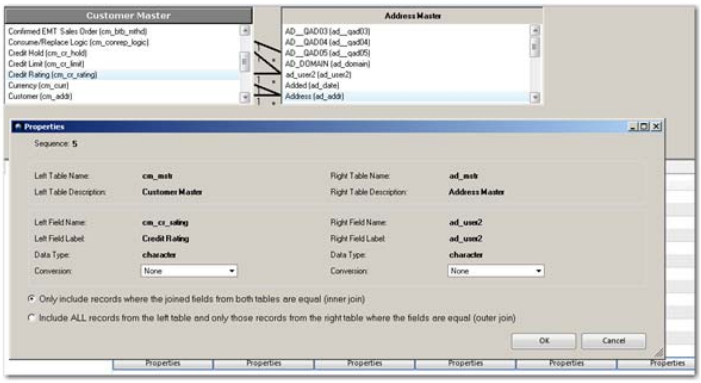


Table Joins

Table Joins

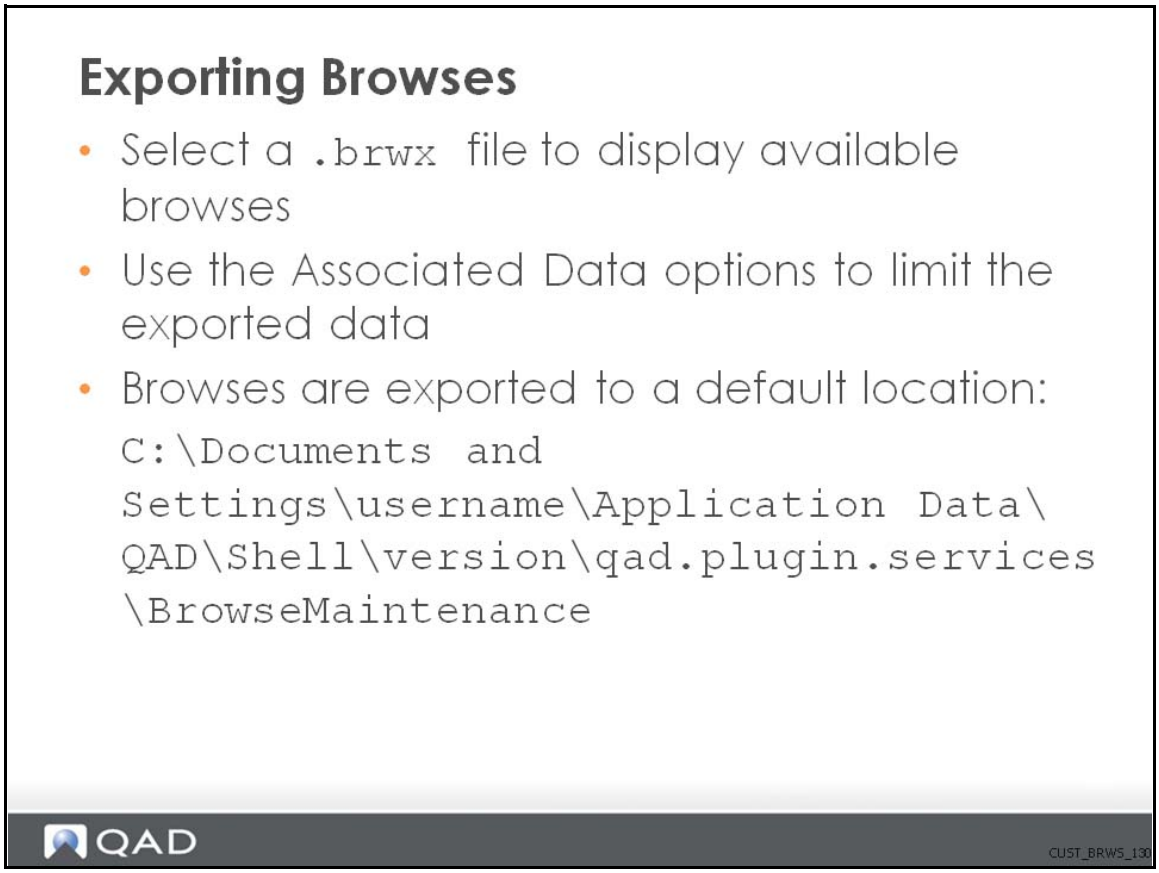
- Drag and drop to create a join
- View and modify join properties
- Data type conversion
- Inner and Outer Joins



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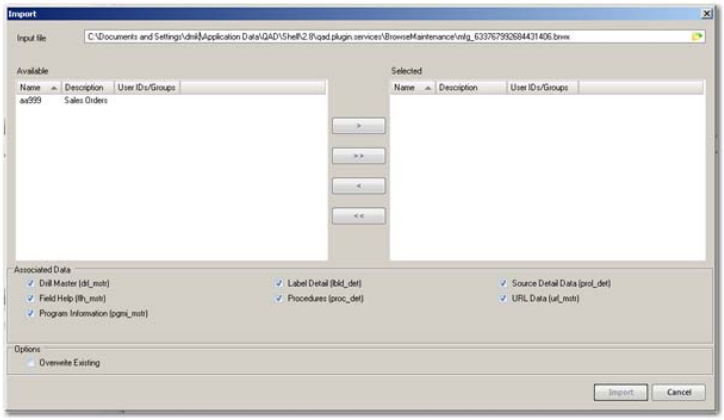
Exporting Browses



Importing Browses

Importing Browses

- Select a browse definition file (`.brwx`) using the Open lookup



- Specify the data to import using the Associated Data options

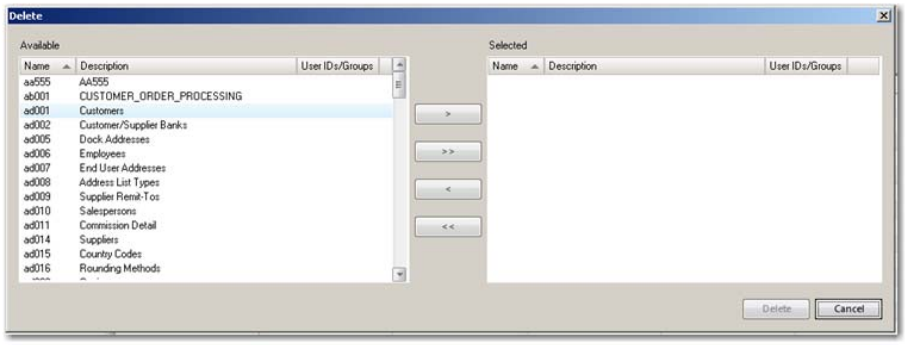
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CUST_BRWS_140

Deleting Multiple Browses

Deleting Multiple Browses

Security considerations: Restricting the use of Browse Import, Export and Multiple Delete functions by modifying the `client-session.xml` file



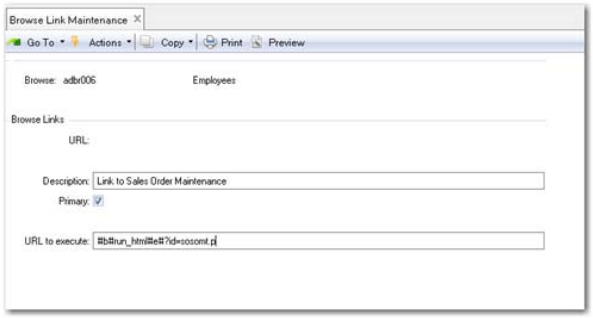
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Browse Link Maintenance

Browse Link Maintenance

- Creating New and Edit buttons on browses that link to Create and Modify programs
- Programs linked as URLs
- Data in the current browse is passed to the linked Modify program



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CUST_BRWS_160

Creating a Browse Link

Creating a Browse Link

- Select a browse
- Specify the program link as a URL to Execute using the syntax:

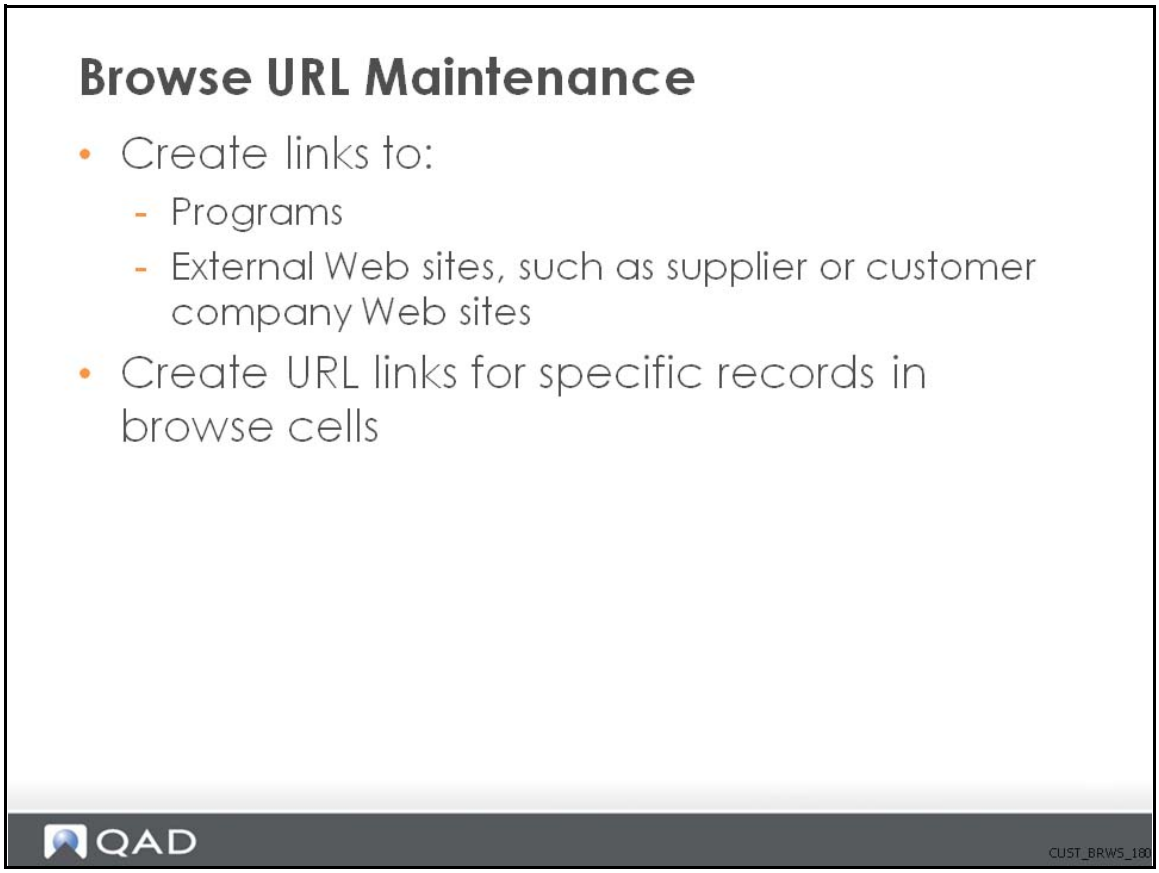
  `#b#run_html#e#?id=program_name`
- Set the HTTP parameters for the program
- Index is the number of submits the program executes
- Field and Value are the field and value you want to load in the linked program



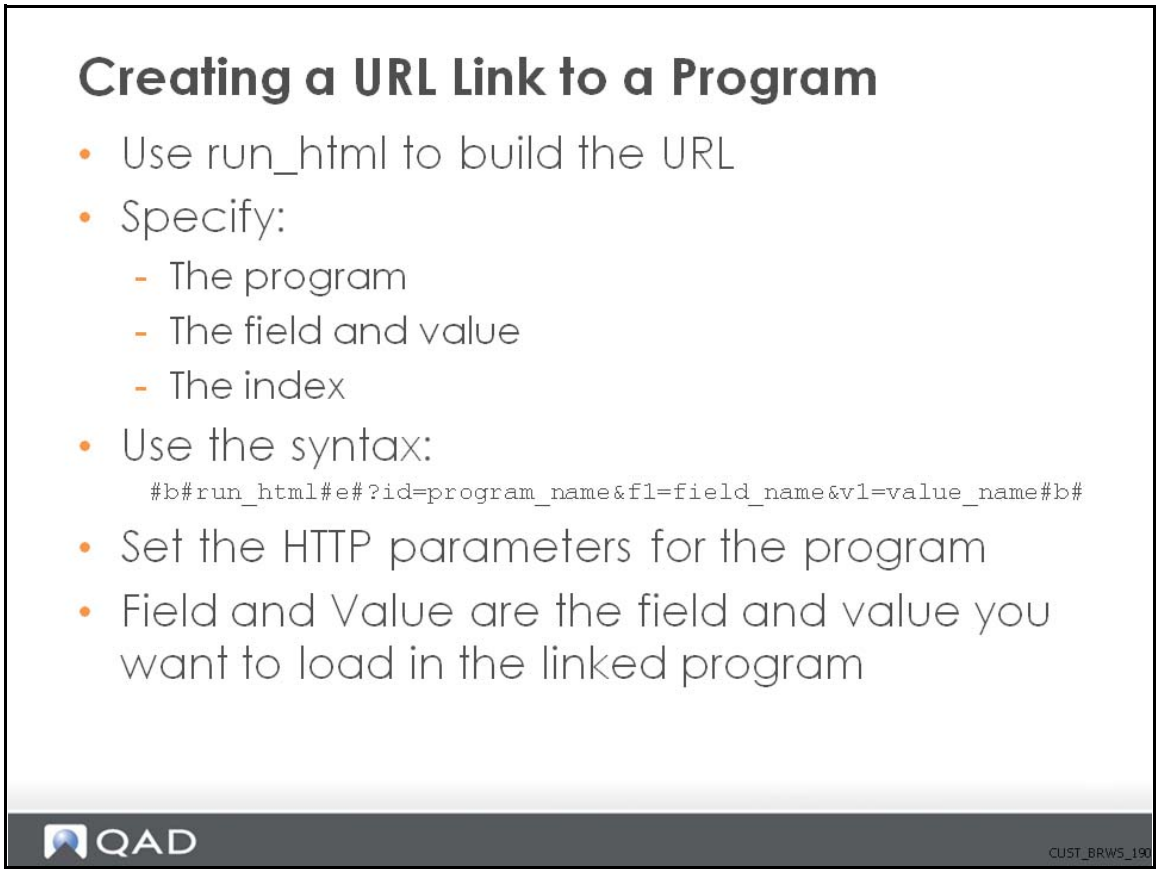
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CUST_BRWS_170

Browse URL Maintenance



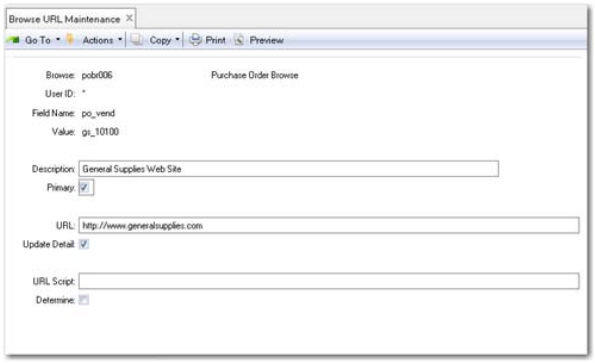
Creating a URL Link to a Program



Creating a Browse Link to a Web Page

Creating a Browse Link to a Web Page

- Specify:
  - The browse
  - Field name and value
  - The URL
- Use the syntax: `http://www.website.com`



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CUST_BRWS_20

Creating a Browse Link to a Web Page 2



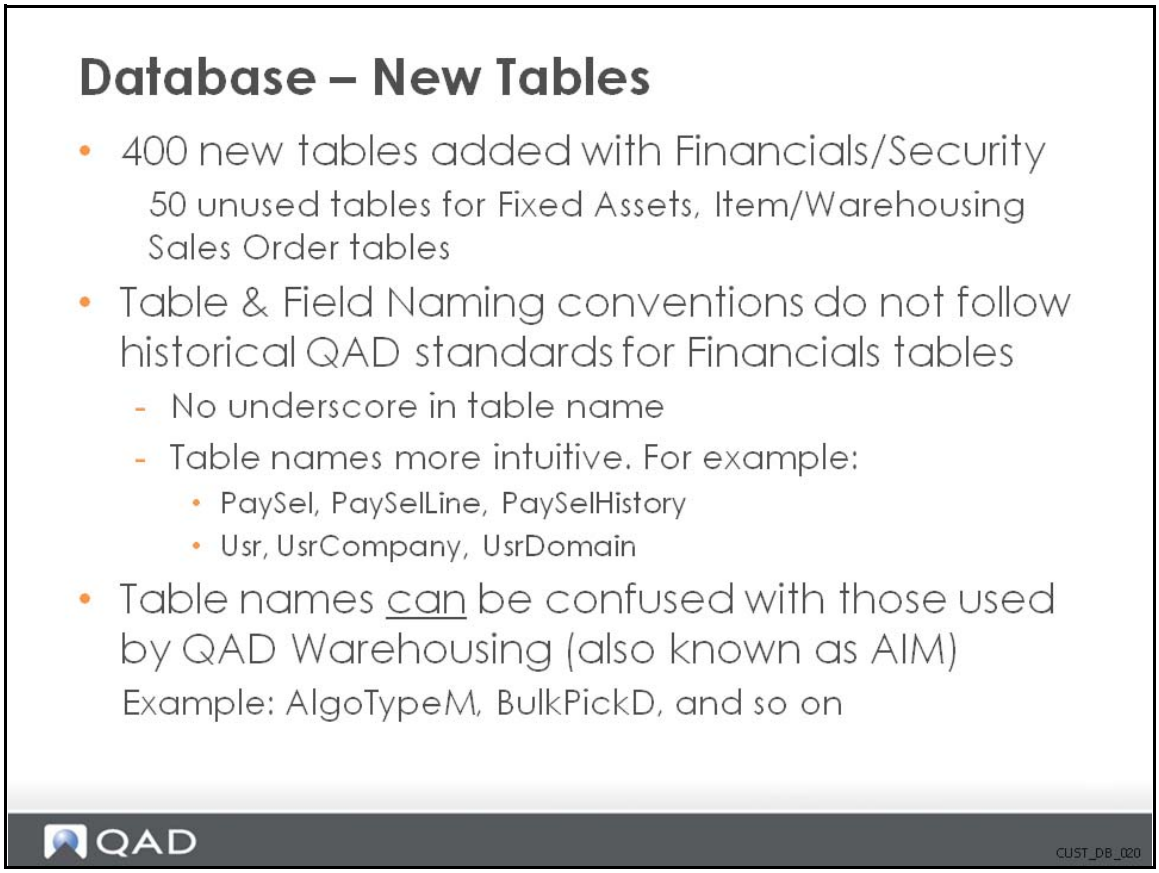
Creating a Browse Link to Financials



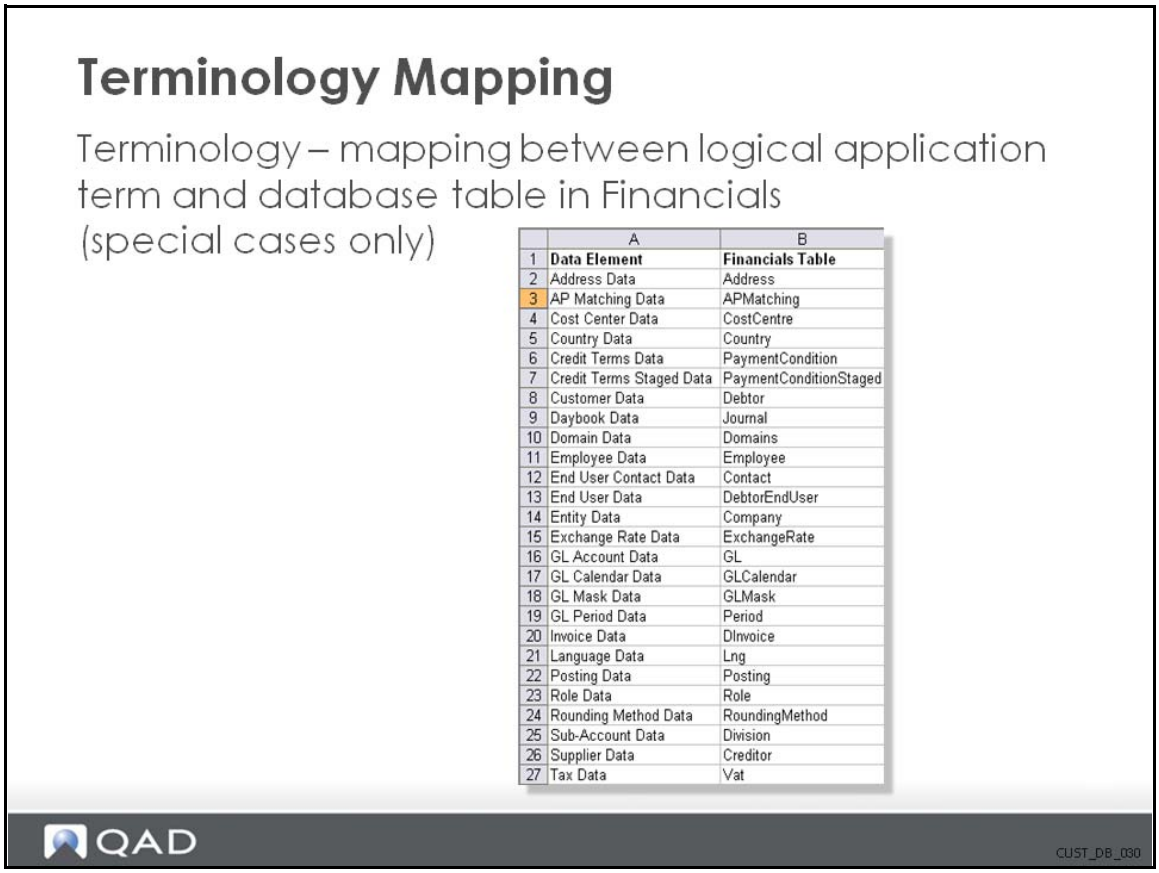
Enterprise Financials Database Schema



Database - New Tables

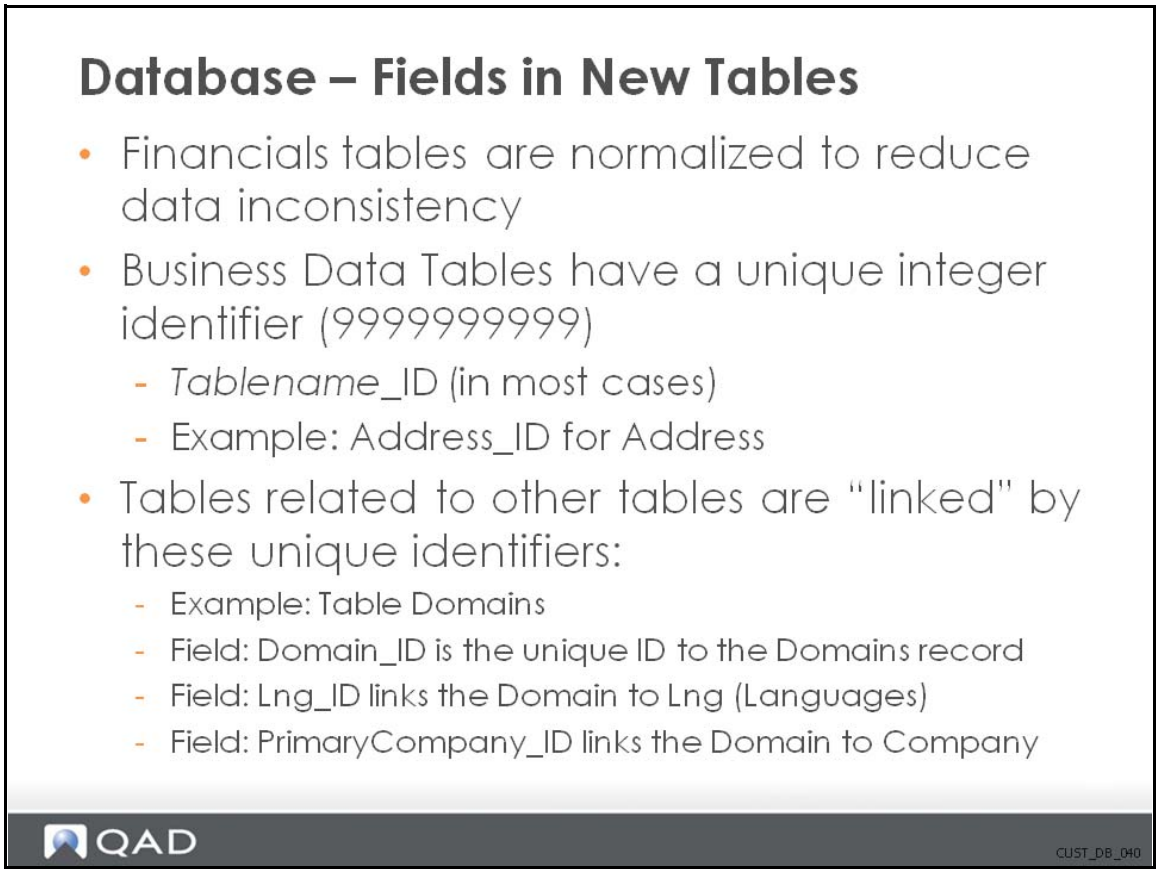


Terminology Mapping

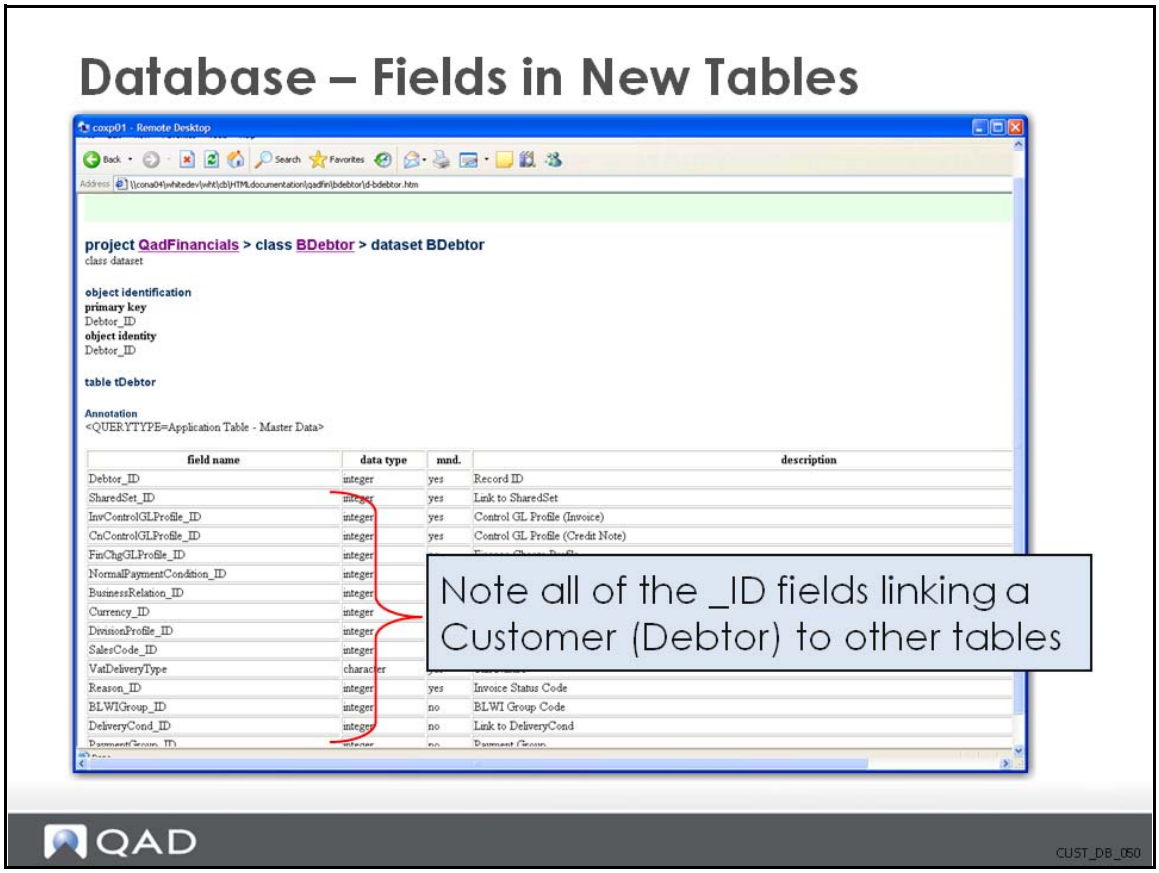


	A	B
1	**Data Element**	**Financials Table**
2	Address Data	Address
3	AP Matching Data	APMatching
4	Cost Center Data	CostCentre
5	Country Data	Country
6	Credit Terms Data	PaymentCondition
7	Credit Terms Staged Data	PaymentConditionStaged
8	Customer Data	Debtor
9	Daybook Data	Journal
10	Domain Data	Domains
11	Employee Data	Employee
12	End User Contact Data	Contact
13	End User Data	DebtorEndUser
14	Entity Data	Company
15	Exchange Rate Data	ExchangeRate
16	GL Account Data	GL
17	GL Calendar Data	GLCalendar
18	GL Mask Data	GLMask
19	GL Period Data	Period
20	Invoice Data	DInvoice
21	Language Data	Lng
22	Posting Data	Posting
23	Role Data	Role
24	Rounding Method Data	RoundingMethod
25	Sub-Account Data	Division
26	Supplier Data	Creditor
27	Tax Data	Vat

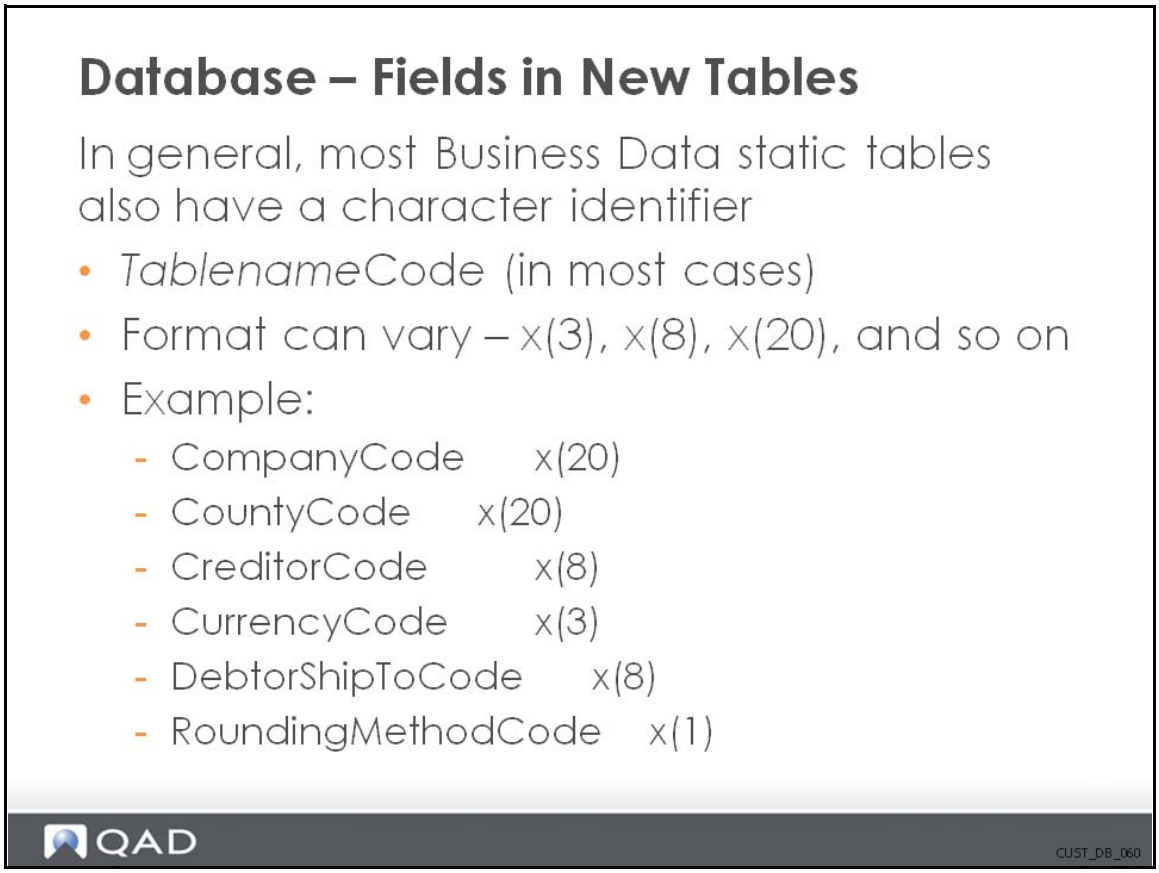
Database - Fields in New Tables



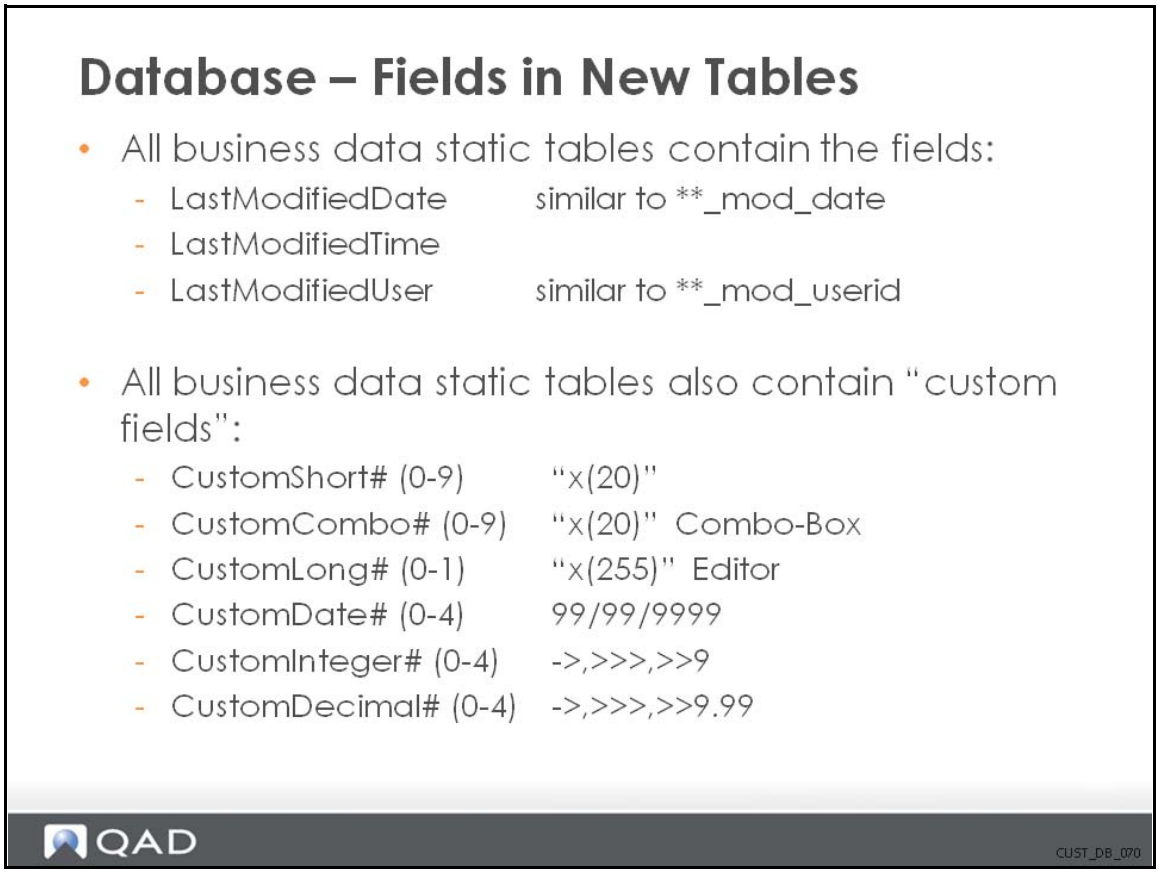
Database - Fields in New Tables 2



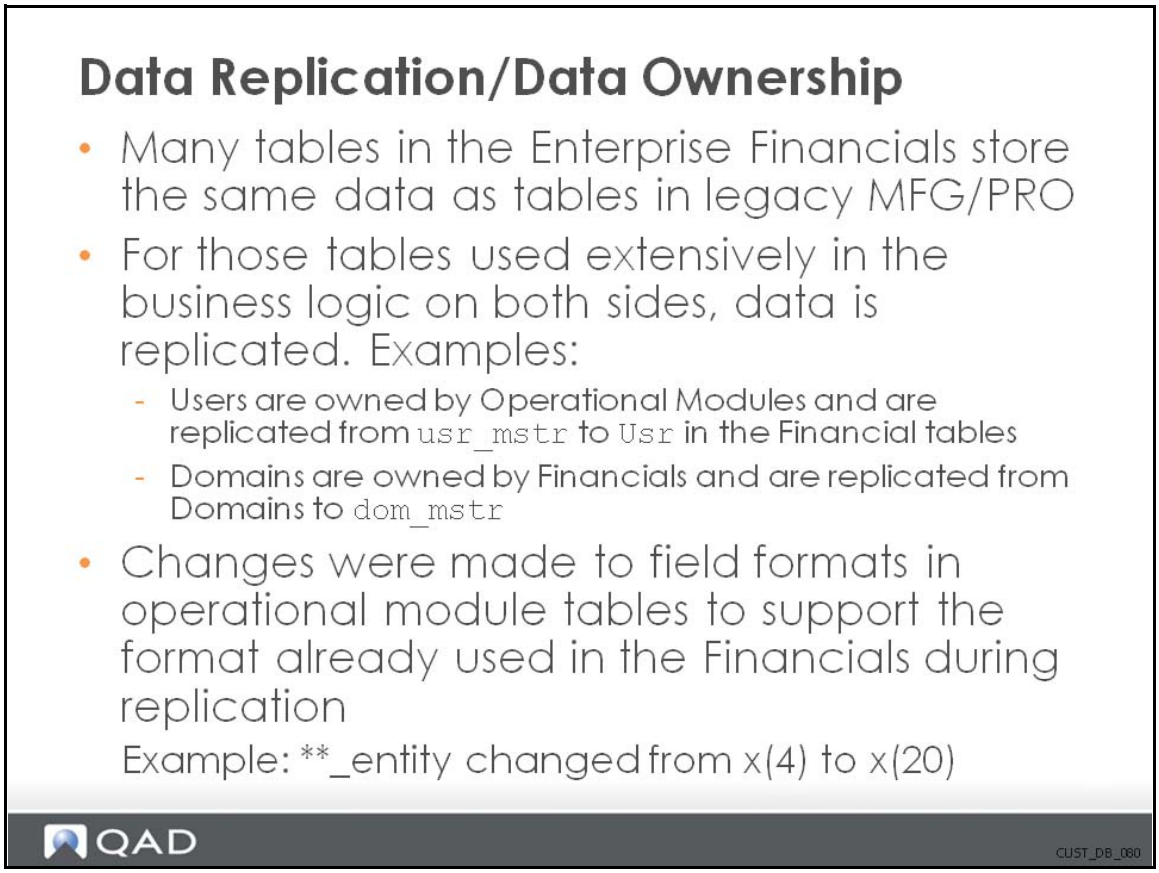
Database - Fields in New Tables 3



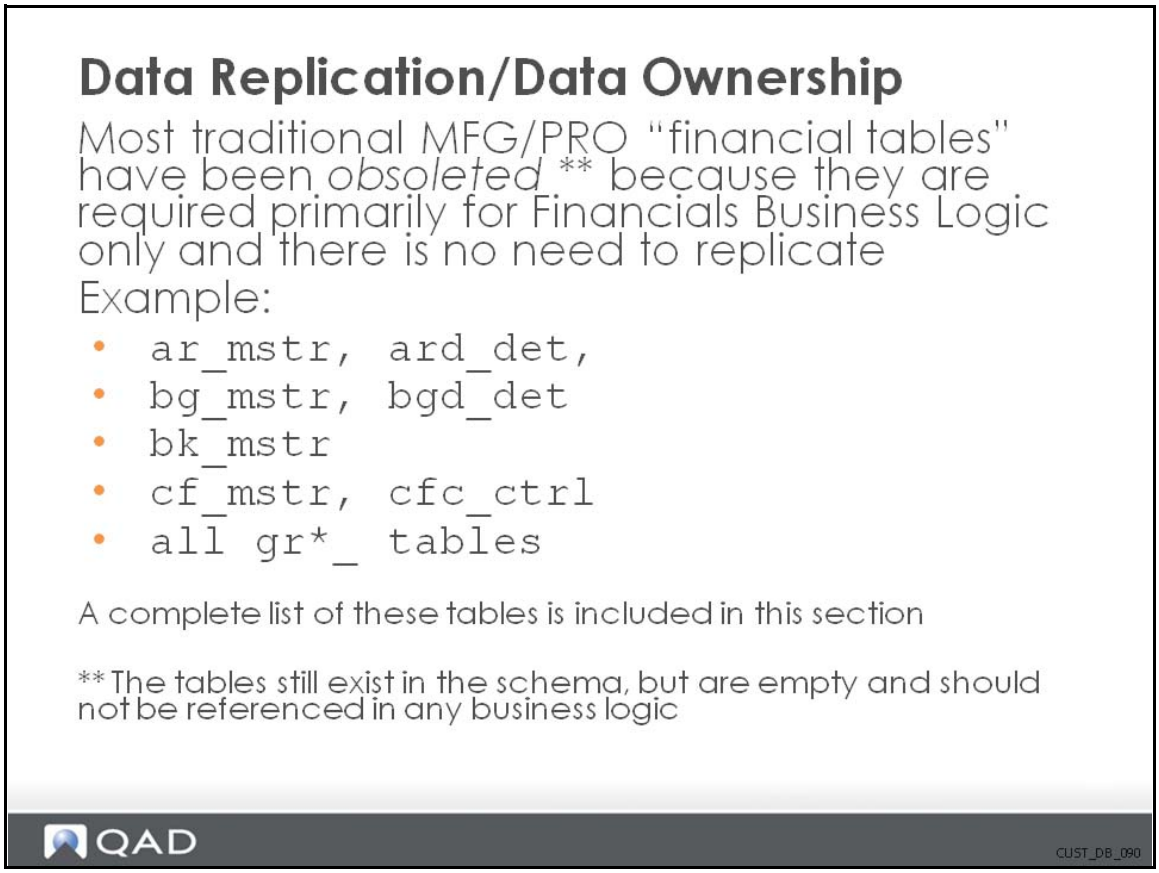
Database - Fields in New Tables 4



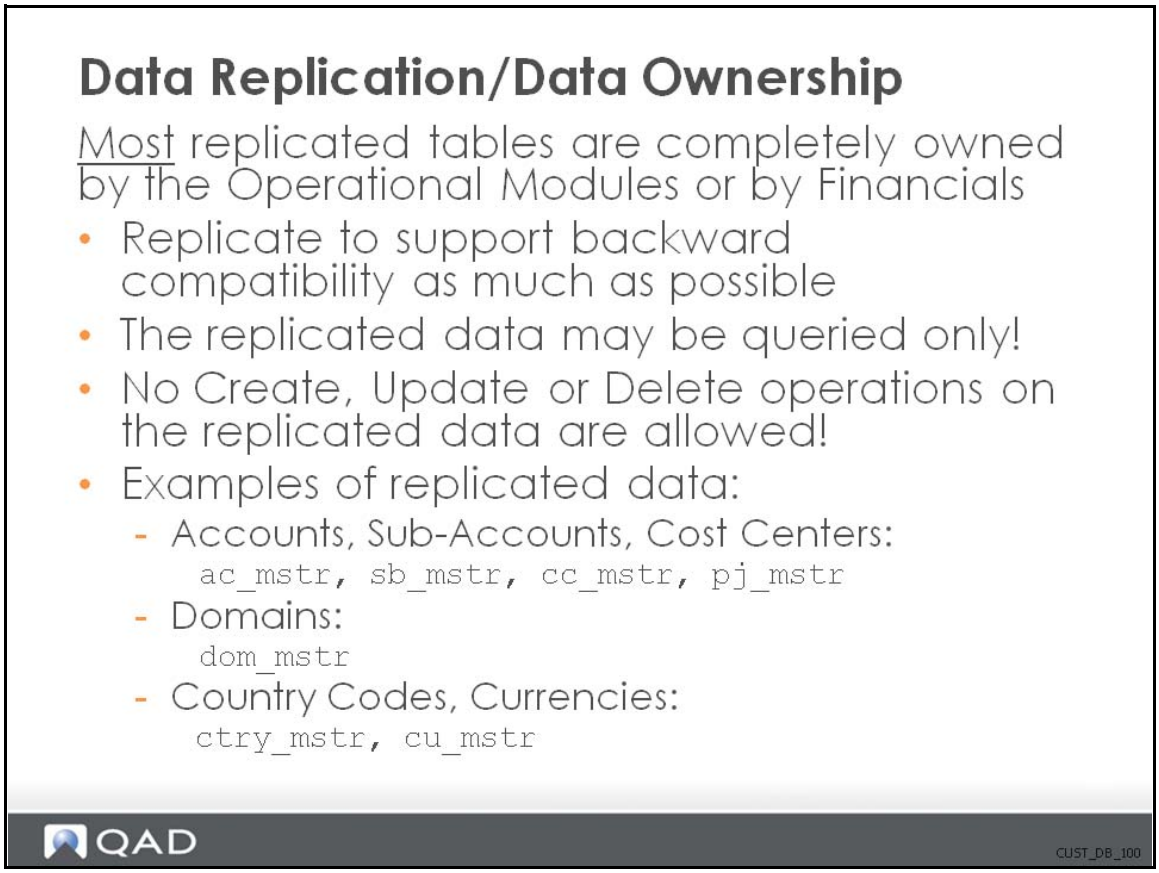
Data Replication/Data Ownership



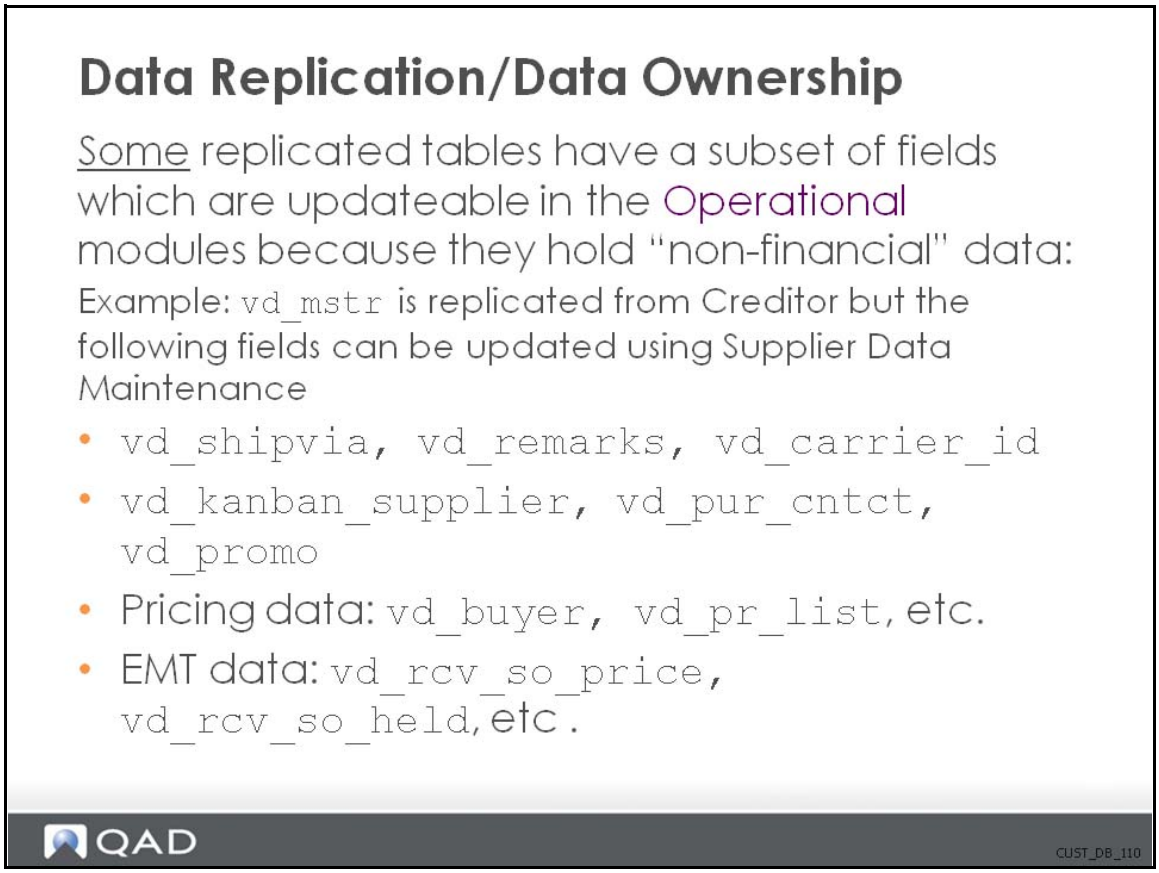
Data Replication/Data Ownership 2



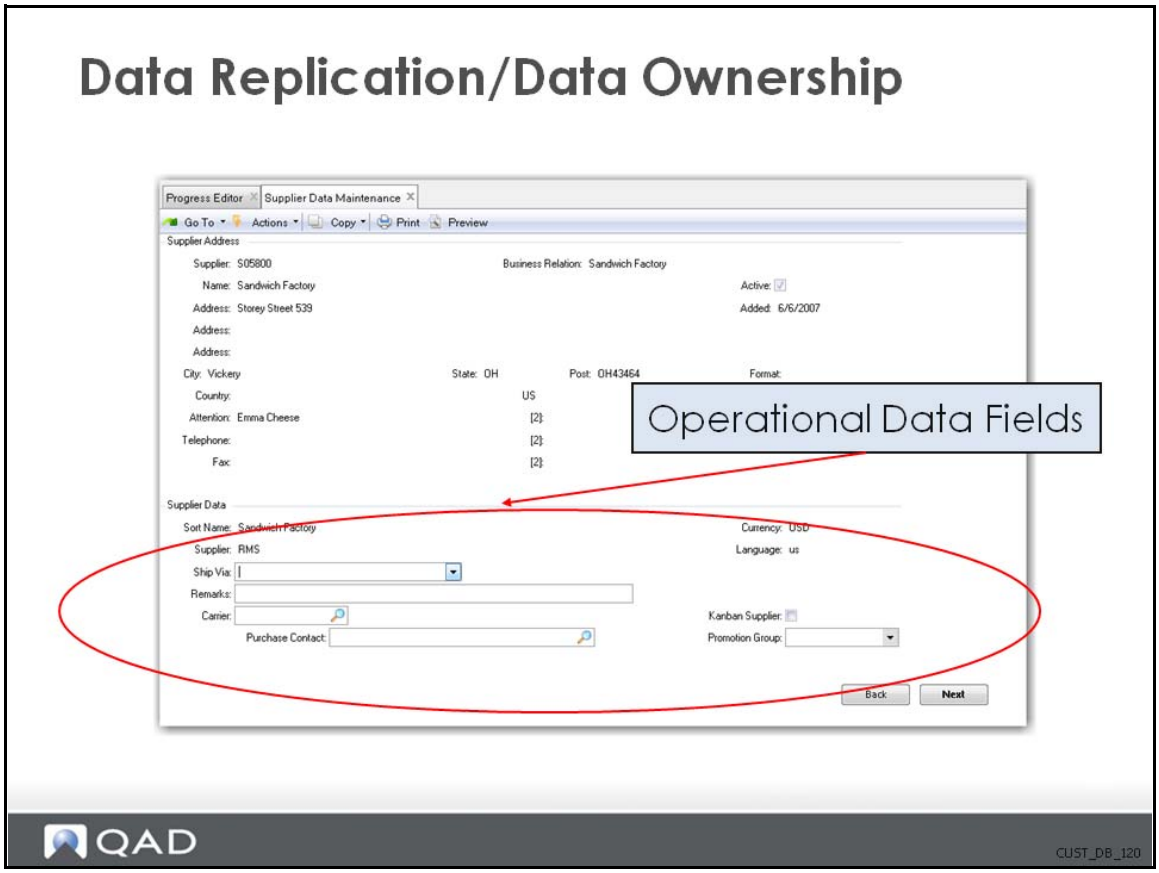
Data Replication/Data Ownership 3



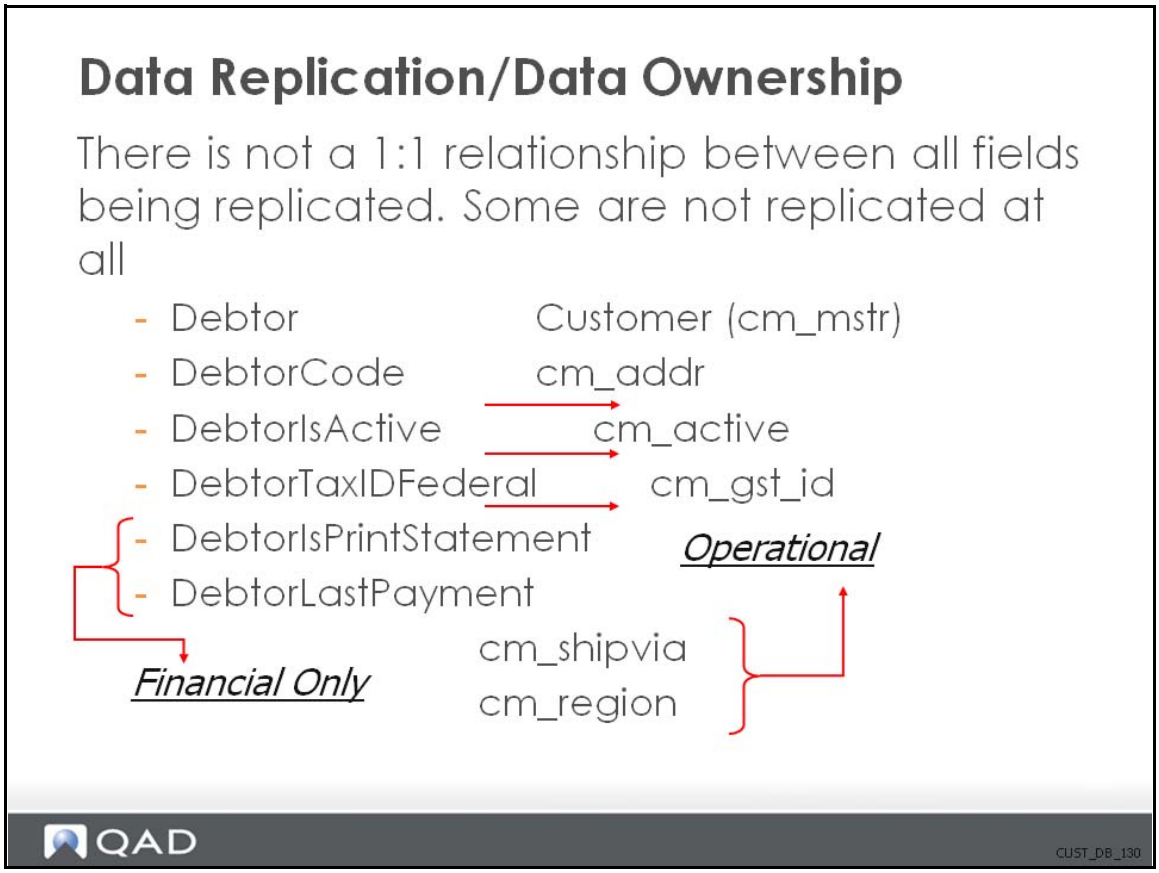
Data Replication/Data Ownership 4



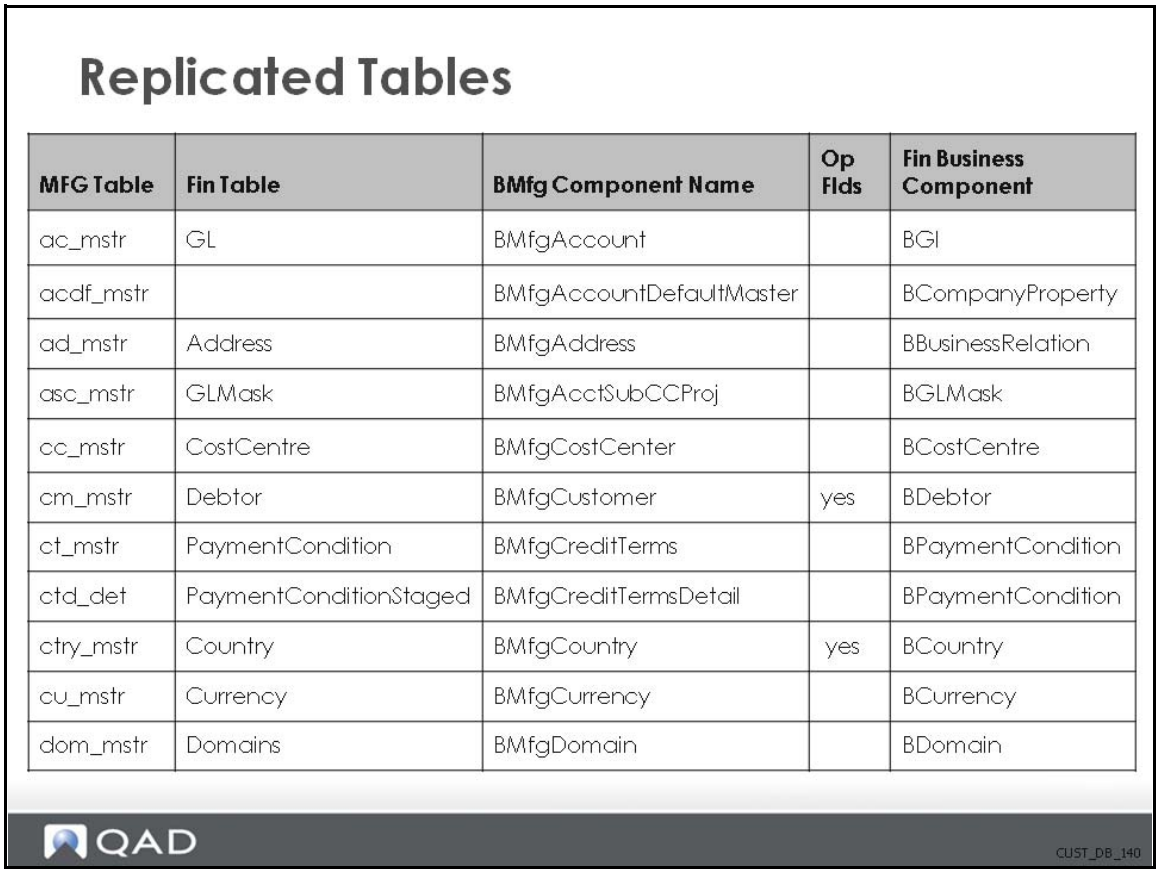
Data Replication/Data Ownership 5



Data Replication/Data Ownership 6



Replicated Tables



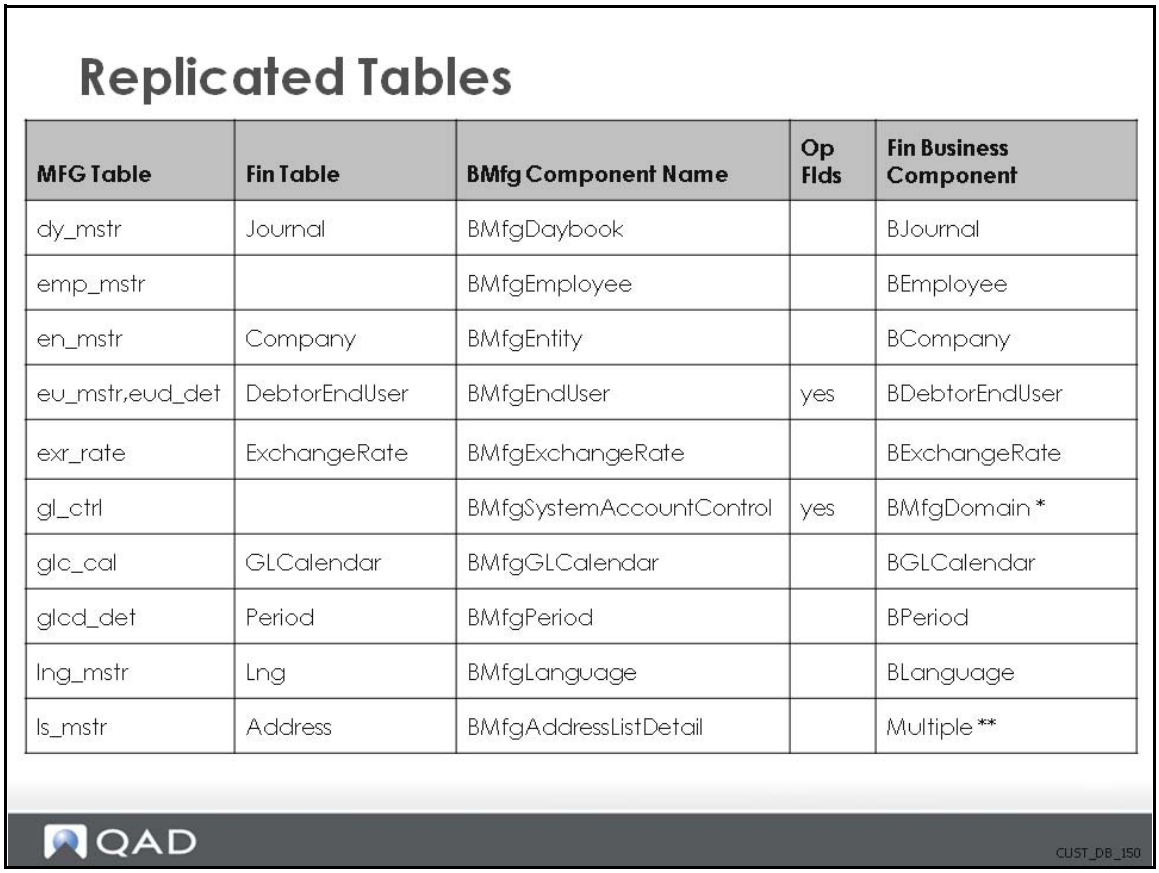
Replicated Tables

MFG Table	Fin Table	BMfg Component Name	Op Flds	Fin Business Component
ac_mstr	GL	BMfgAccount		BGl
acdf_mstr		BMfgAccountDefaultMaster		BCompanyProperty
ad_mstr	Address	BMfgAddress		BBusinessRelation
asc_mstr	GLMask	BMfgAcctSubCCProj		BGLMask
cc_mstr	CostCentre	BMfgCostCenter		BCostCentre
cm_mstr	Debtor	BMfgCustomer	yes	BDebtor
ct_mstr	PaymentCondition	BMfgCreditTerms		BPaymentCondition
ctd_det	PaymentConditionStaged	BMfgCreditTermsDetail		BPaymentCondition
ctry_mstr	Country	BMfgCountry	yes	BCountry
cu_mstr	Currency	BMfgCurrency		BCurrency
dom_mstr	Domains	BMfgDomain		BDomain

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CUST_DB_140

Replicated Tables 2



Replicated Tables

MFG Table	Fin Table	BMfg Component Name	Op Flds	Fin Business Component
dy_mstr	Journal	BMfgDaybook		BJournal
emp_mstr		BMfgEmployee		BEmployee
en_mstr	Company	BMfgEntity		BCompany
eu_mstr,eud_det	DebtorEndUser	BMfgEndUser	yes	BDebtorEndUser
exr_rate	ExchangeRate	BMfgExchangeRate		BExchangeRate
gl_ctrl		BMfgSystemAccountControl	yes	BMfgDomain *
glc_cal	GLCalendar	BMfgGLCalendar		BGLCalendar
glcd_det	Period	BMfgPeriod		BPeriod
lng_mstr	Lng	BMfgLanguage		BLanguage
ls_mstr	Address	BMfgAddressListDetail		Multiple **

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CUST_DB_150

Replicated Tables 3

Replicated Tables

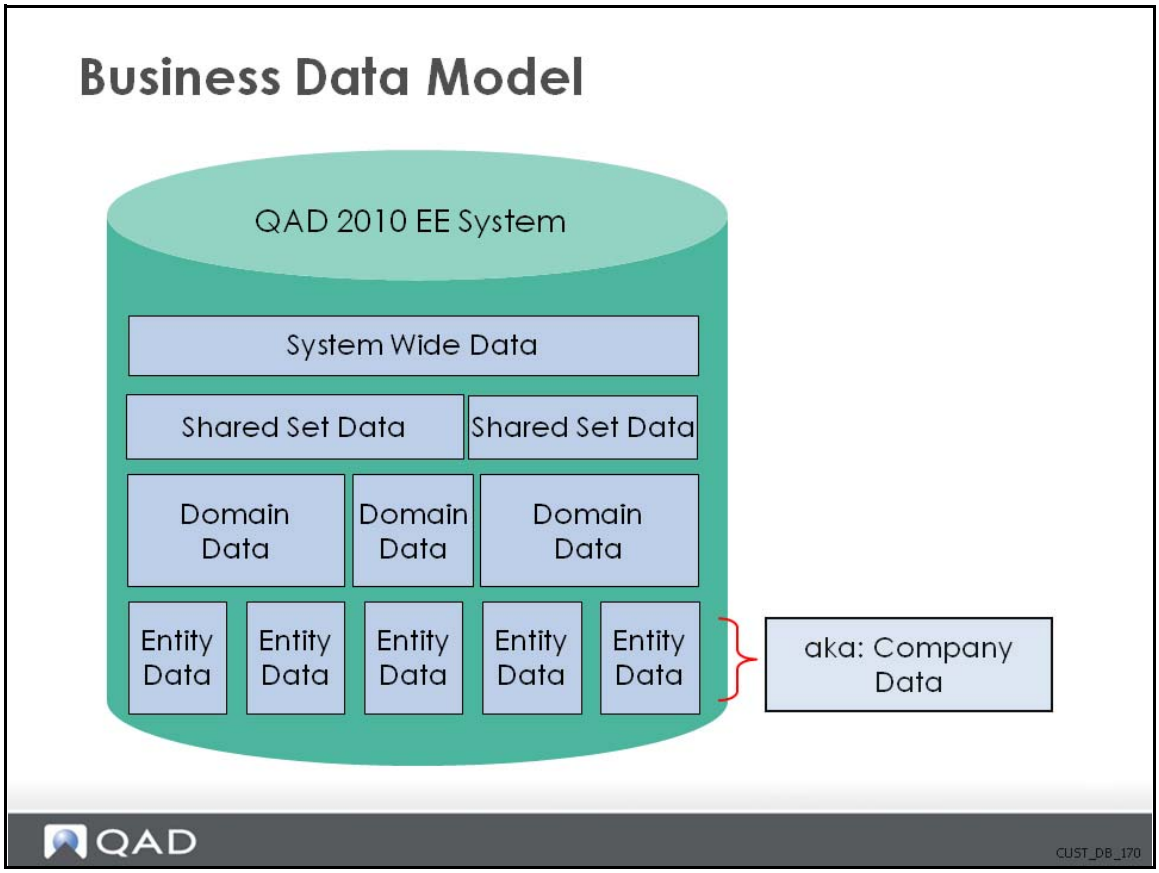
- The only tables currently replicated from ERP to Financials are usr_mstr & tx2_mstr
- There is also some "replication" of Resource data from Menu Maintenance

MFG Table	Fin Table	BMfg Component Name	Op Flds	Fin Business Component
nr_mstr	JournalBook	BMfgNumberRangeManagement	**	BJournal
pj_mstr	Project	BMfgProject		BProject
rnd_mstr	RoundingMethod	BMfgRoundingMethod		BRoundingMethod
sb_mstr	Division	BMfgSubAccount		BDivision
udd_det	UsrDomain	BMfgUserDomainForUser		BUser
usrg_mstr	Role	BMfgRole		BRole
usrgd_det	UserRoleDomain	BMfgUserRole		BUserRole
vd_mstr	Creditor	BMfgSupplier	yes	BCreditor

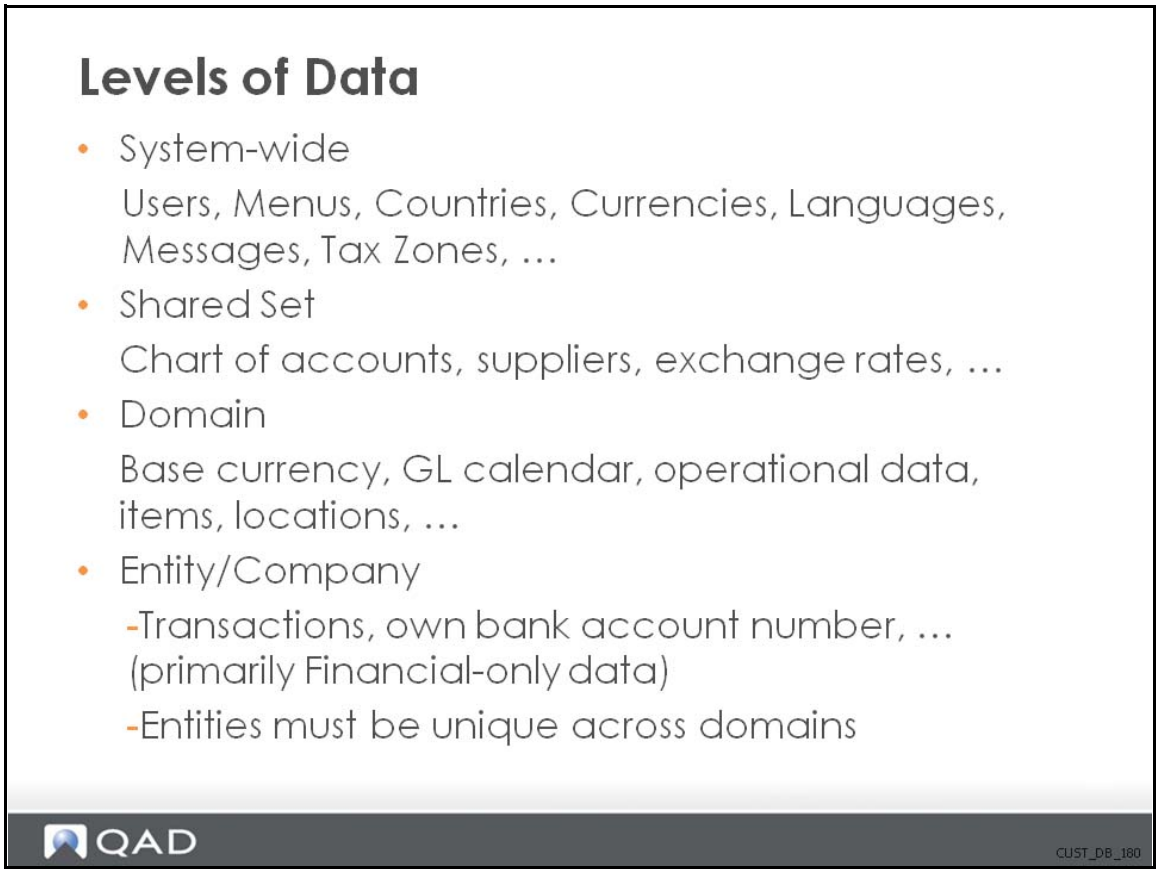
QAD

CUST_DB_160

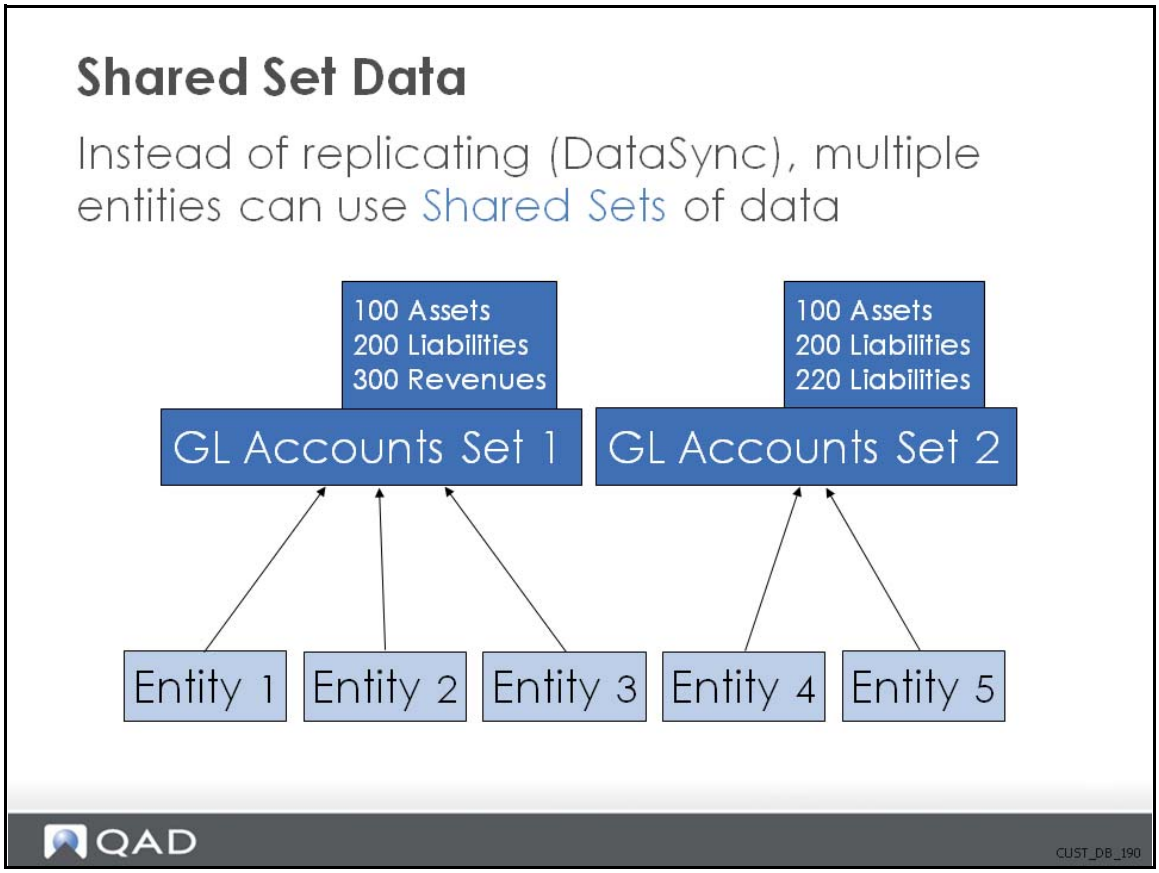
Business Data Model



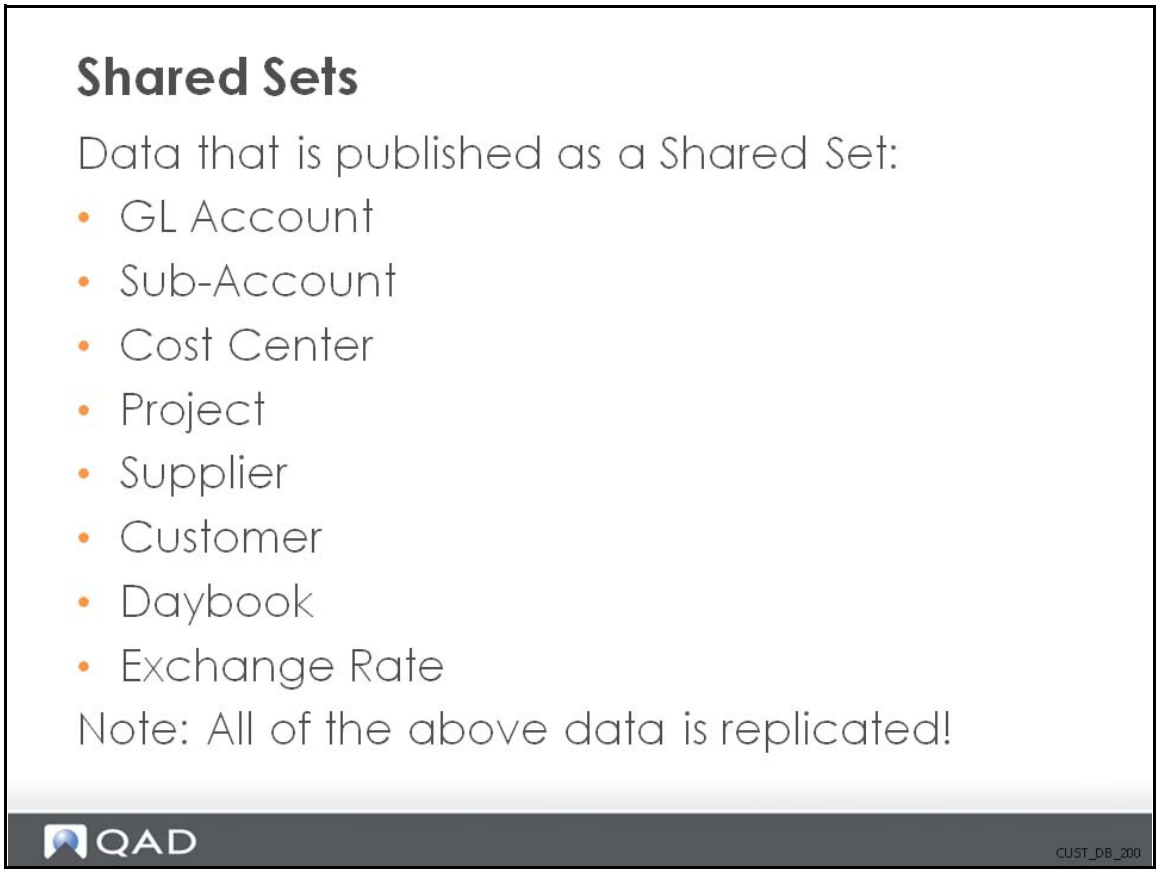
Levels of Data



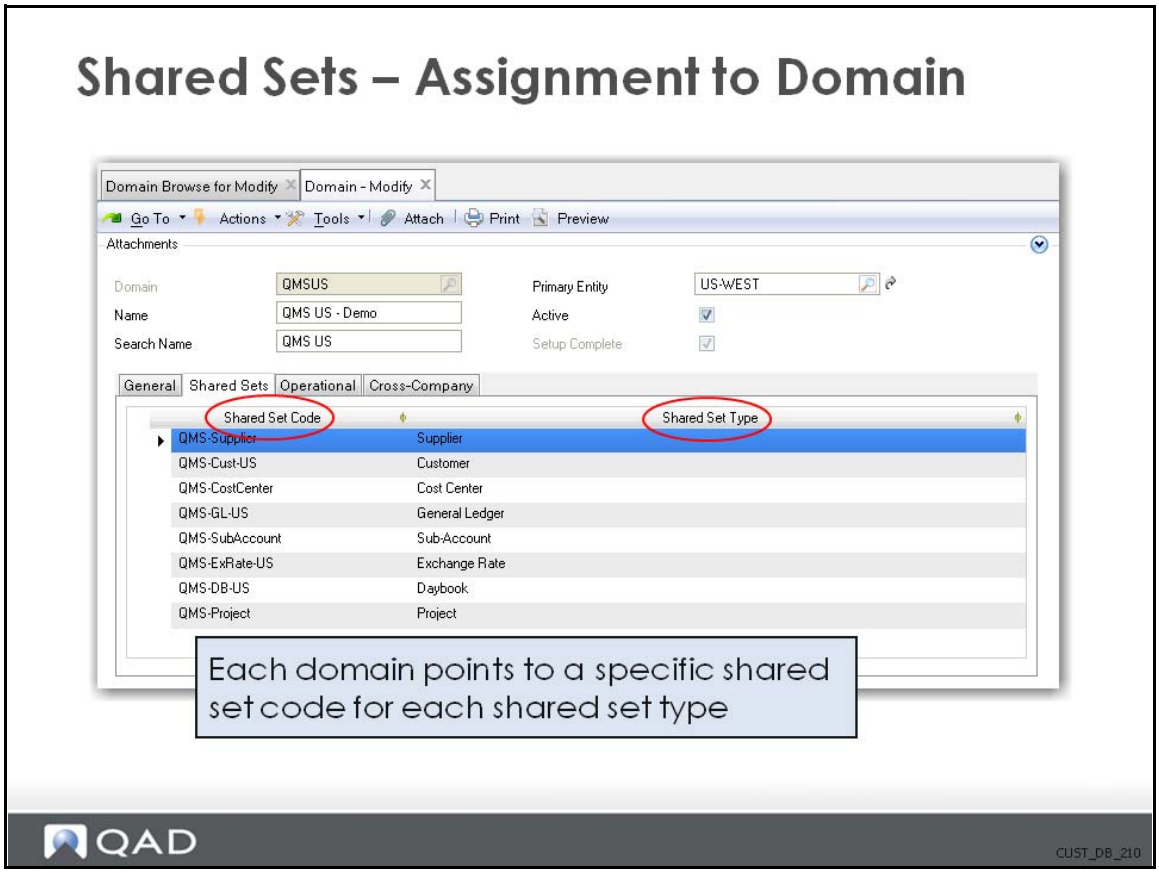
Shared Set Data



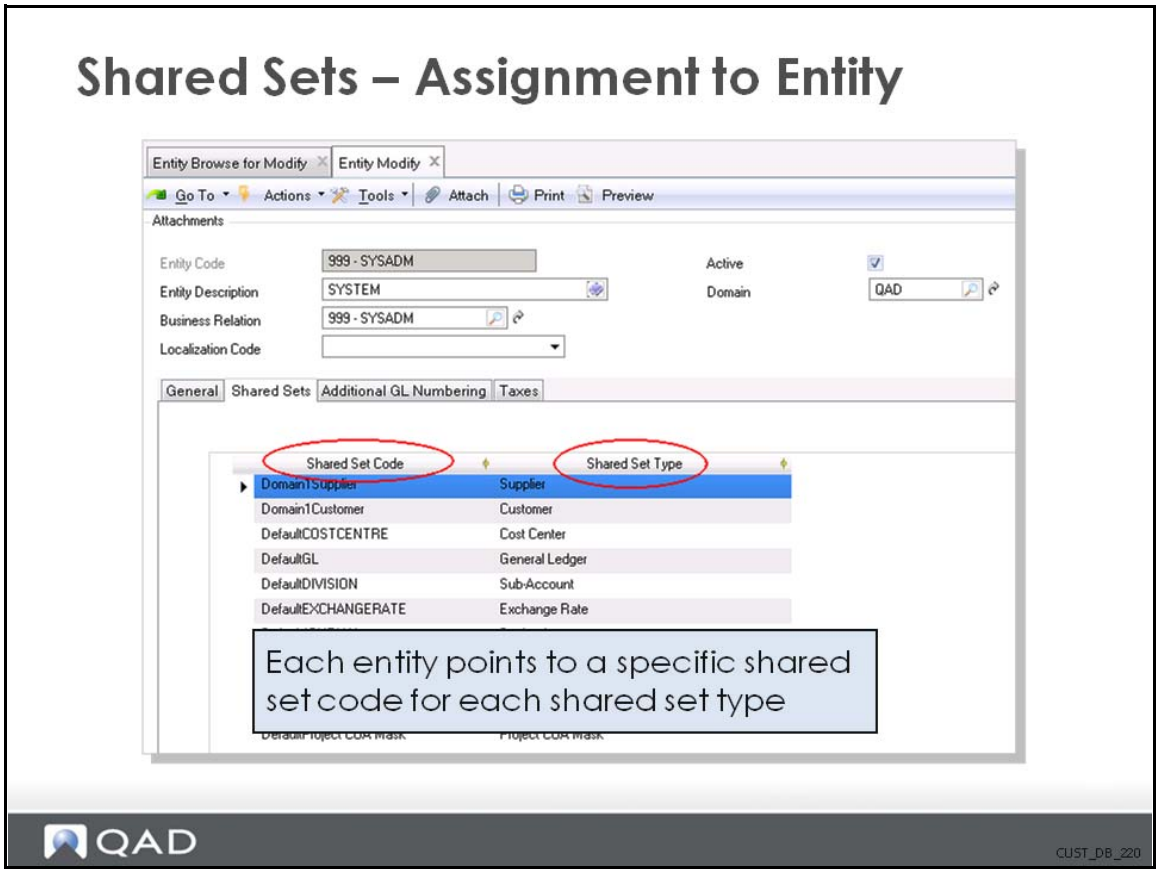
Shared Sets


Shared Sets
Data that is published as a Shared Set:
GL Account
Sub-Account
Cost Center
Project
Supplier
Customer
Daybook
Exchange Rate
Note: All of the above data is replicated!
QAD
CUST_DB_200

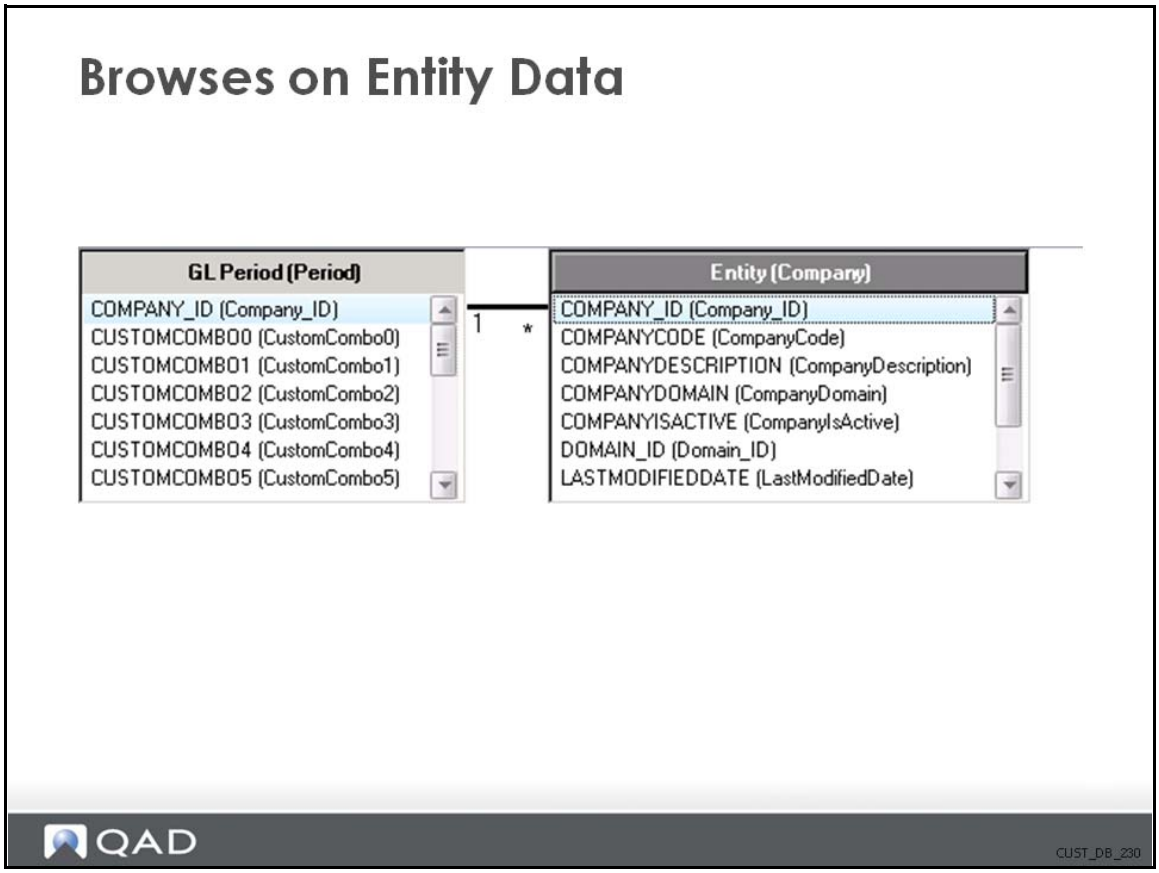
Shared Sets - Assignment to Domain



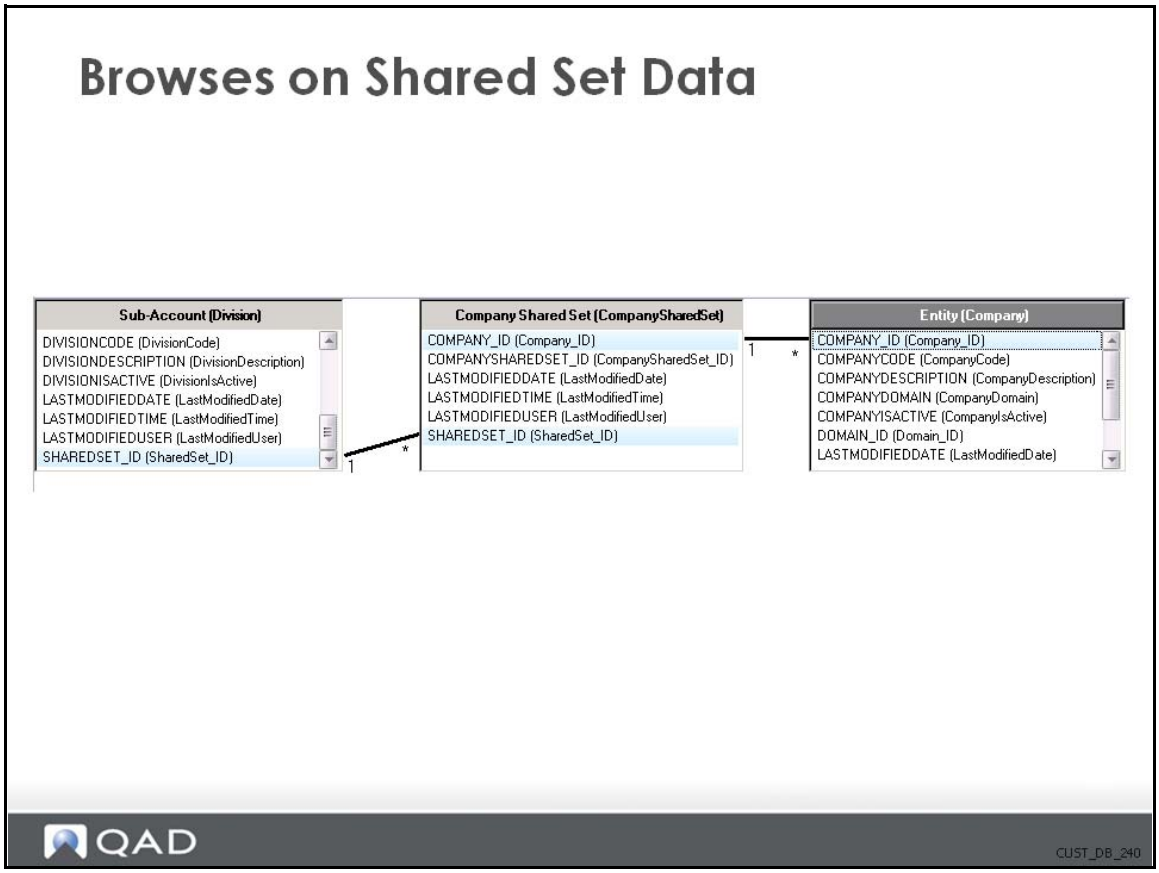
Shared Sets - Assignment to Entity



Browses on Entity Data



Browses on Shared Data



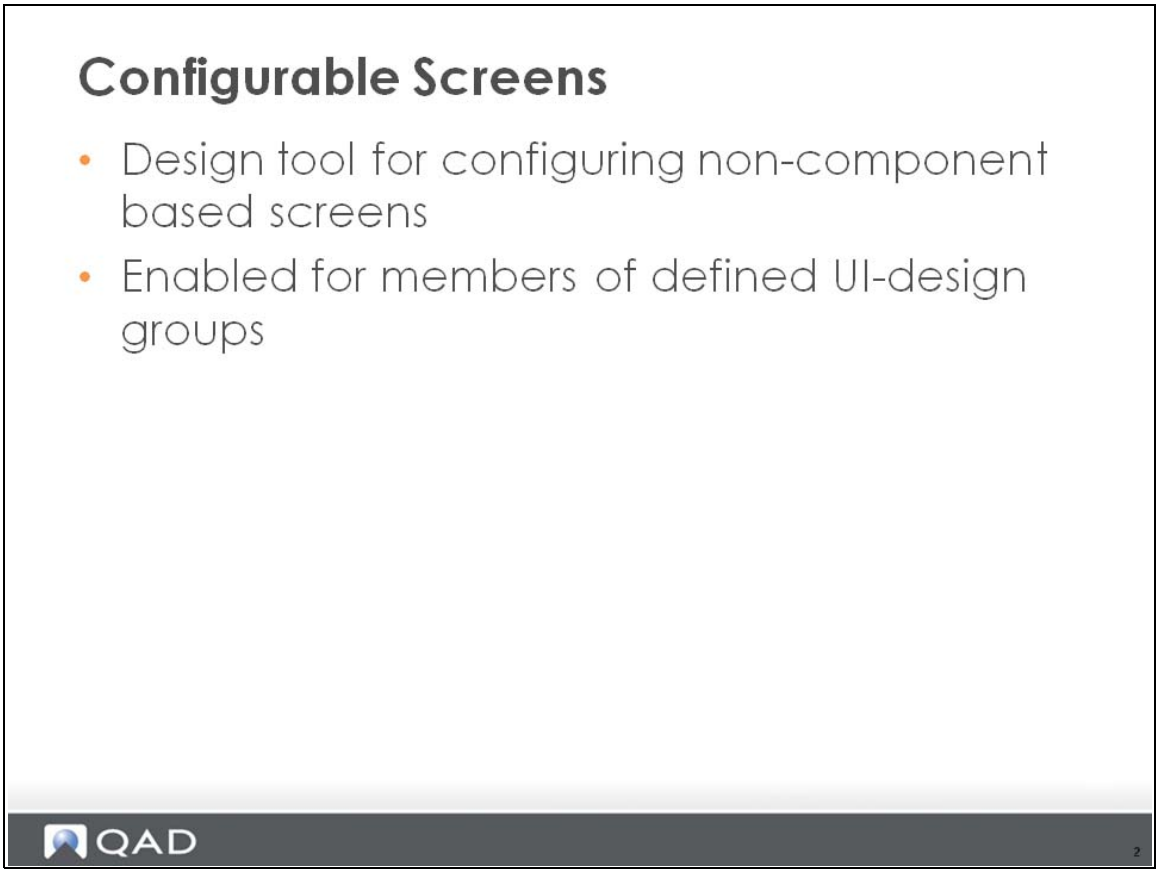
Chapter 3

Customization Using UI Design Mode

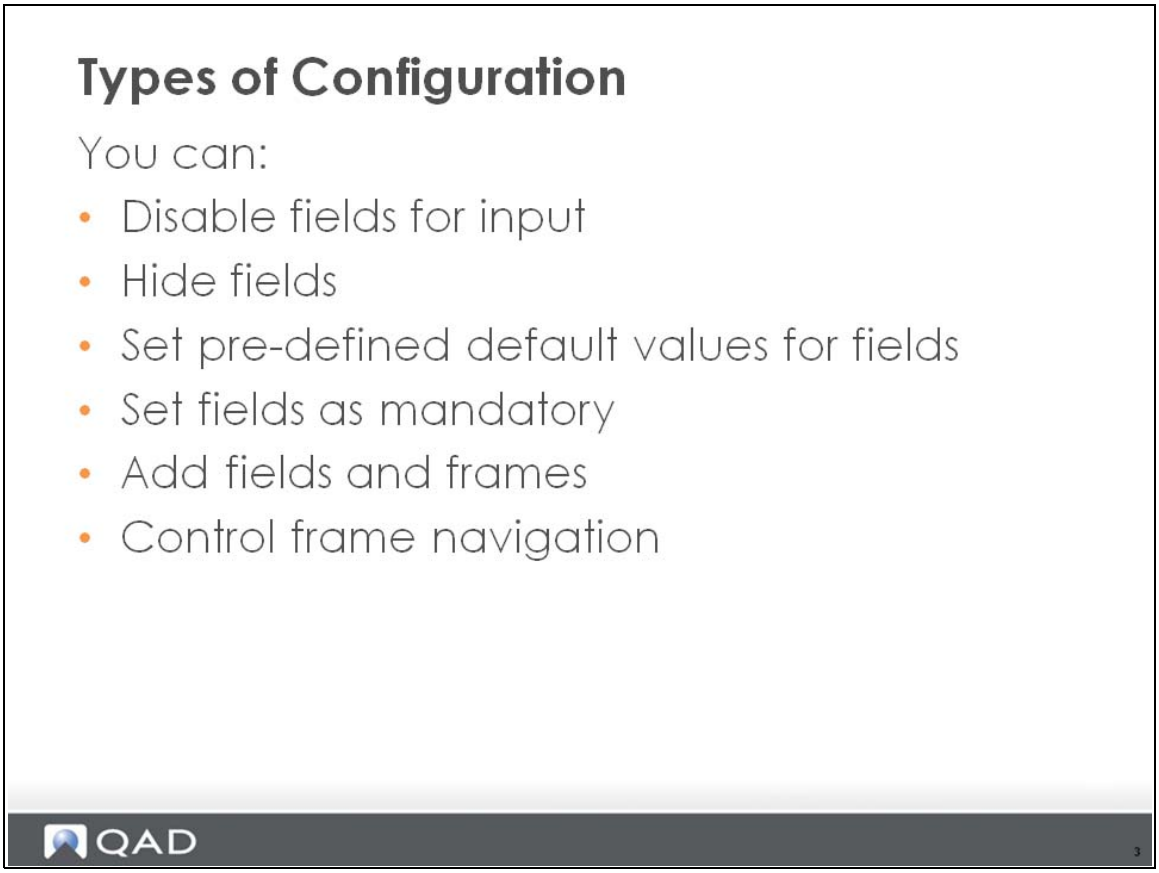
Customization Using QAD Application Features and Functions UI Design Mode



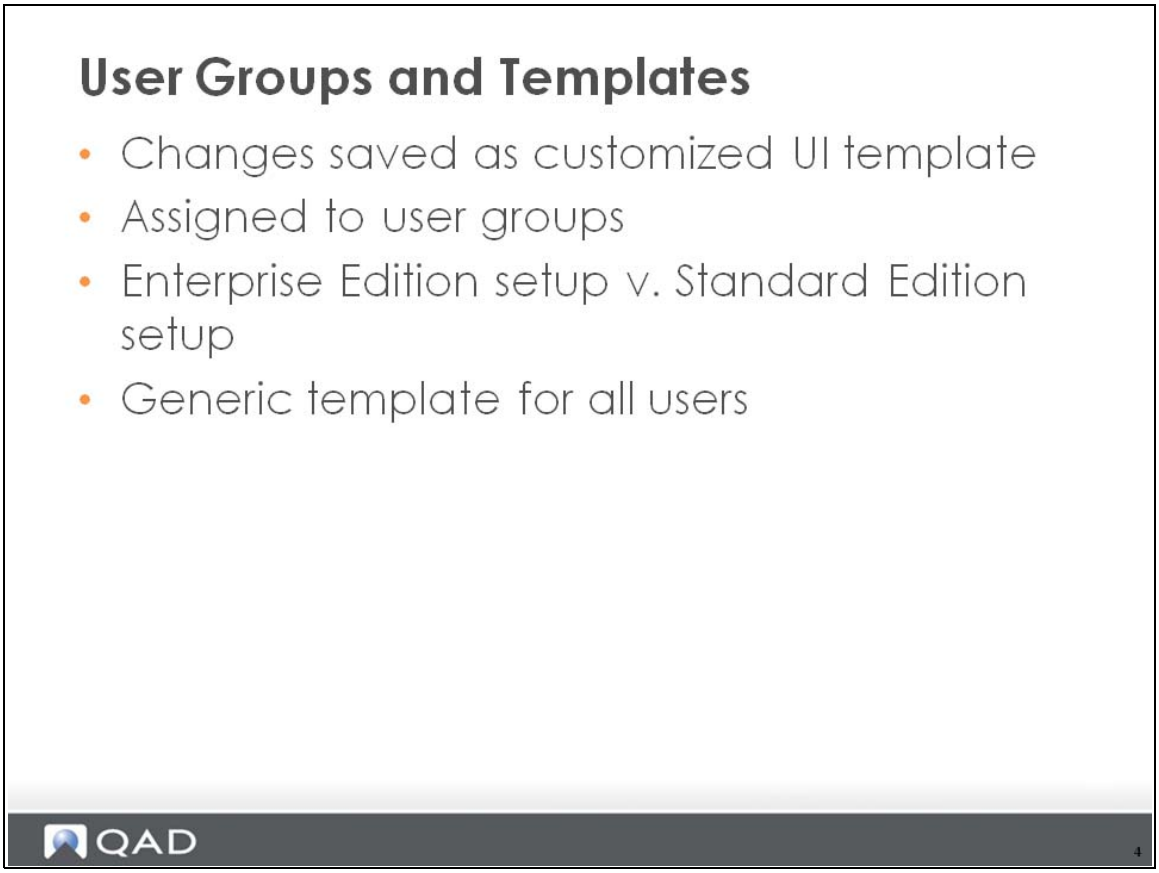
Configurable Screens



Types of Configuration



User Groups and Templates



Error Handling and Template Conflicts

Error Handling and Template Conflicts

- Error messages displayed when mandatory fields hidden or removed
- Possible conflicts when users belong to more than one group
- Conflict management tool to list users, programs, and conflicts



