QAD Enterprise Applications
Enterprise Edition

Training Guide

Customization

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QAD 2012 Enterprise Edition
August 2012

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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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Change Summary

The following table summarizes significant differences between this document and the last published version.

Date/Version	Description	Reference
August 2012/2012EE	Numerous editorial changes	---
November 2012/2010EE	Initial version. No changes.	---

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: Backend

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 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/

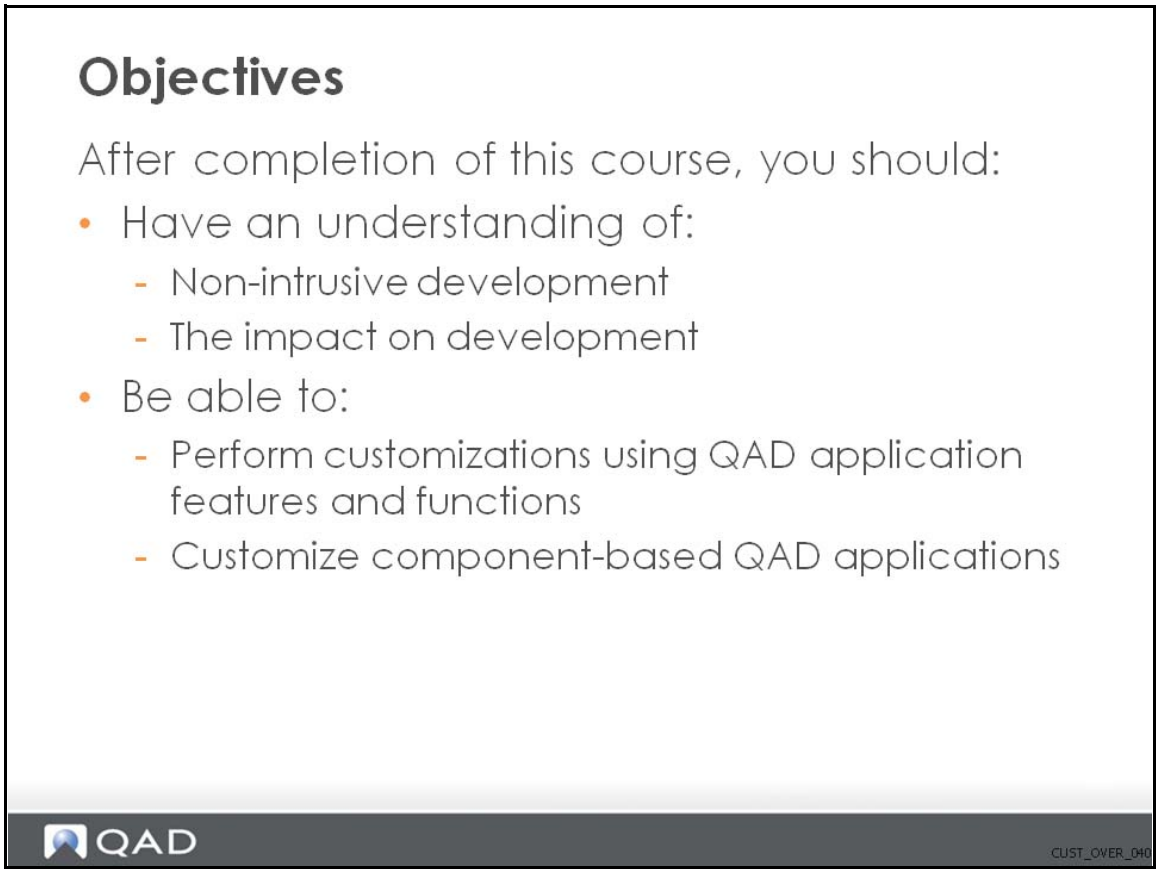
Chapter 1

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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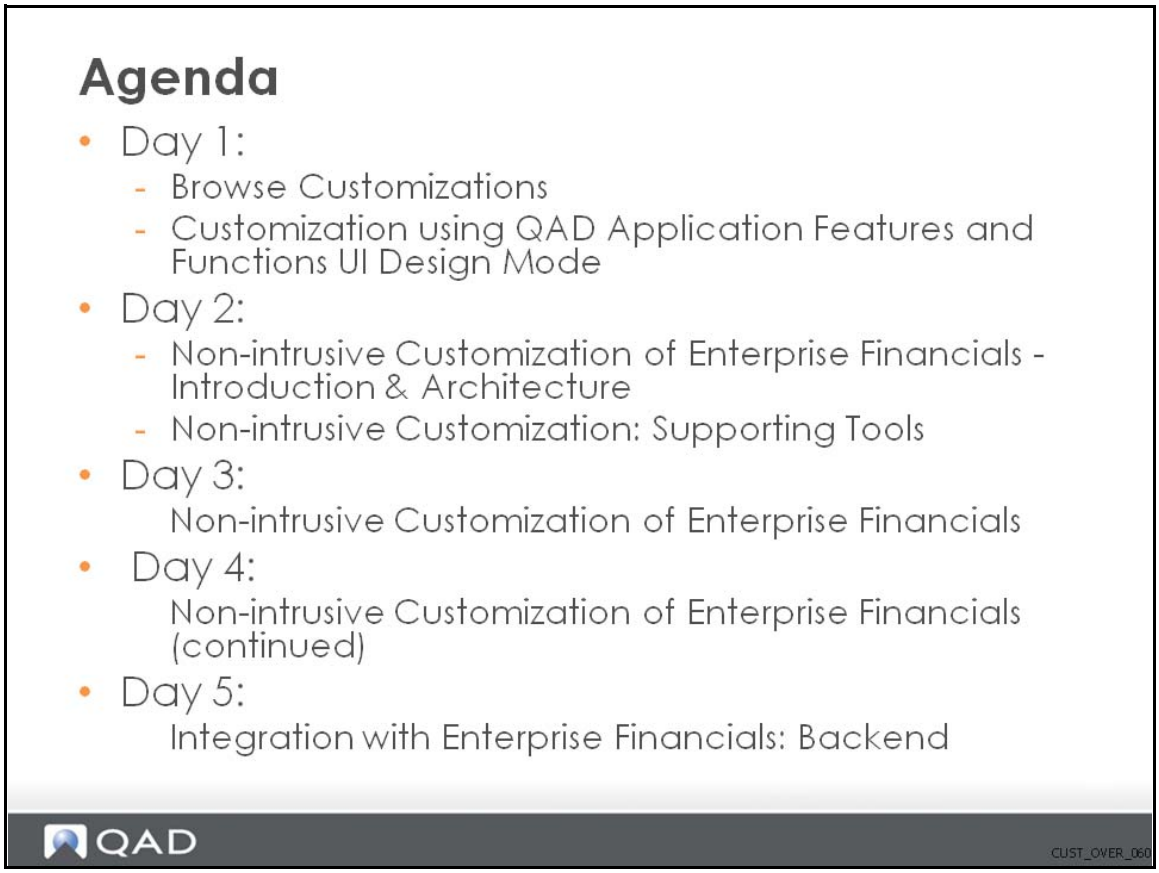
Daily Schedule

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: Backend
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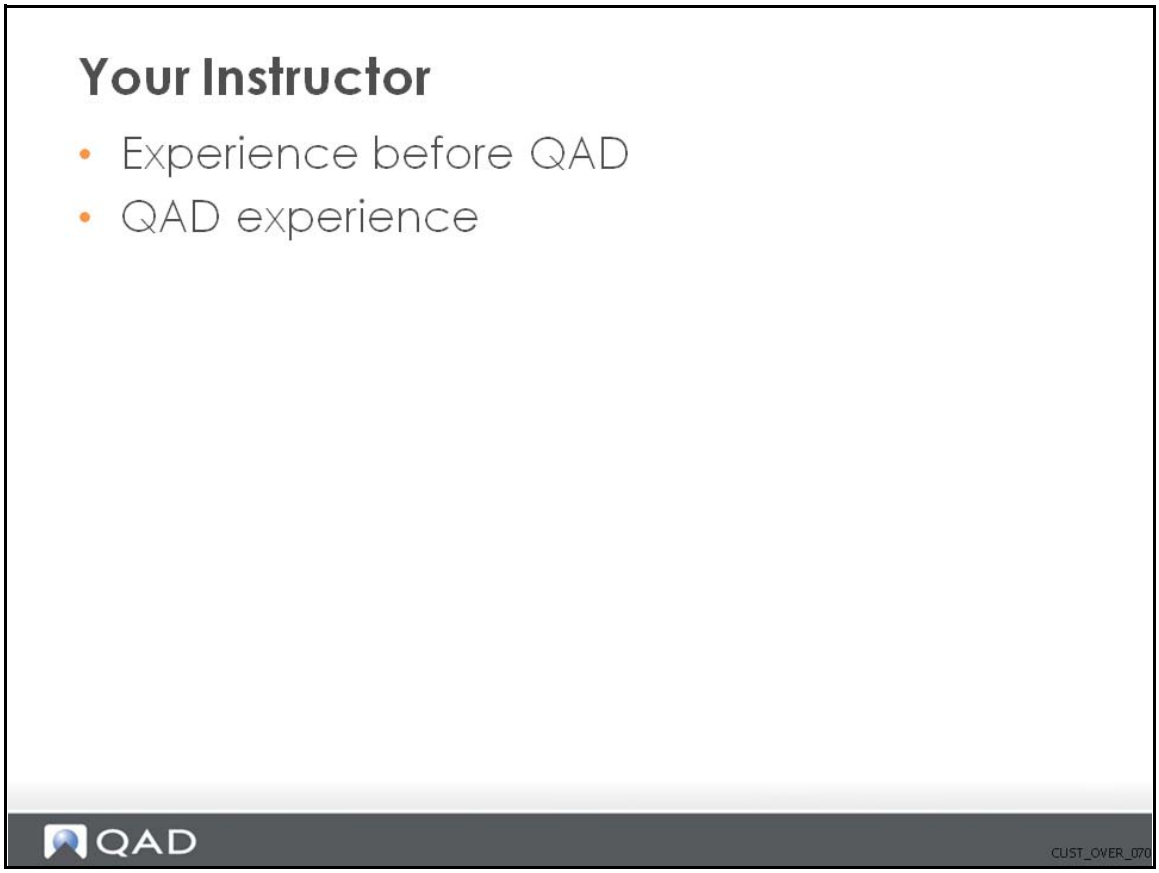
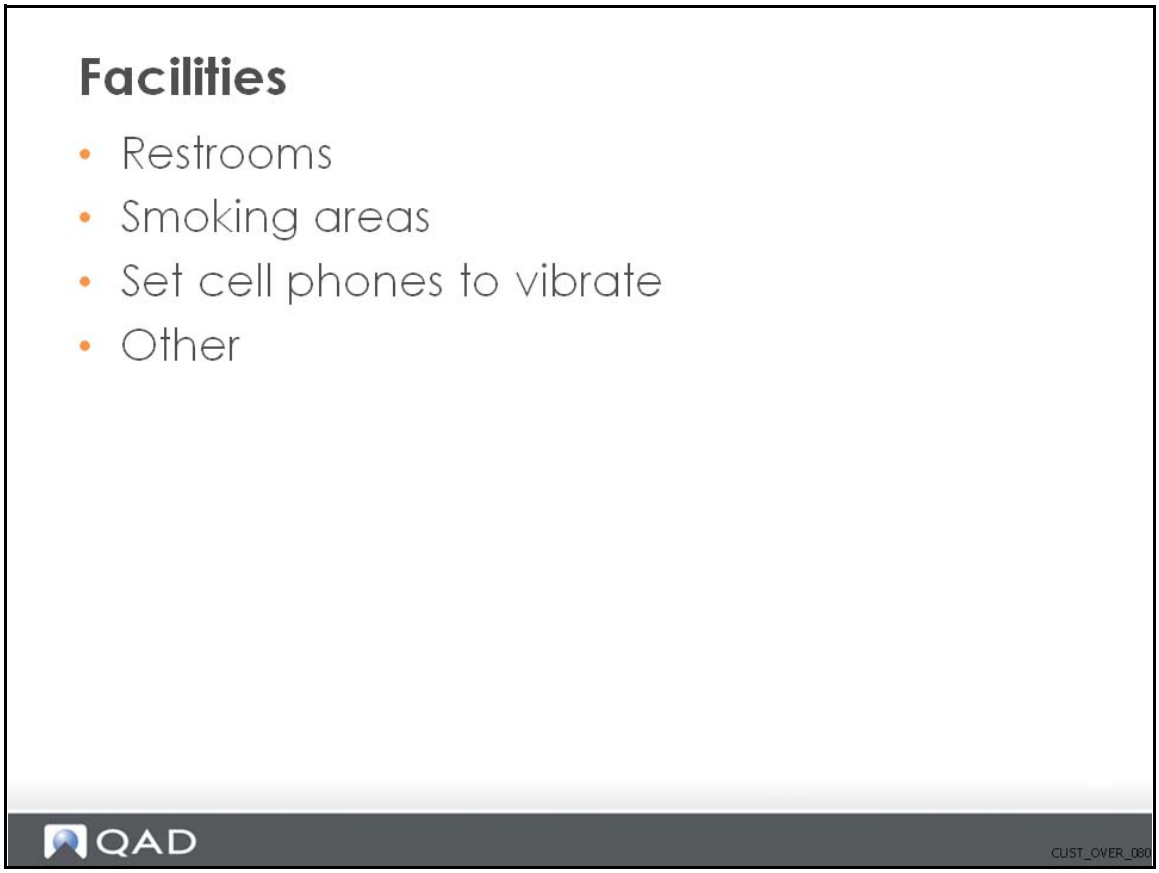
Your Instructor



Facilities


Facilities
Restrooms
Smoking areas
Set cell phones to vibrate
Other
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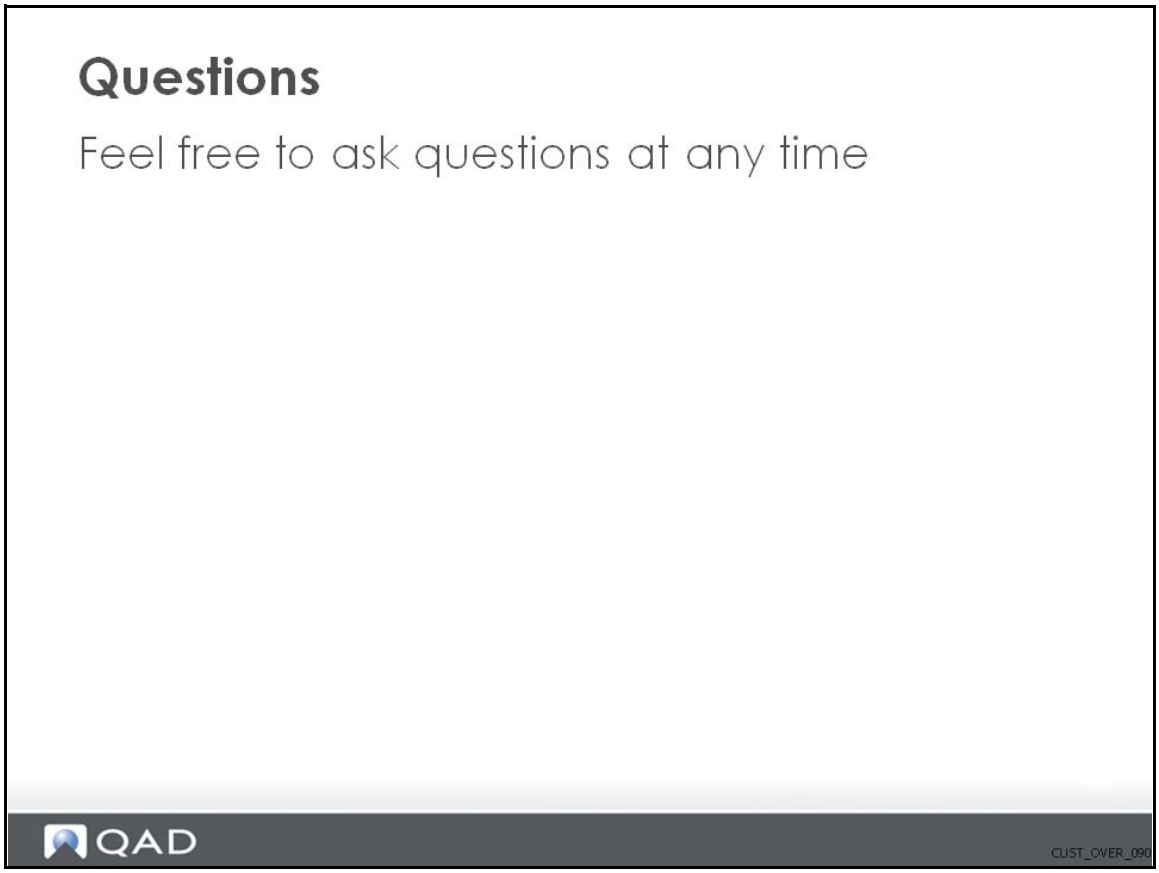
CUST_OVER_080