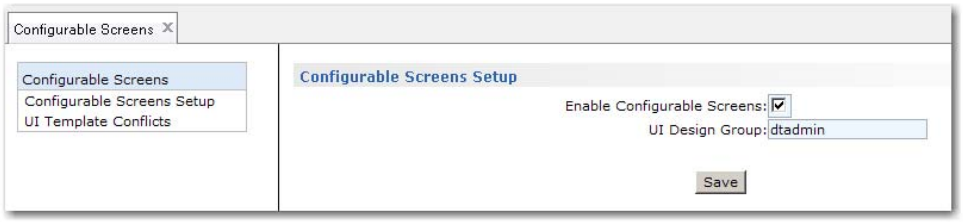
QAD

5

Configurable Screens Setup

Configurable Screens Setup

- Enable the function
- Specify the role that can use this design group
- Save to enable

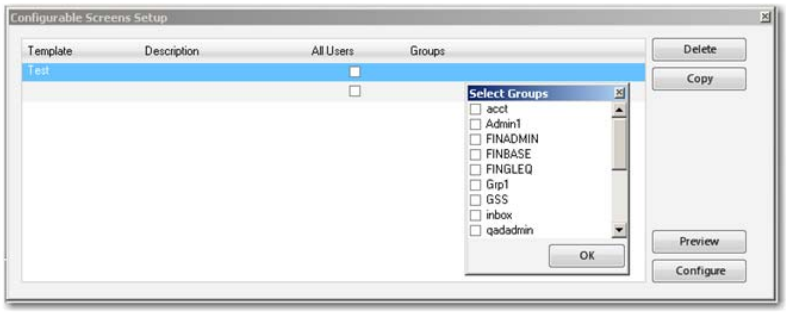


QAD

Creating a Template

Creating a Template

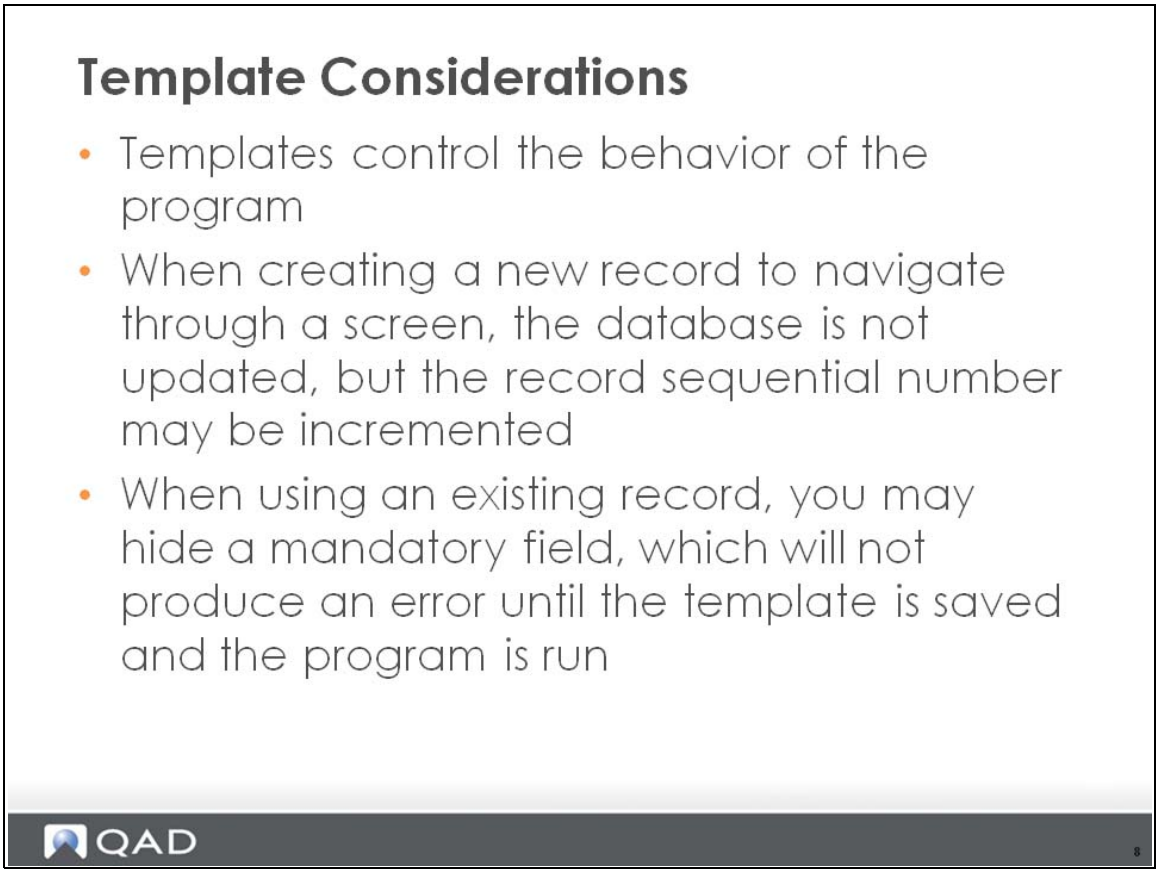
- Select the program to configure
- Right-click to select Design
- Enter a name, description, and roles for the template
- Click Configure to enter Design mode



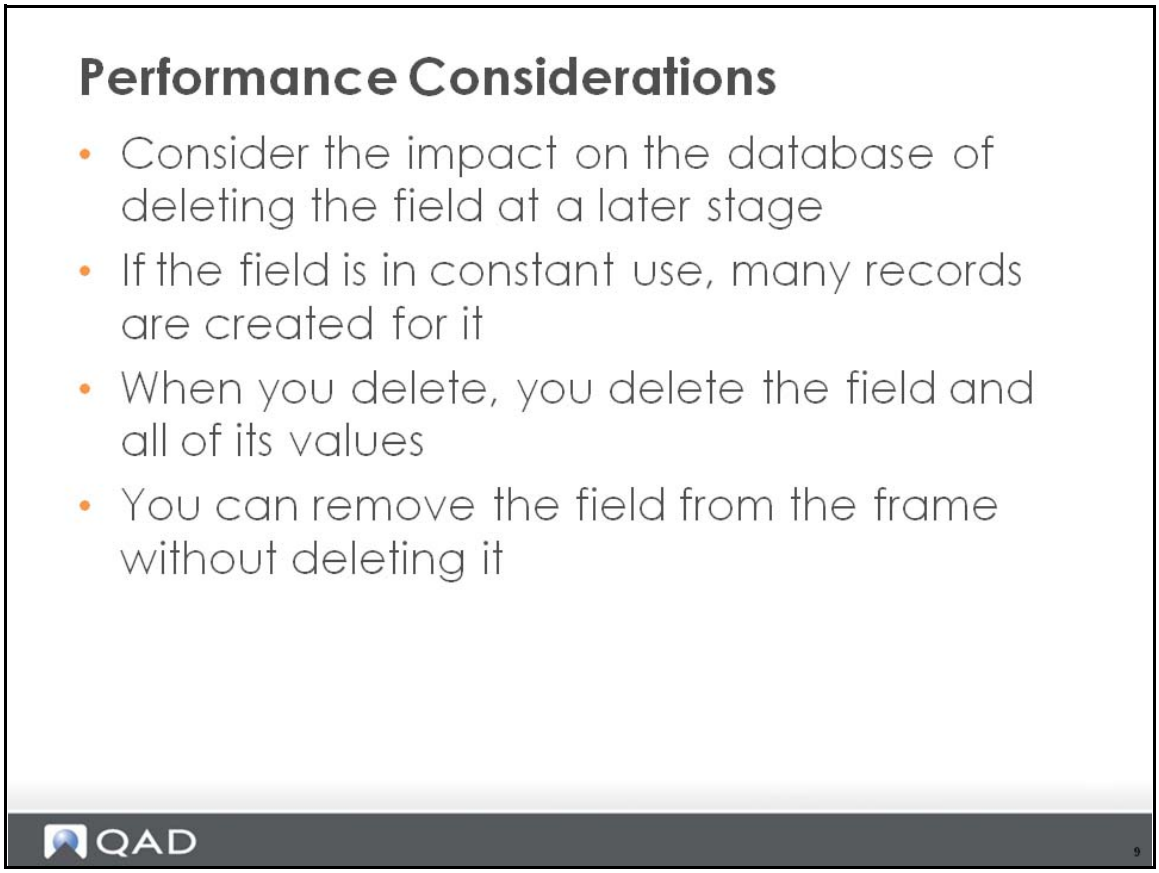
QAD

7

Template Considerations



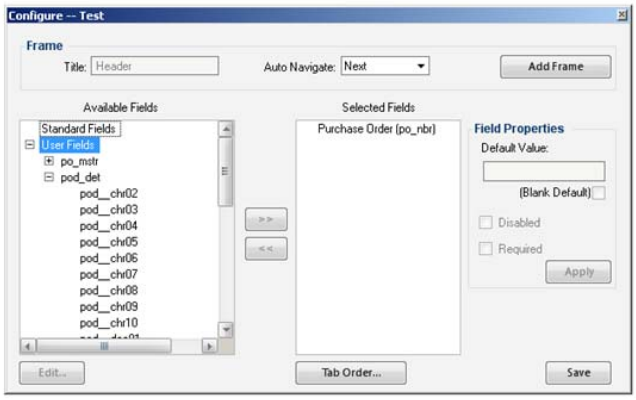
Performance Considerations



Configure Screen

Configure Screen

- Auto-Navigate
- Available and Selected Fields
- Field Properties
- Tab Order



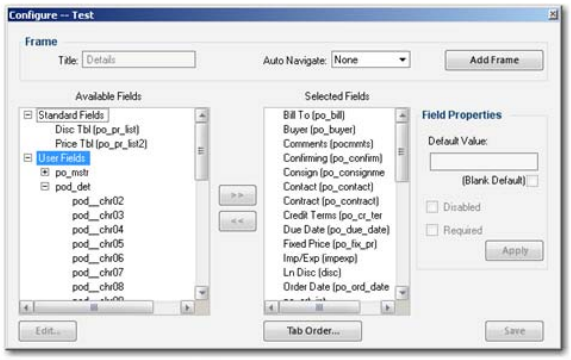
QAD

10

Available Fields

Available Fields

- Standard Fields and User Fields
- Tables and fields defined in `configscreens.xml`
- Add new user fields to `configscreens.xml`
- Default values for fields

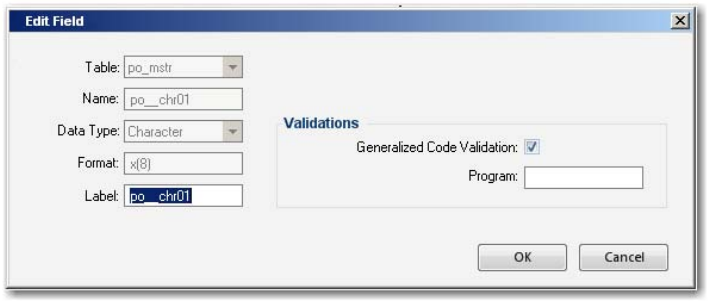


QAD 11

Field Properties

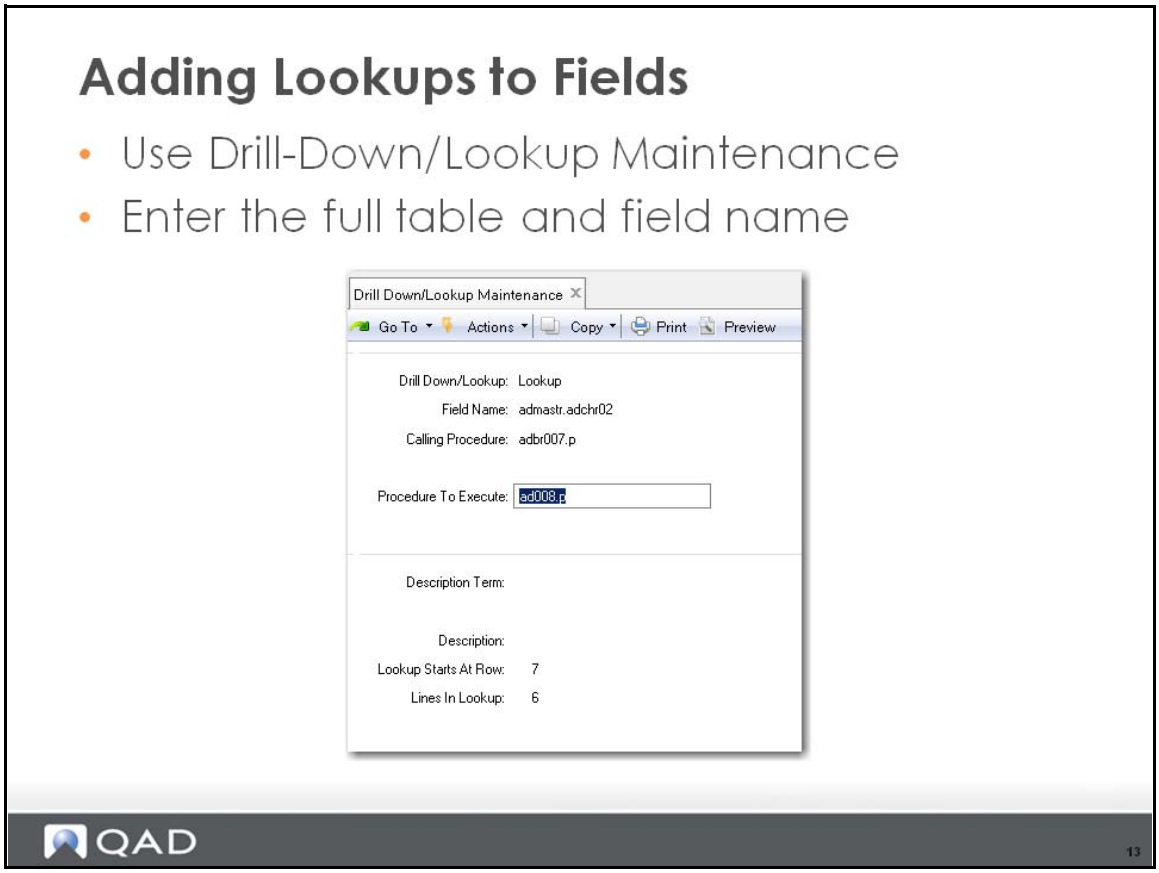
Field Properties

- Editing Field Properties
- Field Validation
- Generalized Codes
- Program Validation

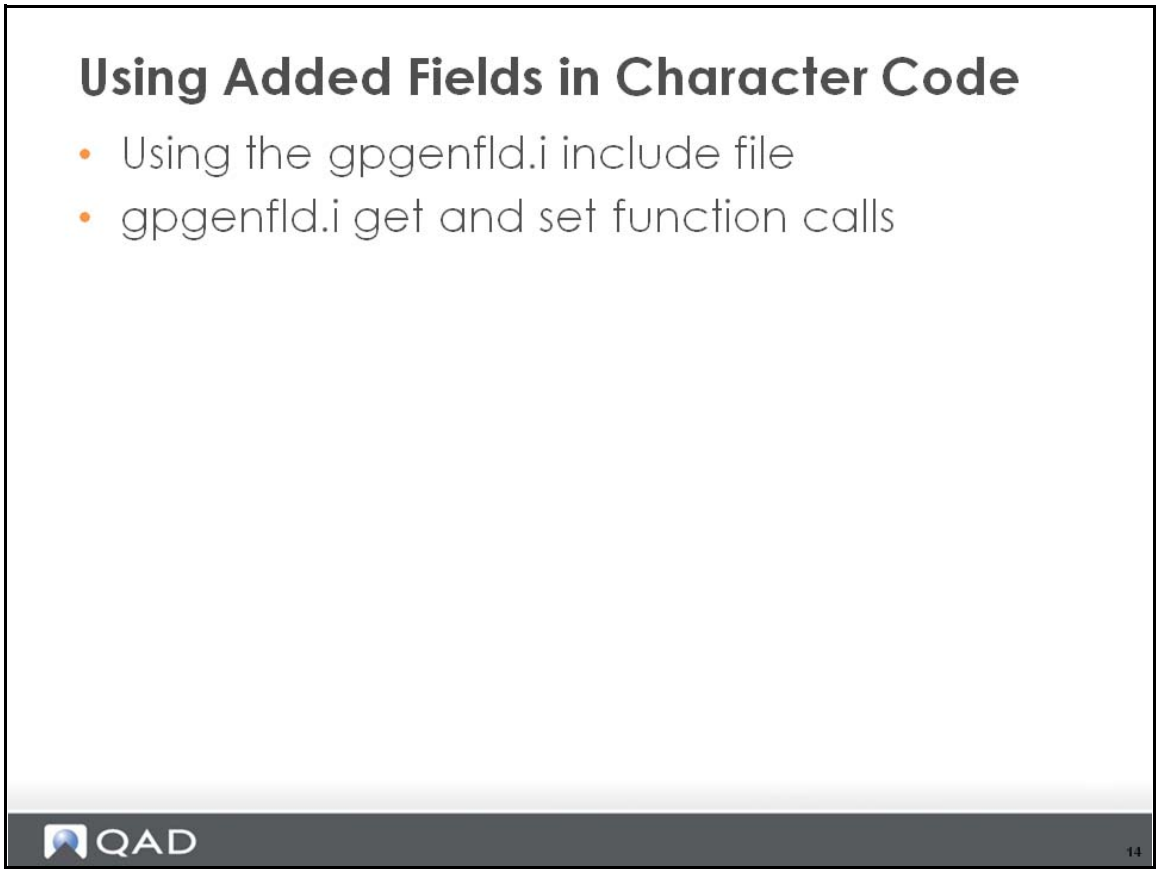


QAD 12

Adding Lookups to Fields



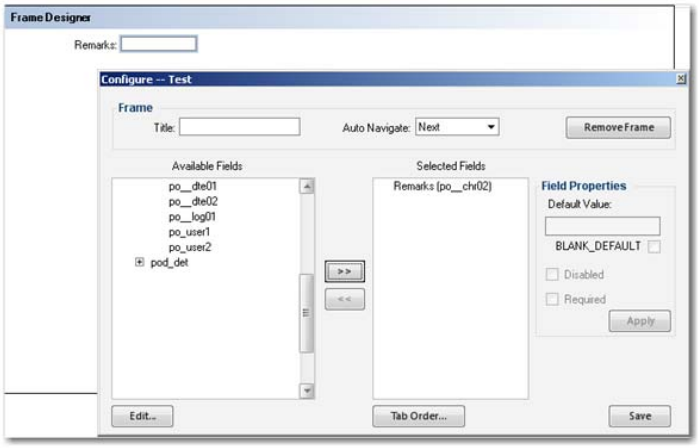
Using Added Fields in Character Code



Adding Frames

Adding Frames

- Frames option is only available when fields are available
- Use Tab Order to set the tabbing order



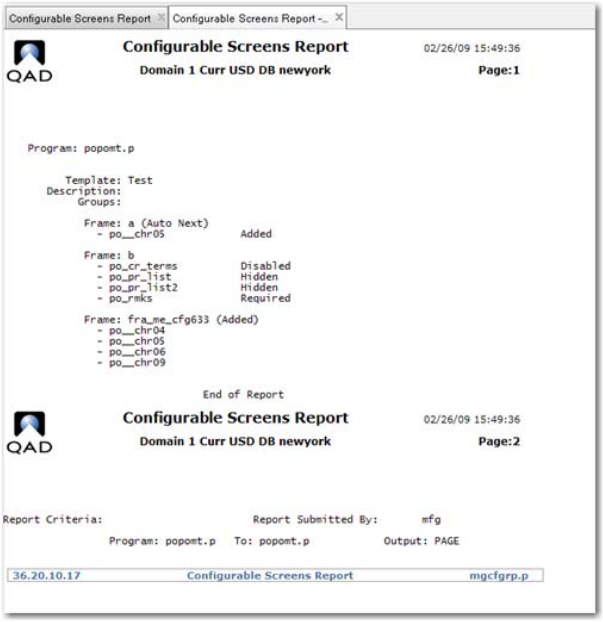
QAD

15

Configurable Screens Report

Configurable Screens Report

- All configured screens
- Details on individual fields


Configurable Screens Report | Configurable Screens Report -_

QAD **Configurable Screens Report** 02/26/09 15:49:36
Domain 1 Curr USD DB newyork **Page:1**

Program: popomt.p

Template: Test
Description:
Groups:

Frame: a (Auto Next)
- po__chr05 Added

Frame: b
- po_cr_terms Disabled
- po_pr_list Hidden
- po_pr_list2 Hidden
- po_rmks Required

Frame: fra_me_cfg633 (Added)
- po__chr04
- po__chr05
- po__chr06
- po__chr09

End of Report

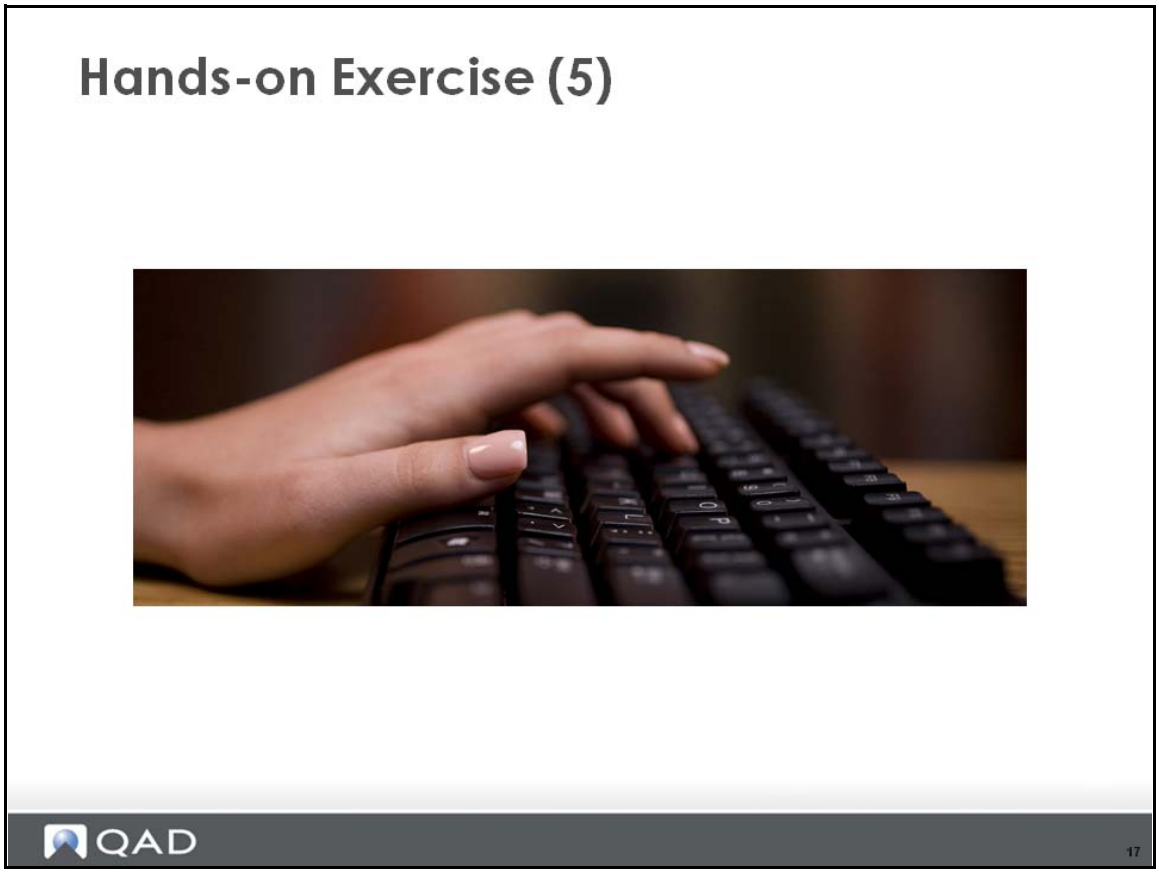
QAD **Configurable Screens Report** 02/26/09 15:49:36
Domain 1 Curr USD DB newyork **Page:2**

Report Criteria: Report Submitted By: mfg
Program: popomt.p To: popomt.p Output: PAGE

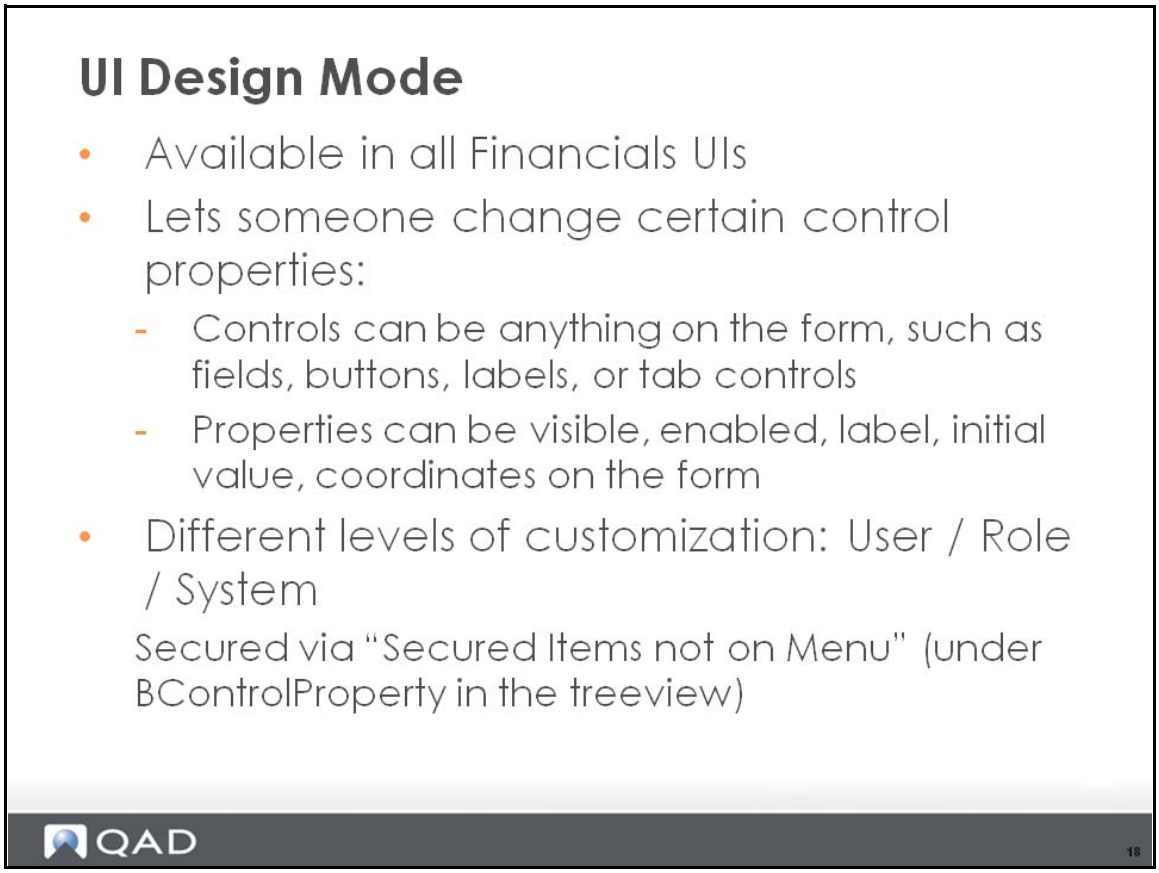
36.20.10.17 Configurable Screens Report mgcfgrp.p

QAD 16

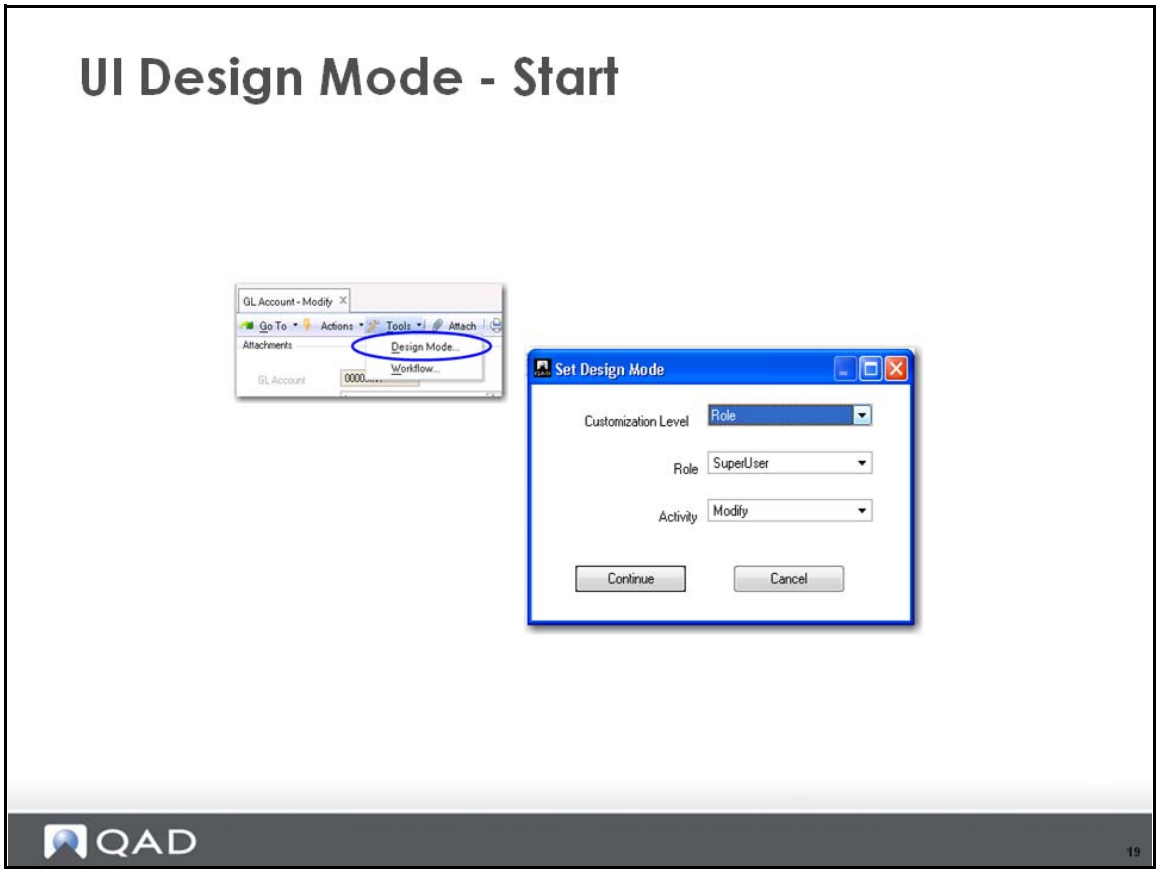
Hands-on Exercise (5)



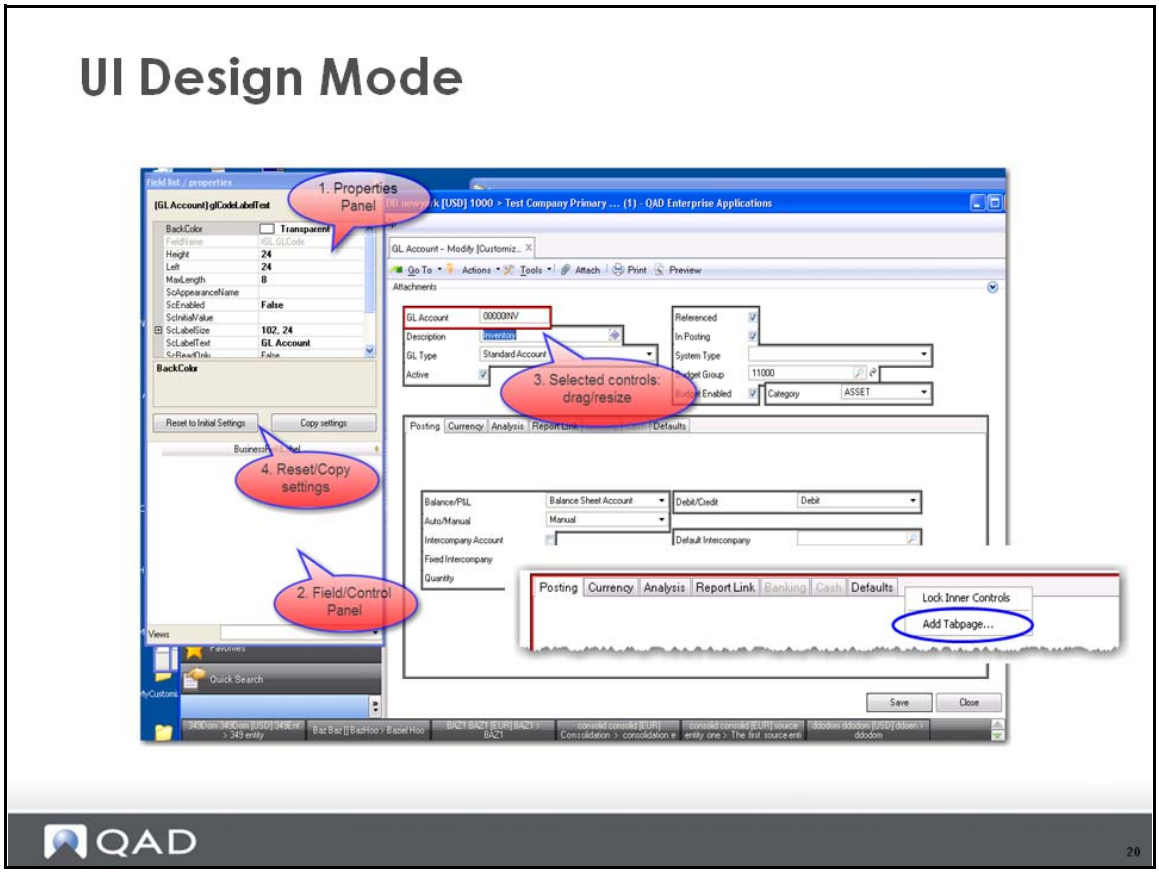
UI Design Mode



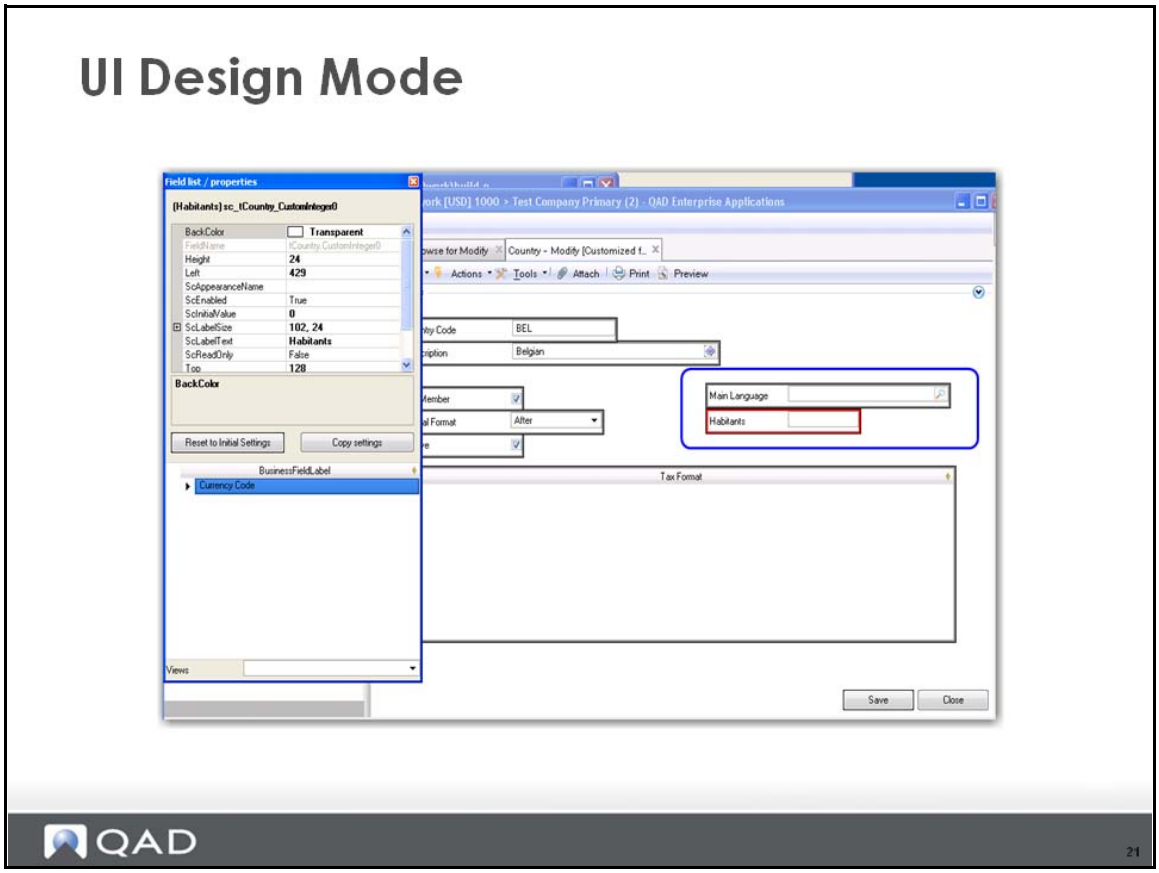
UI Design Mode 2



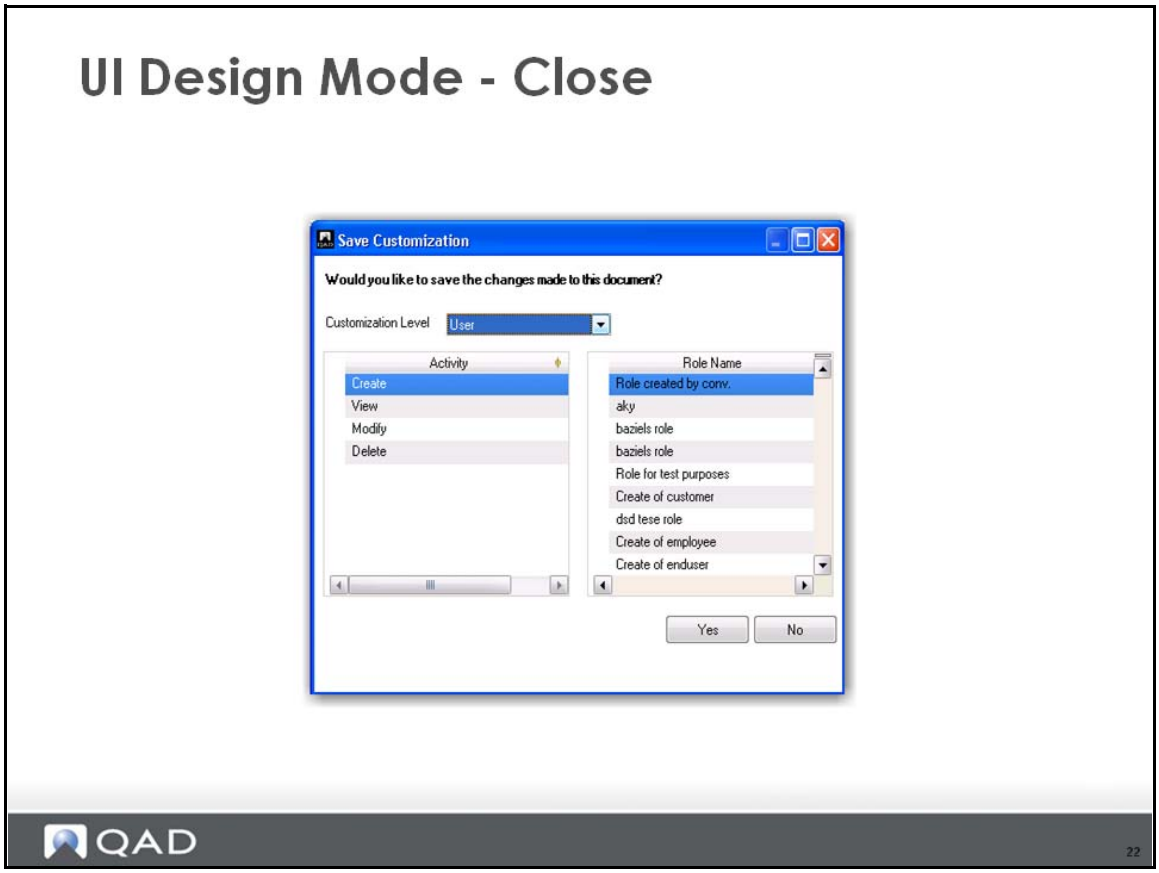
UI Design Mode 3



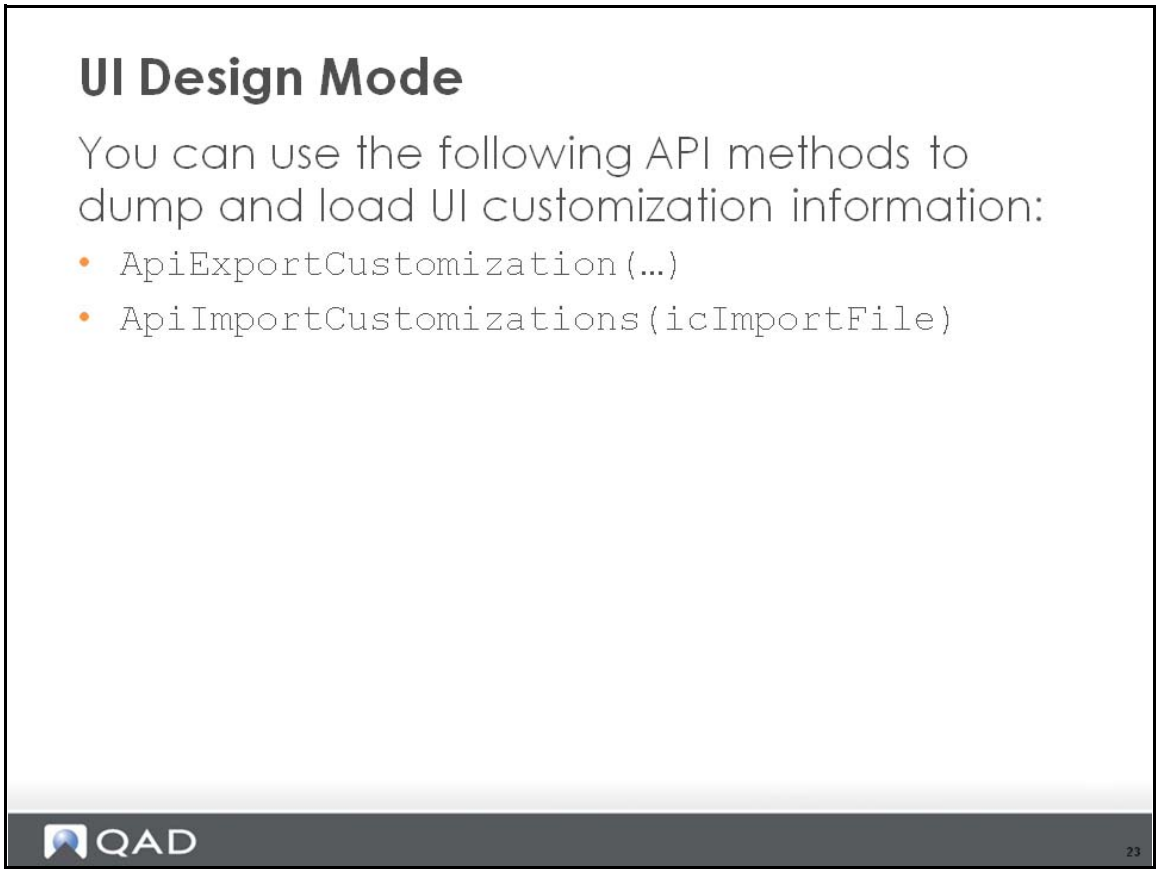
UI Design Mode 4



UI Design Mode 5



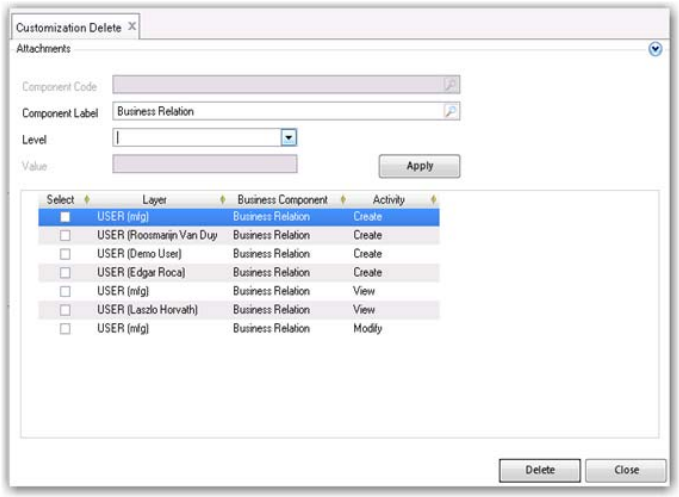
UI Design Mode 6



UI Design Mode 7

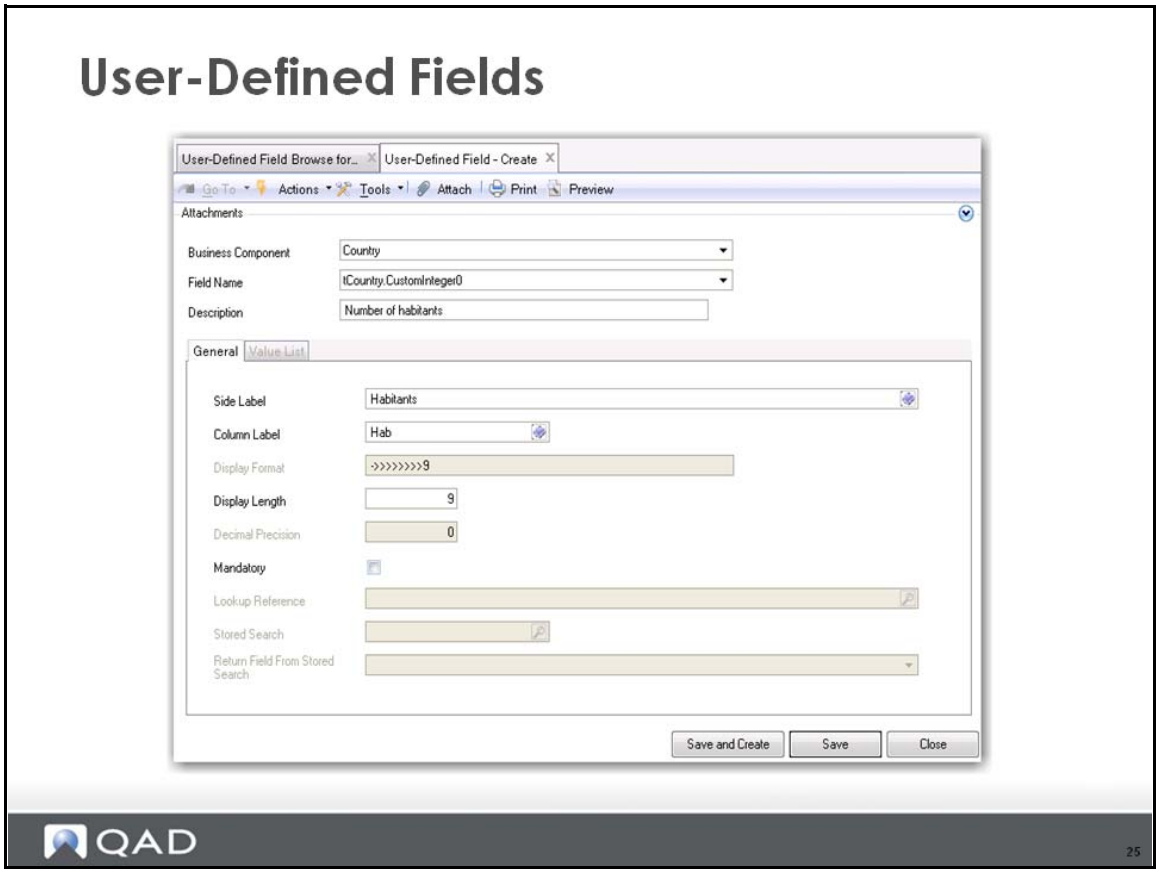
UI Design Mode - Maintenance

- Definition and update via UI Design Mode
- Deletion via "Customization Delete"

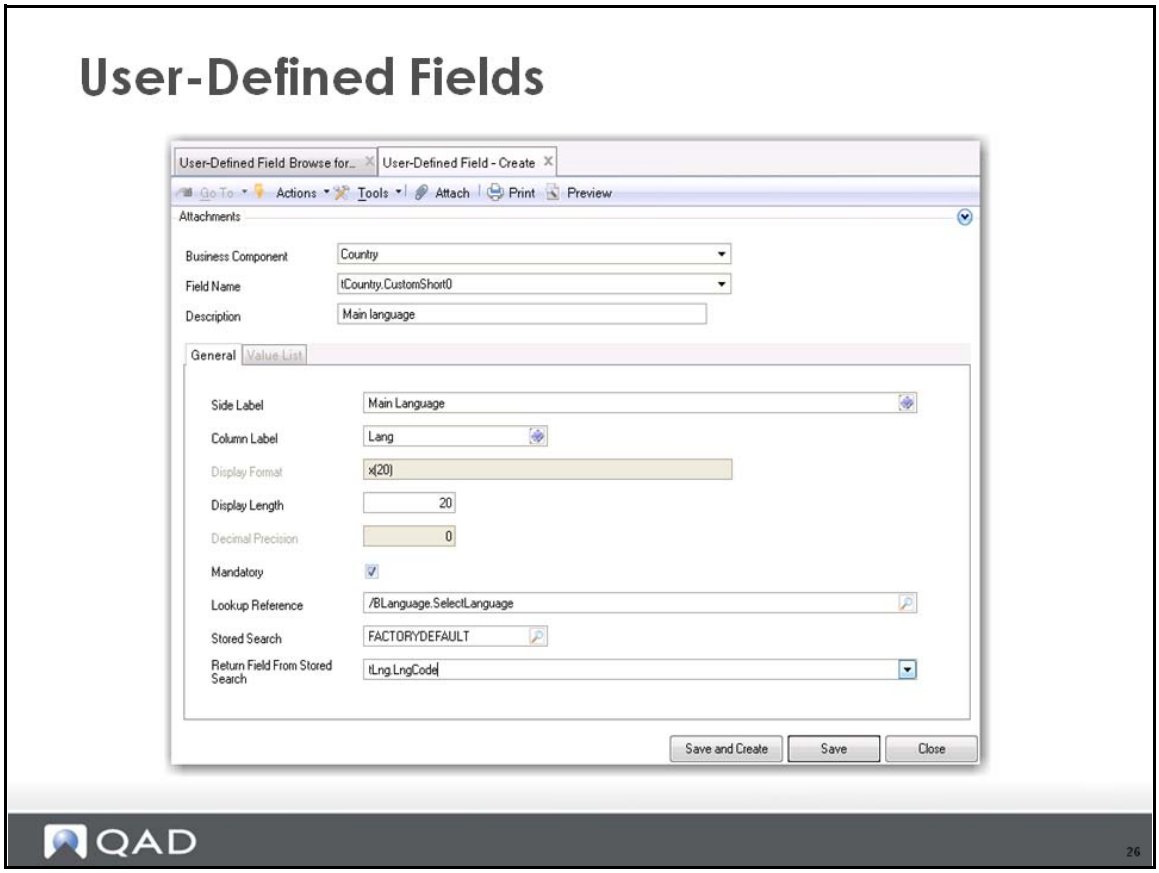


QAD 24

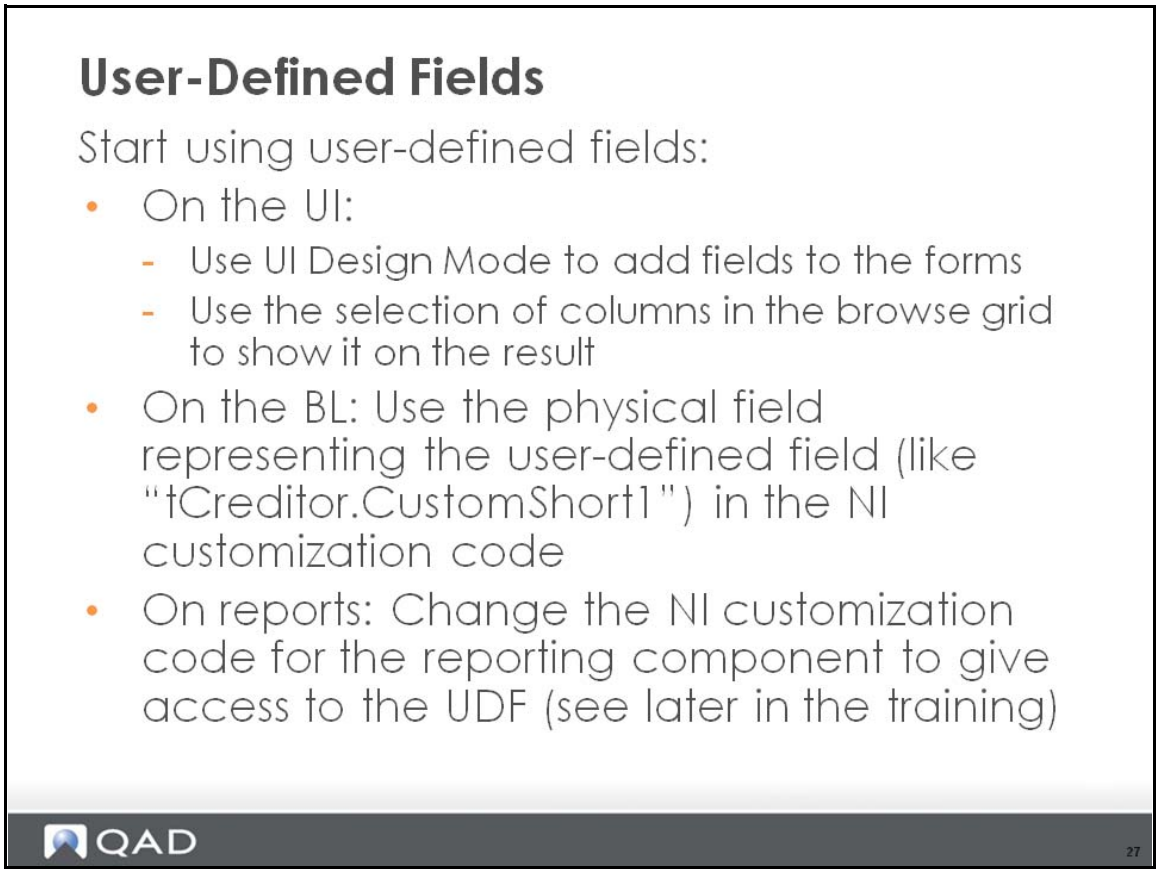
User-Defined Fields



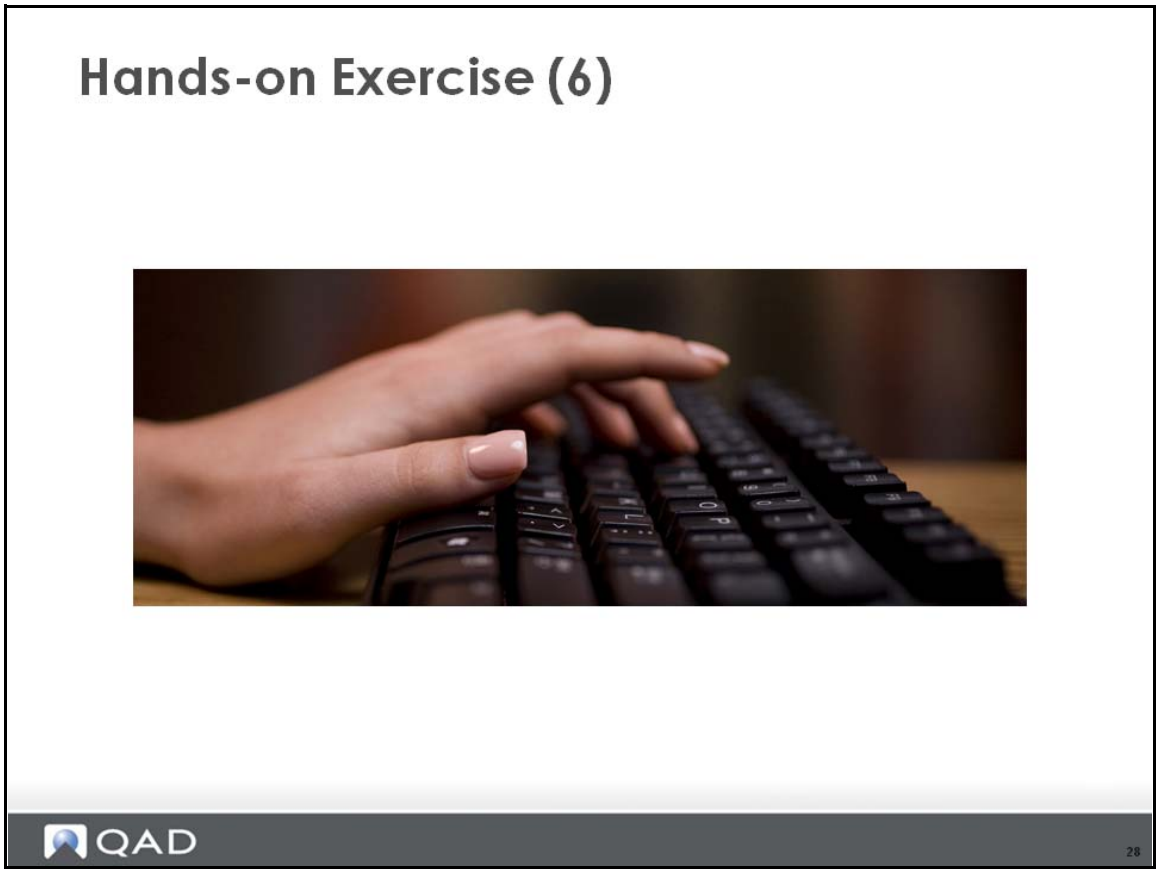
User-Defined Fields 2



User-Defined Fields 3



Hands-on Exercise (6)



Chapter 4

Non-intrusive Customization of Enterprise Financials

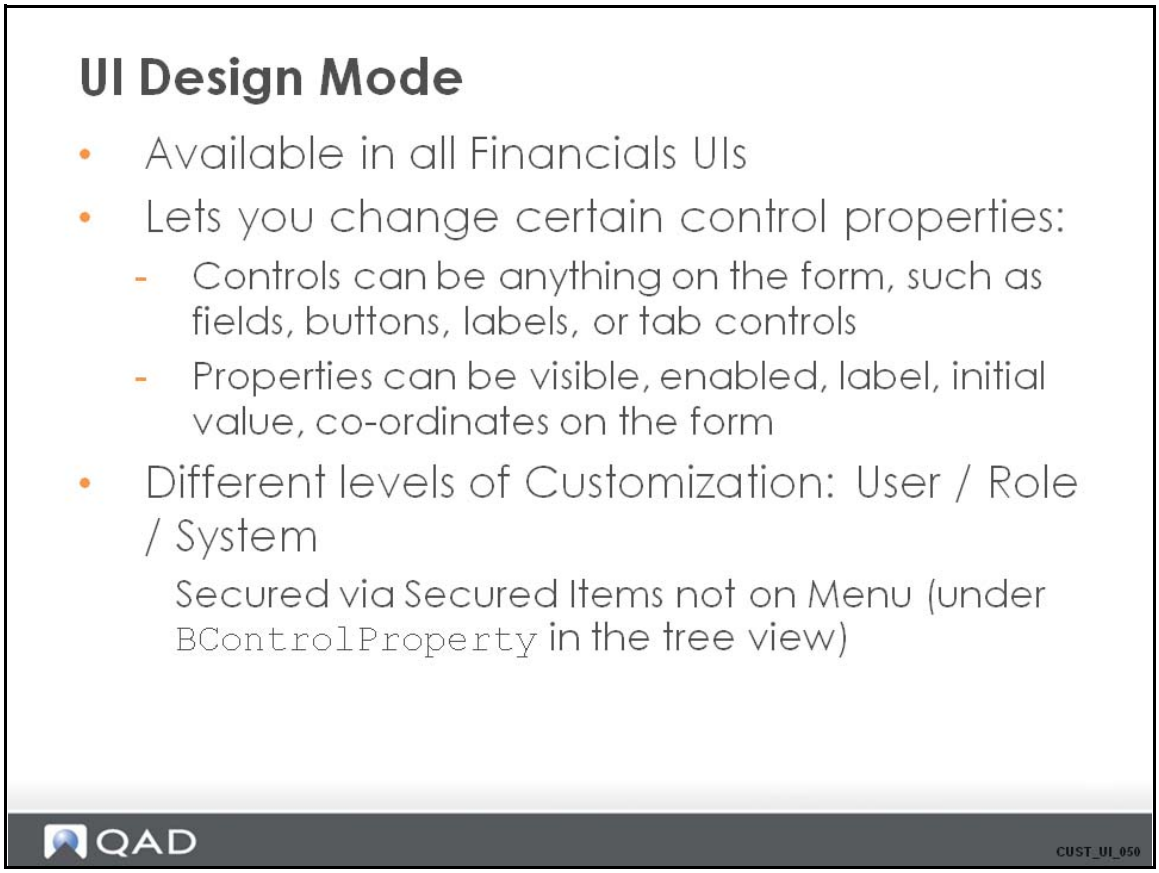
Non-intrusive Customizations of Enterprise Financials



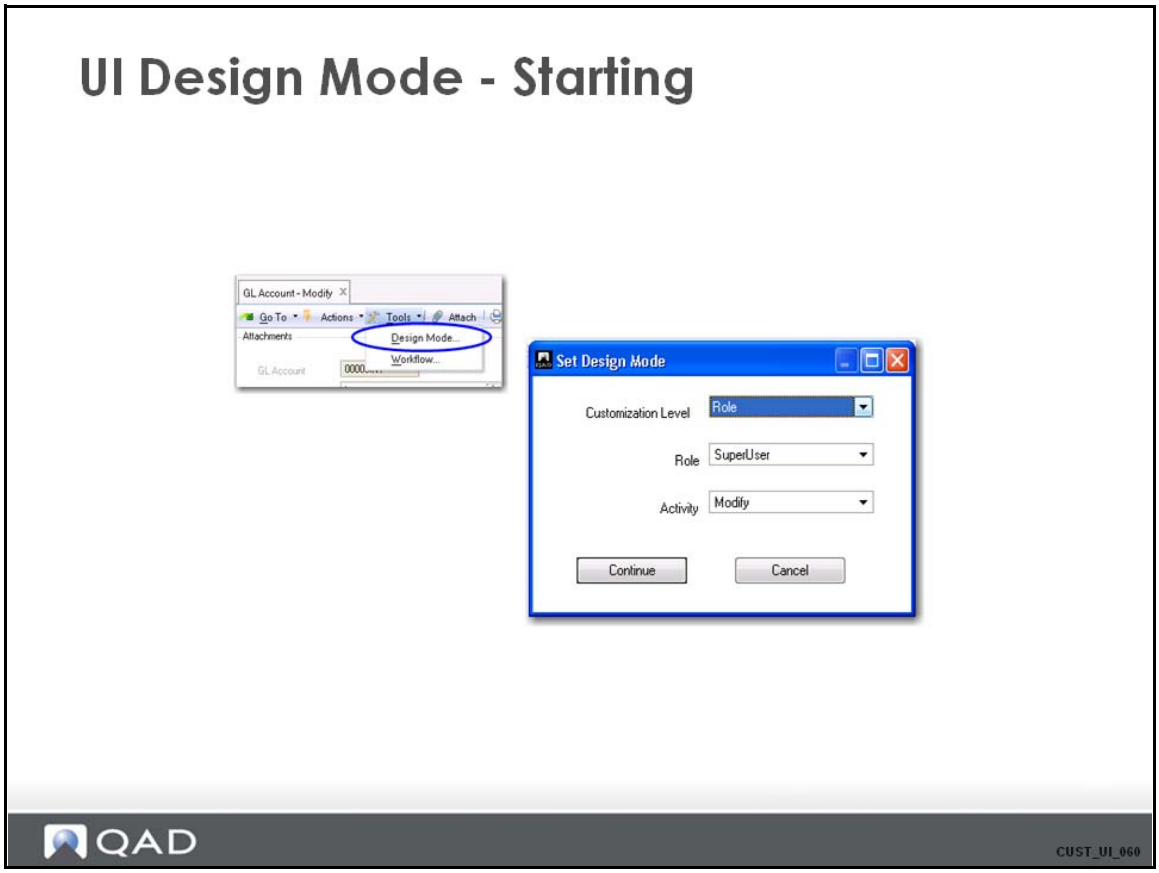
Non-Intrusive Customization: UI Design



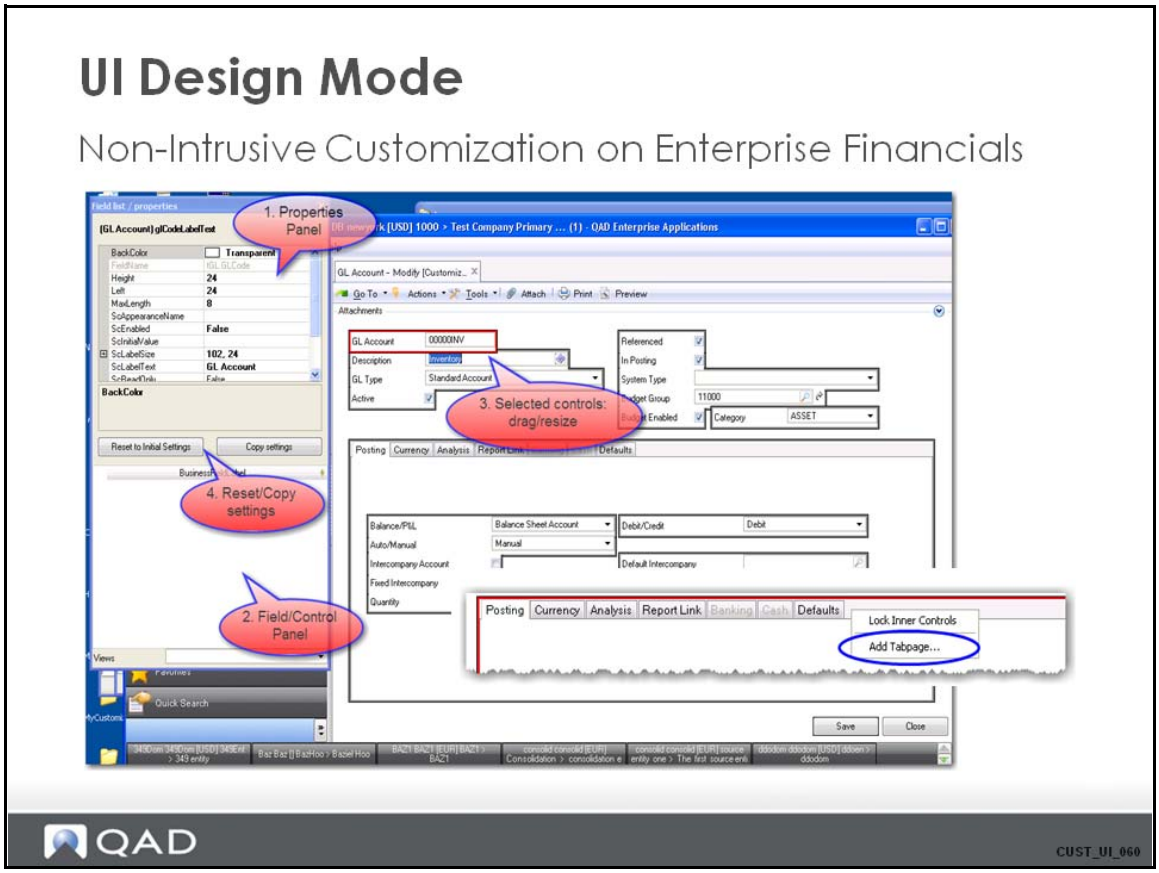
UI Design Mode



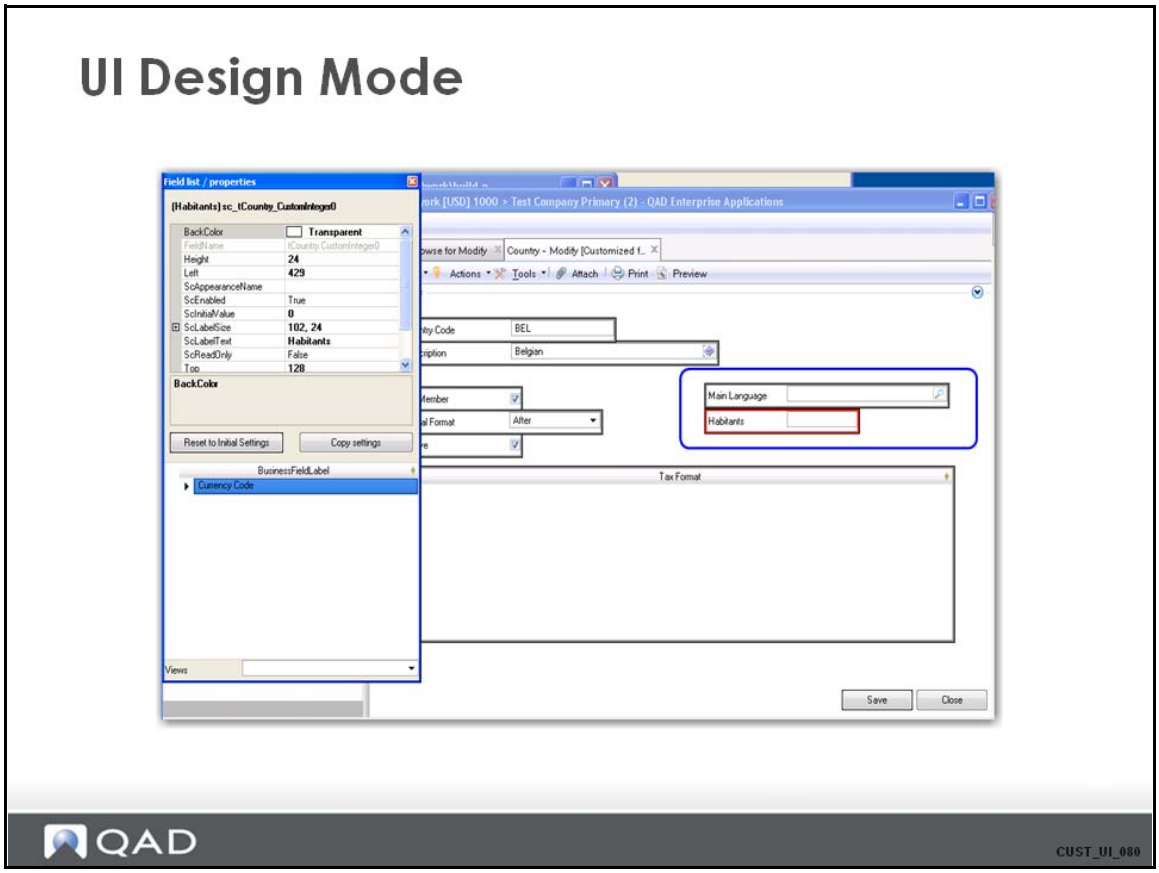
UI Design Mode 2



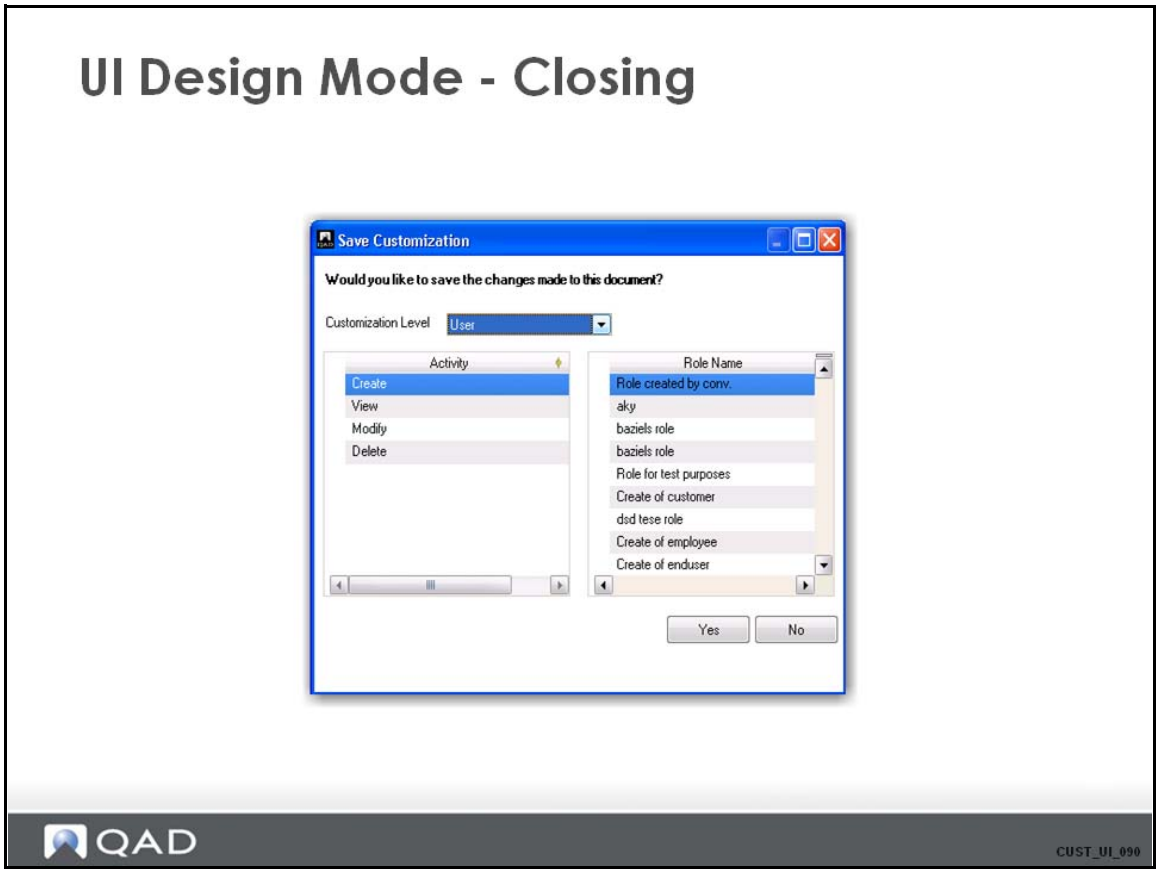
UI Design Mode 3



UI Design Mode 4



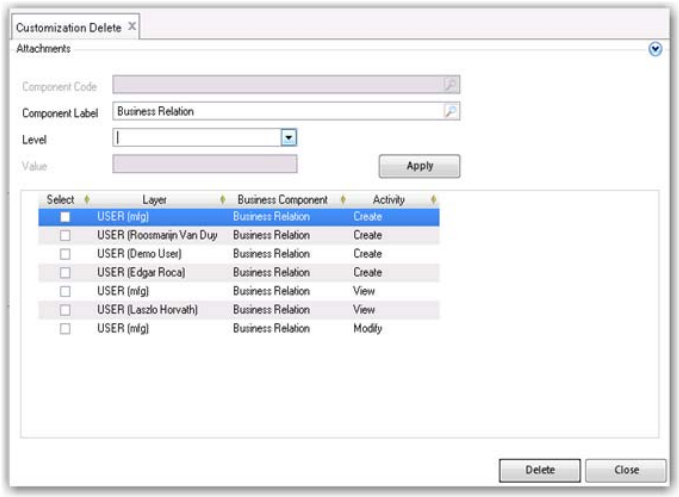
UI Design Mode 5



UI Design Mode 6

UI Design Mode - Maintenance

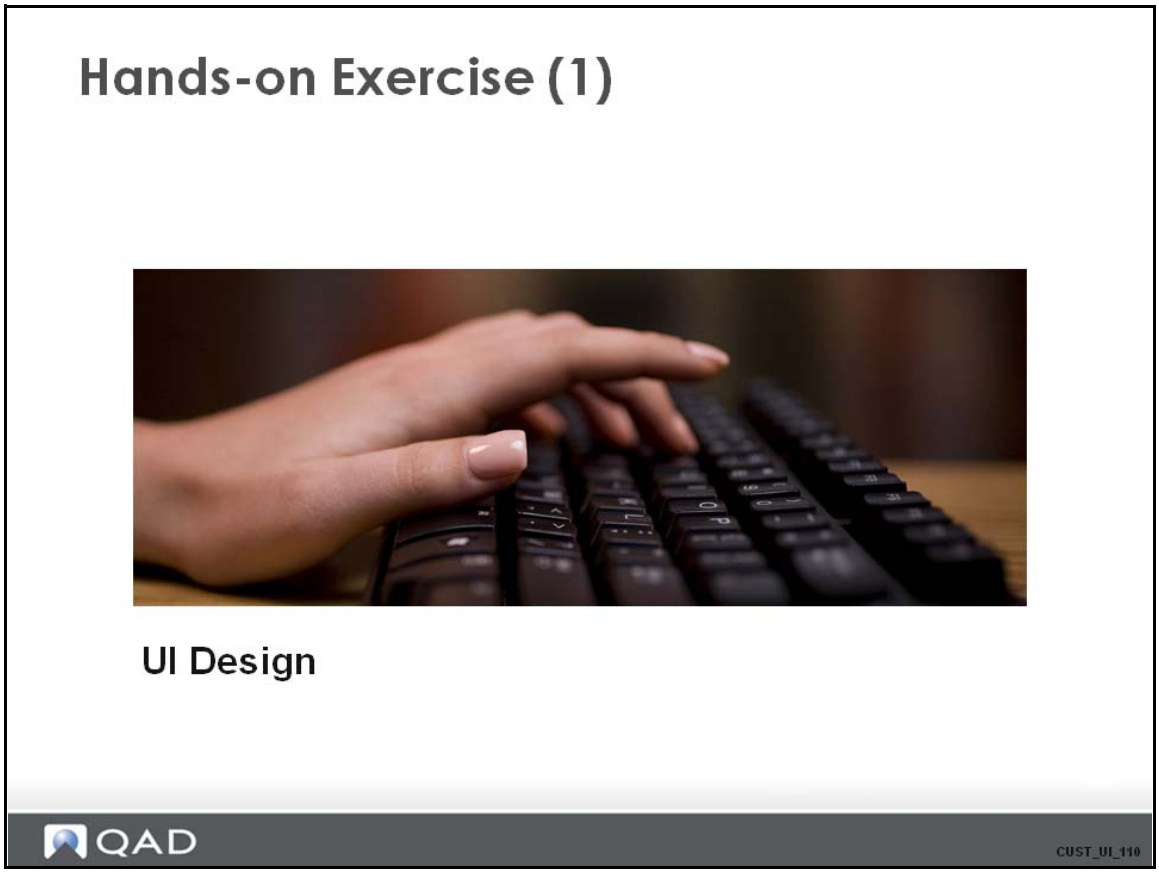
- Definition and update via UI Design Mode
- Deletion via Customization Delete



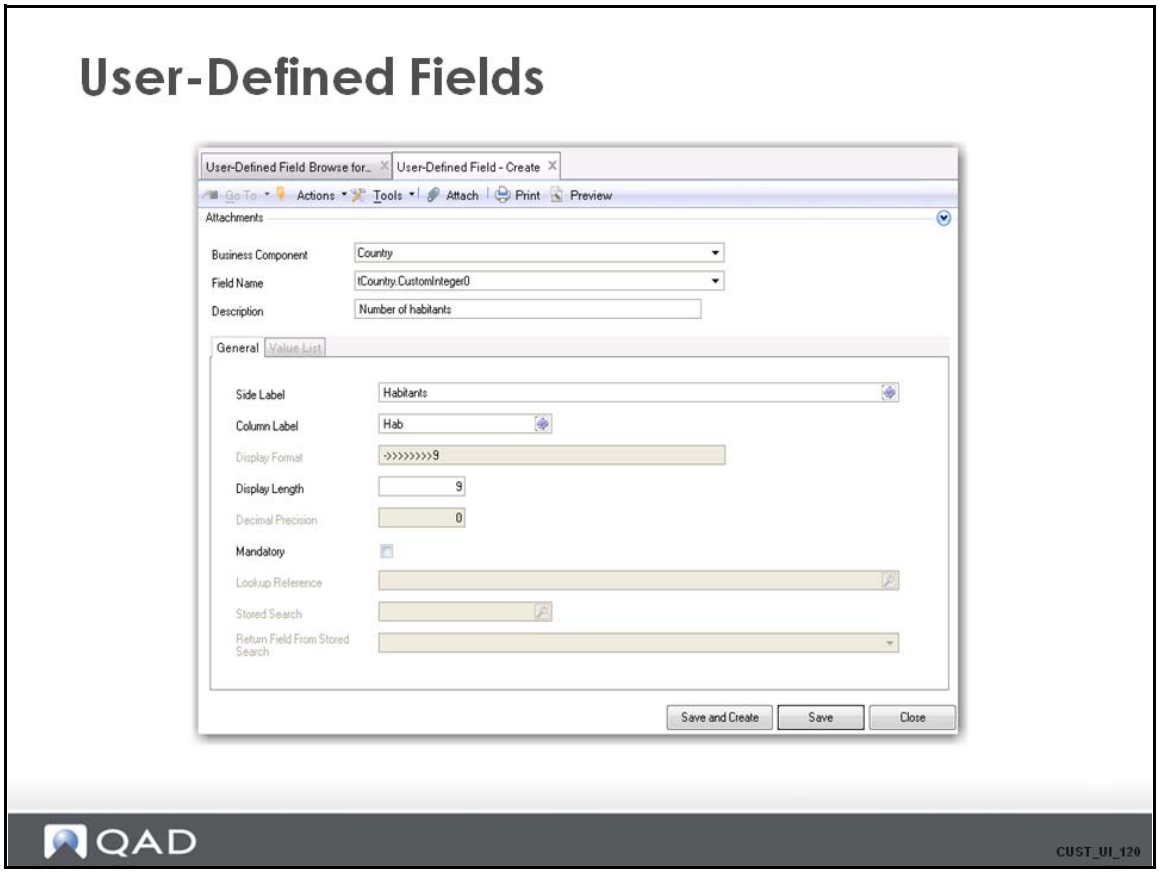
QAD

CUST_UI_100

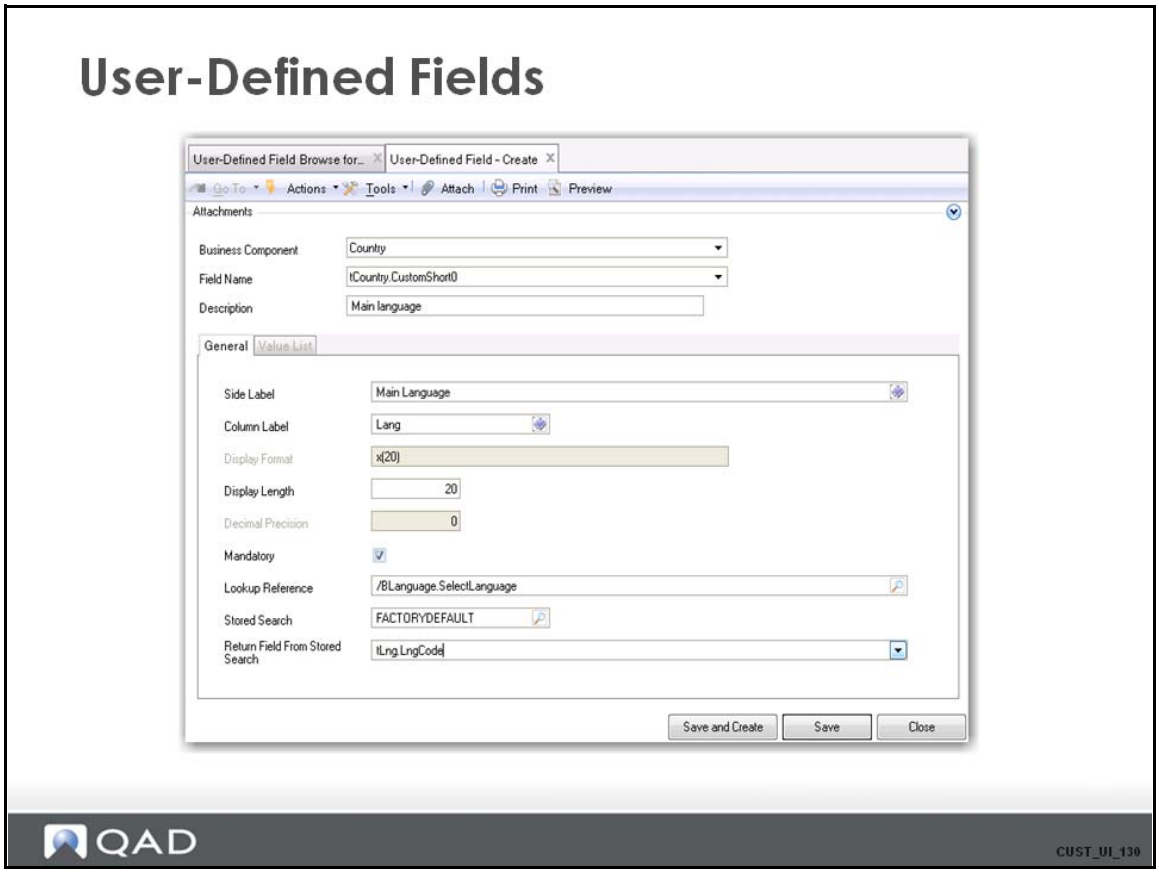
Hands-on Exercise (1)



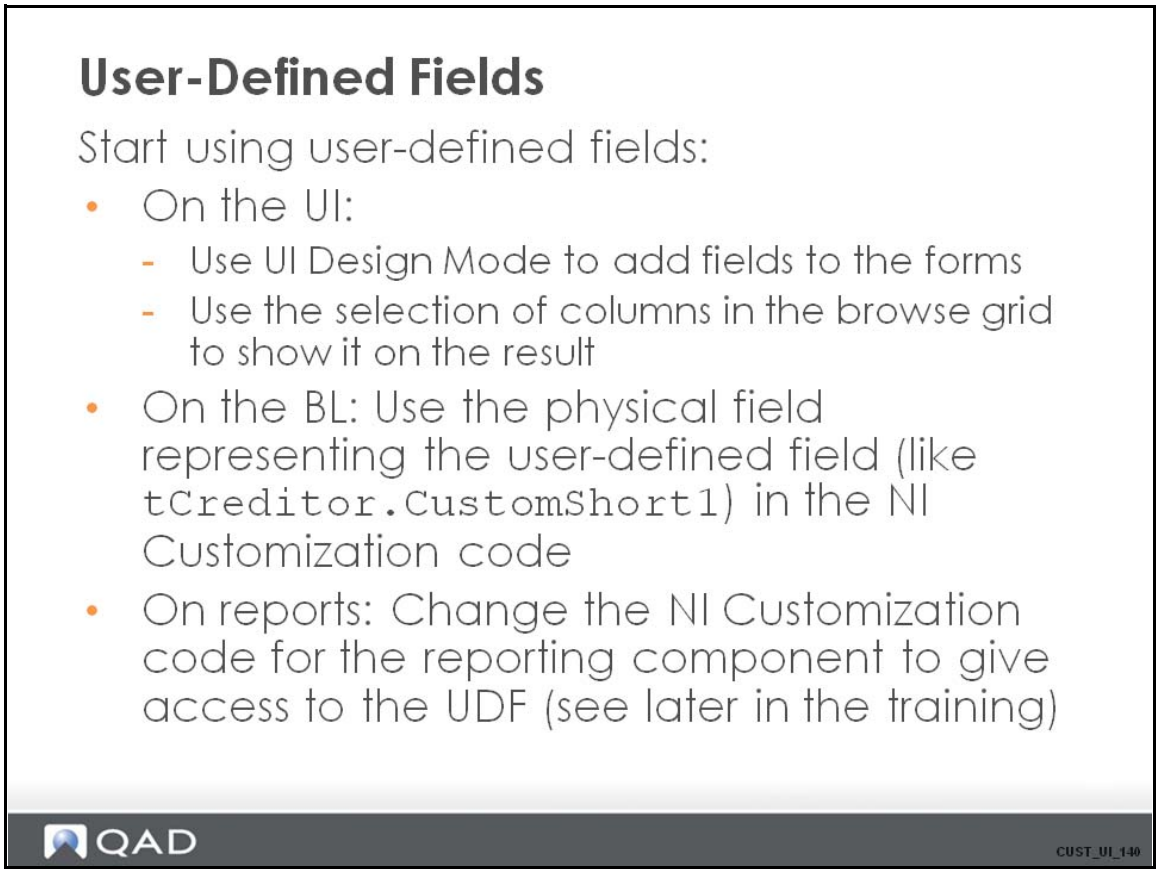
User-Defined Fields



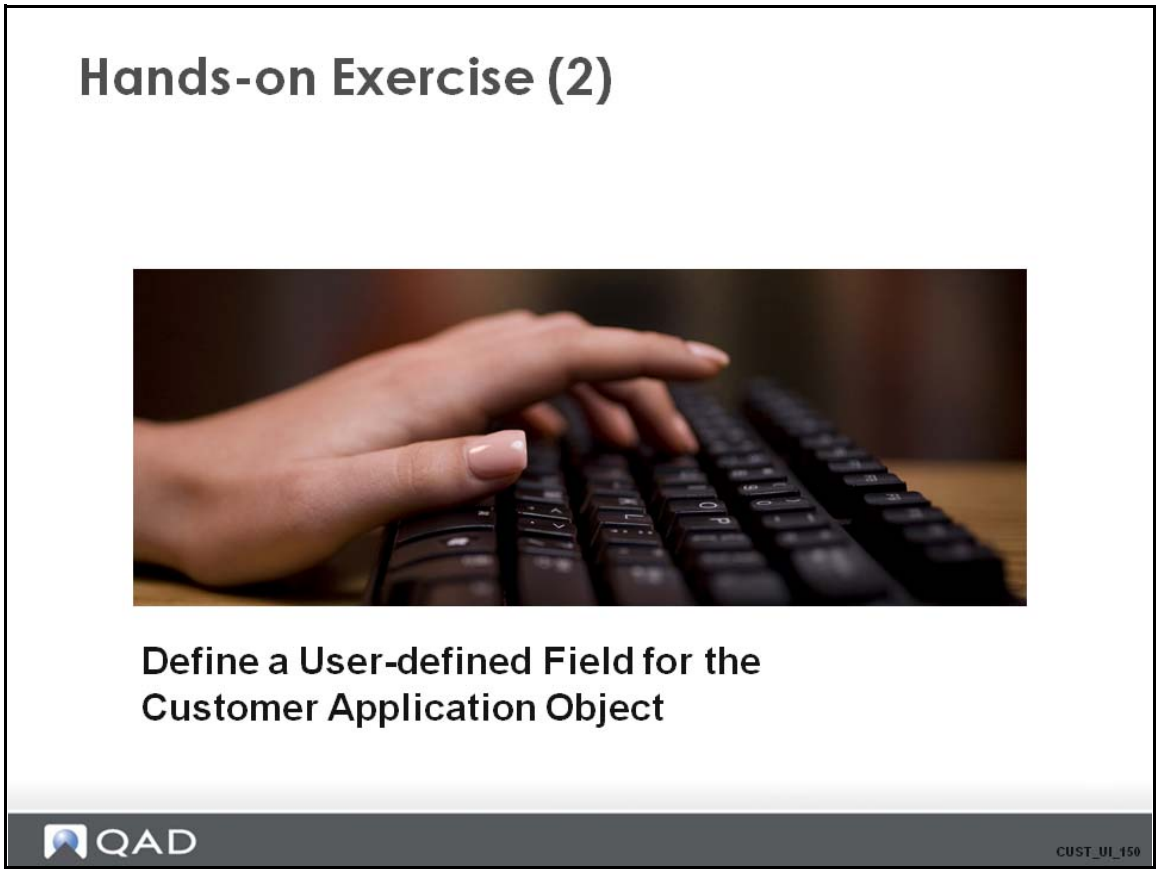
User-Defined Fields 2



User-Defined Fields 3



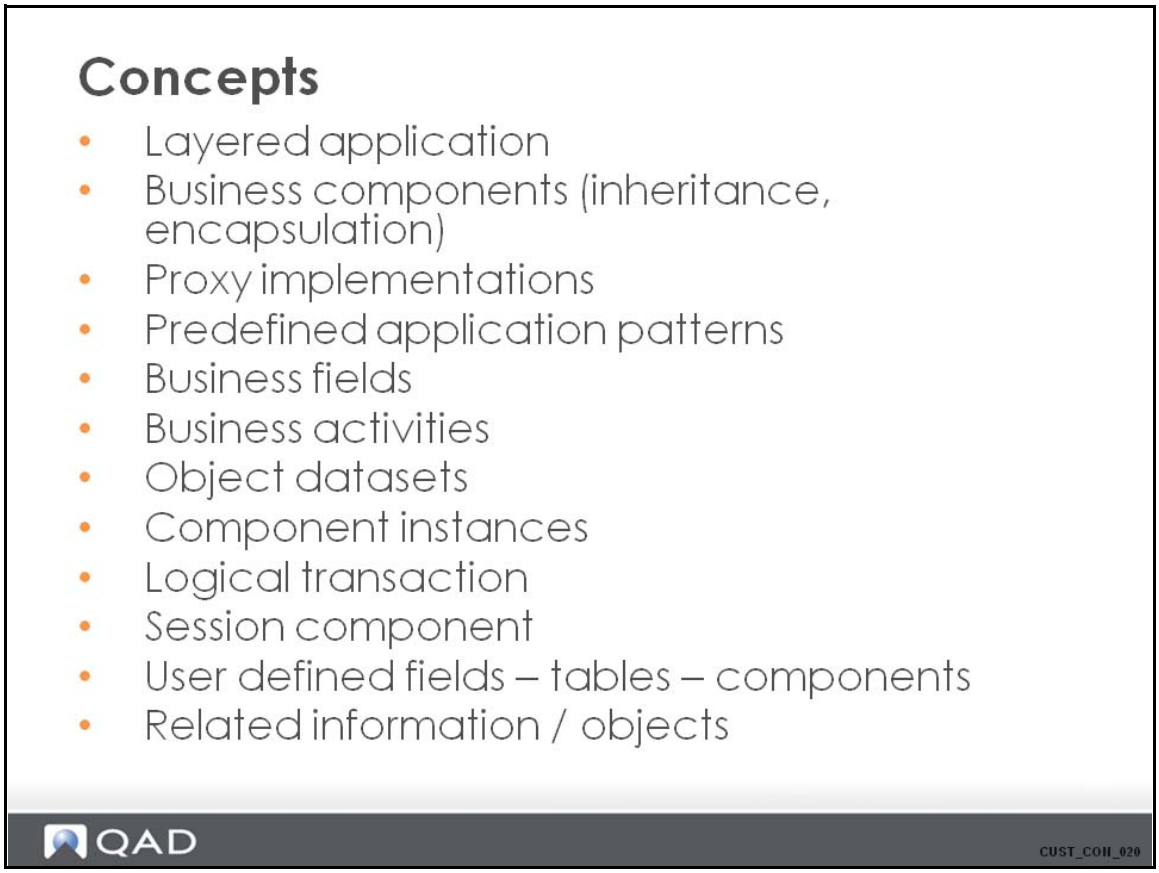
Hands-on Exercise (2)



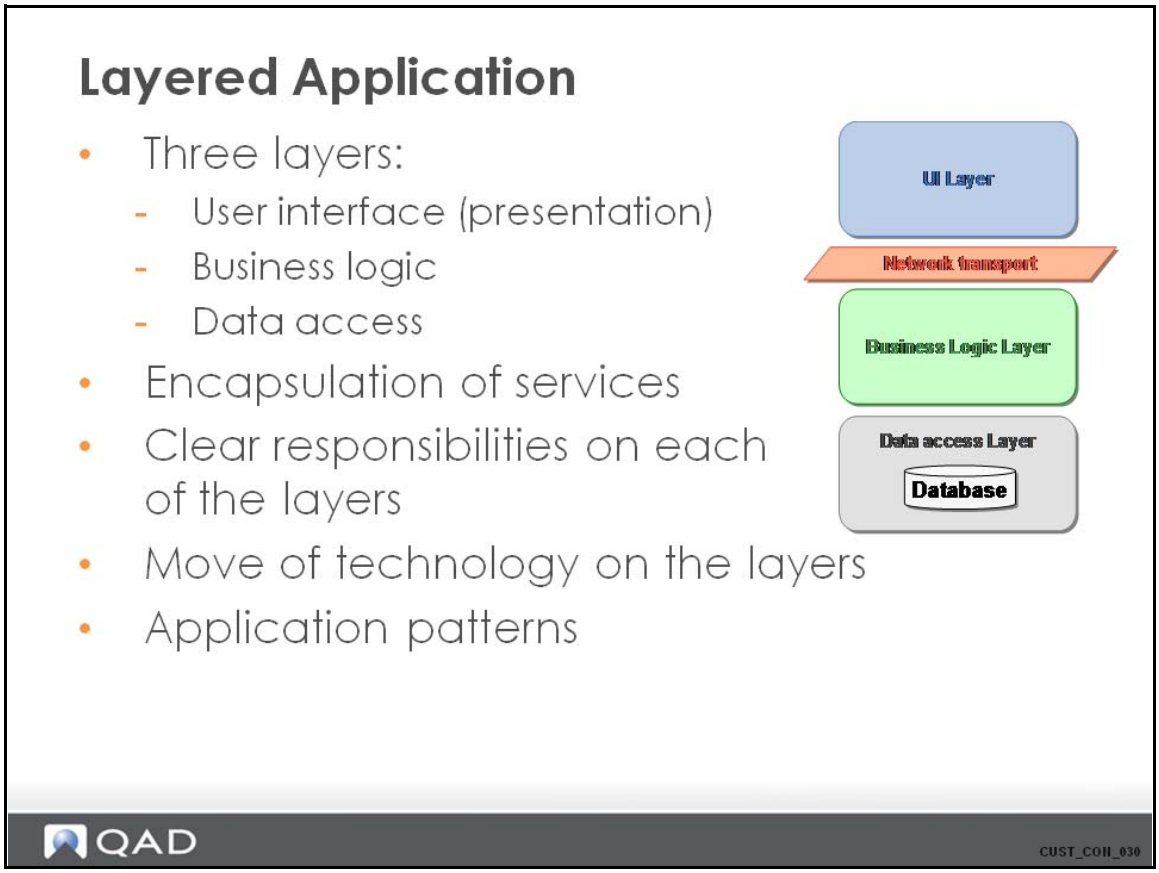
Non-intrusive Customization: Concepts



Concepts


Concepts
Layered application
Business components (inheritance, encapsulation)
Proxy implementations
Predefined application patterns
Business fields
Business activities
Object datasets
Component instances
Logical transaction
Session component
User defined fields – tables – components
Related information / objects
QAD
CUST_CON_020

Layered Application



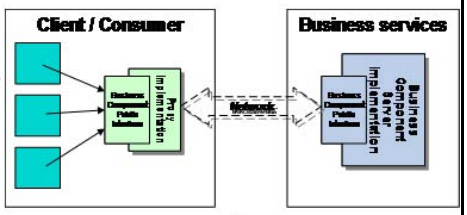
Business Components



Proxy Implementations

Proxy Implementations

- Surrogates for business components that provide access to it on the client (consumer) side
  Client deployment of stubs representing business functions



- Proxies hide the complexity of connection infrastructure, session handling, and state handling for the client
- Proxies are generated and can be used in different types of technologies

QAD

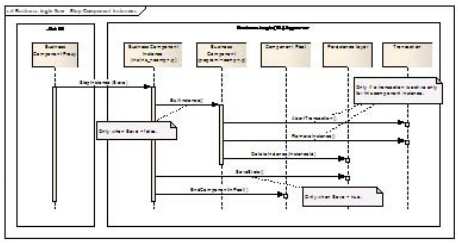
CUST_CON_050

Predefined Application Patterns

Predefined Application Patterns

Provide pre-defined program flows on different levels:

- Examples high-level patterns:
  - Creation of an object
  - Modification of an object
  - Deletion of an object
  - Maintenance of object set
  - Selection of an object

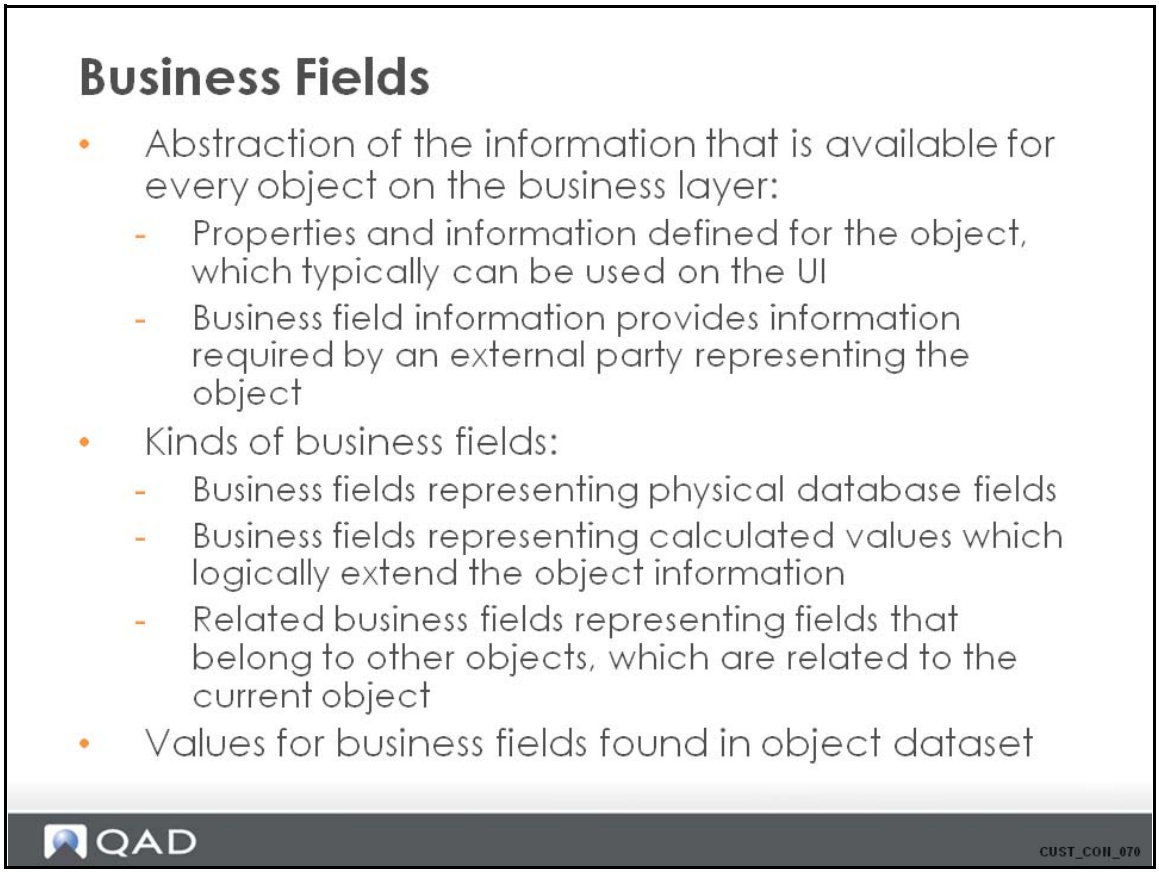


- Examples lower level patterns:
  - Instantiation of components
  - Error processing

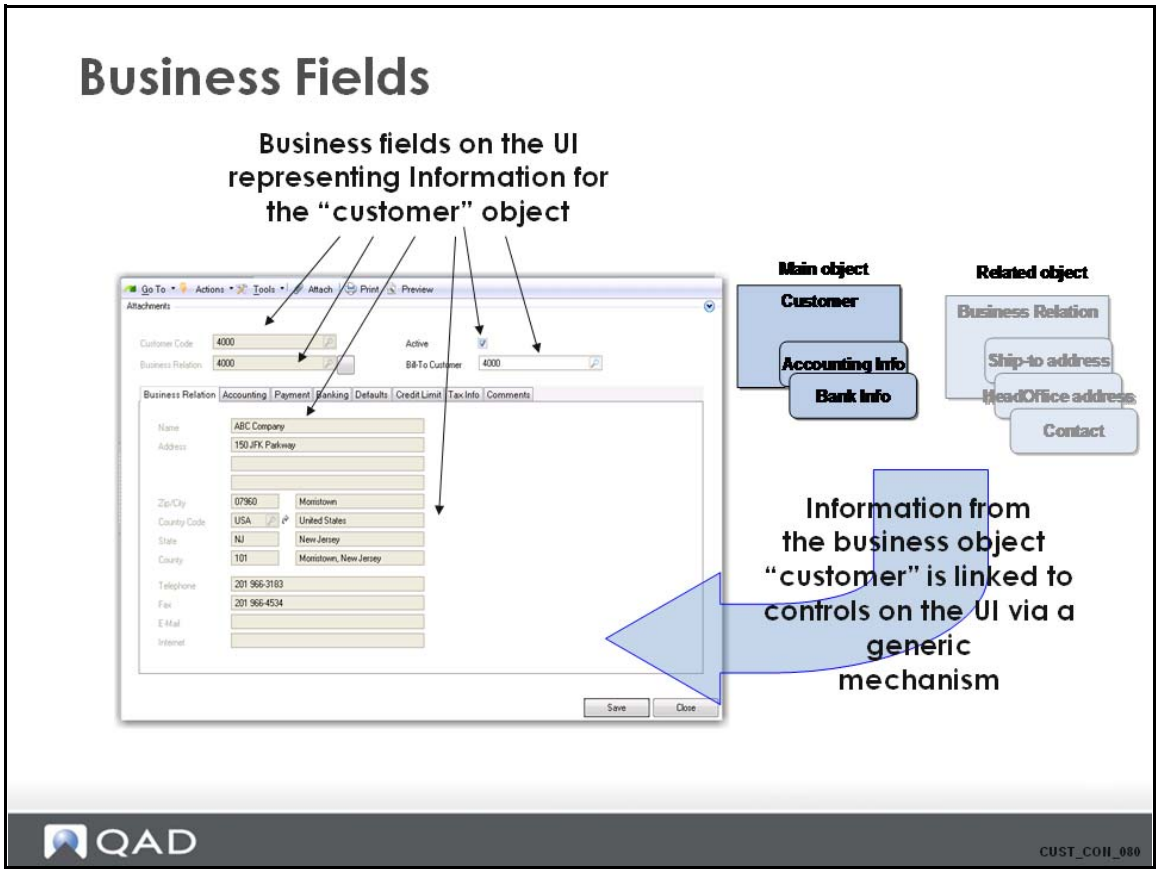
QAD

CUST_CON_060

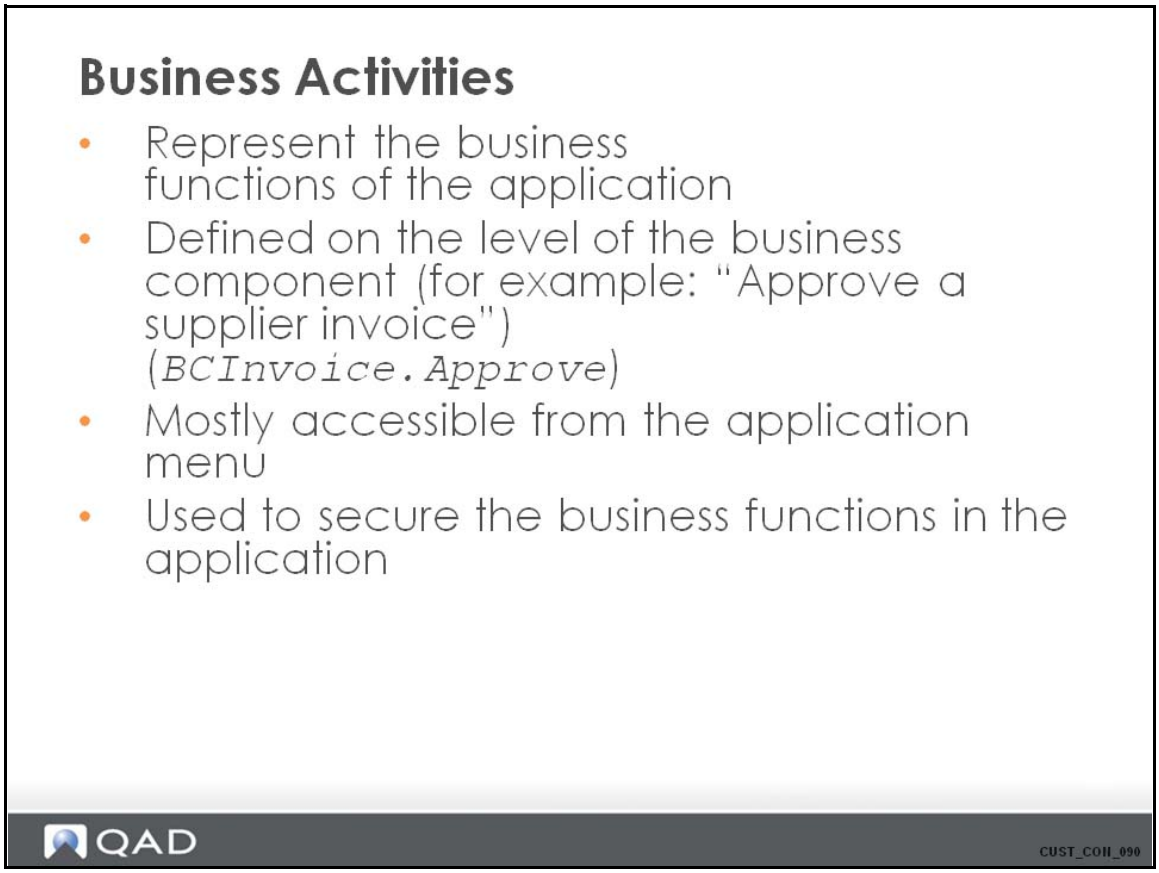
Business Fields



Business Fields 2



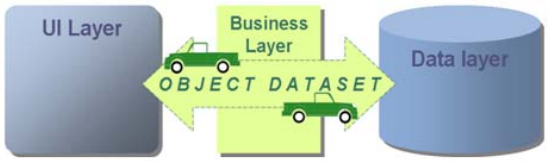
Business Activities



Object Datasets

Object Datasets

- The data associated with an object is passed between the different layers using object datasets

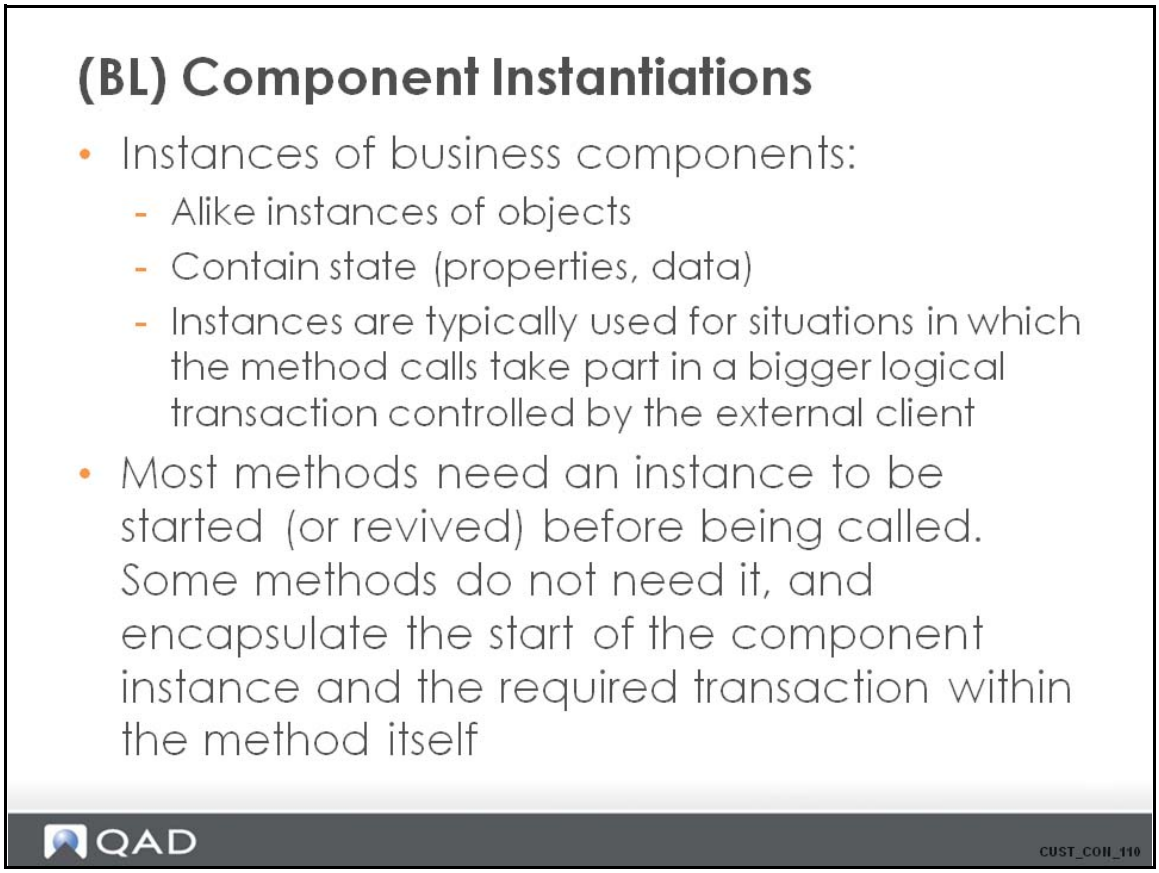


- Object datasets represented by:
  - OpenEdge ProDatasets on the BL side
  - .NET datasets on the UI side
- Object datasets are not only used by the UI client, but all types of consumers of the business services (integration, load functionality, event publishing...)

QAD

CUST_CON_100

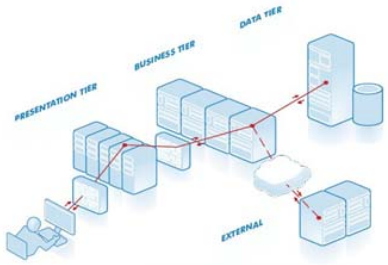
(BL) Component Instantiations



Logical Transactions

Logical Transactions

- Physical transactions do not work well with stateless applications. We must try to eliminate the risk of record locking by optimistic locking

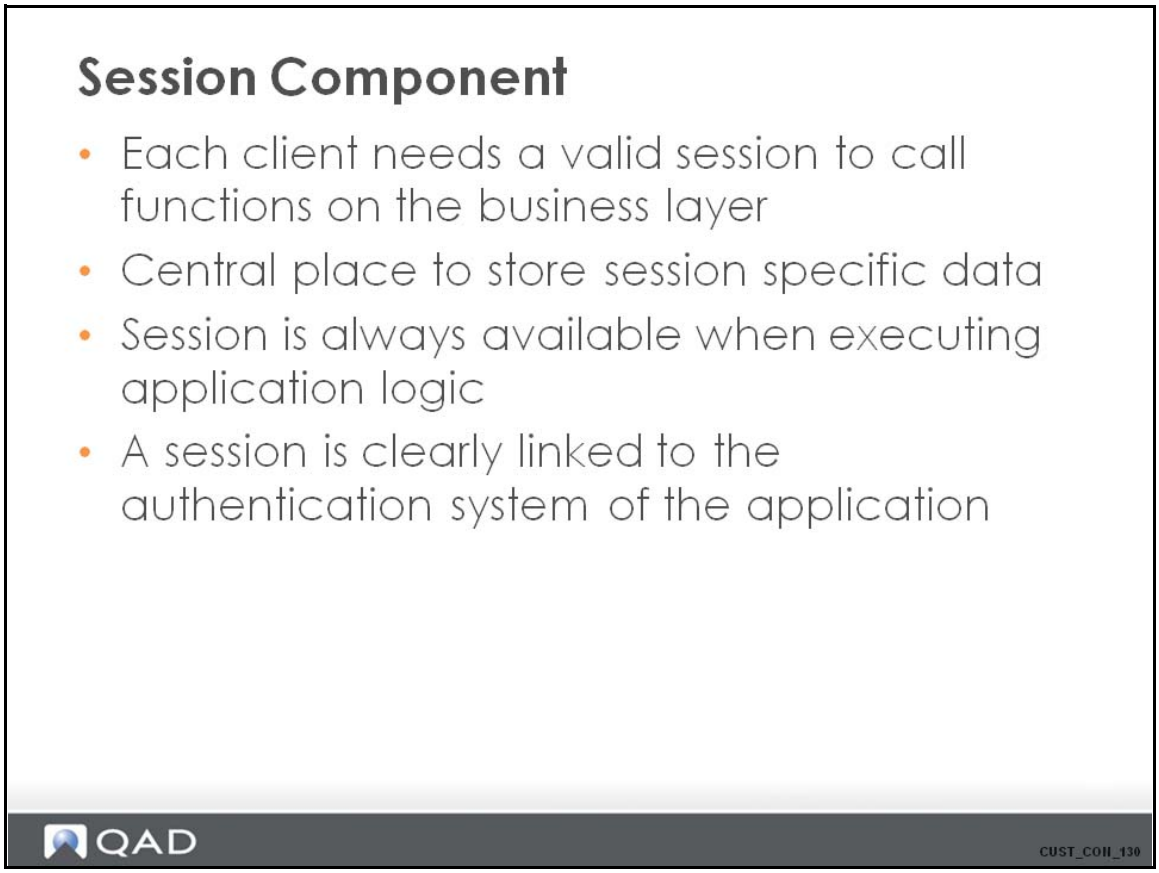


- The transaction control can be encapsulated in the business logic level, but can also be on the level of the UI or an external consumer
- Component instances must be aware of logical transactions

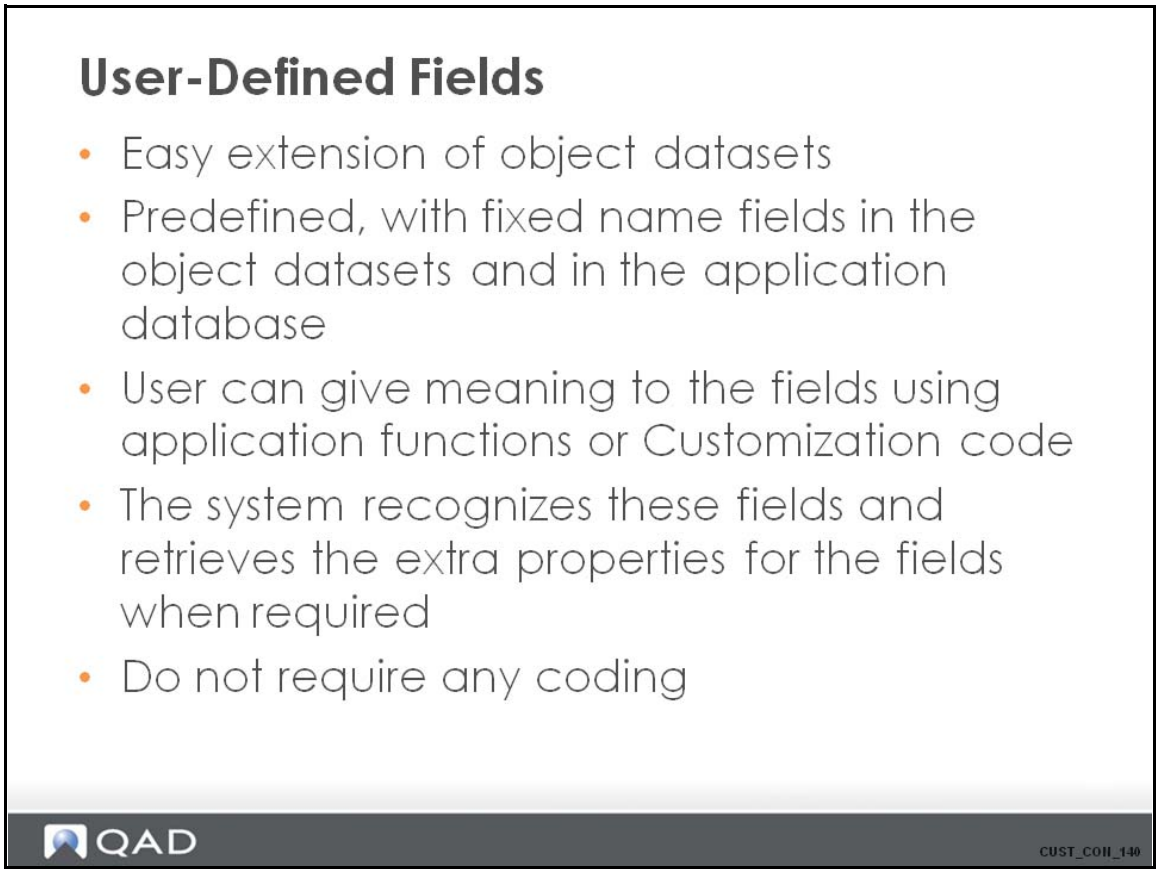
QAD

CUST_CON_120

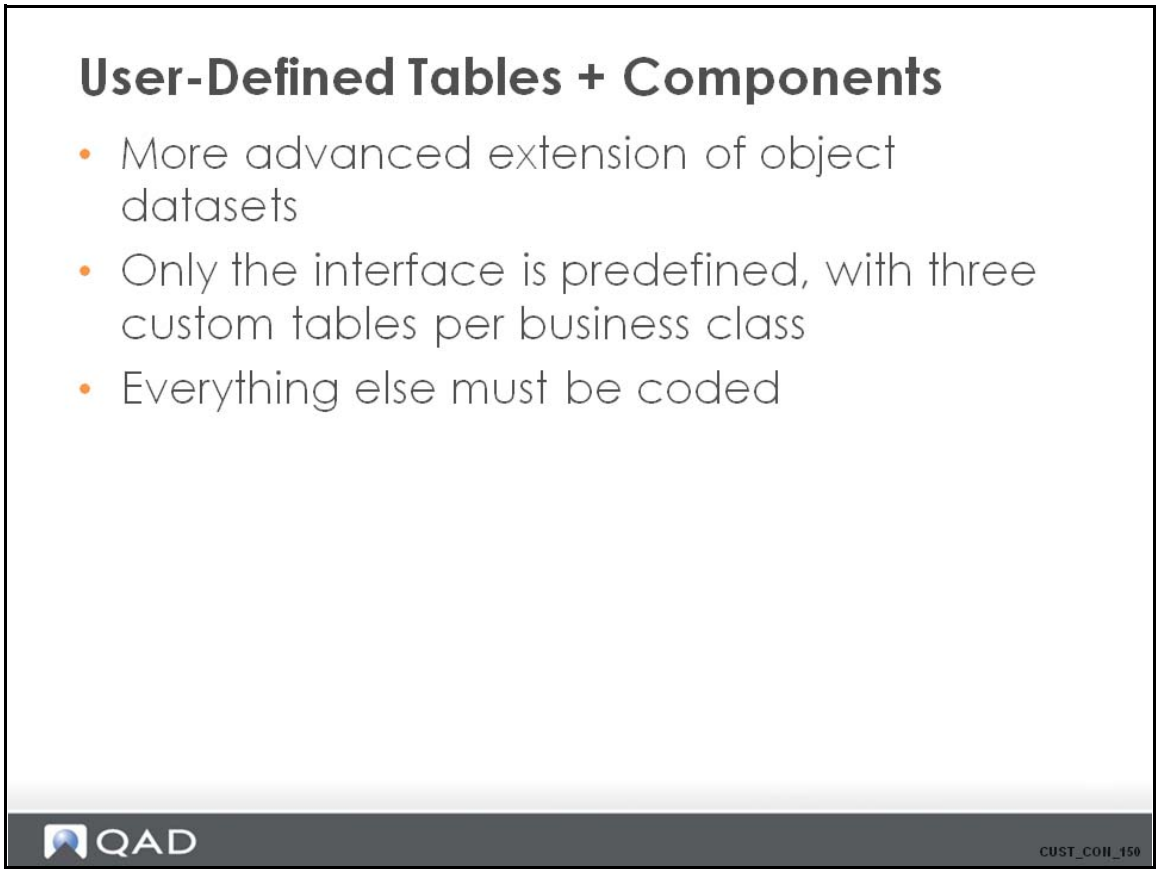
Session Component



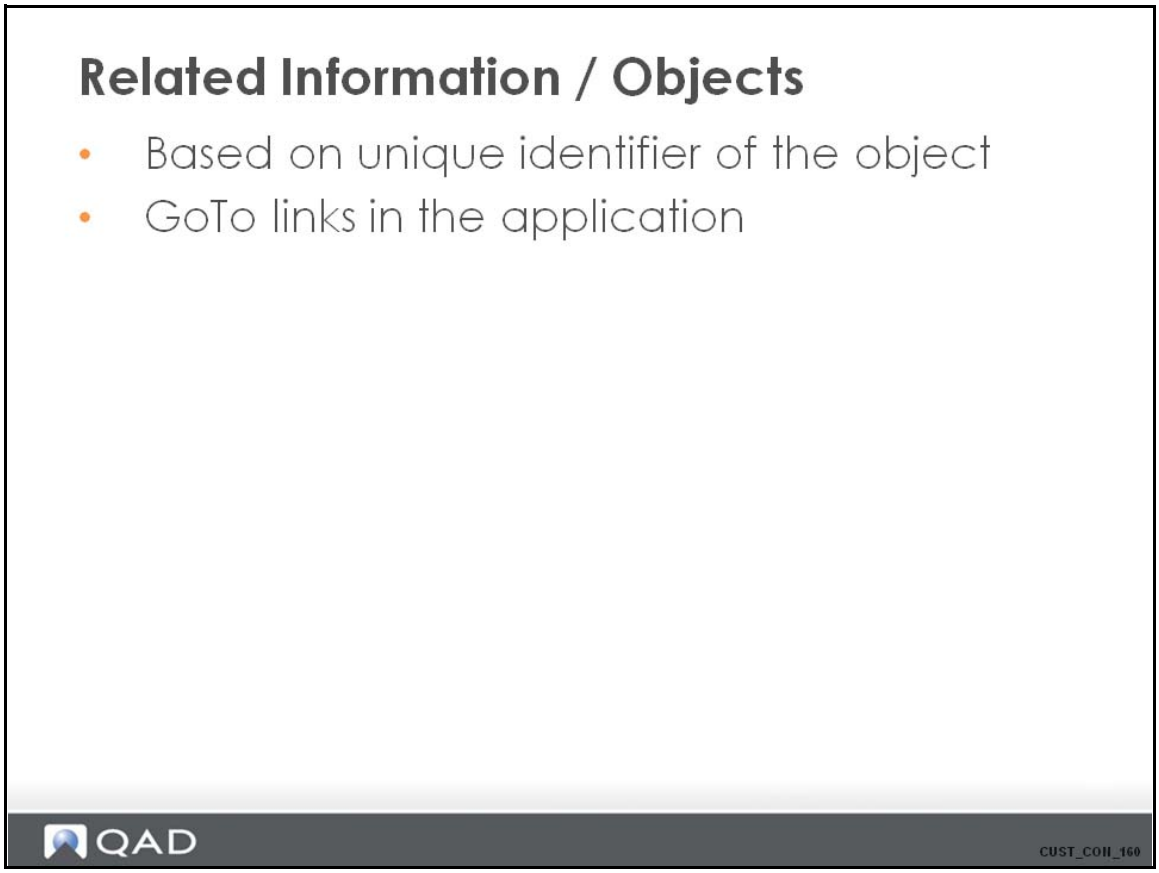
User-Defined Fields



User-Defined Tables + Components



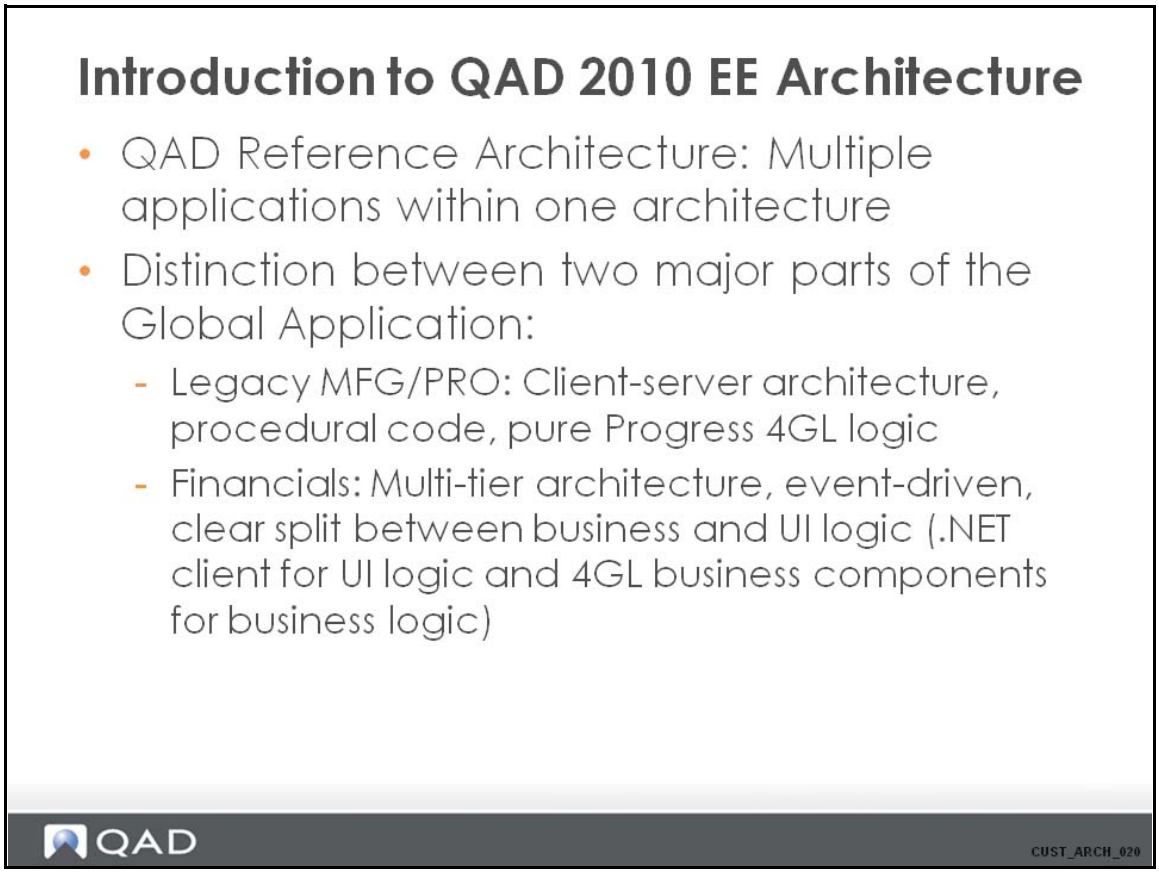
Related Information / Objects



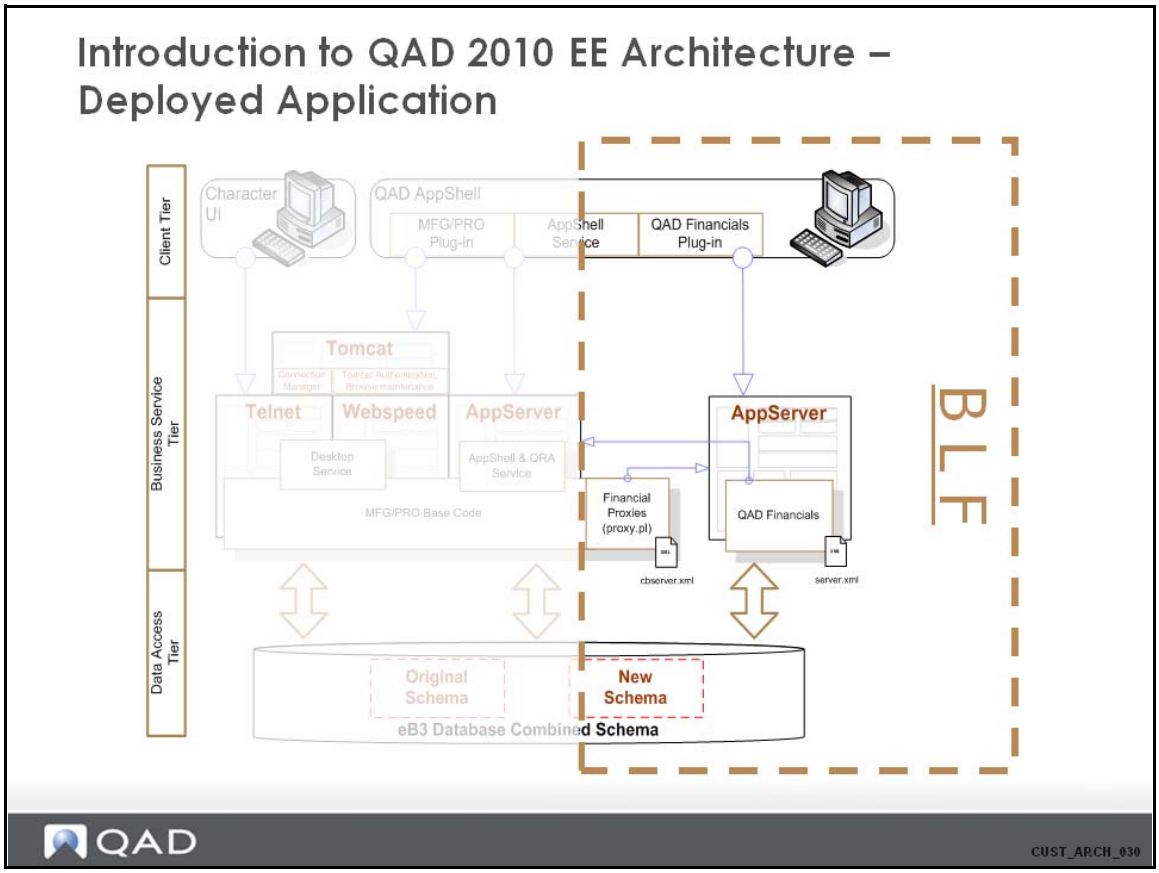
Non-instrusive Customization: Architecture



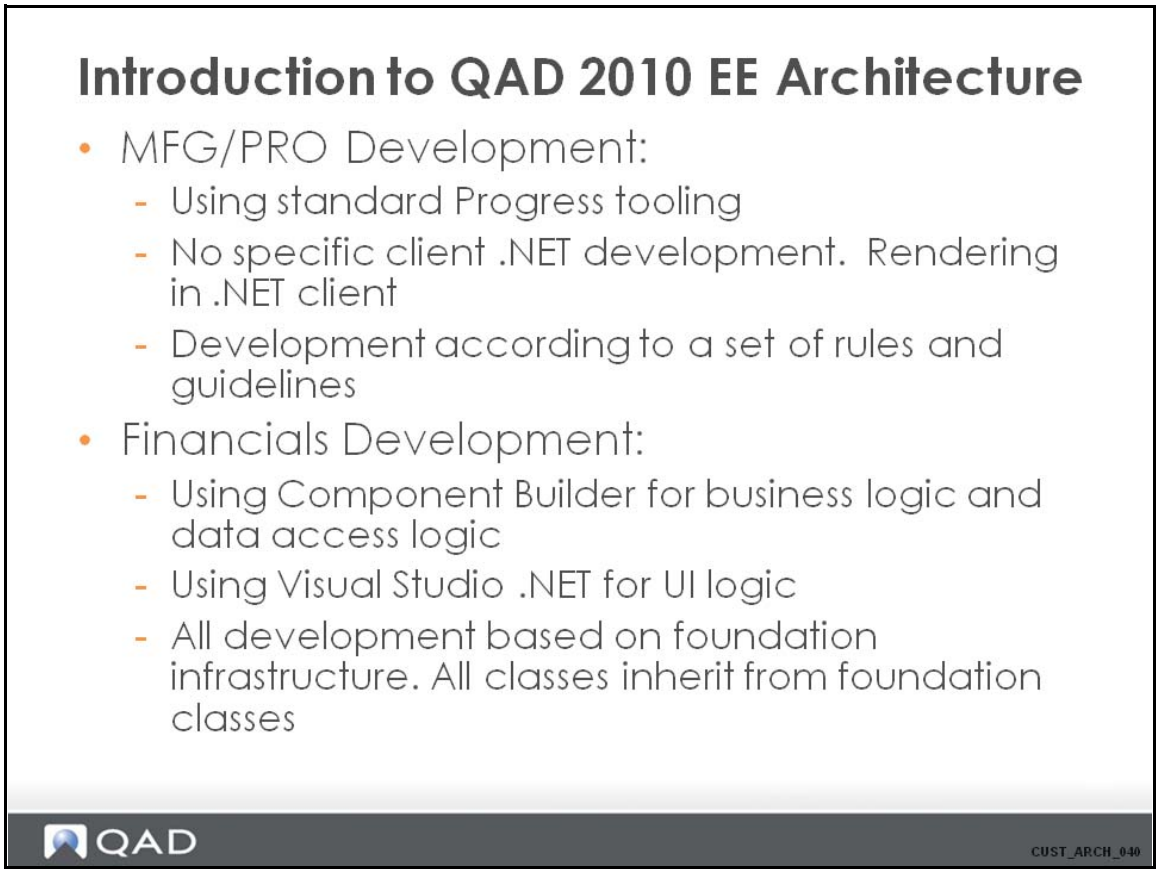
Introduction to QAD 2010 EE Architecture



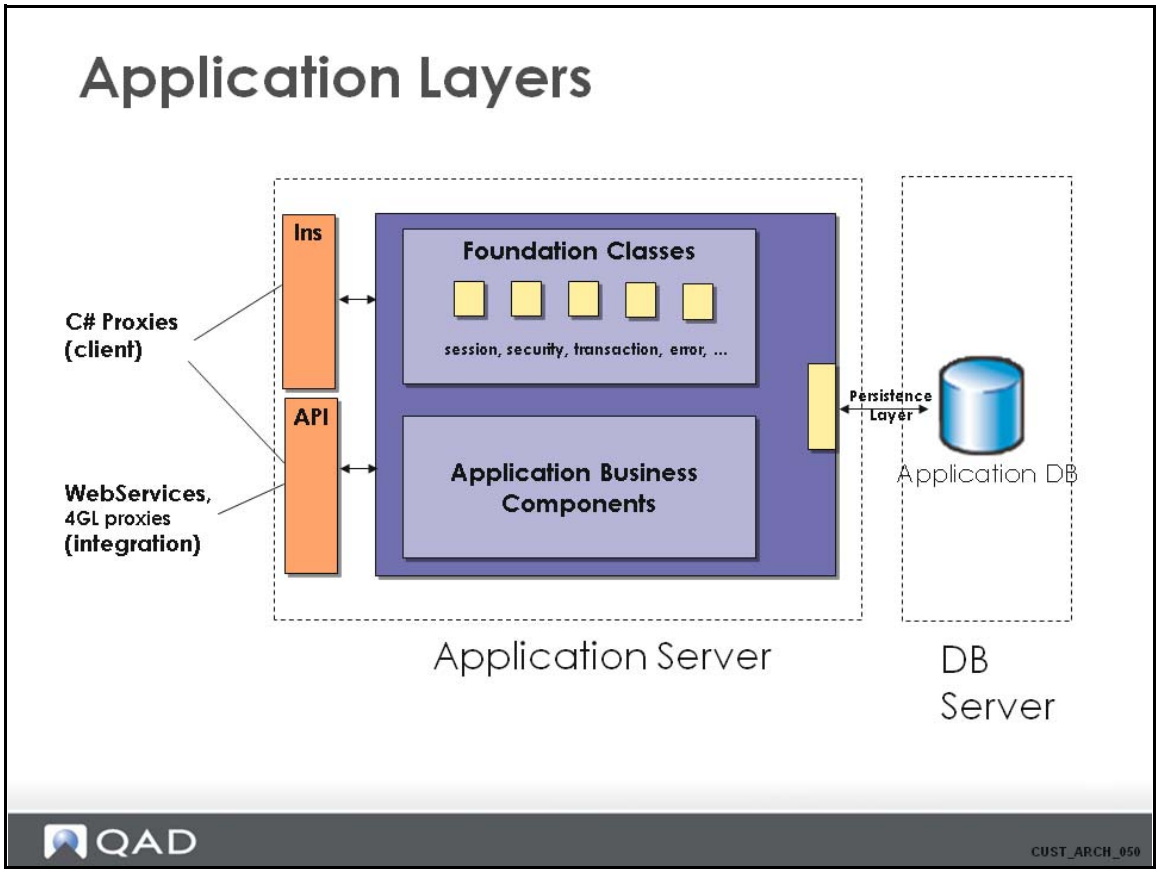
Introduction to QAD 2010 EE Architecture 2



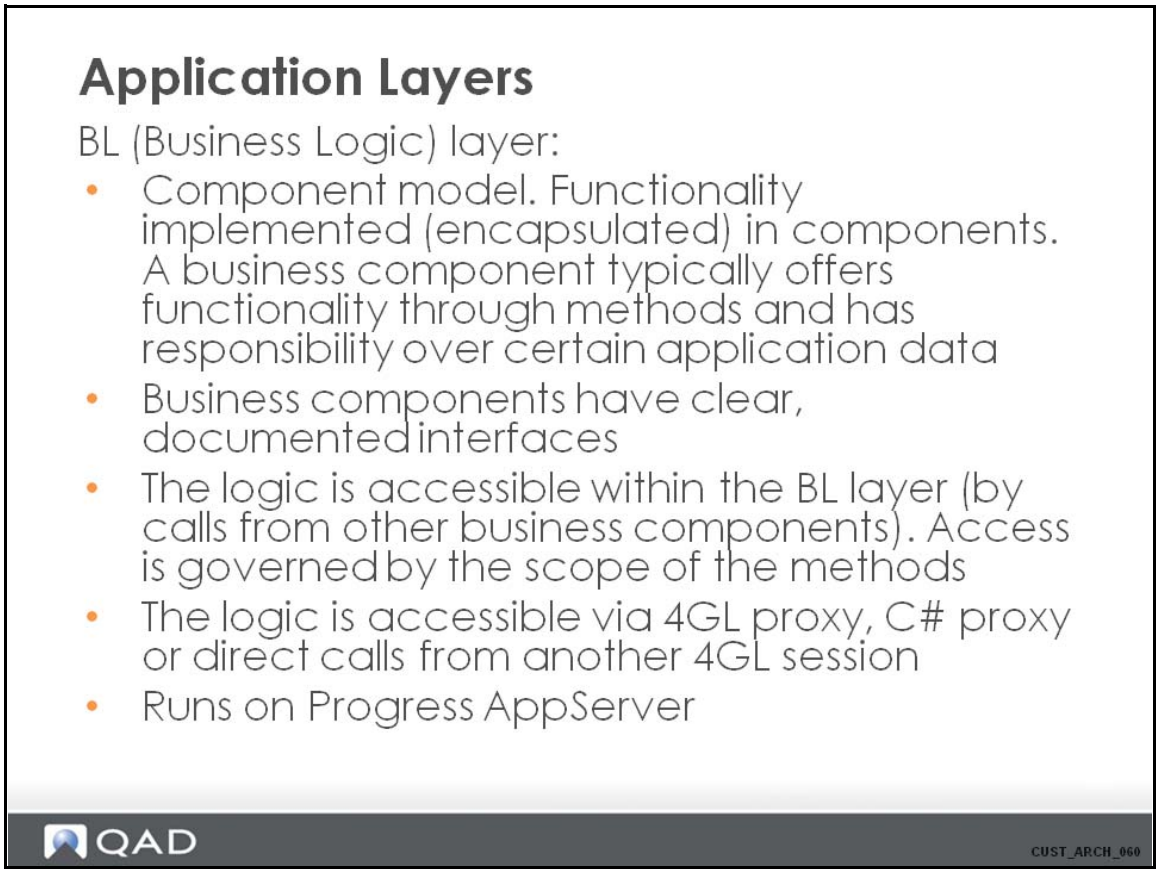
Introduction to QAD 2010 EE Architecture 3



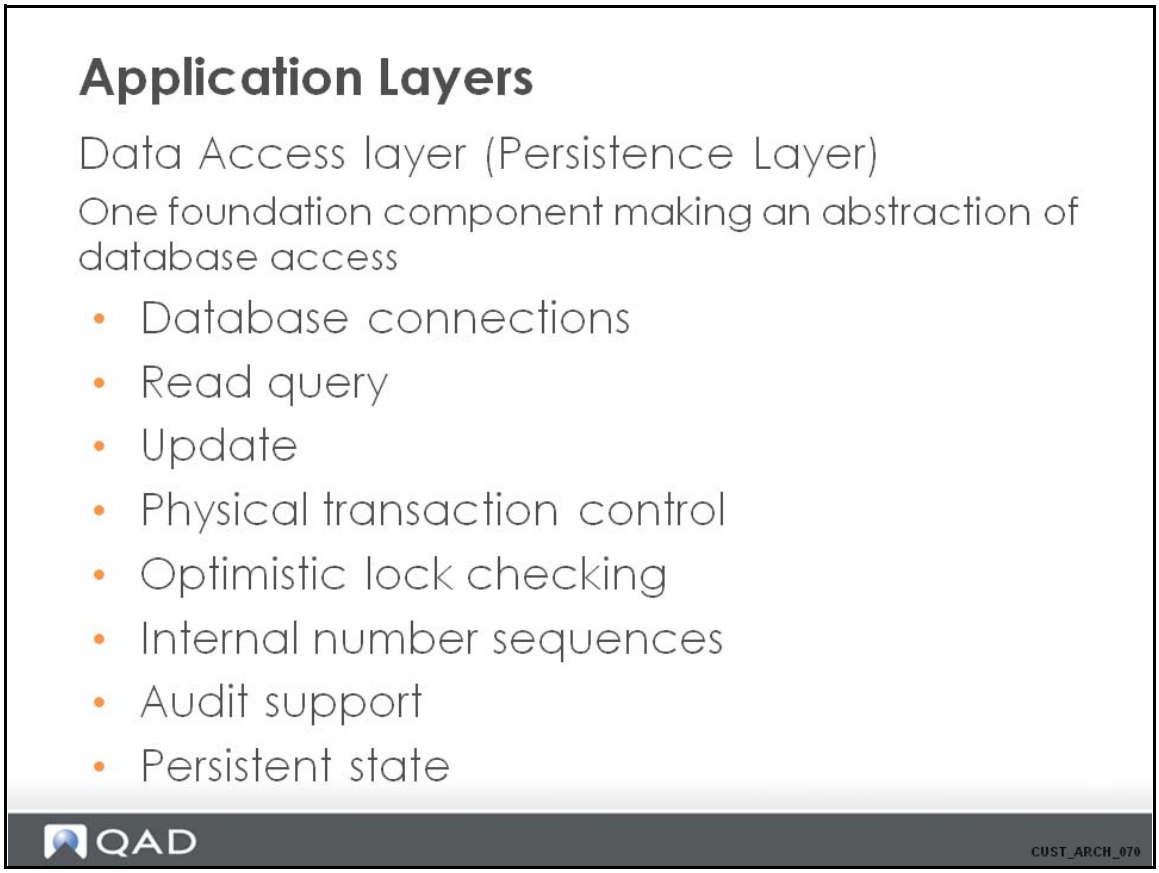
Application Layers



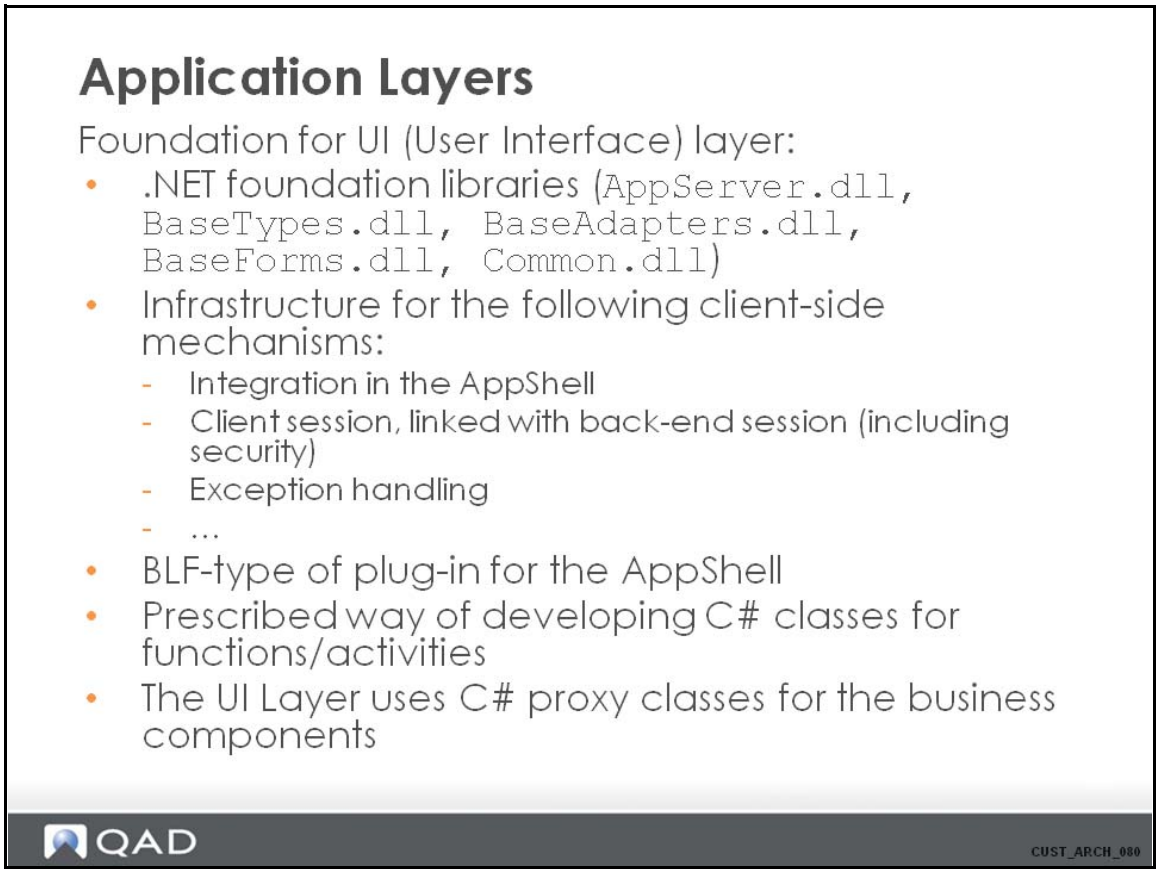
Application Layers 2



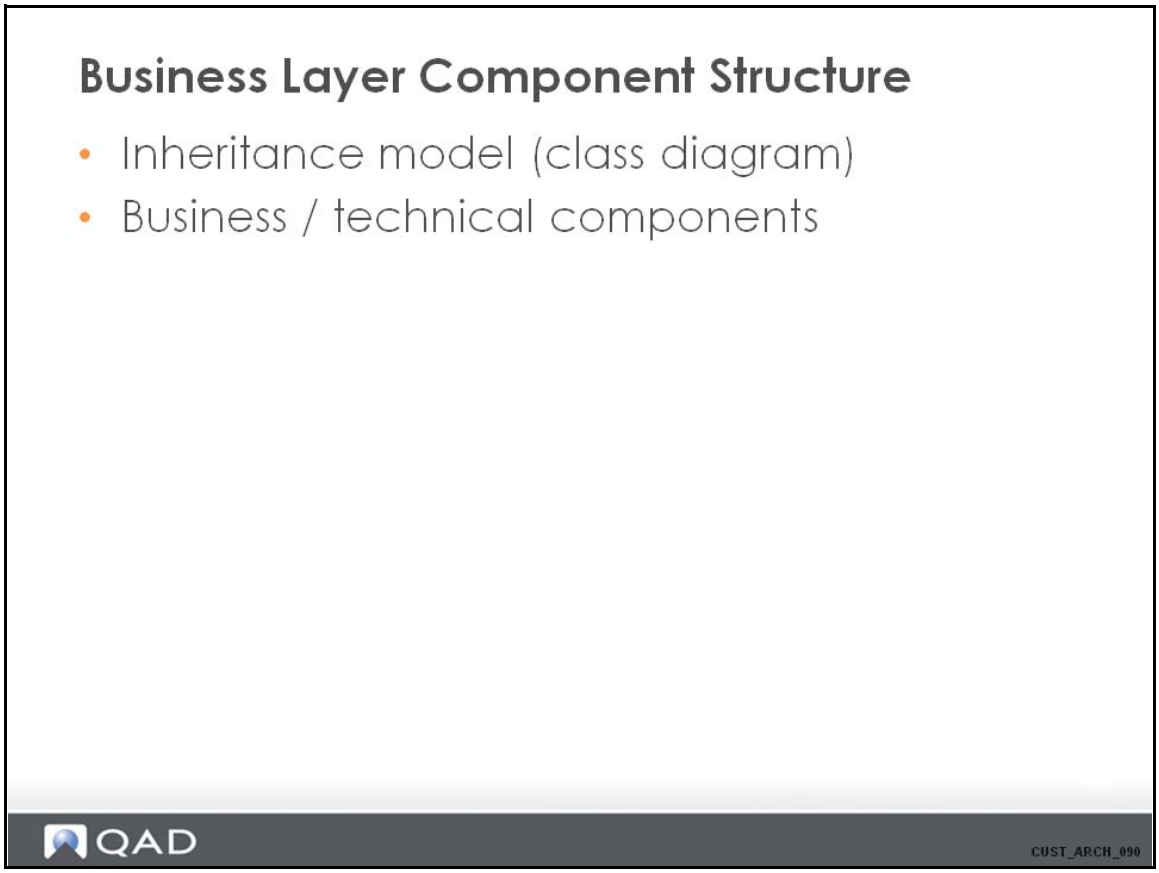
Application Layers 3



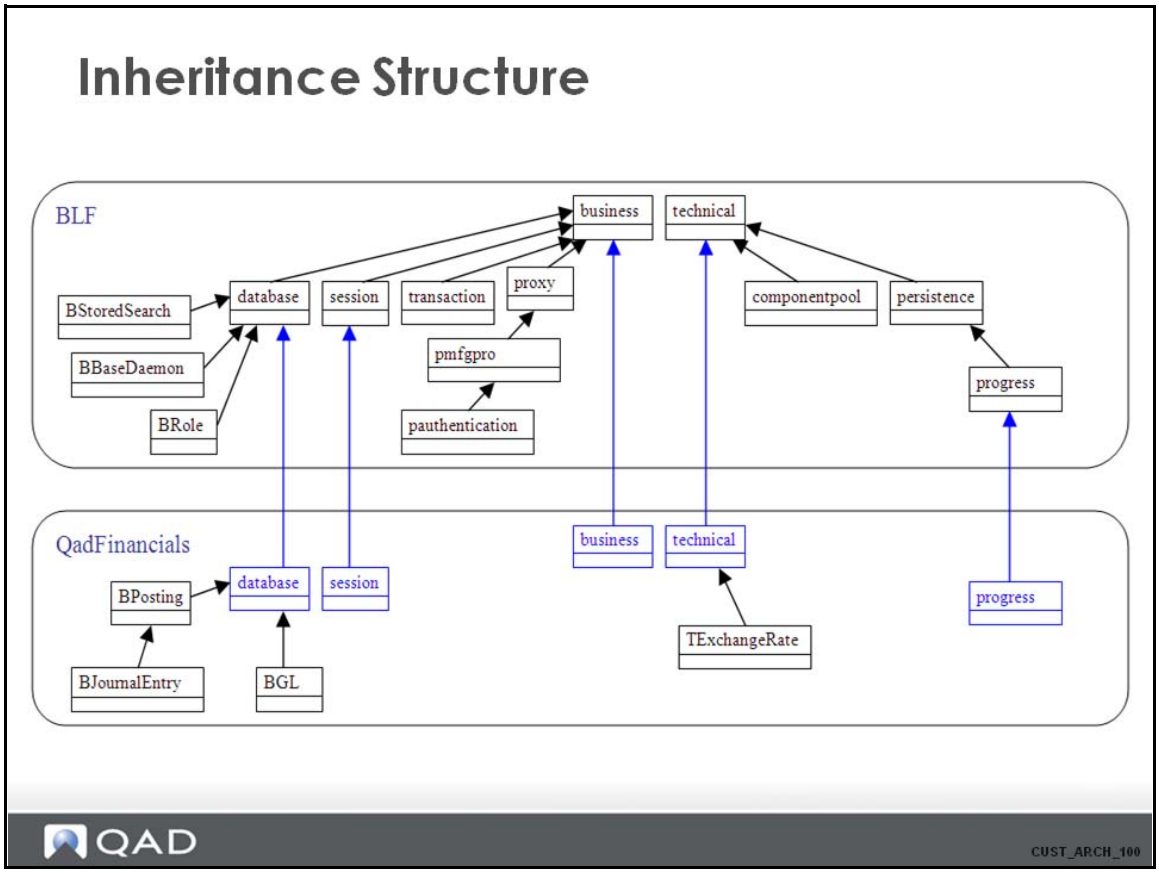
Application Layers 4



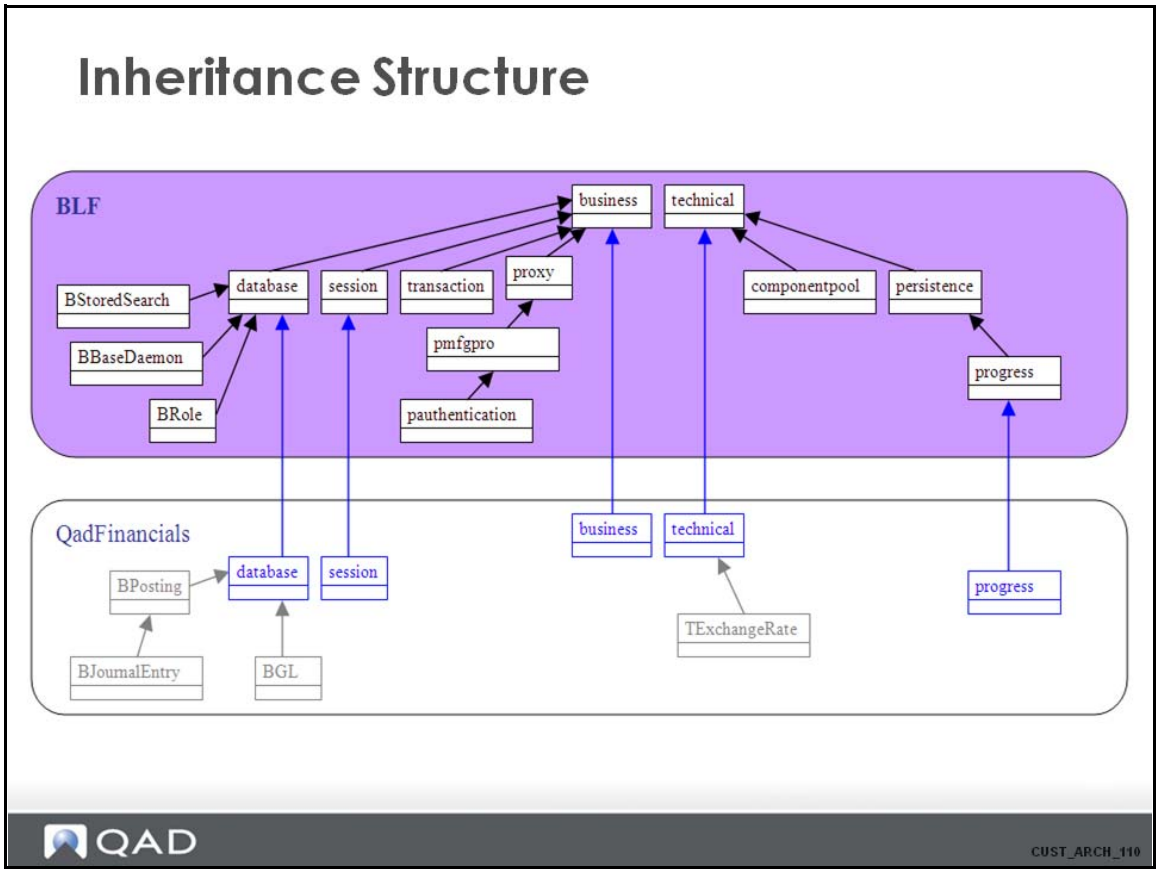
Business Layer Component Structure



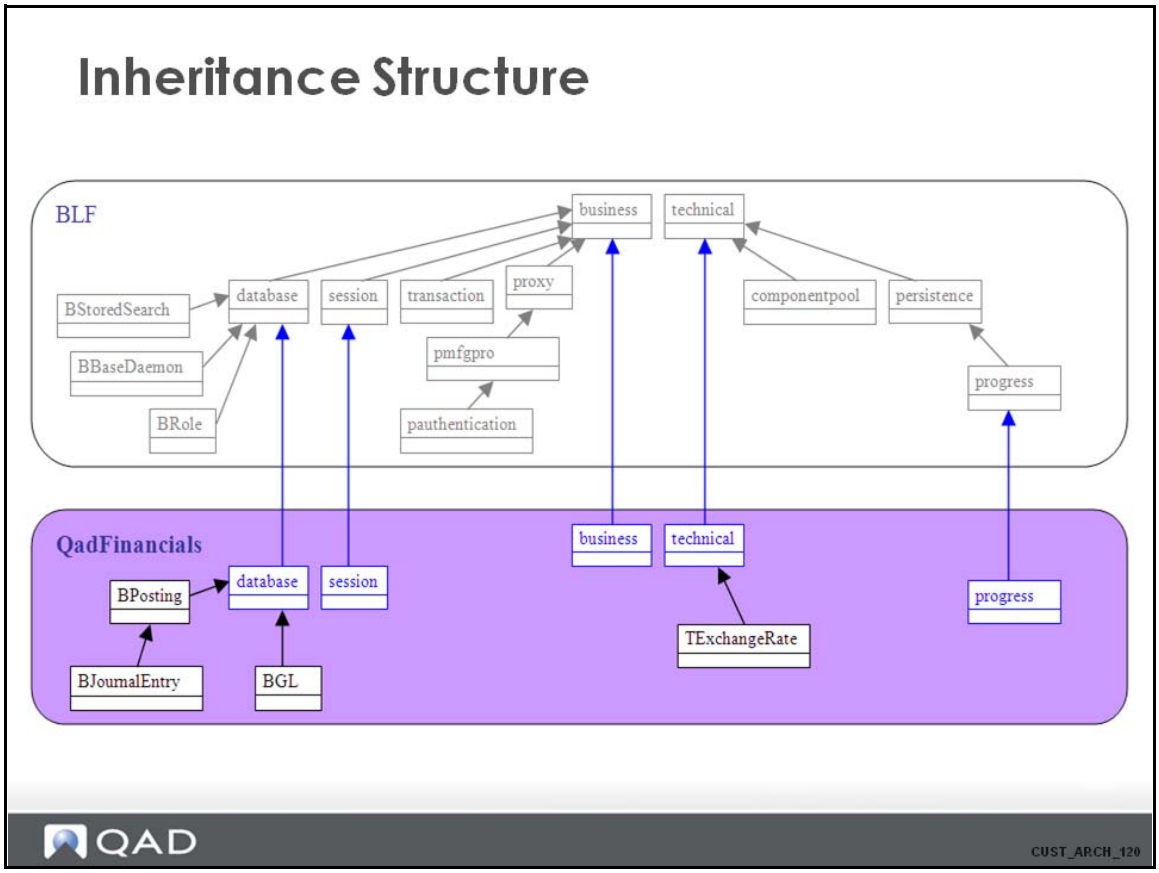
Inheritance Structure



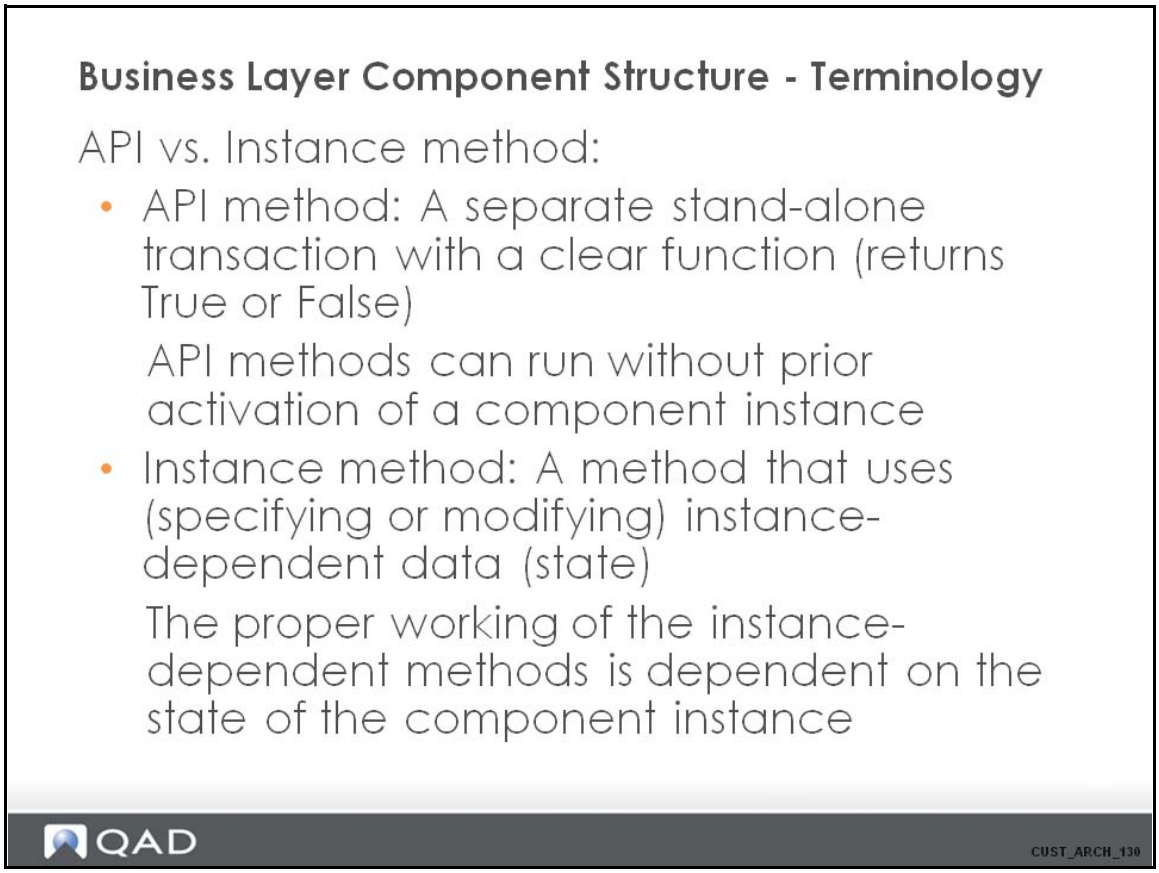
Inheritance Structure 2



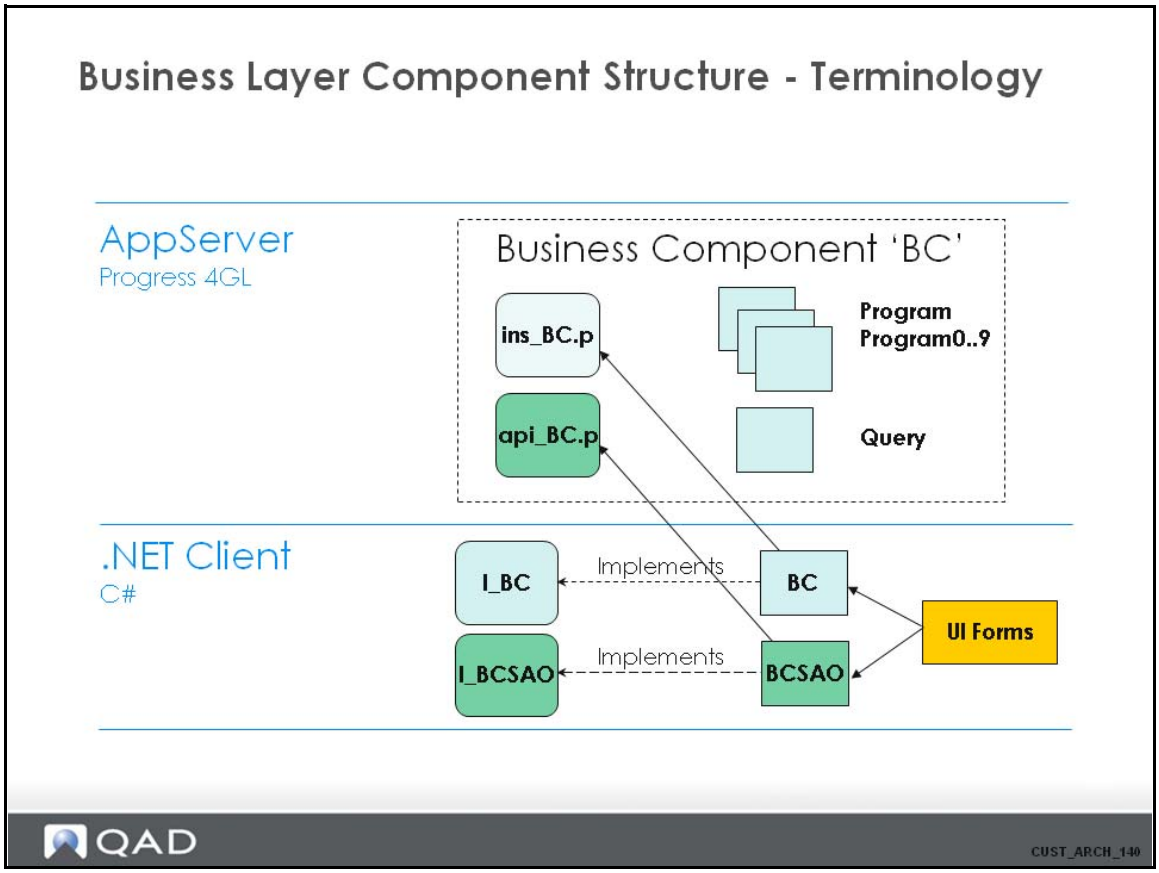
Inheritance Structure 3



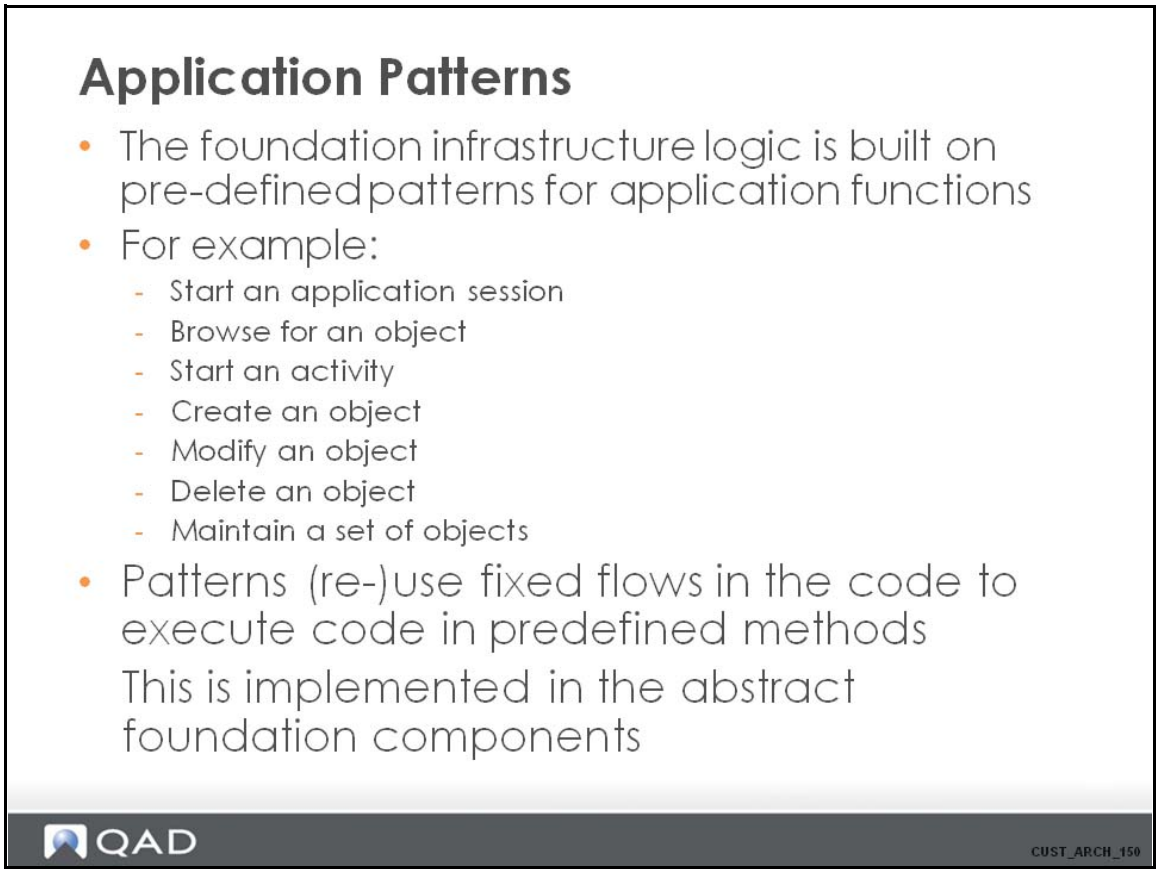
Business Layer Component Structure - Terminology



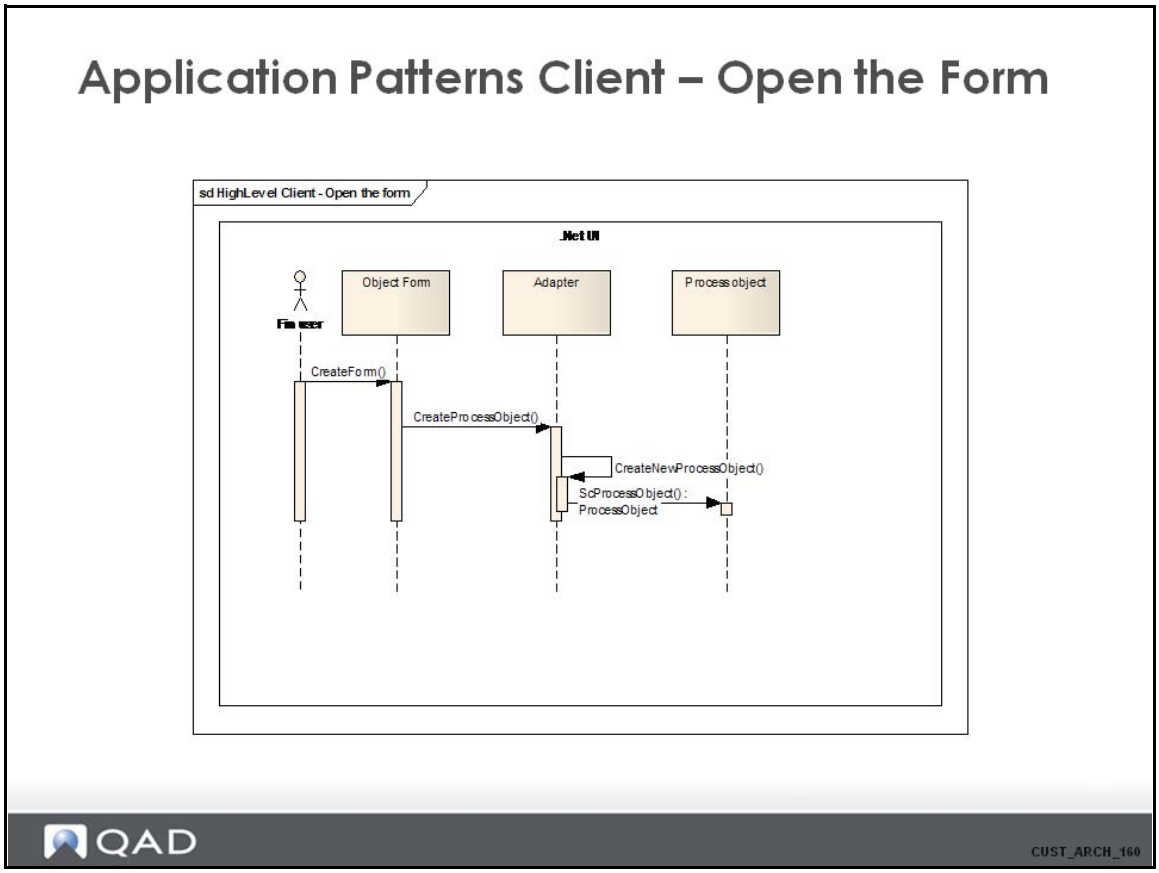
Business Layer Component Structure - Terminology 2



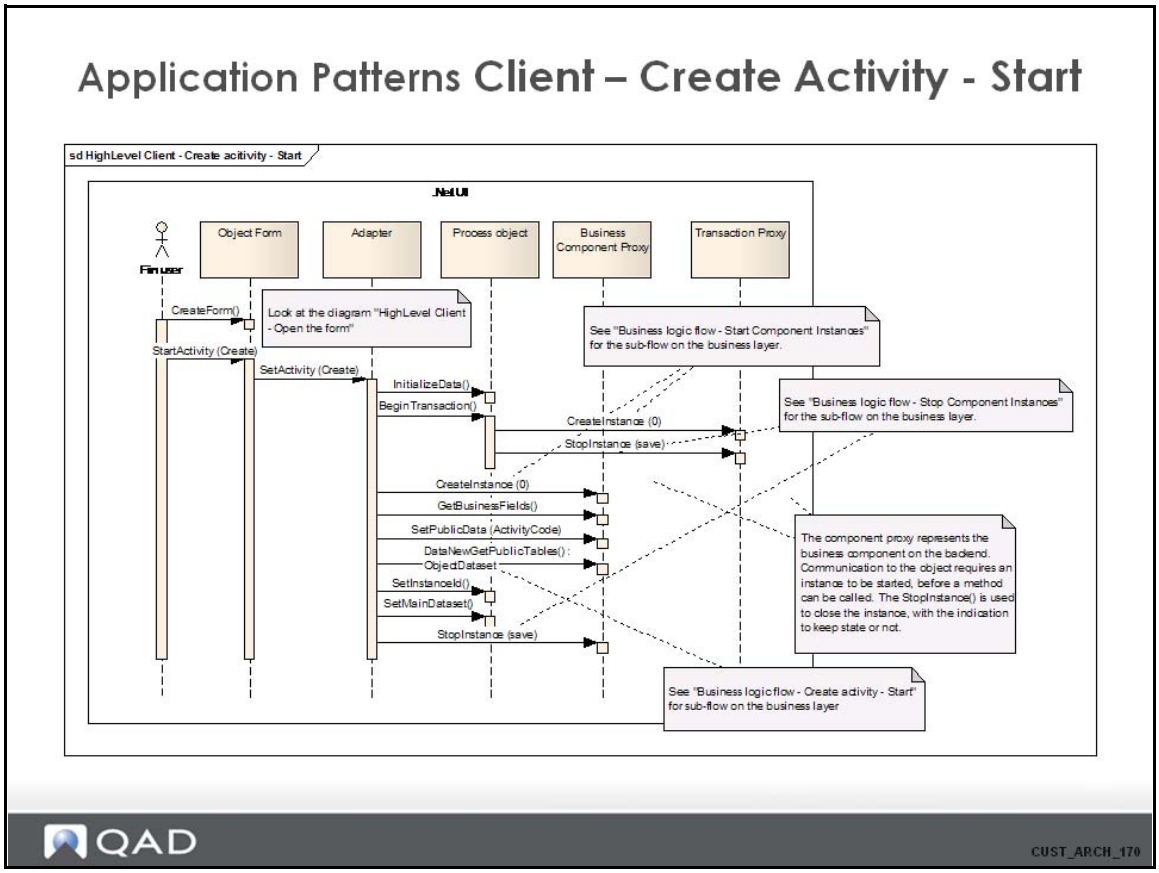
Application Patterns Overview



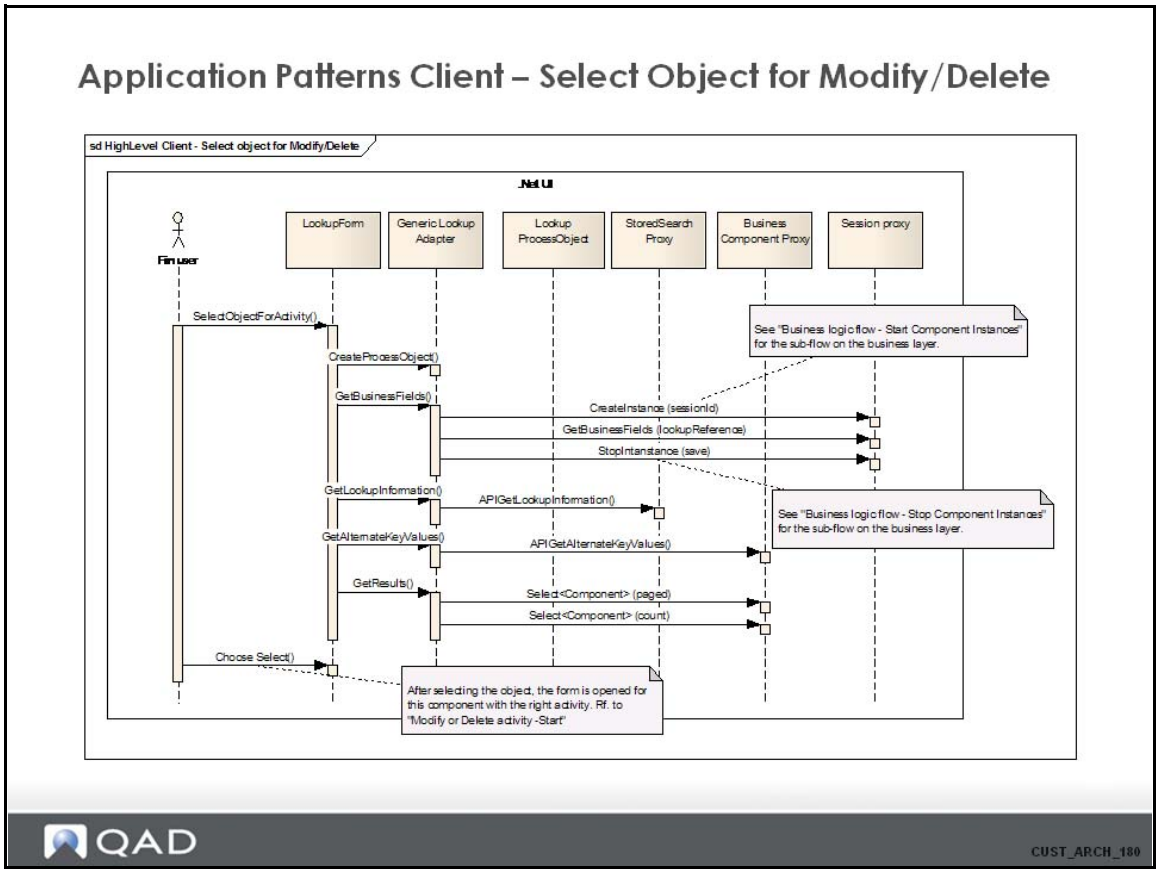
Application Patterns Client



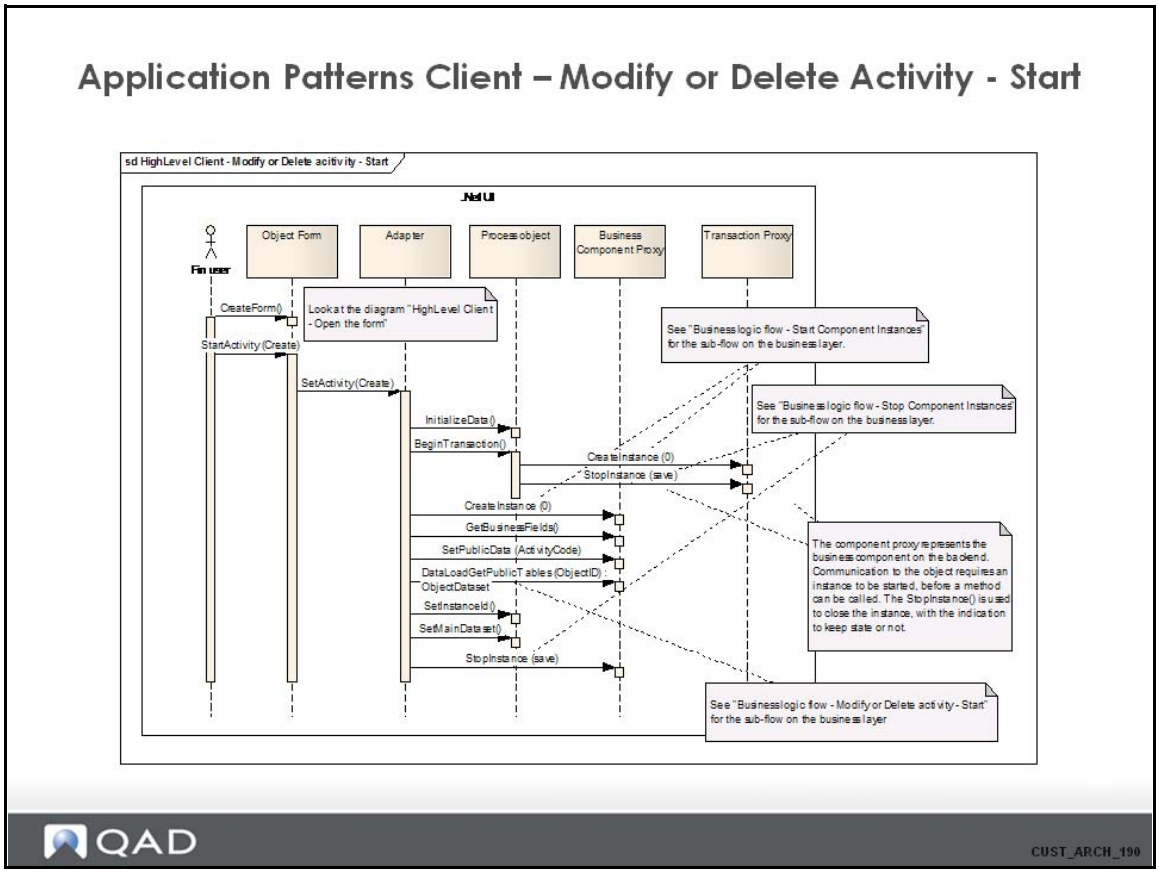
Application Patterns Client 2



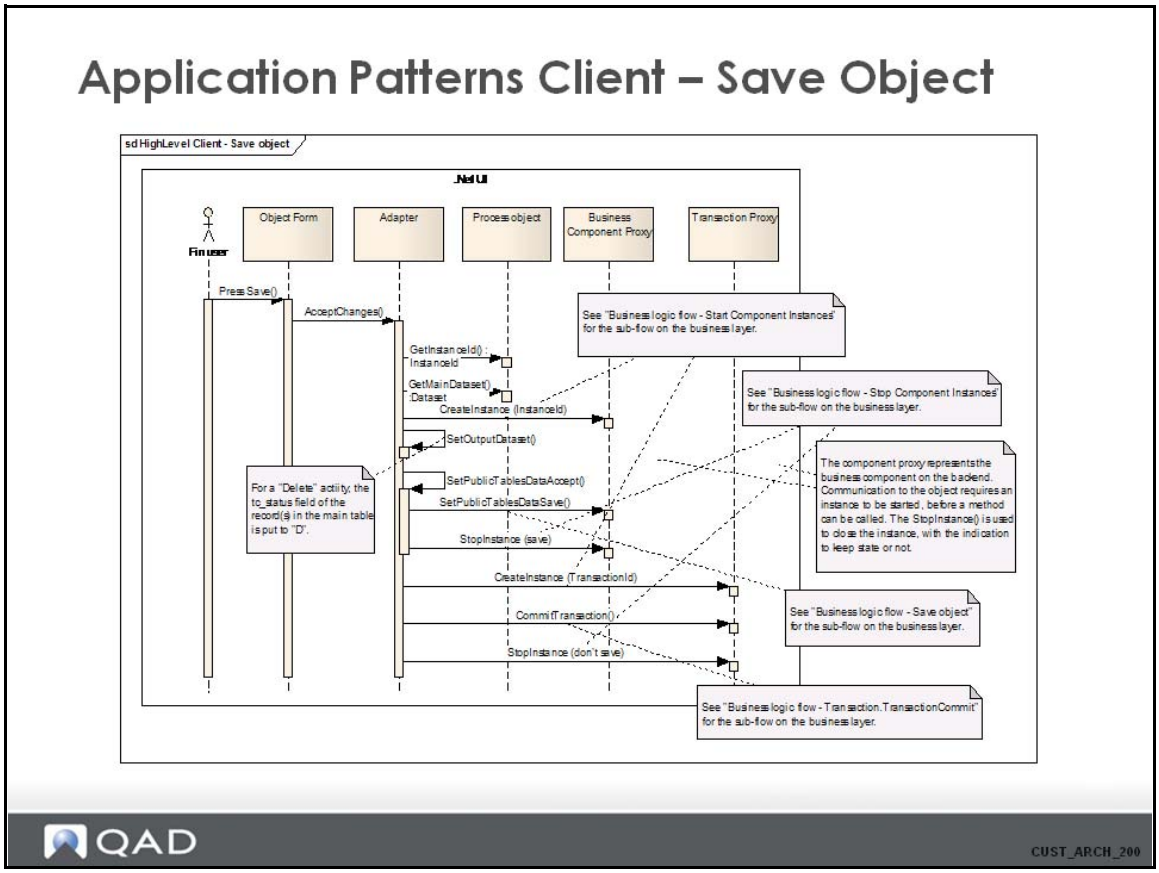
Application Patterns Client 3



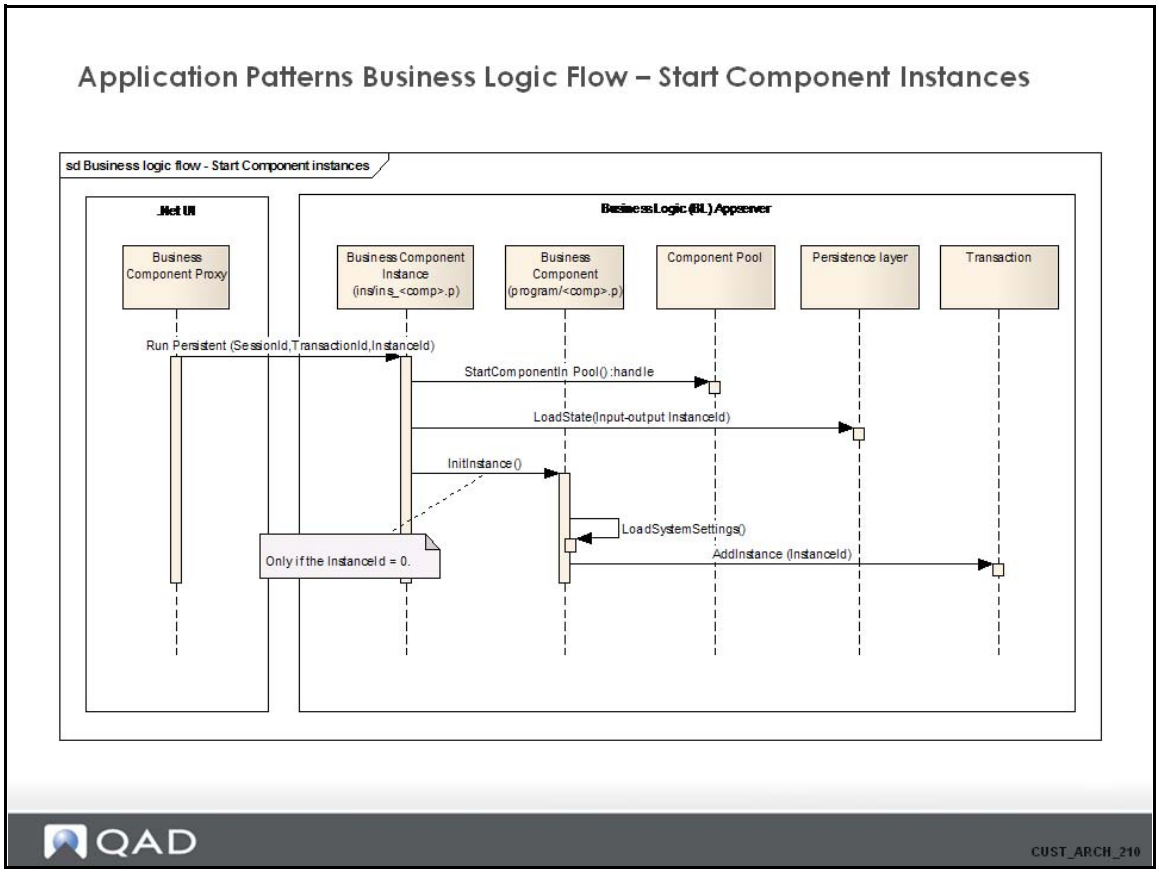
Application Patterns Client 4



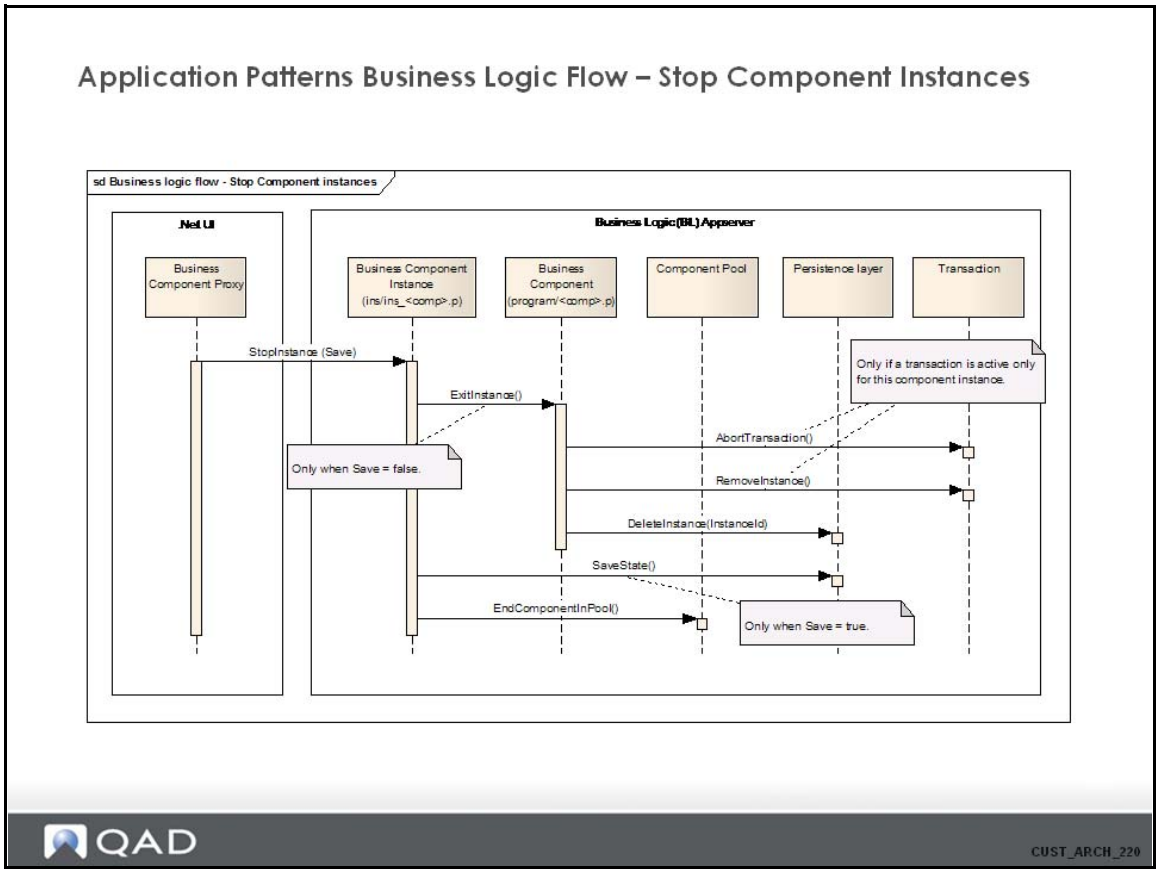
Application Patterns Client 5



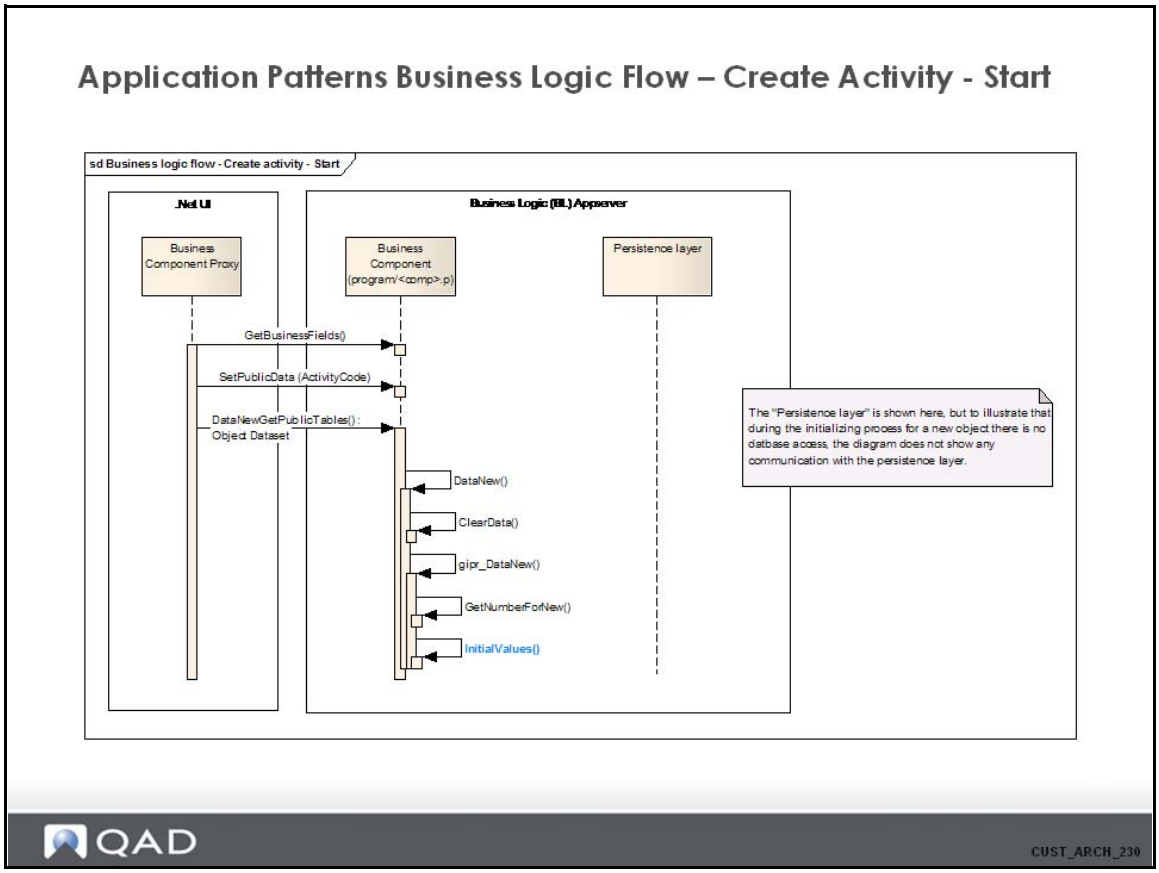
Application Patterns Business Logic Flow



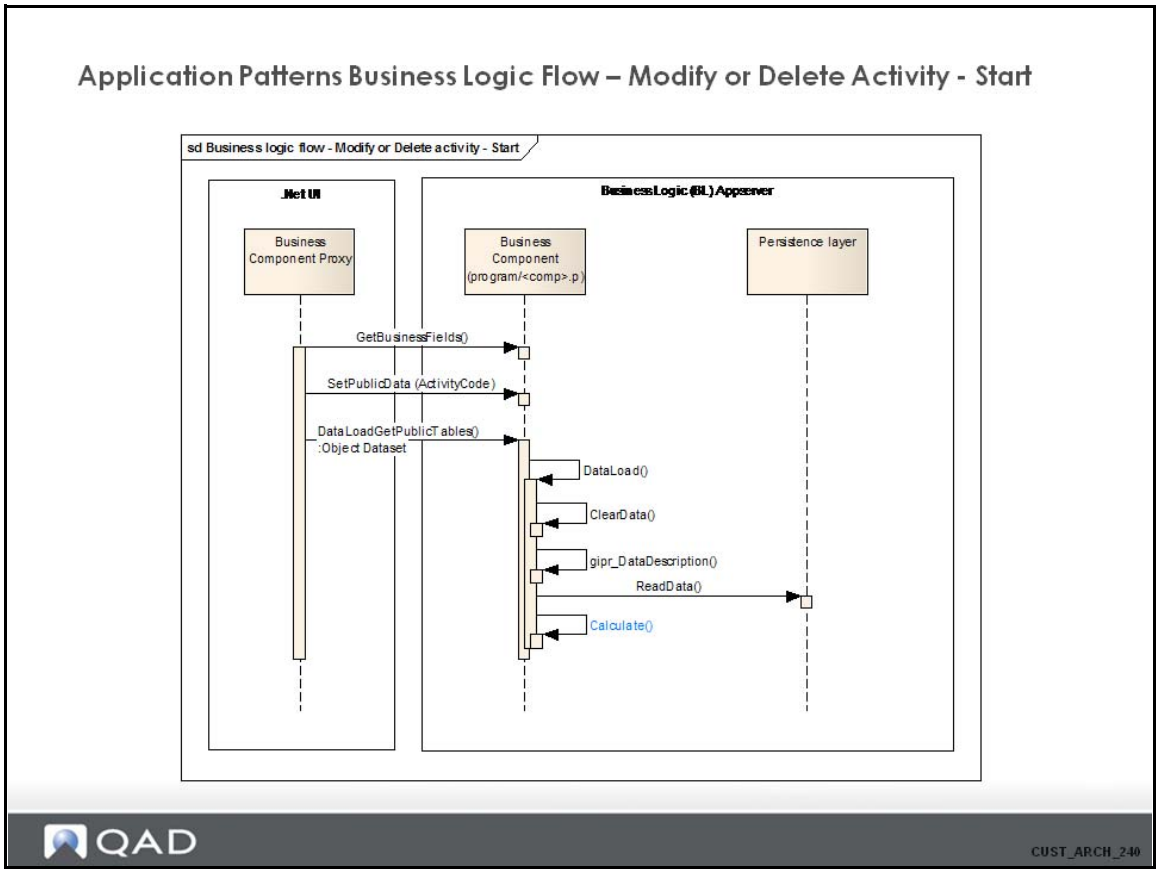
Application Patterns Business Logic Flow 2