Questions


Questions
Feel free to ask questions at any time
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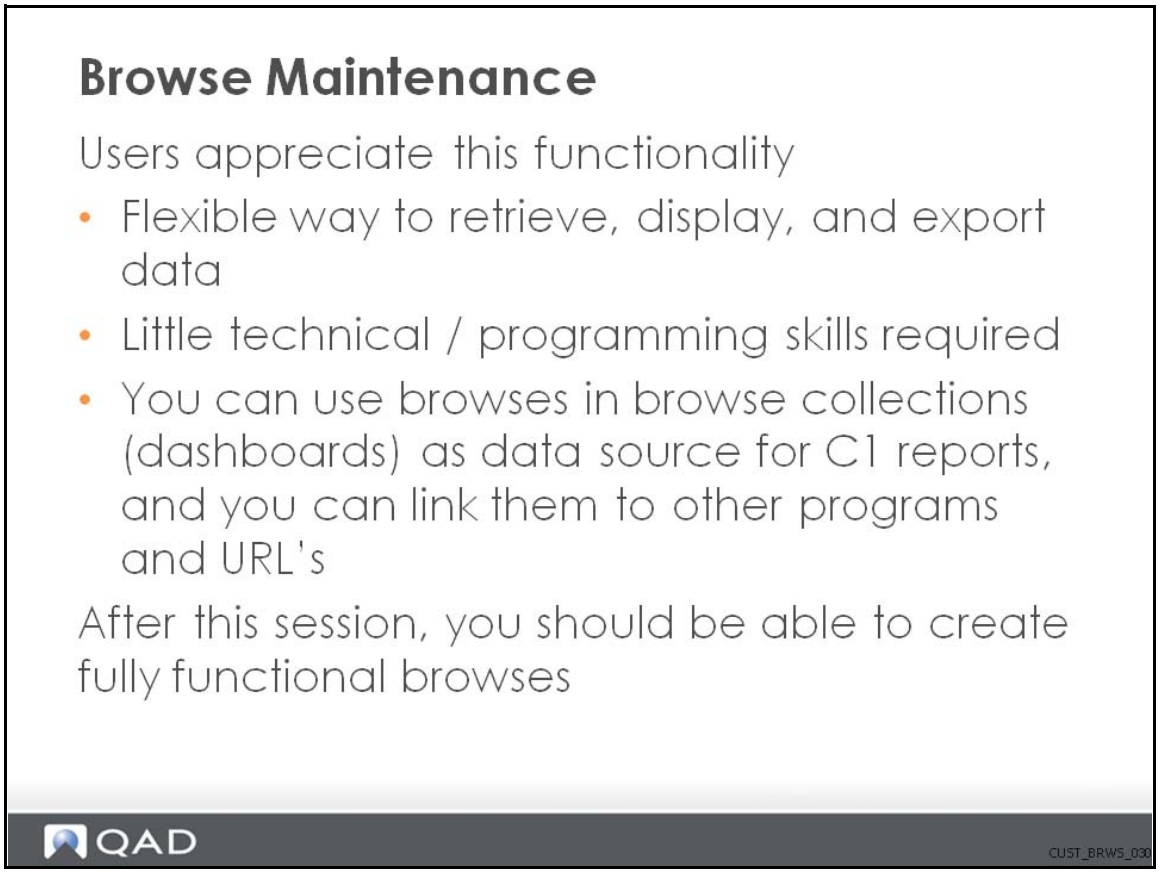
Chapter 2

Browse Customizations

Browse Customizations

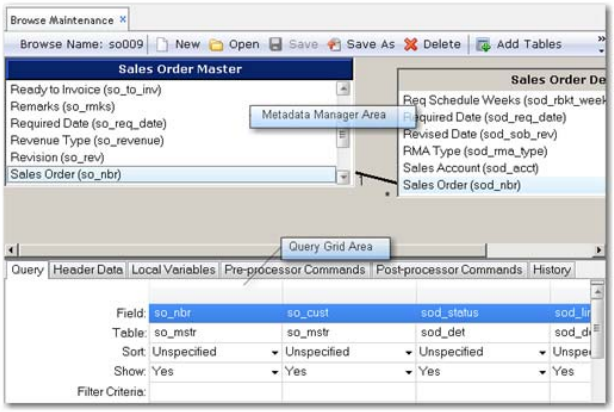
Browse Maintenance



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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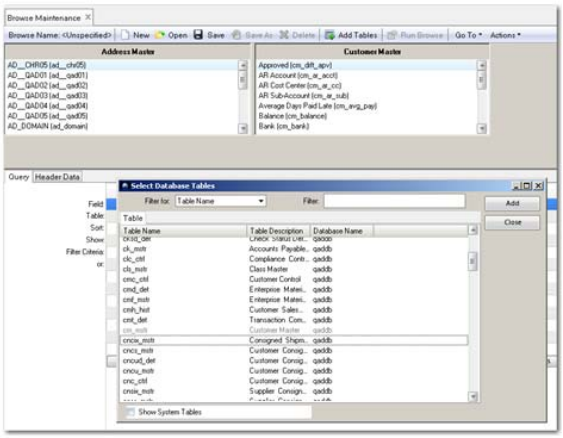
Creating a Browse

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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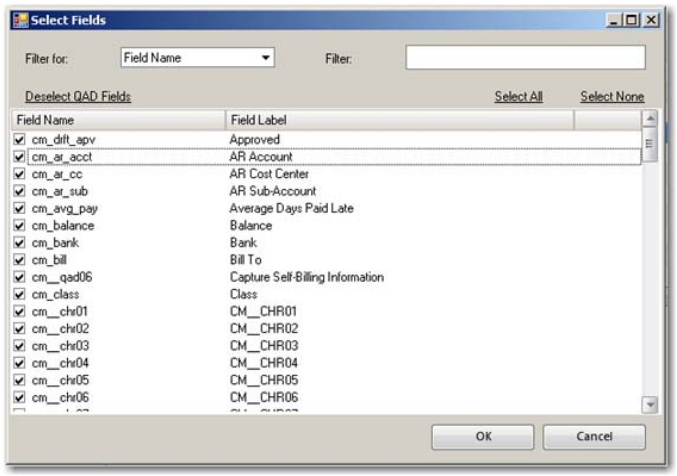
Selecting Fields

Selecting Fields

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



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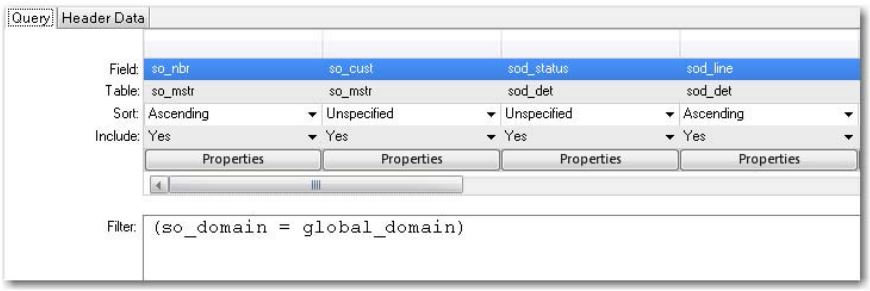
Using the Query Tab

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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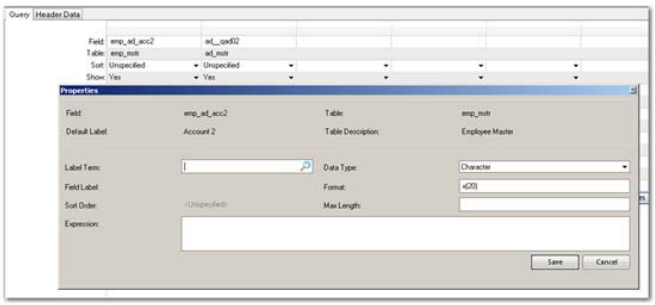
Field Properties

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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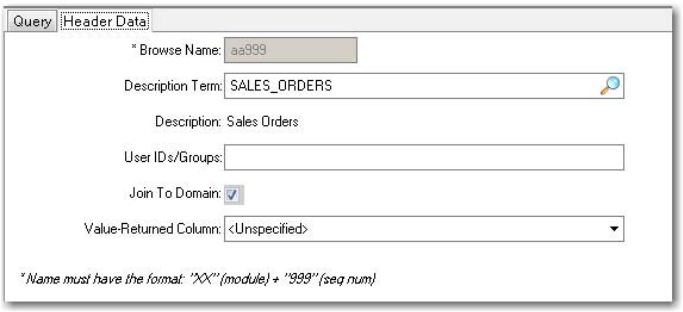
Header Data Tab

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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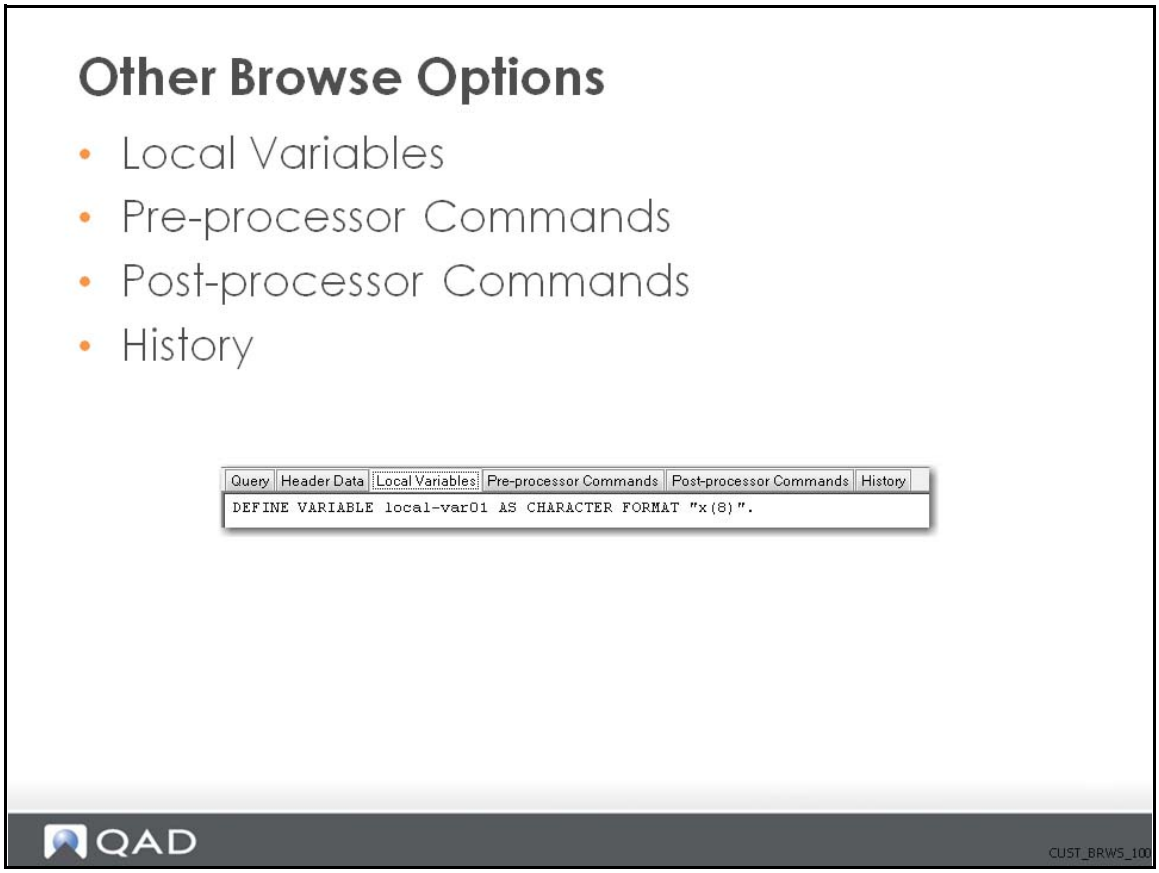
Other Browse Options



Performance Considerations

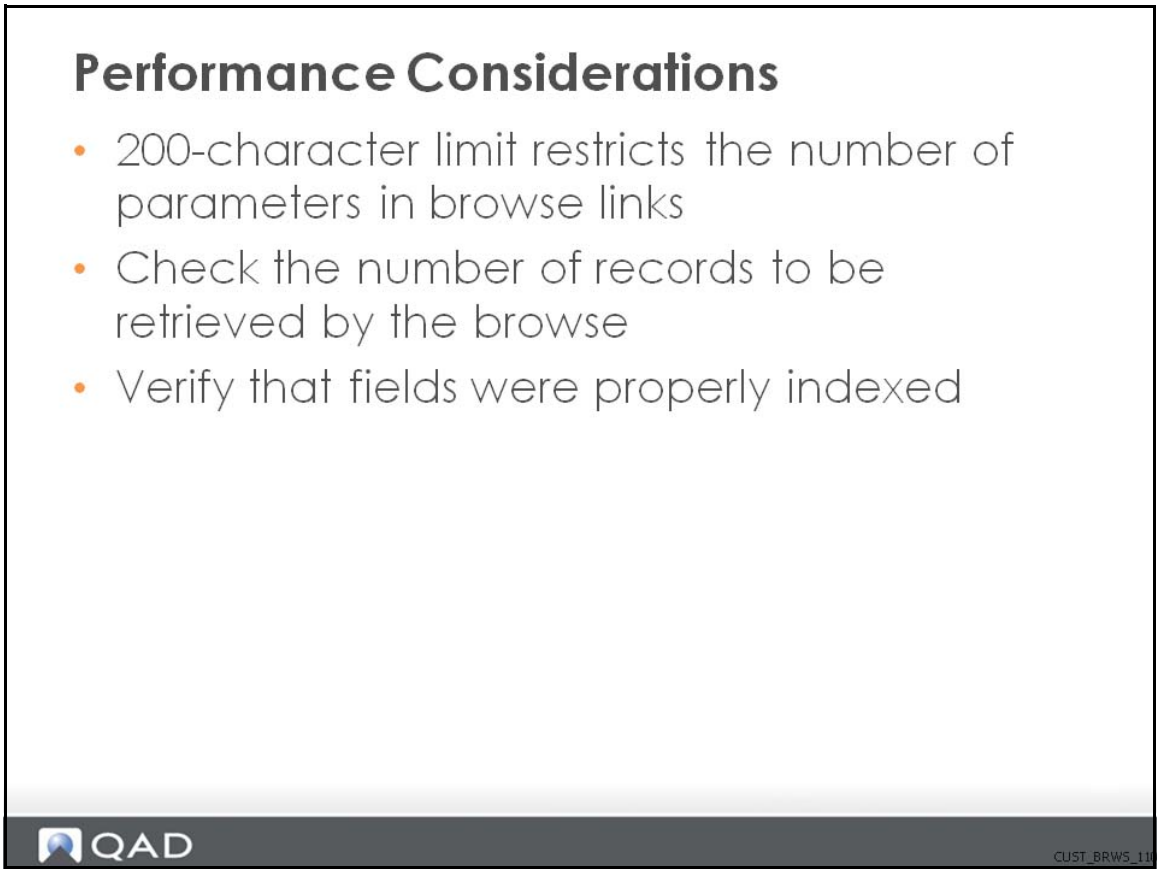
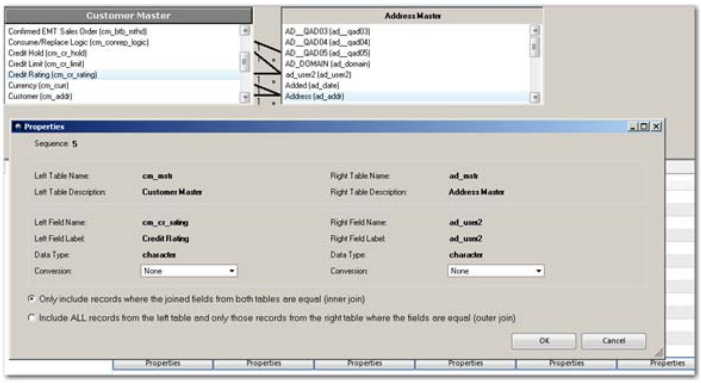


Table Joins

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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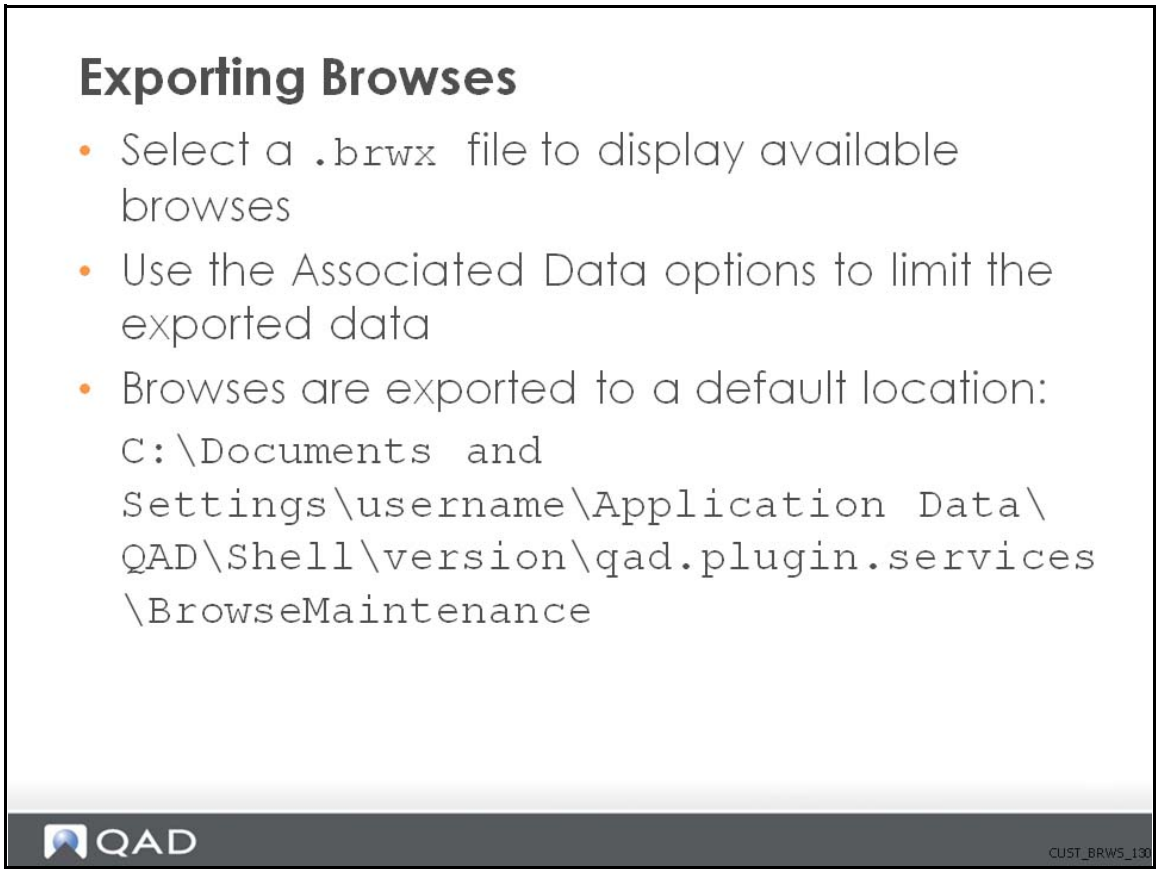
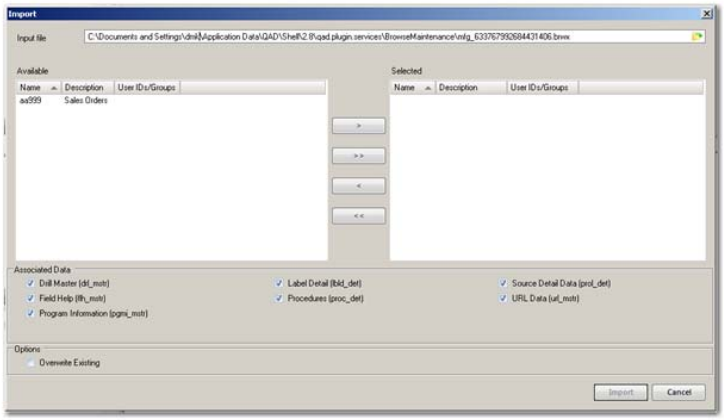
Exporting Browses