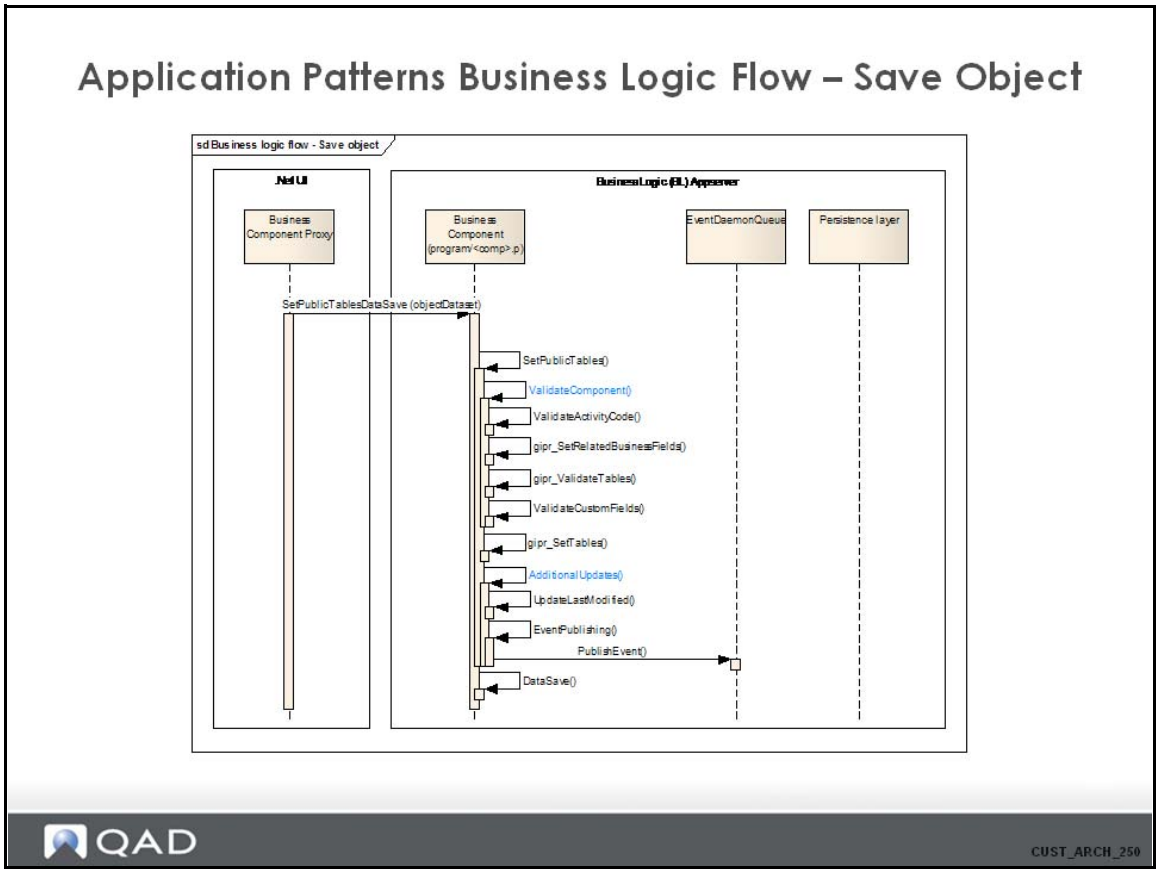
Application Patterns Business Logic Flow 3



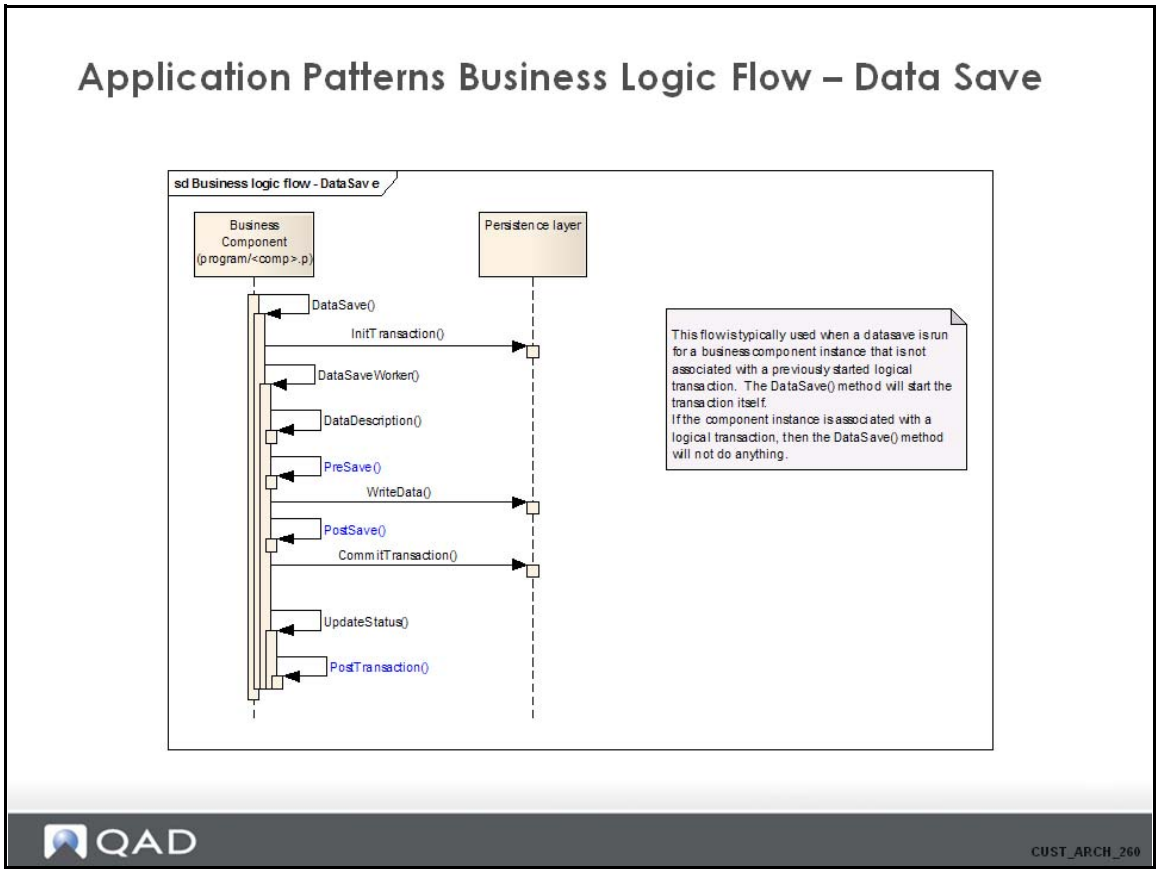
Application Patterns Business Logic Flow 4



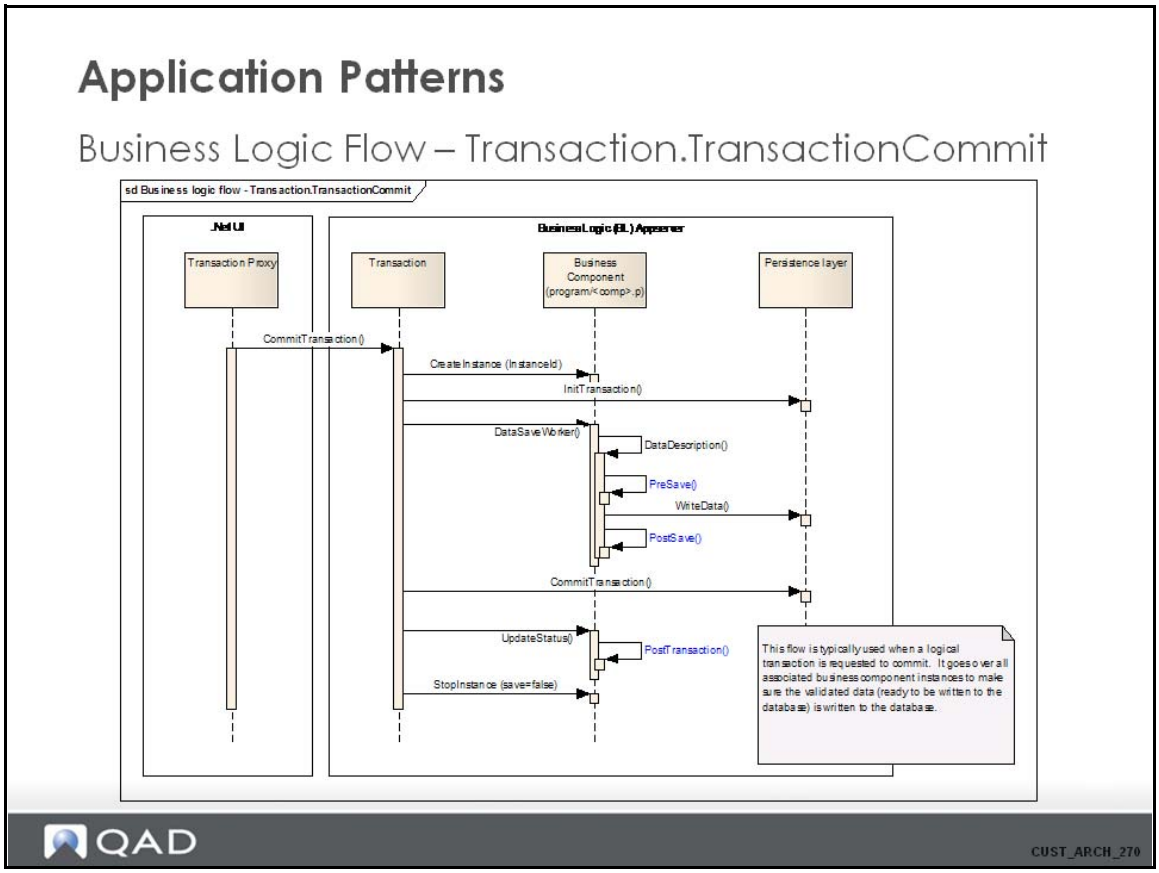
Application Patterns Business Logic Flow 5



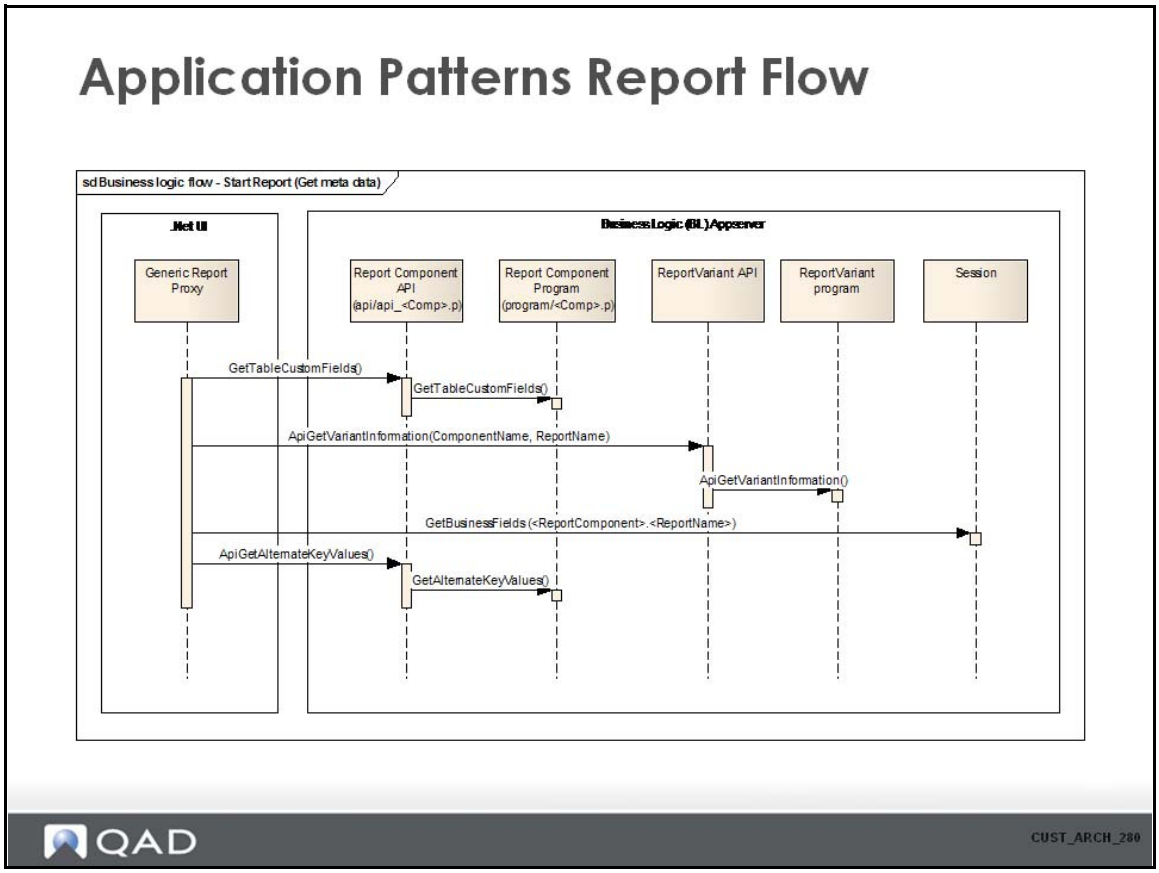
Application Patterns Business Logic Flow 6



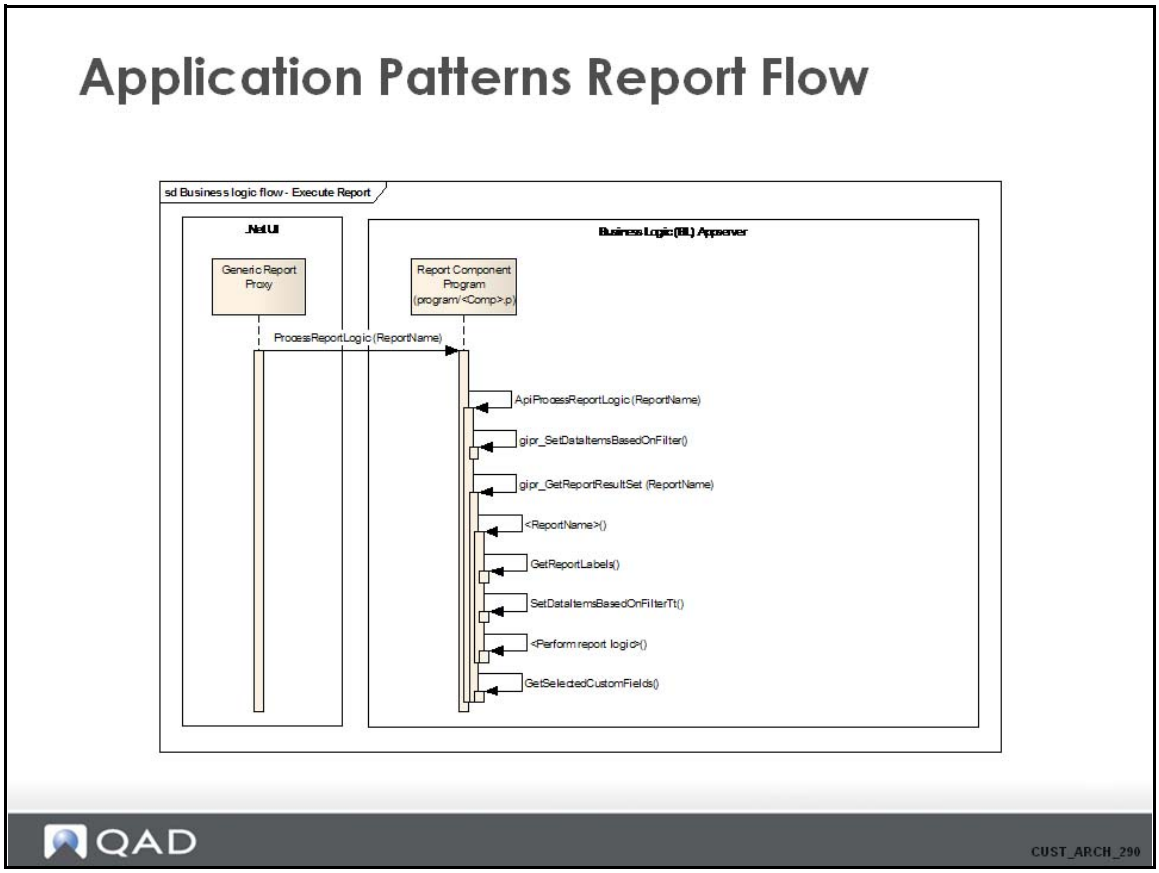
Application Patterns Business Logic Flow 7



Application Patterns Report Flow



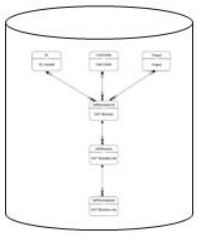
Application Patterns Report Flow 2



Data Handling - Datasets

Data Handling - Datasets

- Widely used in the Financials application layers to keep and manage data
- Imagine a small database in memory
  - A dataset contains one or more temp-tables
  - temp-tables in a dataset are related
  - temp-tables in a dataset can have indexes, and can have constraints defined

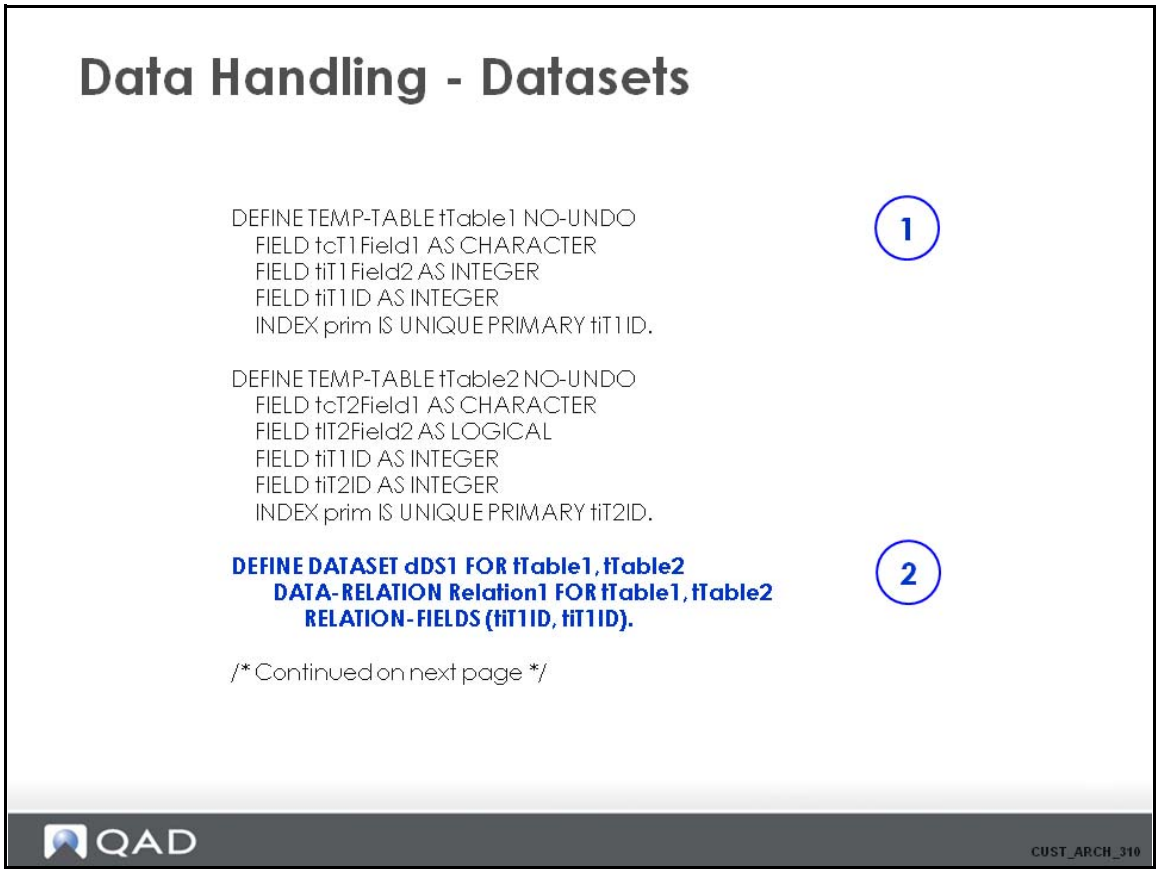


- A dataset can be passed as a parameter to a procedure
- A dataset can easily be serialized to XML format
- A Progress dataset matches a .NET dataset

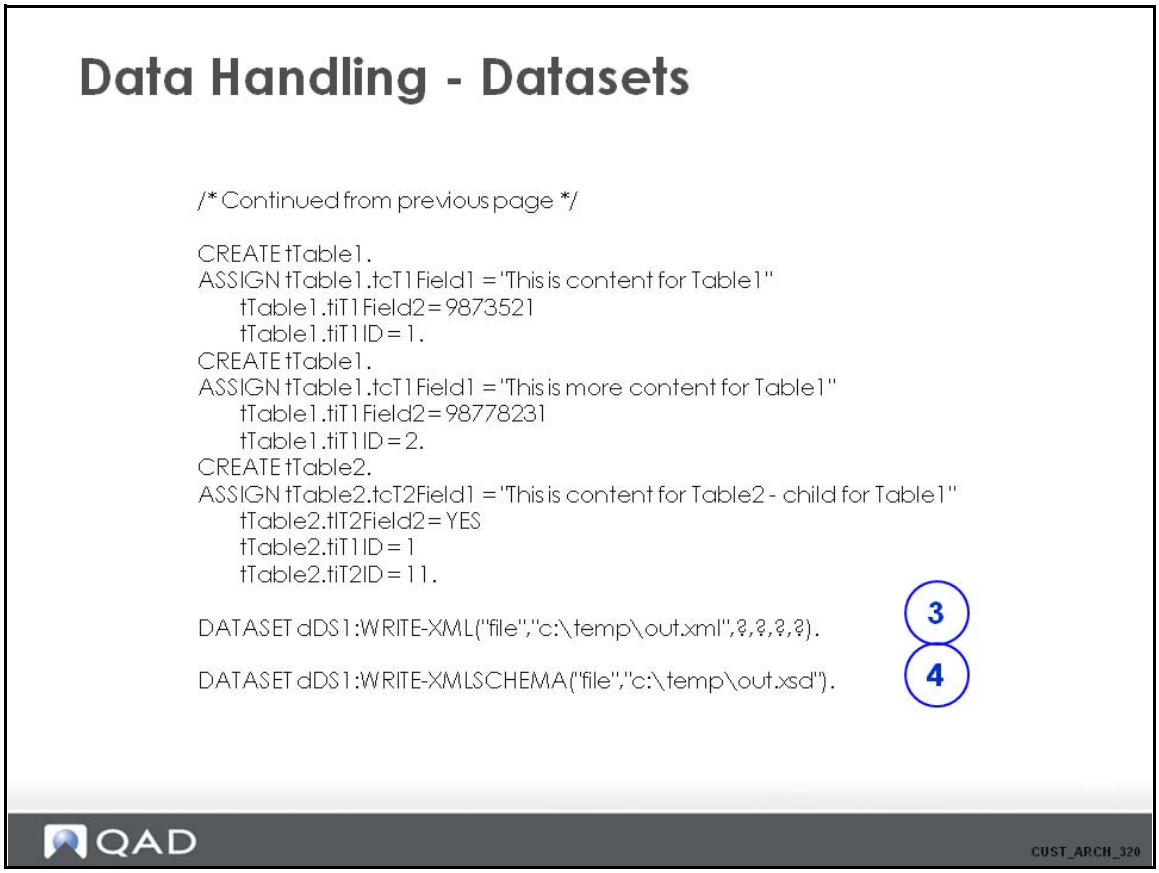
QAD

CUST_ARCH_300

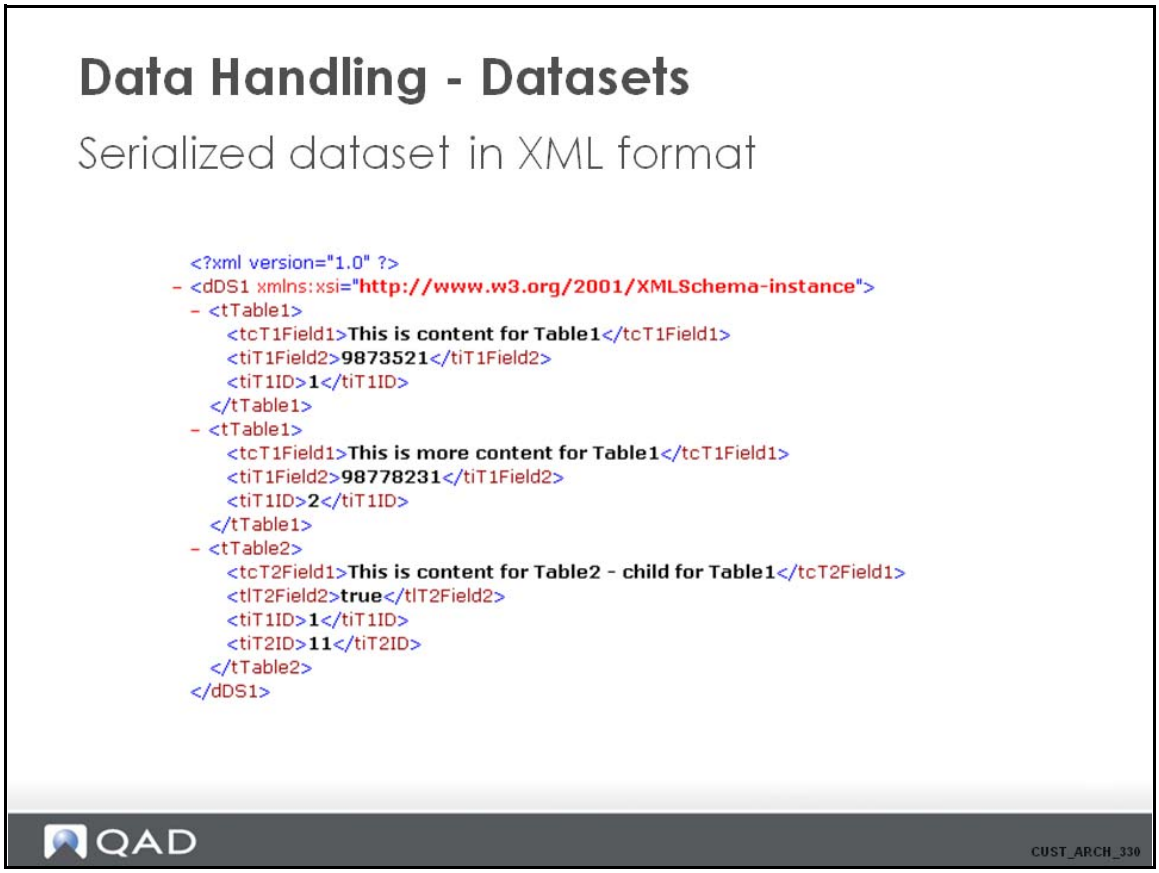
Data Handling - Datasets 2



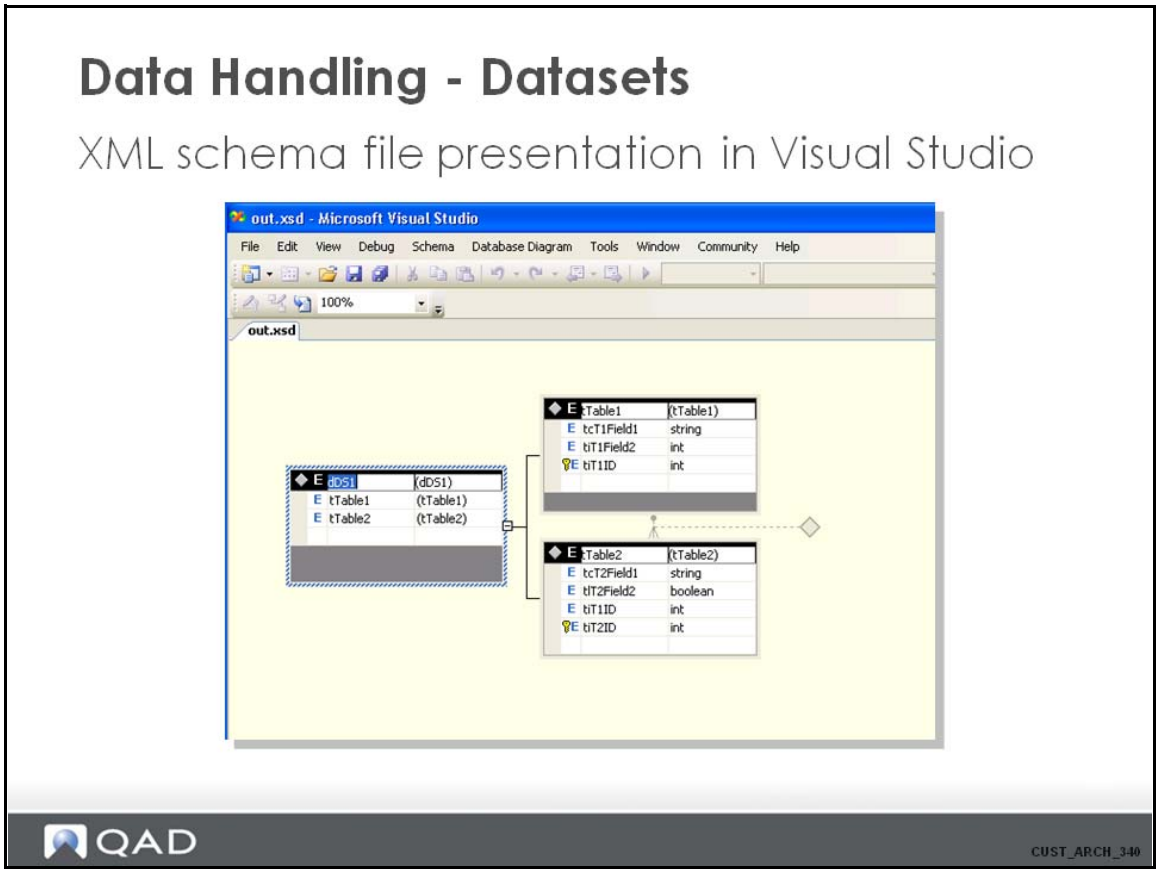
Data Handling - Datasets 3



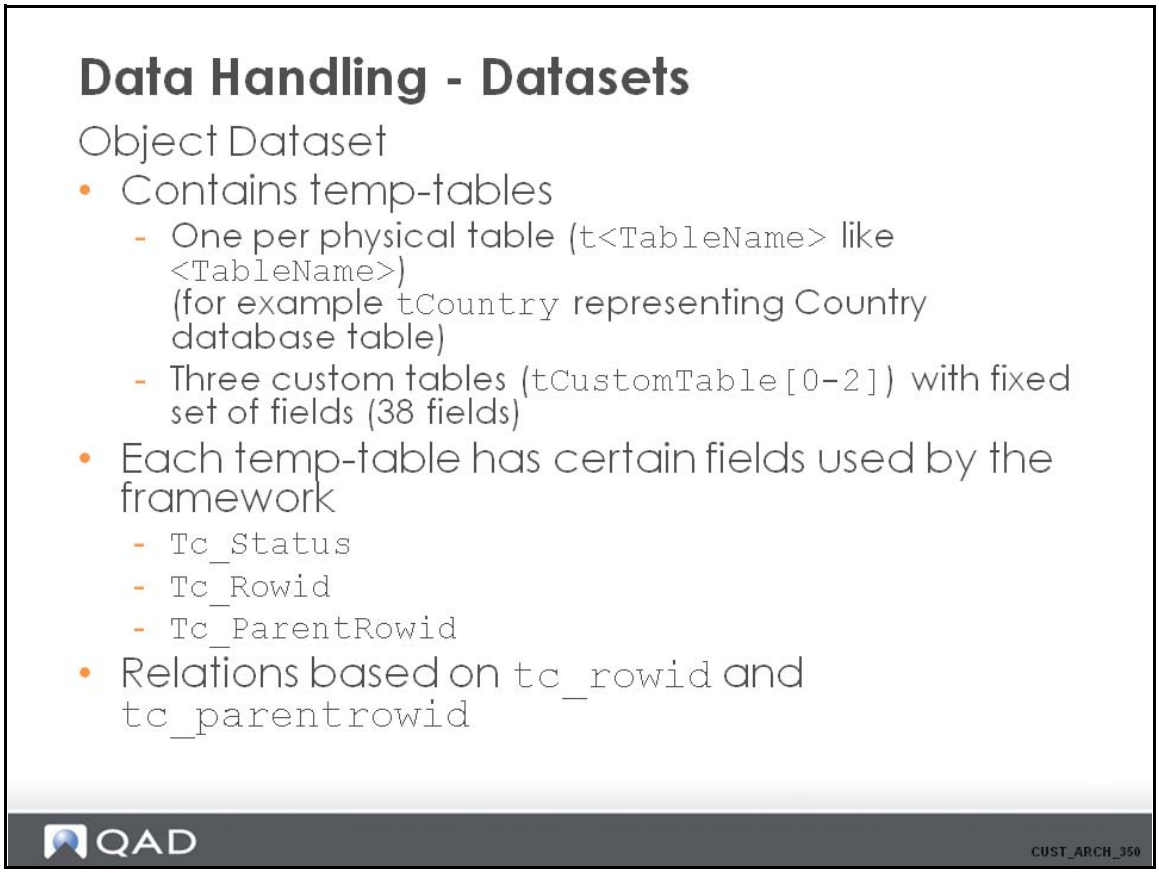
Data Handling - Datasets 4



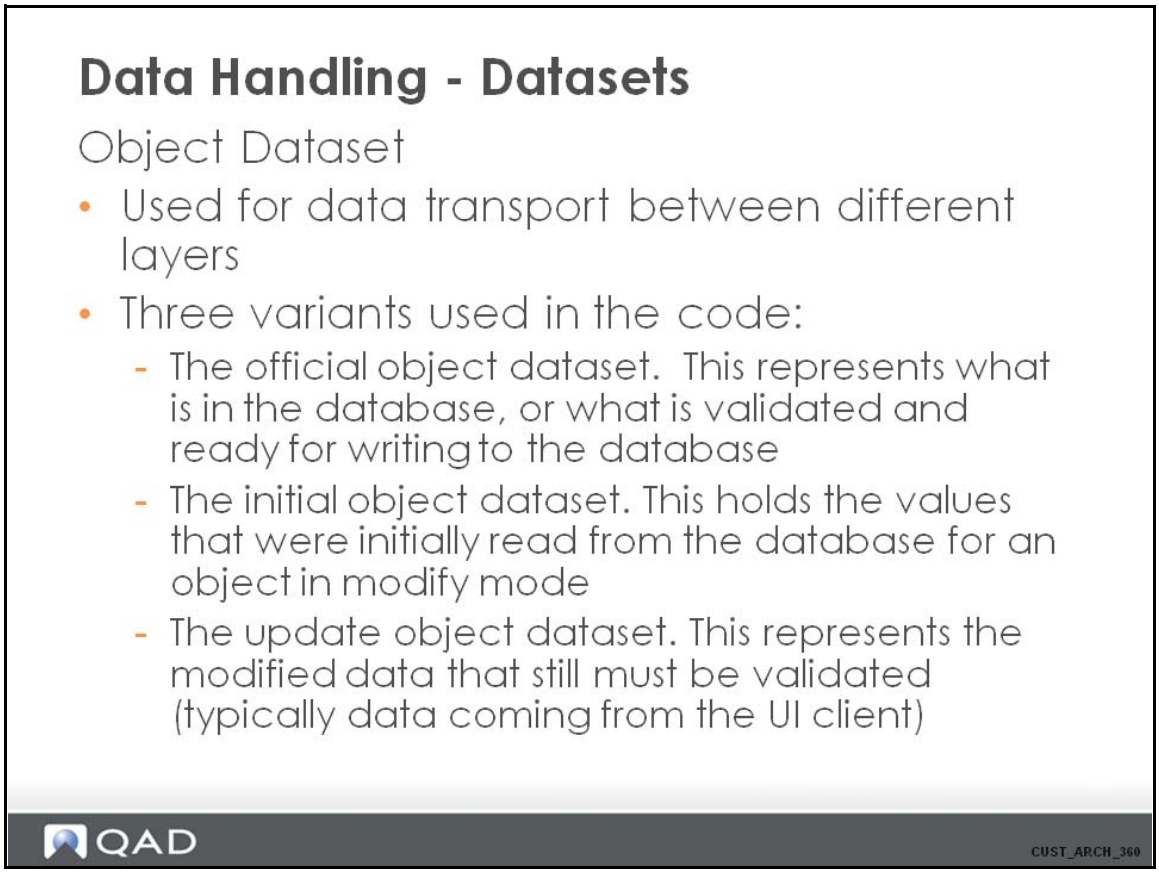
Data Handling - Datasets 5



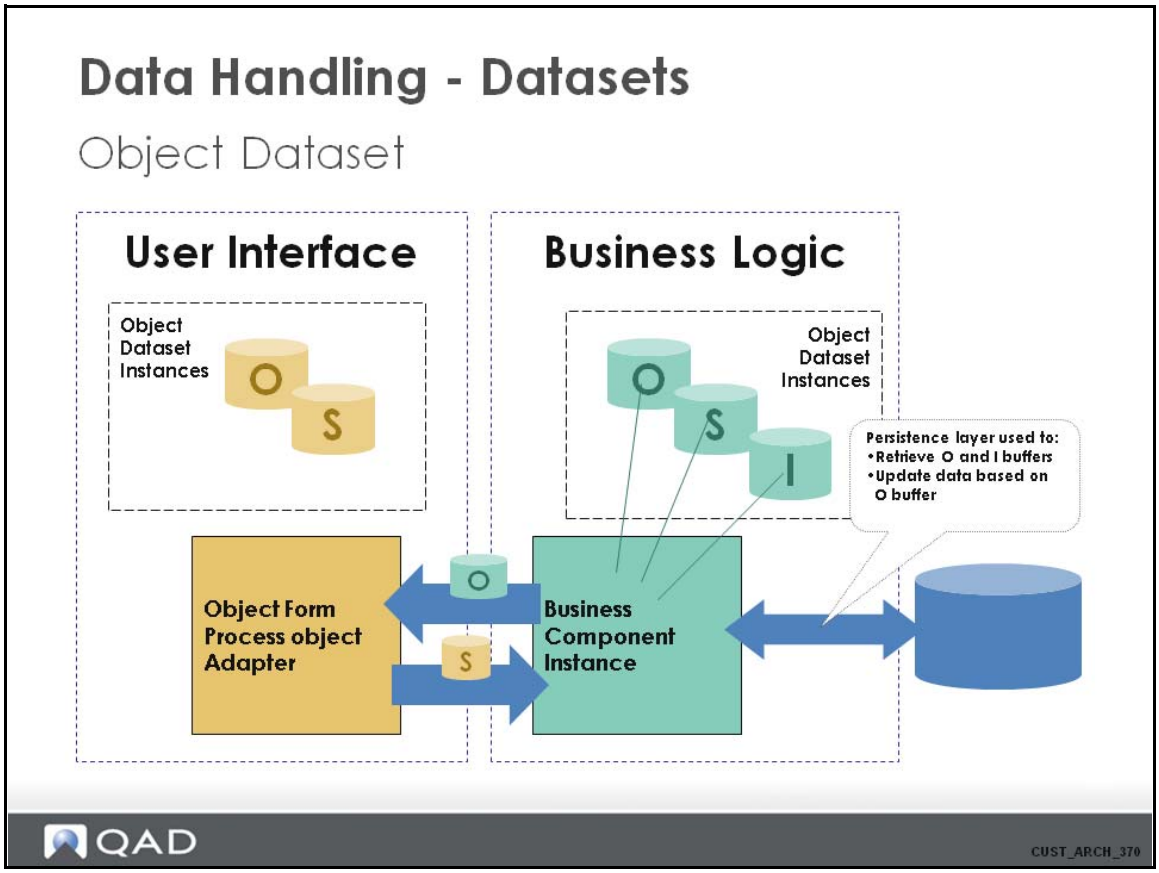
Data Handling - Datasets 6



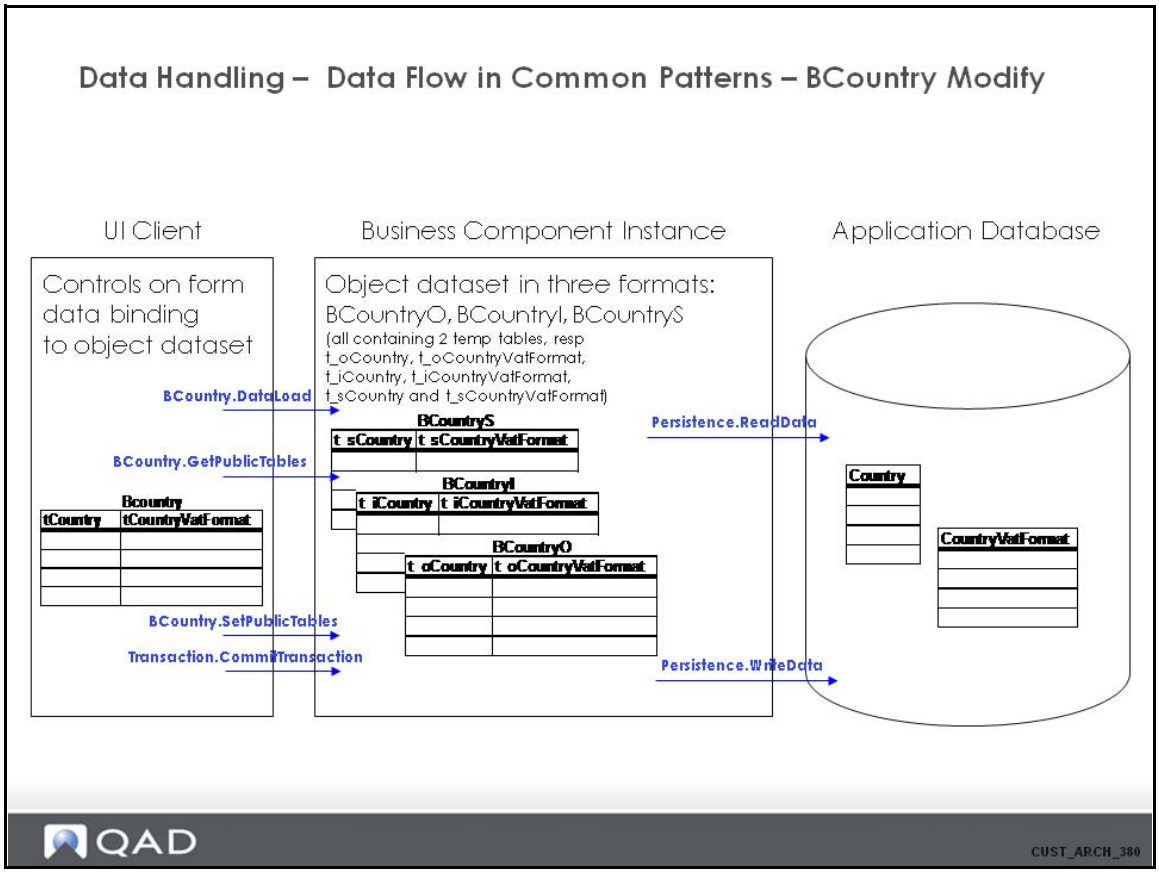
Data Handling - Datasets 7



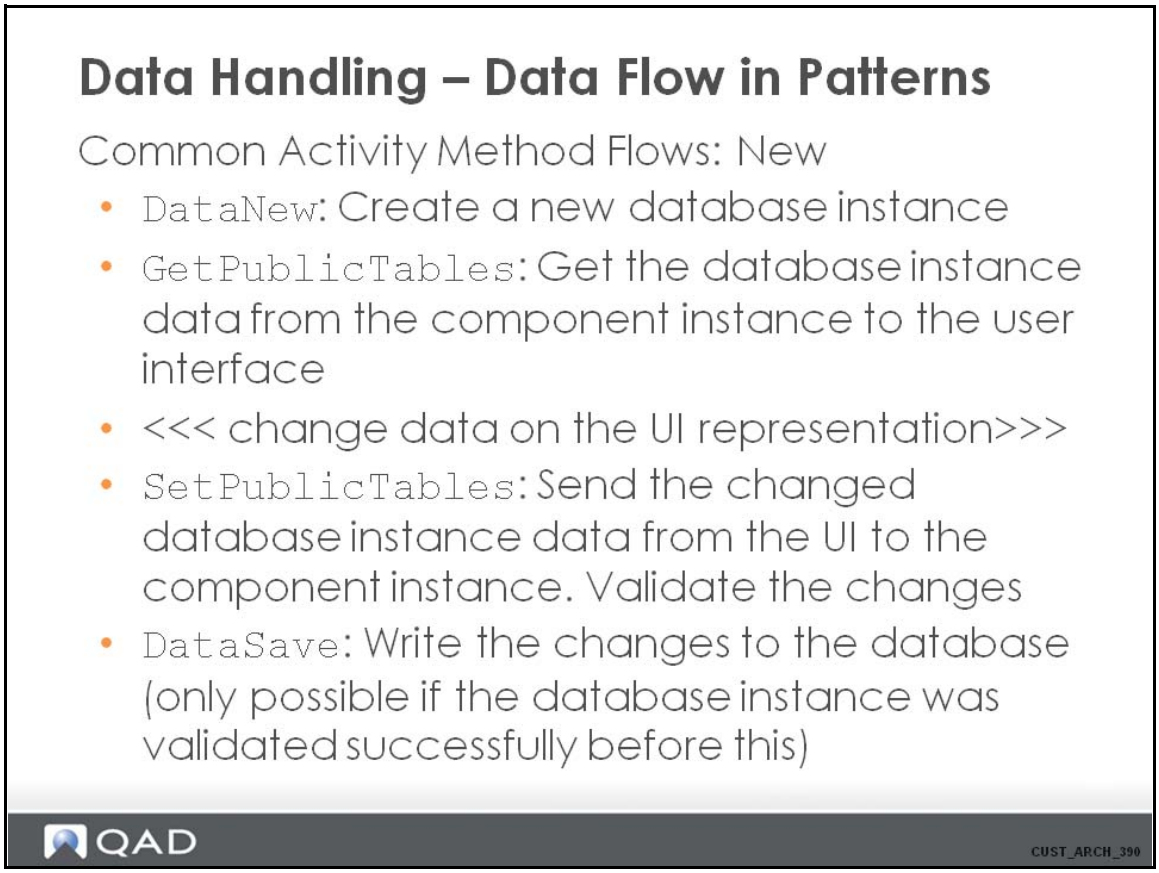
Data Handling - Datasets 8



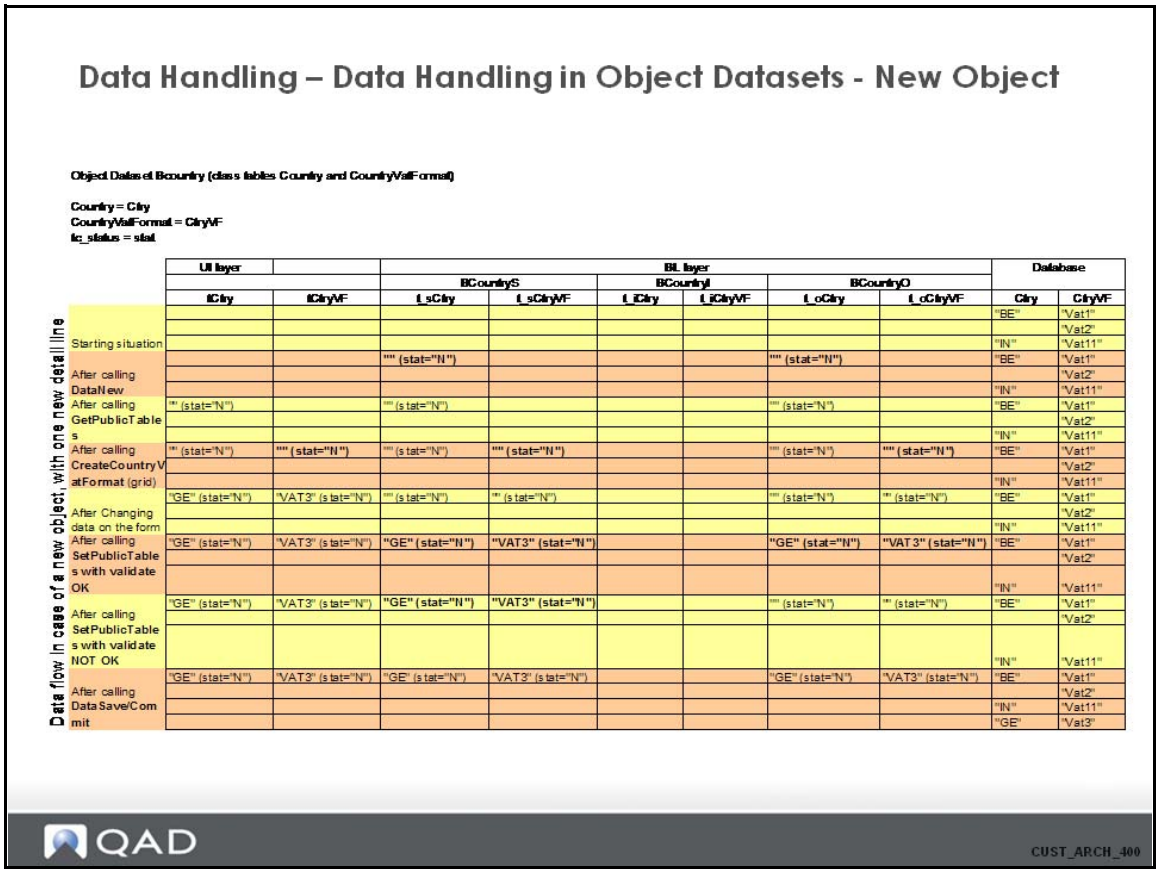
Data Handling - Data Flow In Common Patterns



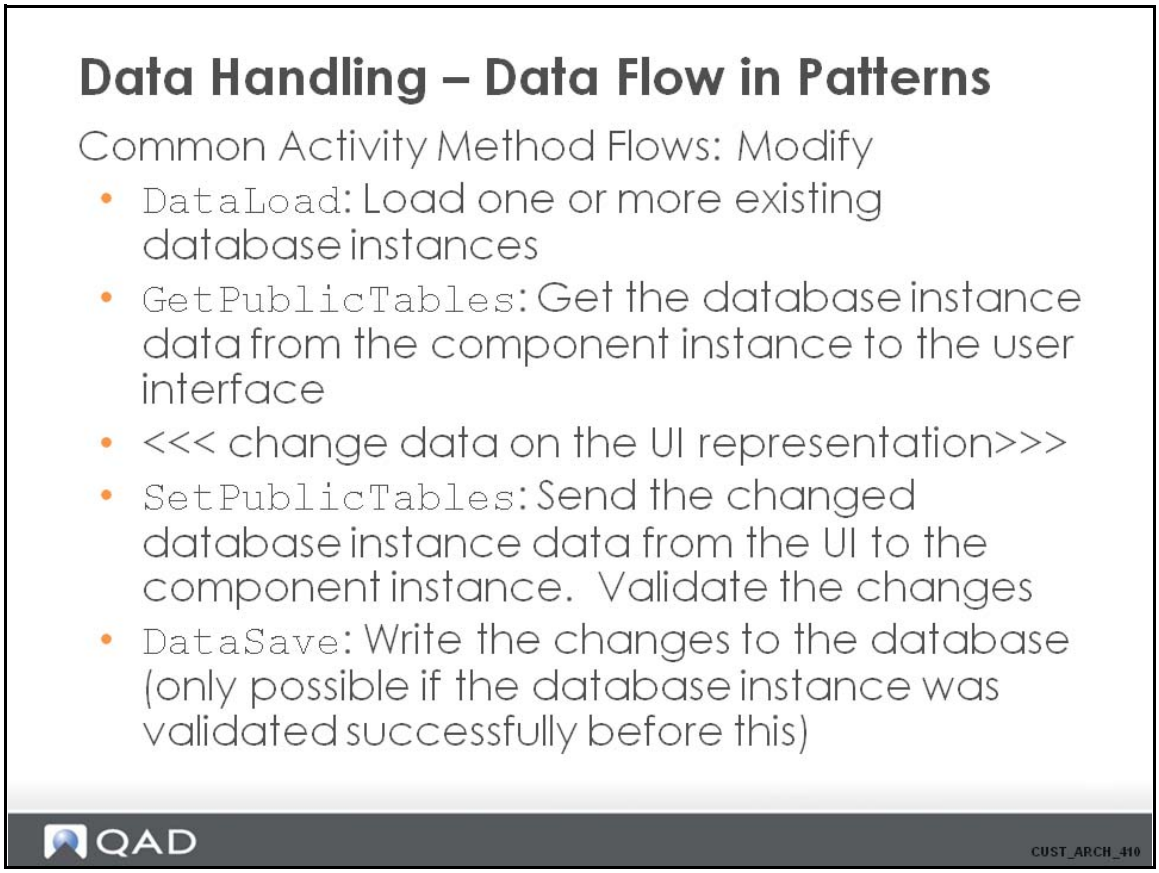
Data Handling - Data Flow in Patterns



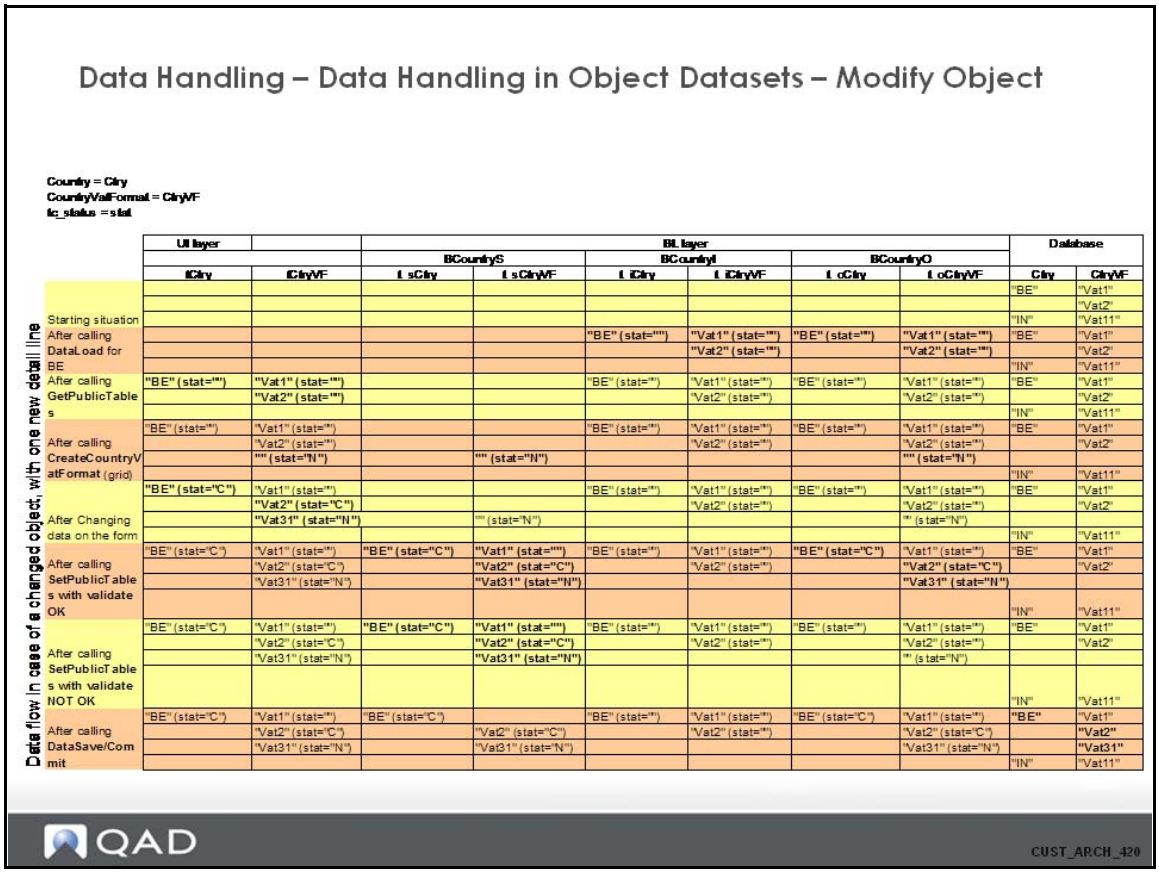
Data Handling - Data Handling in Object Datasets - New Object



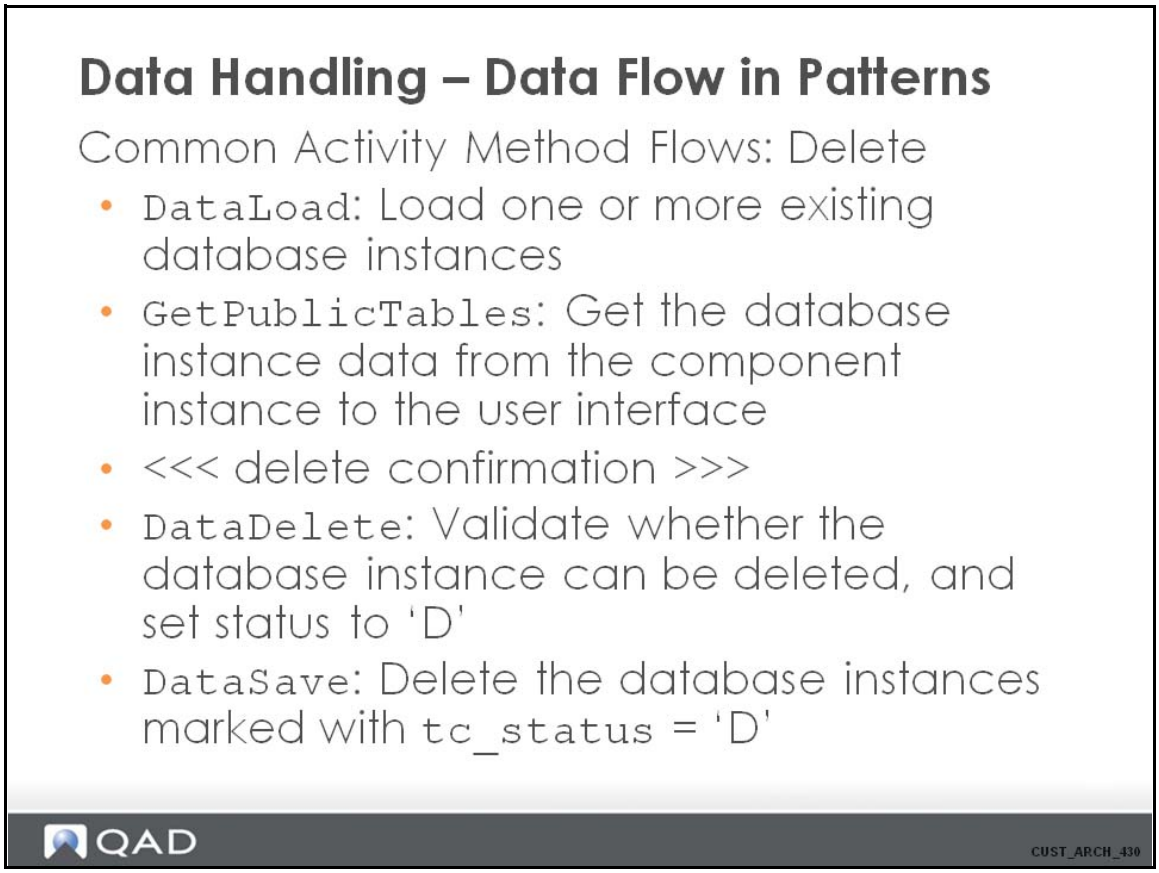
Data Handling - Data Flow in Patterns



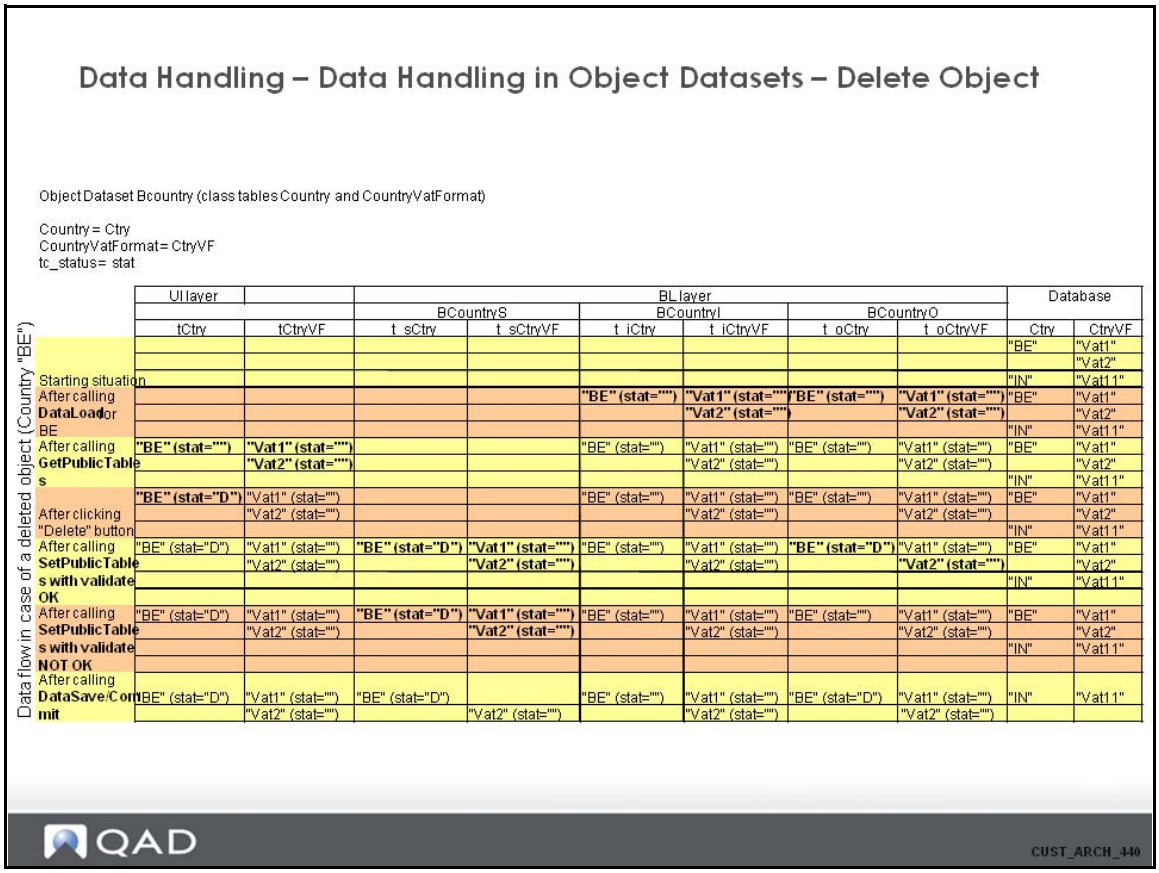
Data Handling - Data Handling in Object Datasets - Modify Object



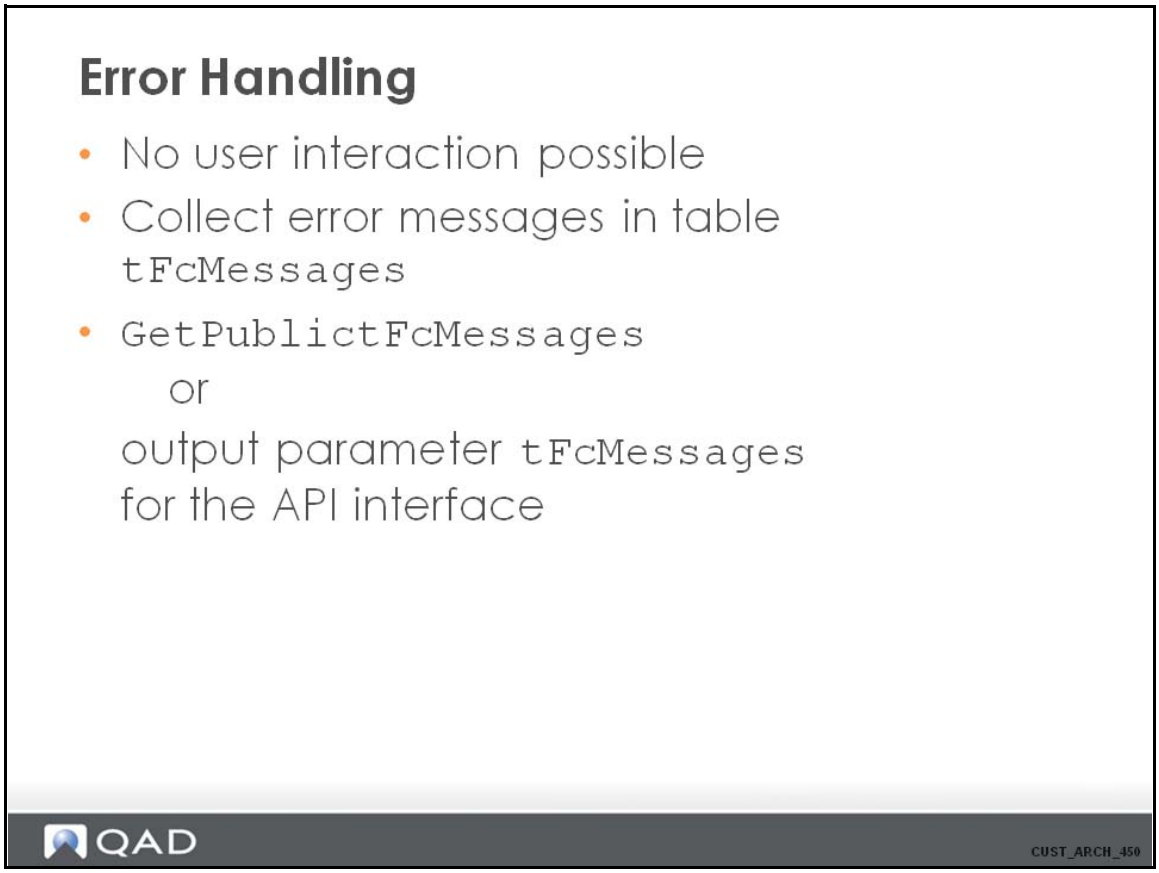
Data Handling - Data Flow in Patterns



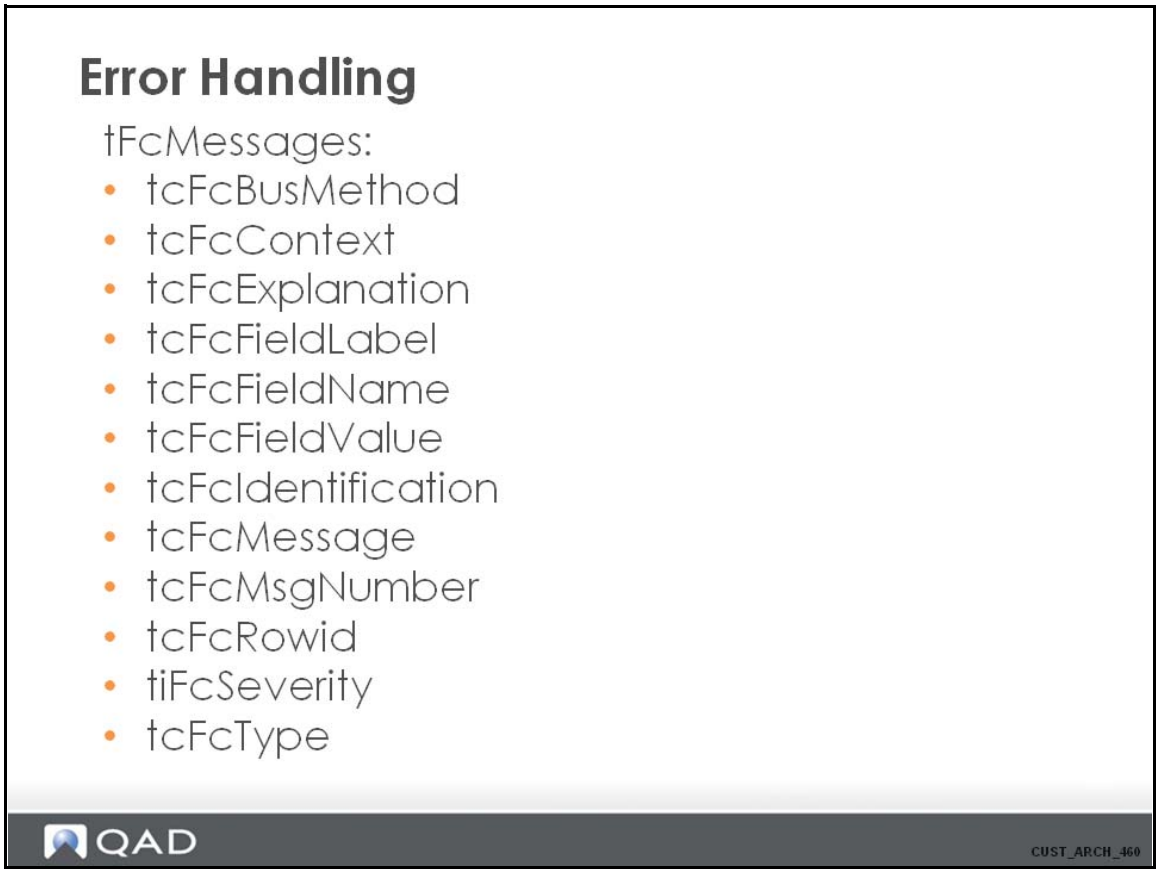
Data Handling - Data Handling in Object Datasets - Delete Objects



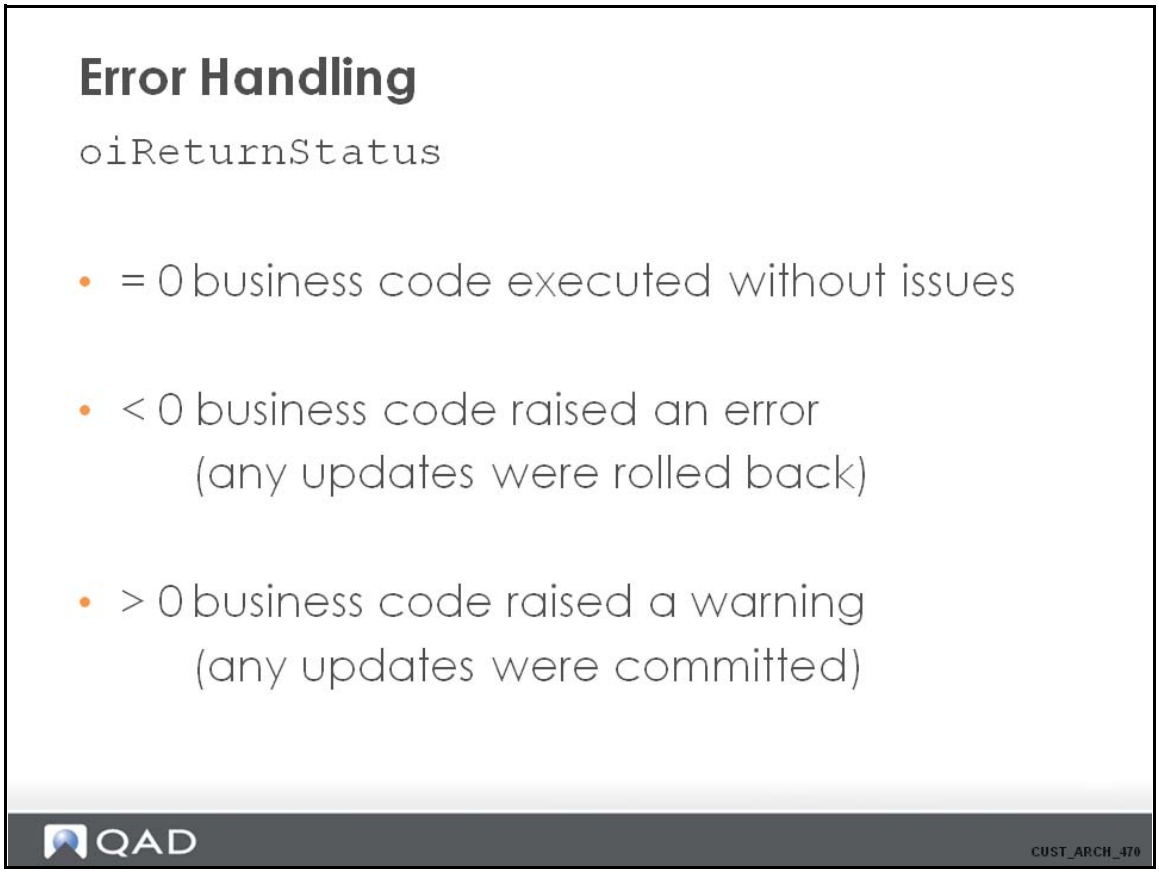
Error Handling



Error Handling 2



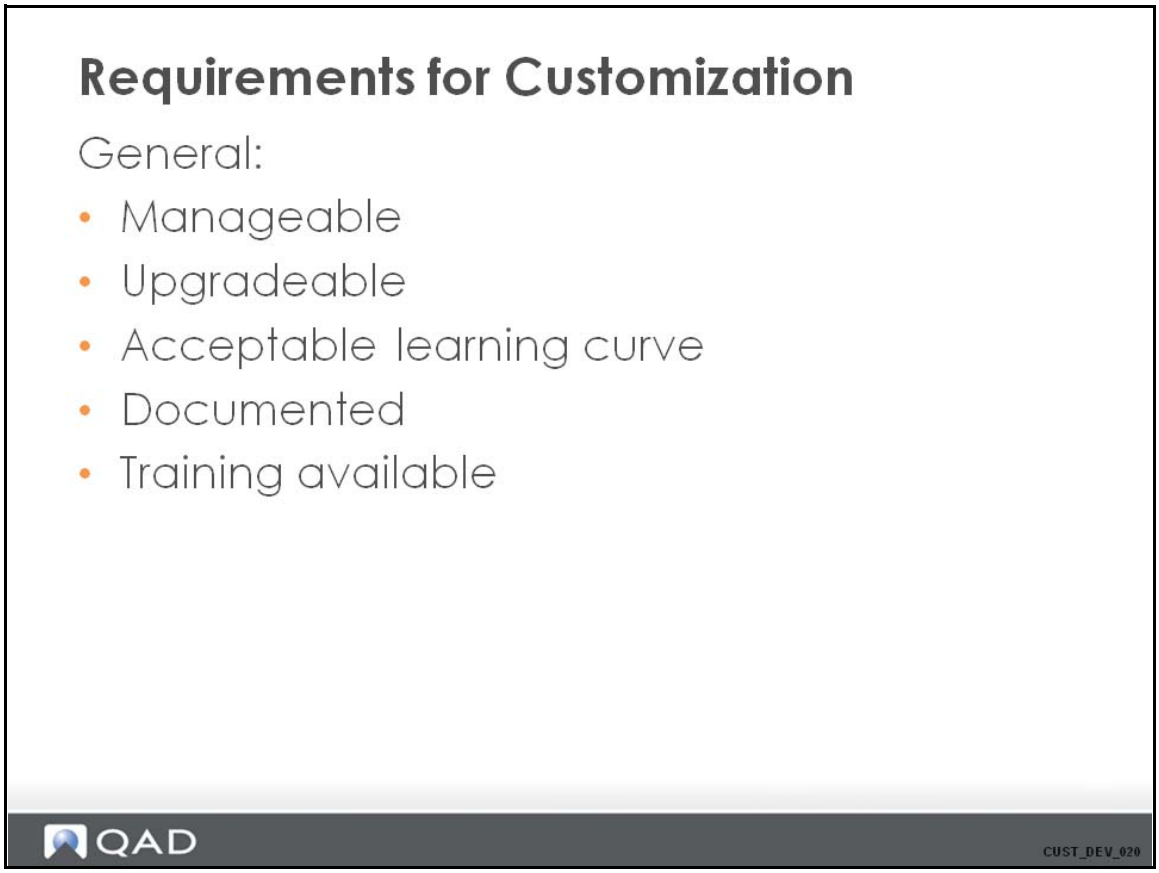
Error Handling 3



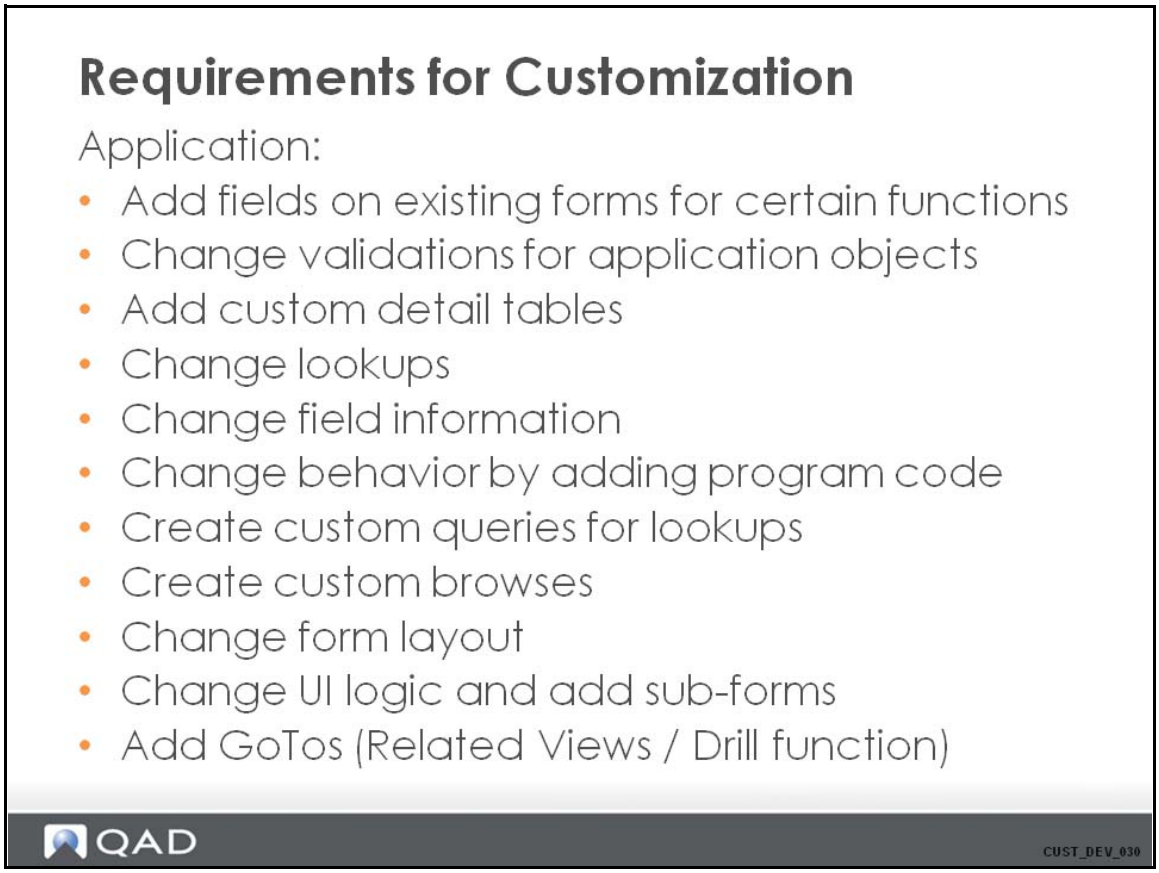
Non-intrusive Customization: Development



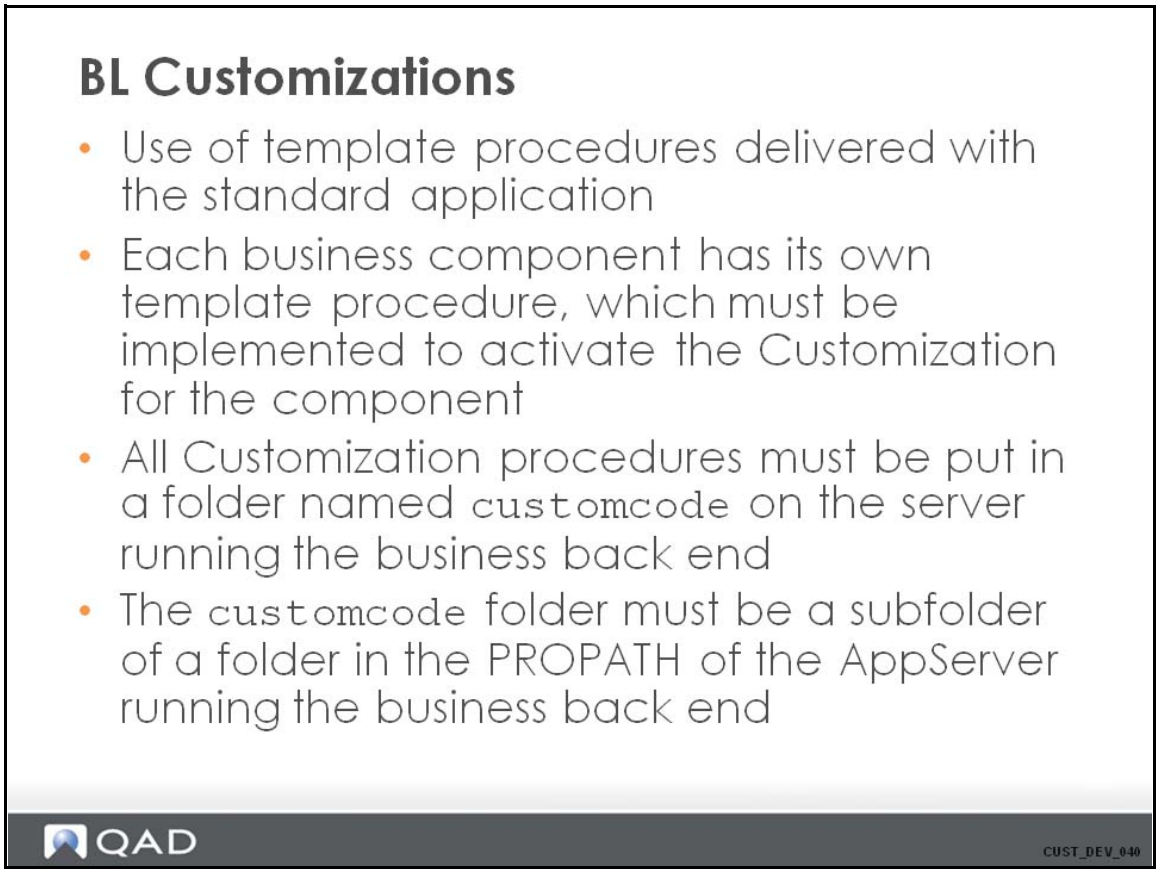
Requirements for Customization



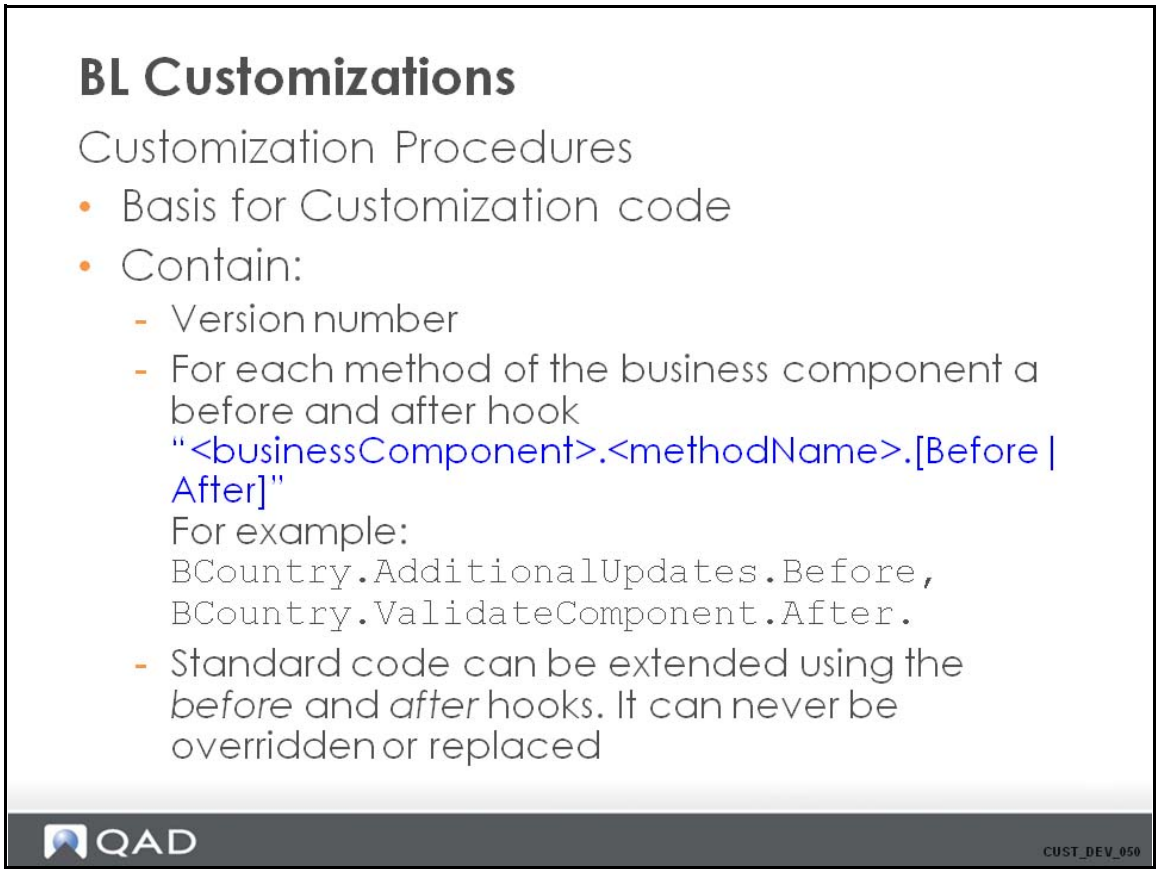
Requirements for Customization 2



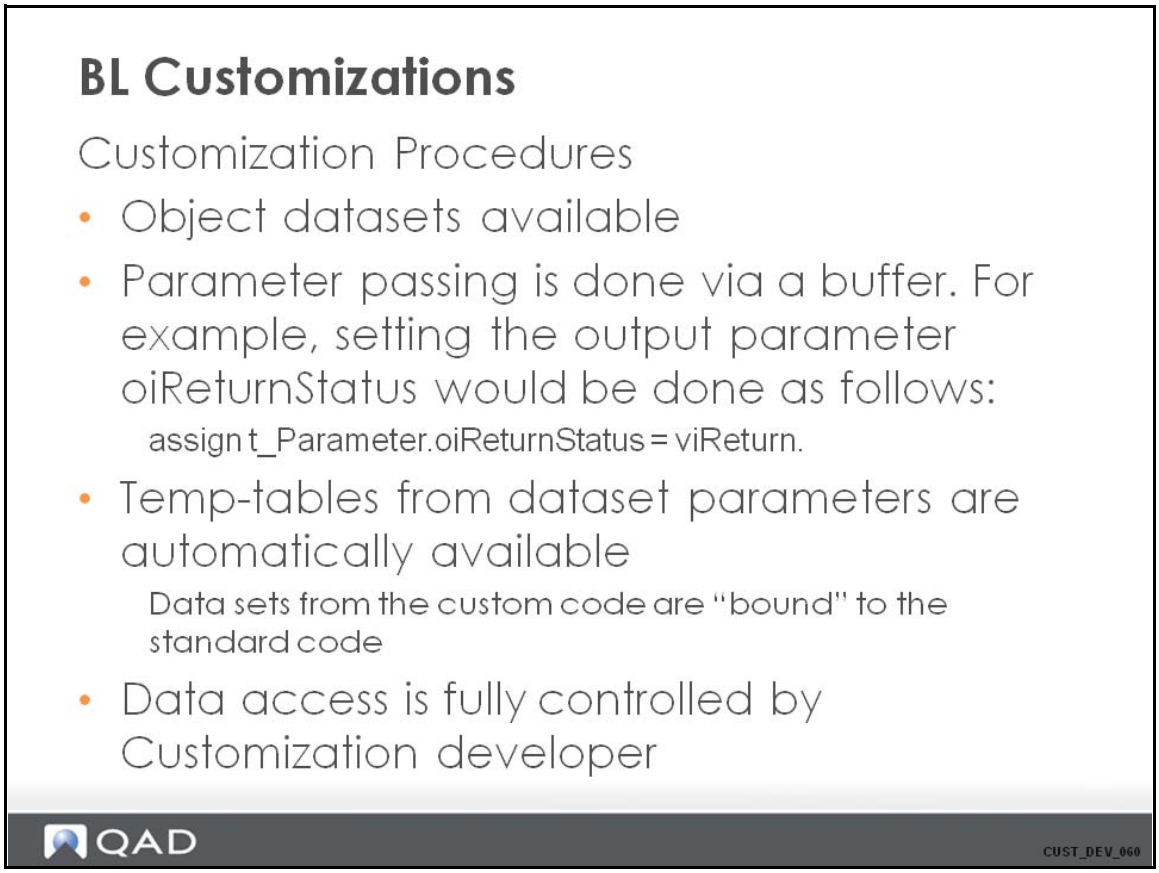
BL Customizations



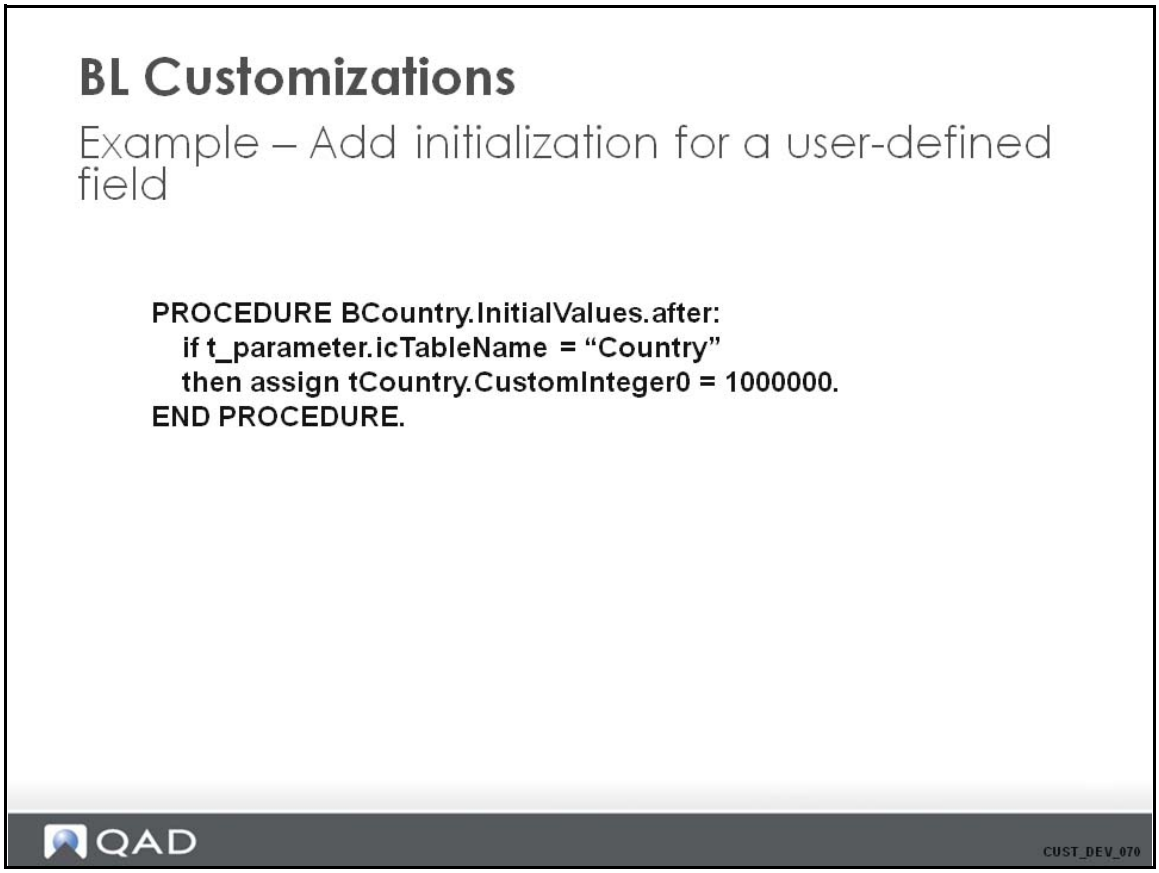
BL Customizations 2



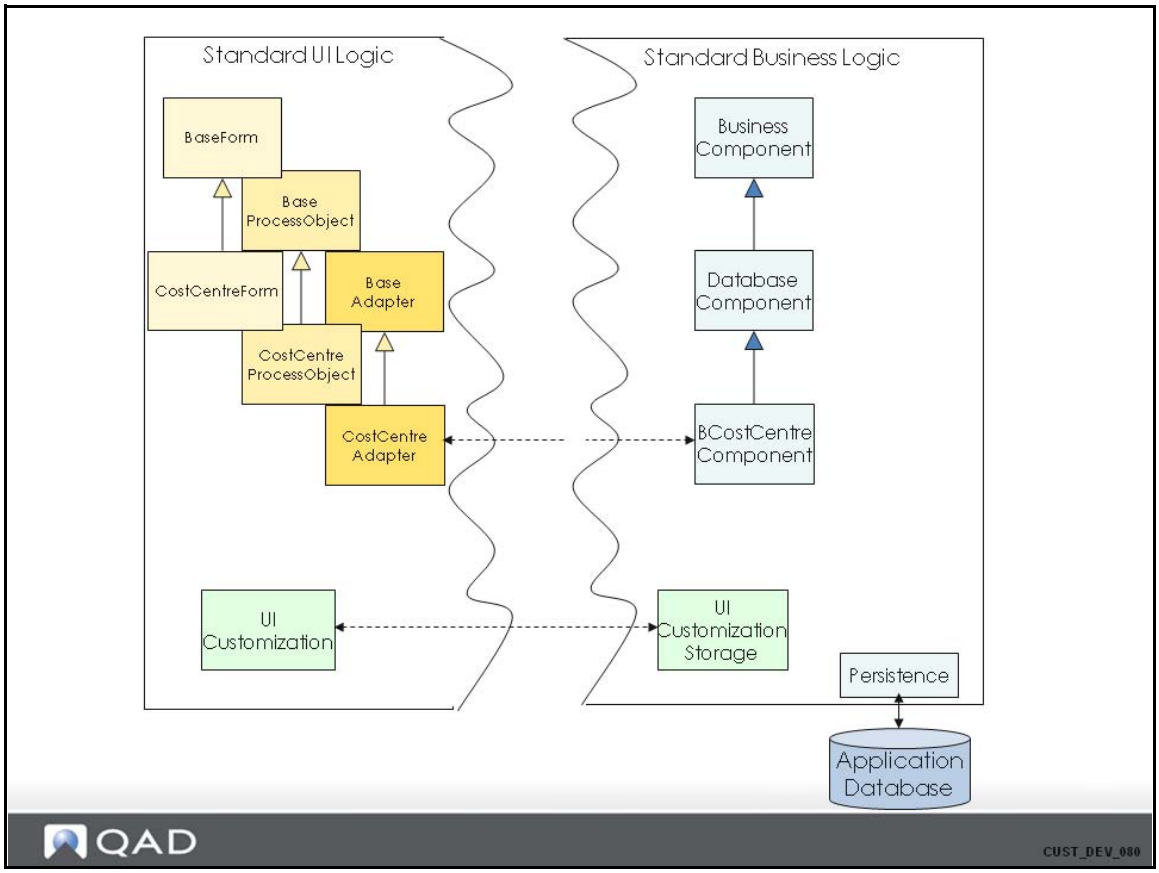
BL Customizations 3



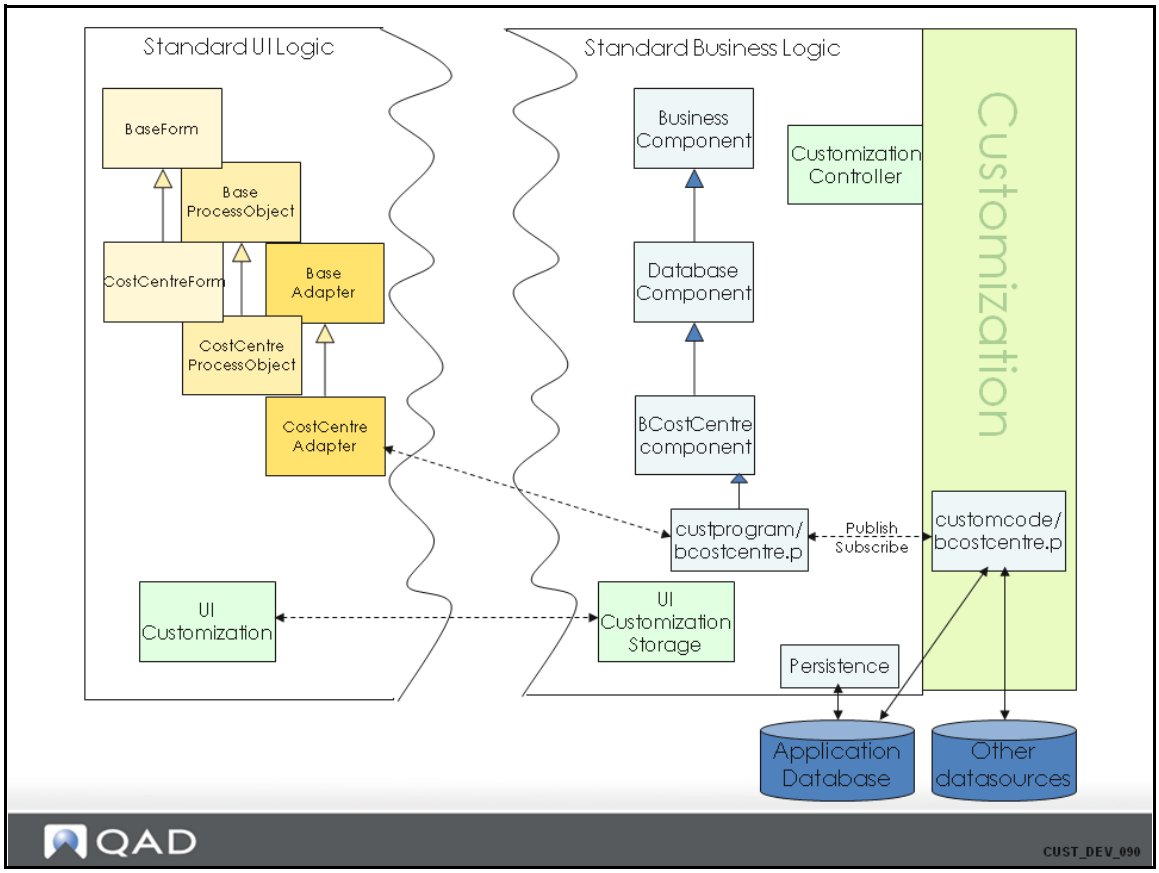
BL Customizations 4



Customization Diagram



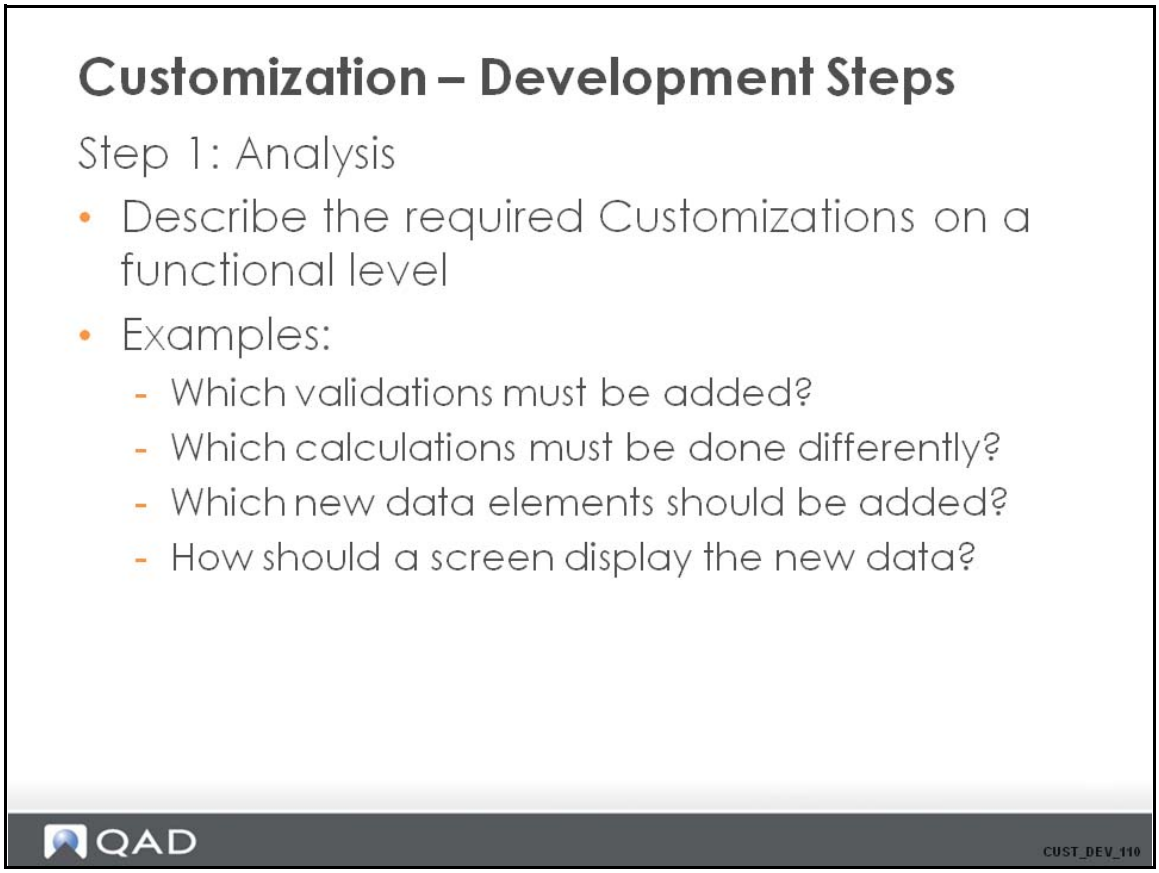
Customization Diagram 2



Customization - Development Steps



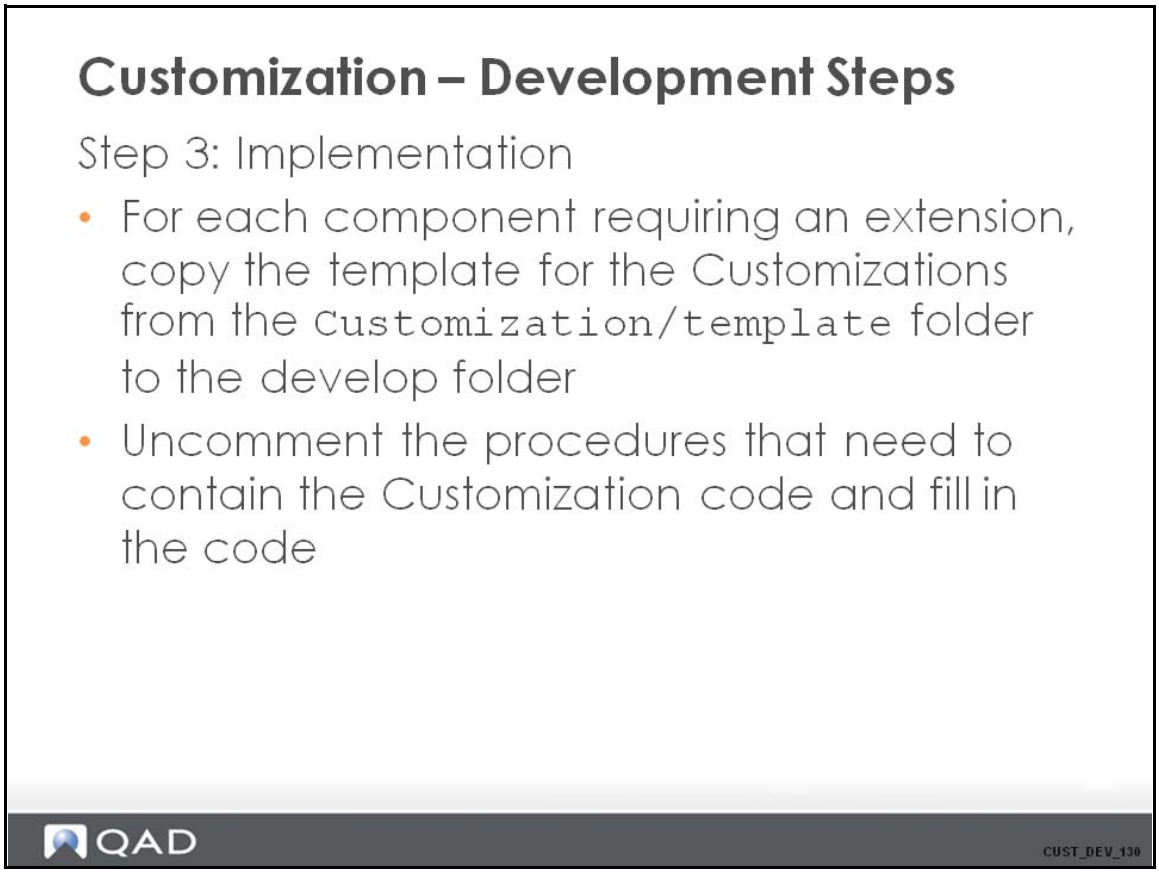
Customization - Development Steps 2



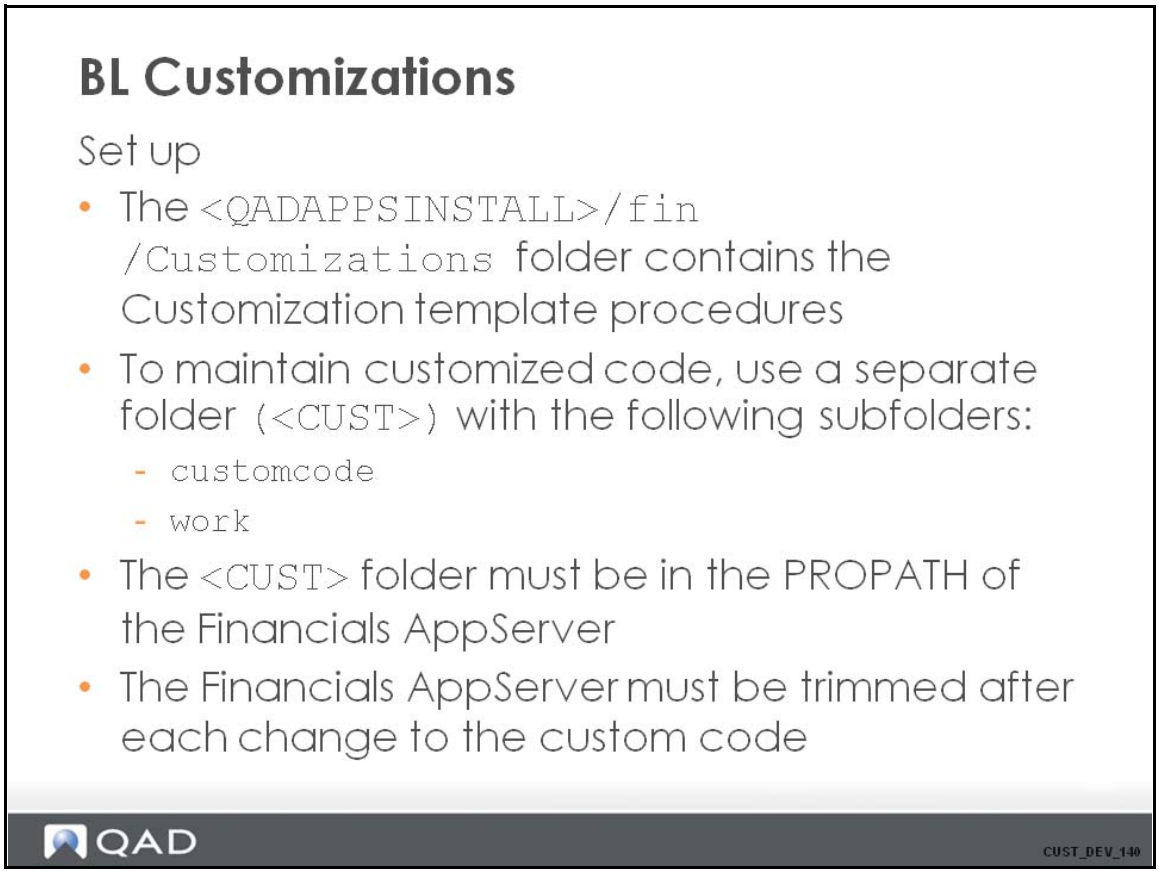
Customization - Development Steps 3



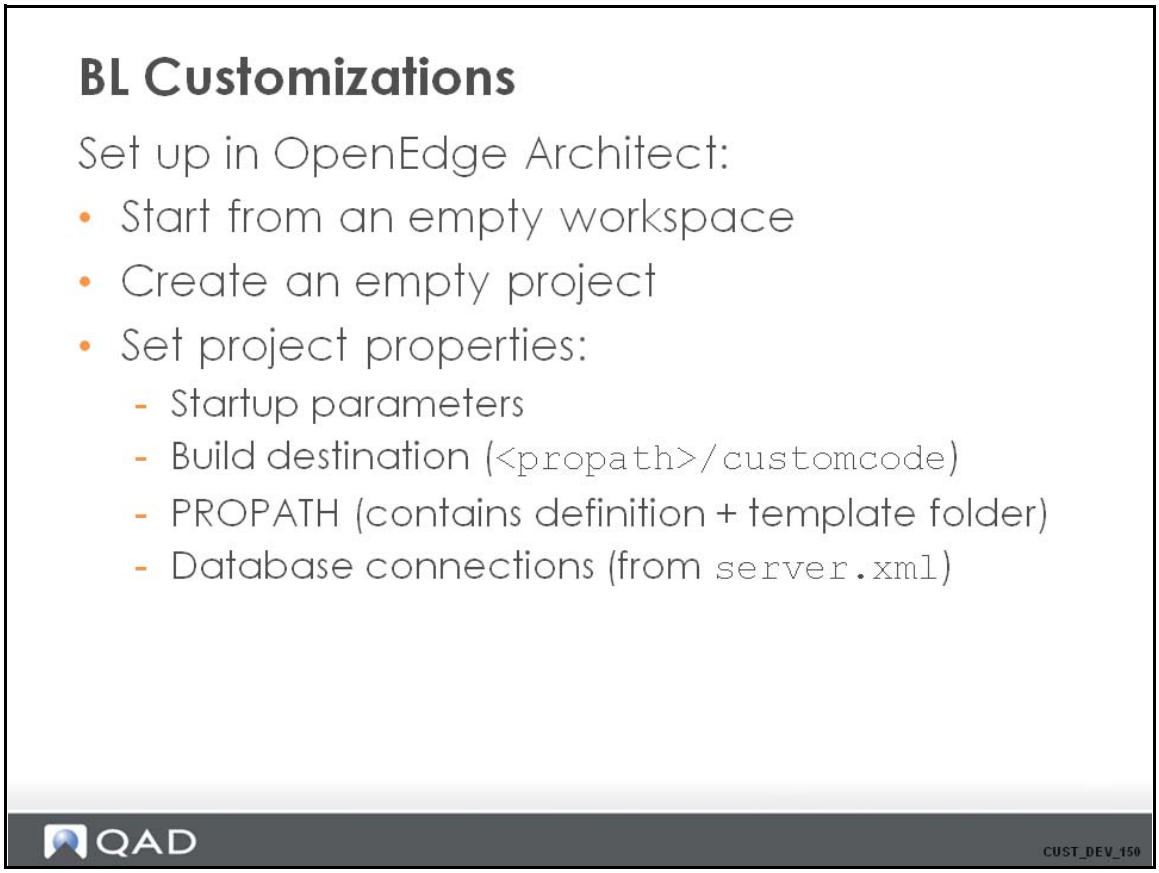
Customization - Development Steps 4



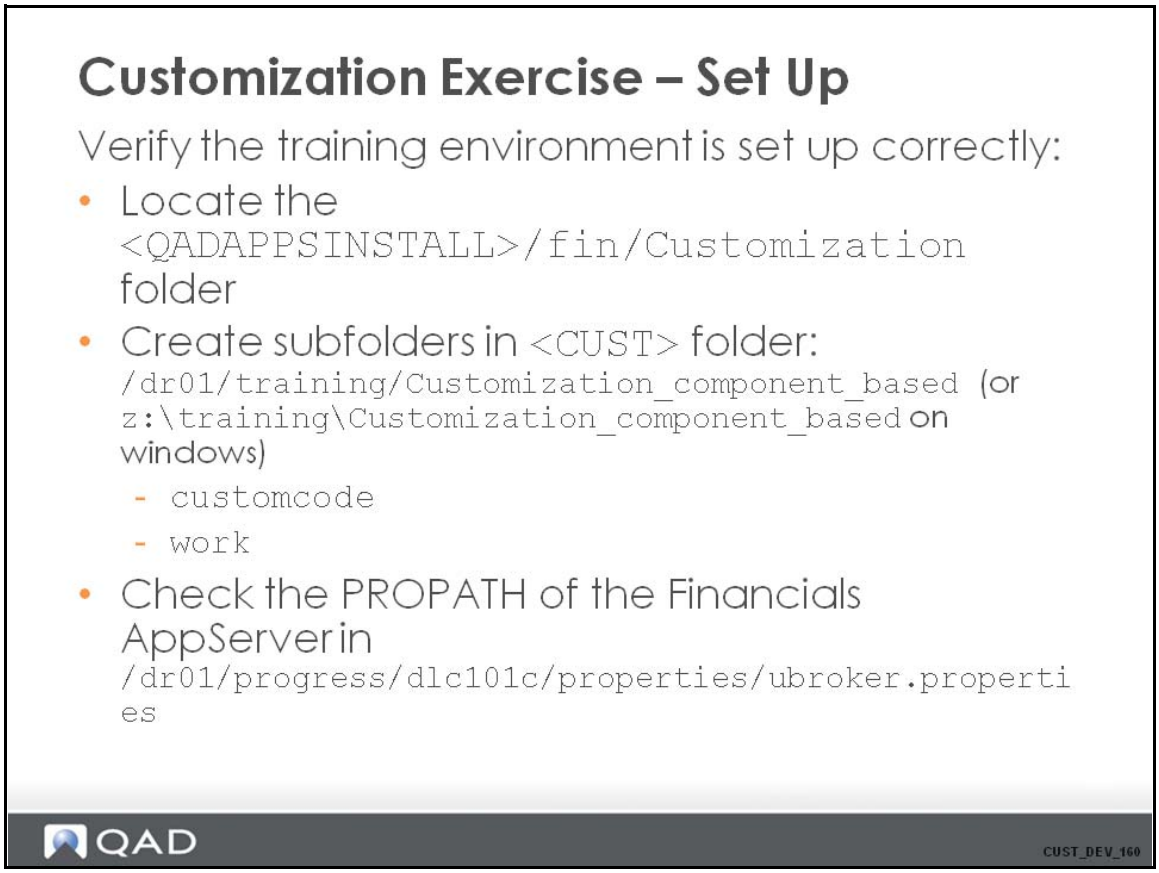
BL Customizations



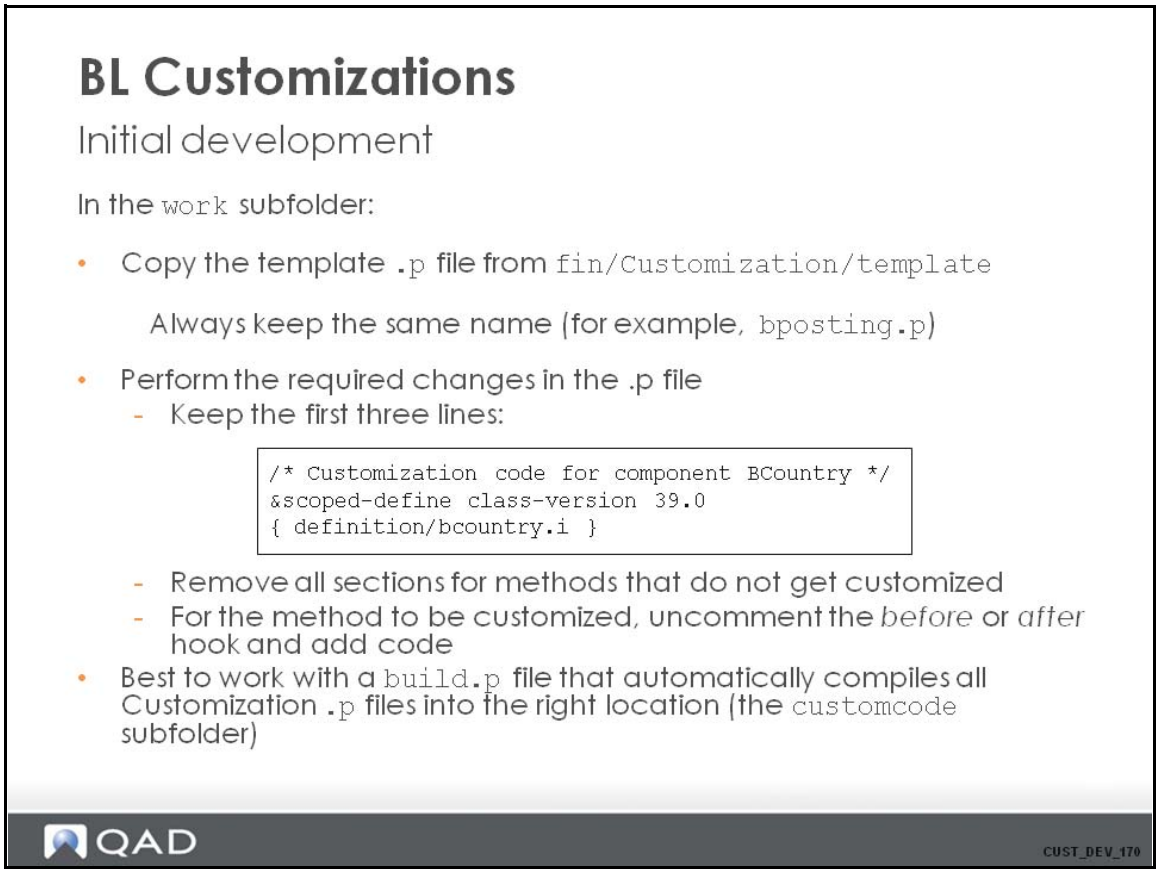
BL Customizations 2



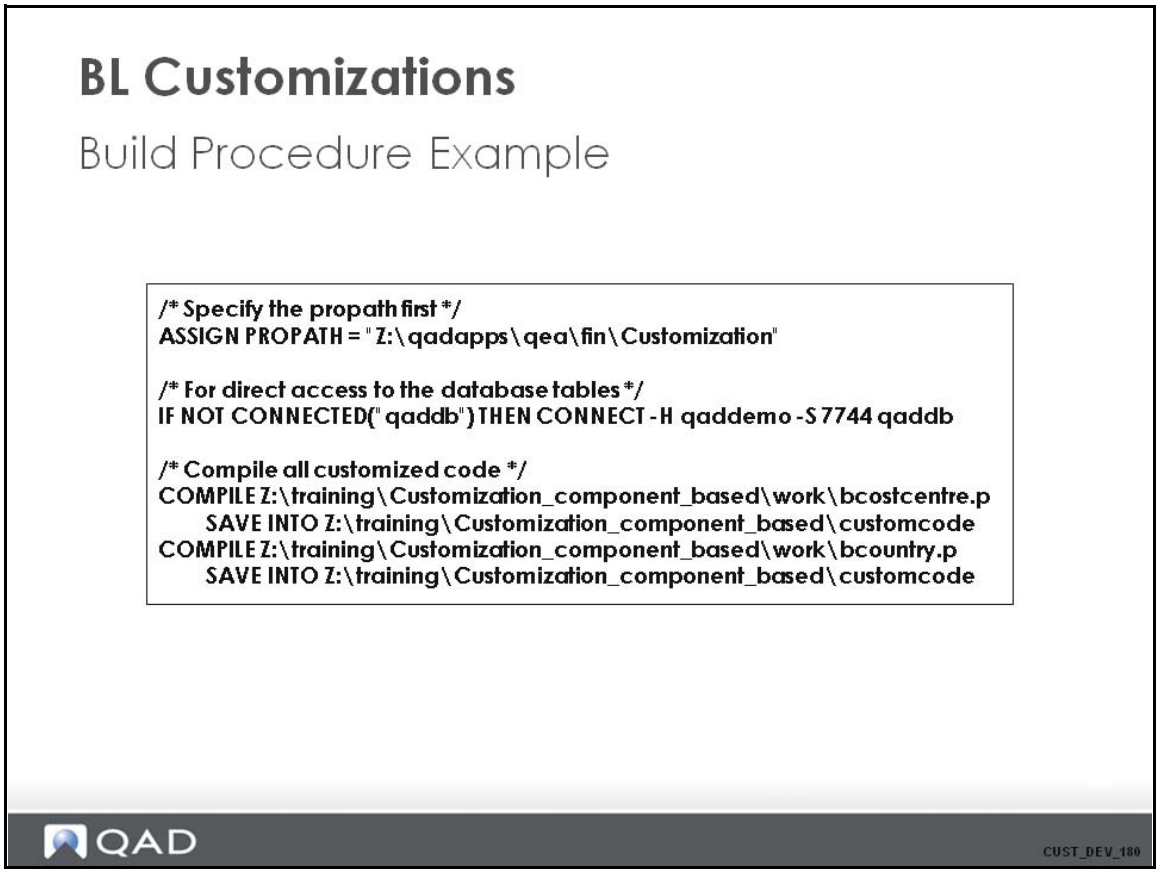
Customization Exercise - Set Up



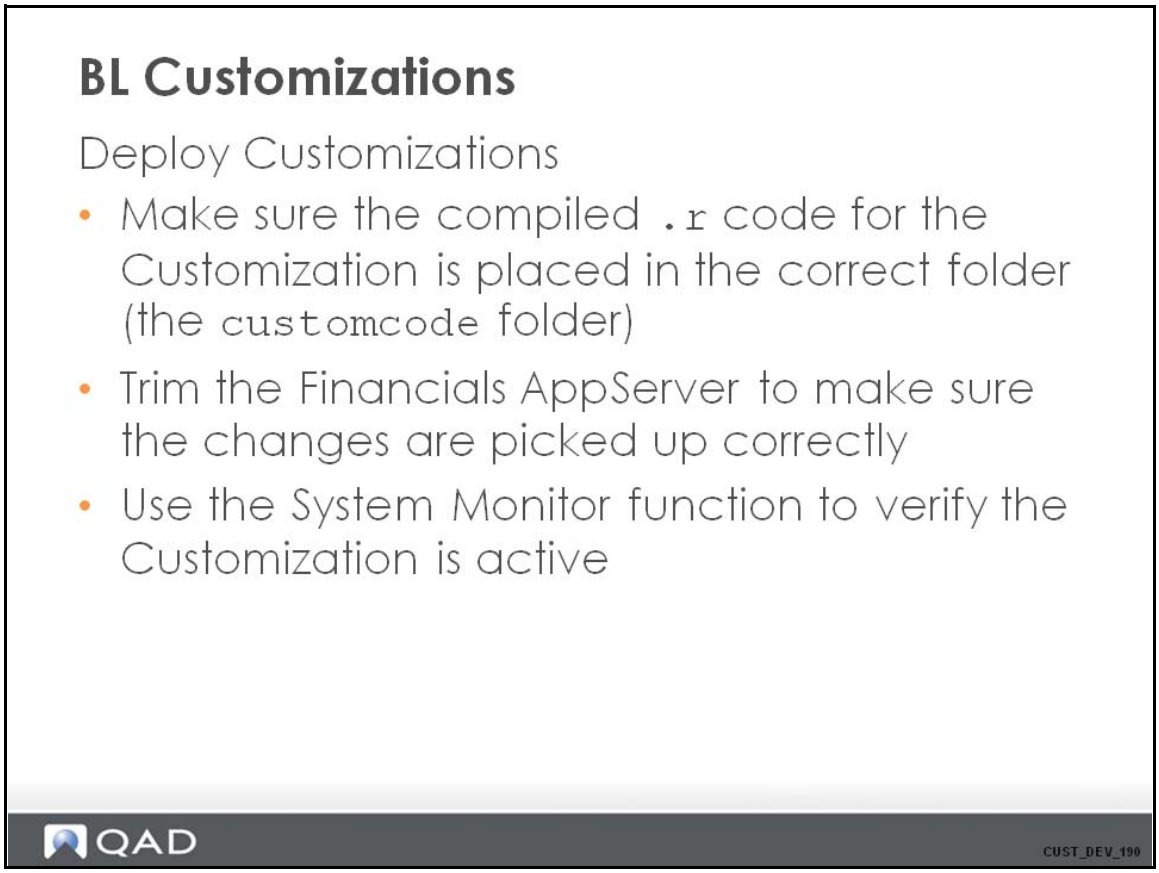
BL Customizations



BL Customizations 2



BL Customizations 3

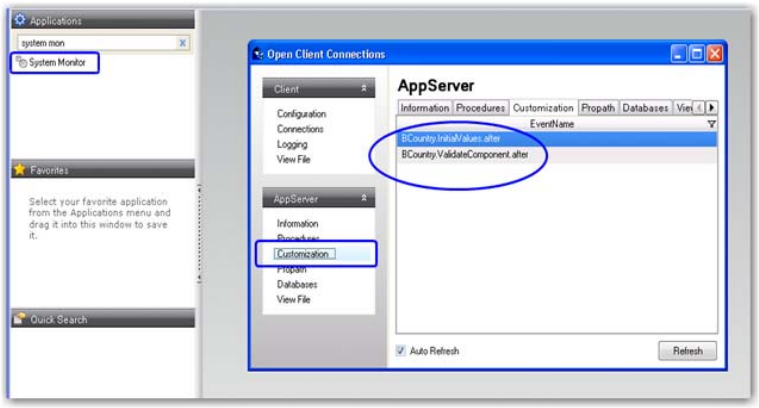


BL Customizations 4

BL Customizations

Use System Monitor to check:

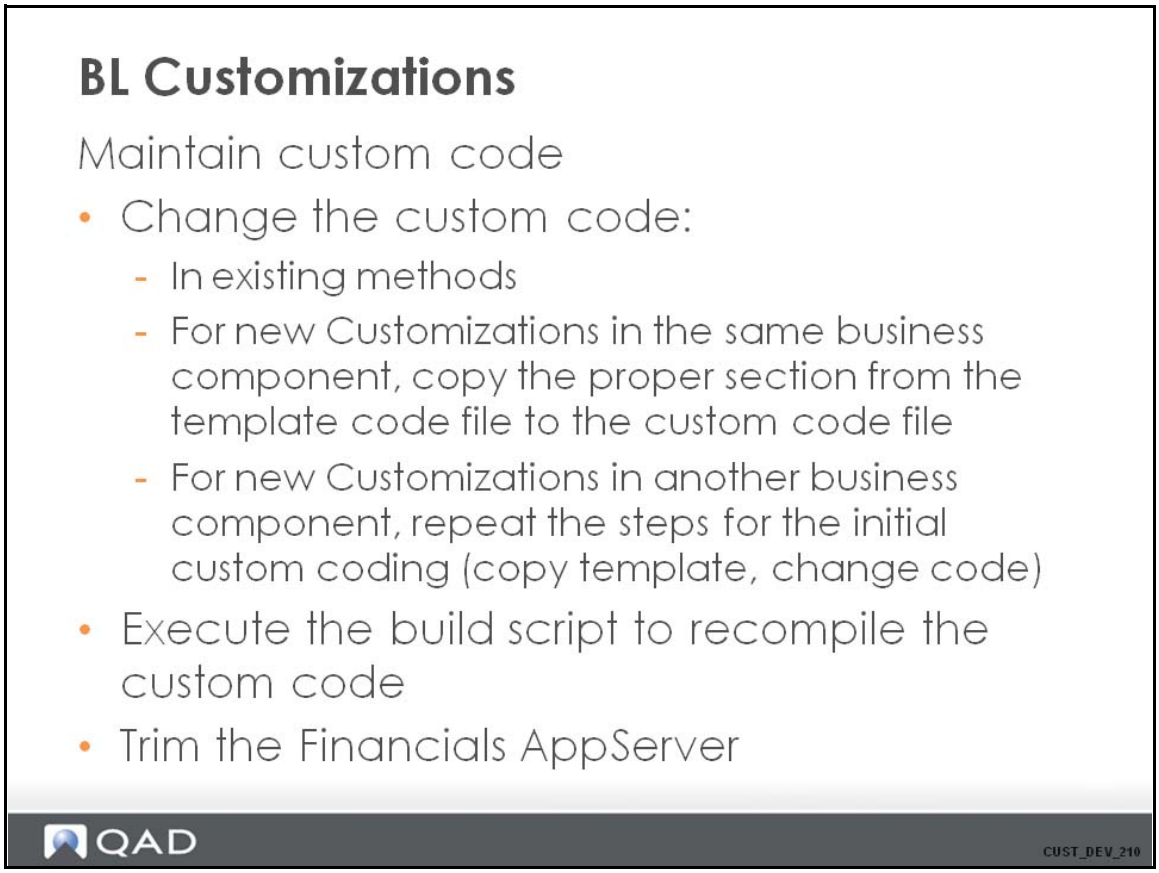
- If Customization is active
- Which hooks are implemented by the backend Customization



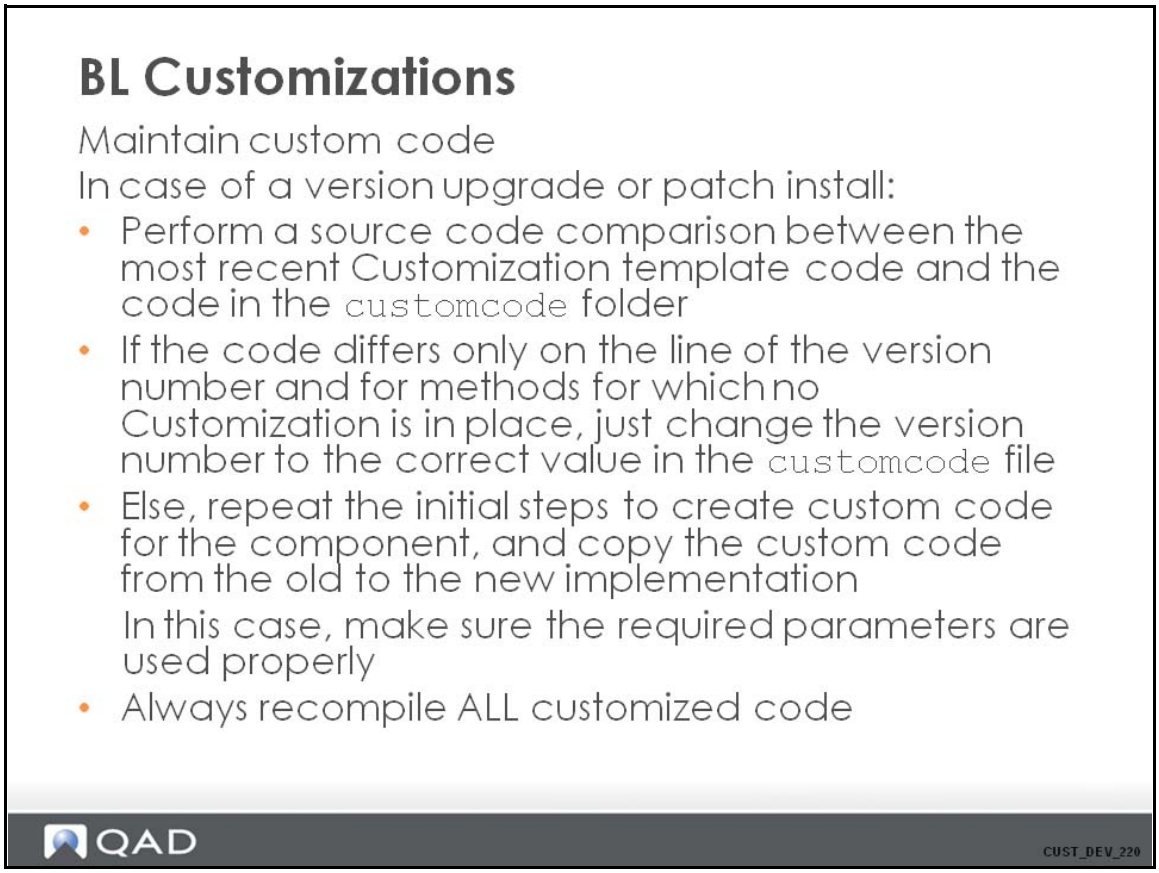
QAD

CUST_DEV_200

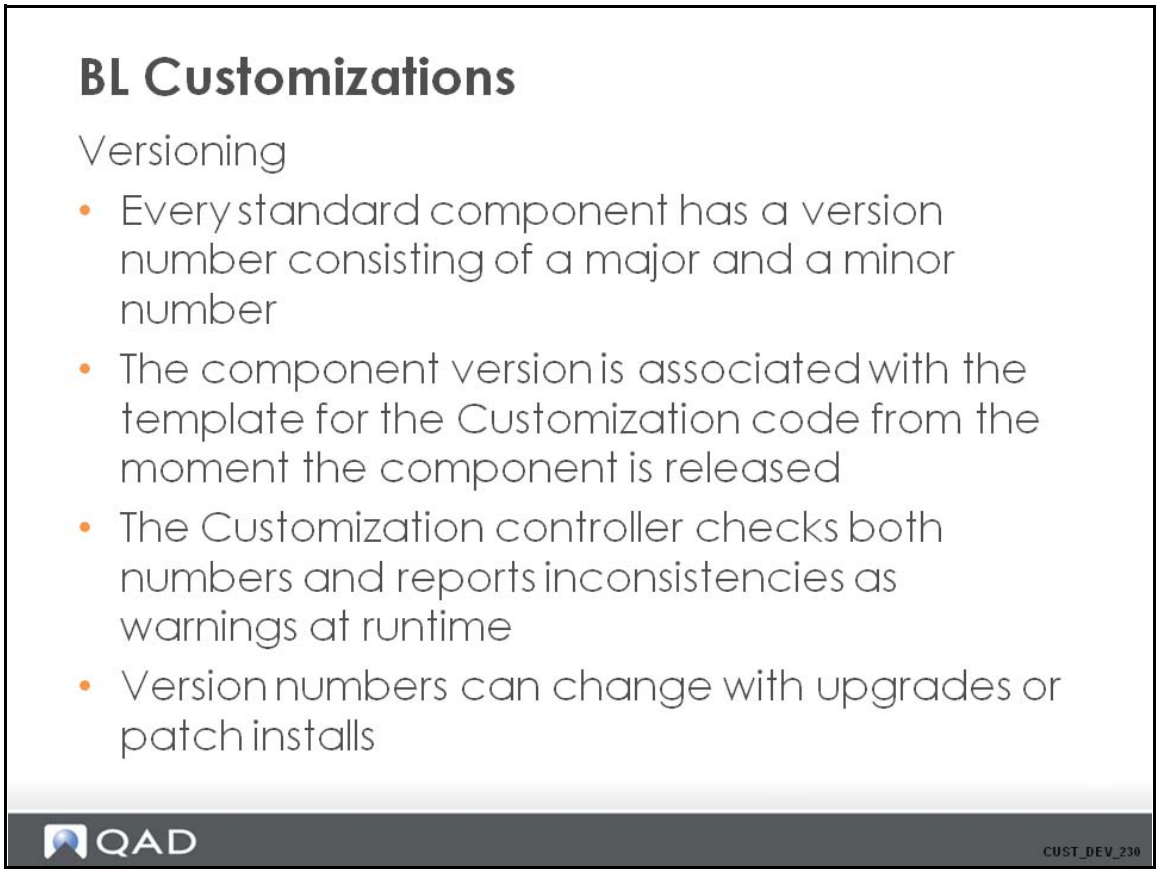
BL Customizations 5



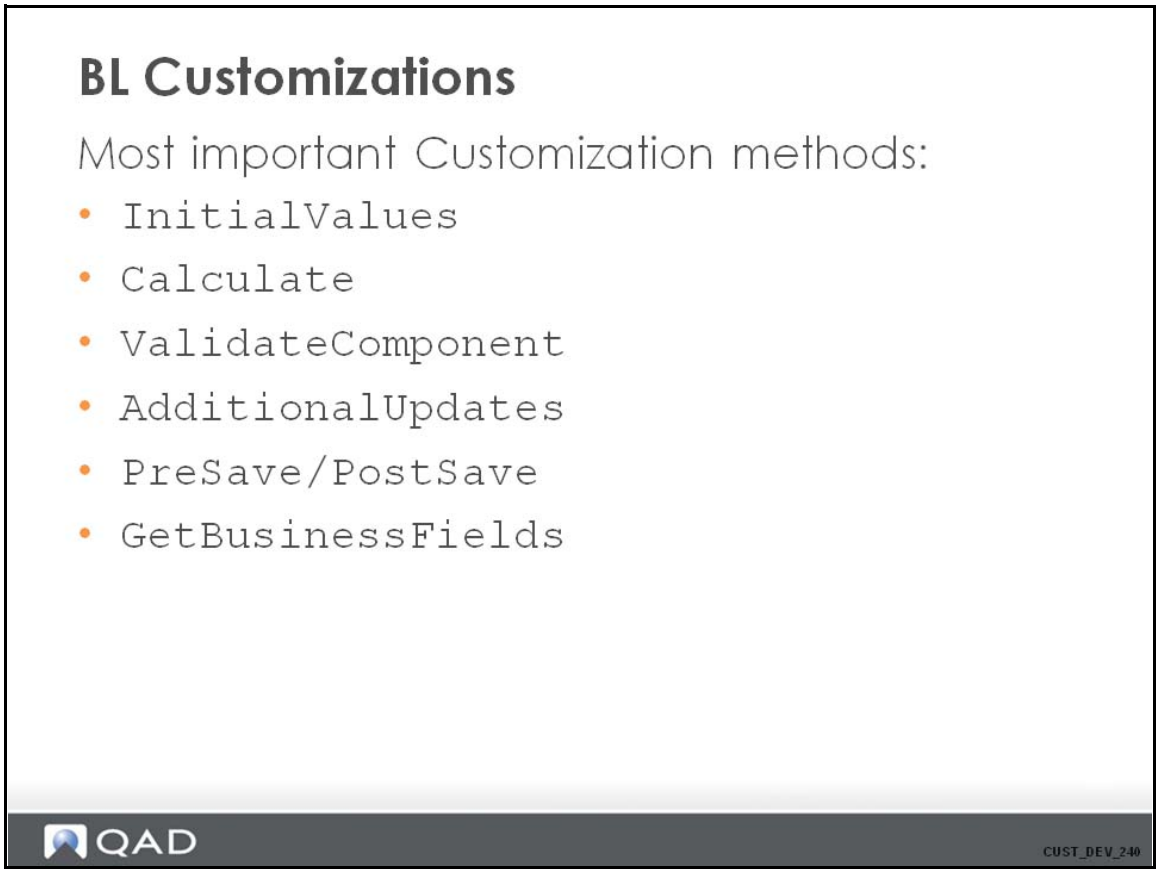
BL Customizations 6



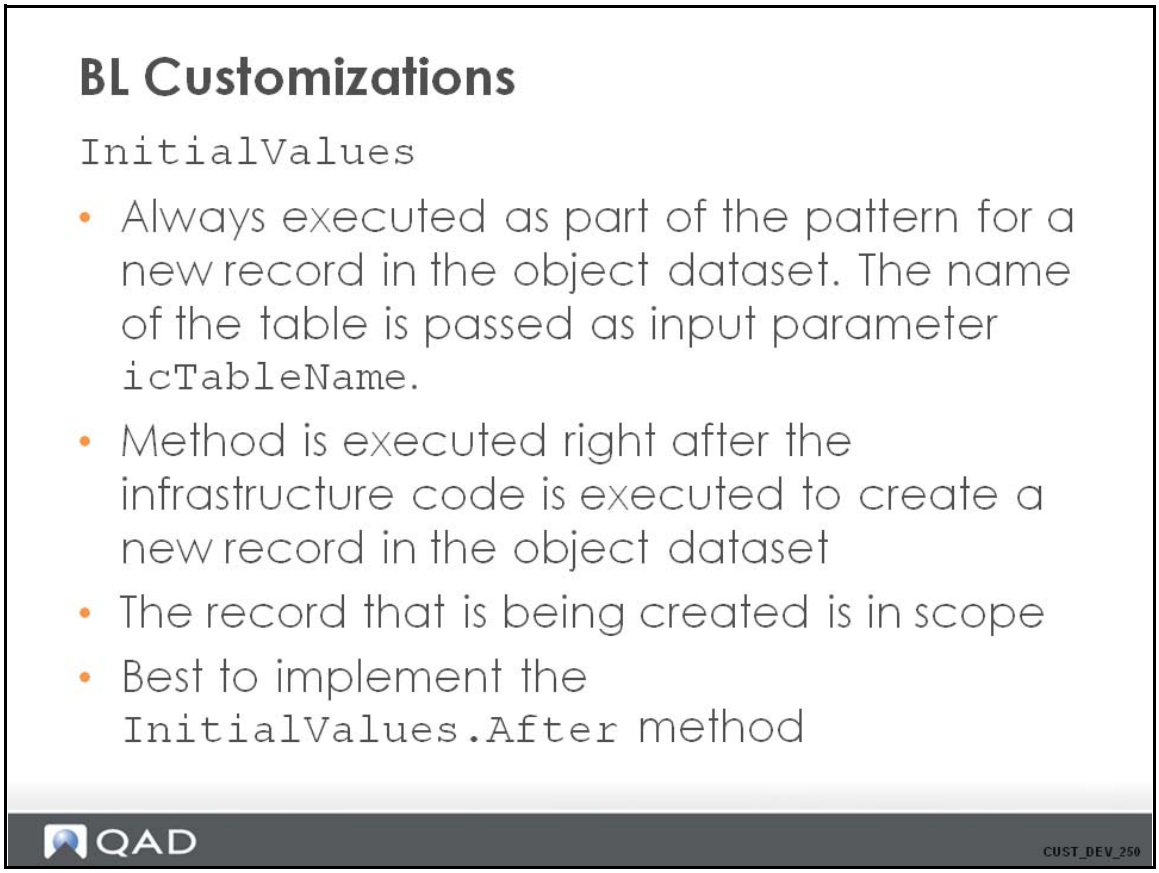
BL Customizations 7



BL Customizations 8



BL Customizations - InitialValues



BL Customizations - InitialValues 2

BL Customizations

InitialValues - Example

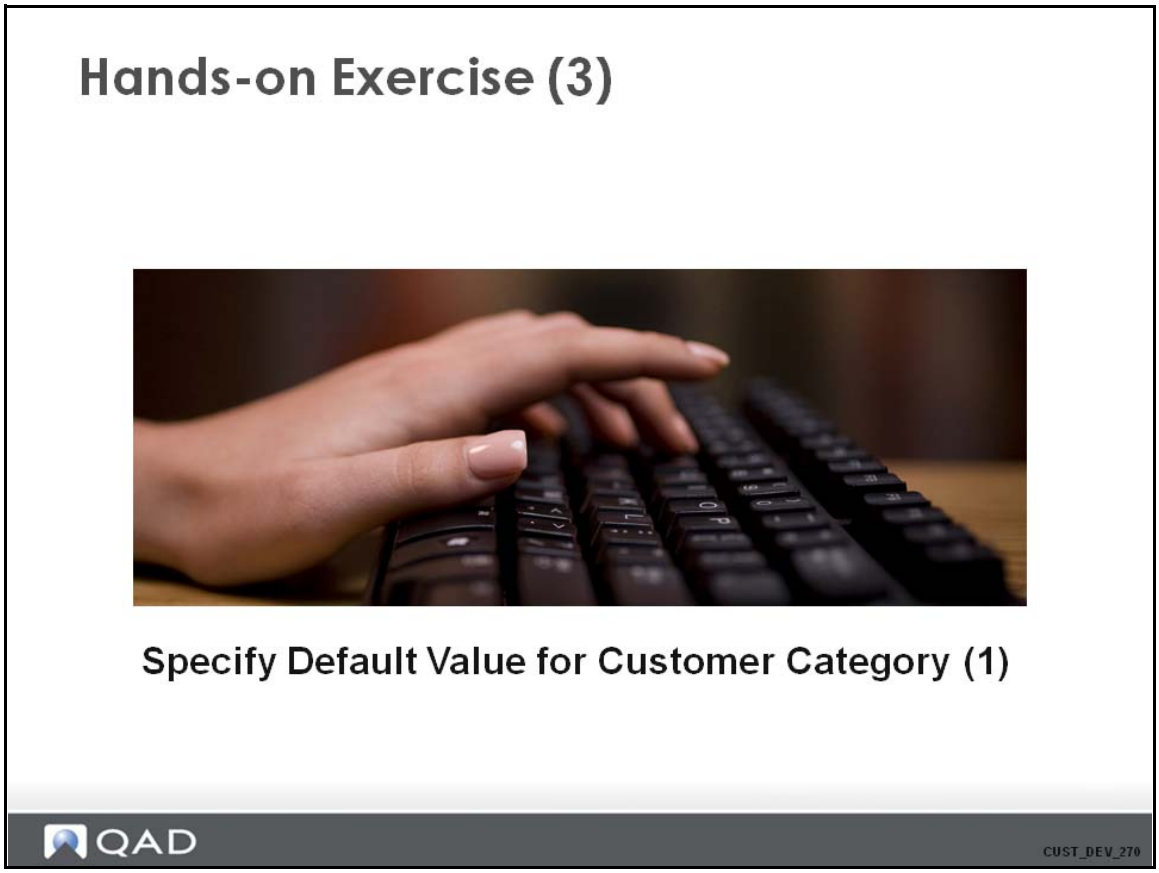
```
/*
Procedure: InitialValues
Description:
Add code here to initialize the calculated fields of a 'new' record (= a record that must be created in the
application database) in a class temp-table.
Parameters:
input icTableName
    (Name of the database table of which a record is created in the class temp-table.)
output oiReturnStatus
    ()
*/

PROCEDURE BCountry.InitialValues.after:
    if t_parameter.icTableName = "Country"
    then assign tCountry.CustomInteger0 = 1000000.
END PROCEDURE.
```

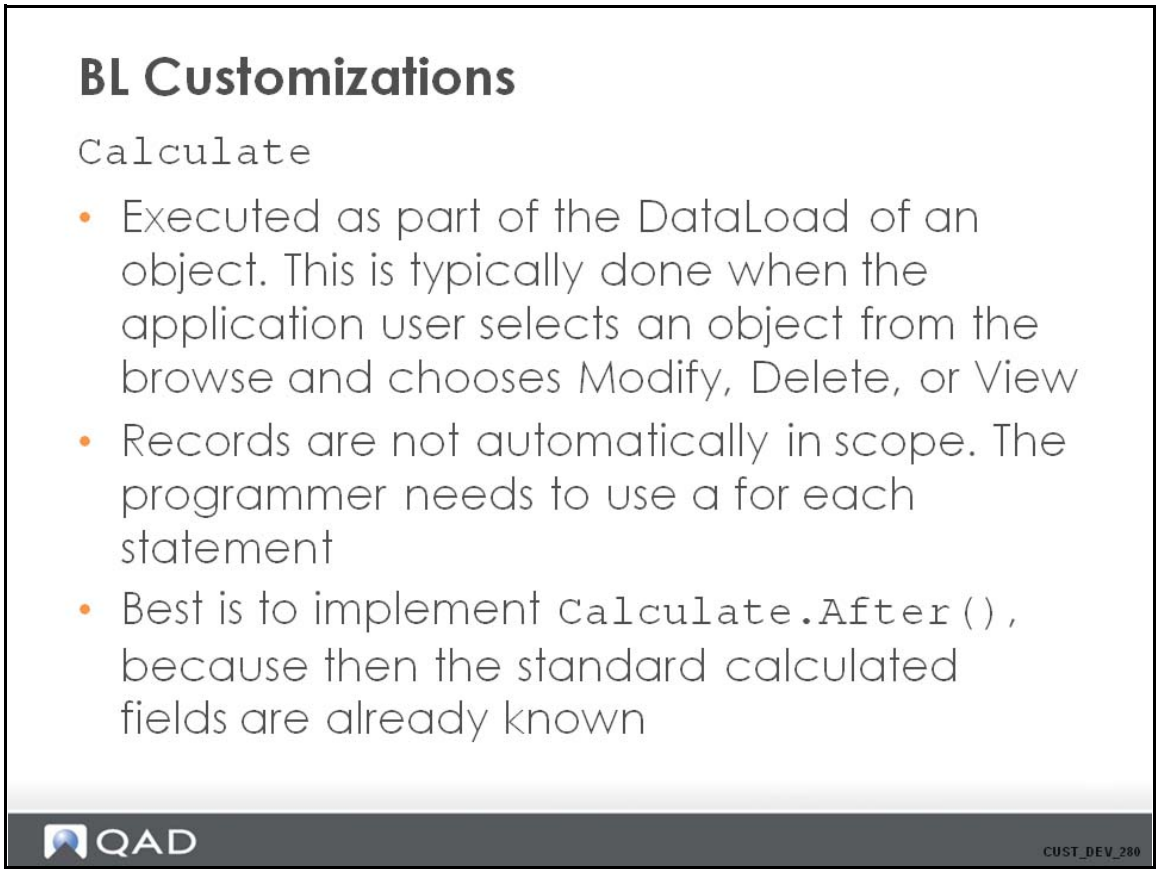
QAD

CUST_DEV_260

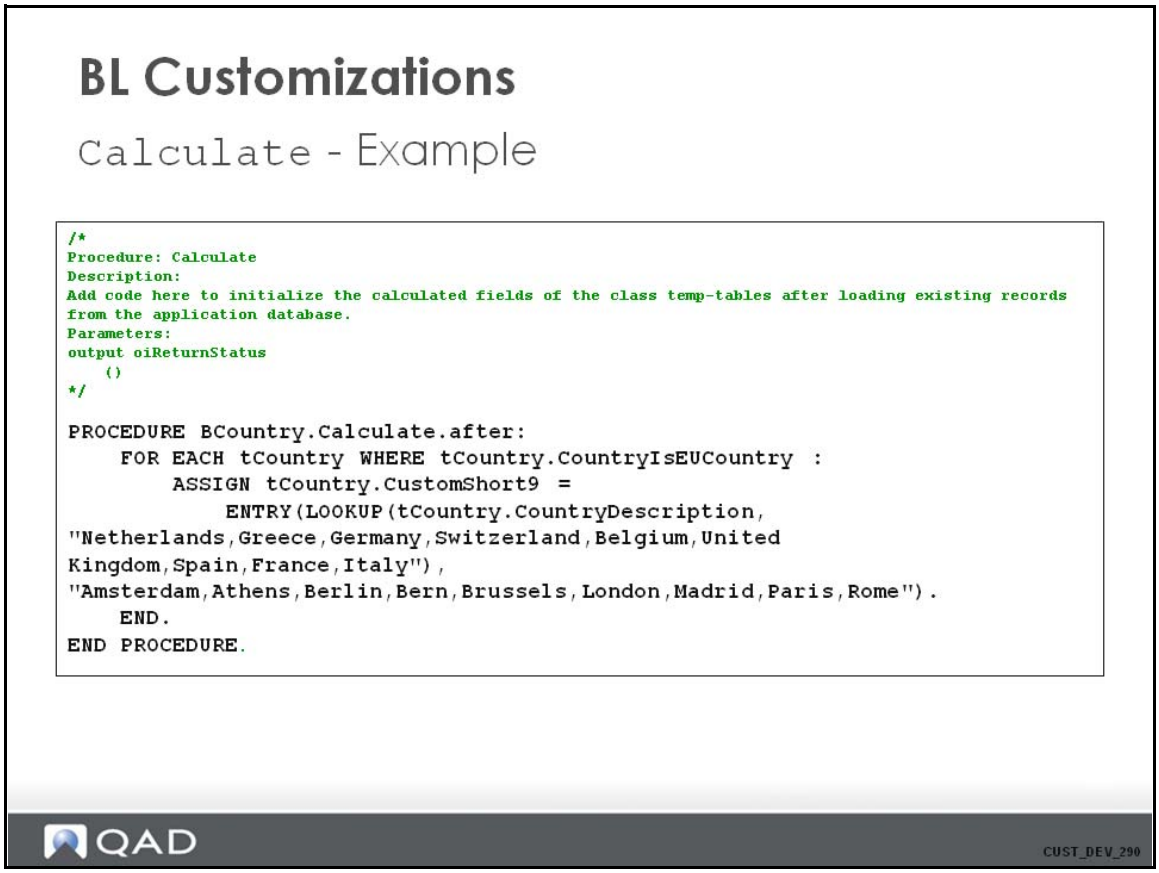
Hands-on Exercise (3)



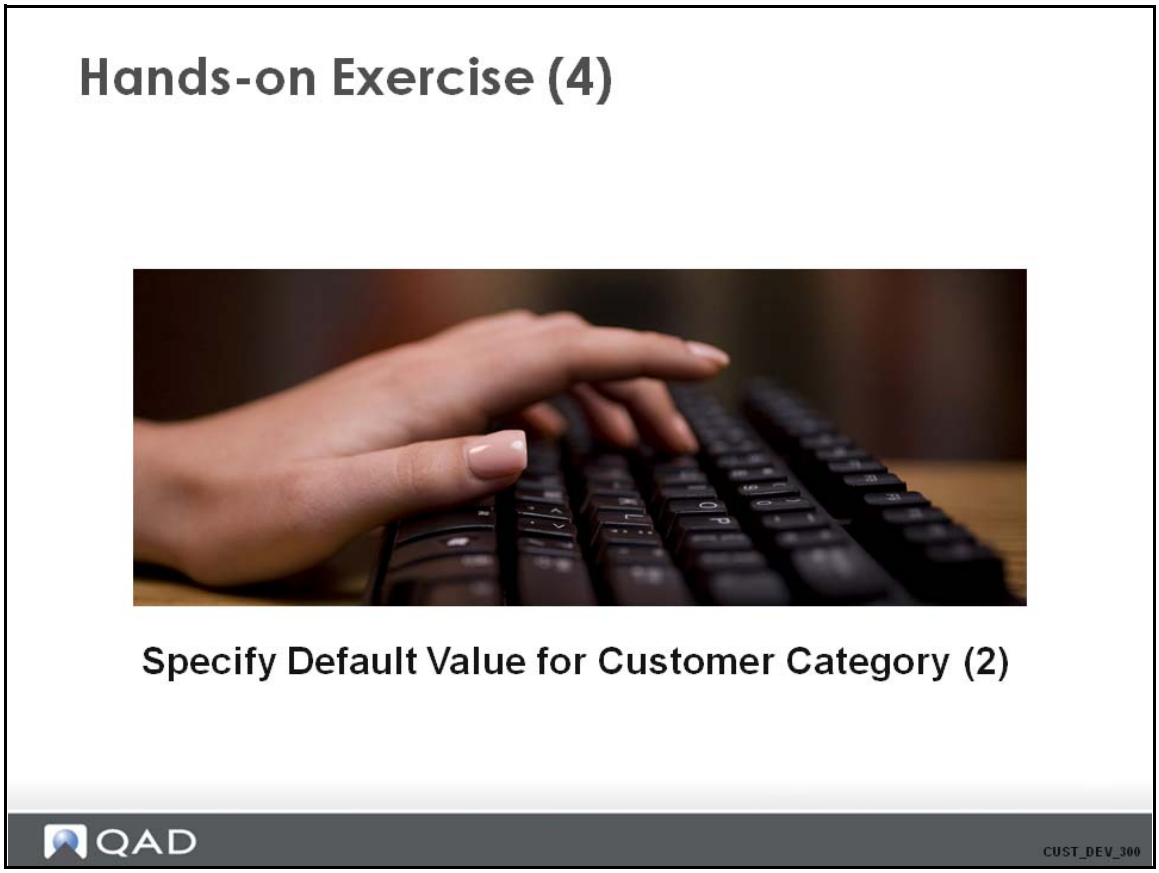
BL Customizations - Calculate



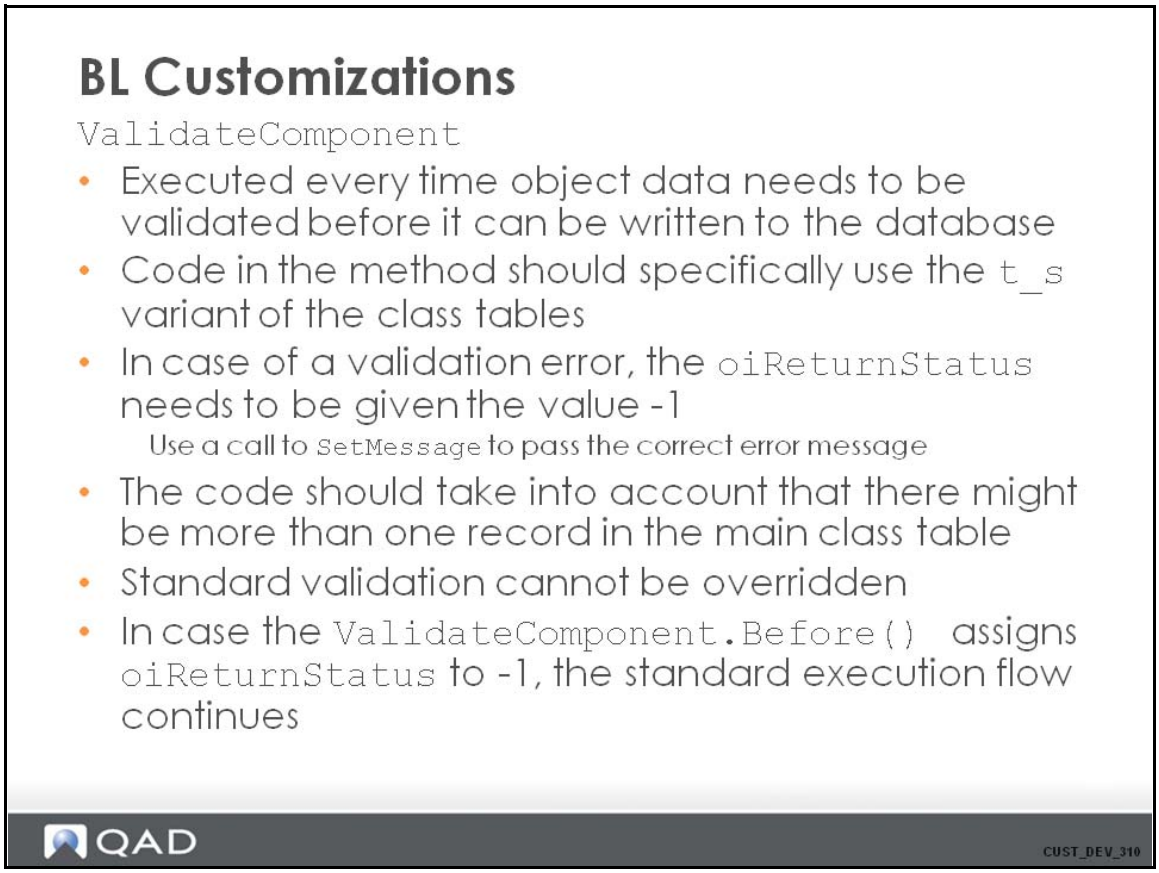
BL Customizations - Calculate 2



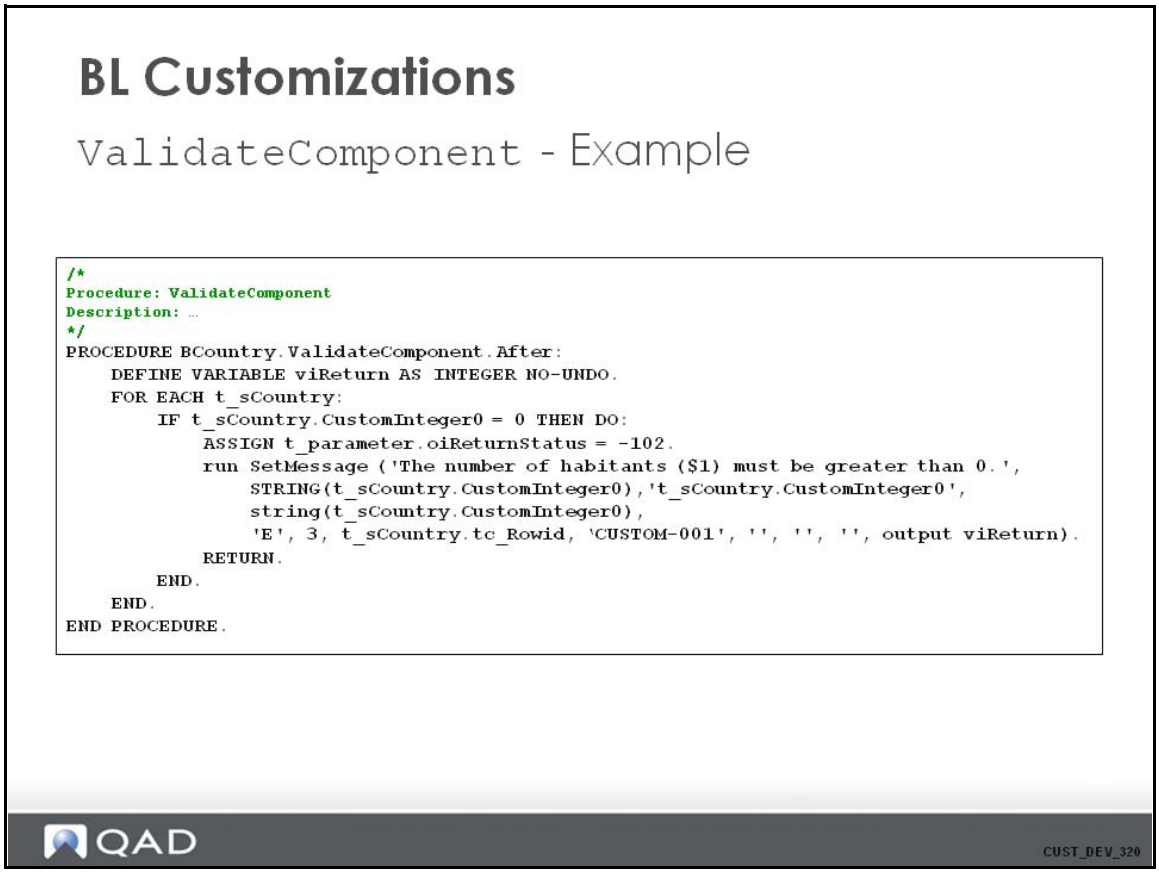
Hands-on Exercise (4)



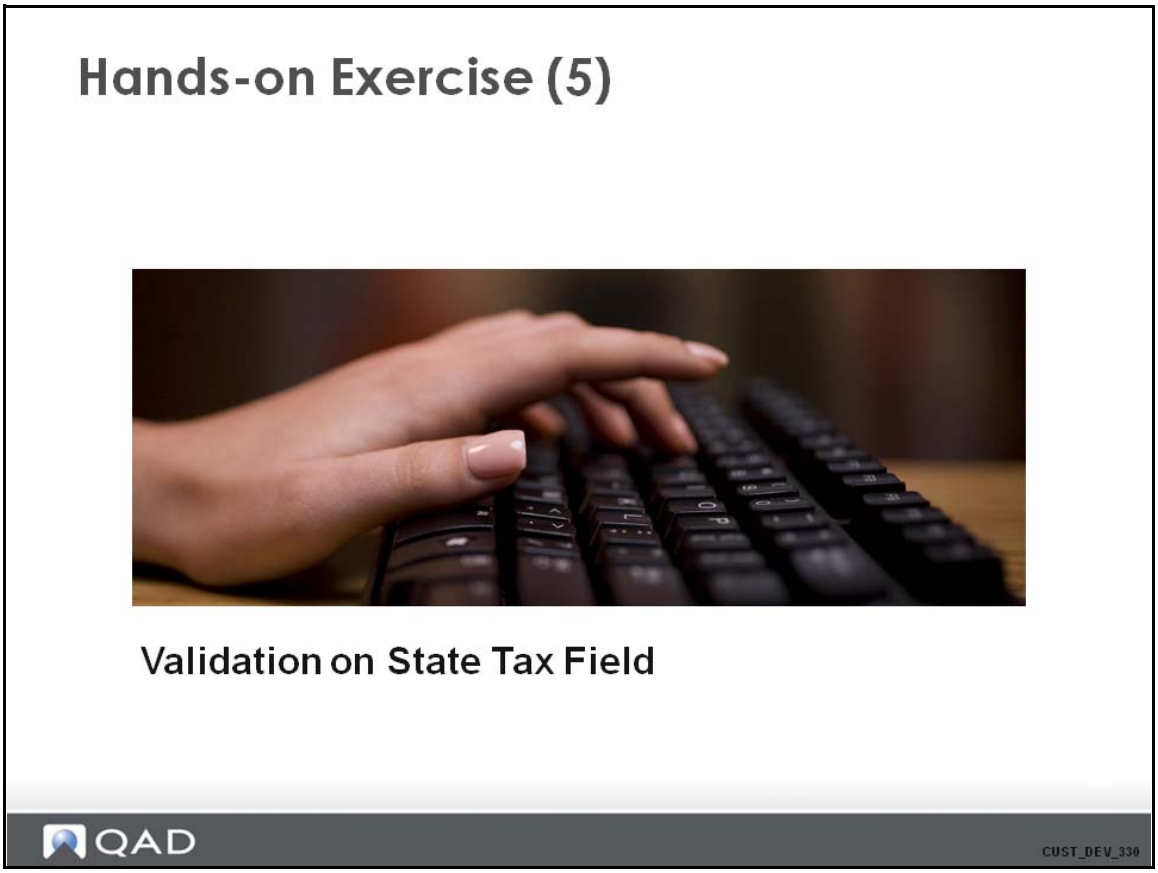
BL Customizations - ValidateComponent



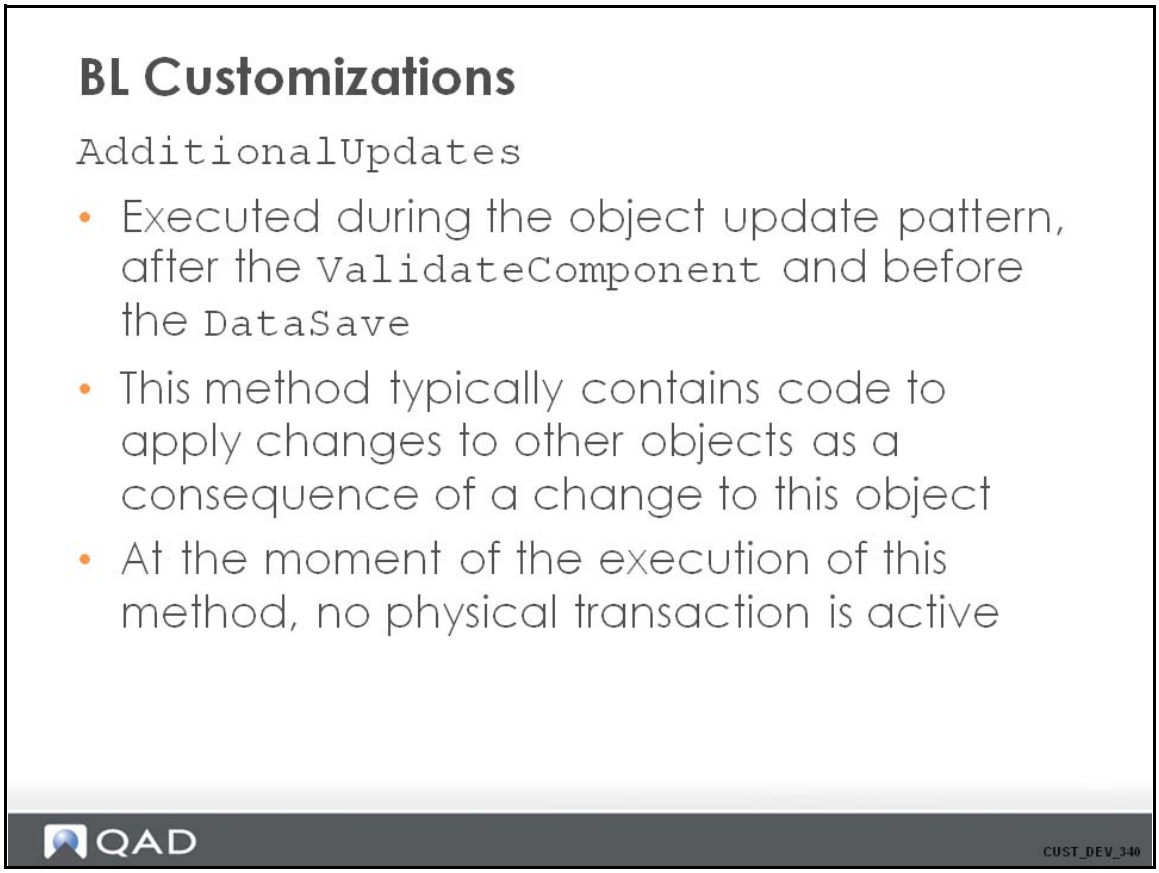
BL Customizations - ValidateComponent 2



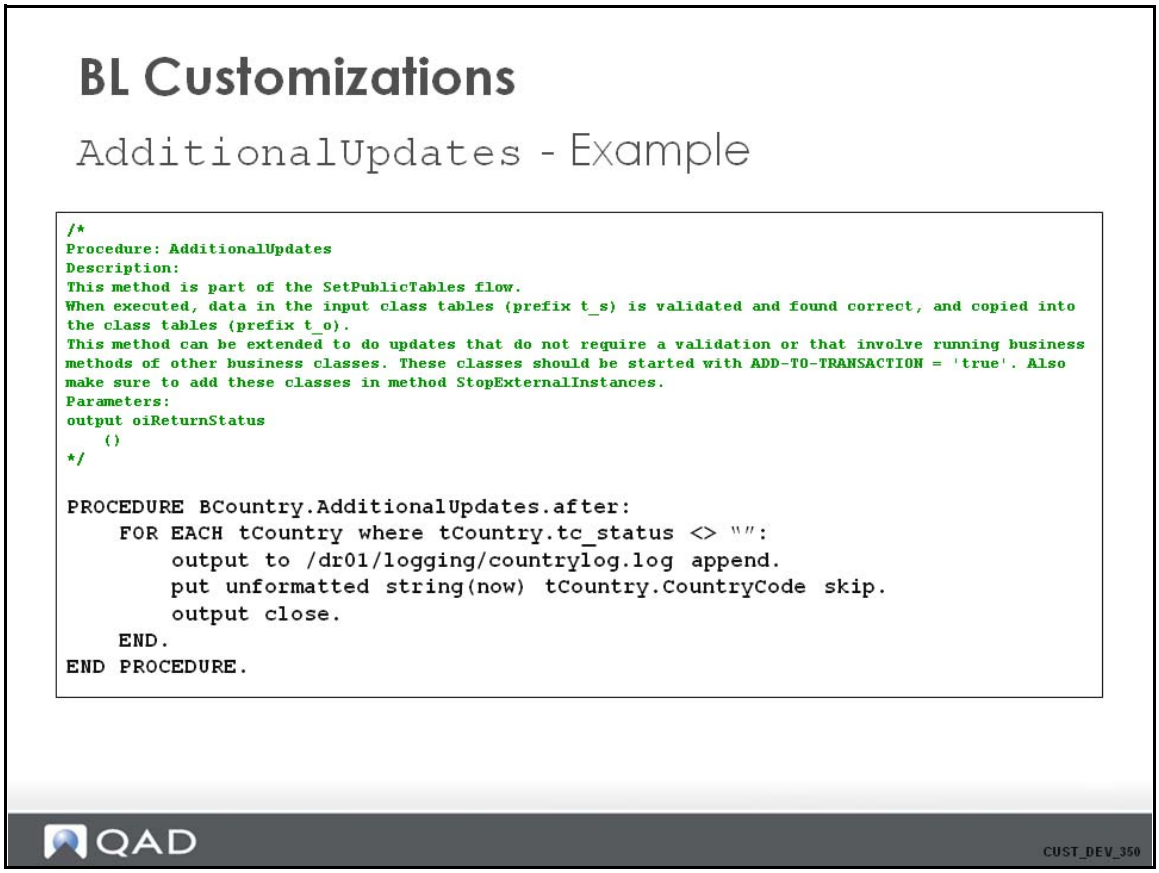
Hands-on Exercise (5)



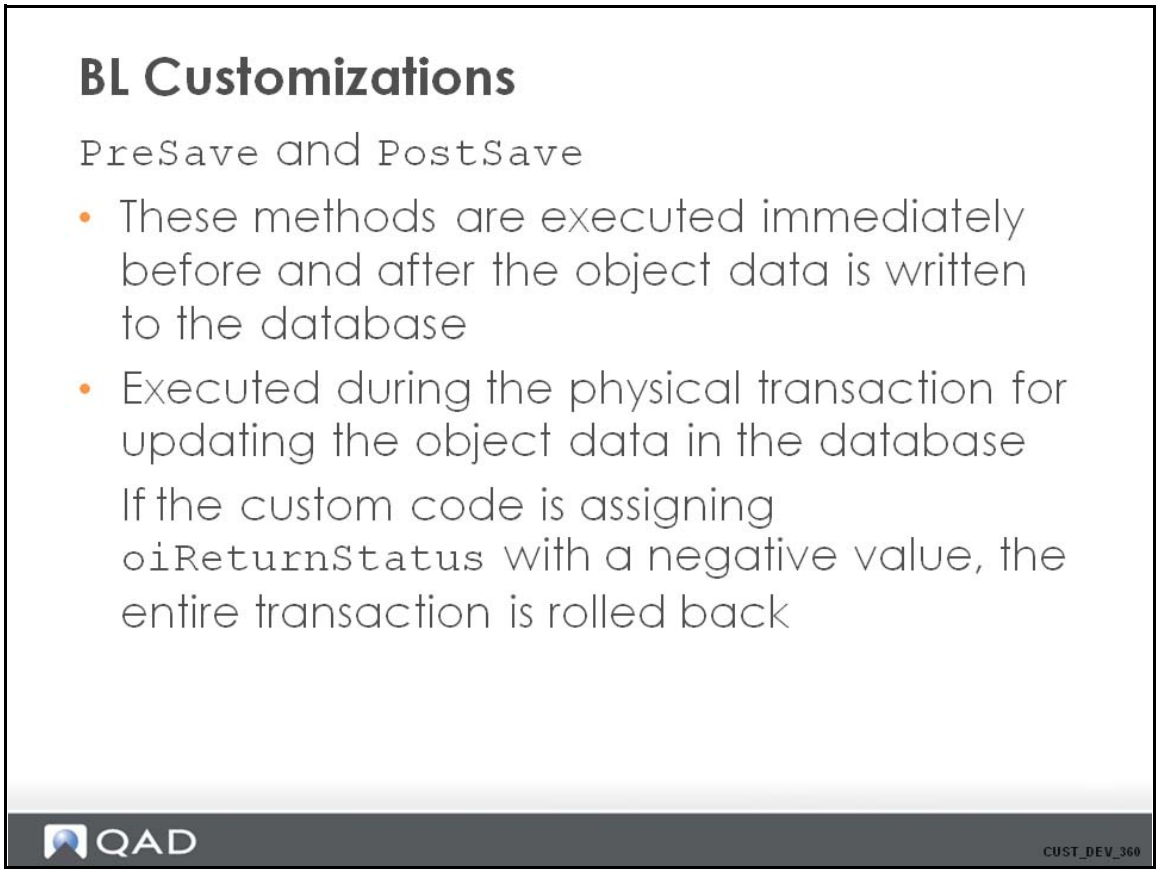
BL Customizations - AdditionalUpdates



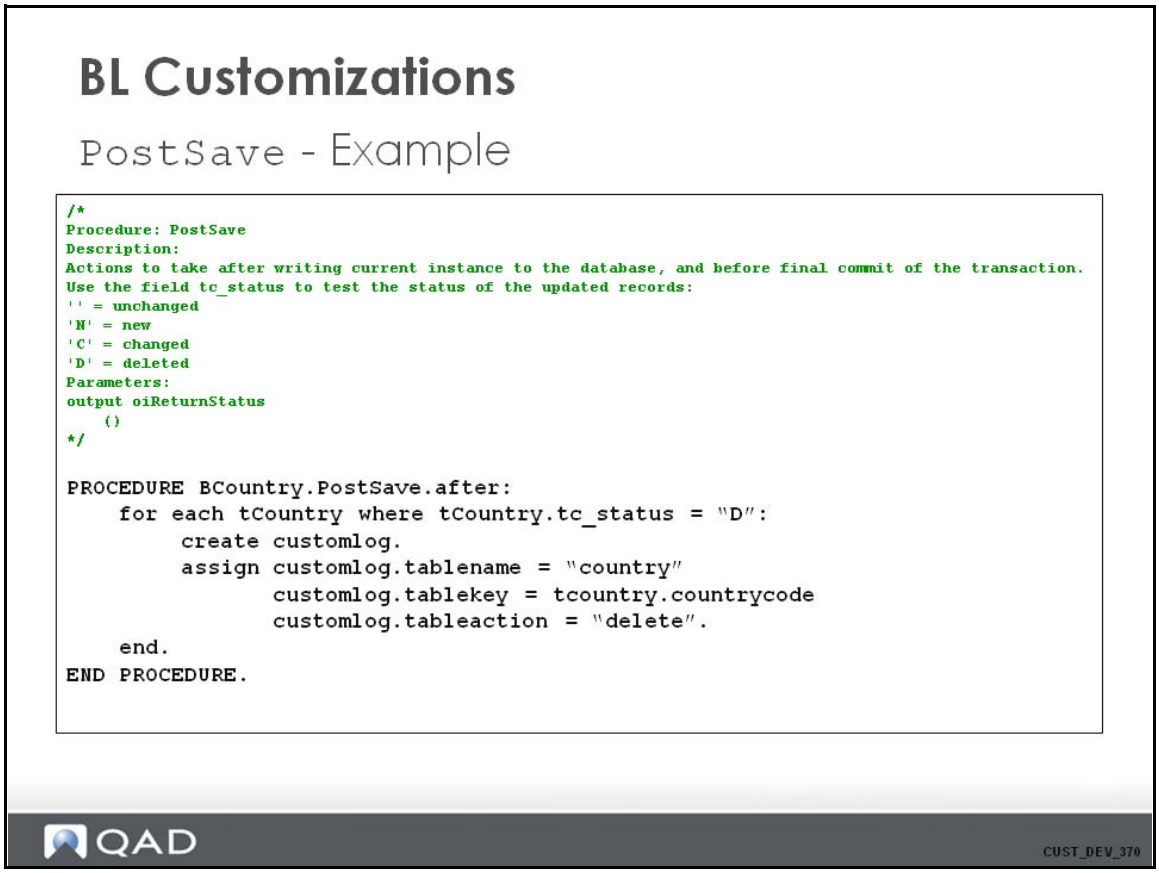
BL Customizations - Additional Updates 2



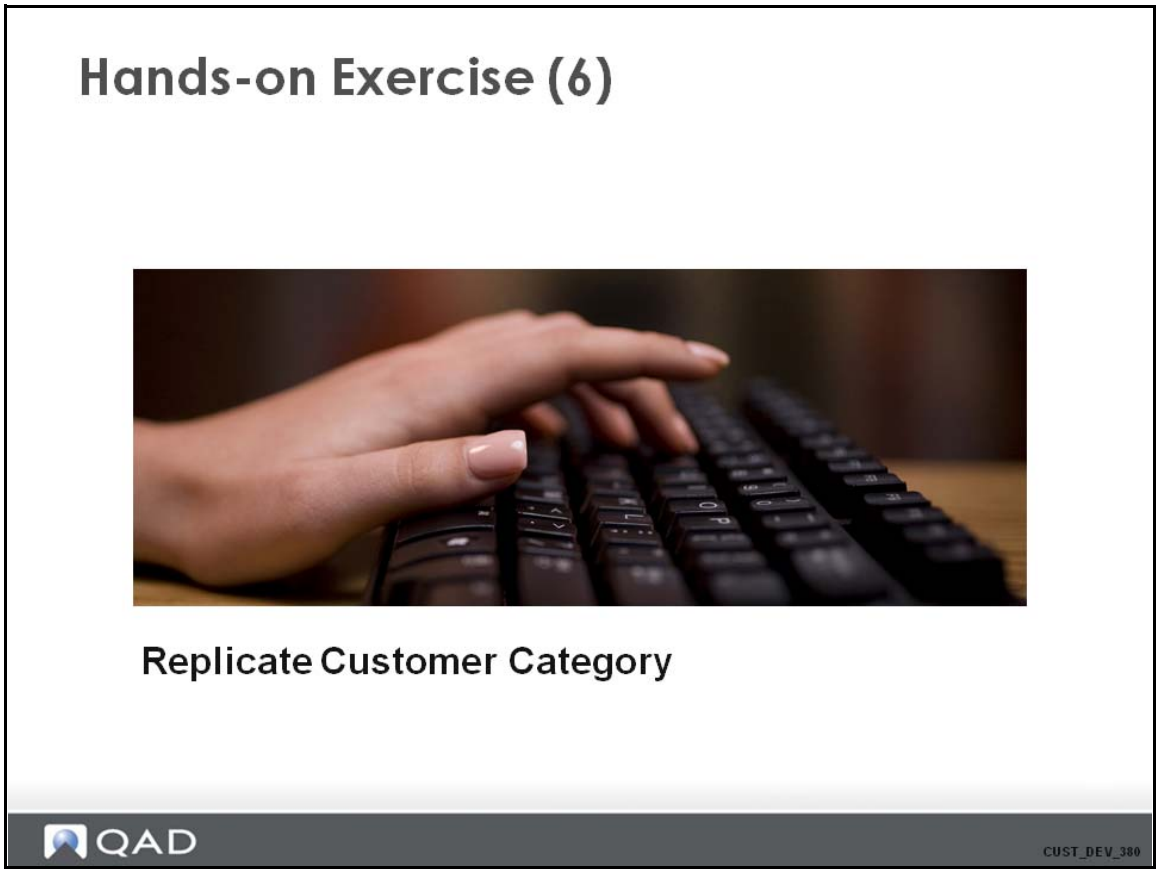
BL Customizations - PreSave and PostSave



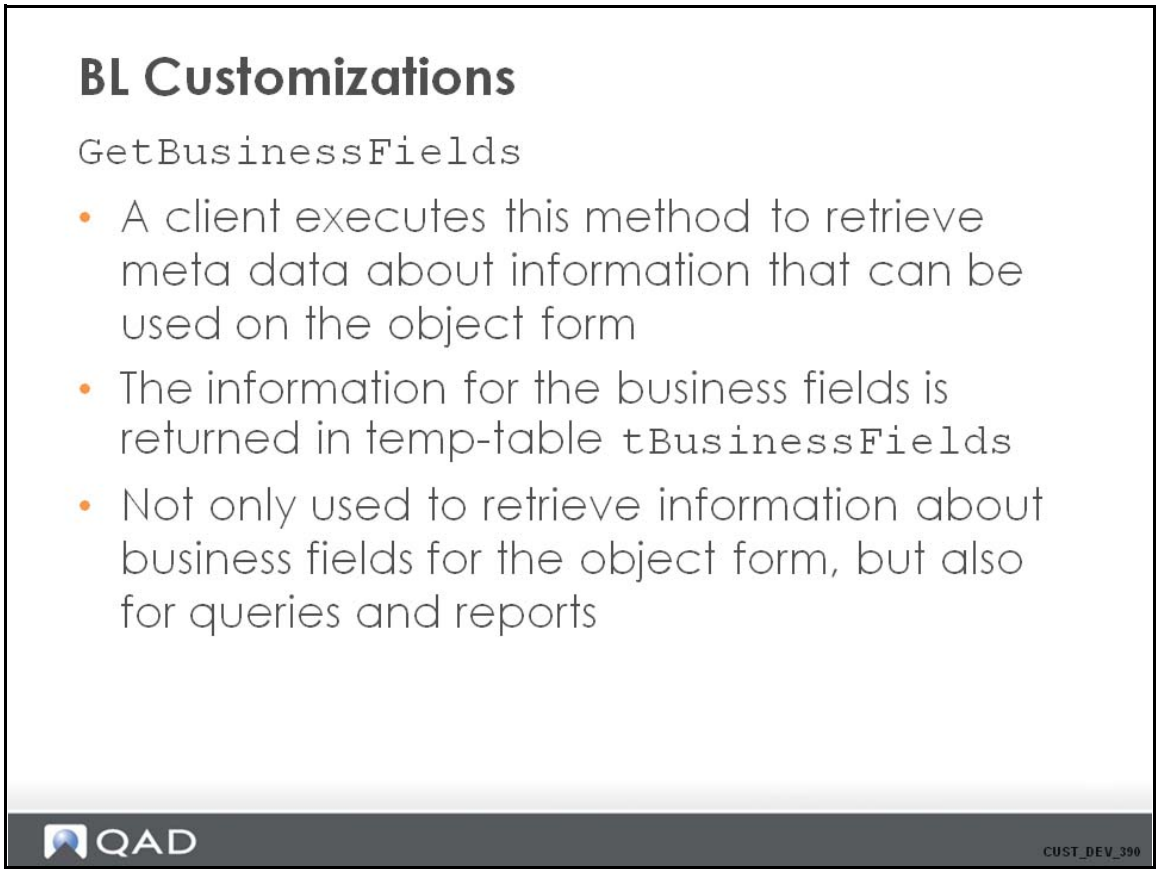
BL Customizations - PostSave



Hands-on Exercise (6)



BL Customizations - GetBusinessFields



BL Customizations - Business Fields Mechanism

BL Customizations

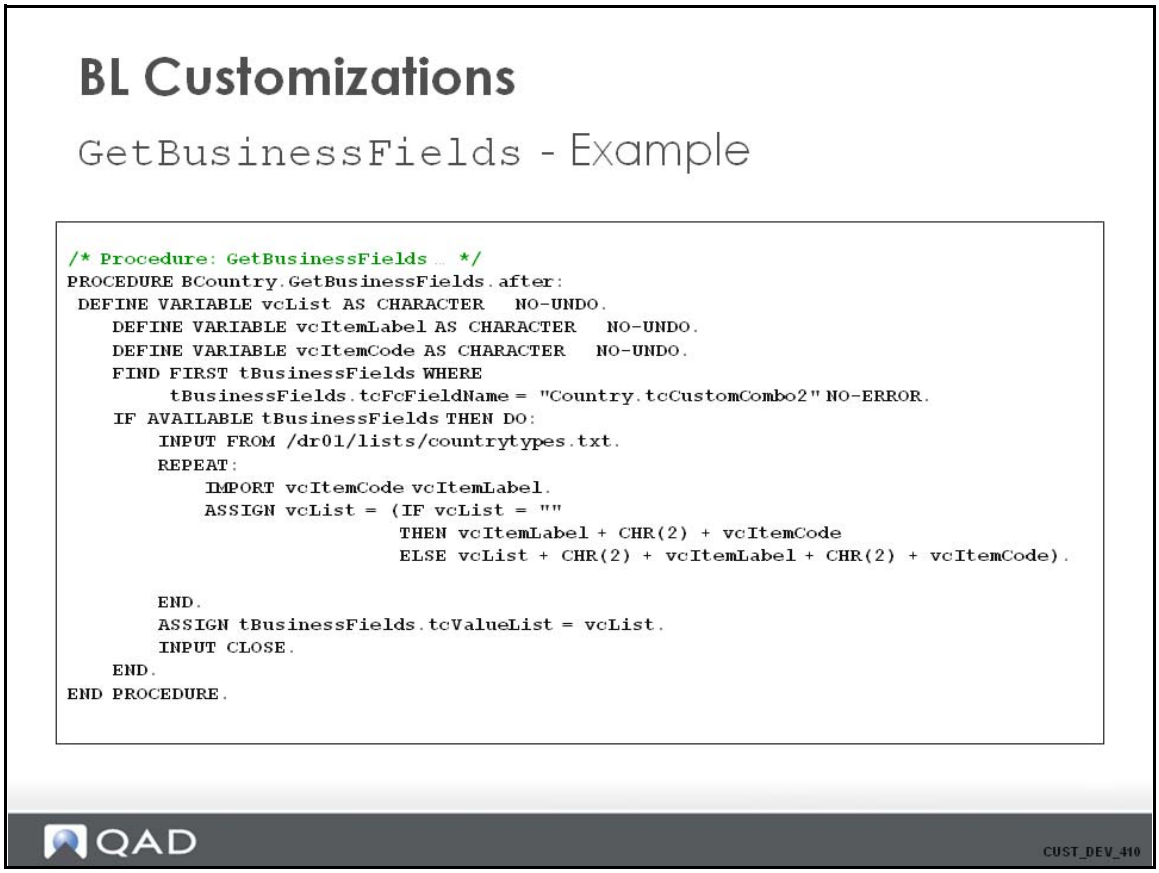
Business Fields Mechanism

The dataset (with one temp table) `tBusinessFields`, which is returned by the `GetBusinessFields()` method, contains the following fields:

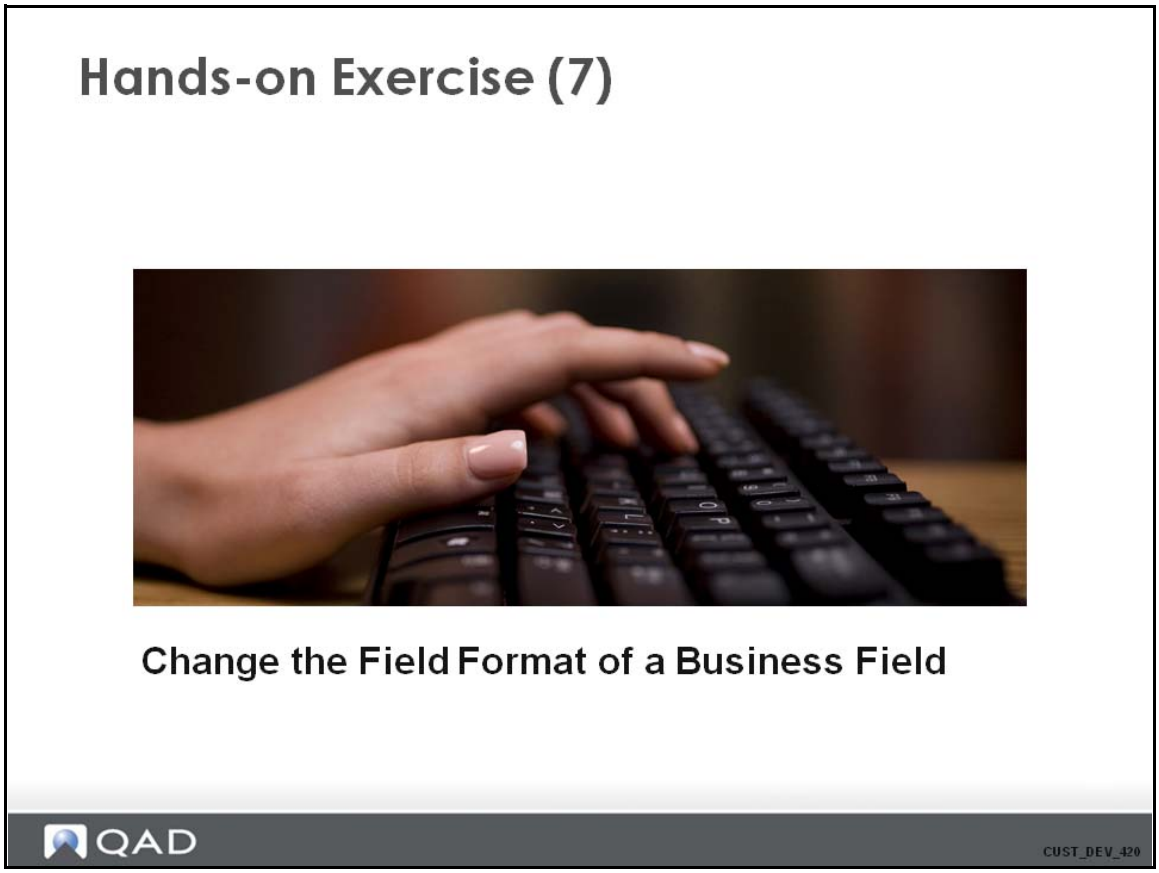
tcColumnLabel	character	Column label
tcControlType	character	ControlType
tcDataType	character	Can be any of the following values c,d,i,l (resp. character, decimal, date, integer or logical)
tcDisabledForActivities	character	business field is disabled for any of these activity codes (comma separated list of activity codes)
tcDisplayFormat	character	DisplayFormat (progress display format like "x(40)")
tcFcDescription	character	Description of the field (currently not used by the UI)
tcFcFieldName	character	The name of the business field.
tcFcFieldType	character	can be "B", "F", "C" (resp. business, filter or custom)
tcFilterOperators	character	This is the list of possible filter operators. This is used in case of "F" typed business fields.
tcHiddenForActivities	character	business field is hidden for any of these activity codes (comma separated list of activity codes)
tcLookupFilterField	character	This is the filter field in the query that is referenced by tcLookupQuery. It receives the value of the current business field upon calling the lookup with the tcLookupQuery reference.
tcLookupQuery	character	The query that should be used when the lookup is chosen for the business field.
tcLookupReturnField	character	This is the business field from the result set from the tcLookupQuery for which the value is returned and filled in into the current business field.
tcRelatedObject	character	Business component to which the business field refers. This activates the "goto" link.
tcSideLabel	character	side label
tiStoredSearch_ID	integer	Linked stored search (this is only available for user-defined business fields)
tcValidationMask	character	The name of the validation mask for the field (this is not used by the UI at the moment)
tcValueList	character	The list of discrete values the business field can have. This is used to populate the combo-box.
tcInitialValue	character	The initial value of the business field. Only used in the "create" activity.
tiSequence	integer	A sequence of the business field. Only used as unique key in the tBusinessFields temp-table.