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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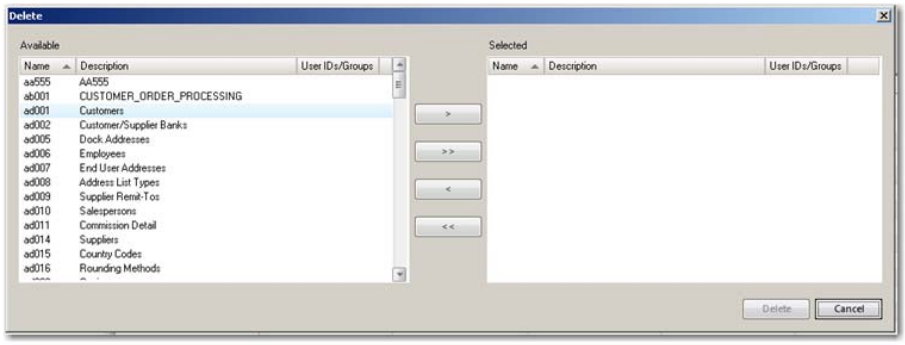
Deleting Multiple Browses

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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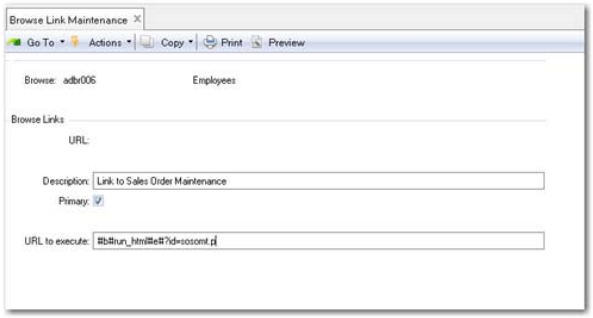
Browse Link Maintenance

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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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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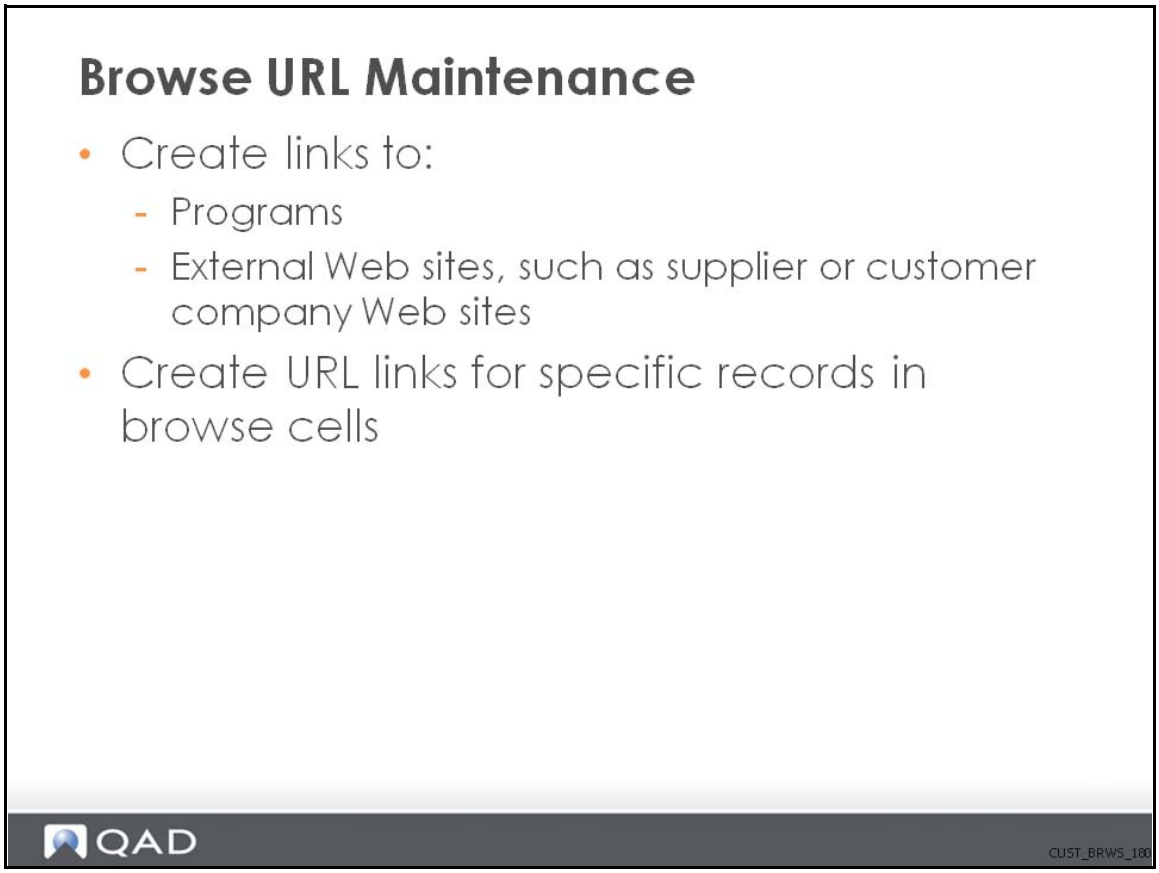
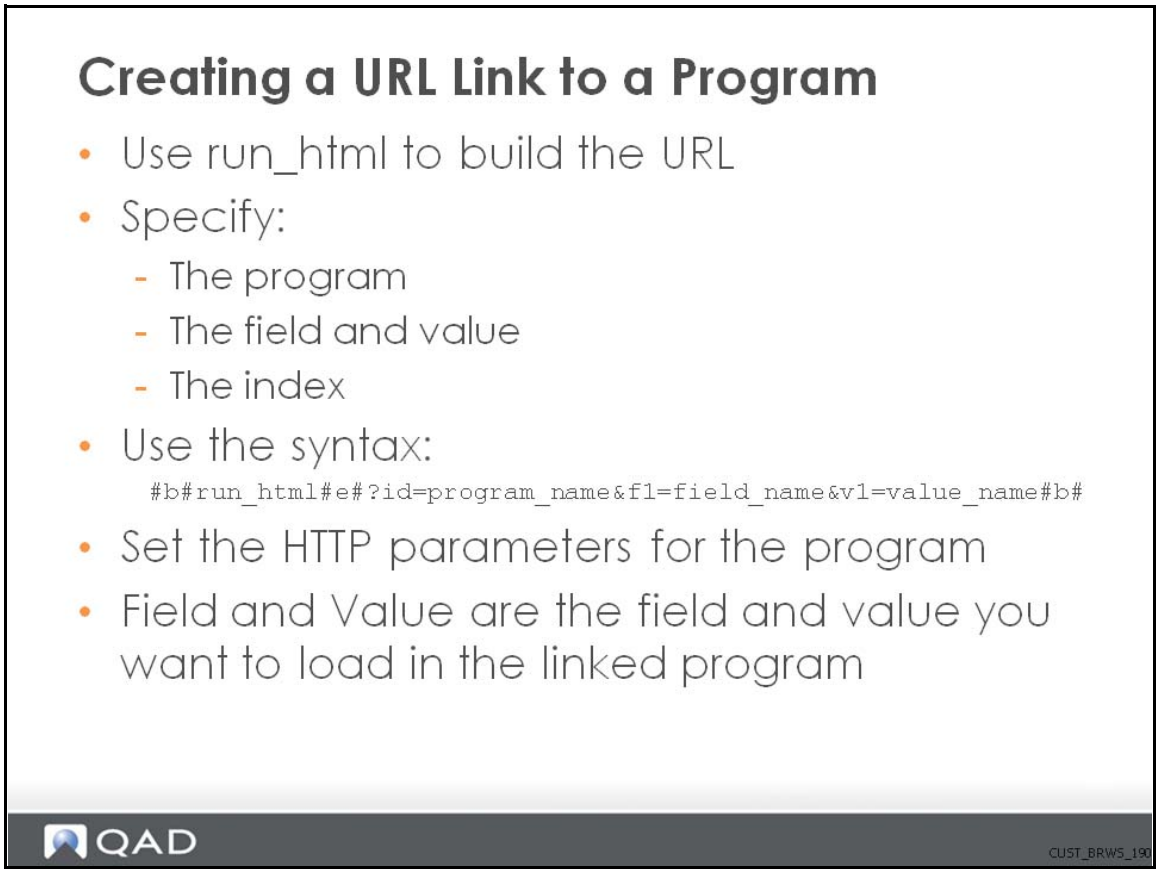
Browse URL Maintenance



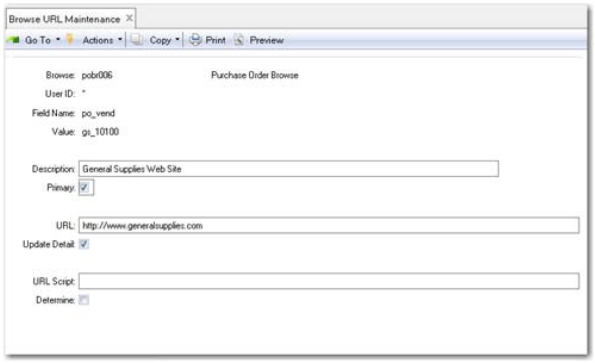
Creating a URL Link to a Program



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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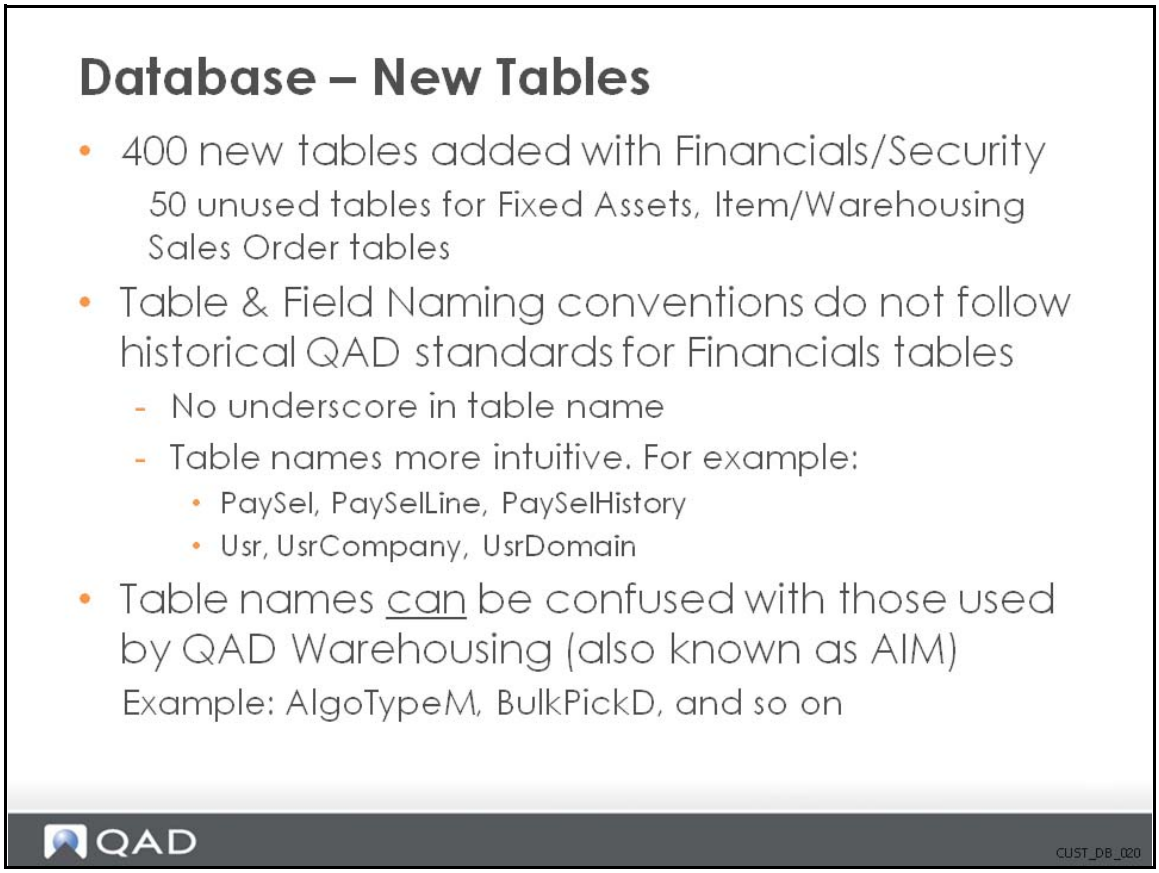
CUST_BRWS_20

Creating a Browse Link to a Web Page 2

Creating a Browse Link to Financials

Enterprise Financials Database Schema

Database - New Tables



Terminology Mapping

Terminology Mapping

Terminology – mapping between logical application term and database table in Financials (special cases only)

	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

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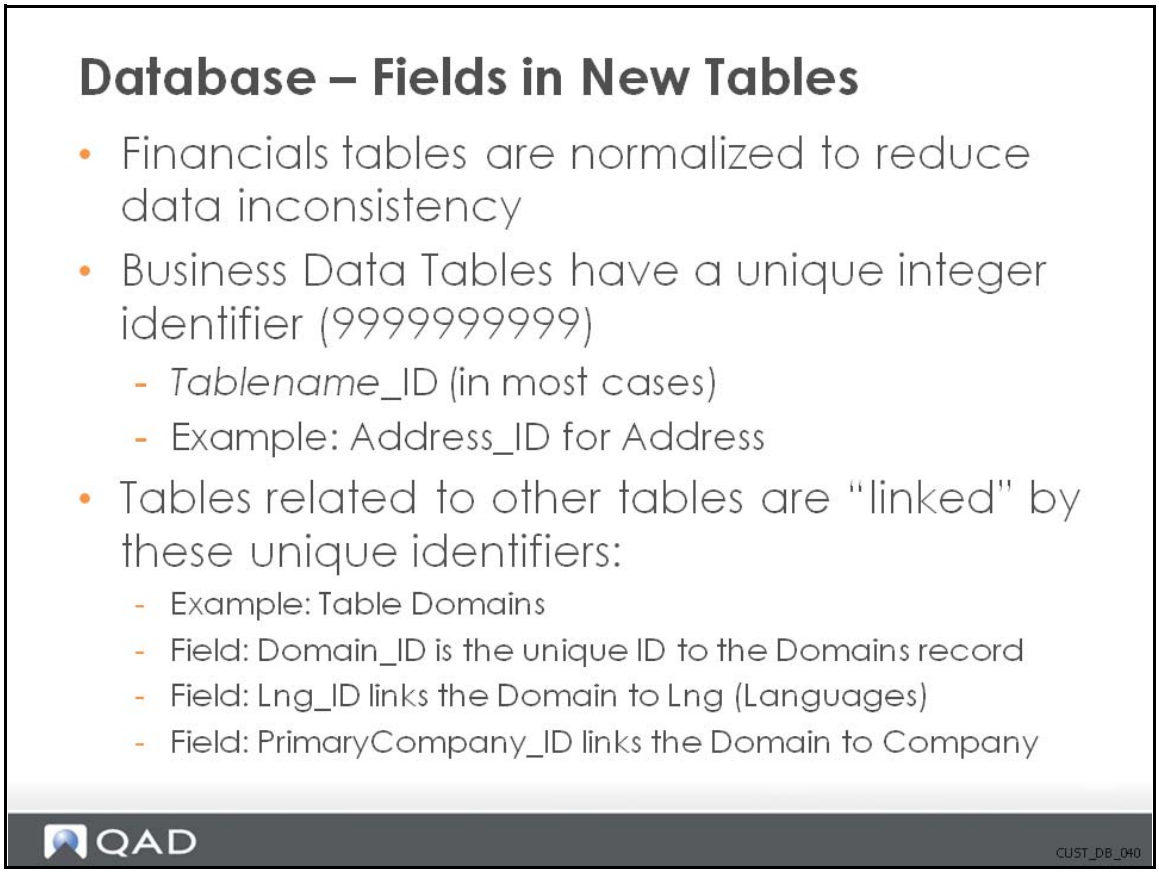
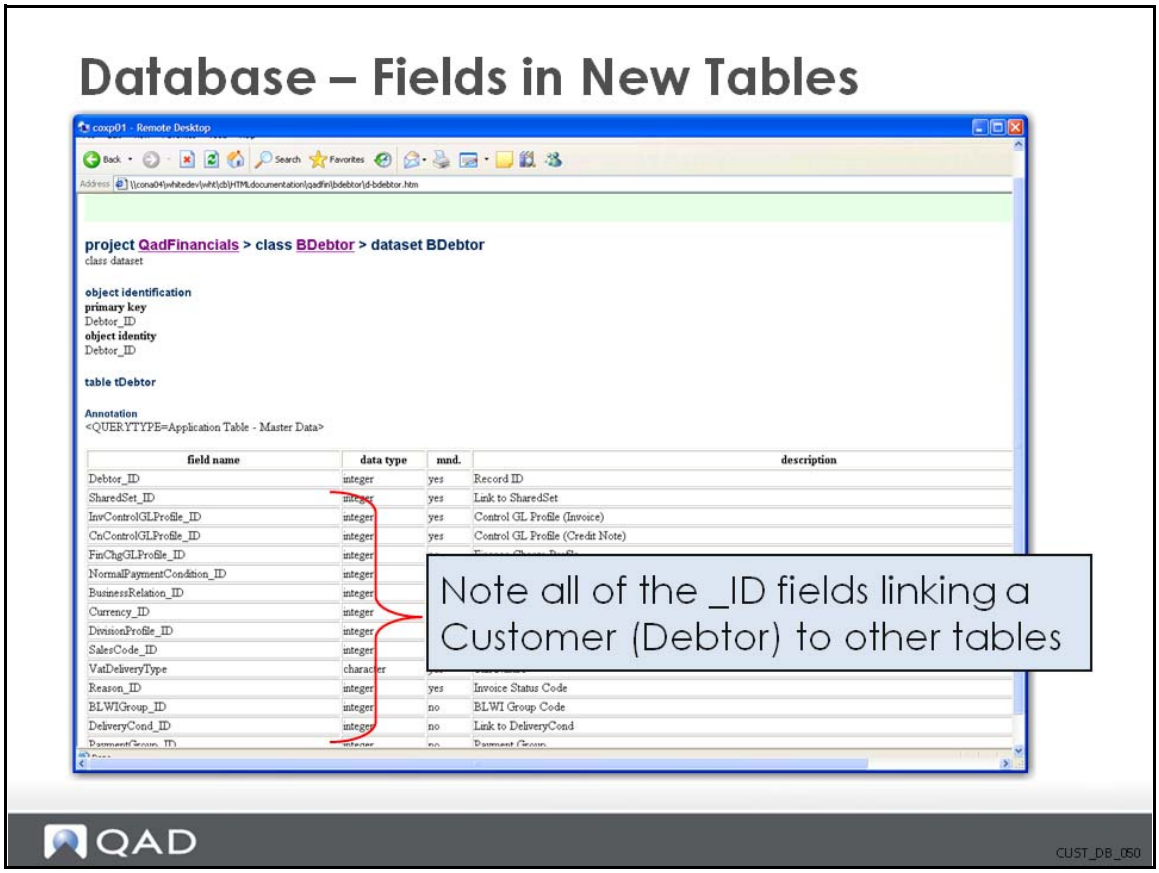
CUST_DB_030