QAD CUST_DEV_400

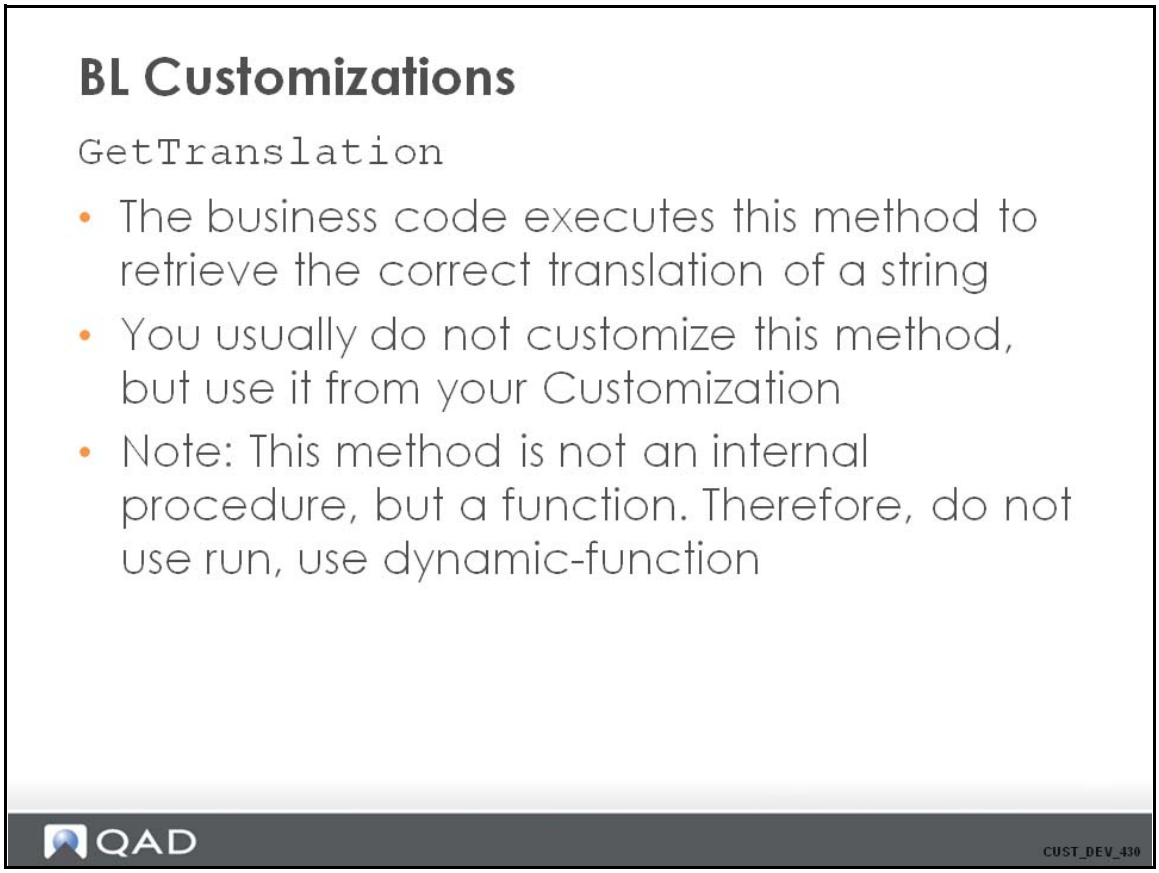
BL Customizations - GetBusinessFields



Hands-on Exercise (7)



BL Customizations - GetTranslation



BL Customizations - GetTranslation 2

BL Customizations

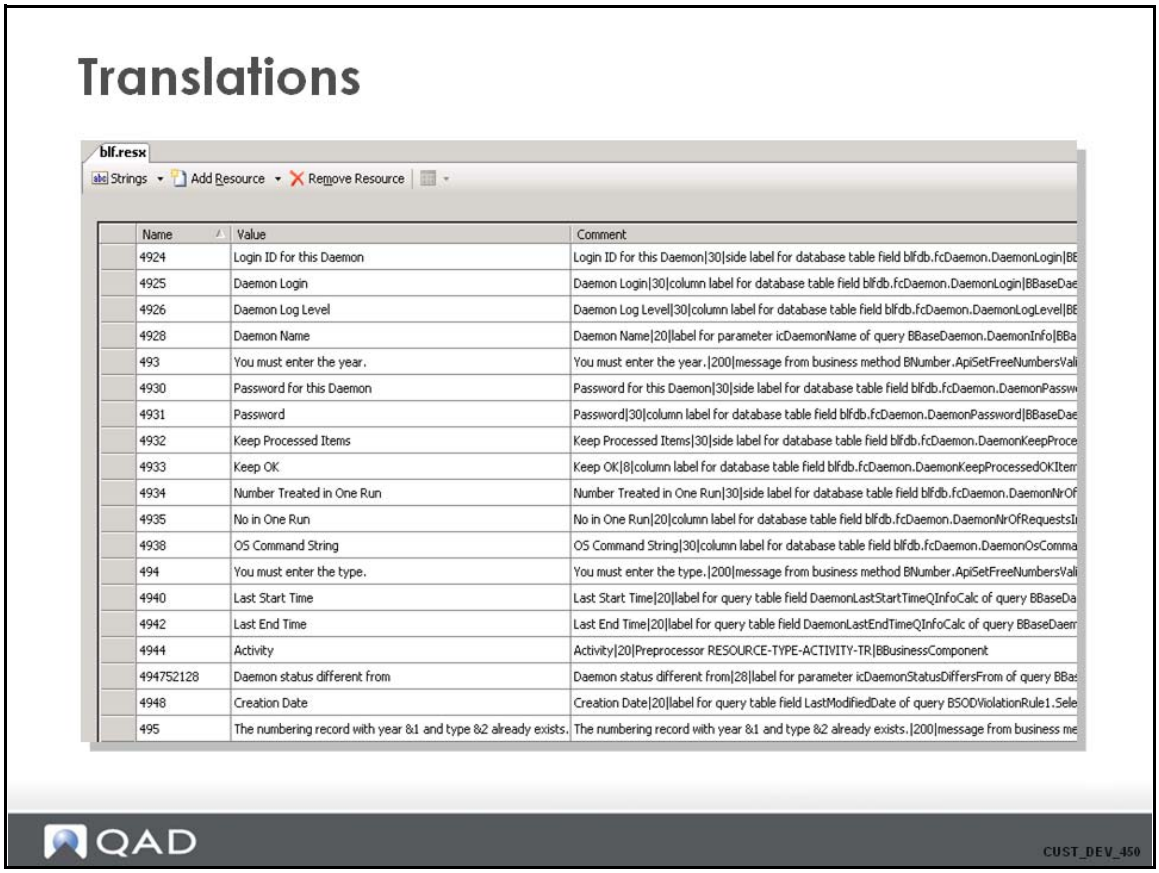
GetTranslation - Example

```
PROCEDURE BCountry.ValidateComponent.before:
    DEFINE VARIABLE viReturn AS INTEGER NO-UNDO.
    DEFINE VARIABLE vcMessage AS CHARACTER NO-UNDO.
    FOR EACH t_sCountry:
        IF t_sCountry.CustomInteger0 = 0 THEN DO:
            ASSIGN t_parameter.oiReturnStatus = -102.
            ASSIGN vcMessage = DYNAMIC-FUNCTION
                 ('GetTranslation' in {&TARGETPROCEDURE}, 12345, PCode',
                  'The number of habitants ($1) must be greater than 0.').
            run SetMessage
               (vcMessage,
                STRING(t_sCountry.CustomInteger0),
                't_sCountry.CustomInteger0',
                string(t_sCountry.CustomInteger0),
                'E', 3, t_sCountry.tc_Rowid,
                'CUSTOM-001', '', '', '', output viReturn).
            RETURN.
        END.
    END.
END PROCEDURE.
```

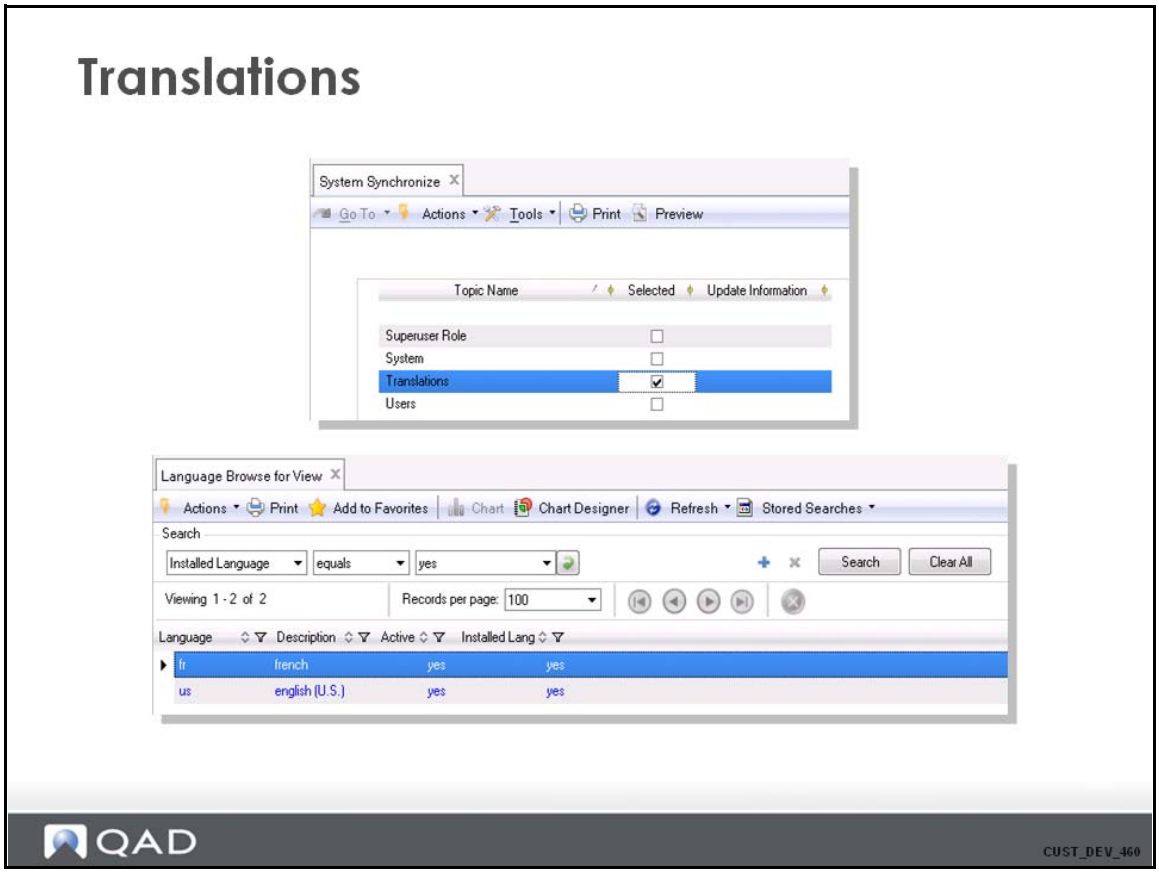
QAD

CUST_DEV_440

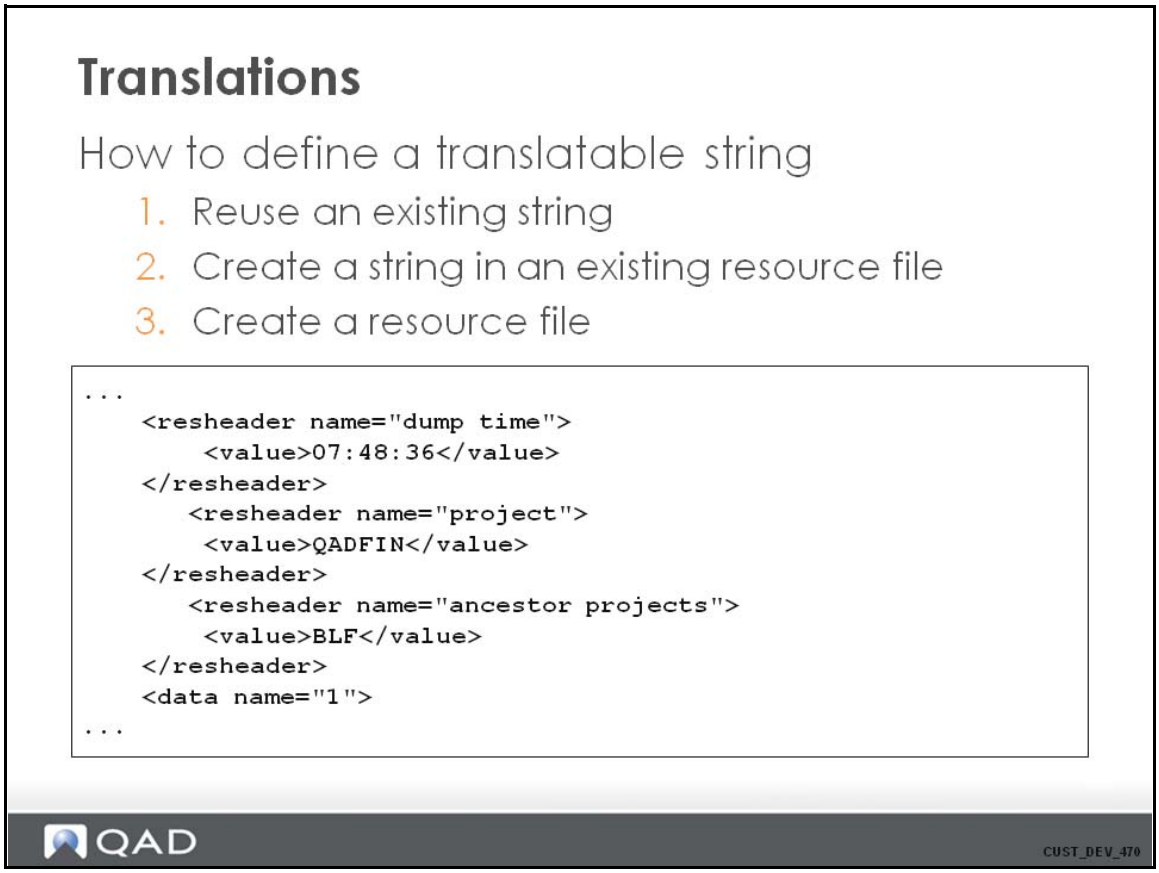
Translations



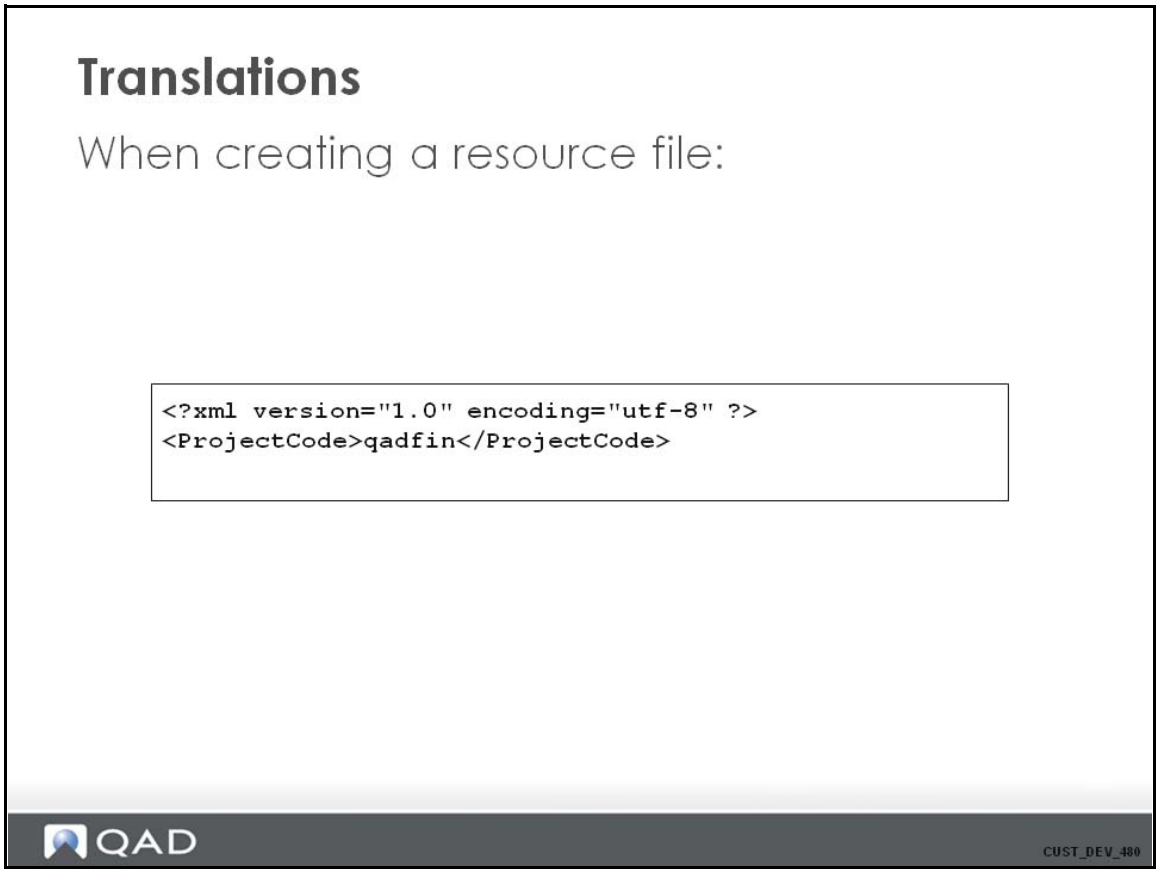
Translations 2



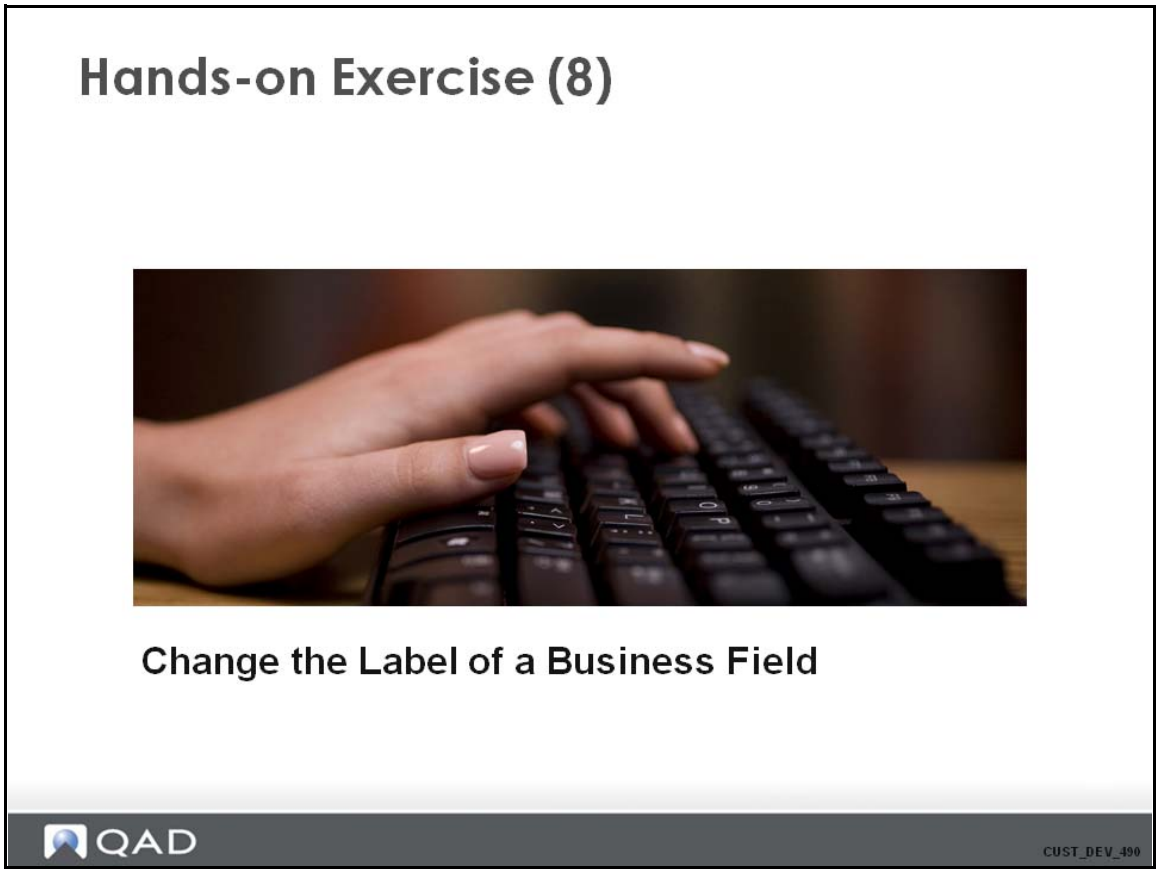
Translations 3



Translations 4



Hands-on Exercise (8)



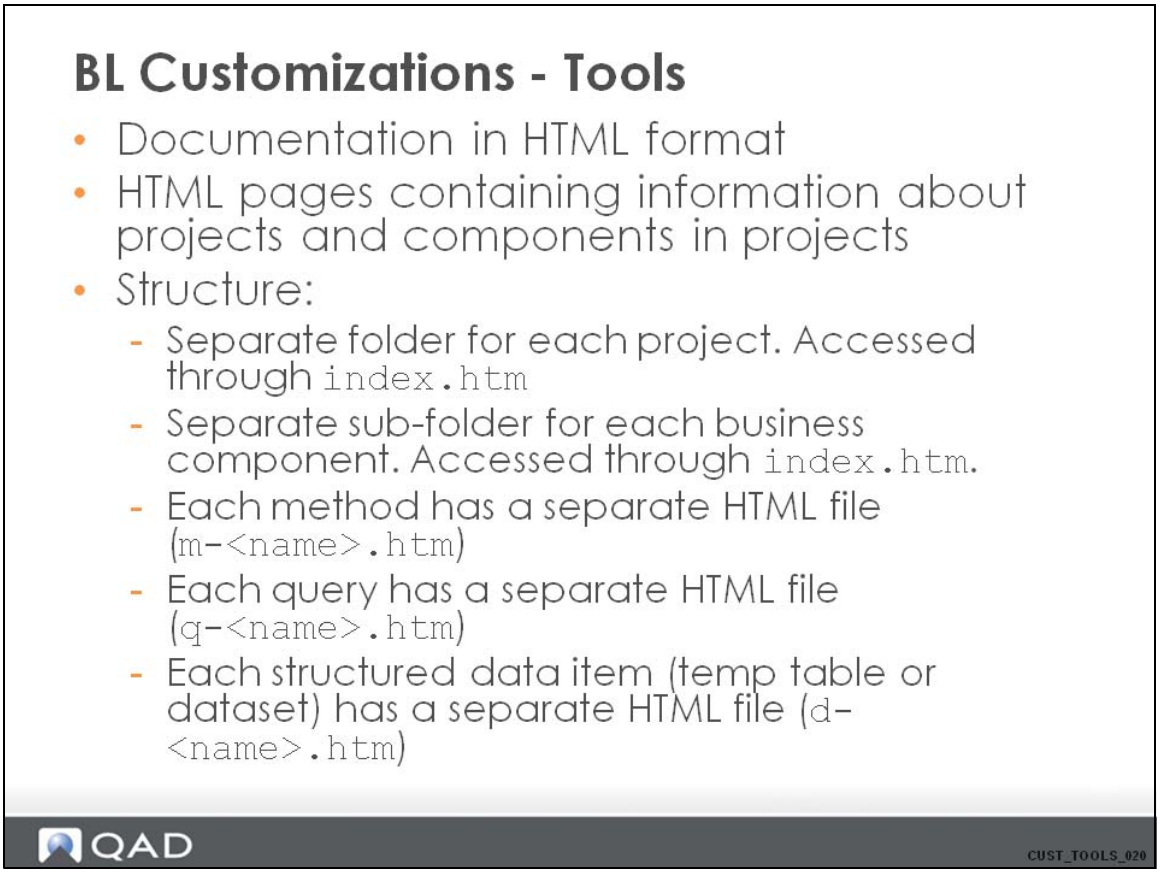
Chapter 5

Non-intrusive Customization: Supporting Tools

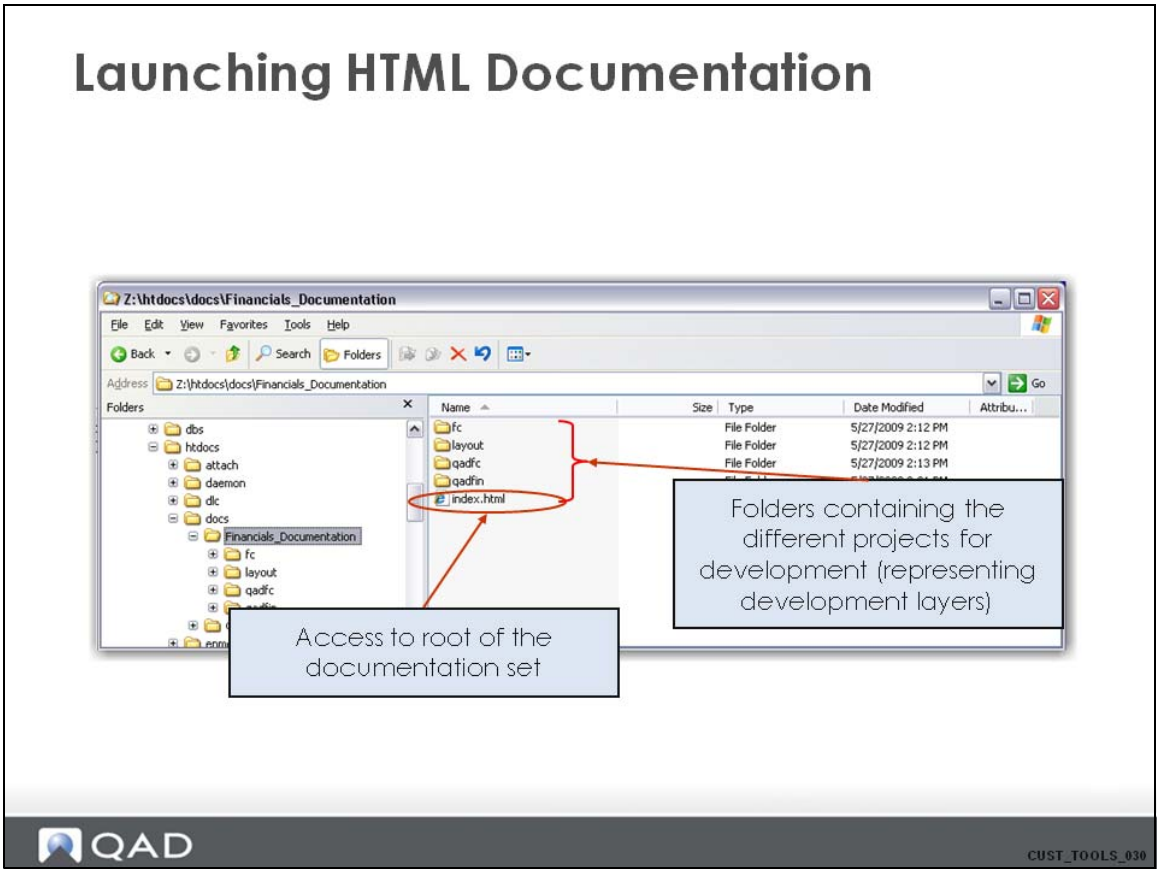
Non-intrusive Customization: Supporting Tools



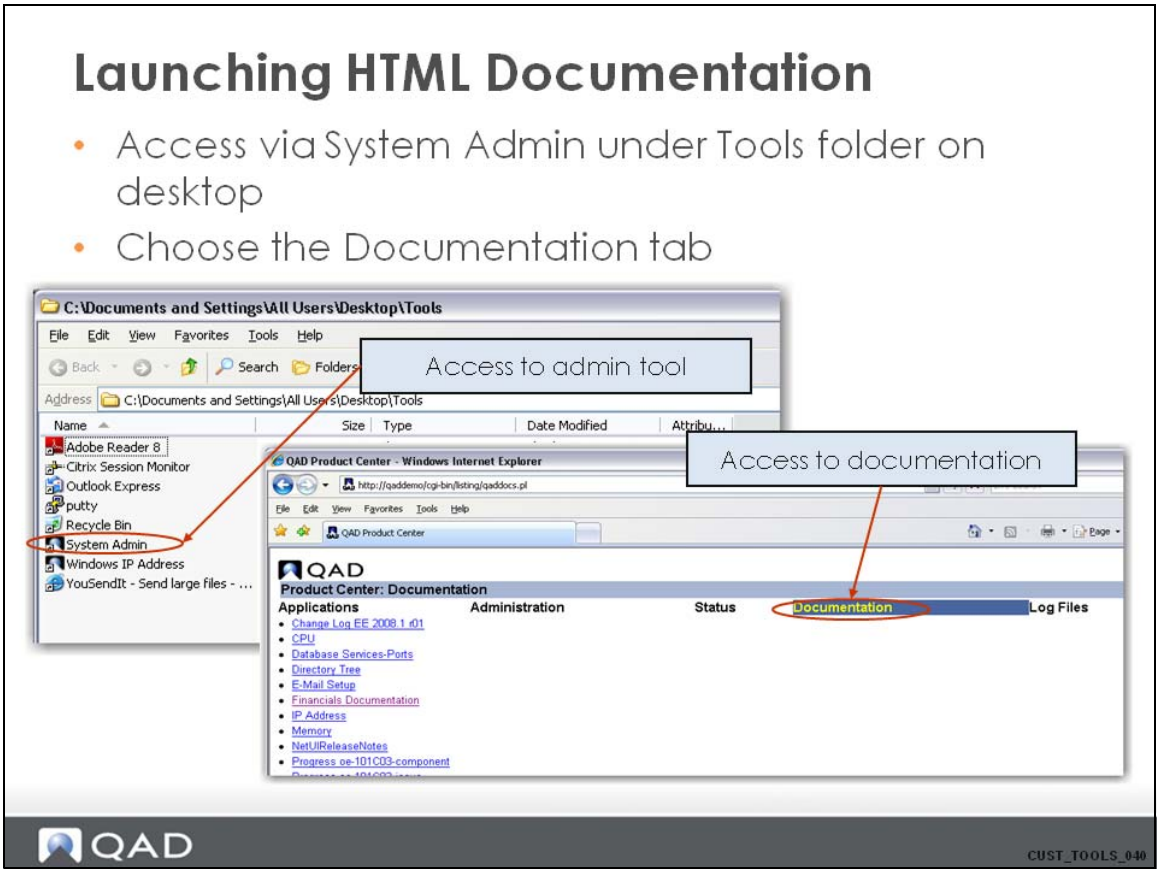
BL Customization - Tools



Launching HTML Documentation



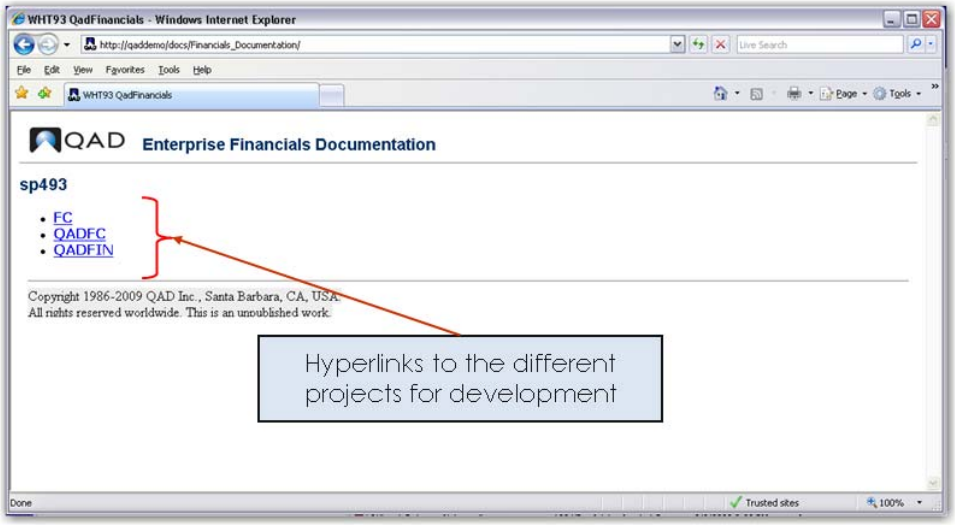
Launching HTML Documentation 2



Navigating HTML Documentation 3

Navigating HTML Documentation

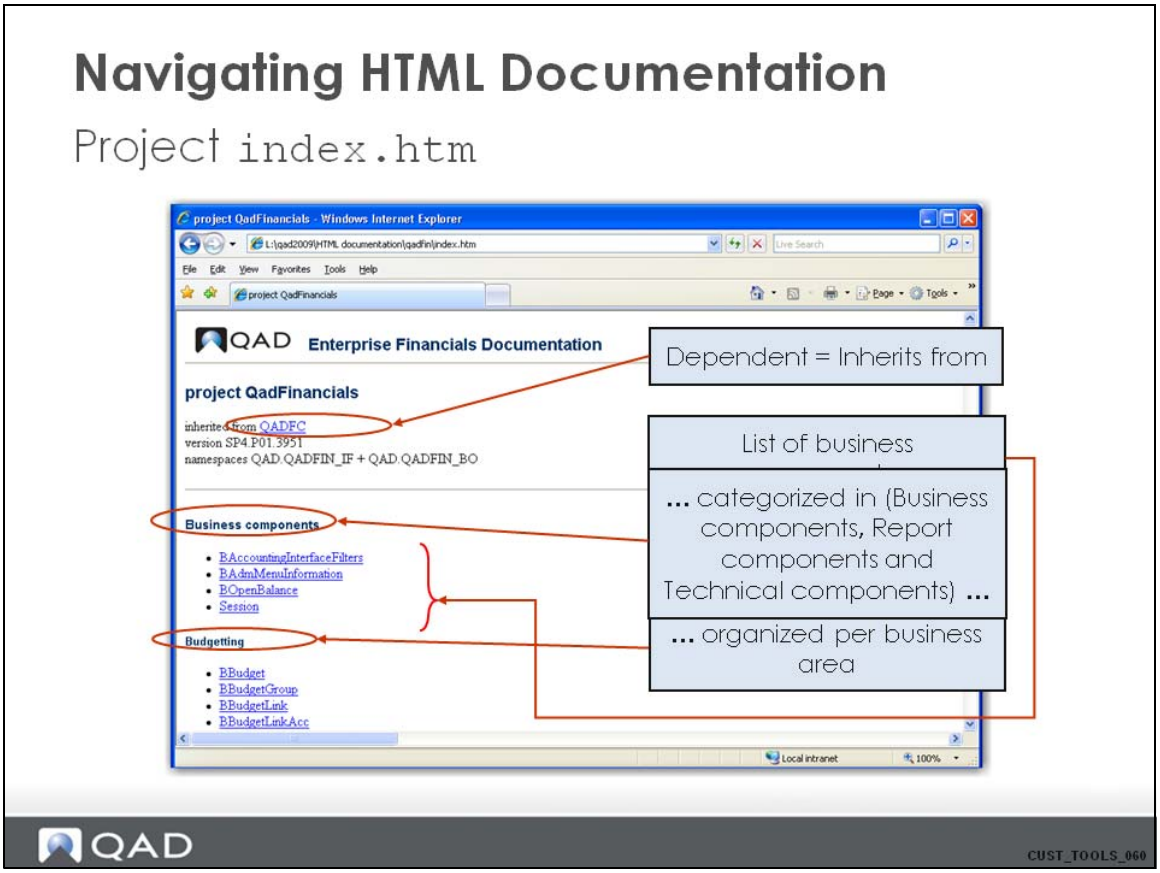
Main `index.htm`



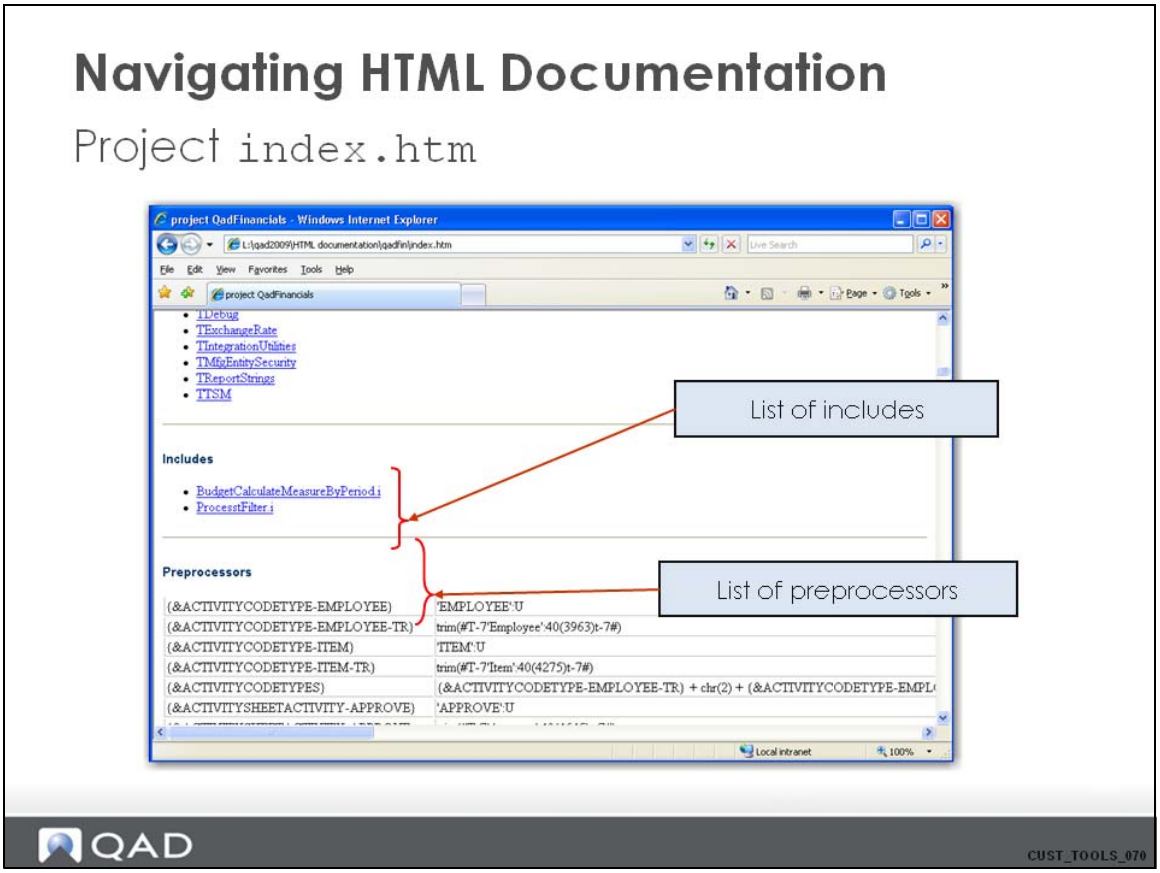
QAD

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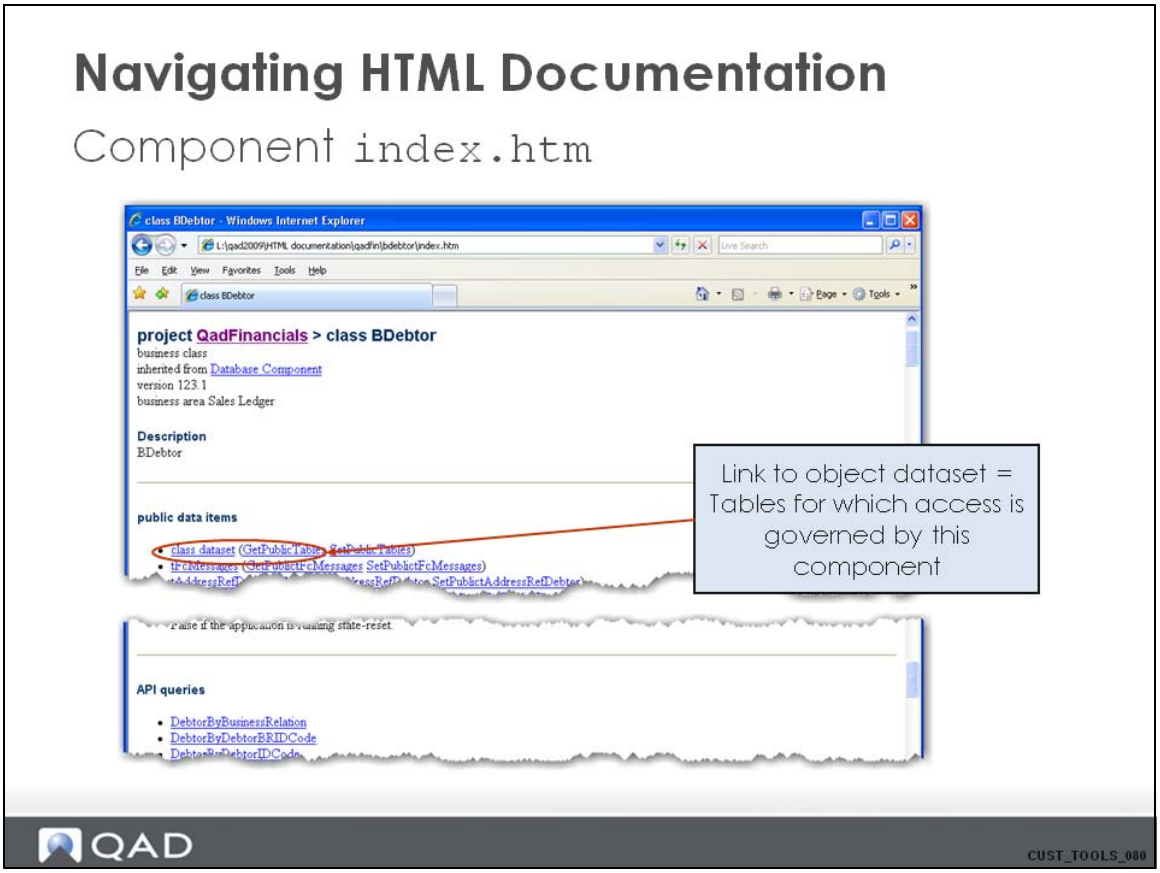
Navigating HTML Documentation 4



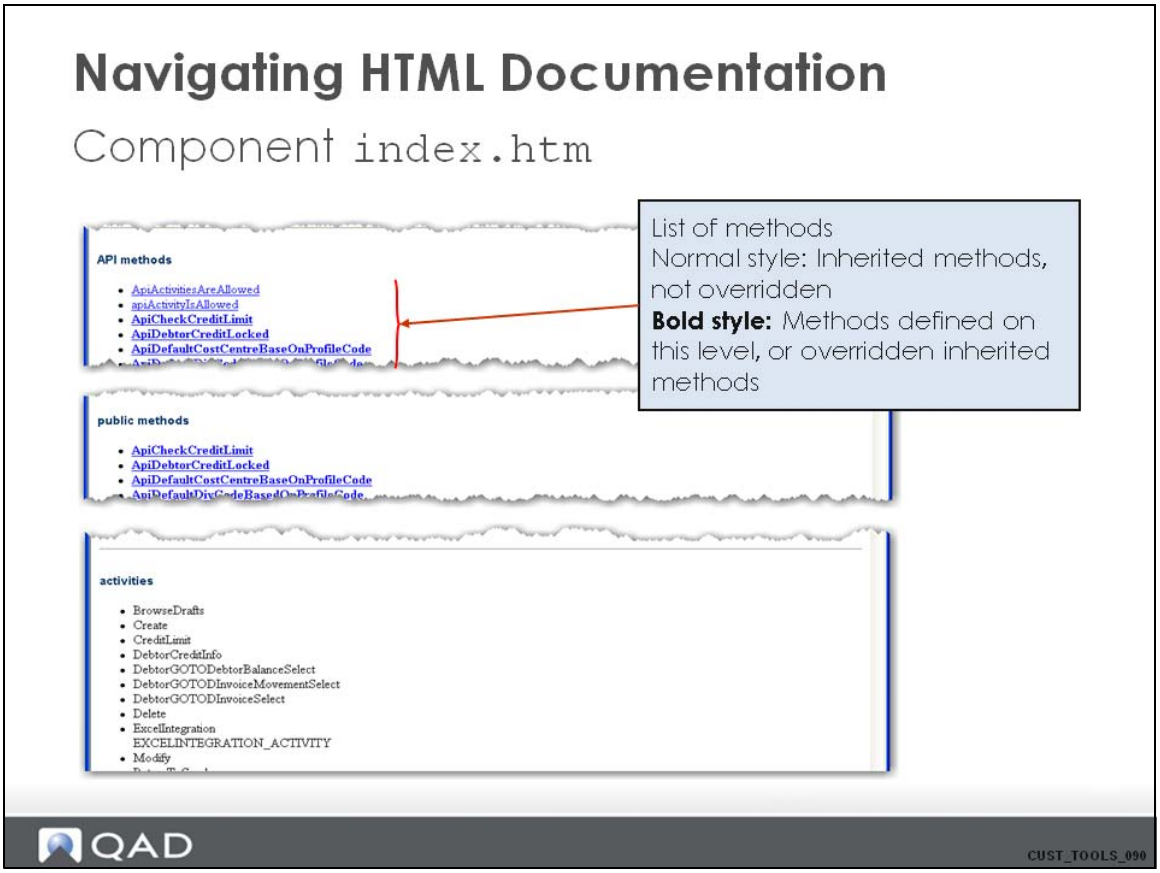
Navigating HTML Documentation 5



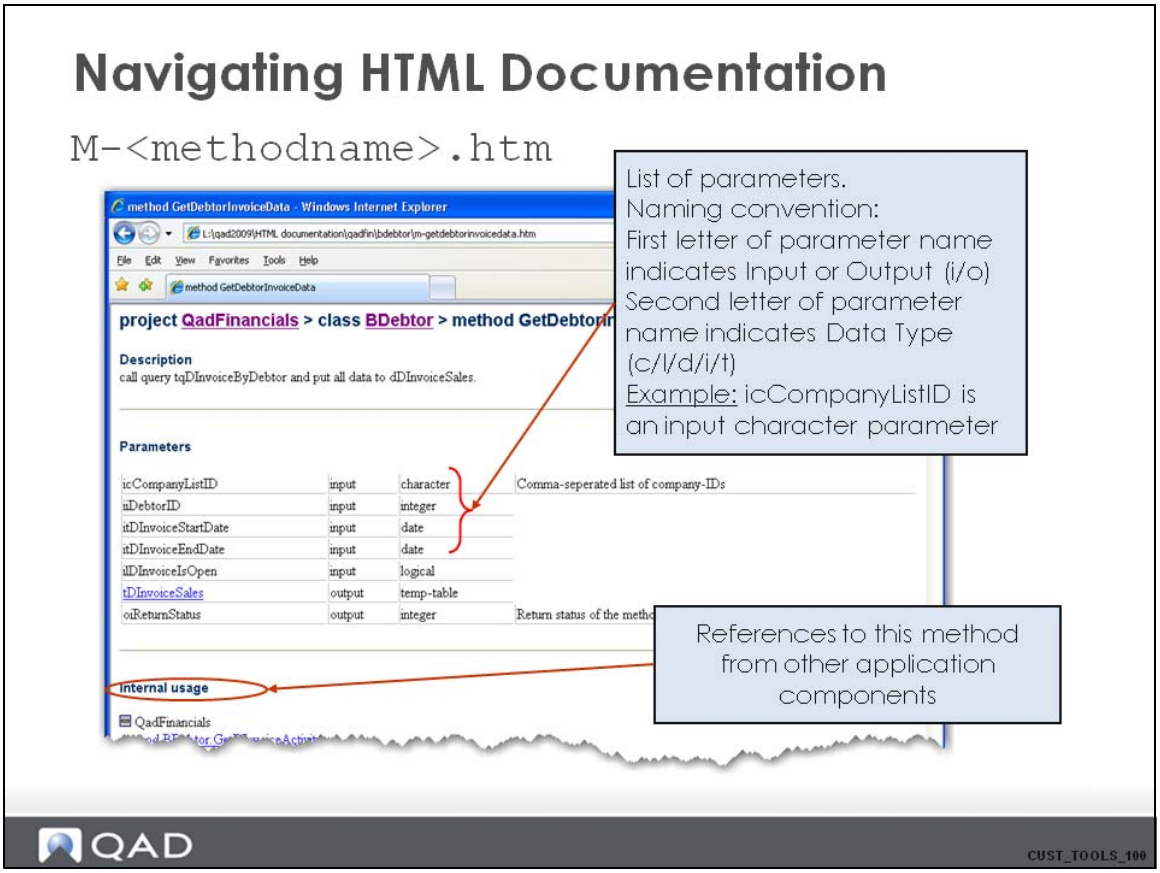
Navigating HTML Documentation 6



Navigating HTML Documentation 7



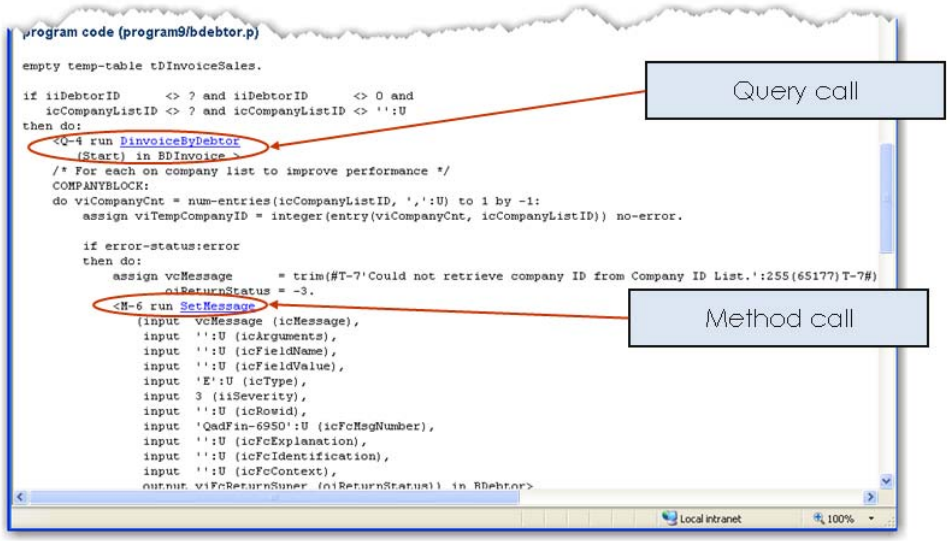
Navigating HTML Documentation 8



Navigating HTML Documentation 9

Navigating HTML Documentation

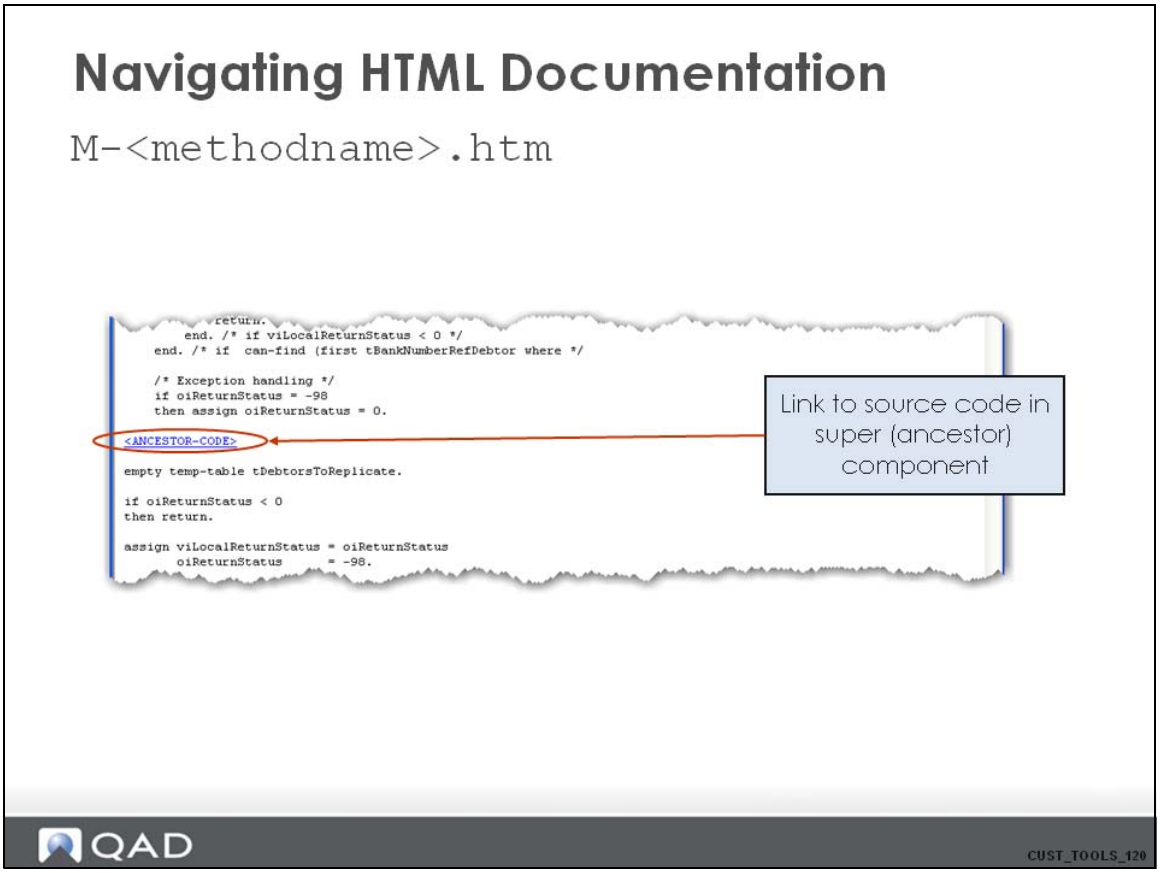
M-<methodname>.htm



QAD

CUST_TOOLS_110

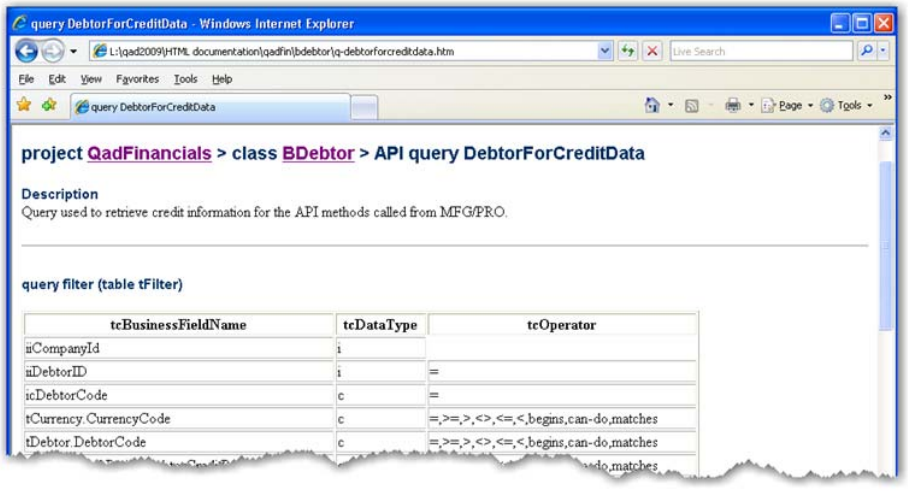
Navigating HTML Documentation 10



Navigating HTML Documentation 11

Navigating HTML Documentation

Q-<queryname>.htm



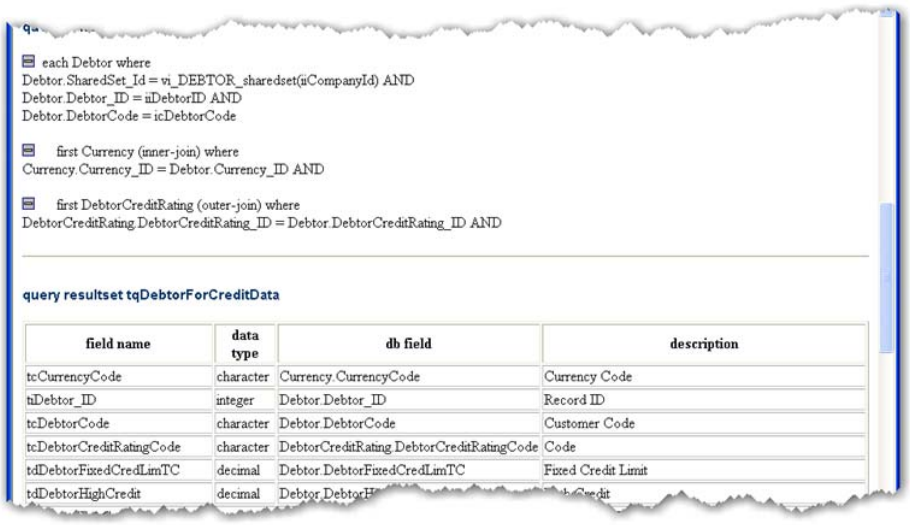
QAD

CUST_TOOLS_130

Navigating HTML Documentation 12

Navigating HTML Documentation

Q-<queryname>.htm



each Debtor where
Debtor.SharedSet_Id = vi_DEBTOR_sharedset(iiCompanyId) AND
Debtor.Debtor_ID = iiDebtorID AND
Debtor.DebtorCode = icDebtorCode

first Currency (inner-join) where
Currency.Currency_ID = Debtor.Currency_ID AND

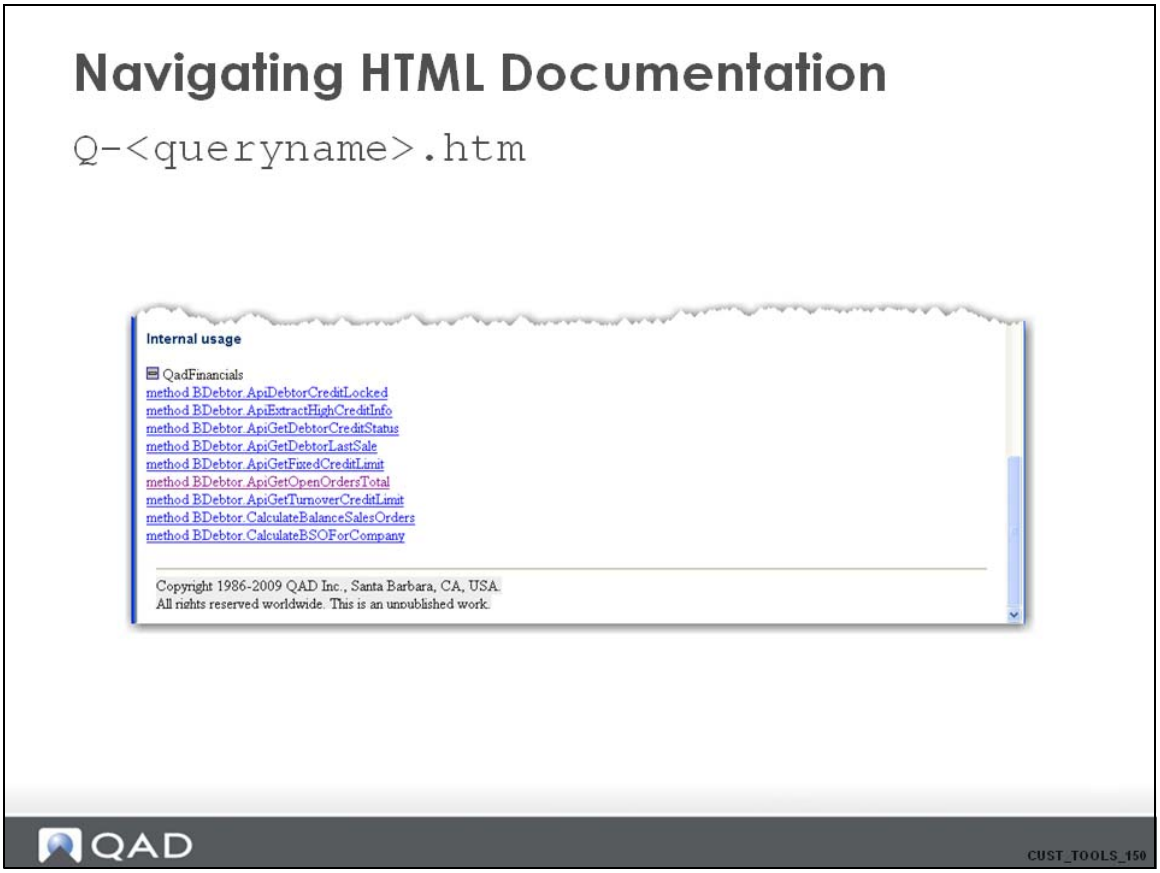
first DebtorCreditRating (outer-join) where
DebtorCreditRating.DebtorCreditRating_ID = Debtor.DebtorCreditRating_ID AND

query resultset tqDebtorForCreditData

field name	data type	db field	description
tcCurrencyCode	character	Currency.CurrencyCode	Currency Code
tiDebtor_ID	integer	Debtor.Debtor_ID	Record ID
tcDebtorCode	character	Debtor.DebtorCode	Customer Code
tcDebtorCreditRatingCode	character	DebtorCreditRating.DebtorCreditRatingCode	Code
tdDebtorFixedCredLimTC	decimal	Debtor.DebtorFixedCredLimTC	Fixed Credit Limit
tdDebtorHighCredit	decimal	Debtor.DebtorH	

QAD CUST_TOOLS_140

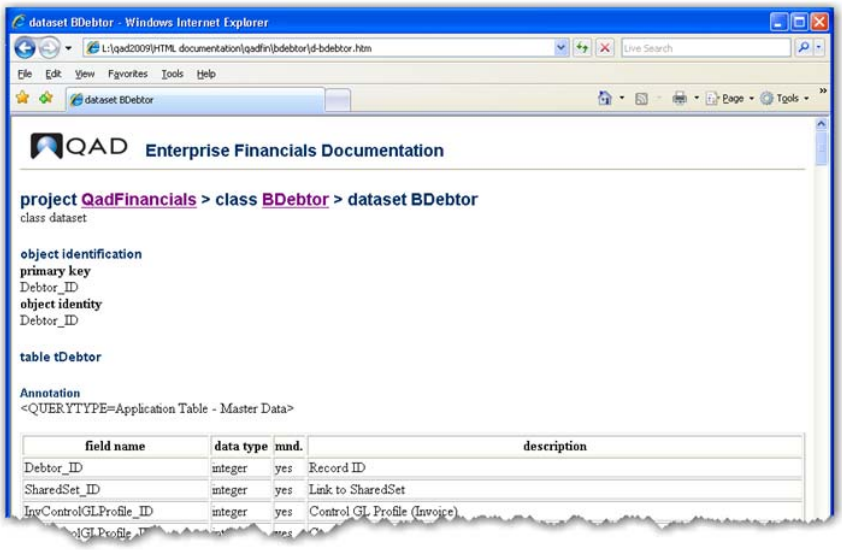
Navigating HTML Documentation 13



Navigating HTML Documentation 14

Navigating HTML Documentation

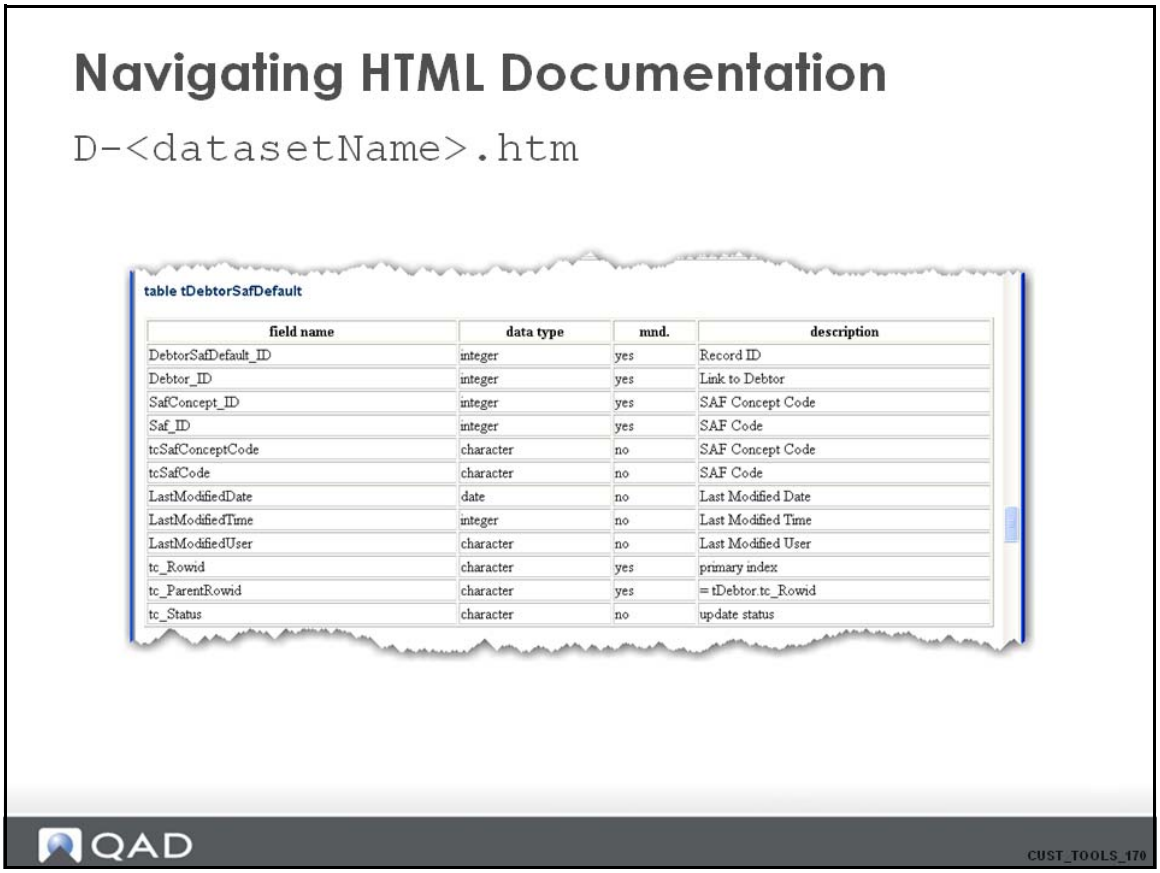
D-<datasetName>.htm



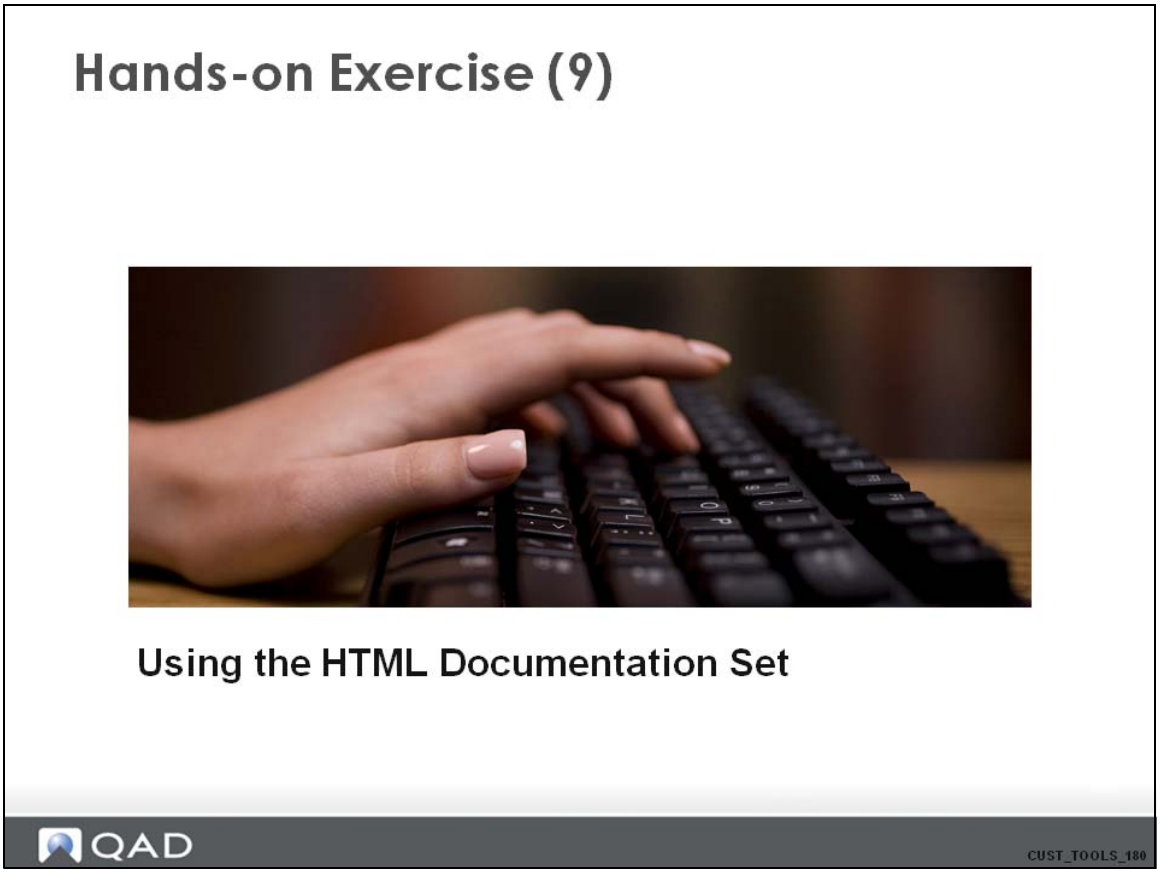
QAD

CUST_TOOLS_160

Navigating HTML Documentation 15



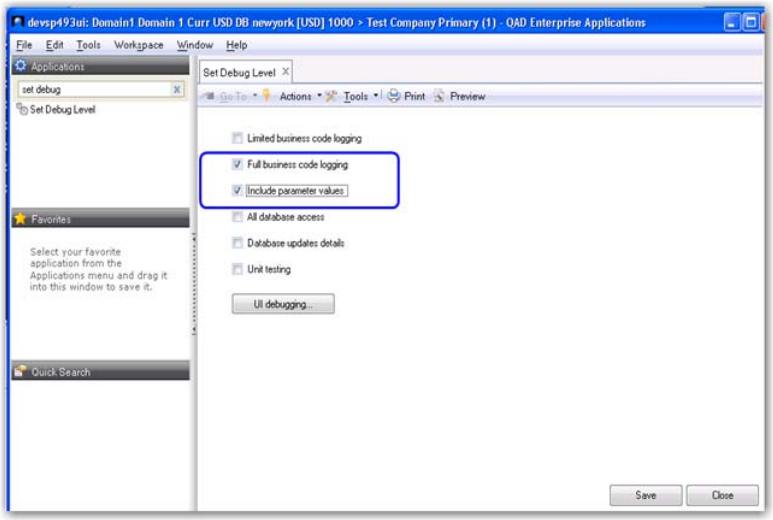
Hands-on Exercise (9)



BL Customizations - Tools

BL Customizations – Tools

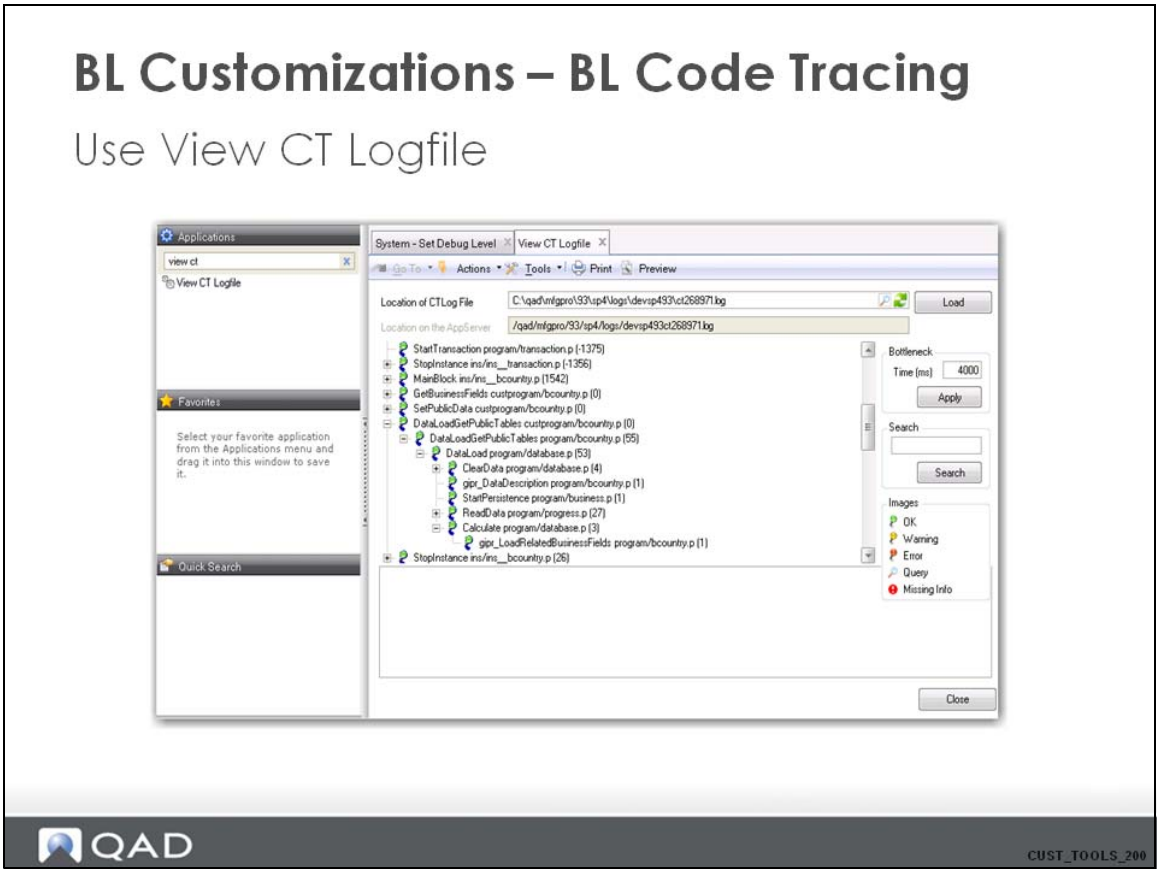
- BL Code Tracing (CT Log file)
- Use Set Debug Level



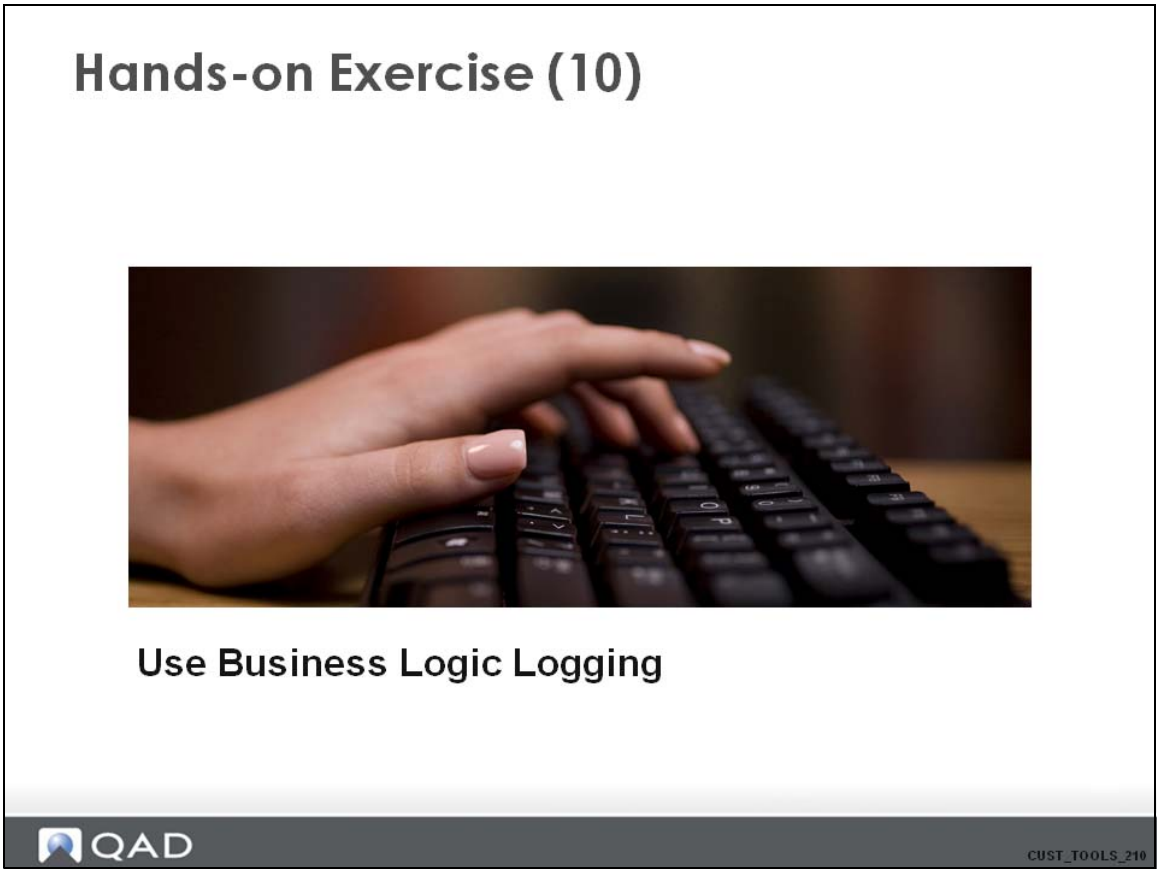
QAD

CUST_TOOLS_190

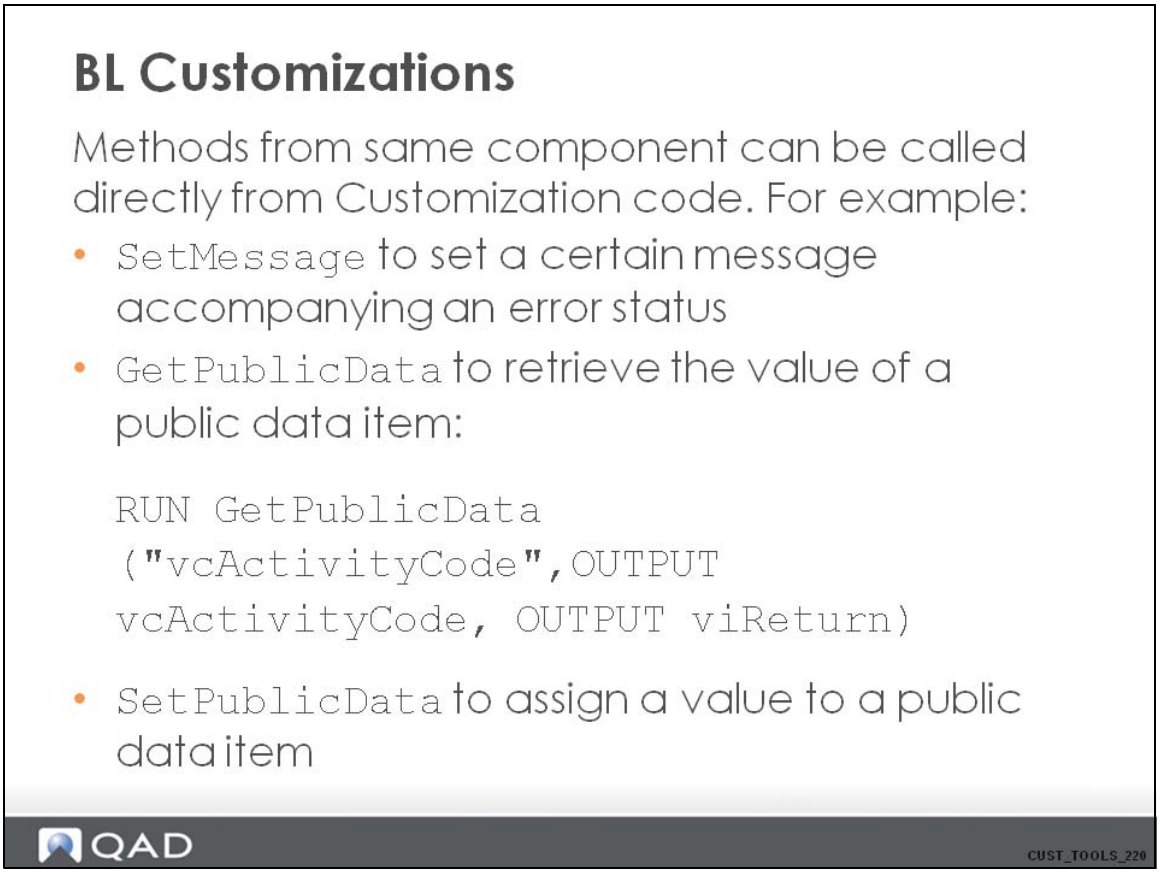
BL Customizations - BL Code Tracing



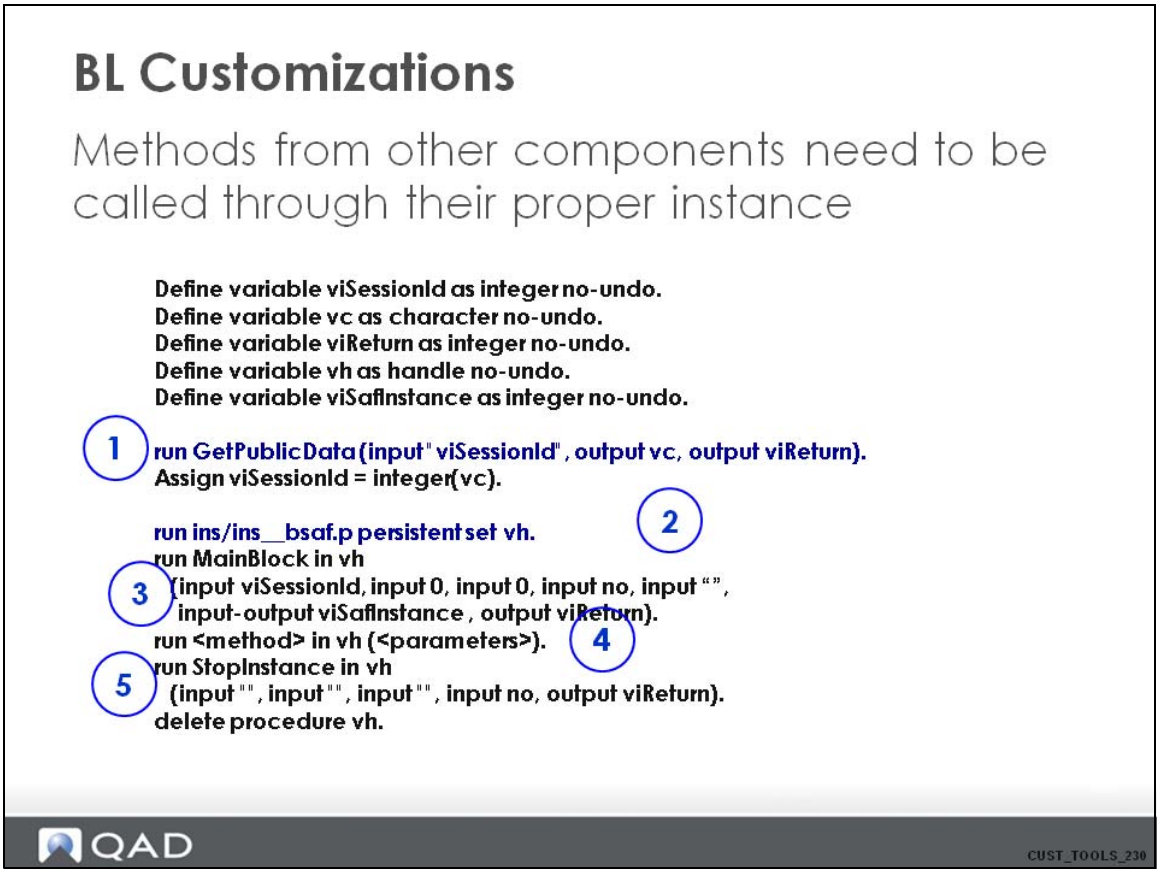
Hands-on Exercise (10)



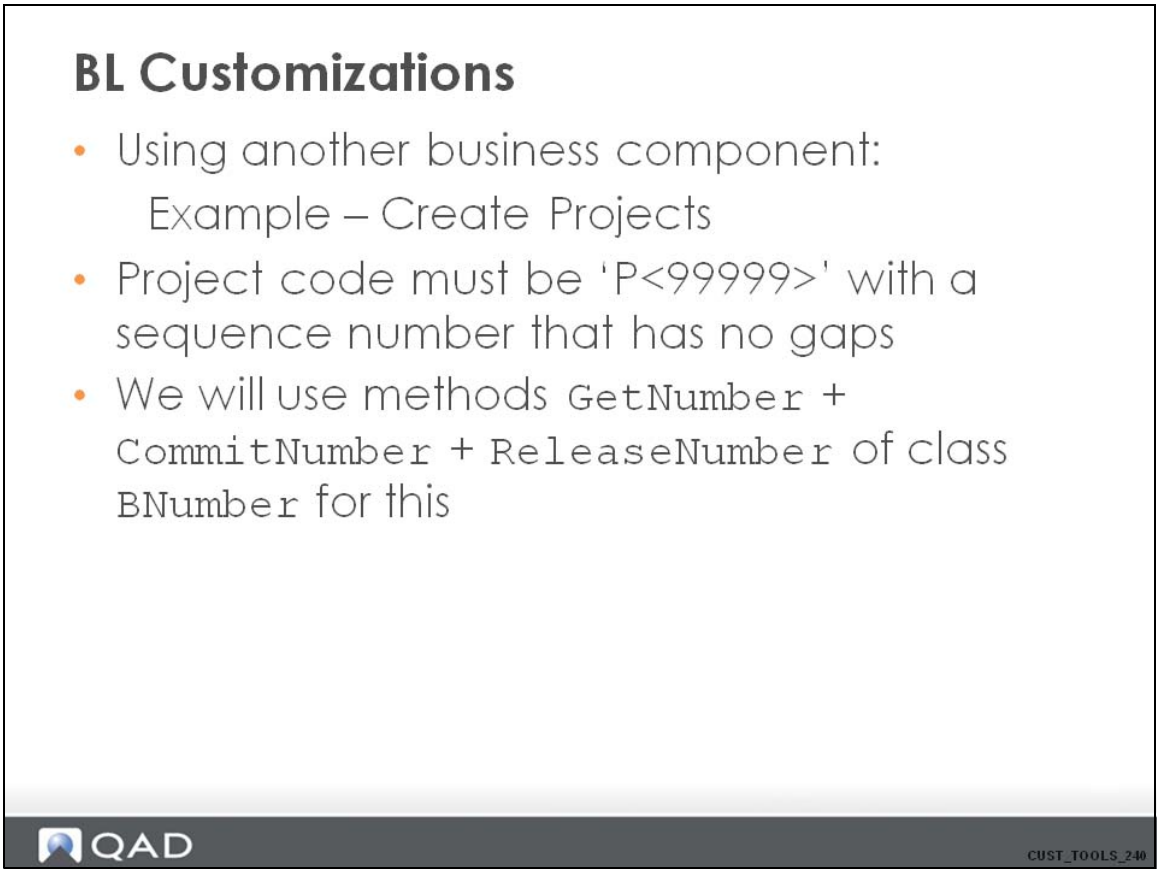
BL Customizations



BL Customizations 2



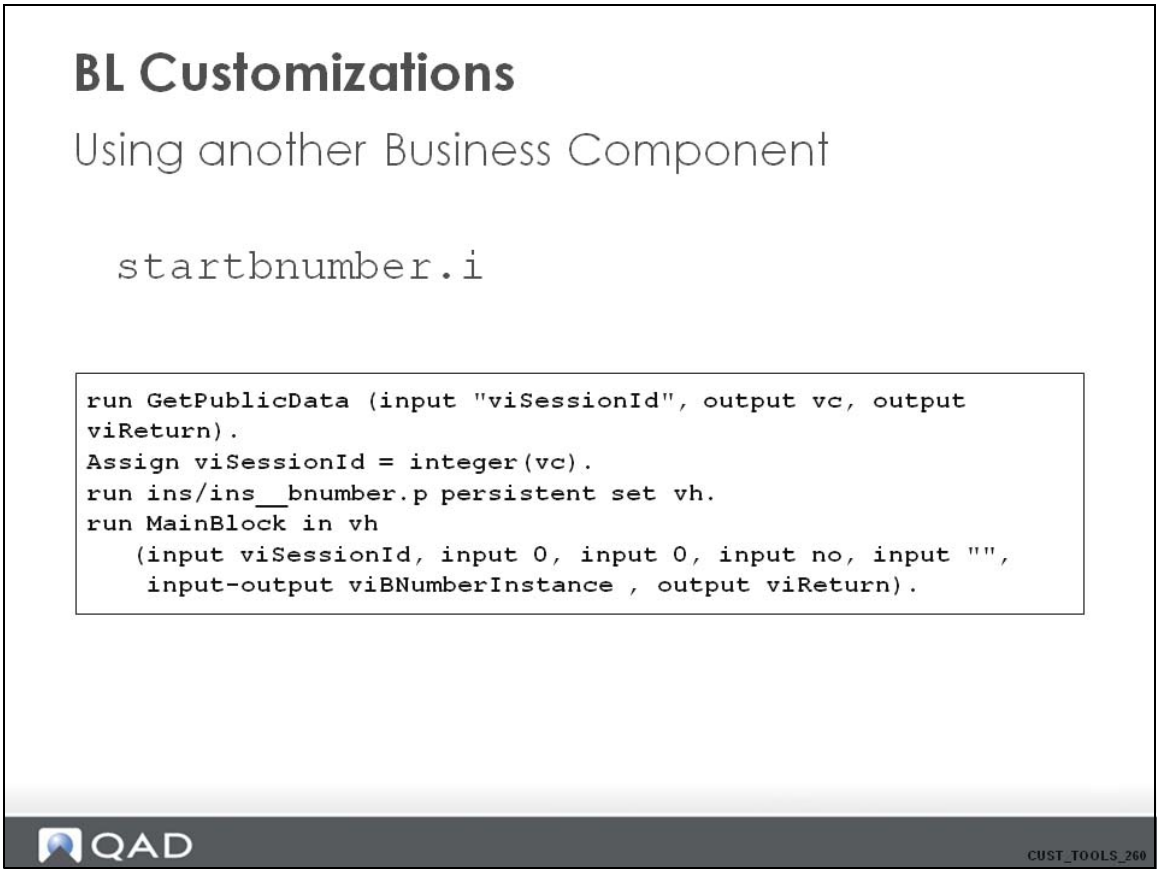
BL Customizations 3



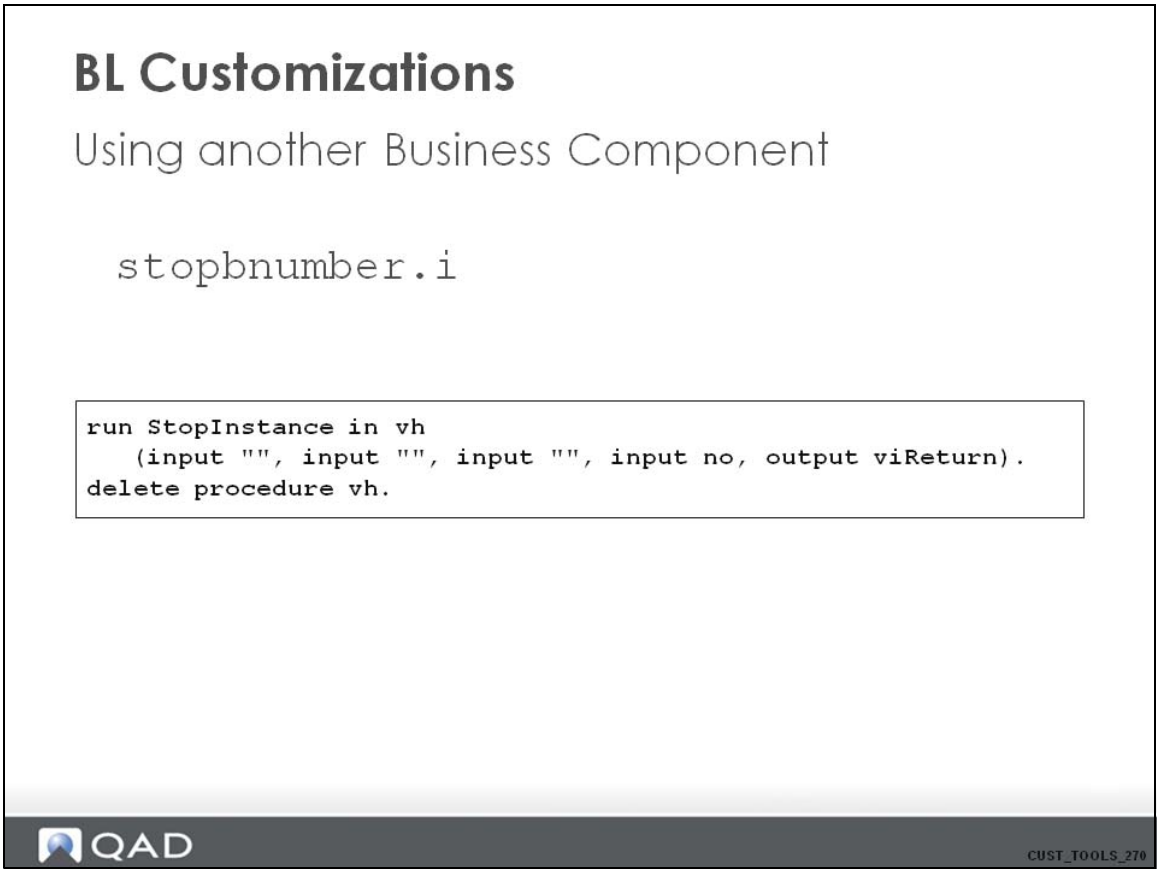
BL Customizations 4



BL Customizations 5



BL Customizations 6



BL Customizations 7

BL Customizations

Using another Business Component

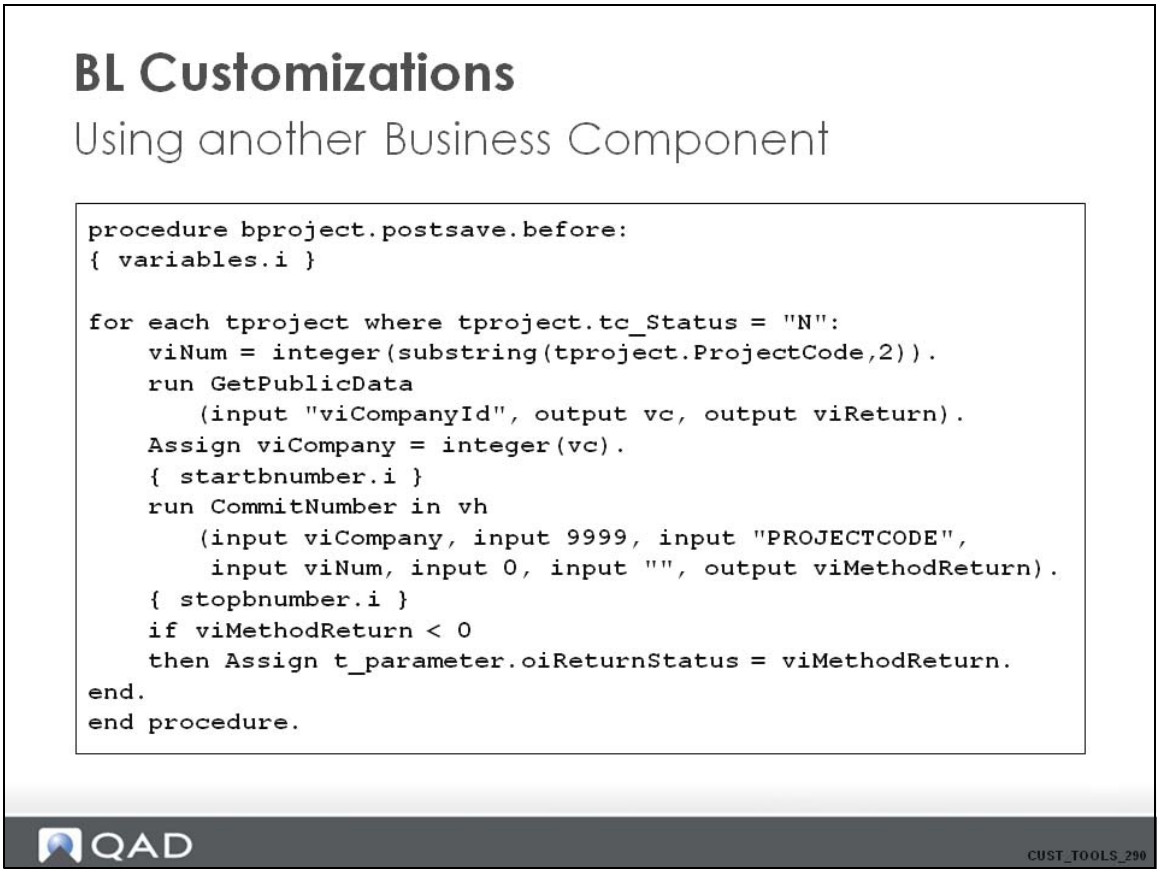
```
procedure bproject.initialvalues.before:
{ variables.i }

if t_parameter.icTableName = "project" then do:
    run GetPublicData
       (input "viCompanyId", output vc, output viReturn).
    Assign viCompany = integer(vc).
    { startbnumber.i }
    run GetNumber in vh
       (input viCompany, input 9999, input "PROJECTCODE",
        output viNum, input 0, input "", output viMethodReturn).
    { stopbnumber.i }
    if viMethodReturn < 0
    then Assign t_parameter.oiReturnStatus = viMethodReturn.
    else Assign tproject.projectcode = "P" + string(viNum,"99999").
end.
end procedure.
```

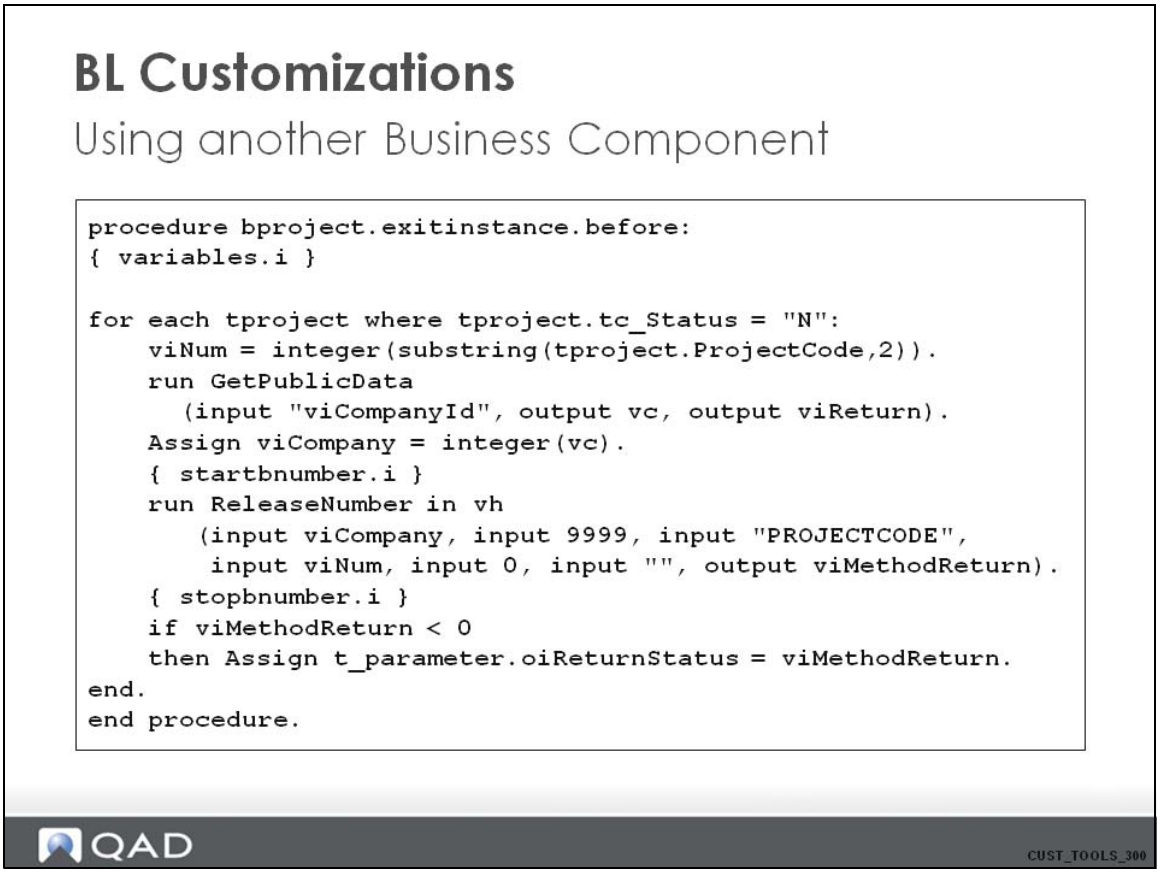
QAD

CUST_TOOLS_280

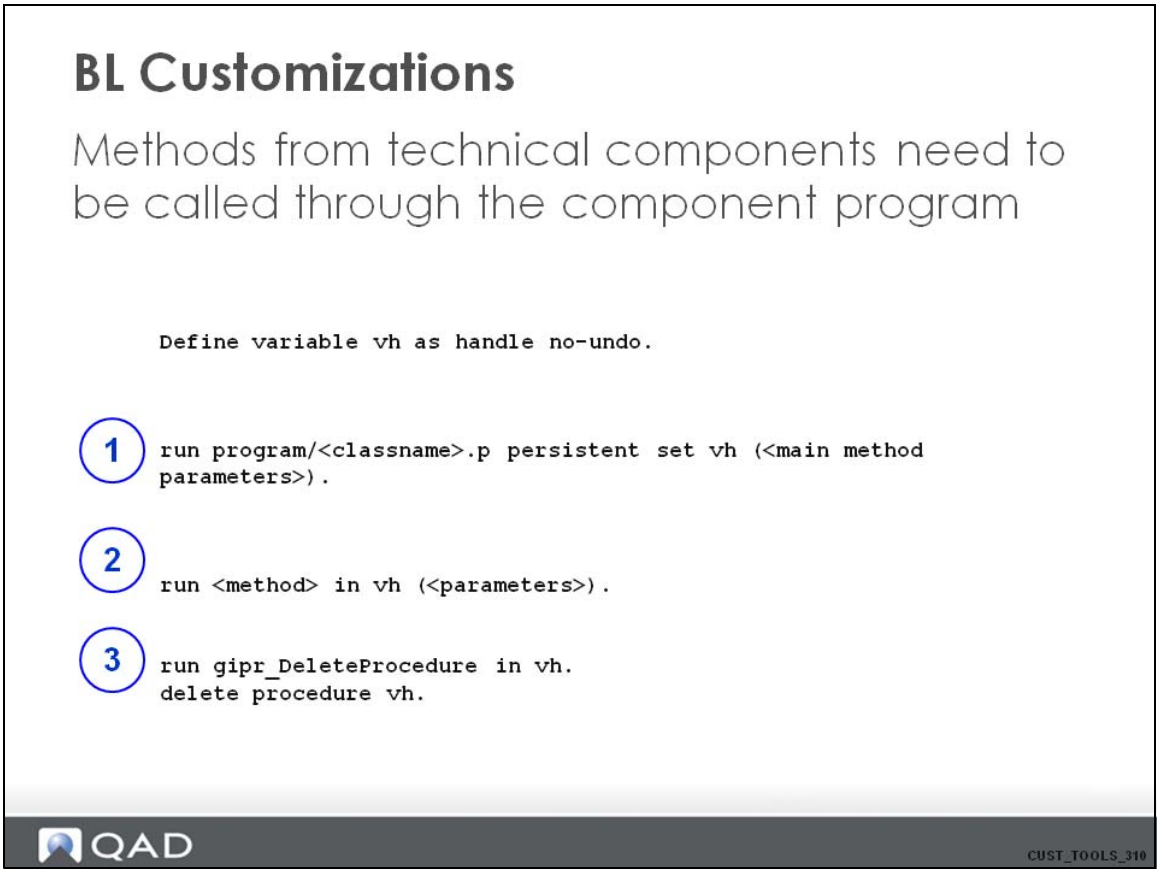
BL Customizations 8



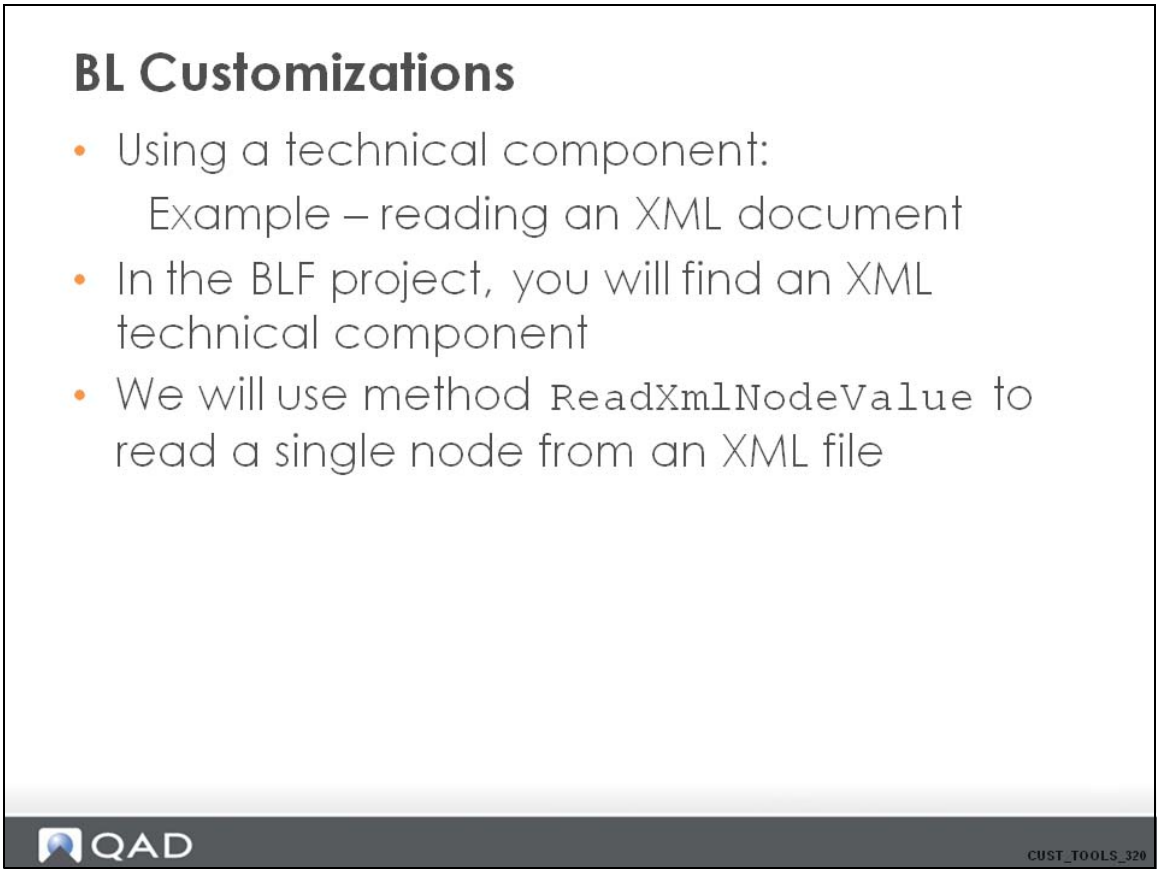
BL Customizations 9



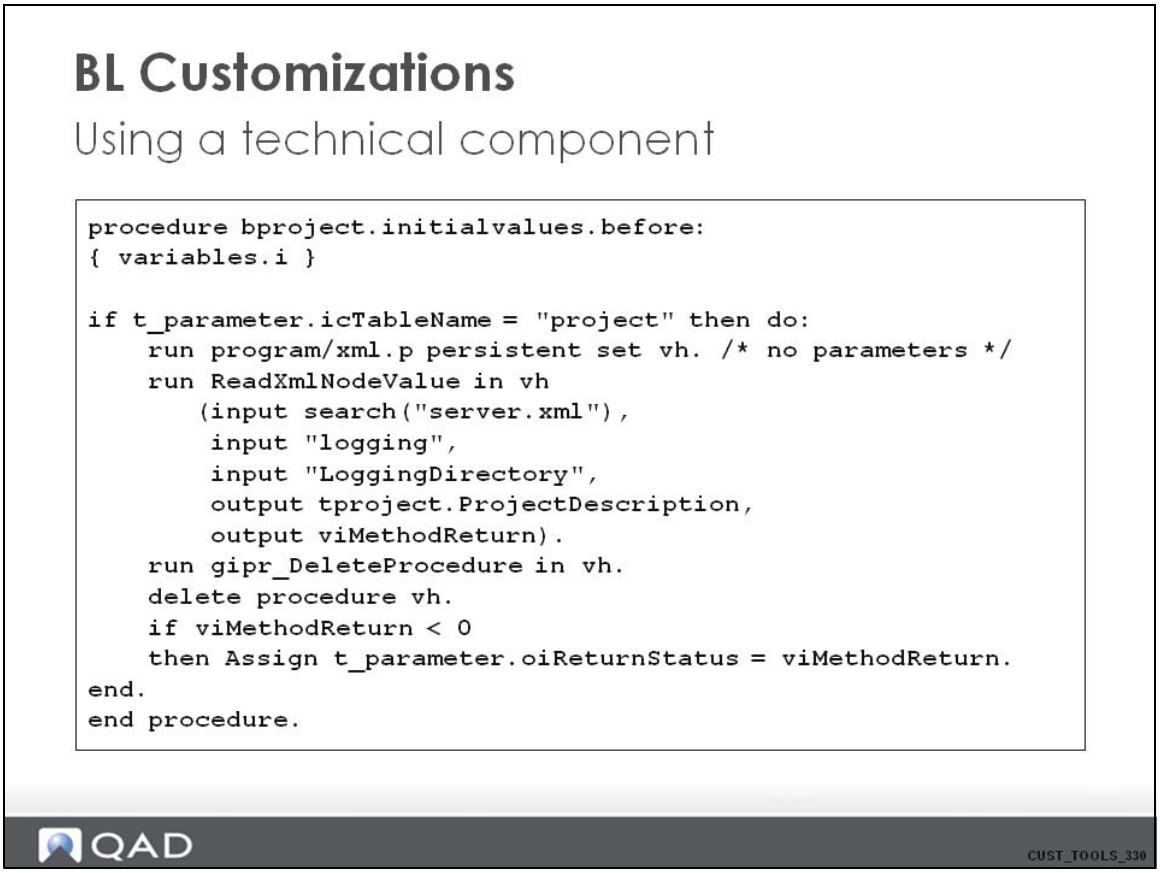
BL Customizations 10



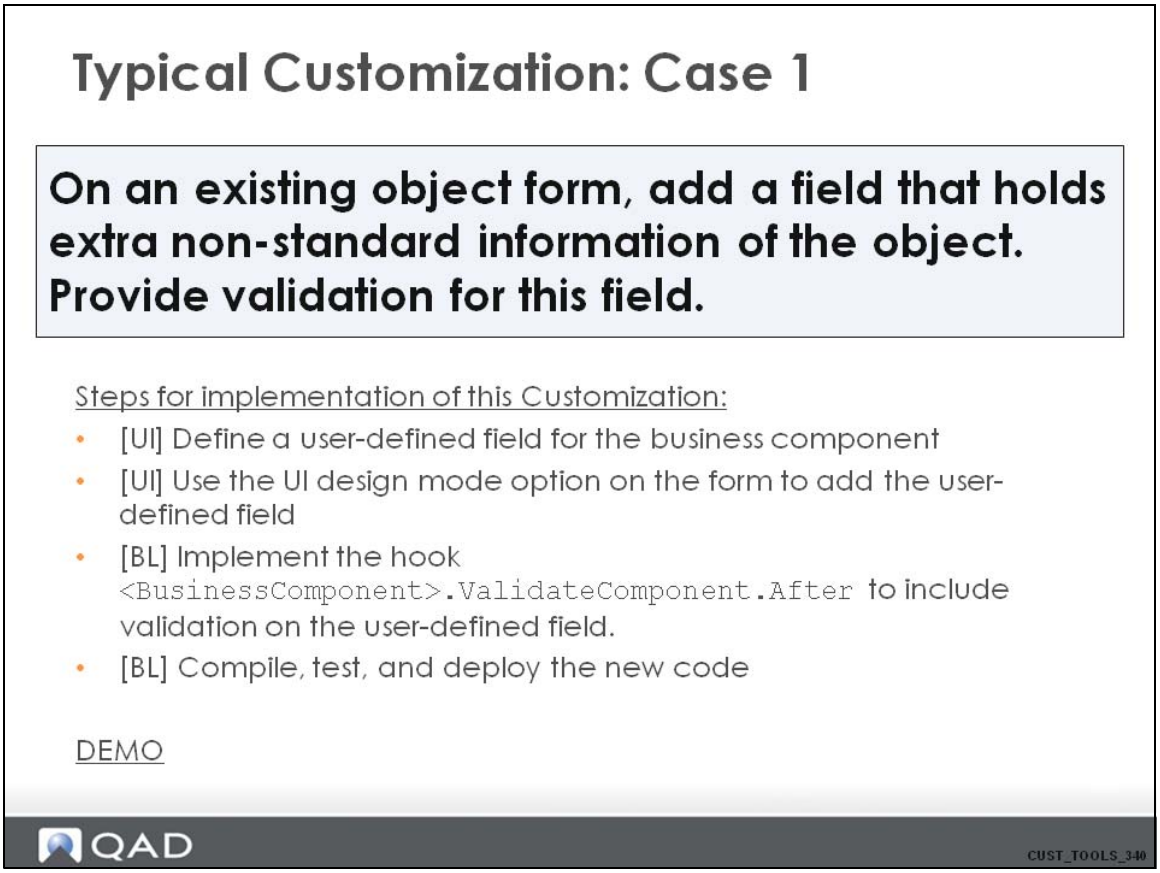
BL Customizations 11



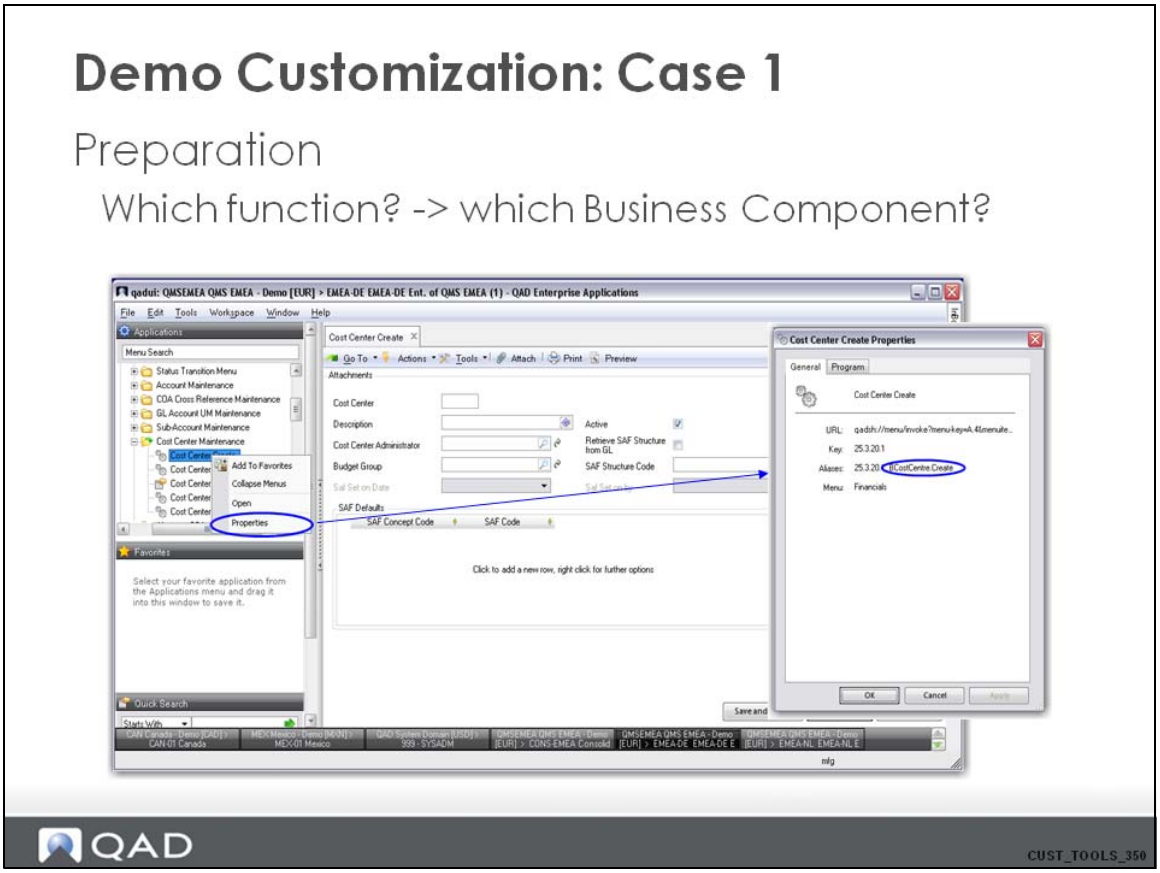
BL Customizations 12



Typical Customization: Case 1



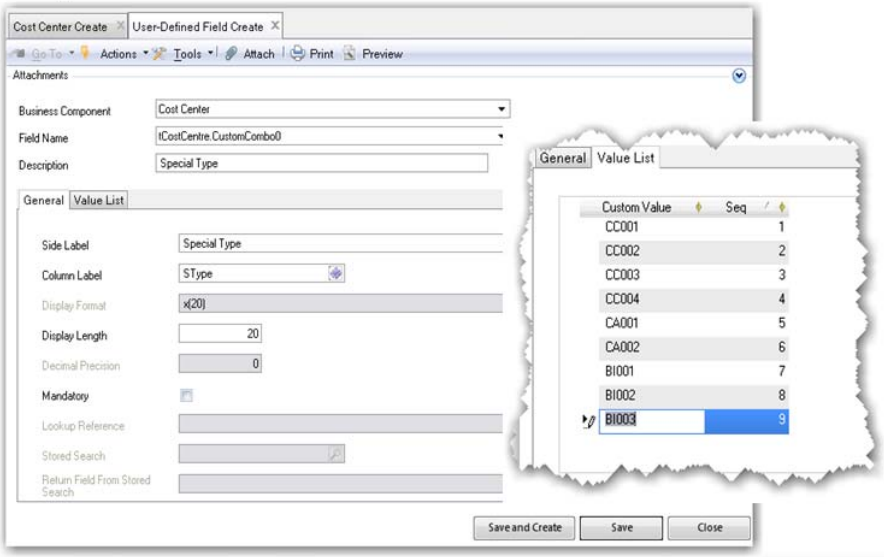
Demo Customization: Case 1



Demo Customization: Case 1 (2)

Demo Customization: Case 1

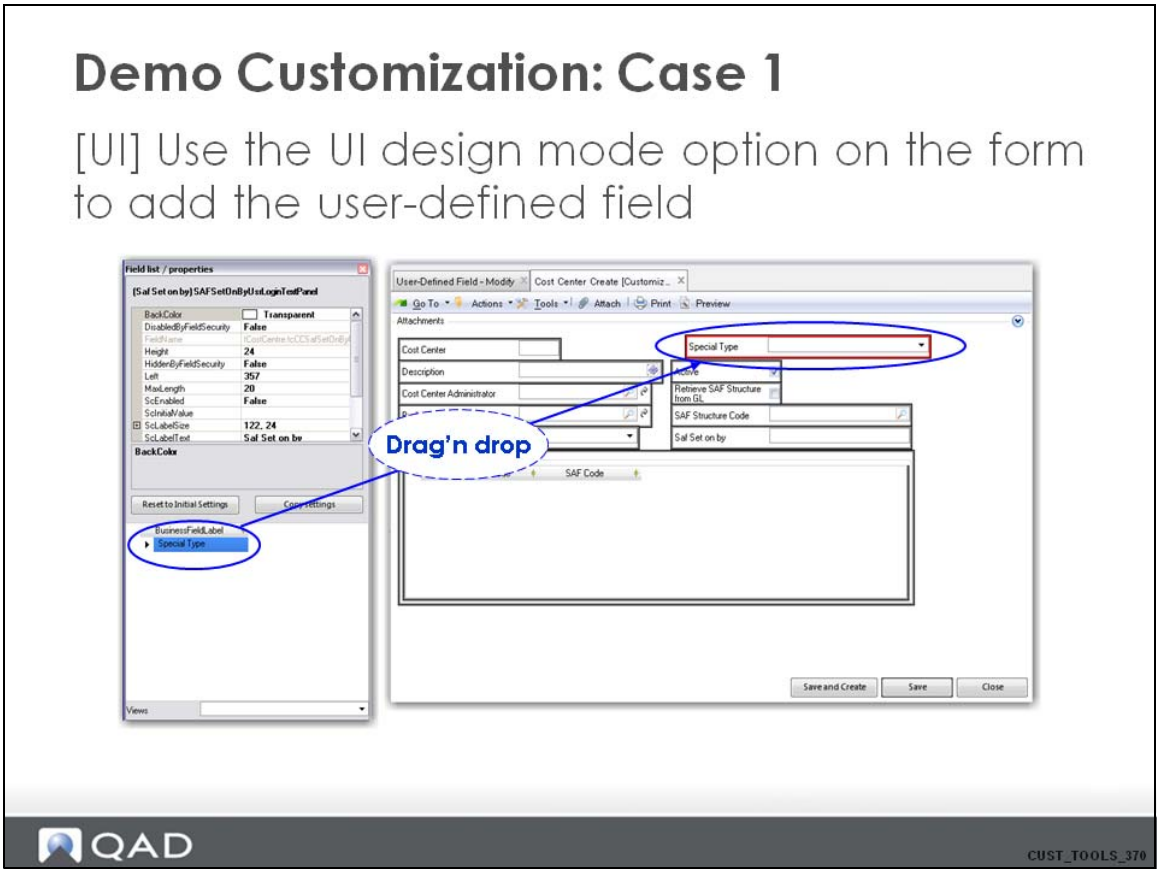
[UI] Define a user-defined field for the business component



QAD

CUST_TOOLS_360

Demo Customization: Case 1 (3)

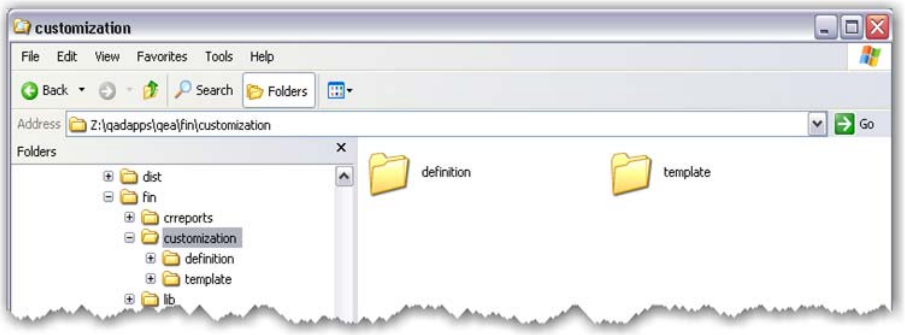


Demo Customization: Case 1 (4)

Demo Customization: Case 1

Preparation

- Fin AppServer PROPATH should include a folder with `customcode` as sub-folder
- Find the `Customization` folder in the installation folder of the Financials business layer



QAD

CUST_TOOLS_380

Demo Customization: Case 1 (5)

Demo Customization: Case 1

[BL] Implement the hook `<BusinessComponent>.ValidateComponent.After` to include validation on the user-defined field

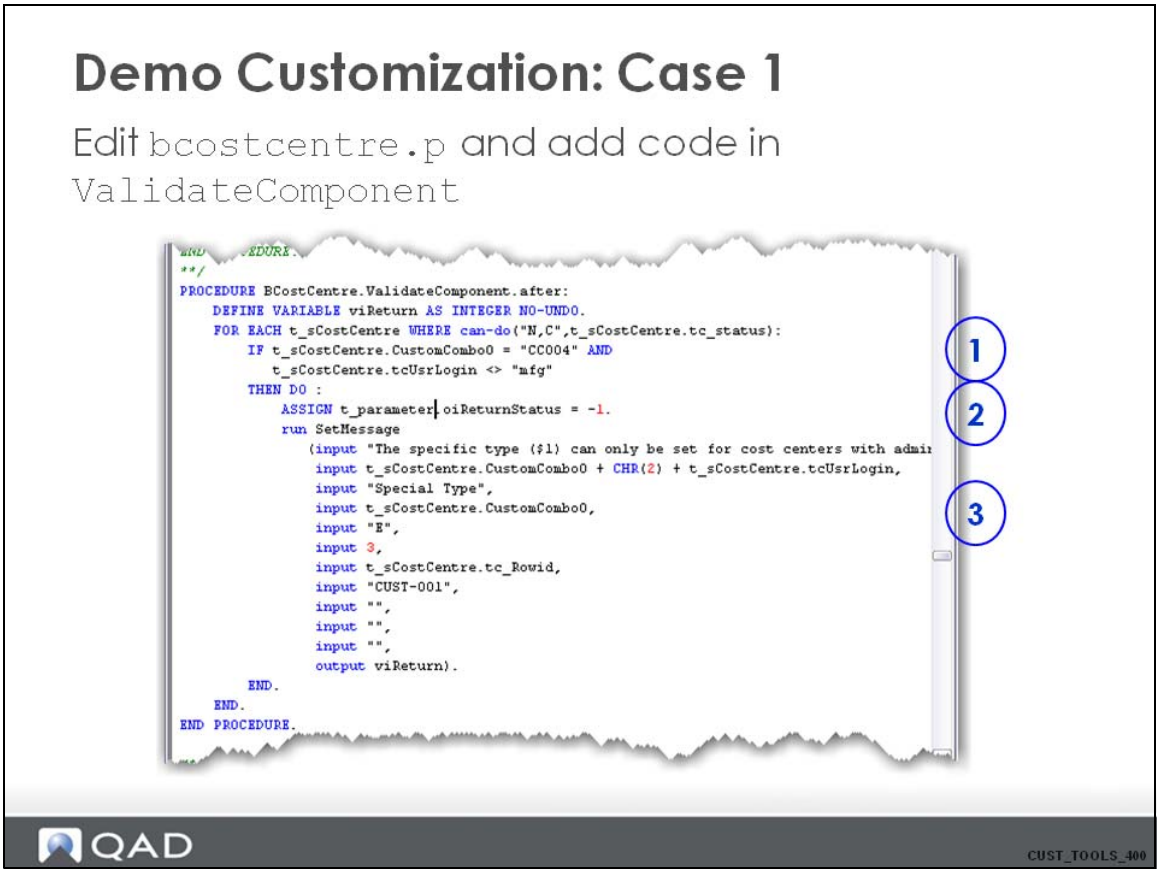
Copy the file `bcostcentre.p` from the `Customization/template` folder to the folder that will contain the Customization source code



QAD

CUST_TOOLS_390

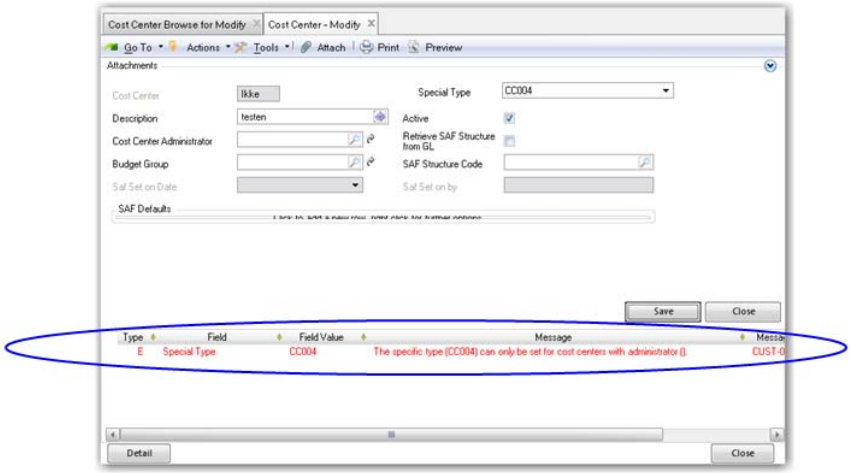
Demo Customization: Case 1 (6)



Demo Customization: Case 1 (7)

Demo Customization: Case 1

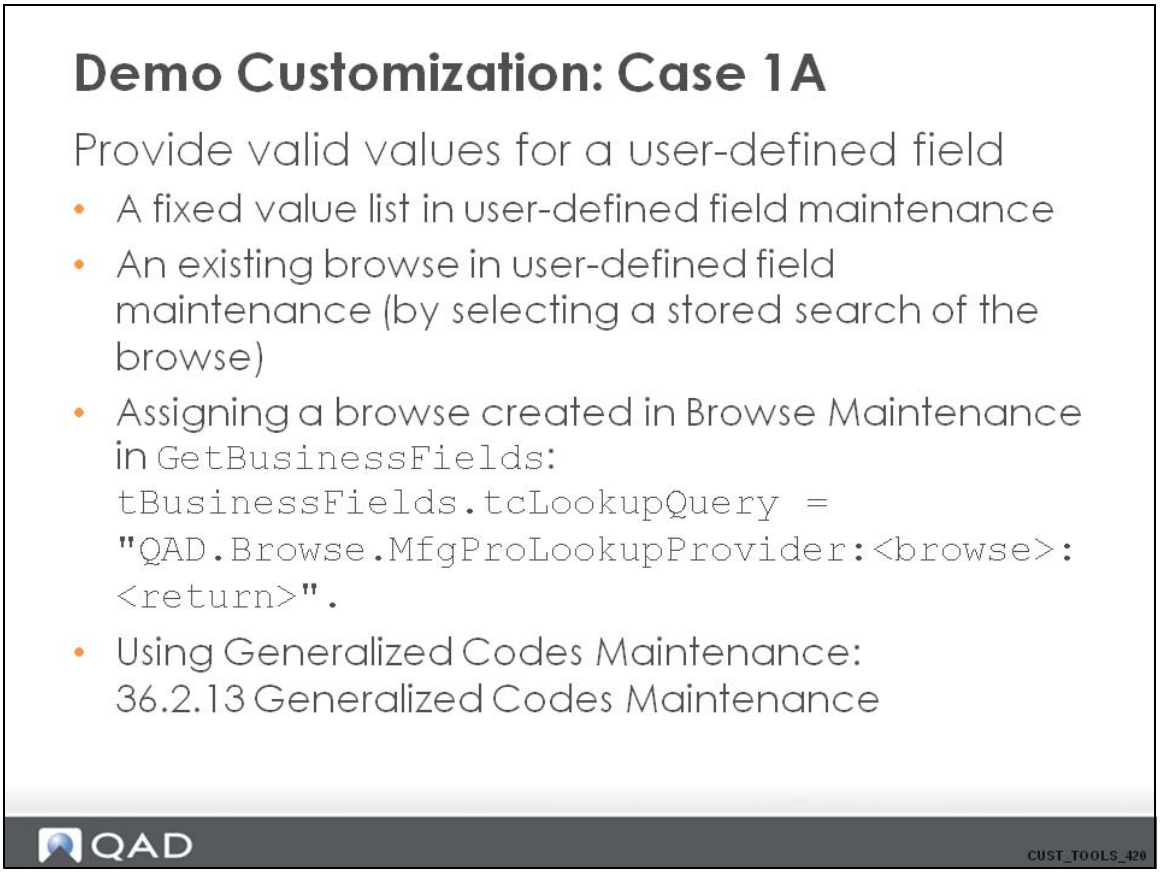
Compile, deploy customization, trim the AppServer, and run the Cost Center Create or Modify again



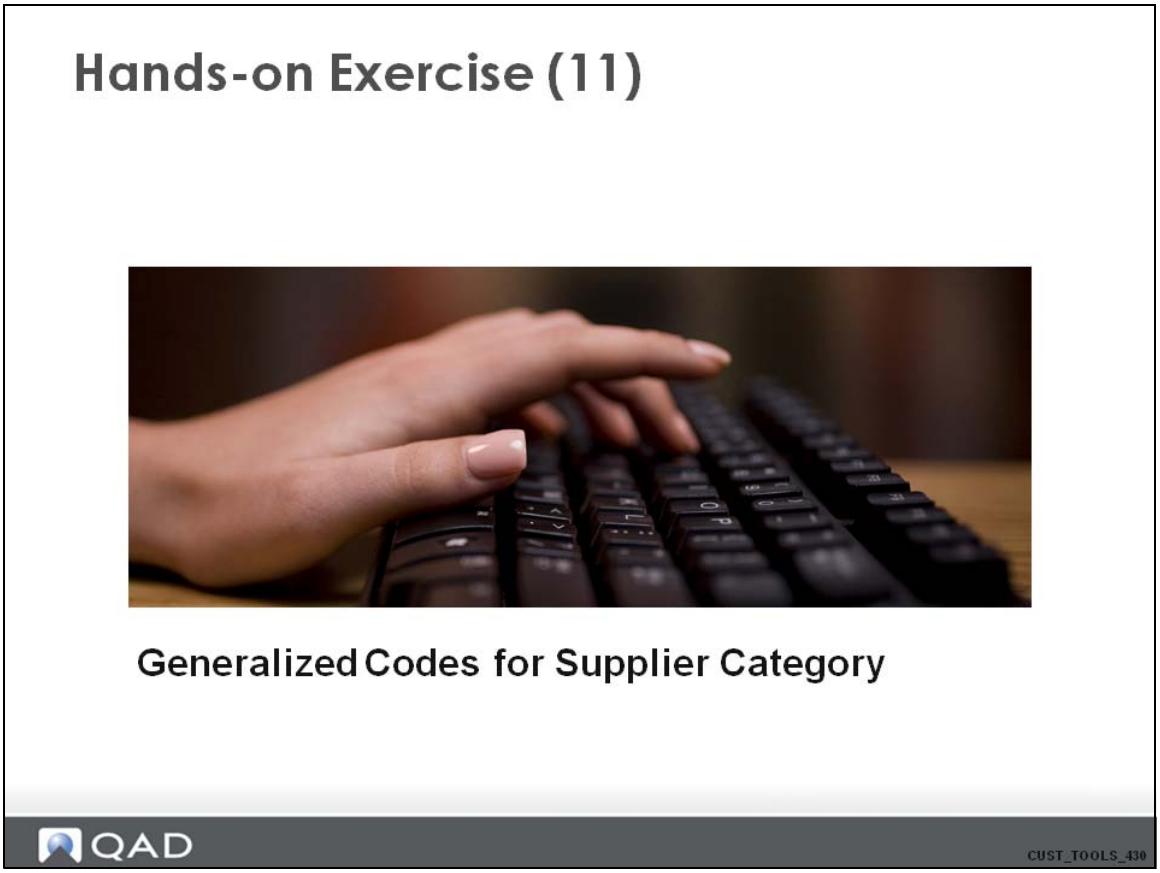
QAD

CUST_TOOLS_410

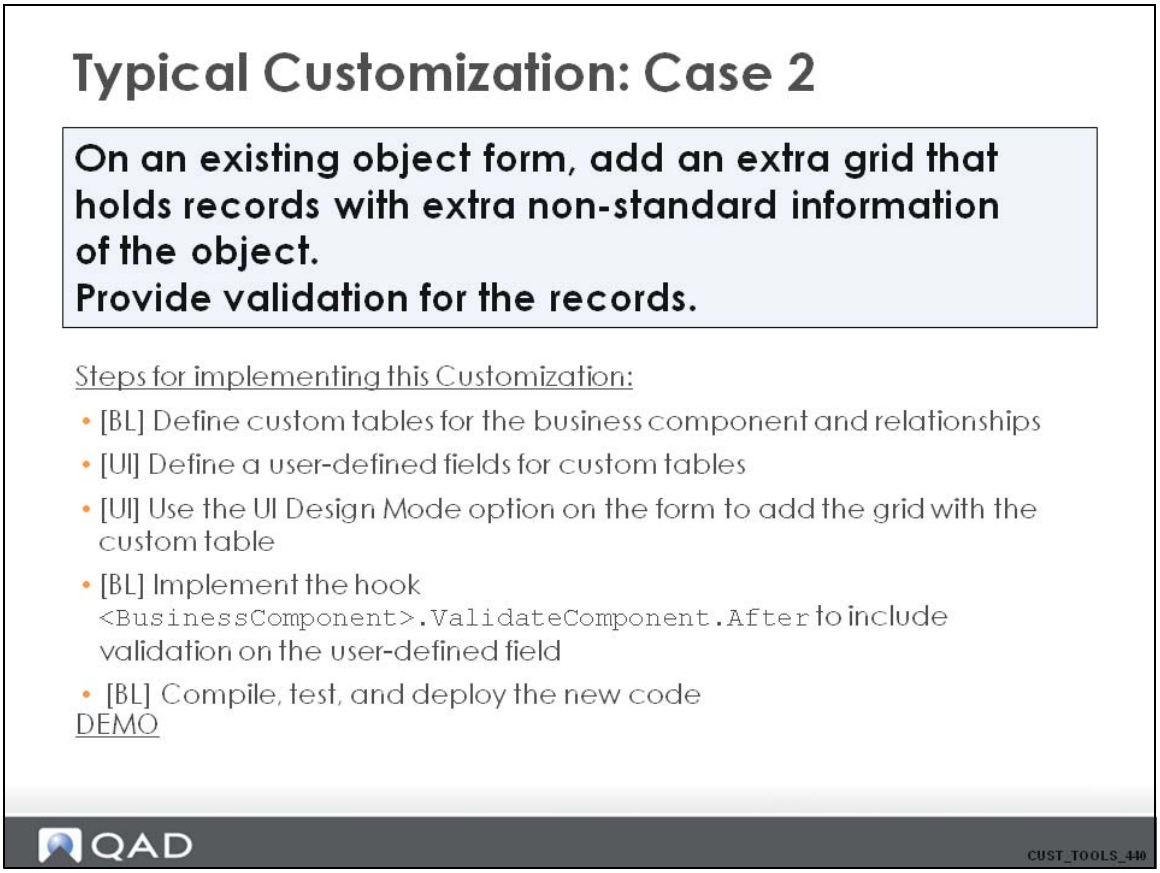
Demo Customization: Case 1A



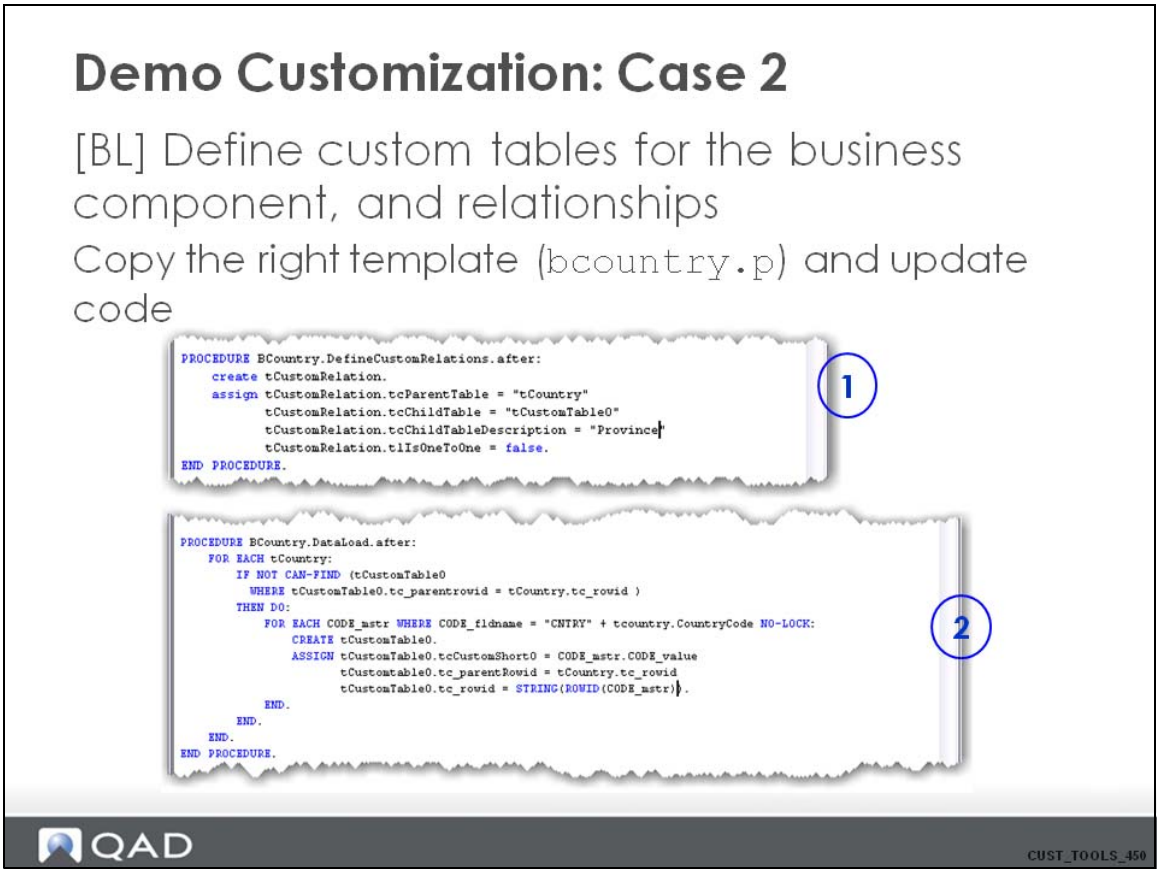
Hands-on Exercise (11)



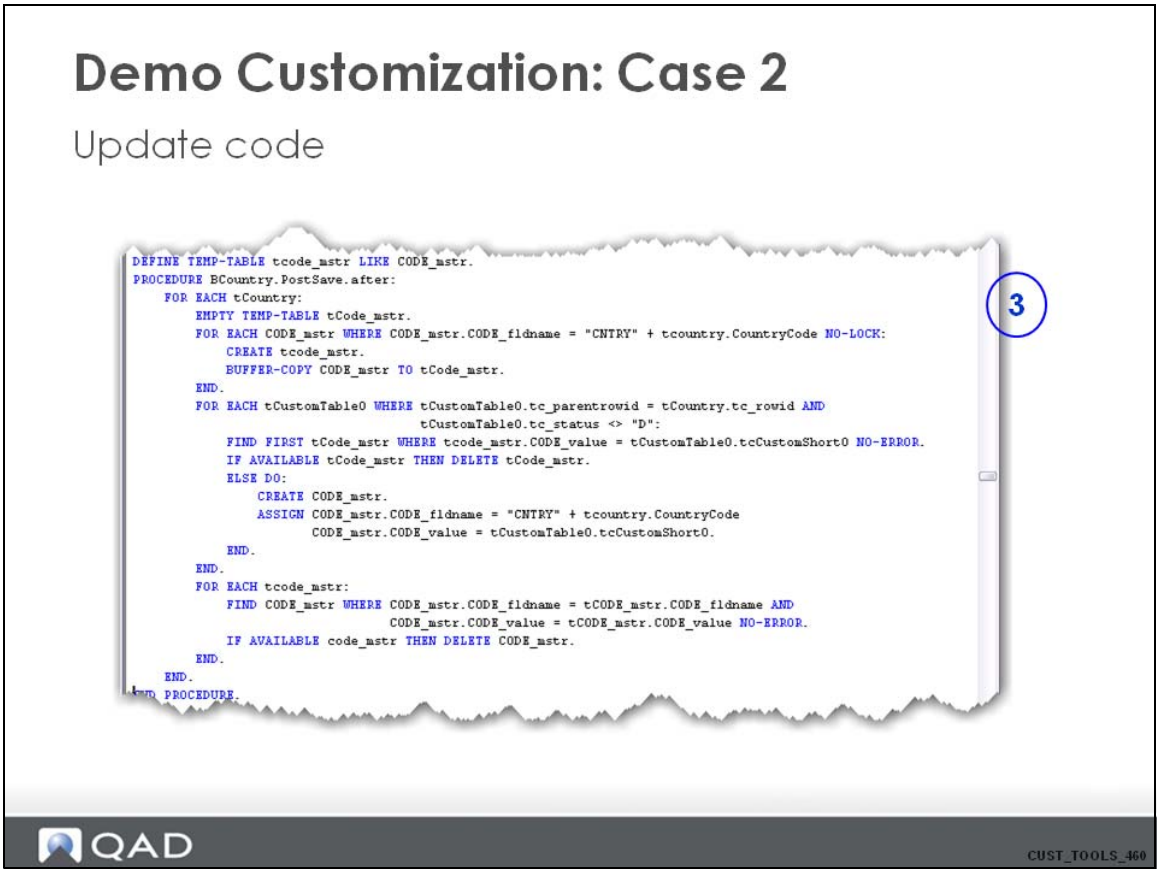
Typical Customization: Case 2



Demo Customization: Case 2



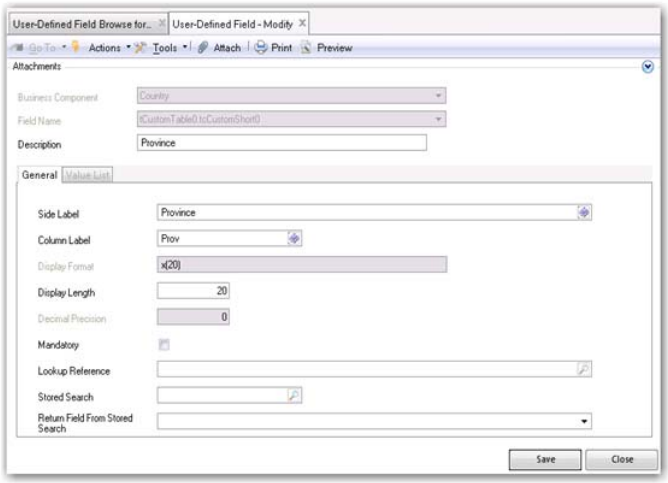
Demo Customization: Case 2 (2)



Demo Customization: Case 2 (3)

Demo Customization: Case 2

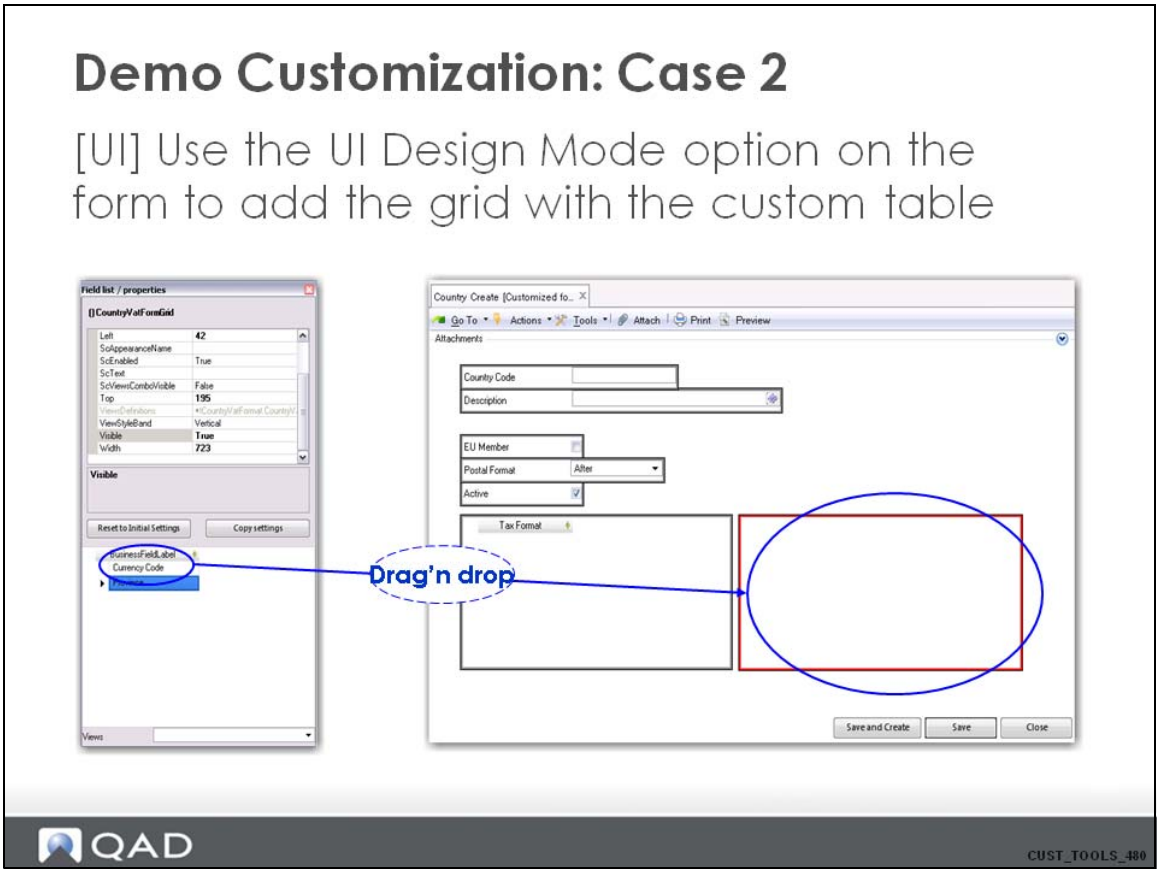
- Compile, deploy Customization, trim the AppServer
- [UI] Define a user-defined fields for custom tables



QAD

CUST_TOOLS_470

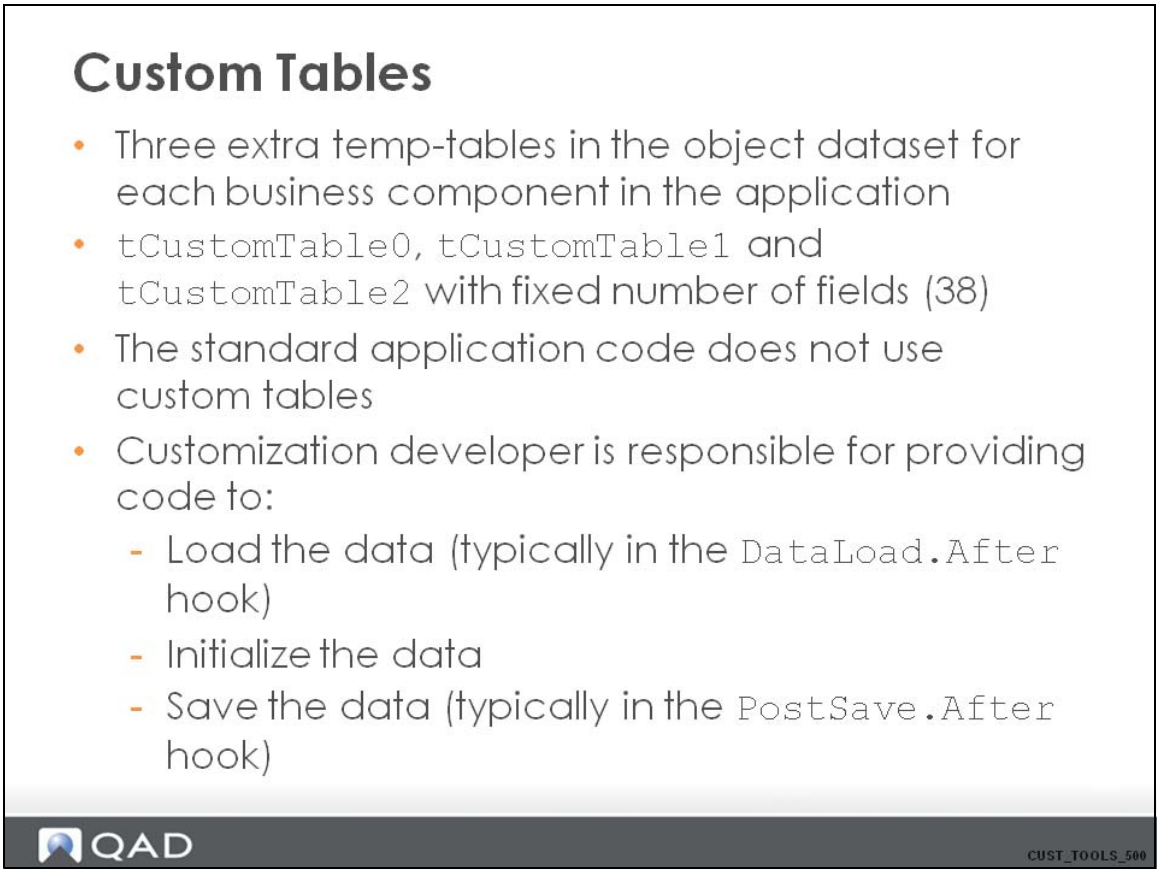
Demo Customization: Case 2 (4)



Demo Customization: Case 2 (5)



Custom Tables



Custom Tables 2

Custom Tables

- Three extra temp-tables:

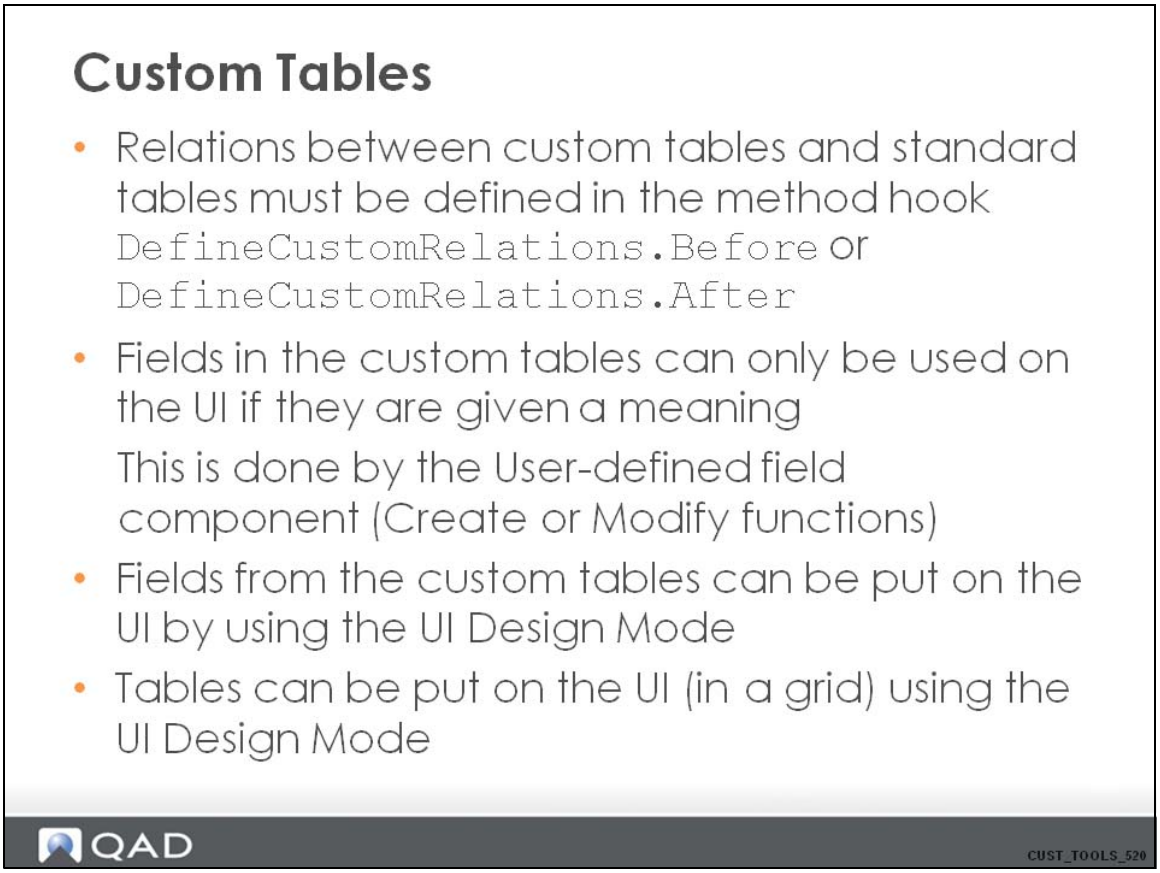


- Fixed list of fields:
  - tcCustomShort[0-9]
  - tcCustomCombo[0-9]
  - tcCustomLong[0-1]
  - ttCustomDate[0-4]
  - tiCustomInteger[0-4]
  - tdCustomDecimal[0-4]
  - tcCustomNote

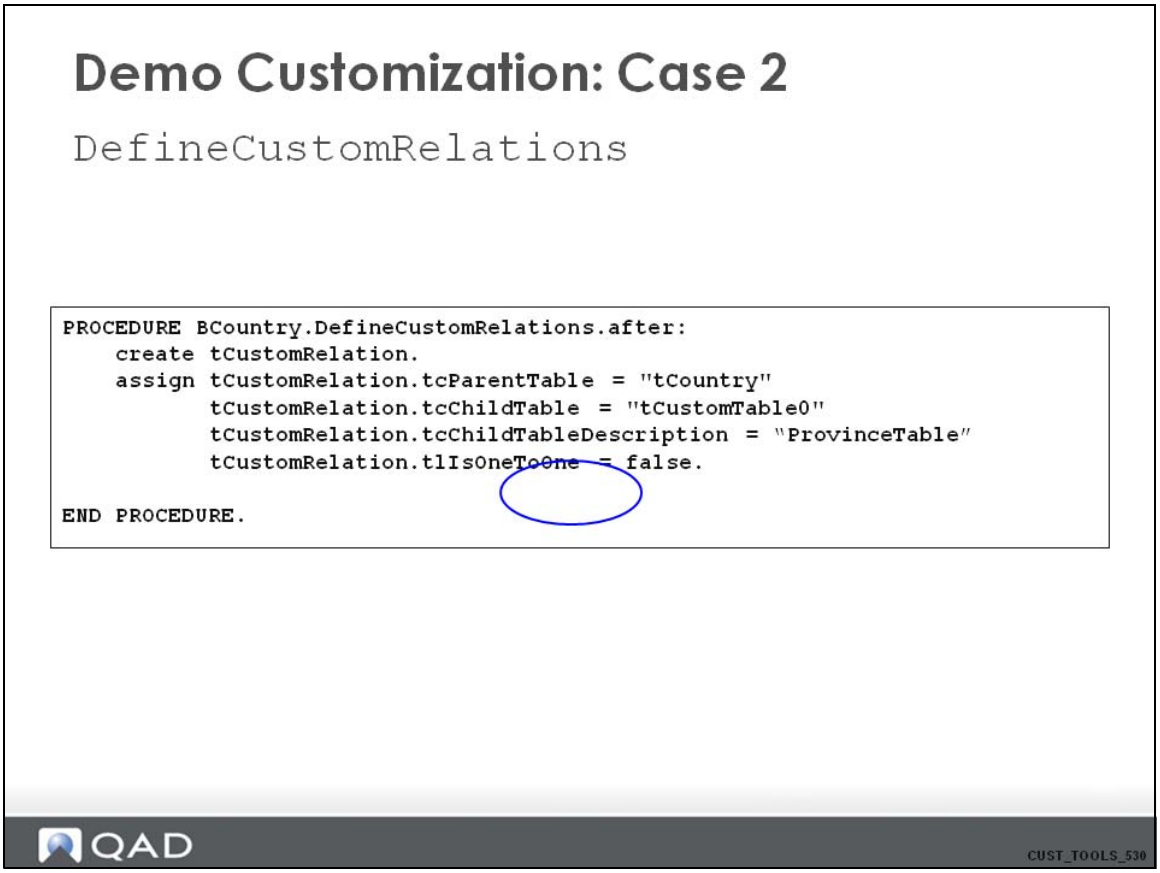
QAD

CUST_TOOLS_510

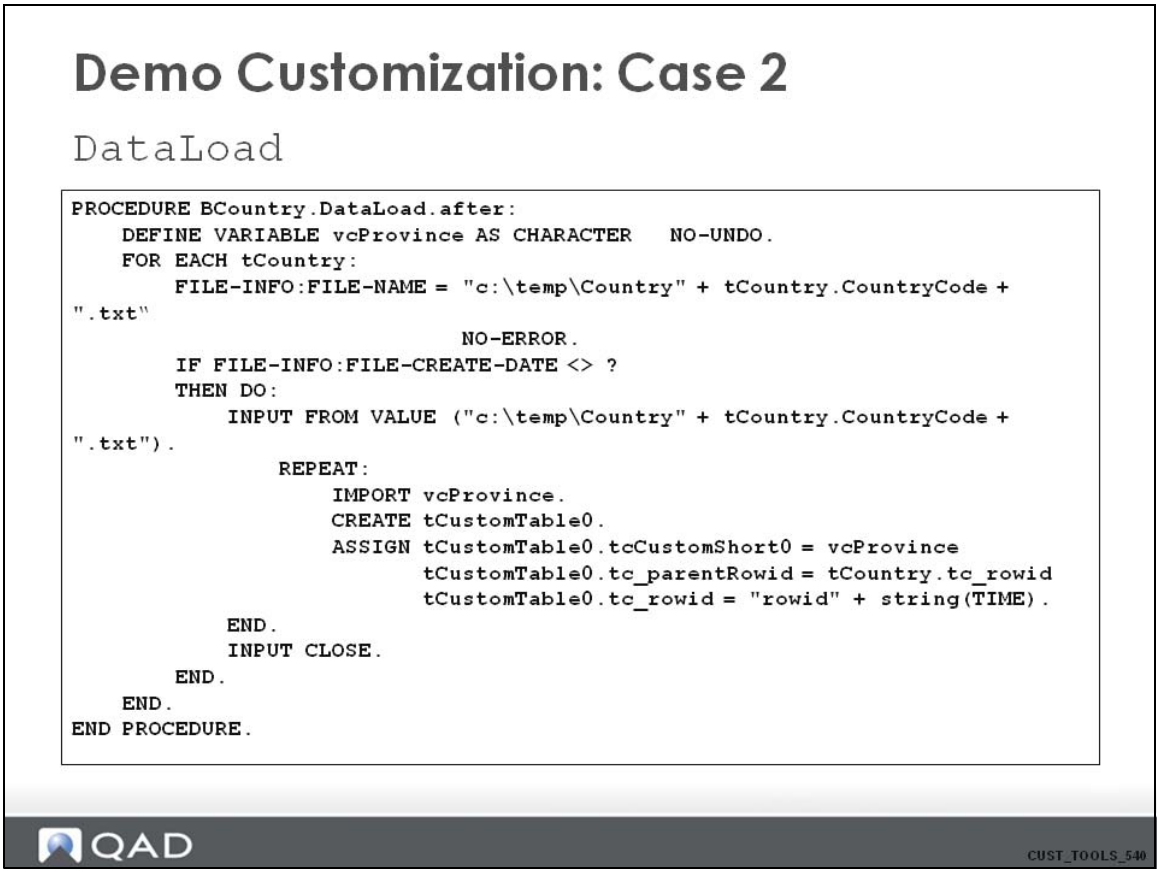
Custom Tables 3



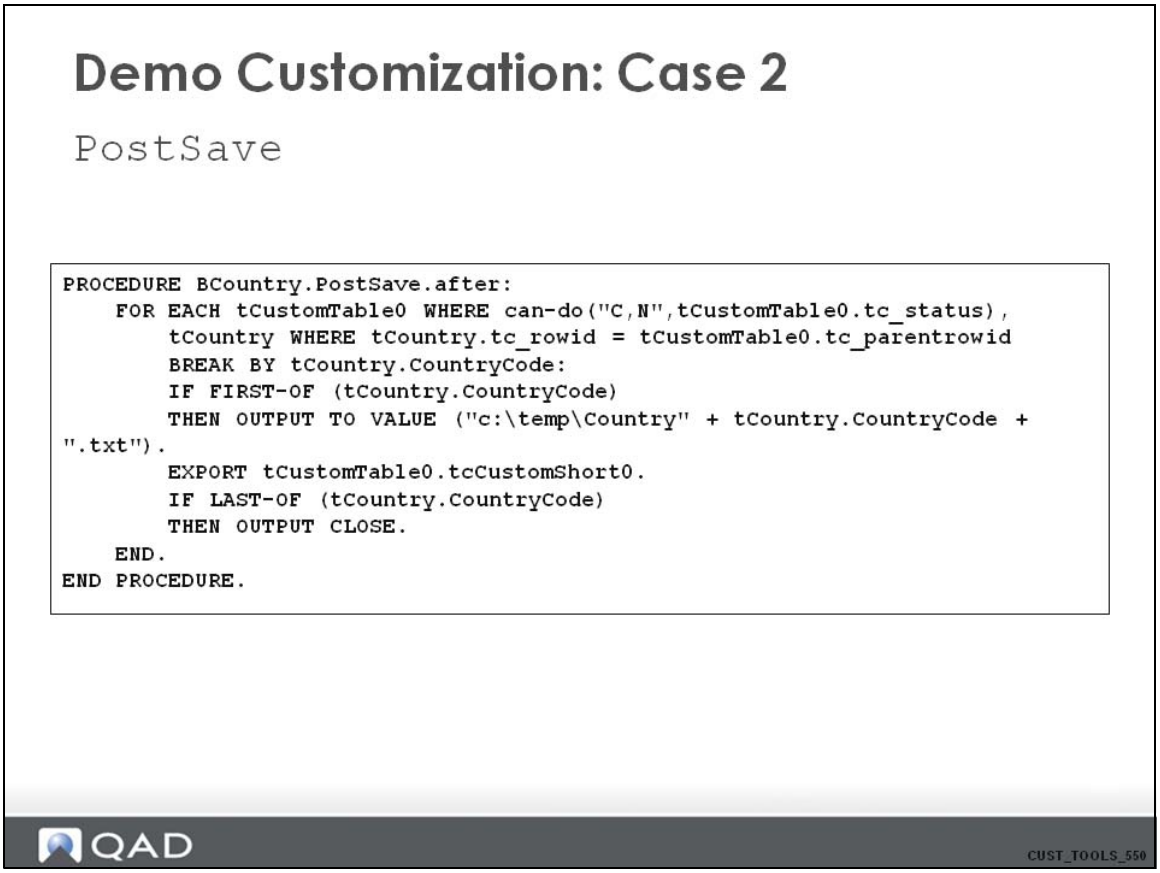
Demo Customization: Case 2 - DefineCustomRelations



Demo Customization: Case 2 - DataLoad



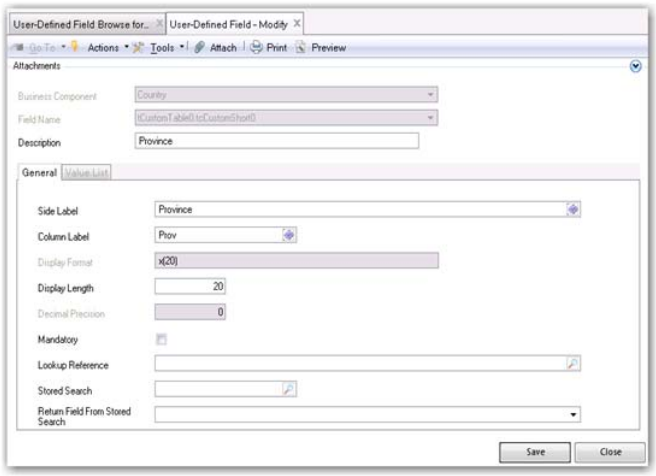
Demo Customization: Case 2 - PostSave



Demo Customization: Case 2 - Compile and Deploy

Demo Customization: Case 2

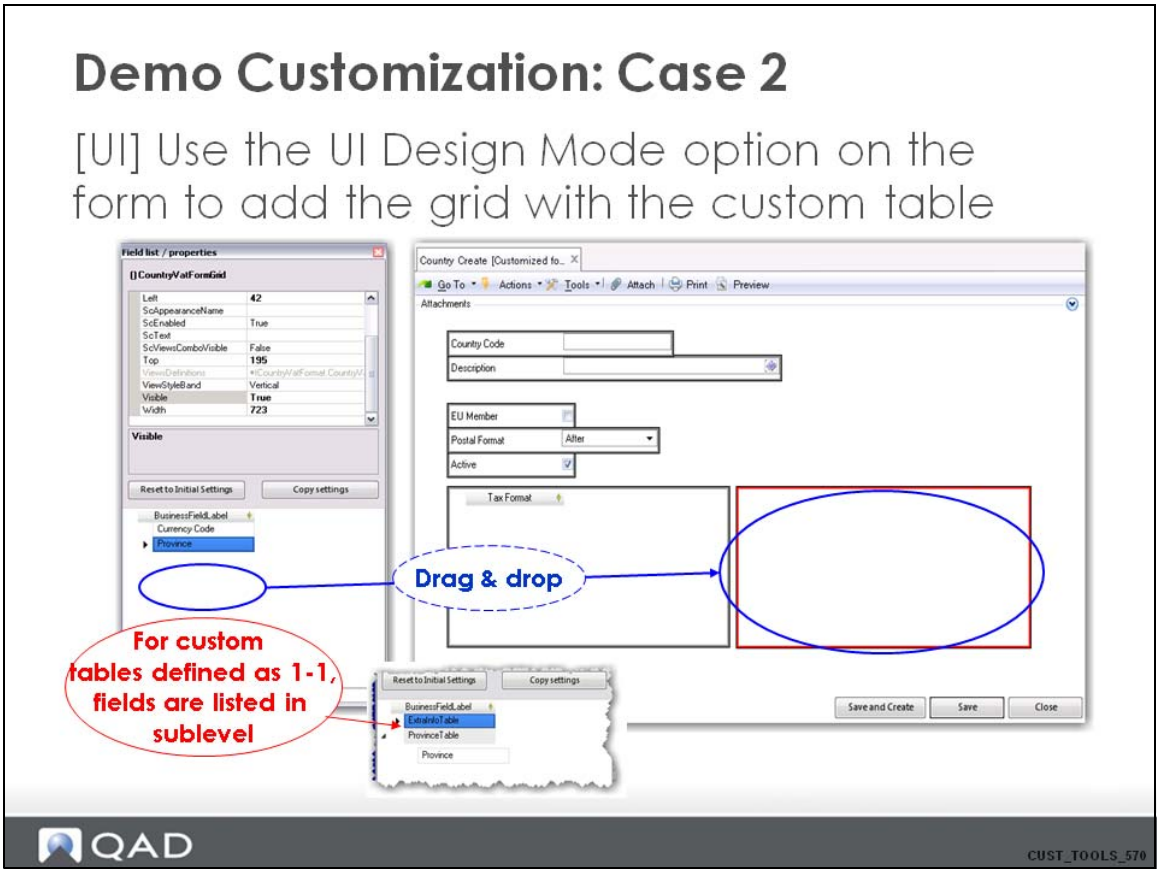
- Compile, deploy Customization, trim the AppServer
- [UI] Define a user-defined field for custom tables



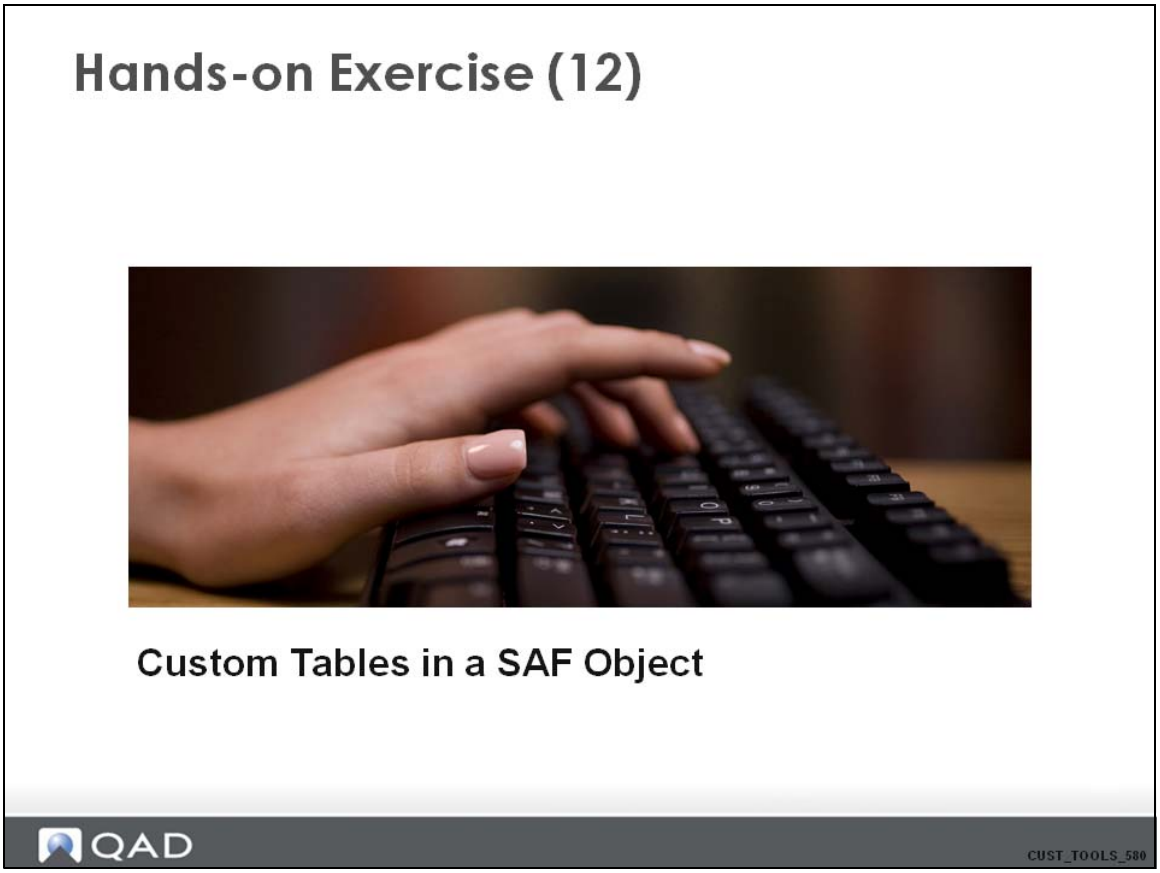
QAD

CUST_TOOLS_560

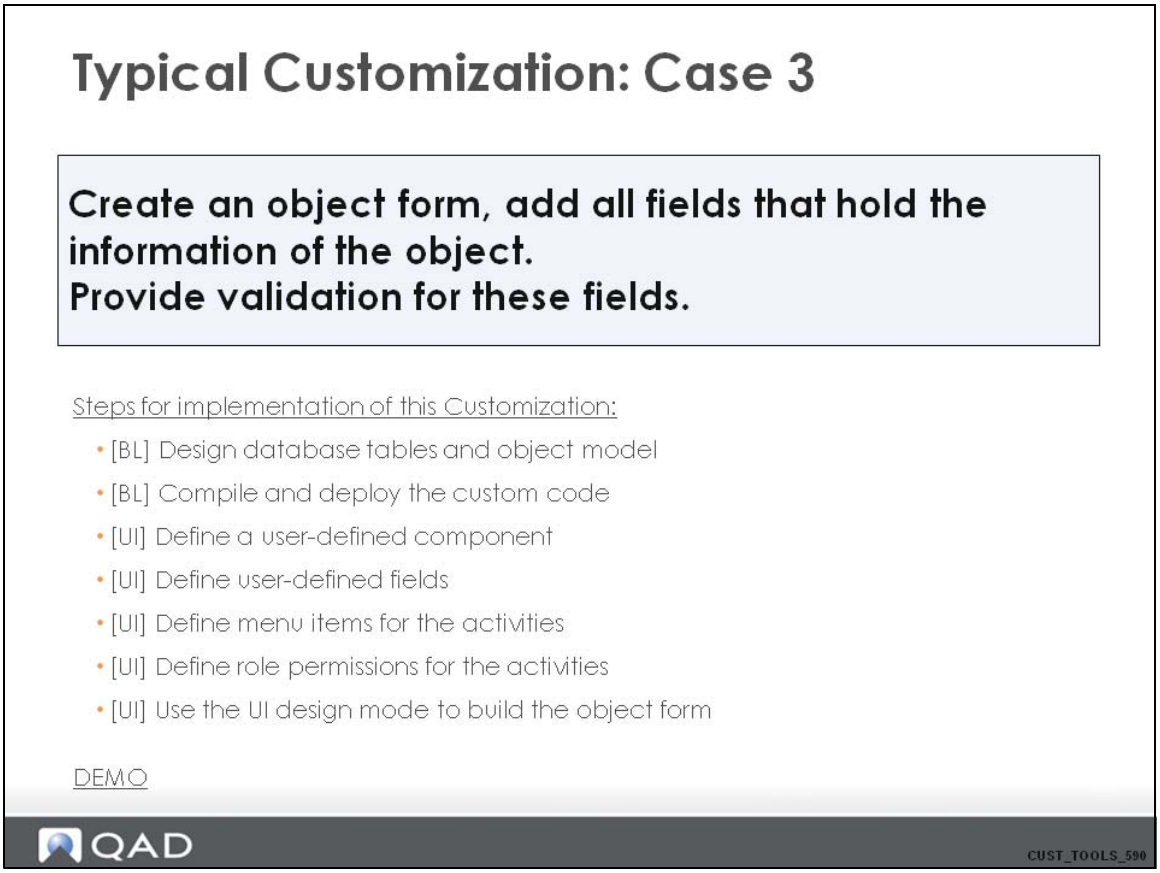
Demo Customization: Case 2 - Add Grid



Hands-on Exercise (12)



Typical Customization: Case 3



Demo Customization: Case 3 - Database Model

Demo Customization: Case 3

Database model

Table: LeaseCar

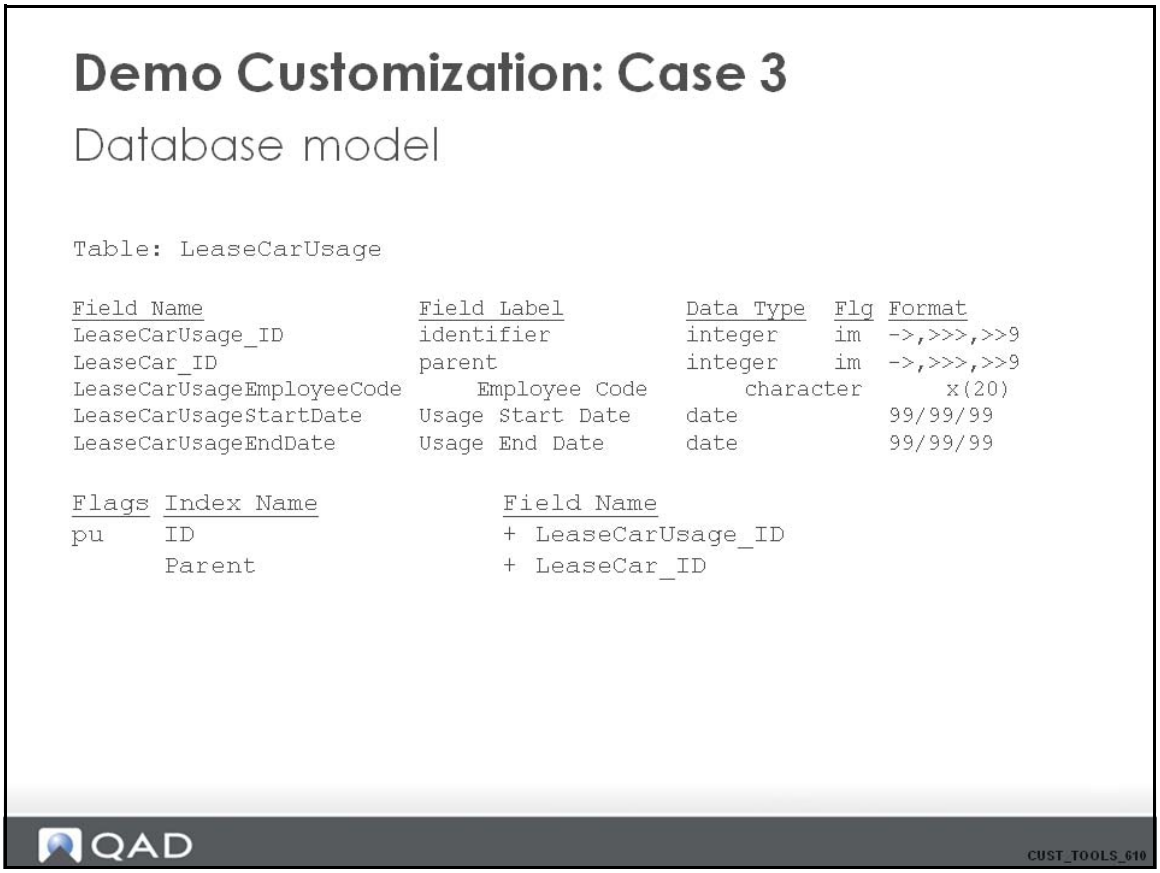
Field Name	Field Label	Data Type	Flg	Format
LeaseCar_ID	identifier	integer	im	->,>>>,>>9
LeaseCarLicensePlate	License plate	character	im	x(20)
LeaseCarType	Type of Car	character		x(40)
LeaseCarStartDate	Lease Start Date	date		99/99/99
LeaseCarEndDate	Lease End Date	date		99/99/99
LeaseCarCompany	Lease Company Code	character		x(20)

Flags	Index Name	Field Name
pu	ID	+ LeaseCar_ID
u	Plate	+ LeaseCarLicensePlate

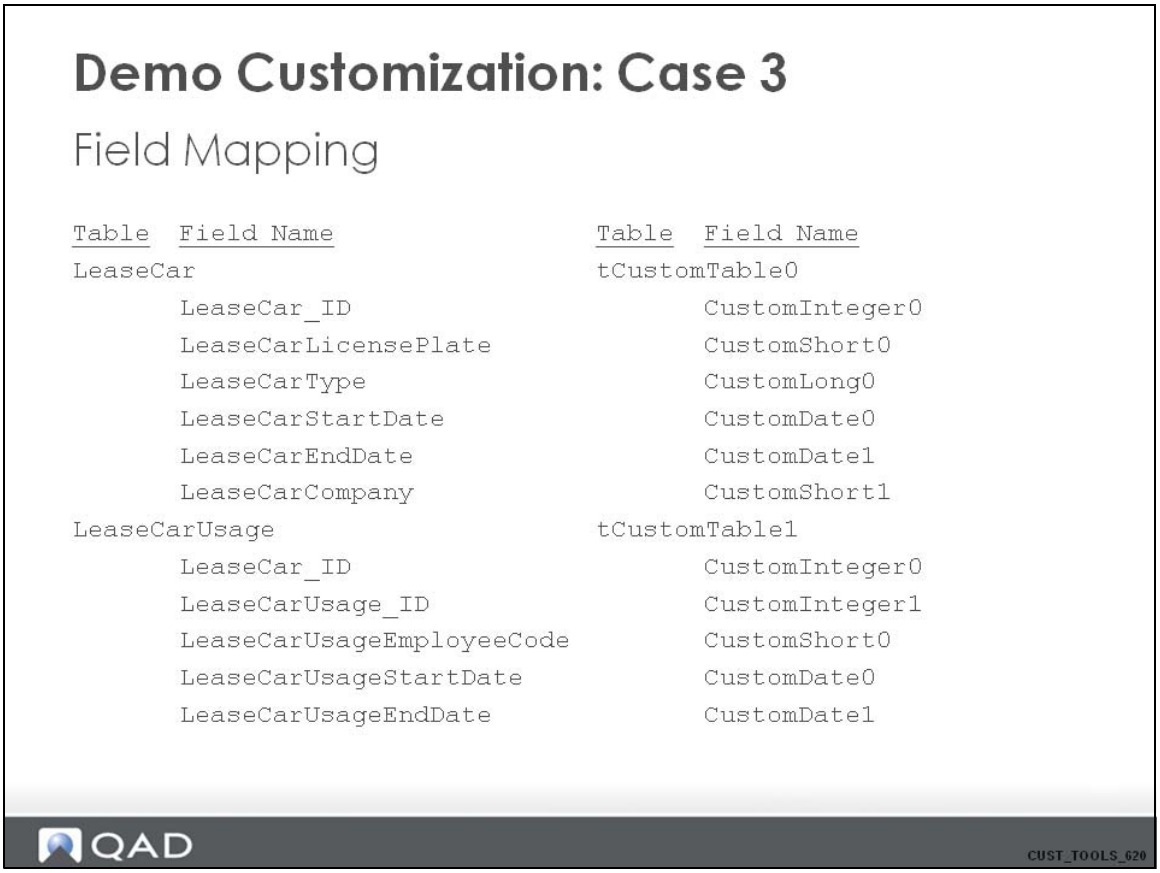
QAD

CUST_TOOLS_600

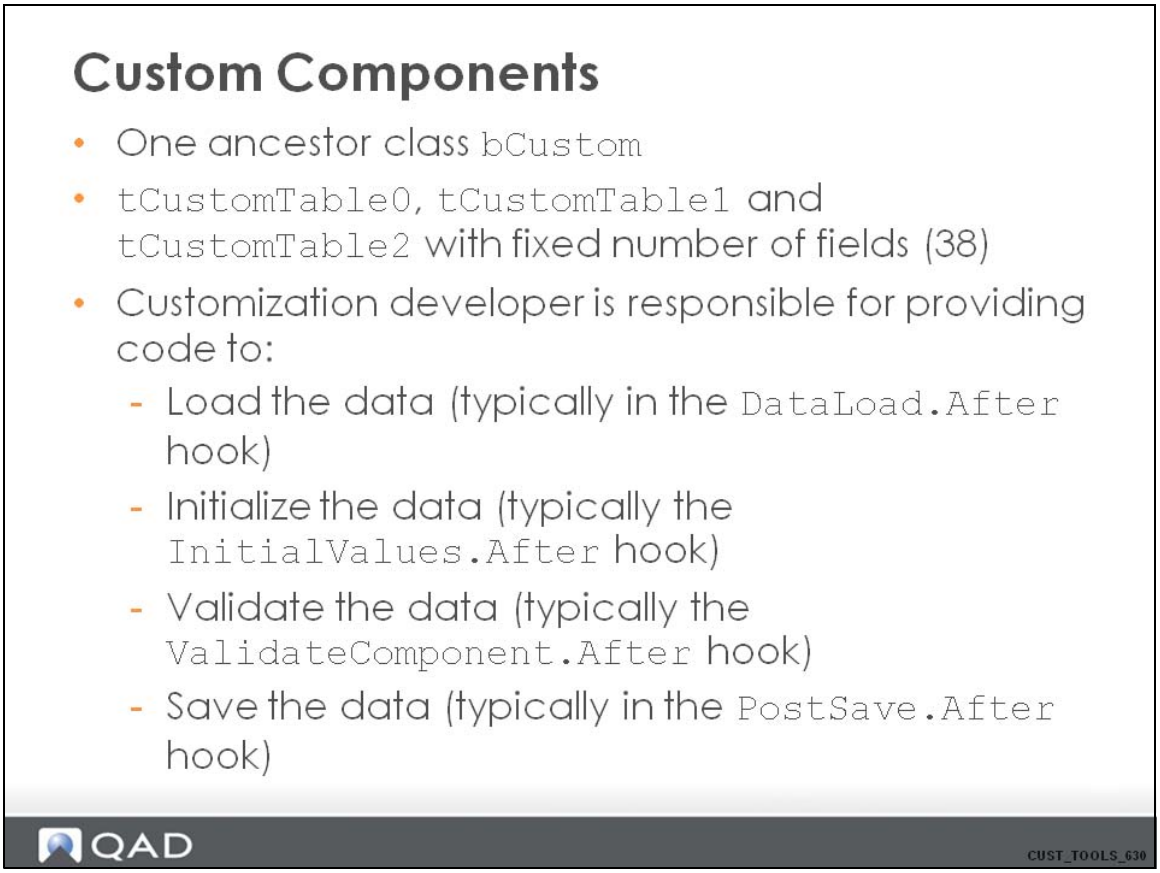
Demo Customization: Case 3 - Database Model 2



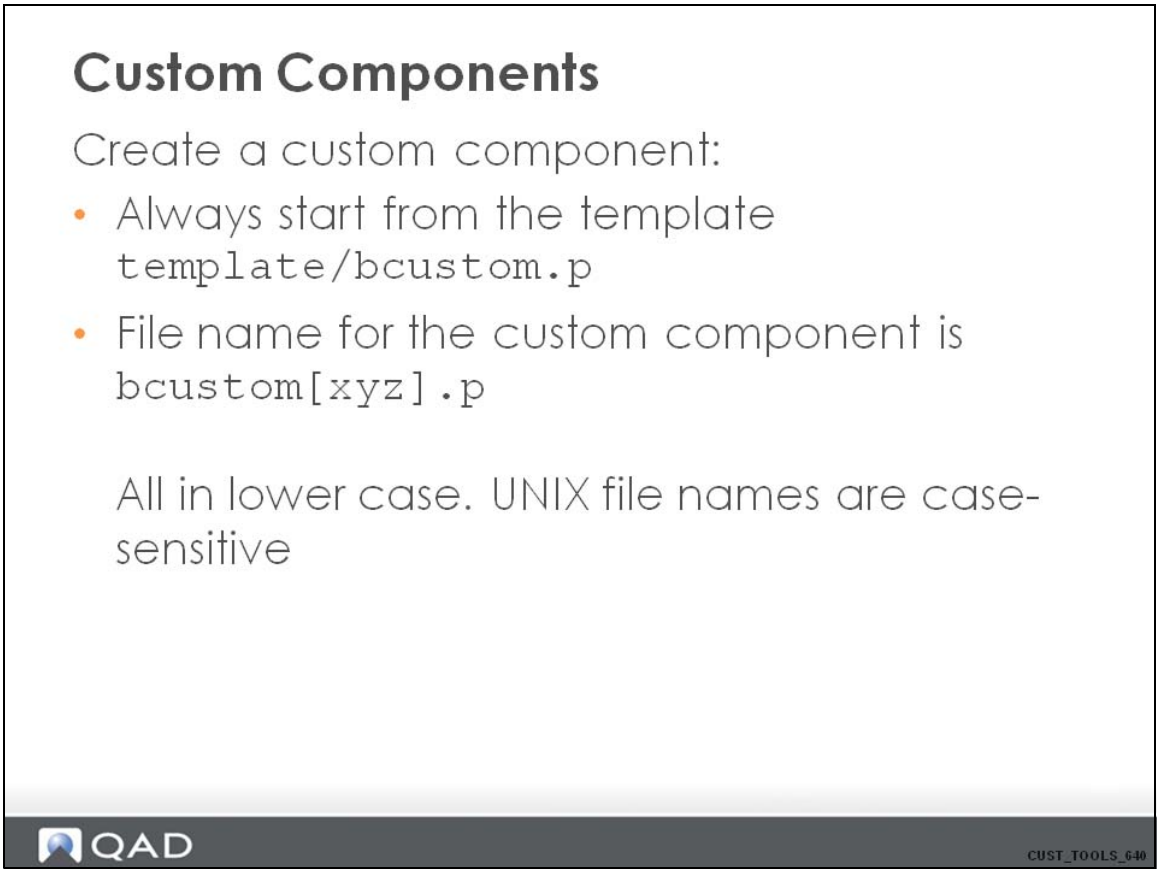
Demo Customization: Case 3 - Field Mapping



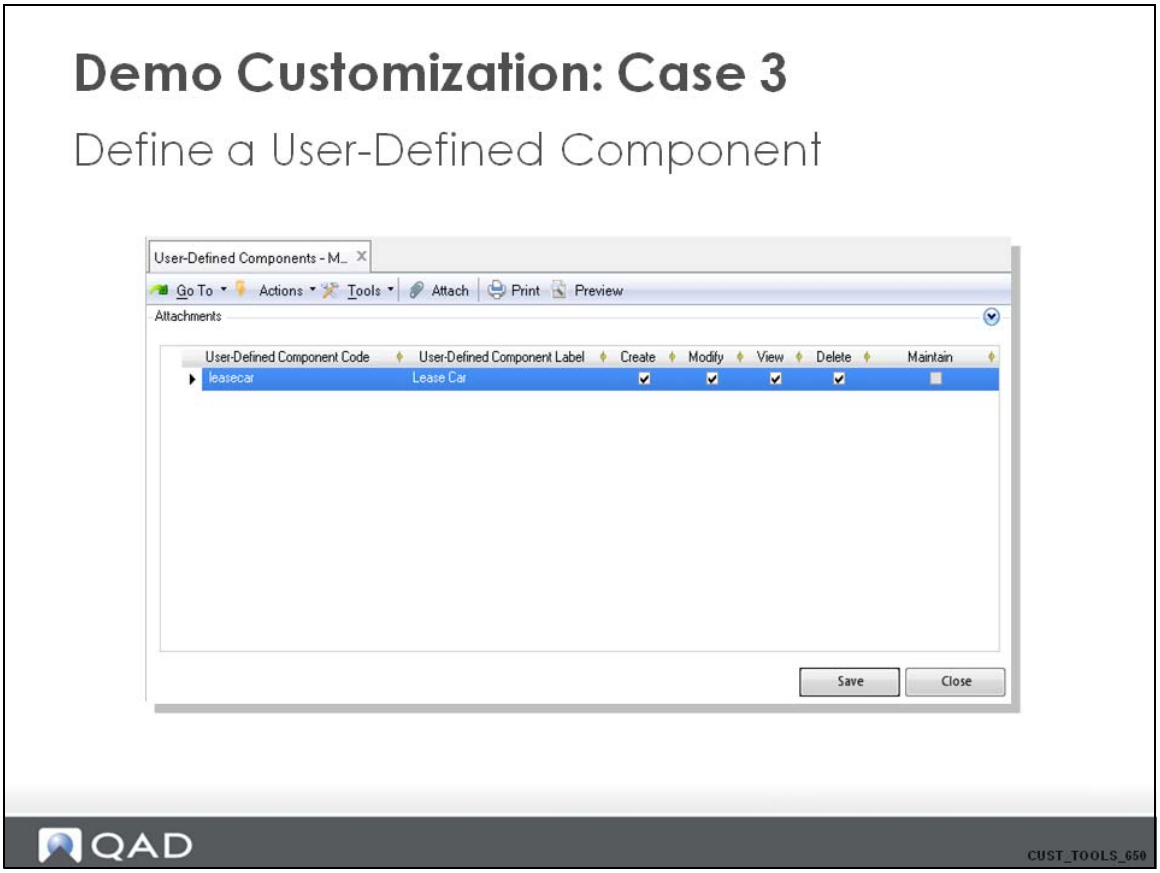
Custom Components



Custom Components 2



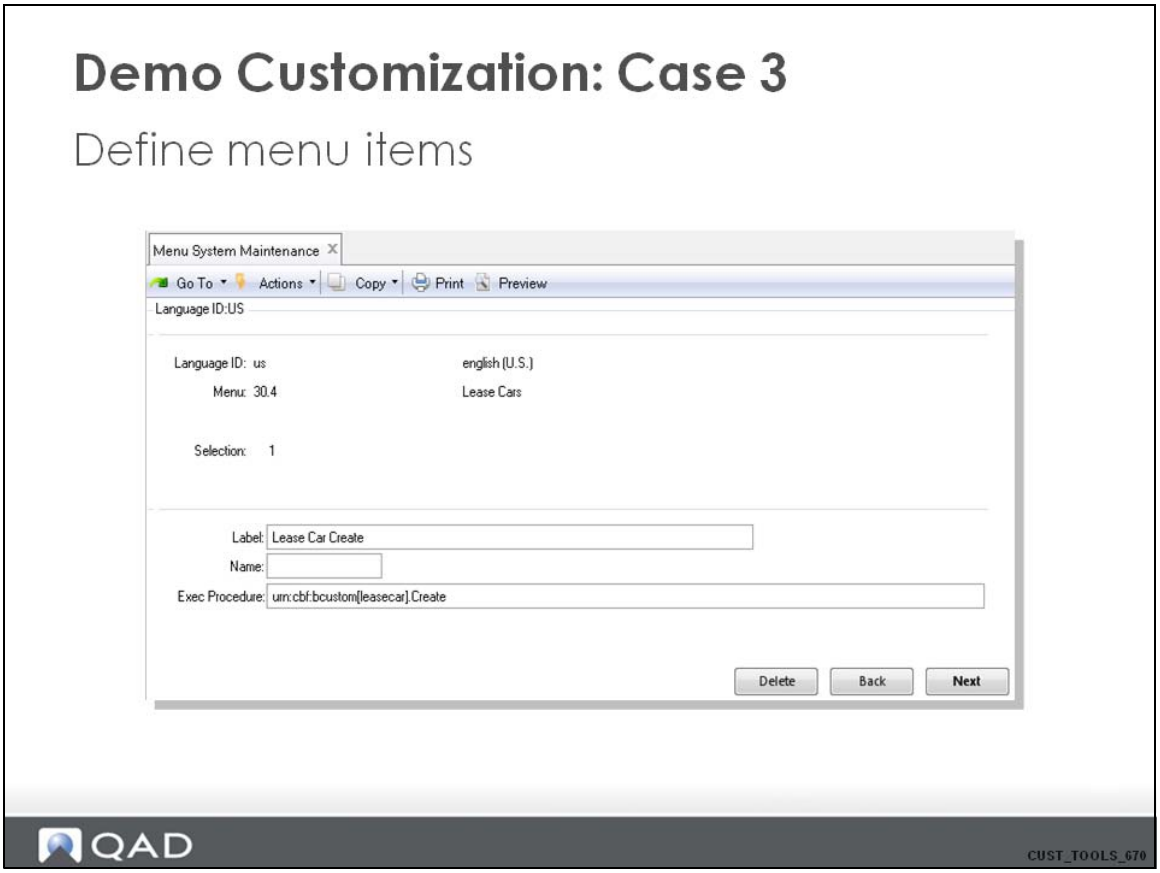
Demo Customization: Case 3 - Define User-Defined Component



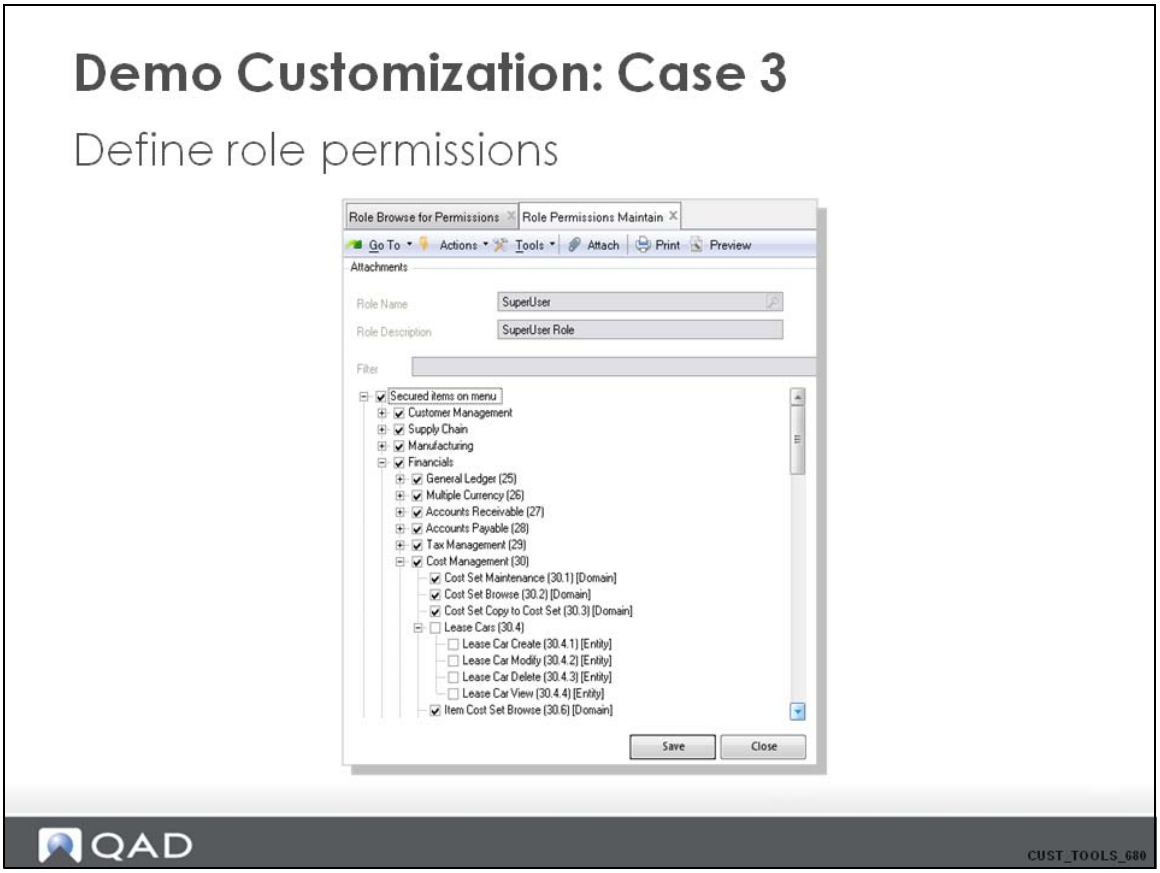
Demo Customization: Case 3 - Define User-Defined Fields



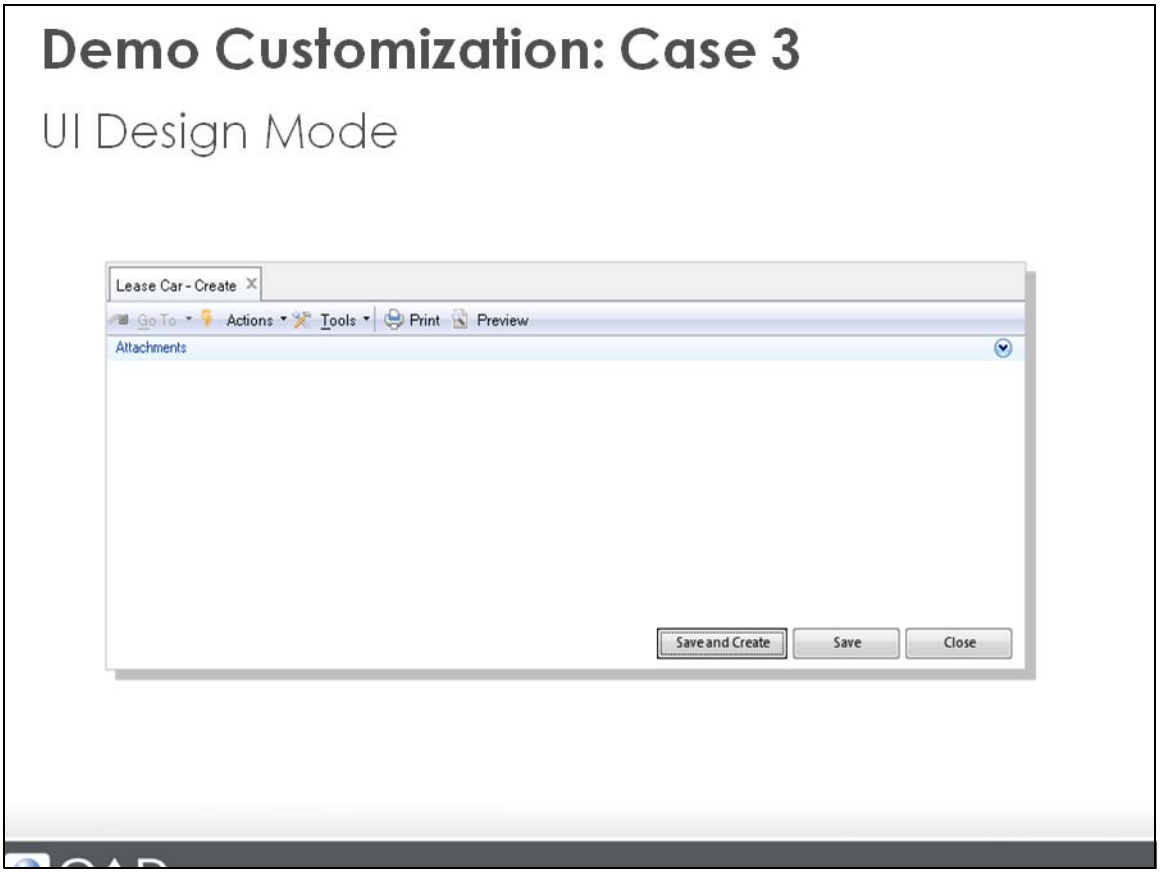
Demo Customization: Case 3 - Define Menu Items



Demo Customization: Case 3 - Define Role Permissions



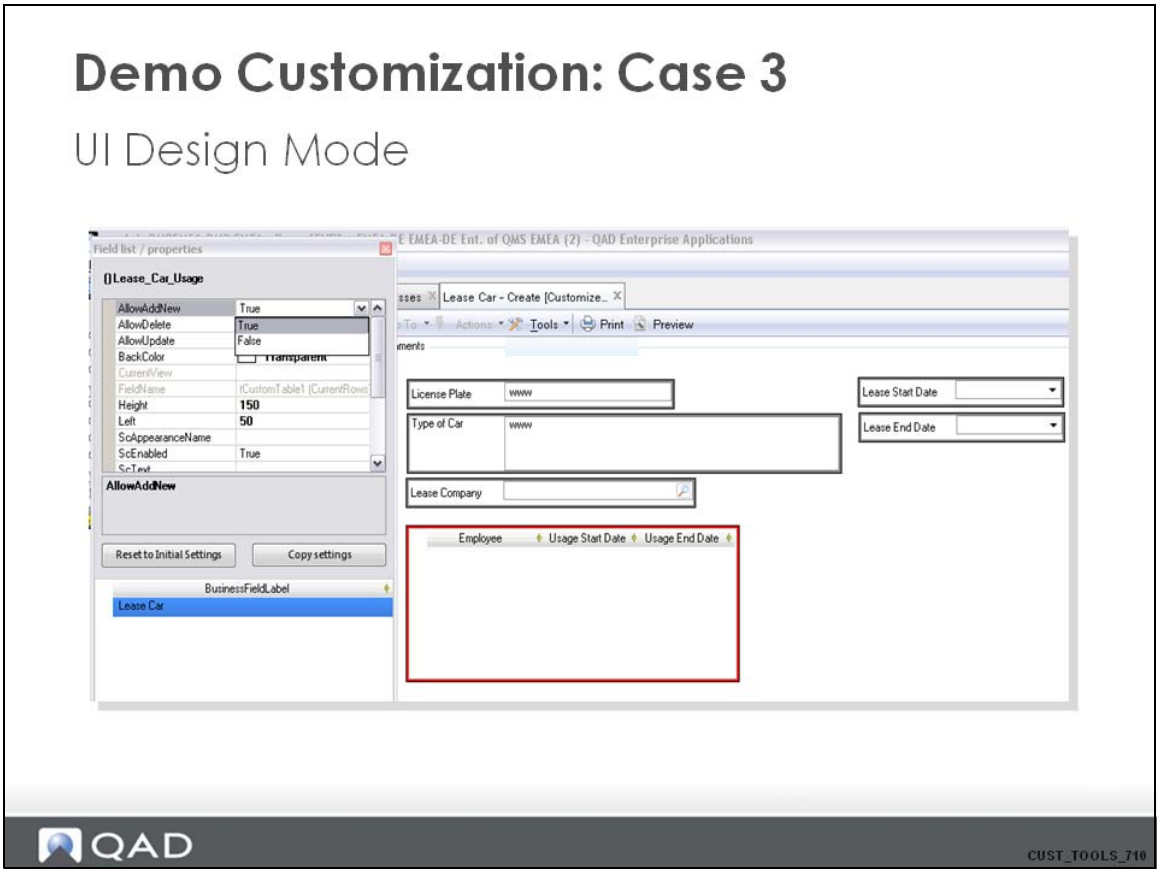
Demo Customization: Case 3 - UI Design Mode