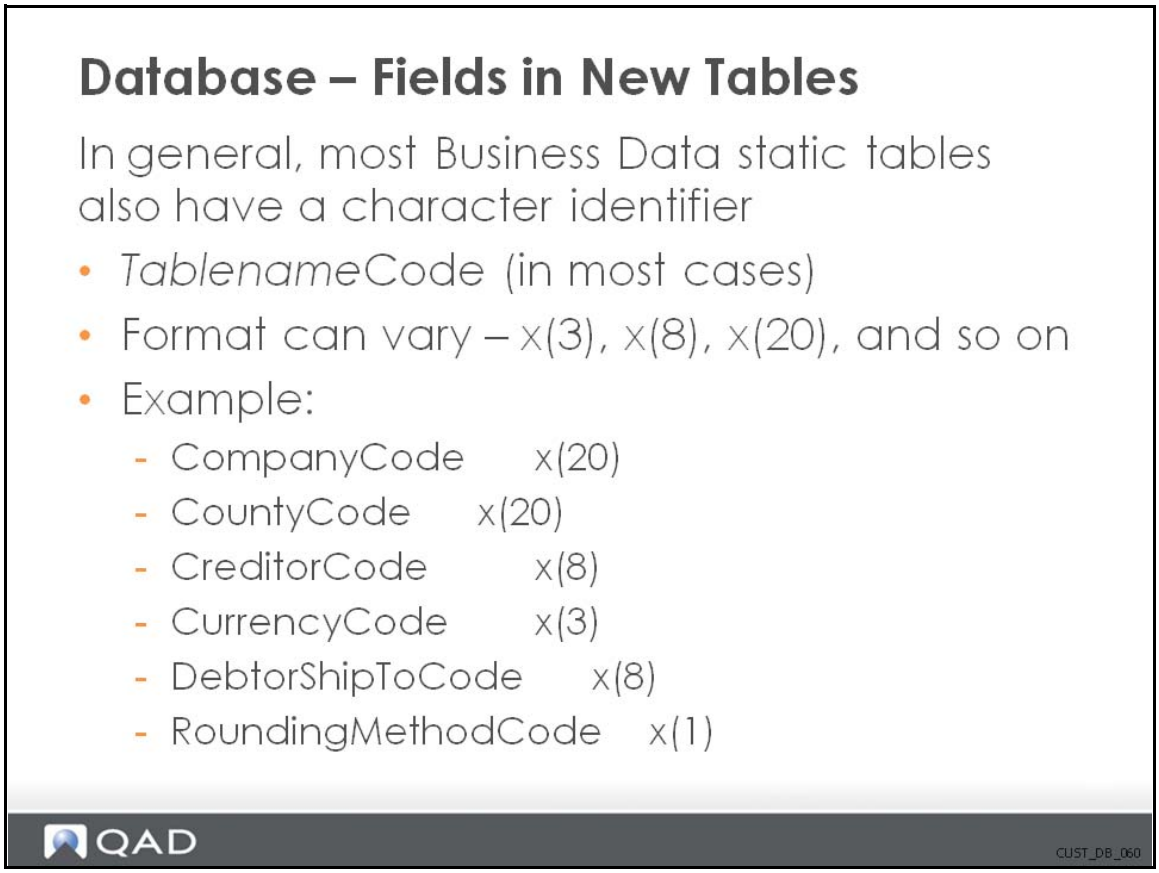
Database - Fields in New Tables



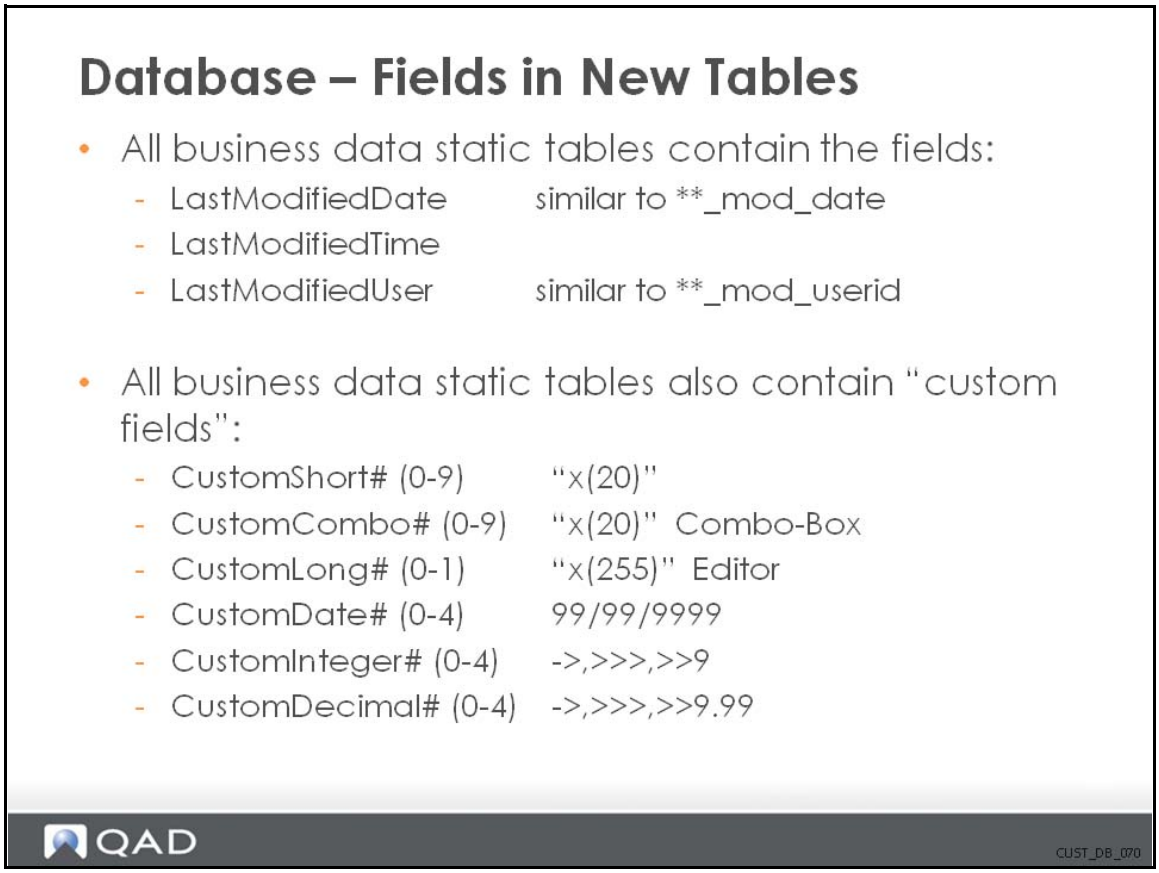
Database - Fields in New Tables 2



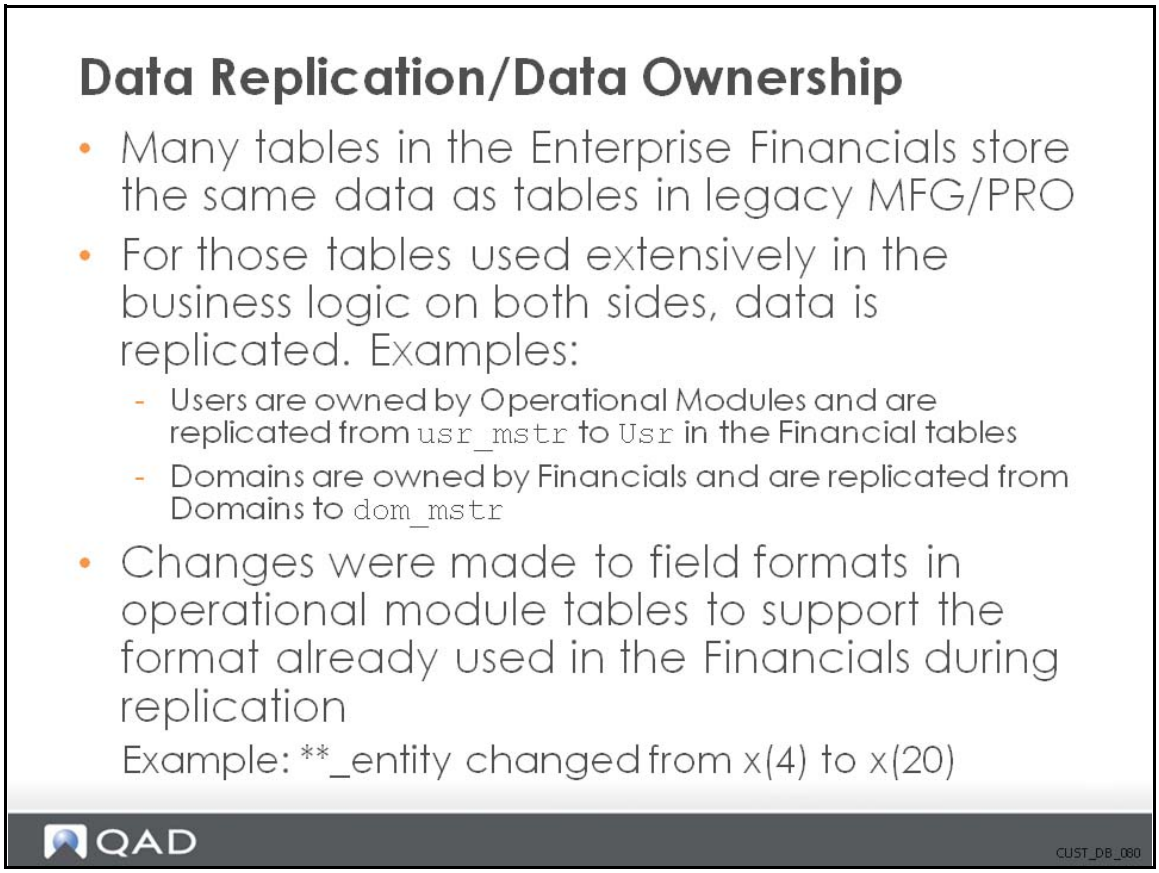
Database - Fields in New Tables 3



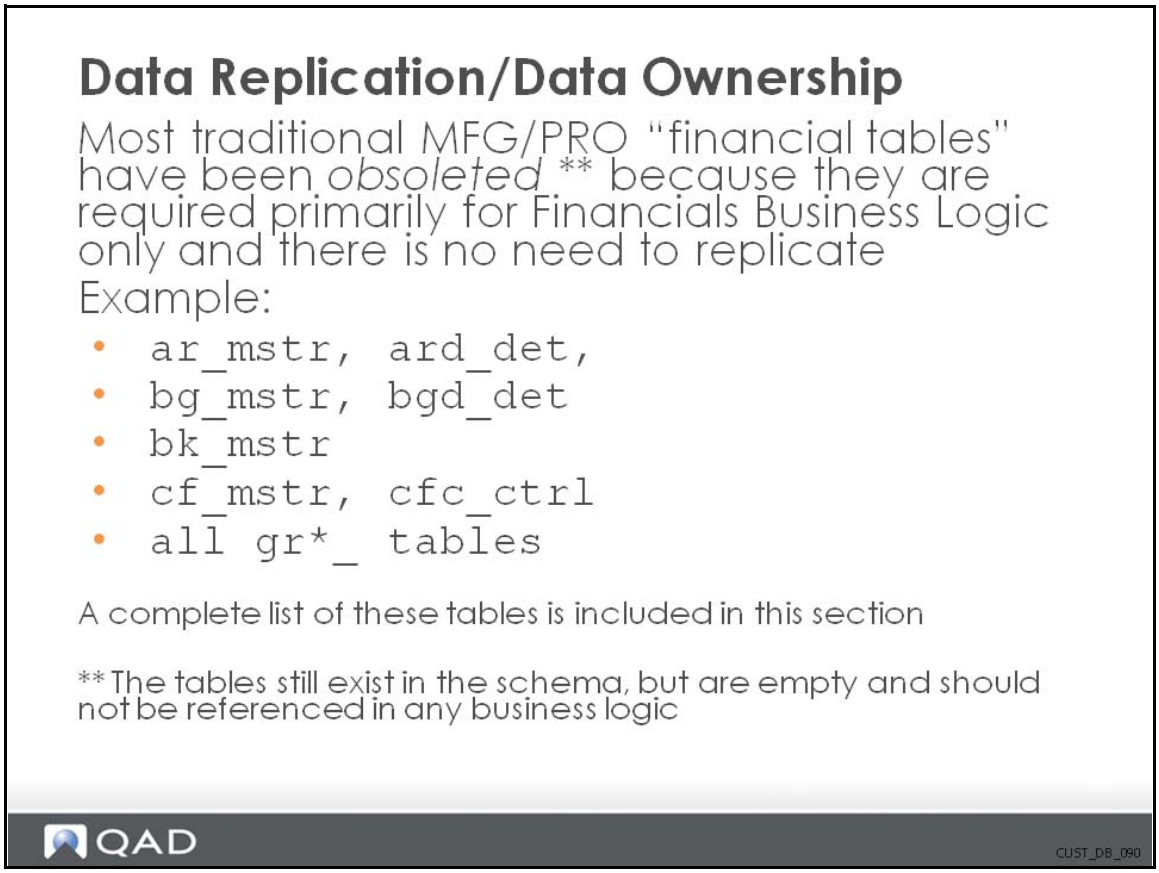
Database - Fields in New Tables 4



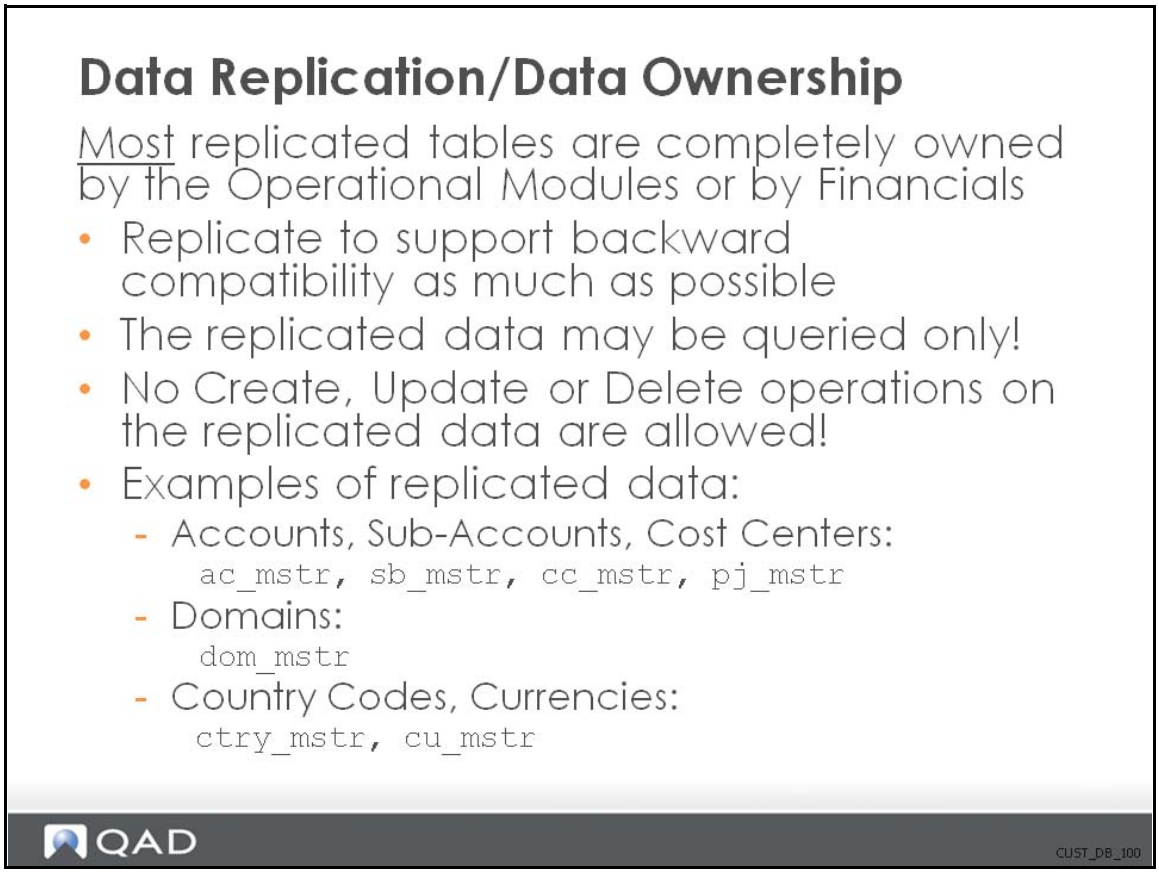
Data Replication/Data Ownership



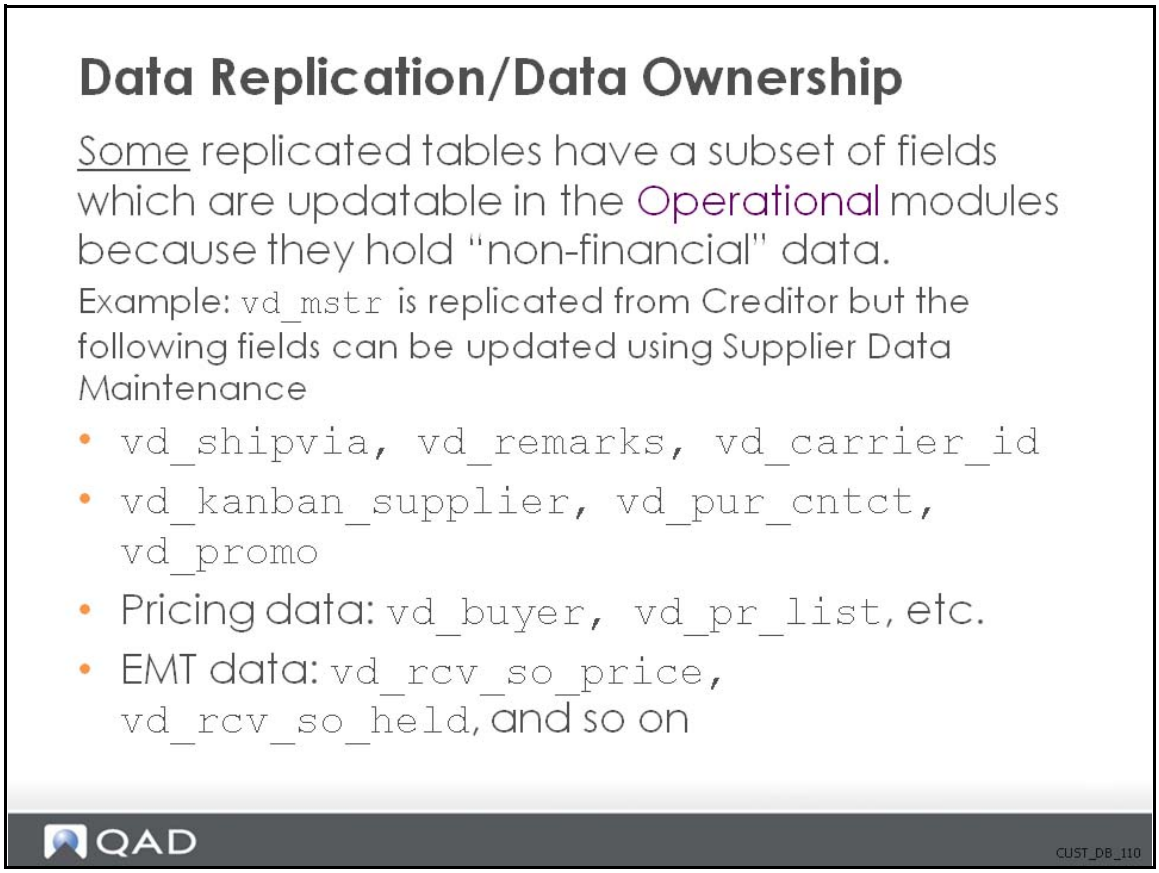