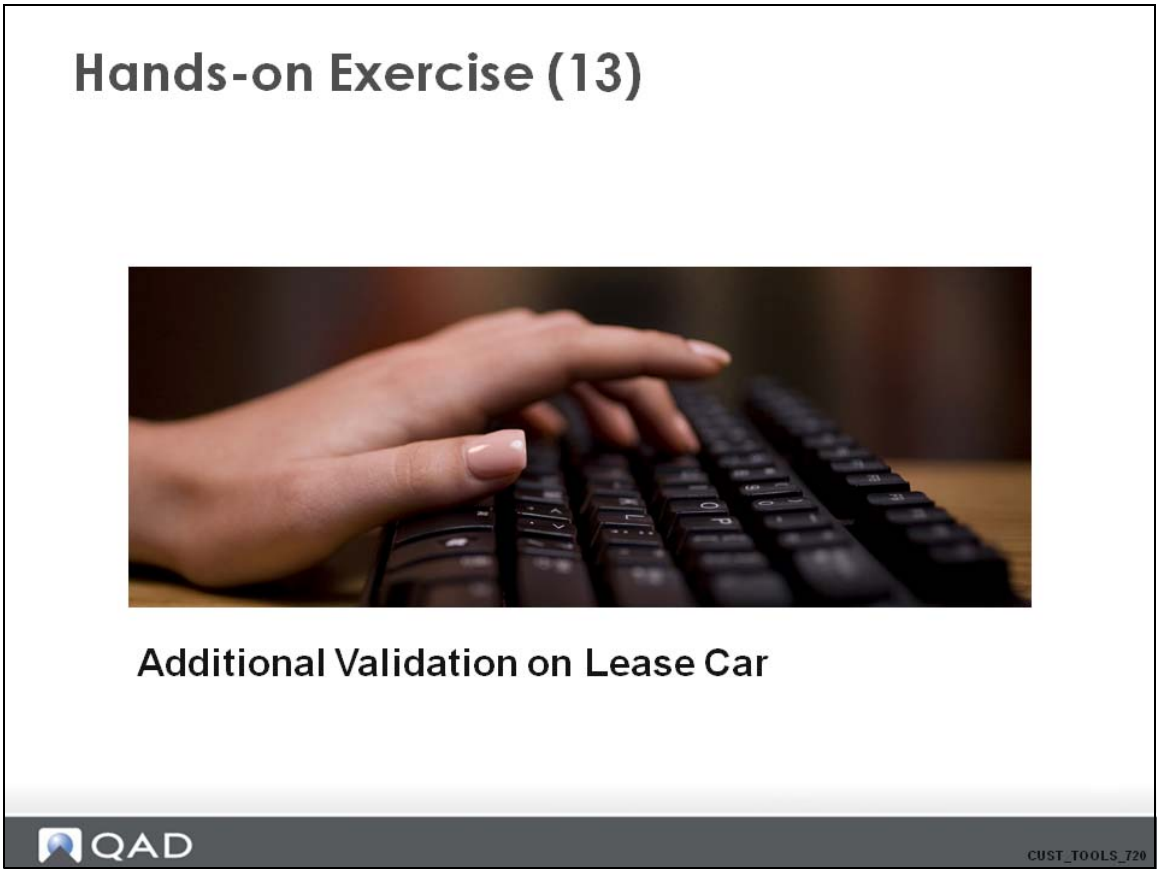
Demo Customization: Case 3 - UI Design Mode 2



Demo Customization: Case 3 - UI Design Mode 3



Hands-on Exercise (13)



Report Customization



Report Framework for Financials Reports



Report Framework for Financials Reports 2



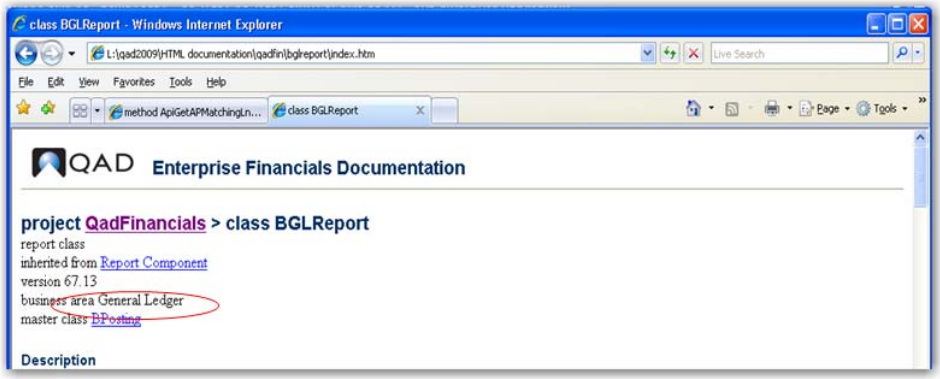
Report Framework for Financials Reports 3

Report Framework for Financials Reports

Report business component development

Inheritance from abstract foundation component

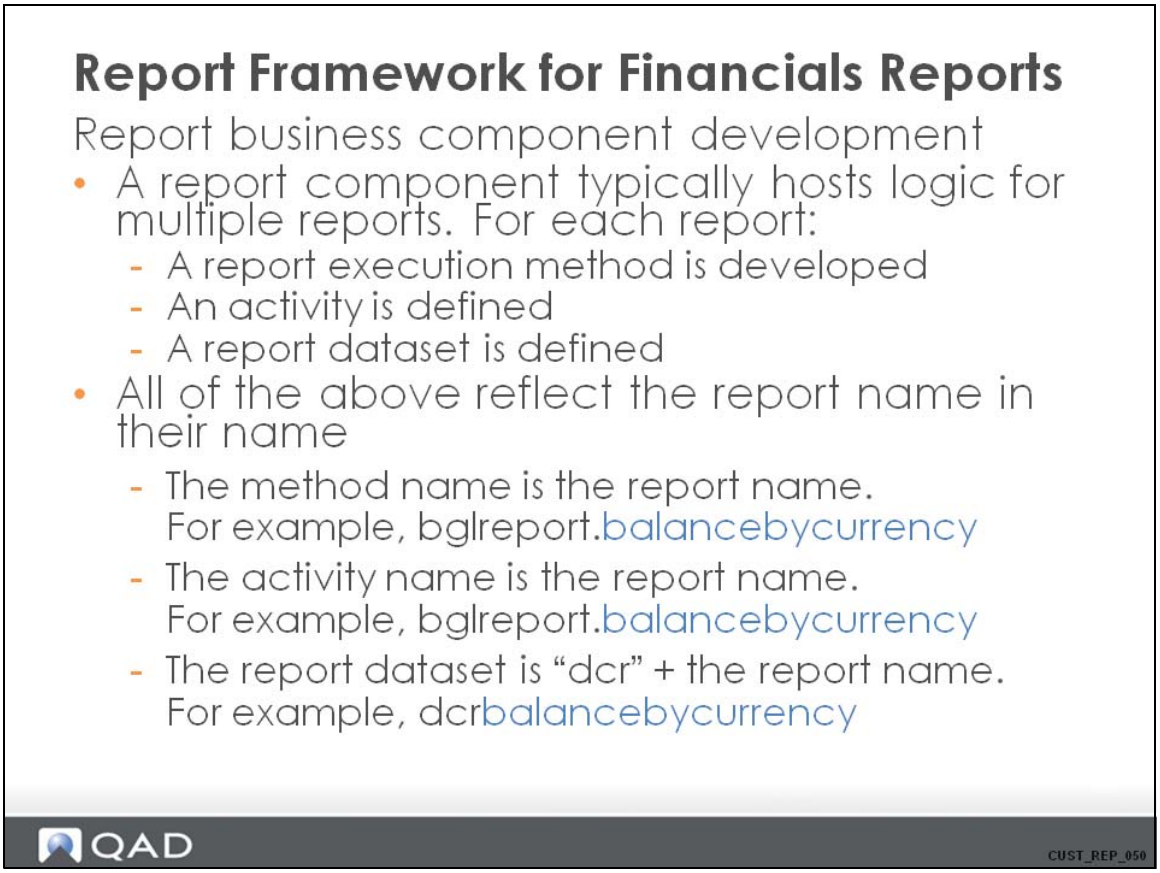
Report Component



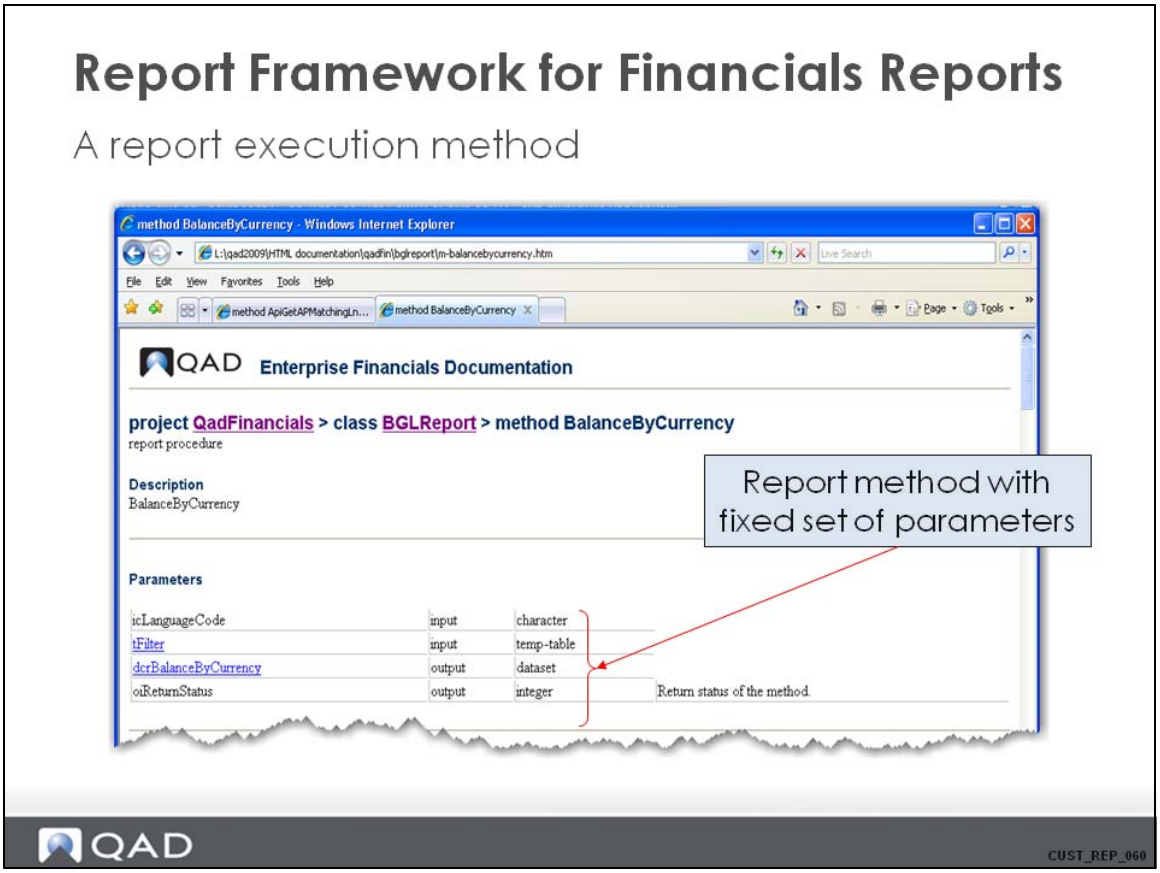
QAD

CUST_REP_040

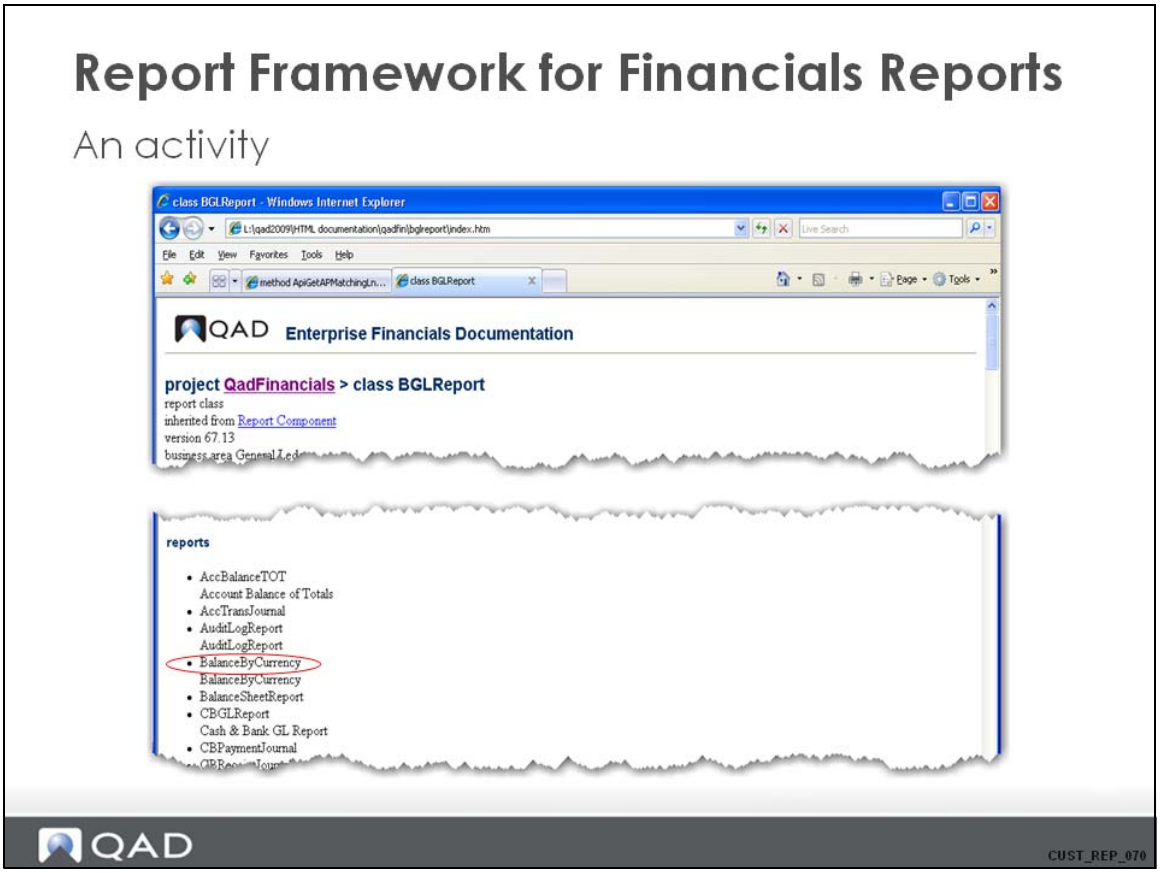
Report Framework for Financials Reports 4



Report Framework for Financials Reports 5



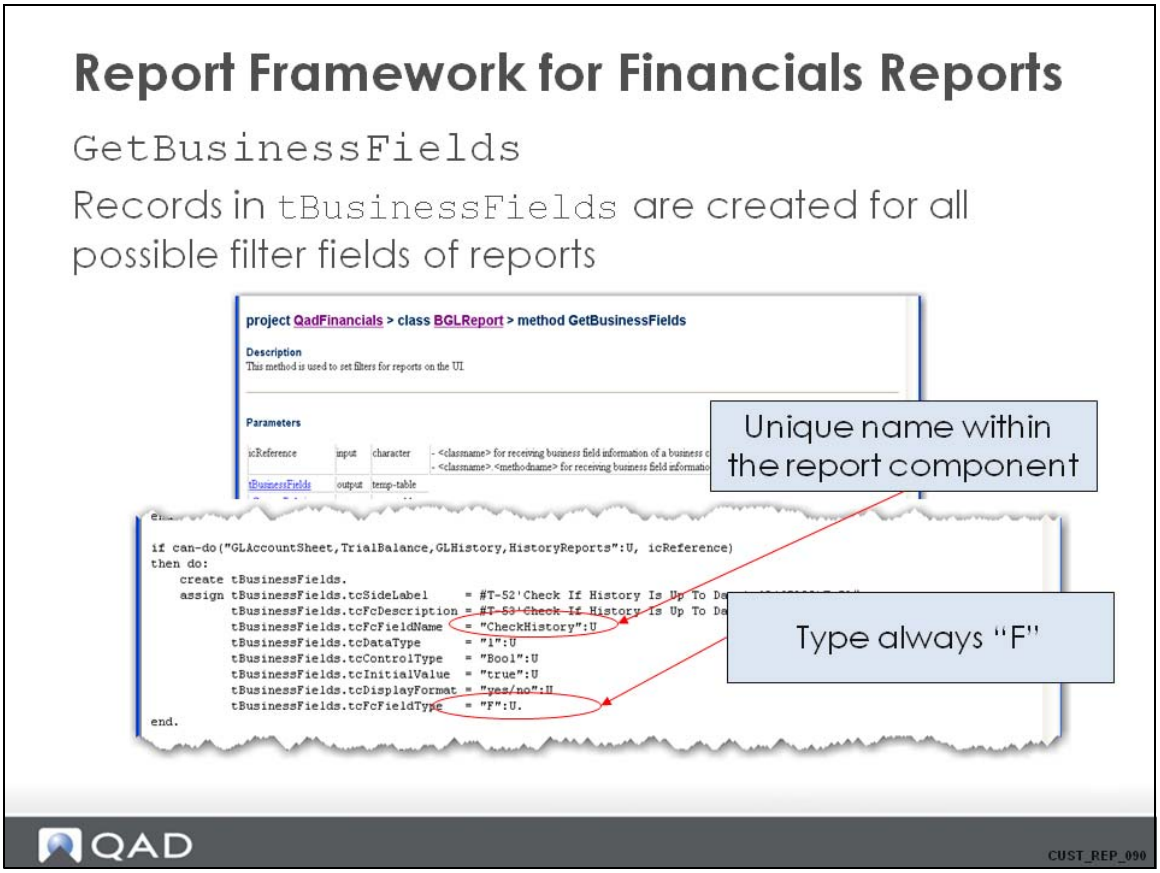
Report Framework for Financials Reports 6



Report Framework for Financials Reports 7



Report Framework for Financials Reports 8



Report Framework for Financials Reports 9

Report Framework for Financials Reports

`SetDataItemsBasedOnFilterTT`

Read the records from the `tqFilter` and fill in the correct data items (variables)

project QadFinancials > class BGLReport > method SetDataItemsBasedOnFilterTT

Description

```
for each tFilter:
    case tFilter.tcBusinessFieldName:
        when "SortBy":U
        then do:
            if tFilter.tcParameterValue = "Posting Date":U
            then assign vcSortByFilter = "1" no-error.

            if tFilter.tcParameterValue = "Sequence Number":U
            then assign vcSortByFilter = "2" no-error.
        end.

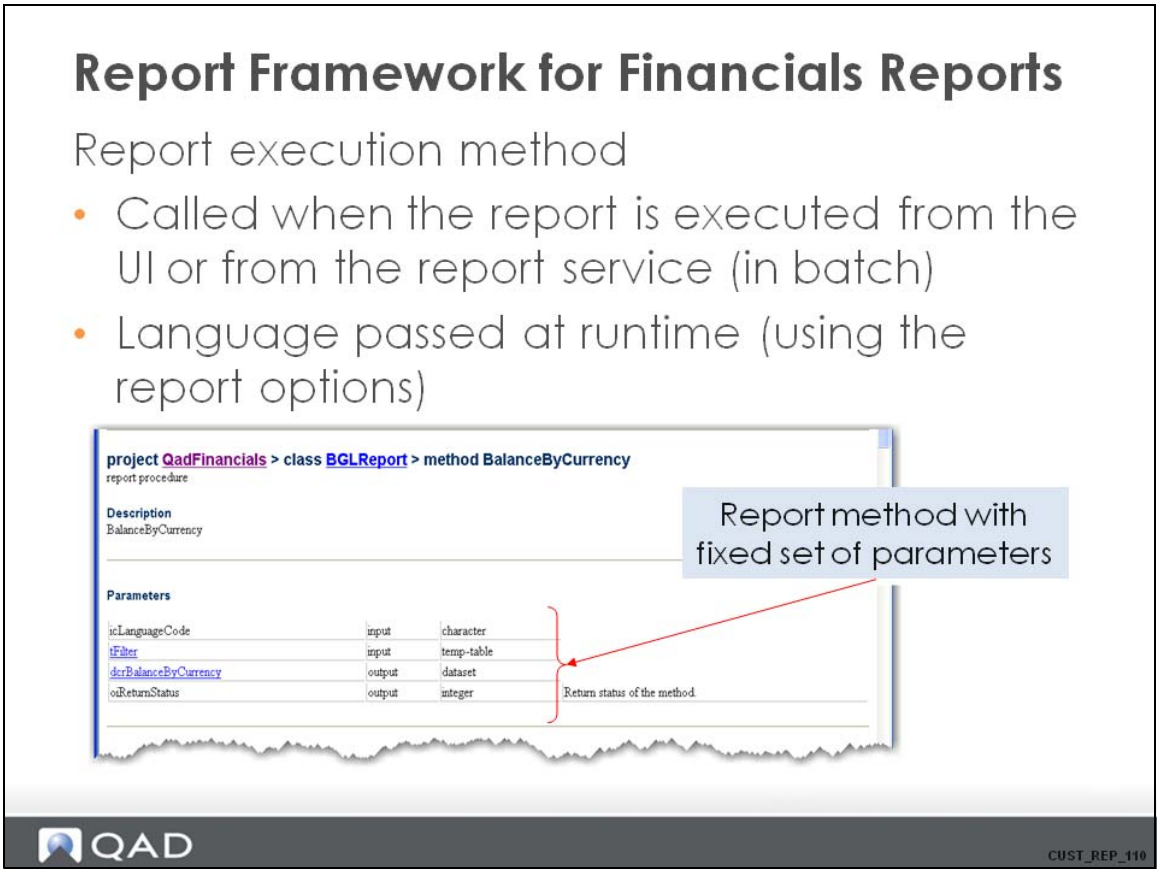
        when "AccYear":U
        then assign viFromAccYearFilter = int(tFilter.tcParameterValue) no-error.

        when "AccPeriod":U
        then assign viFromAccPeriodFilter = int(tFilter.tcParameterValue) no-error.
```

QAD

CUST_REP_100

Report Framework for Financials Reports 10

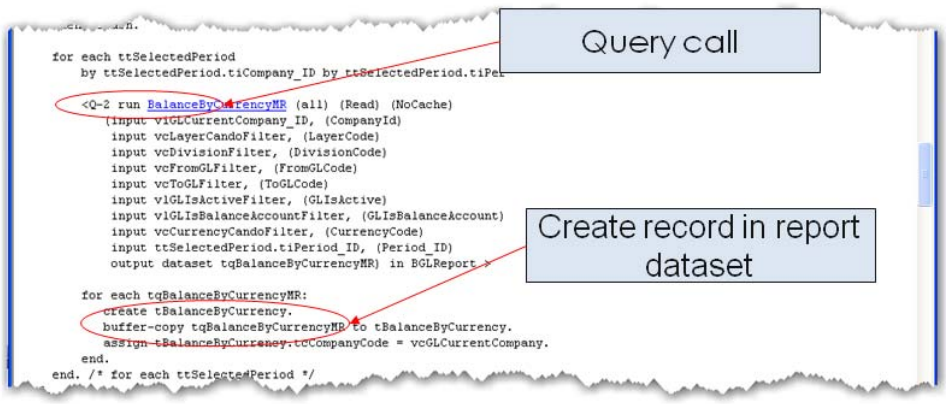


Report Framework for Financials Reports 11

Report Framework for Financials Reports

Report execution method

Typically is code that calls one or more queries and based on that data populates the report dataset



QAD CUST_REP_120

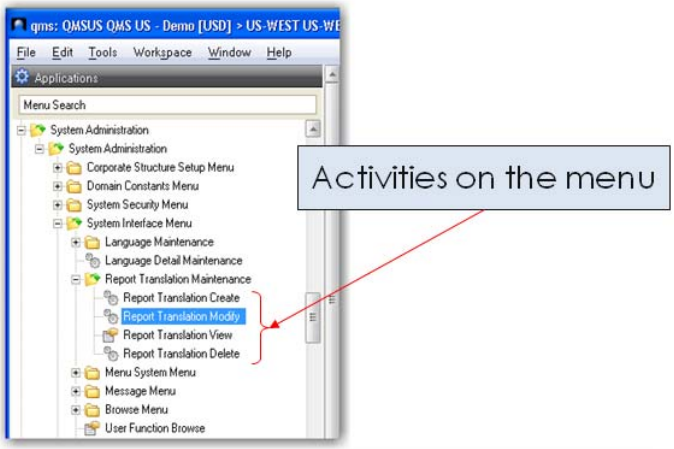
Report Framework for Financials Reports 12

Report Framework for Financials Reports

Languages and Translations

`BReportTranslation` component

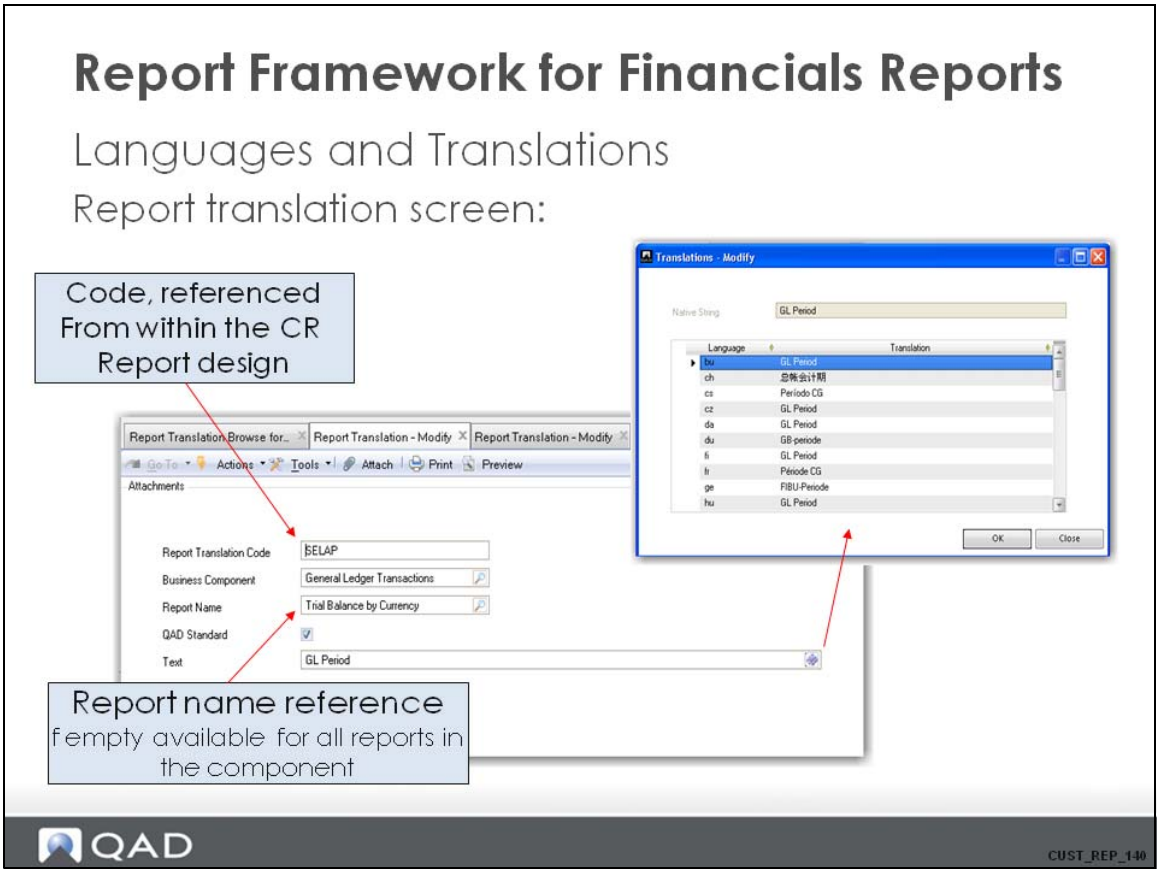
- This component is used to maintain the labels and translations on specific reports
- Menu items:



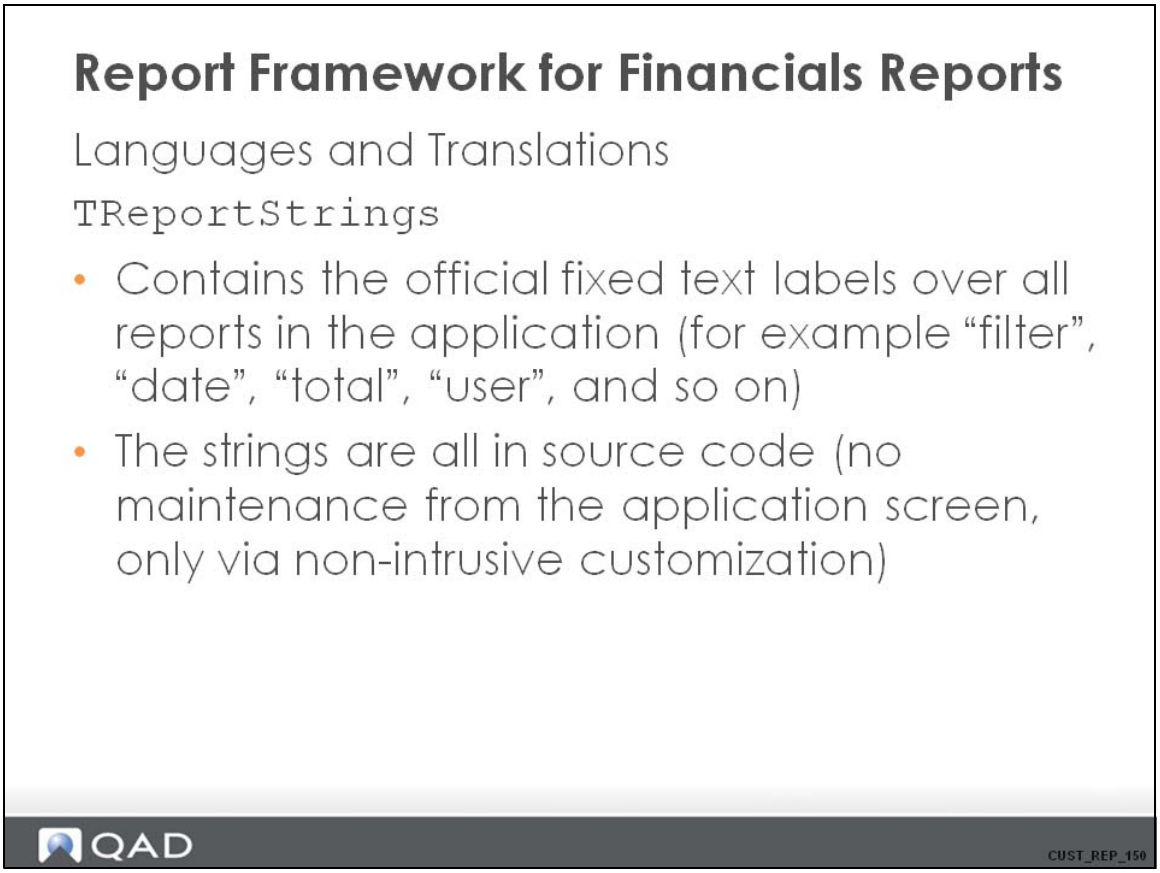
QAD

CUST_REP_130

Report Framework for Financials Reports 13



Report Framework for Financials Reports 14



Report Framework for Financials Reports 15

Report Framework for Financials Reports

Languages and Translations

- `TReportStrings.MainBlock` method contains the code
- Translation is fixed and comes with the QAD application installation
- Strings referenced from Crystal reports in a similar way as the specific report labels

```
create tReportStrings.
assign tReportStrings.tcStringText = #T-3'Date':10(358)t-3#
       tReportStrings.tcStringCode = "O-DATE":U.

create tReportStrings.
assign tReportStrings.tcStringText = #T-4'DB':2(359)t-4#
       tReportStrings.tcStringCode = "O-DB":U.

create tReportStrings.
assign tReportStrings.tcStringText = #T-5'End of Report':20(360)t-5#
       tReportStrings.tcStringCode = "O-EOR":U.

create tReportStrings.
assign tReportStrings.tcStringText = #T-6'Filter Values for this Report':100(361)T-6#
       tReportStrings.tcStringCode = "O-FILTER":U.

create tReportStrings.
assign tReportStrings.tcStringText = #T-7'No Data':20(362)t-7#
       tReportStrings.tcStringCode = "O-ND":U.

create tReportStrings.
assign tReportStrings.tcStringText = #T-8'Page':10(363)t-8#
```

QAD

CUST_REP_160

Report Framework for Financials Reports 16

Report Framework for Financials Reports

For all of the strings defined in `TReportStrings` component, do the following:

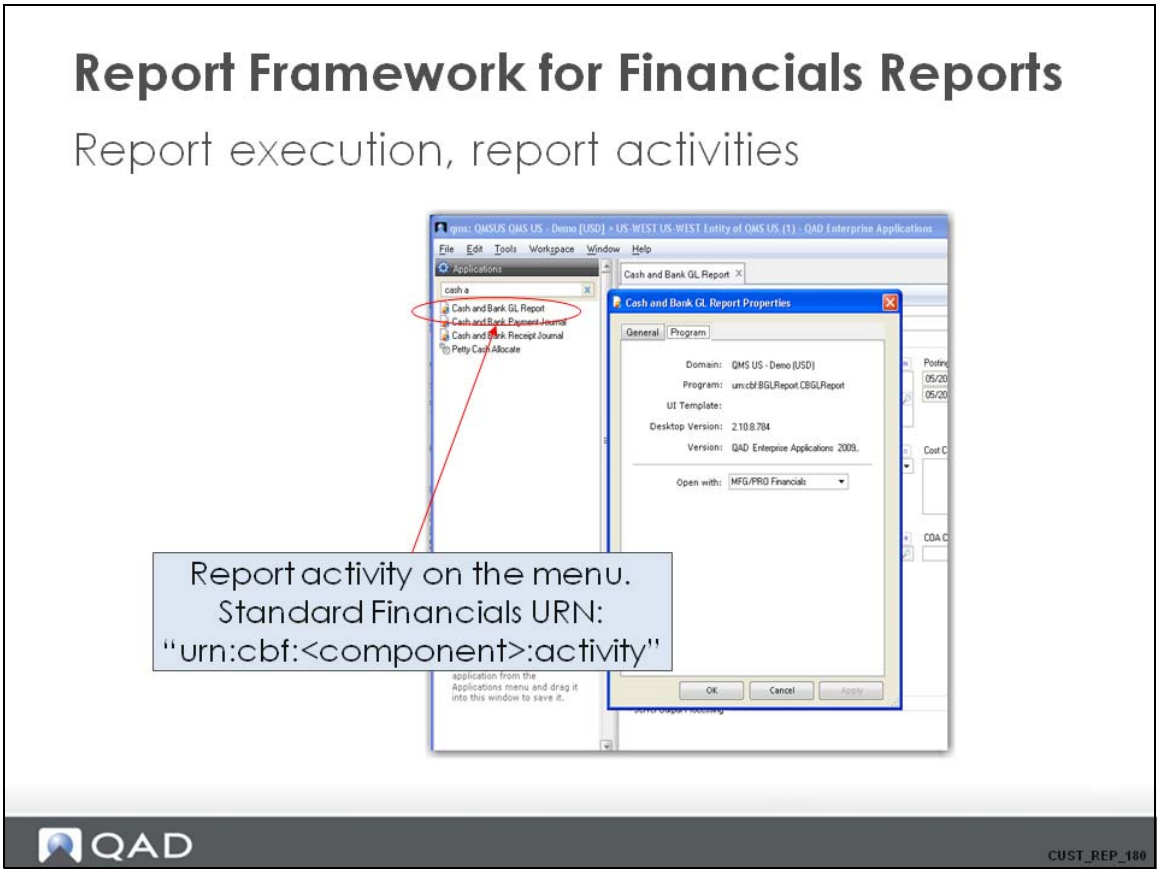
1. System Synchronize (36.24.3.2) for Report Strings
2. Log out from the application and log in again



QAD

CUST_REP_170

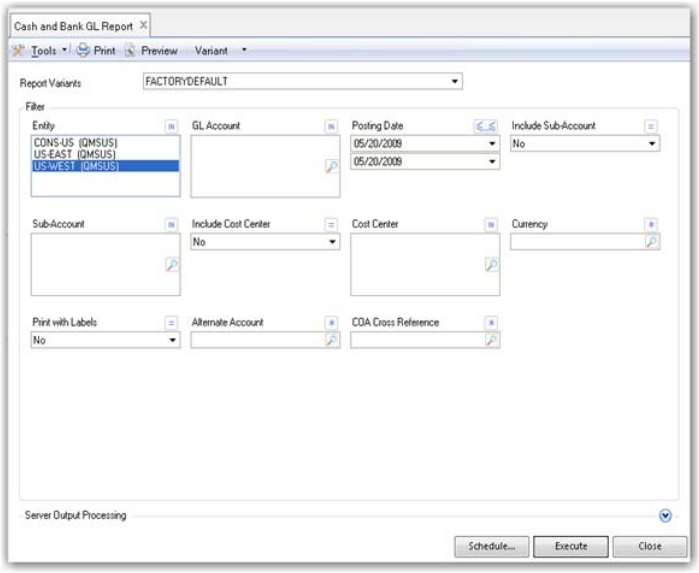
Report Framework for Financials Reports 17



Report Framework for Financials Reports 18

Report Framework for Financials Reports

Generic UI report execution interface



QAD

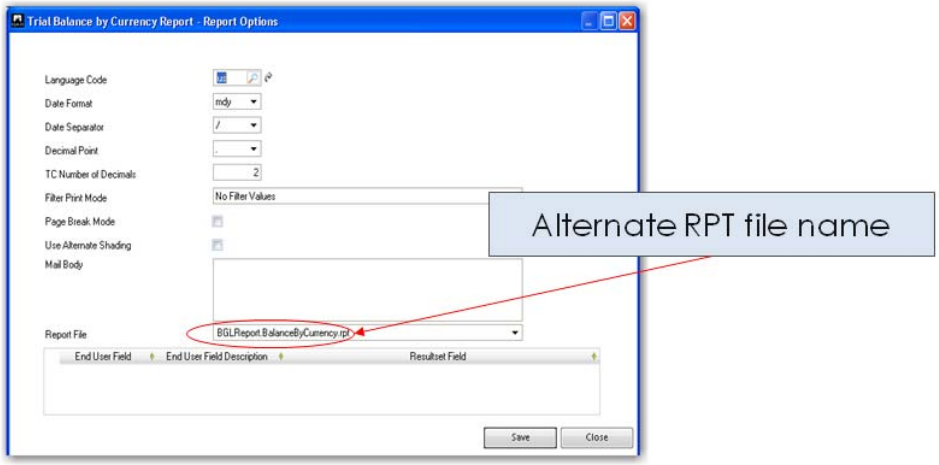
CUST_REP_190

Report Framework for Financials Reports 19

Report Framework for Financials Reports

Generic UI report execution interface

Use Tools->Report options... to pass settings for the report execution



QAD

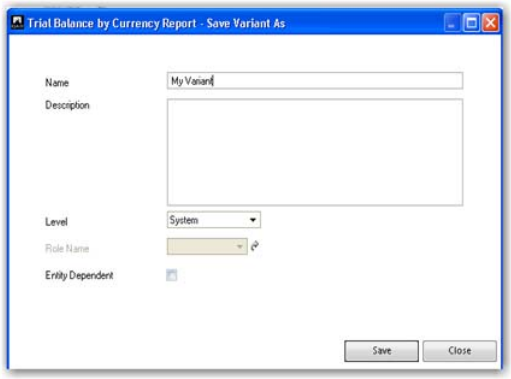
CUST_REP_200

Report Framework for Financials Reports 20

Report Framework for Financials Reports

Generic UI report execution interface

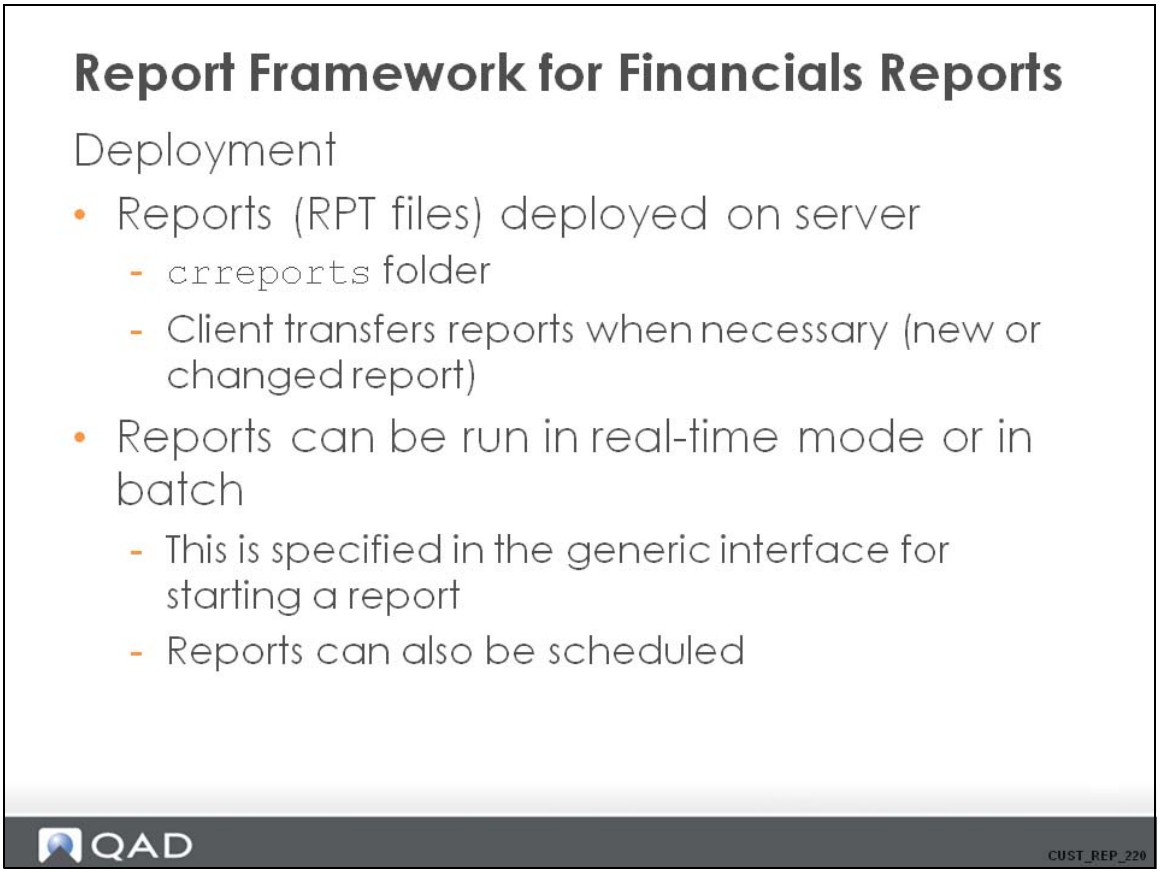
- Settings can be saved as variants.
  (Variant->Save as…)
  Saved data: Report options and filter field settings
- System comes with factory default variant for each report



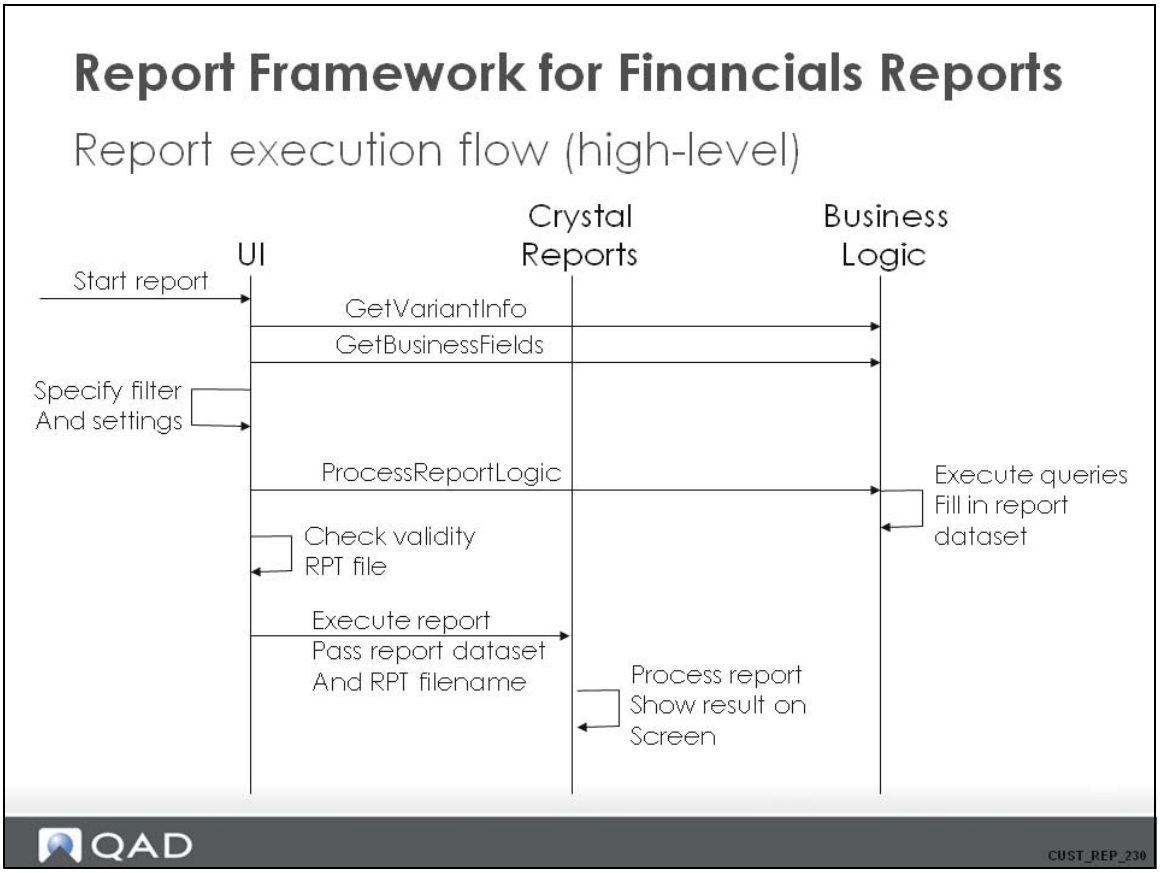
QAD

CUST_REP_210

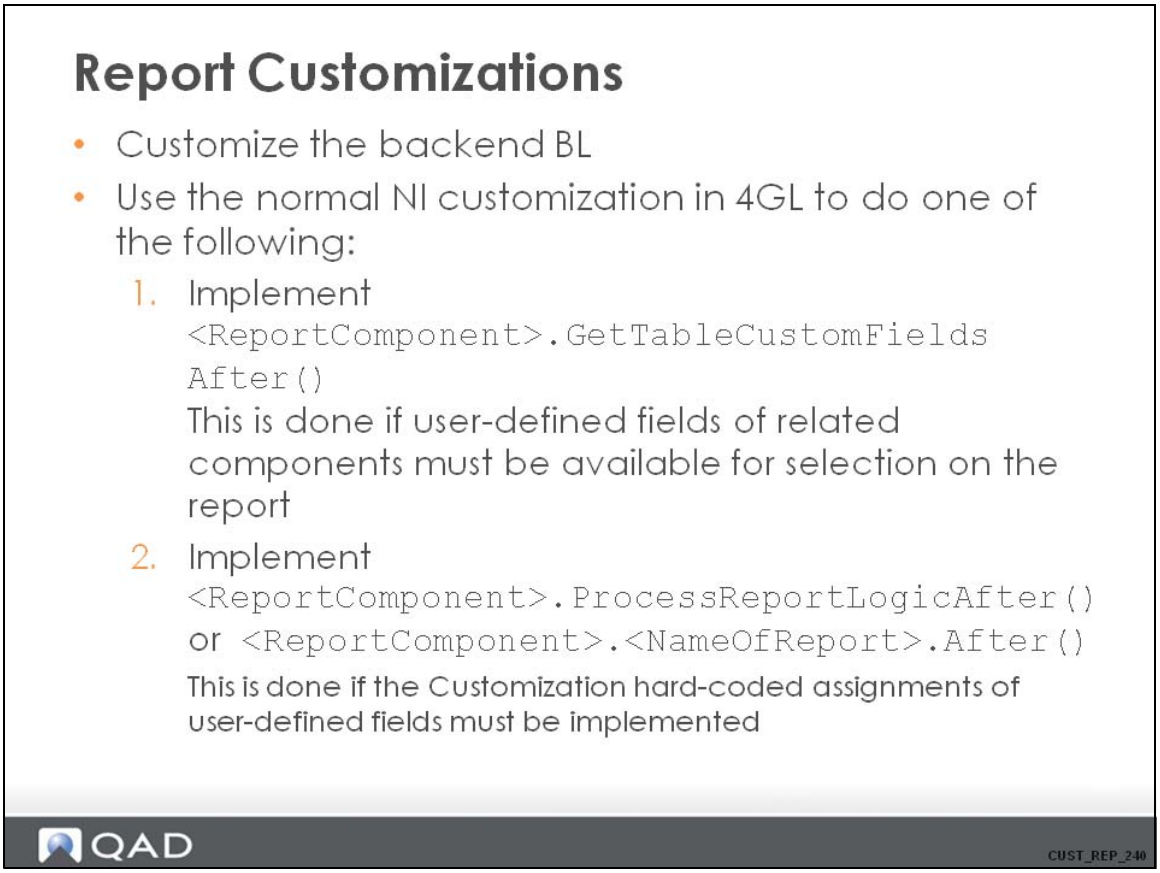
Report Framework for Financials Reports 21



Report Framework for Financials Reports 22



Report Customizations

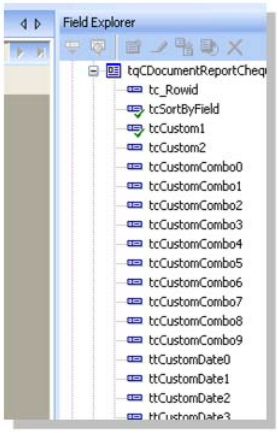


Report Customization - User-Defined Fields

Reports Customization

User-defined fields (Custom Fields)

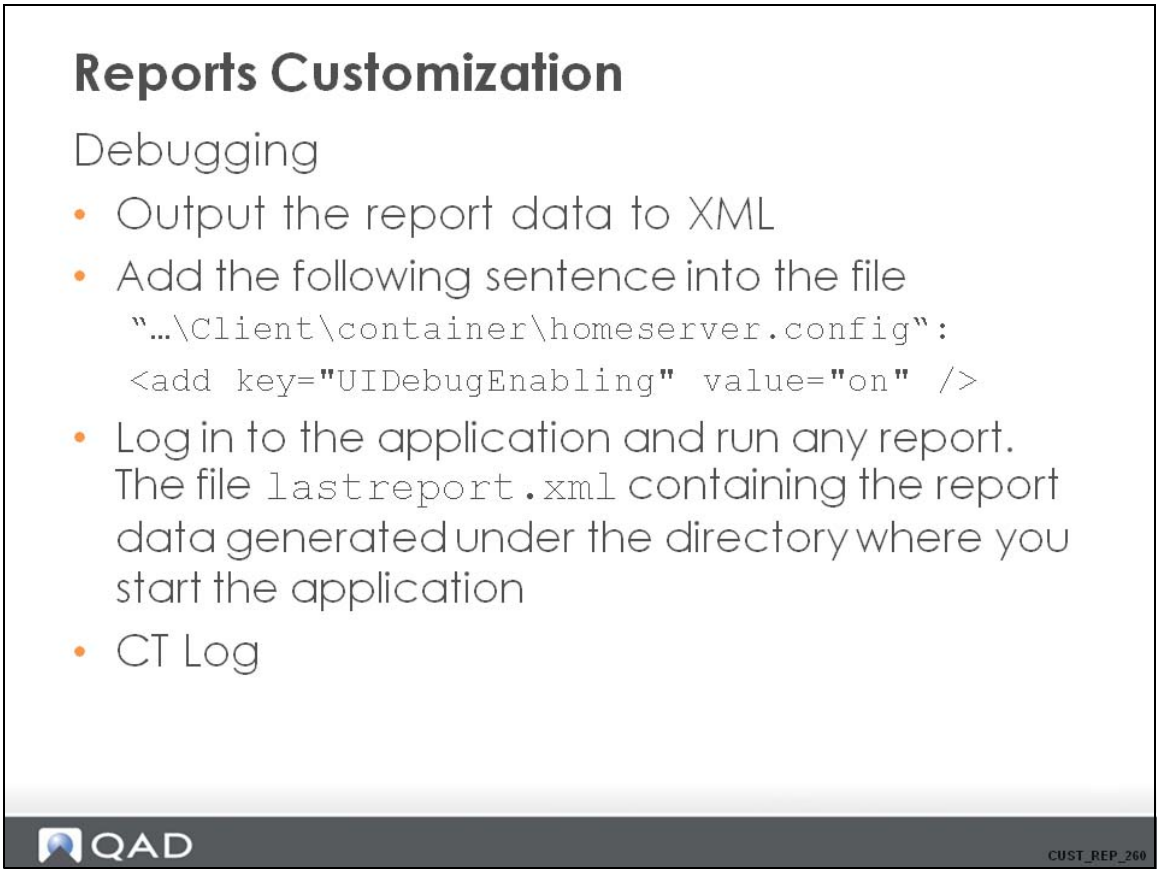
- The custom fields are just used as normal data fields in reports
- On BL side, ensure the correct values are assigned for custom fields



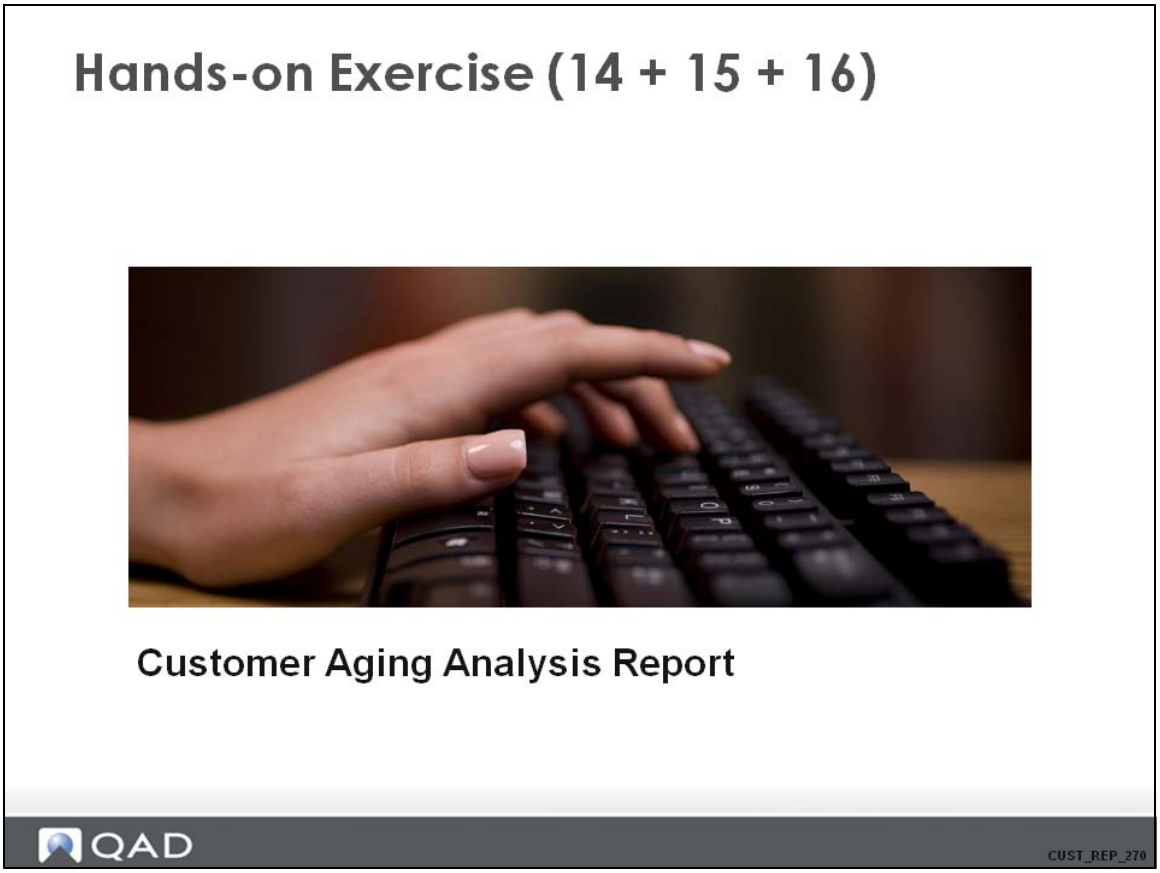
QAD

CUST_REP_250

Report Customization - Debugging



Hands-on Exercise (14 + 15 + 16)



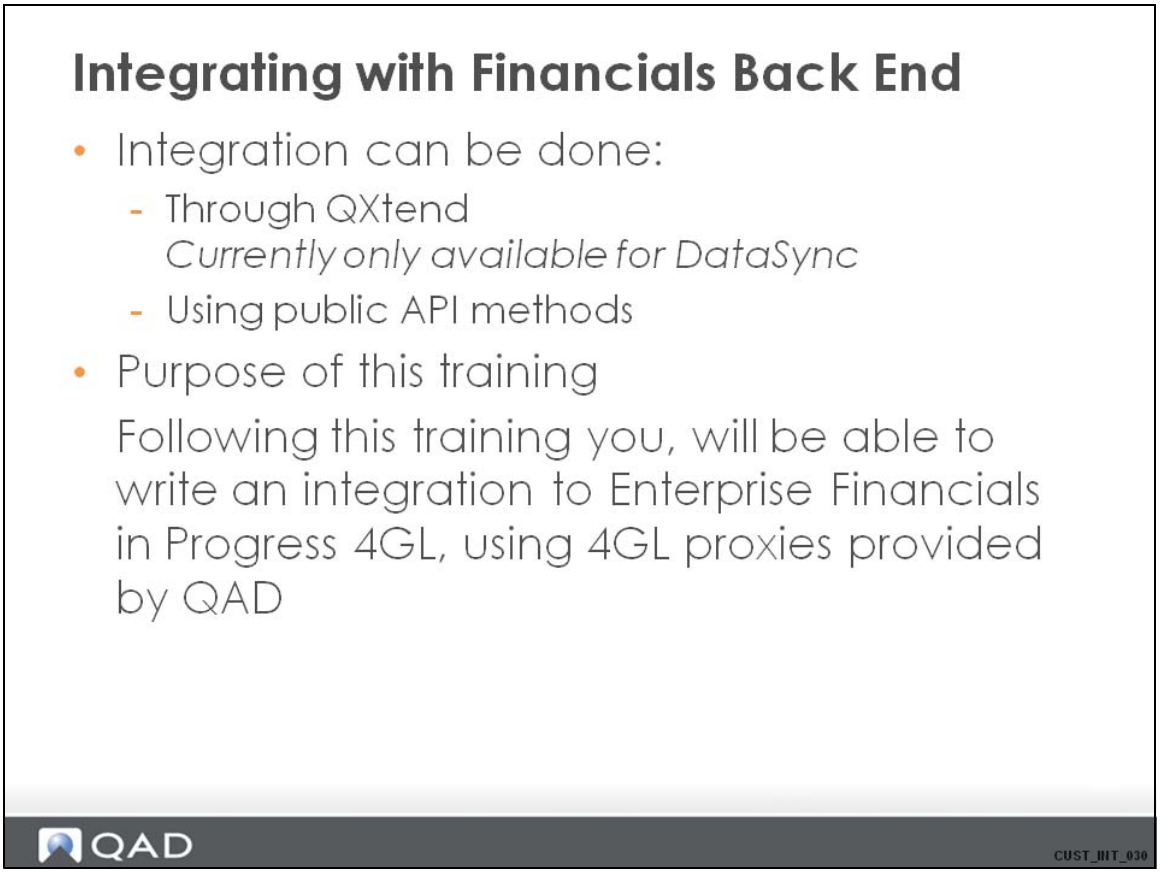
Chapter 6

Integration with Enterprise Financials: Back End

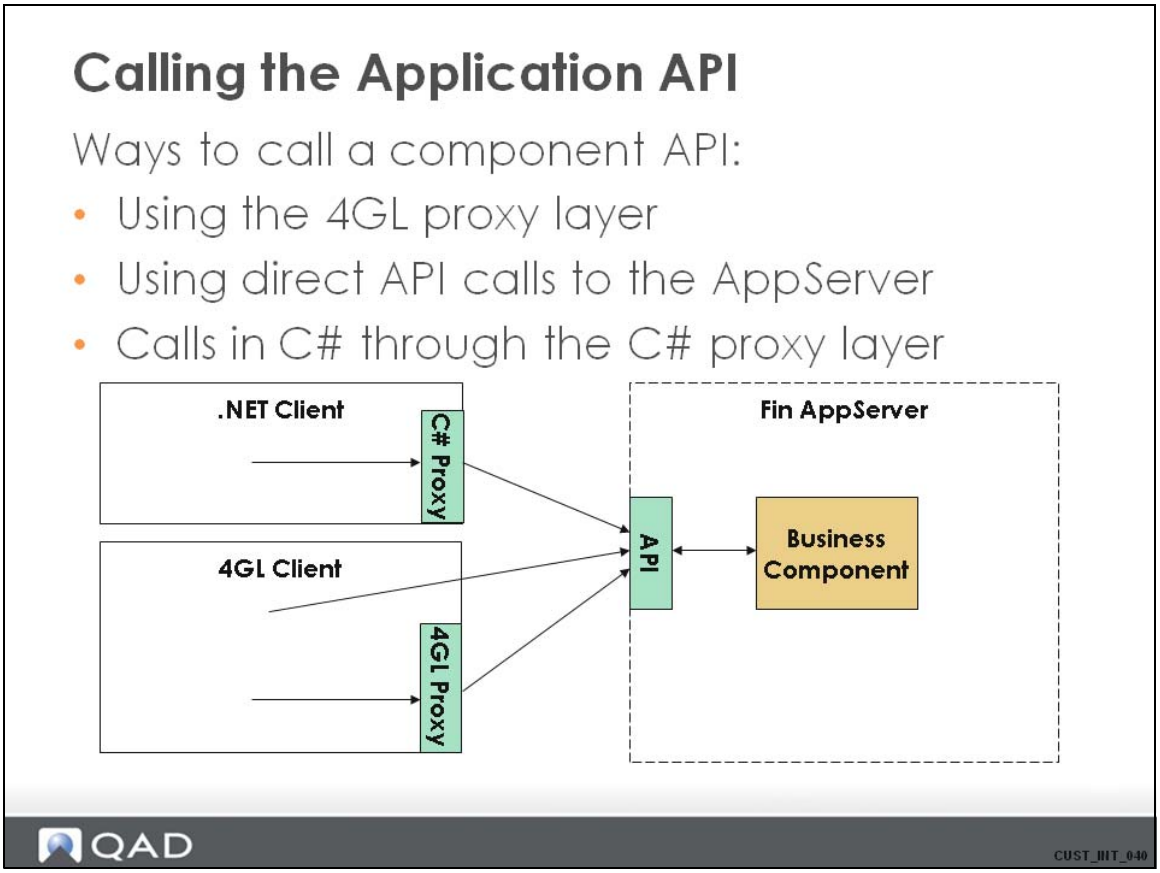
Integration with Enterprise Financials: Back End



Integrating with Financials Back End



Calling the Application API 1

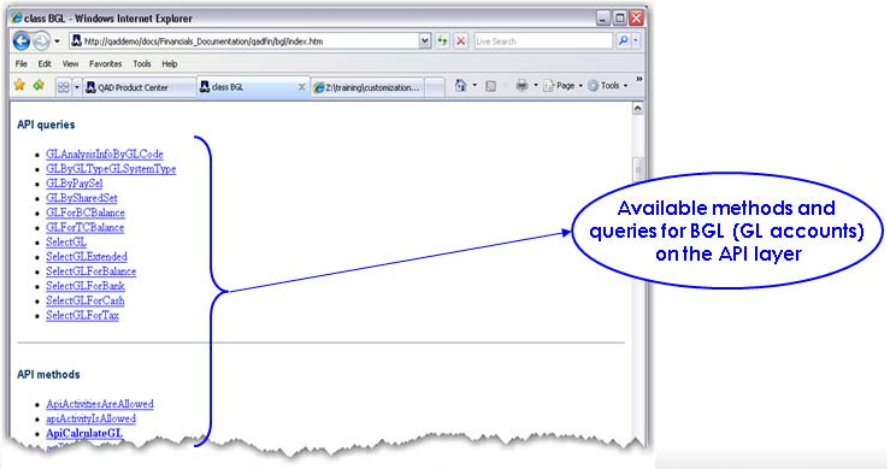


Calling the Application API 2

Calling the Application API

Available API methods:

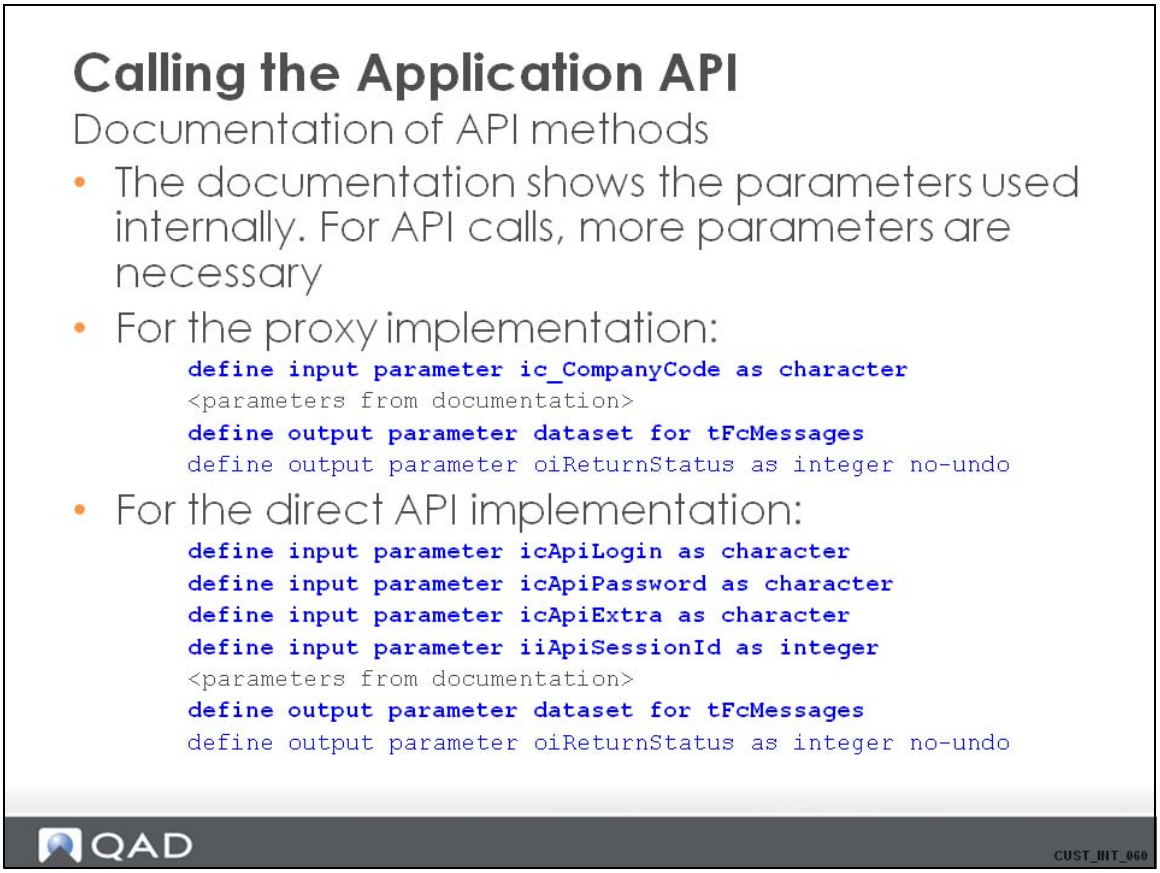
- Use HTML documentation
- Look for API queries and methods on the main page of a business component



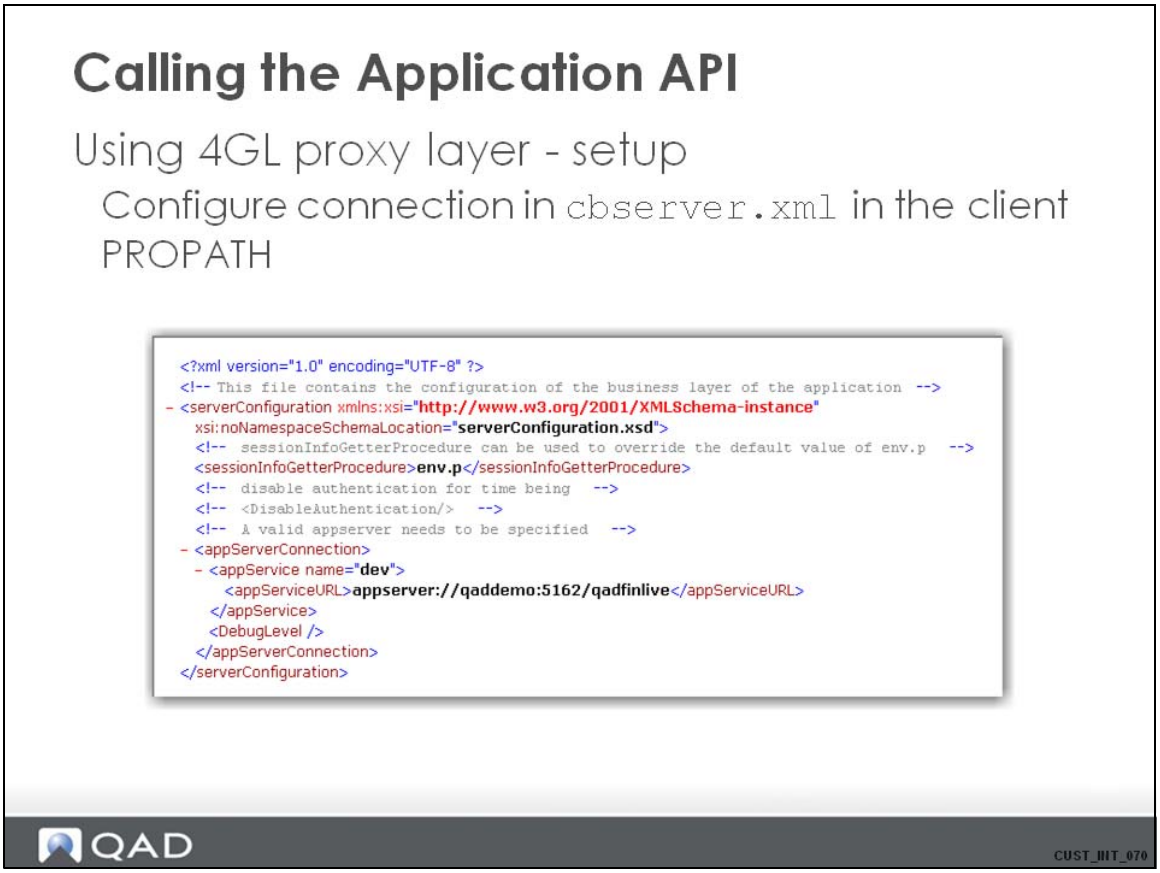
QAD

CUST_INT_050

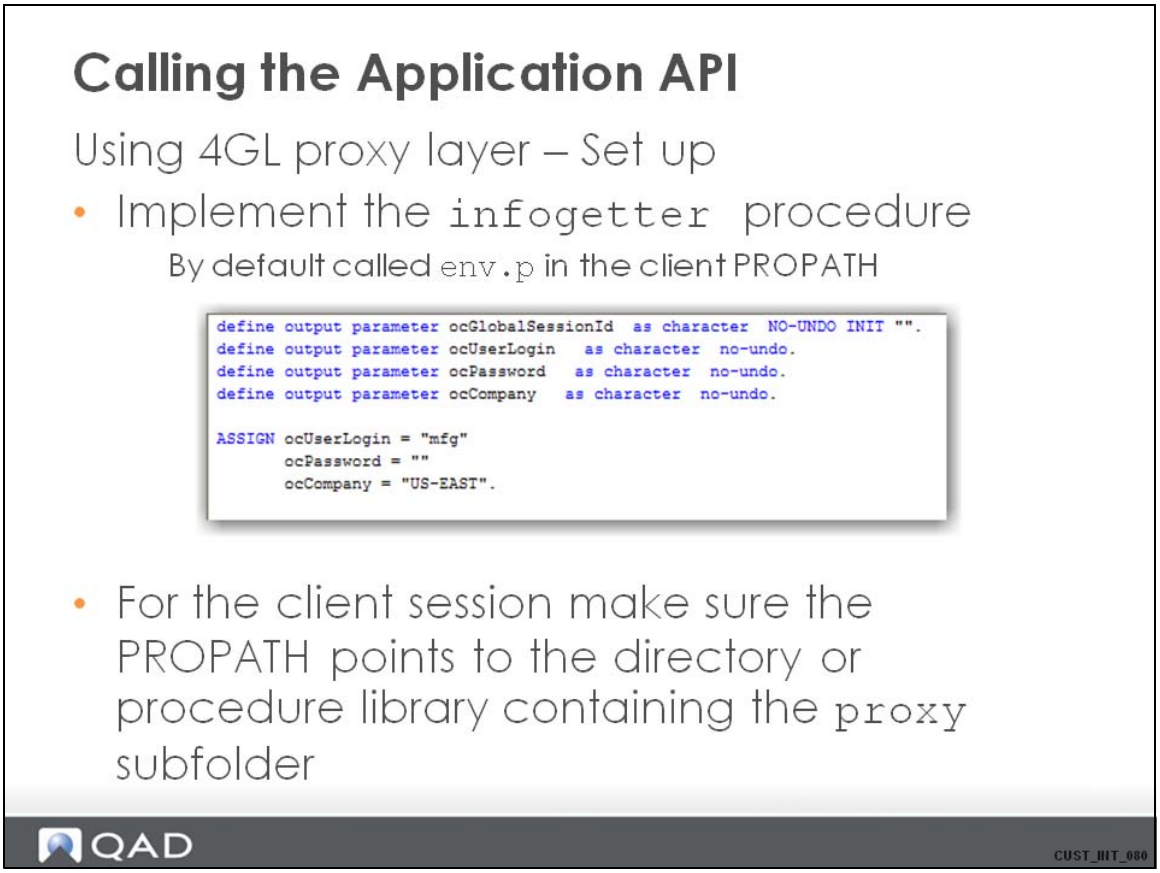
Calling the Application API 3



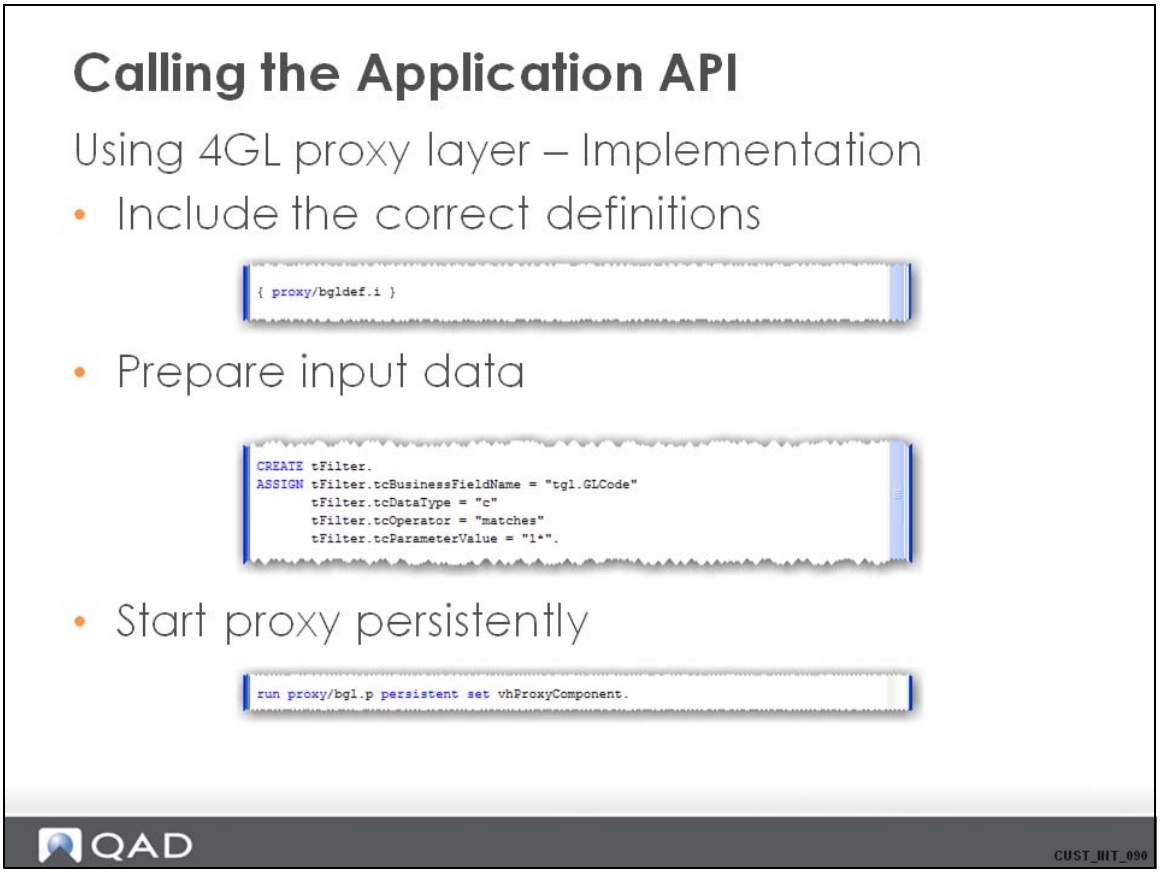
Calling the Application API 4



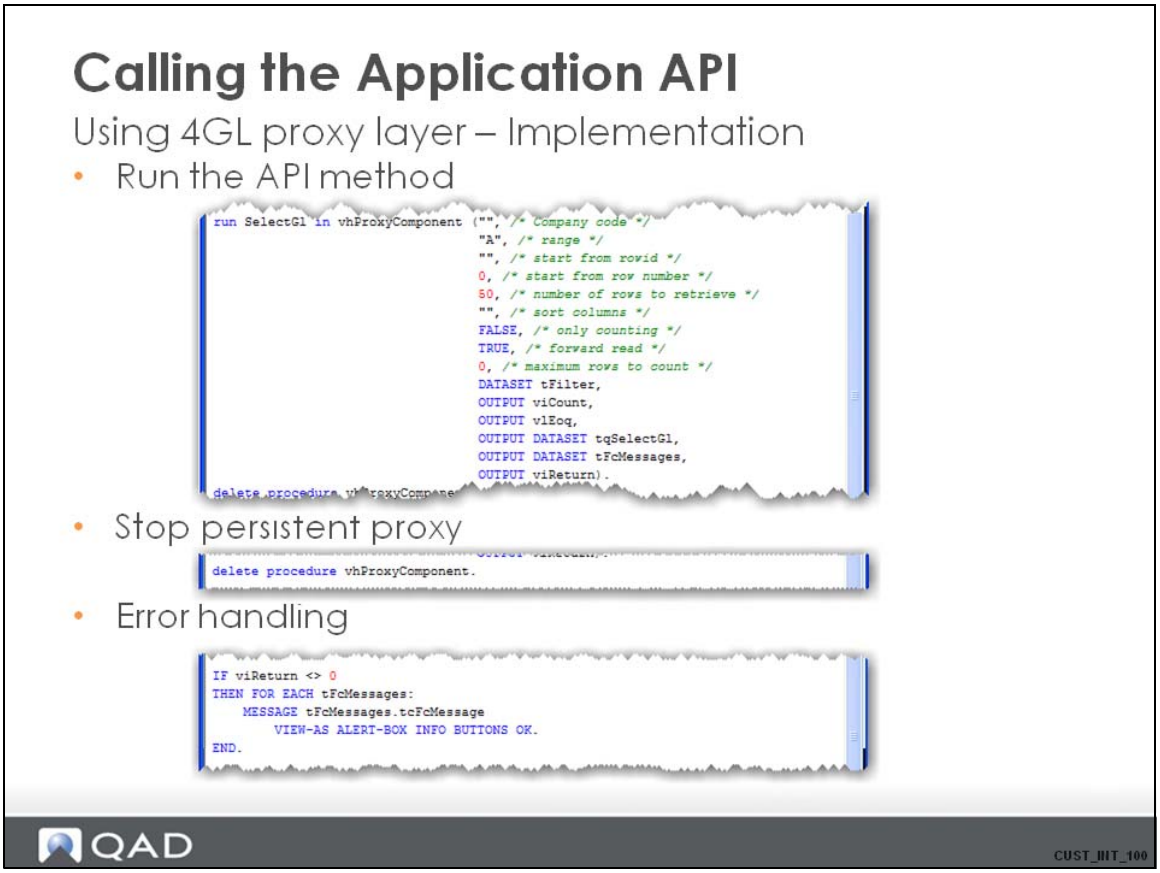
Calling the Application API 5



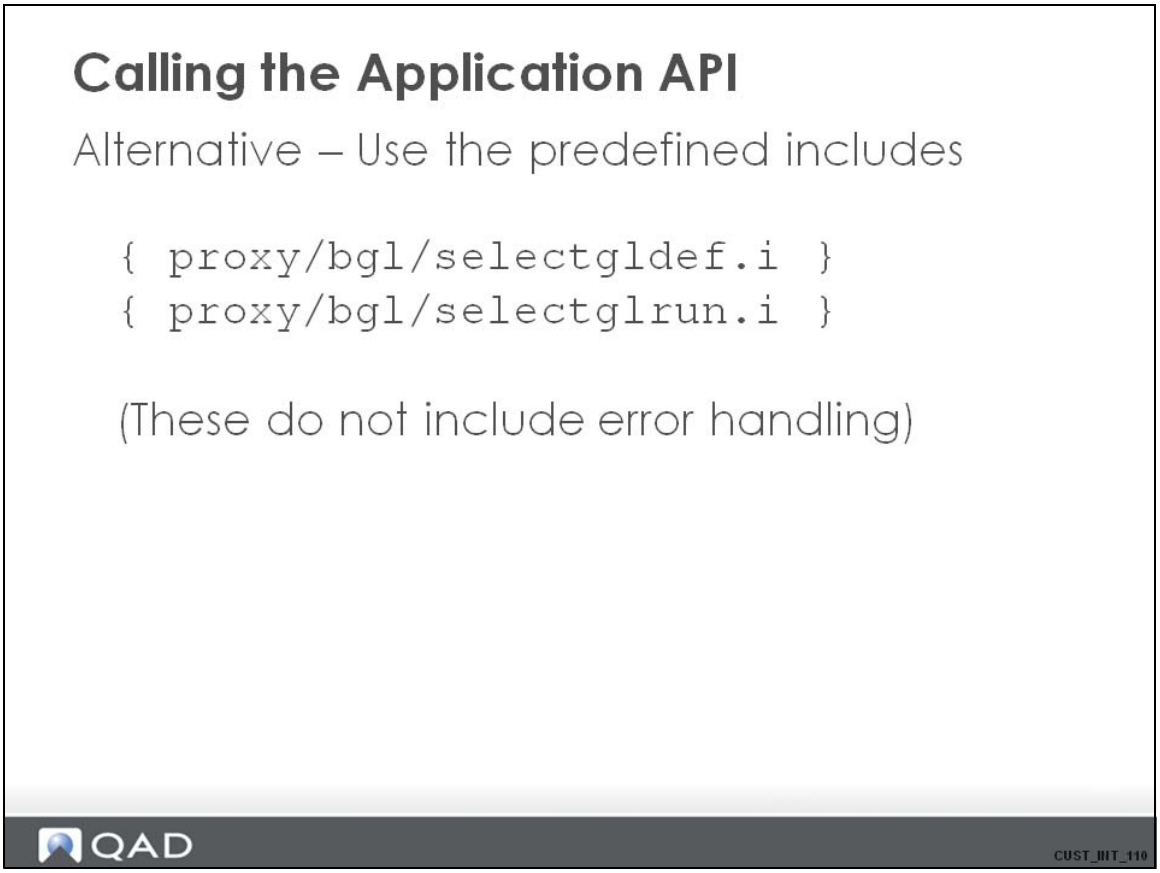
Calling the Application API 6



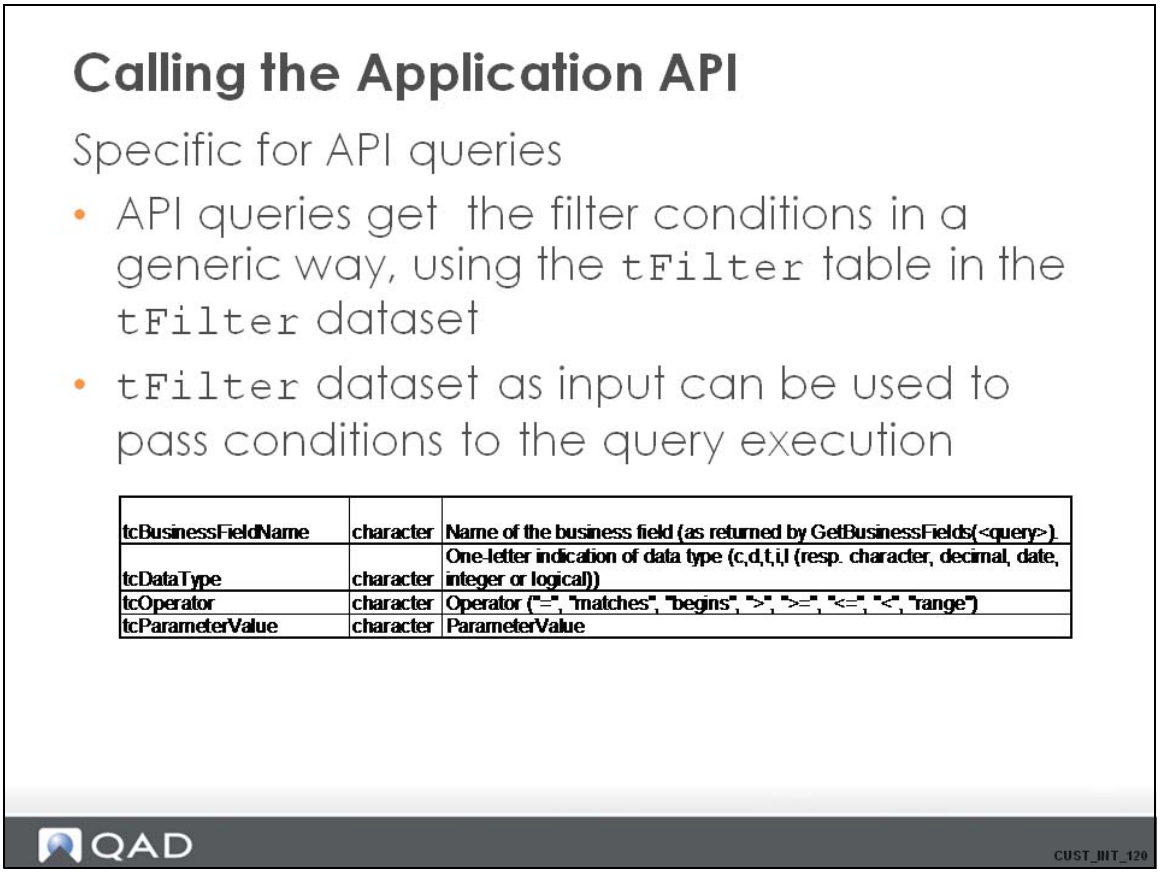
Calling the Application API 7



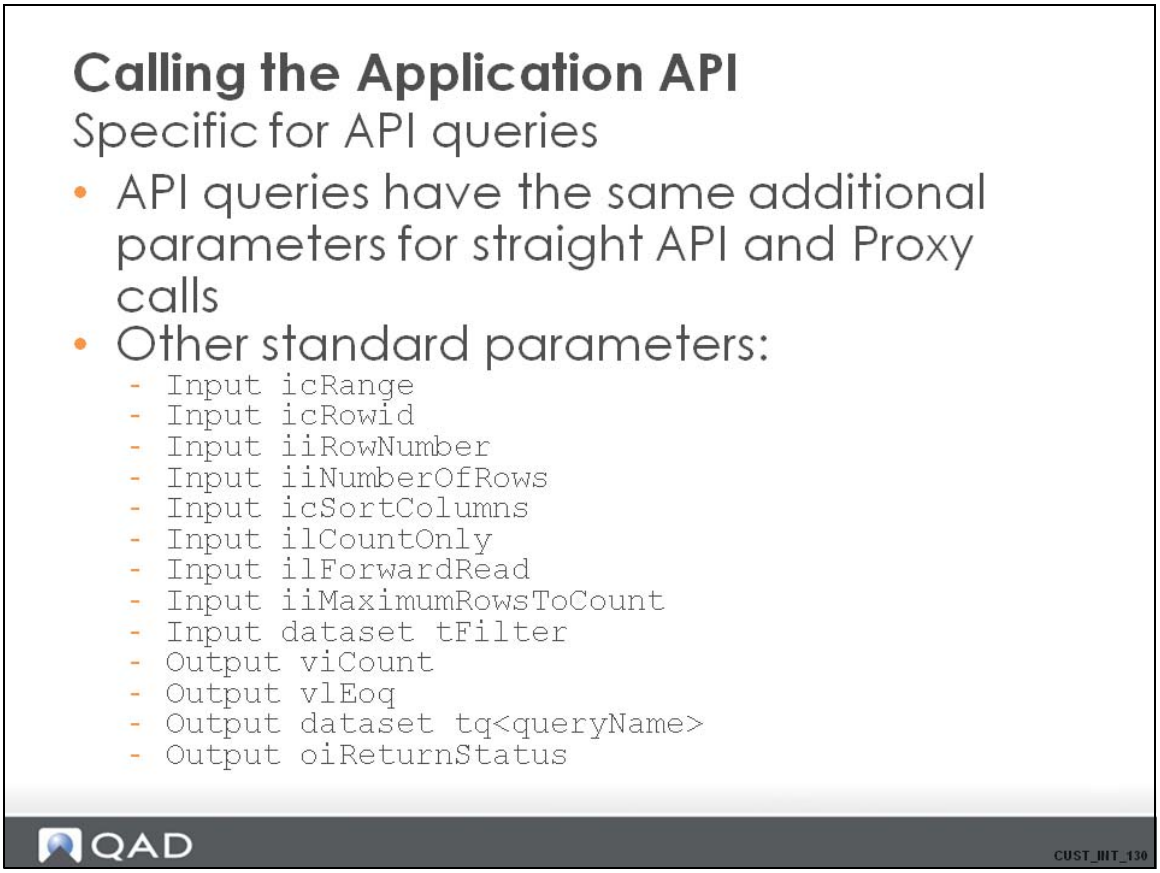
Calling the Application API 8



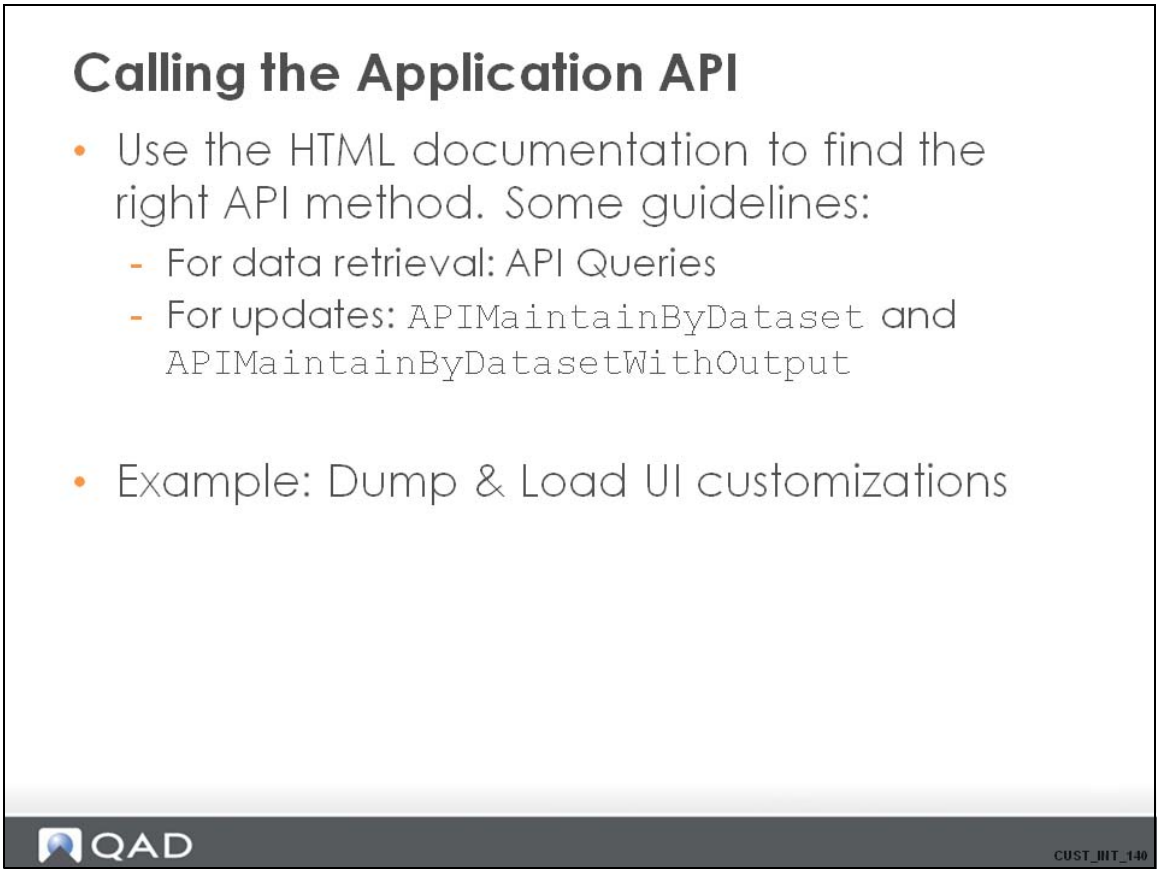
Calling the Application API 9



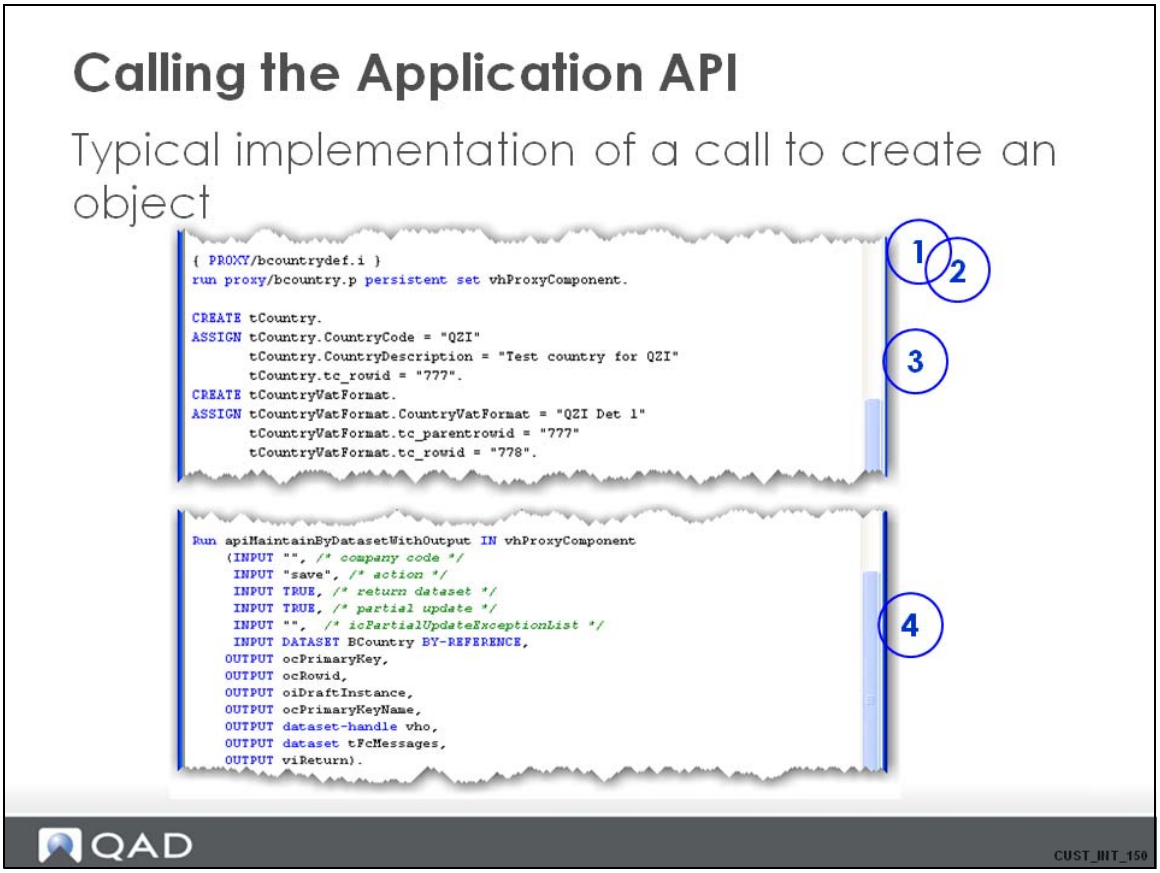
Calling the Application API 10



Calling the Application API 11



Calling the Application API 12



Calling the Application API 13

Calling the Application API

Typical implementation of a call to create an object

```
*/
DATASET tFcmessages:WRITE-XML("file",
                              "C:\develop\work\Integration\foundation\API\Output\whEx
                              true,
                              ?,
                              ?,
                              FALSE,
                              NO).

IF VALID-HANDLE(vh0) THEN
    vh0:WRITE-XML("file","C:\develop\work\Integration\foundation\api\Output\vh0.x
```

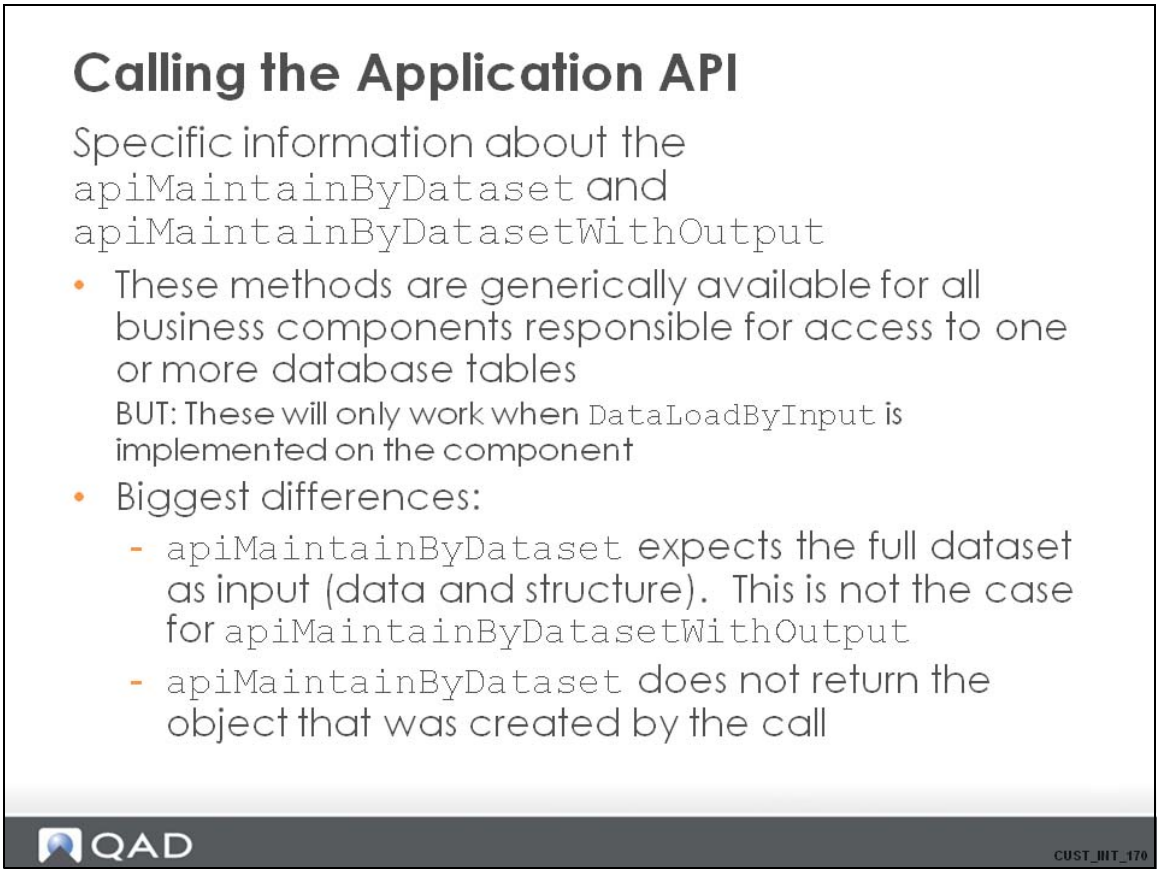
5

6

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Calling the Application API 14



Calling the Application API 15