Data Replication/Data Ownership 2



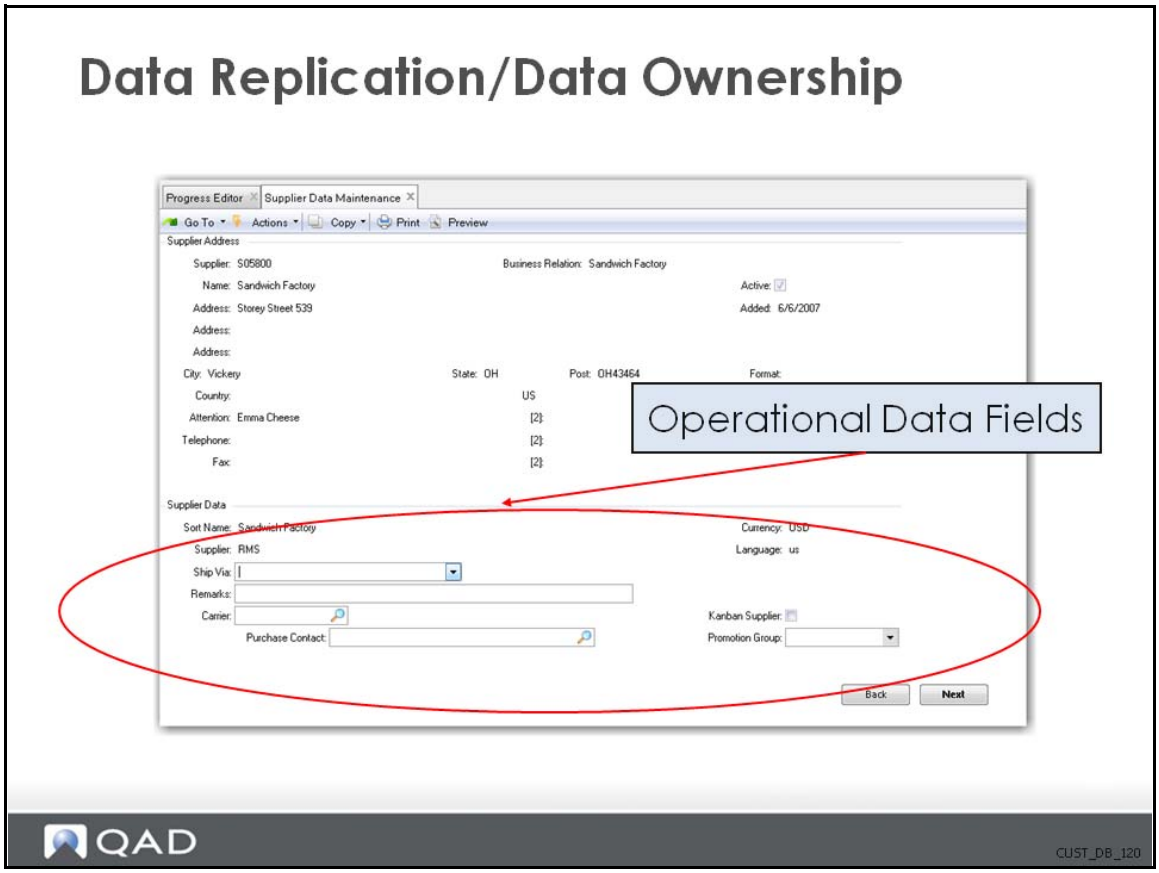
Data Replication/Data Ownership 3



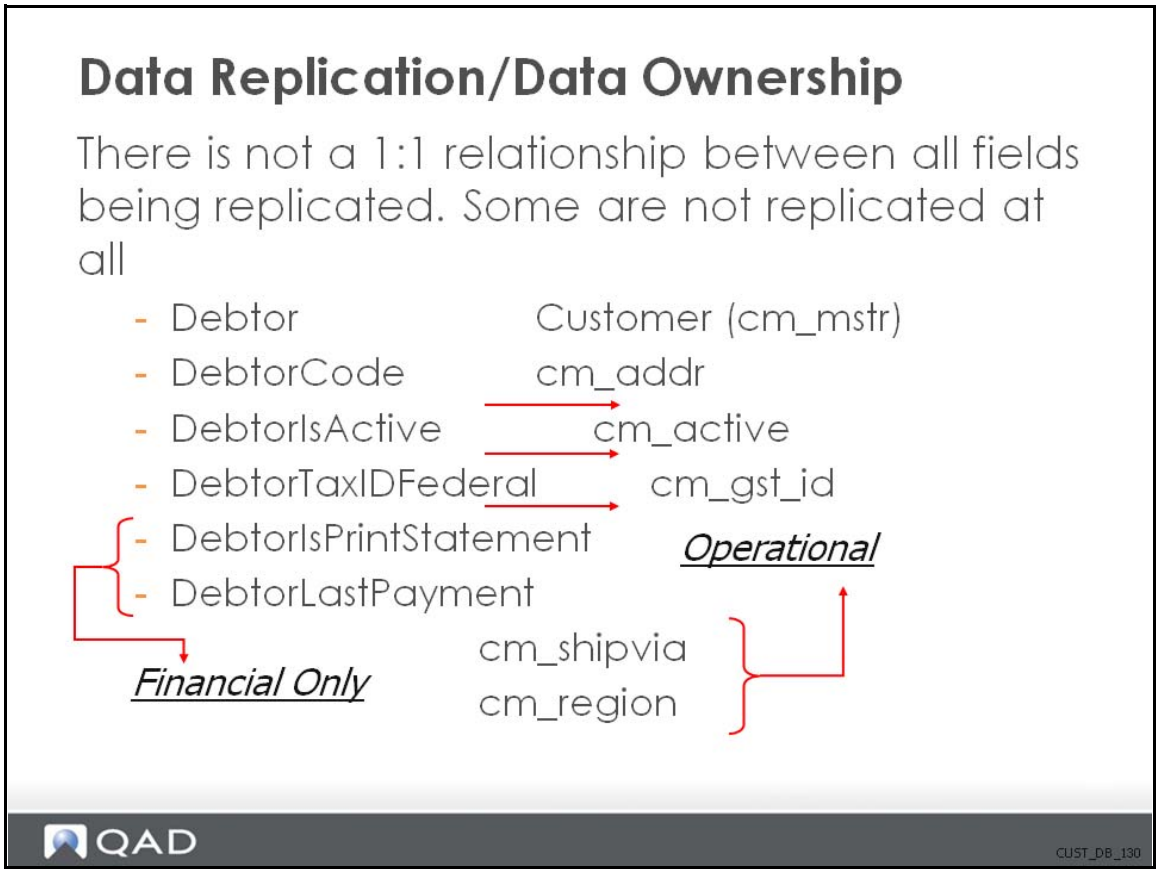
Data Replication/Data Ownership 4



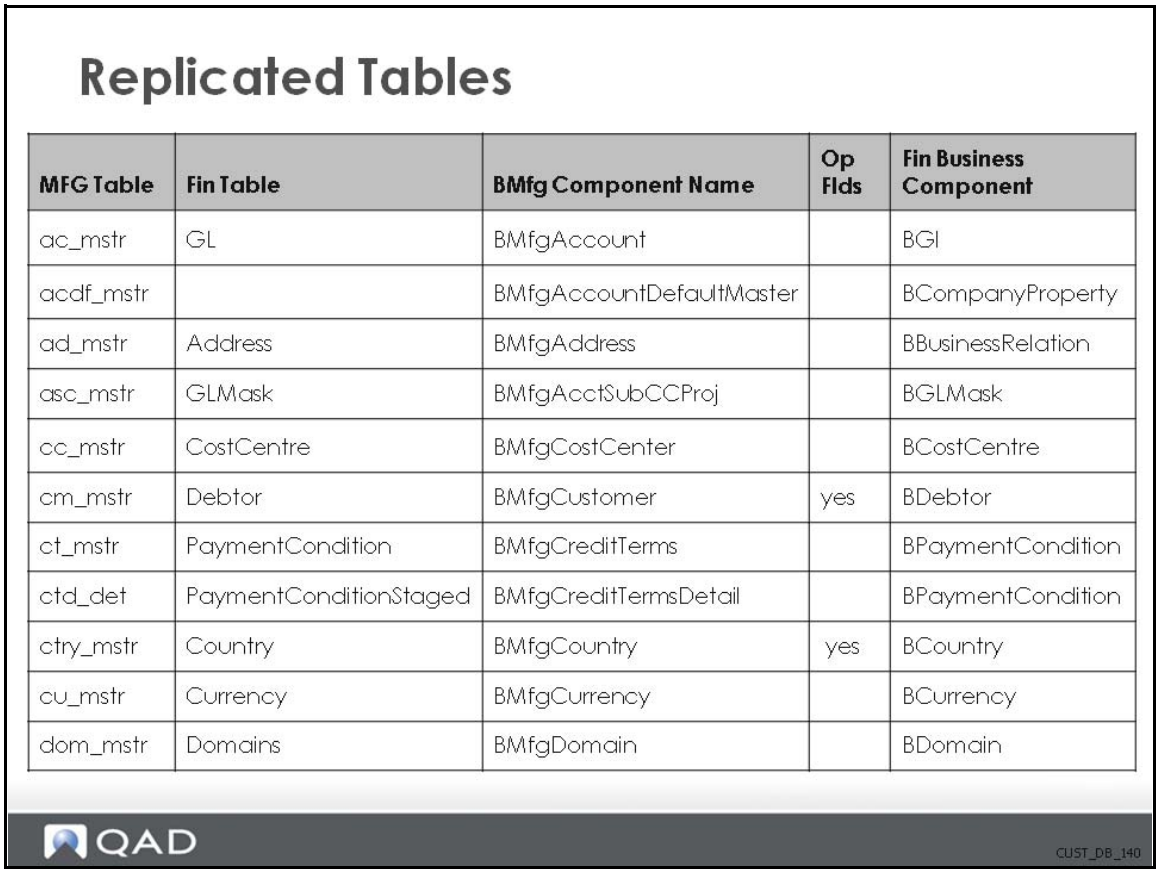
Data Replication/Data Ownership 5



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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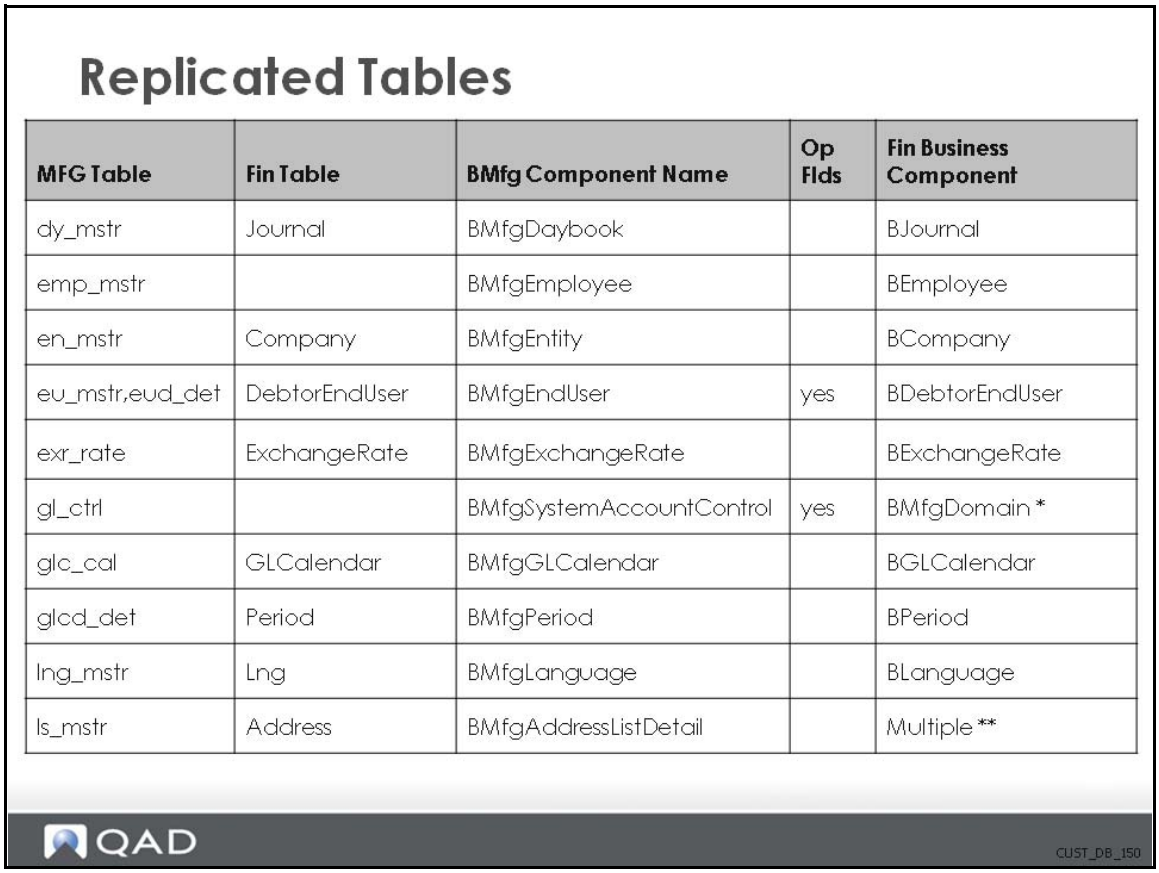
CUST_DB_140

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

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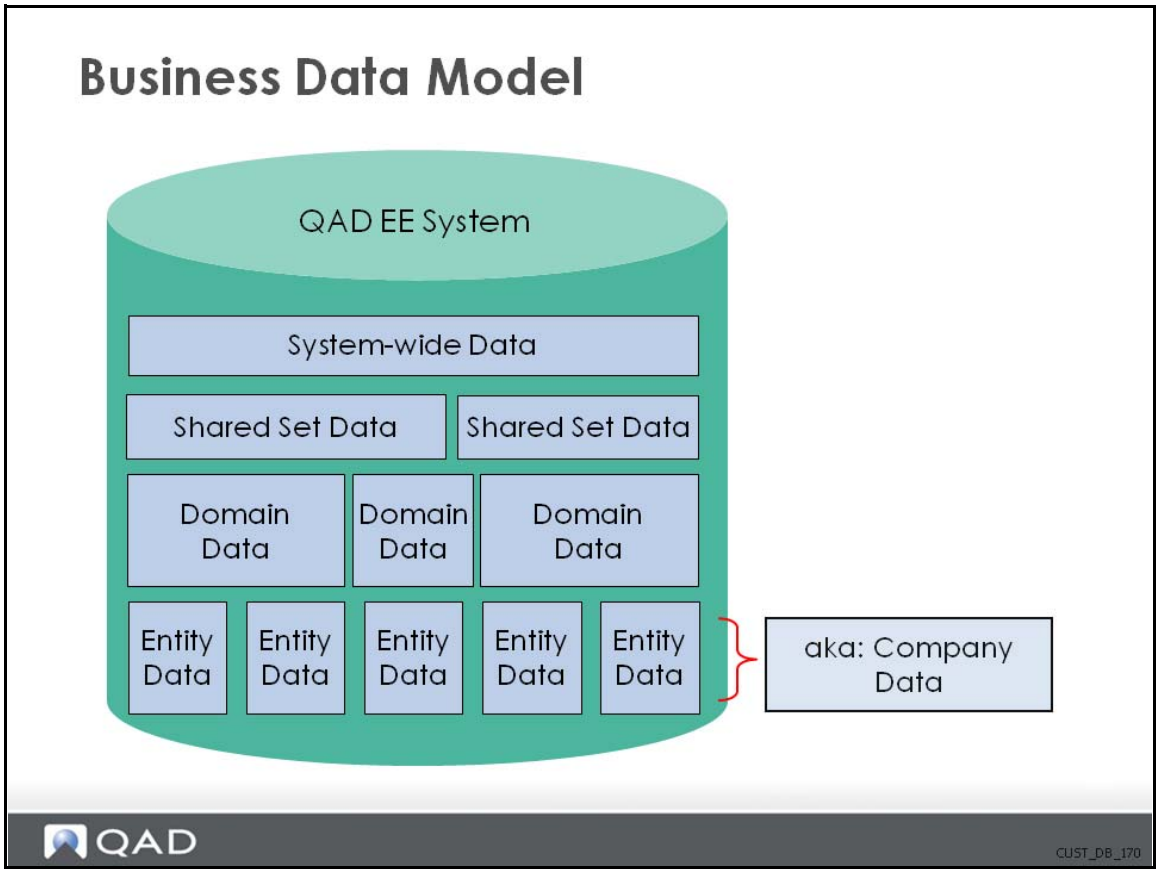
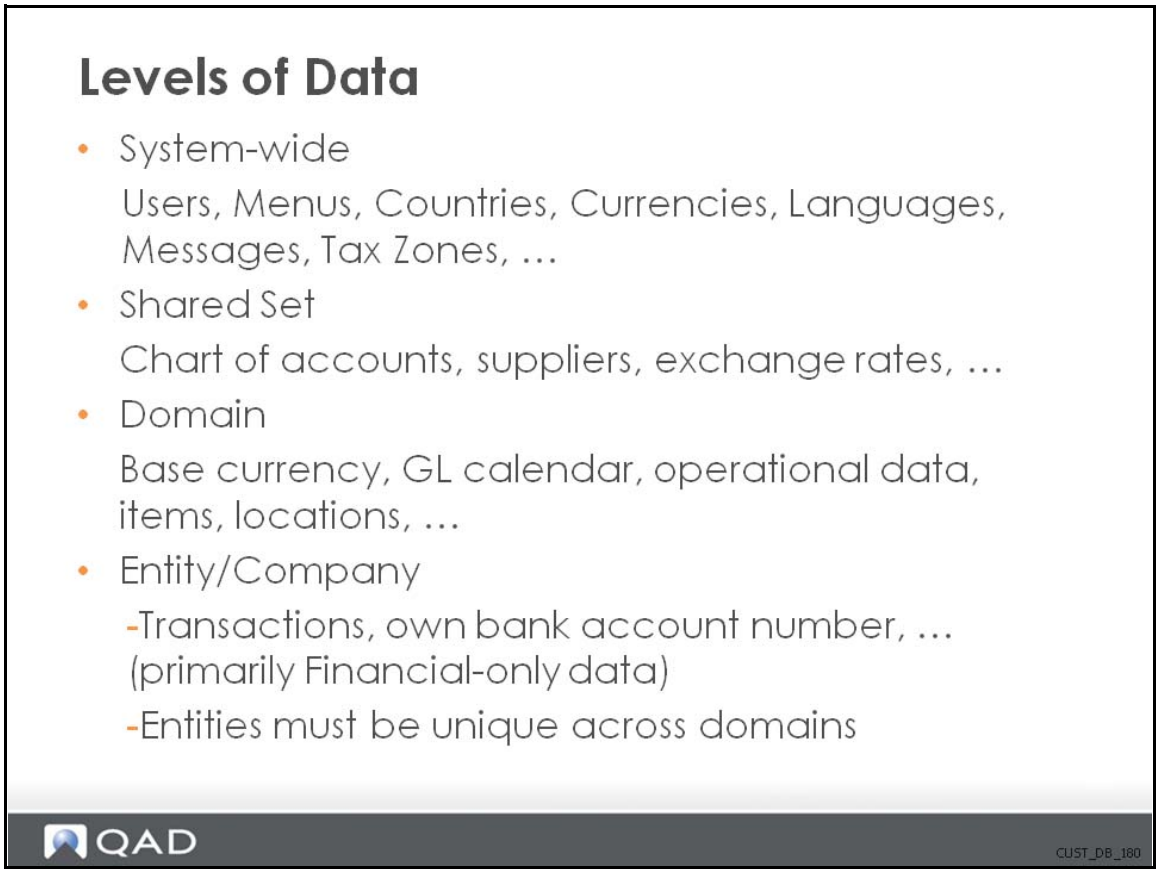
CUST_DB_160

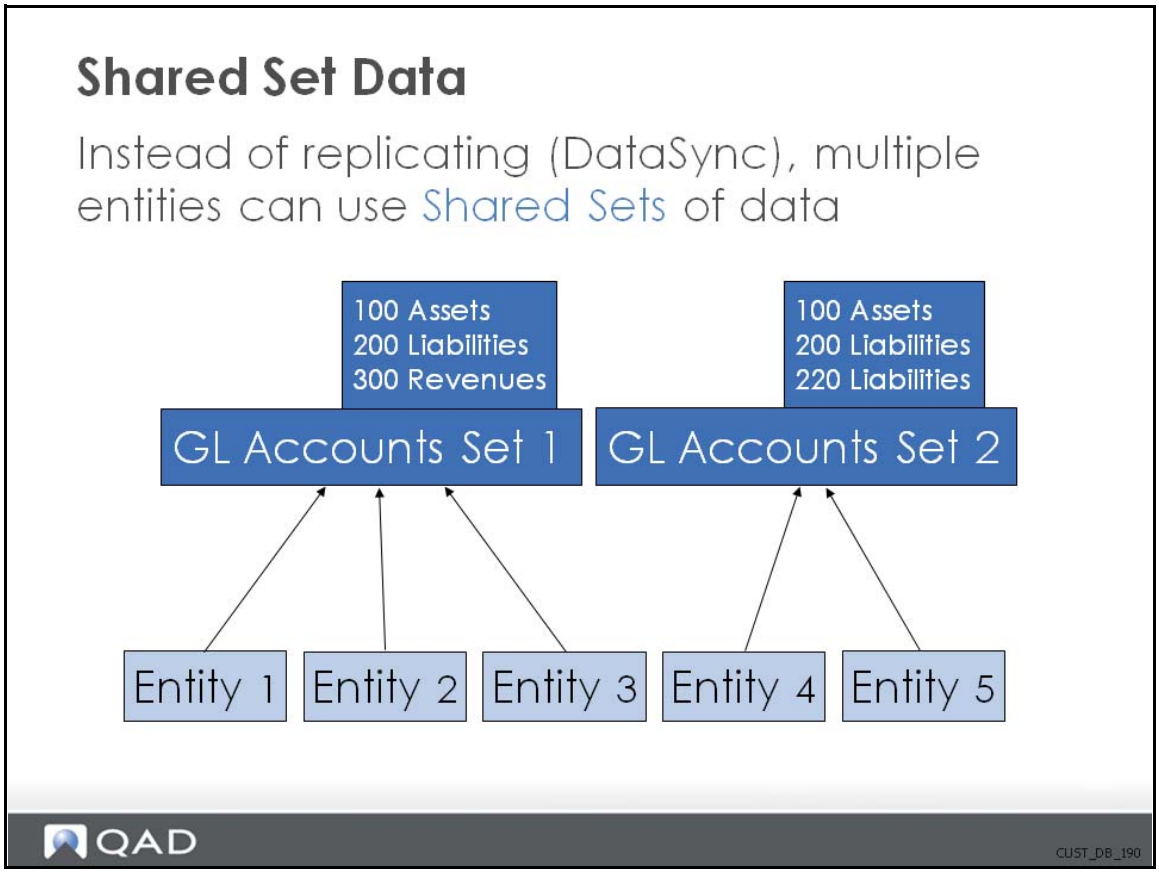
Business Data Model



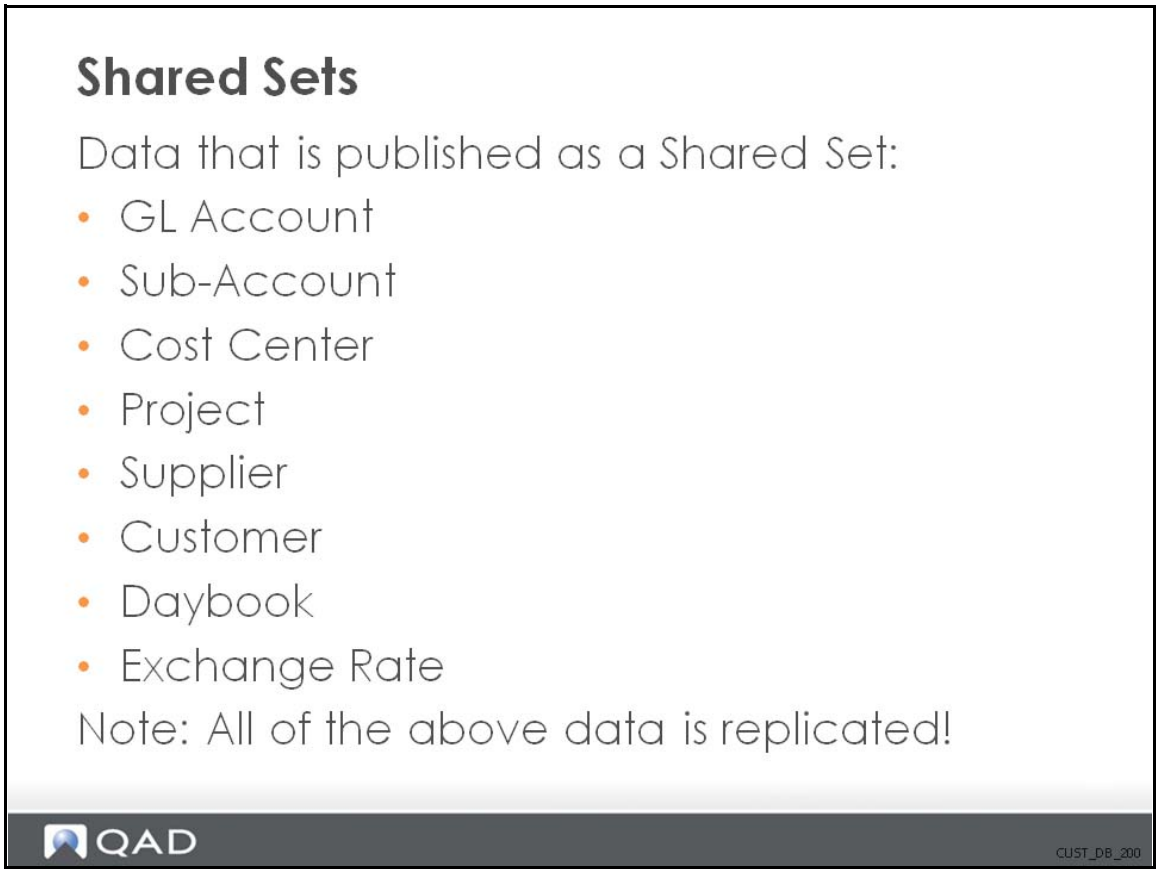
Levels of Data



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!
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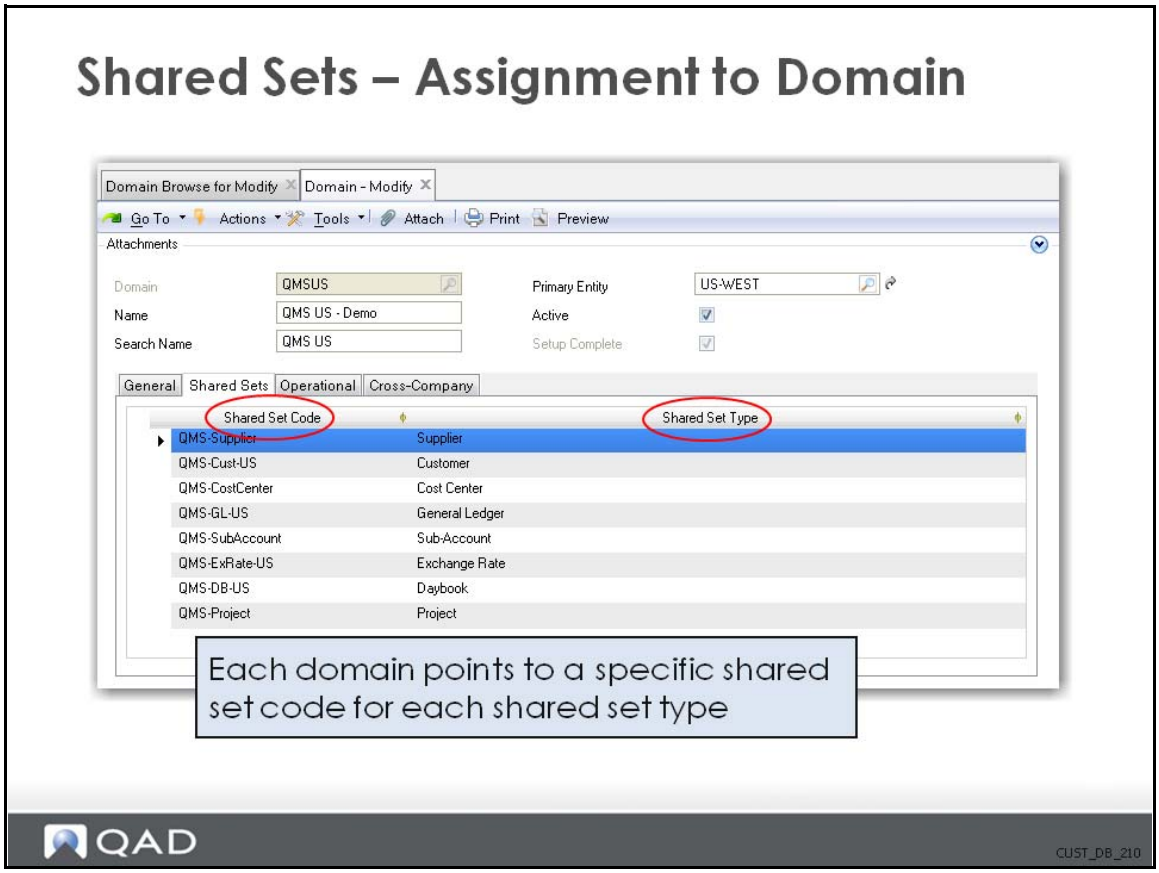
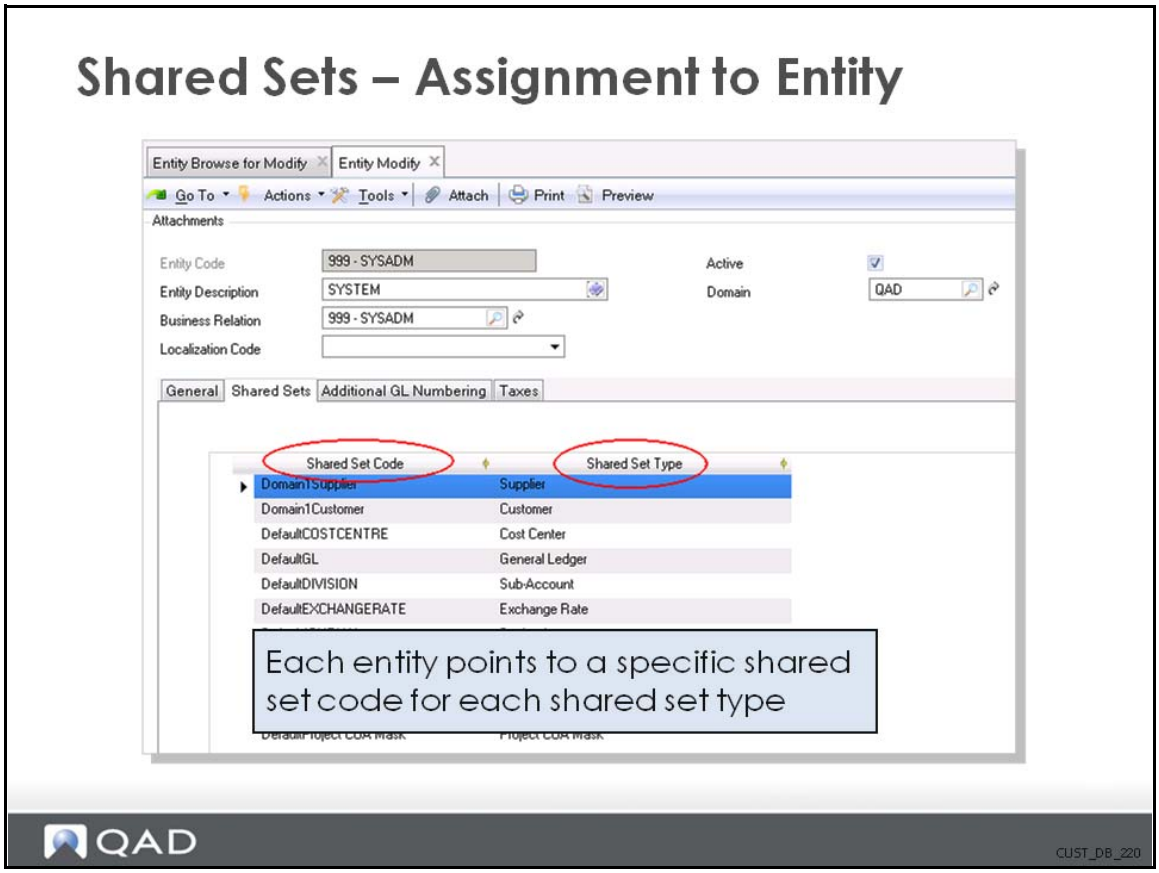
CUST_DB_200

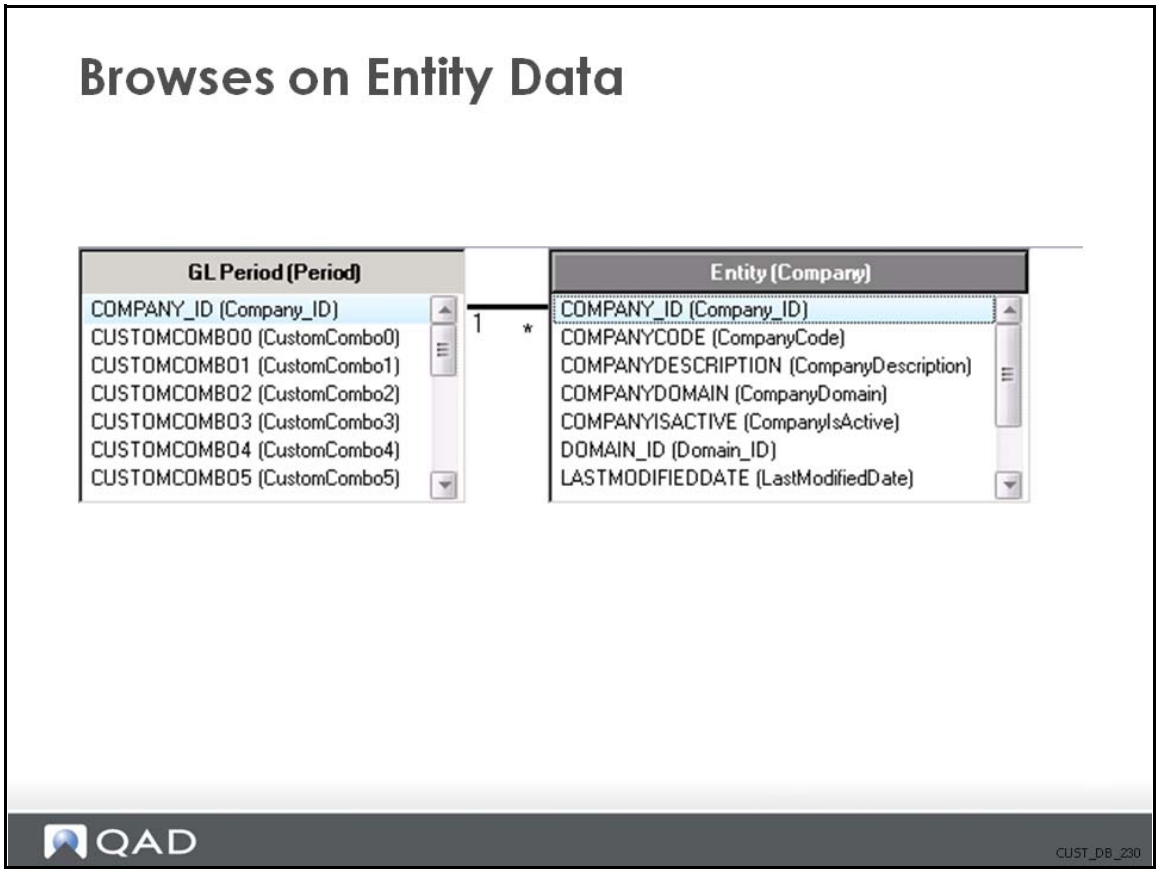
Shared Sets - Assignment to Domain



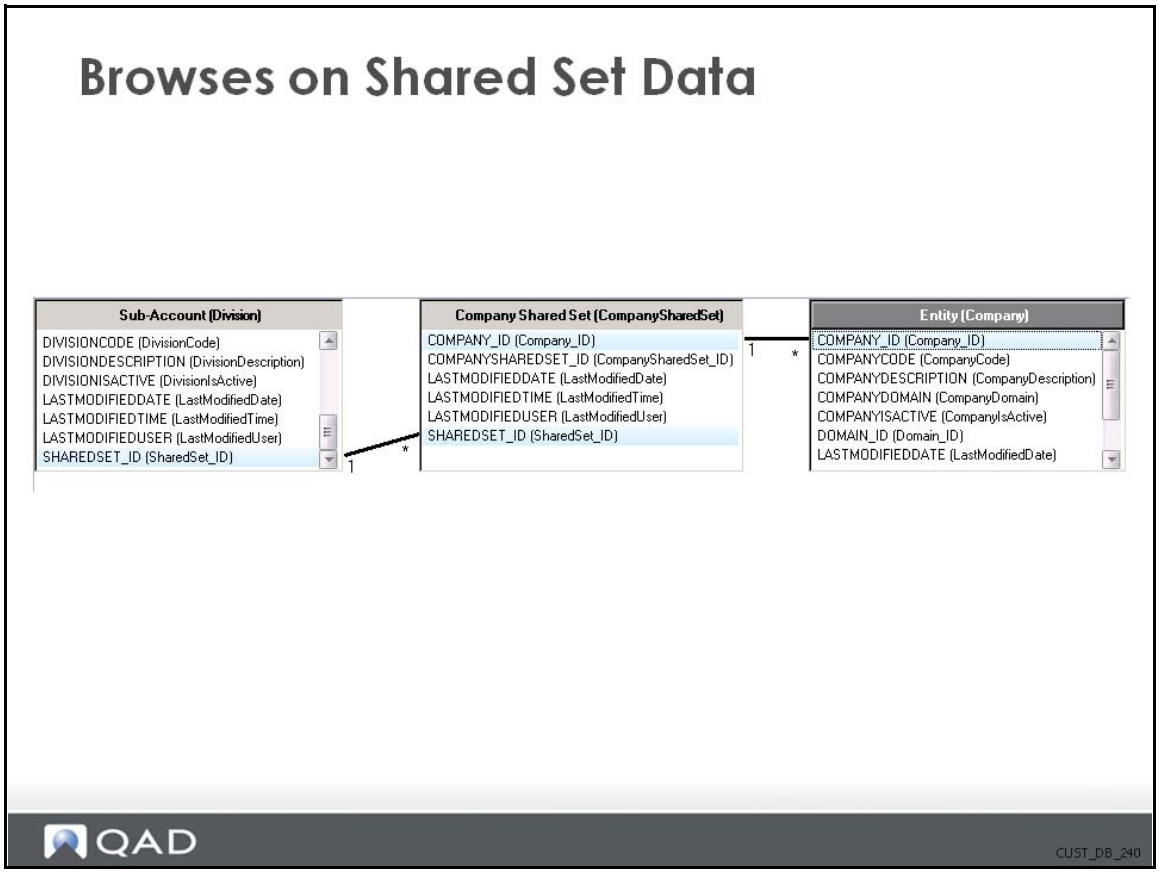
Shared Sets - Assignment to Entity



Browses on Entity Data



Browses on Shared Data

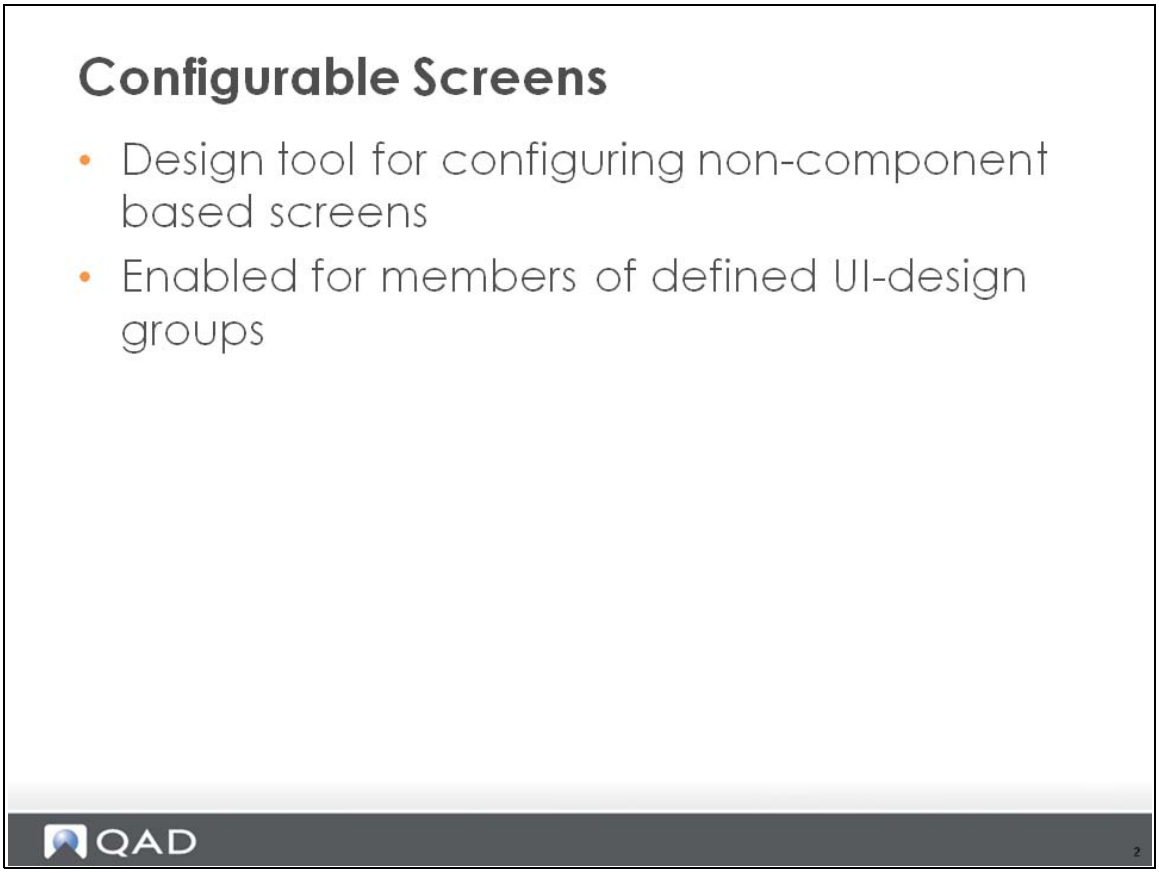


Chapter 3

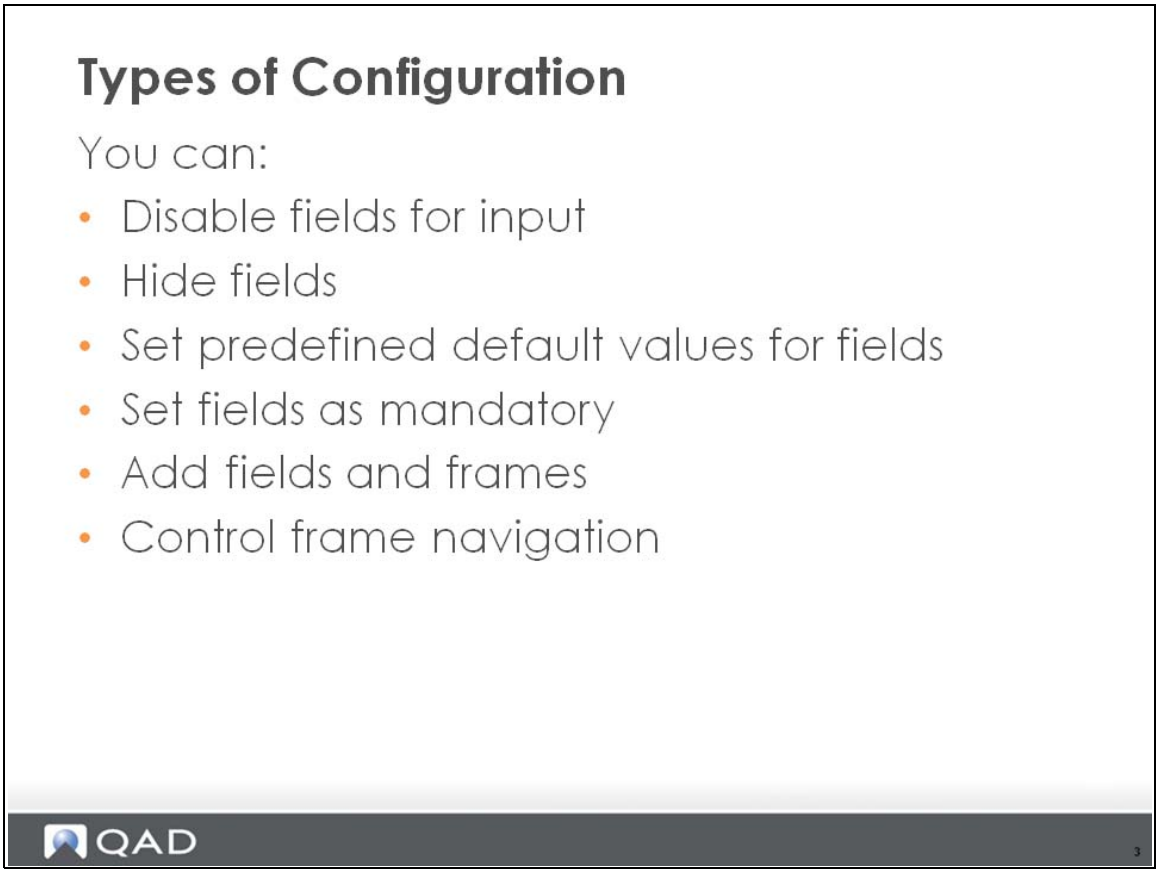
Customization Using UI Design Mode

Customization Using QAD Application Features and Functions UI Design Mode

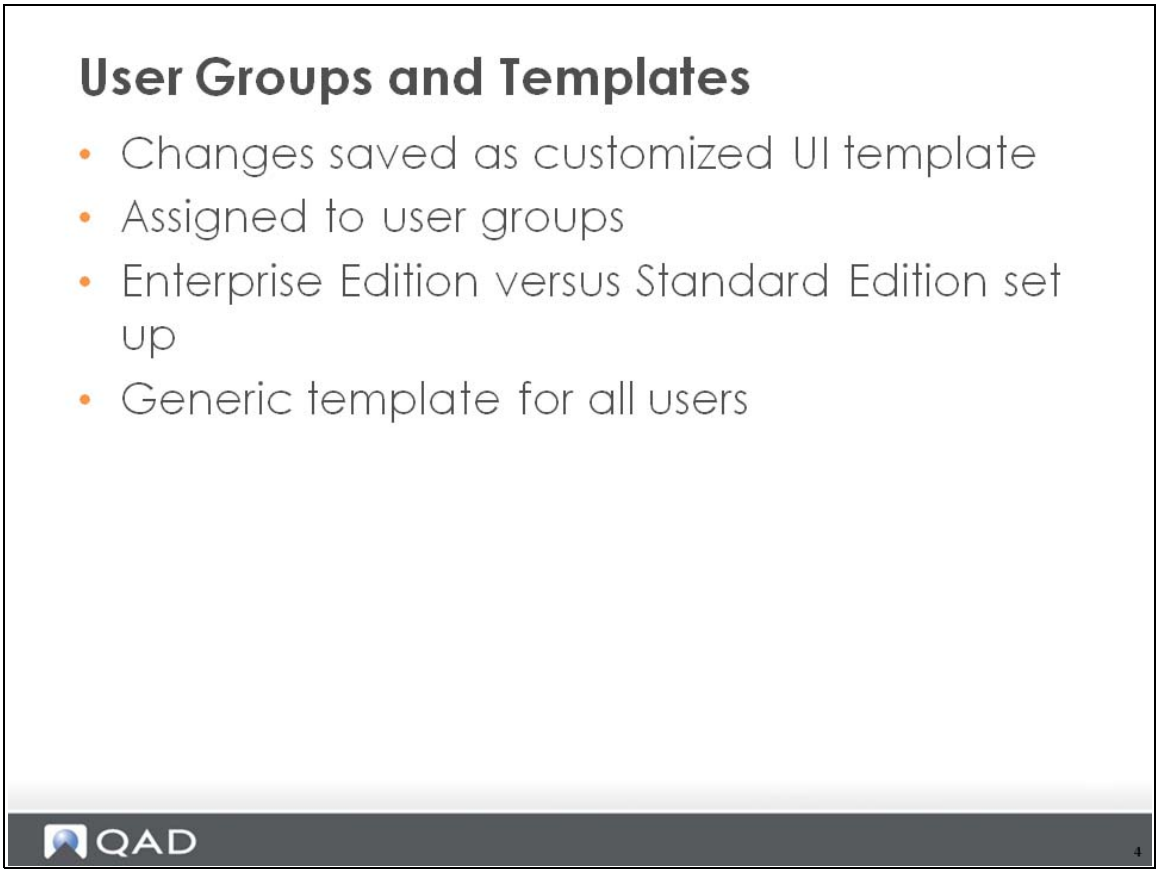
Configurable Screens



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

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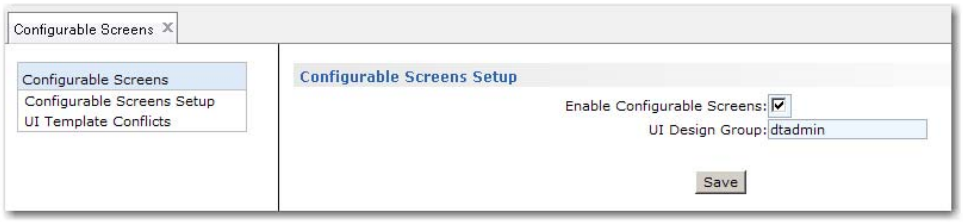
Configurable Screens Setup

Configurable Screens Setup

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



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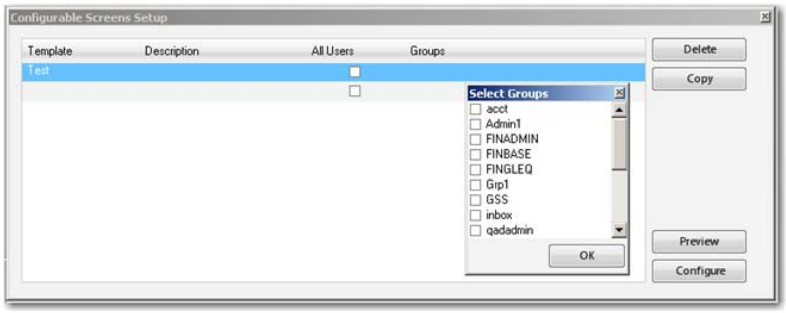
6

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



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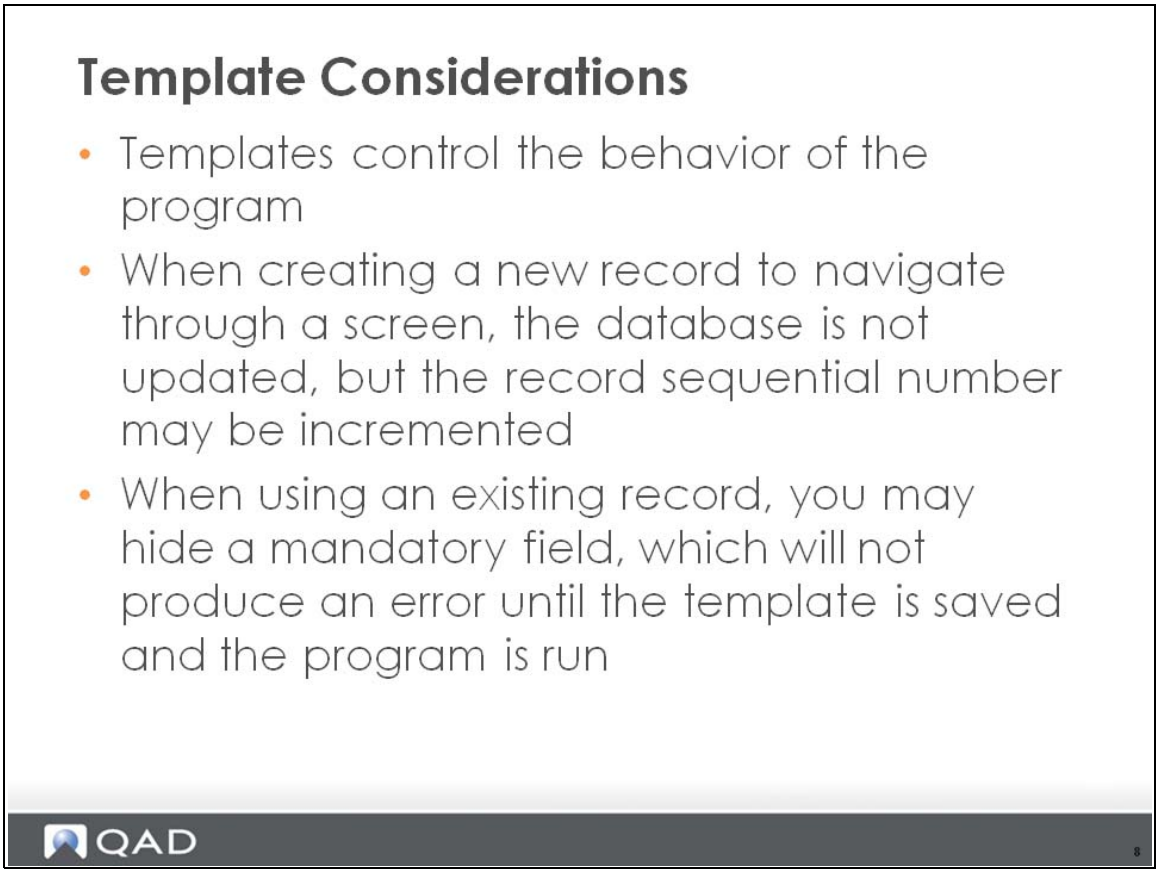
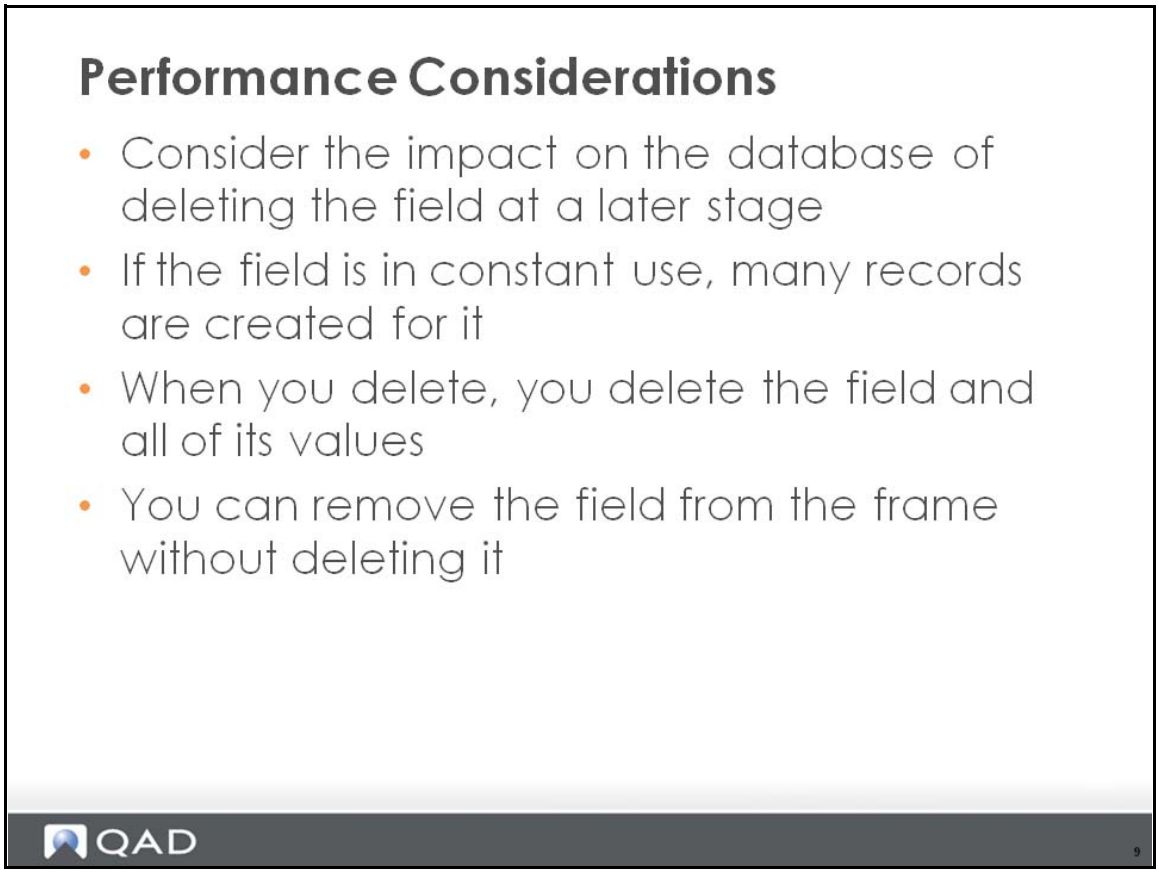
Template Considerations



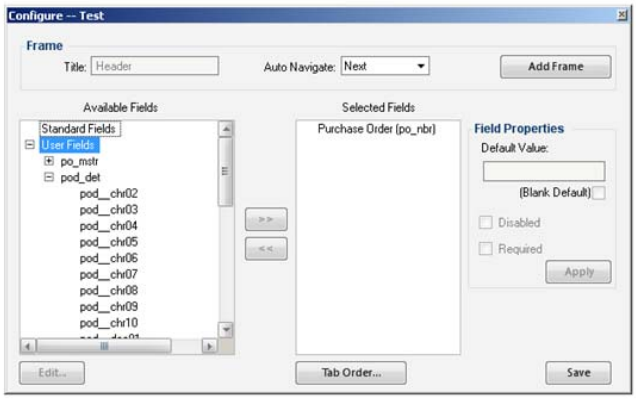
Performance Considerations



Configure Screen

Configure Screen

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



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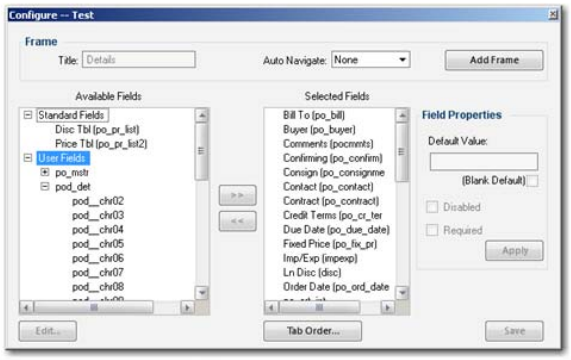
Available Fields

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

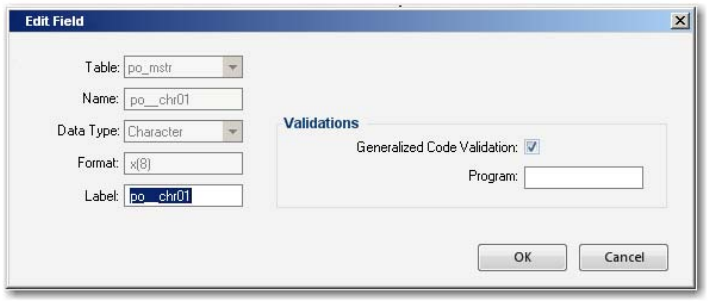


QAD 11

Field Properties

Field Properties

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



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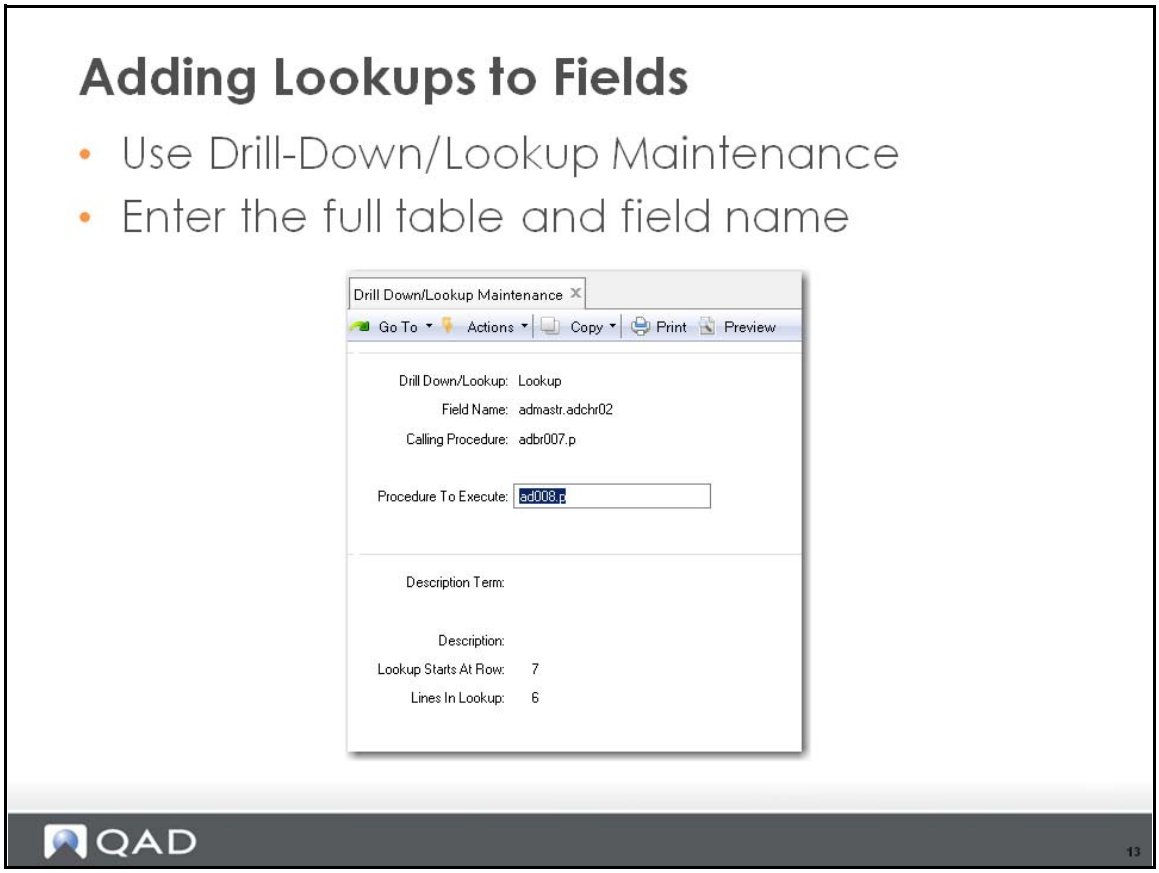
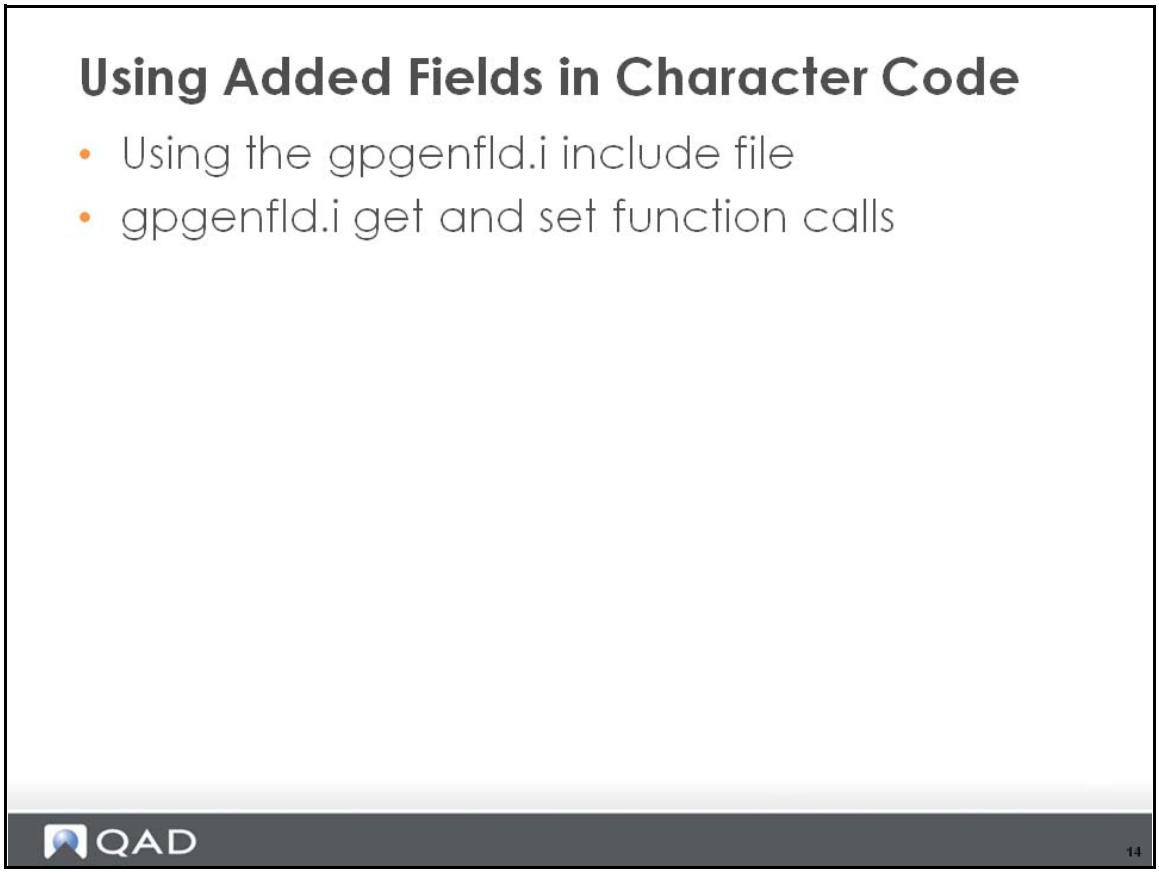
Adding Lookups to Fields



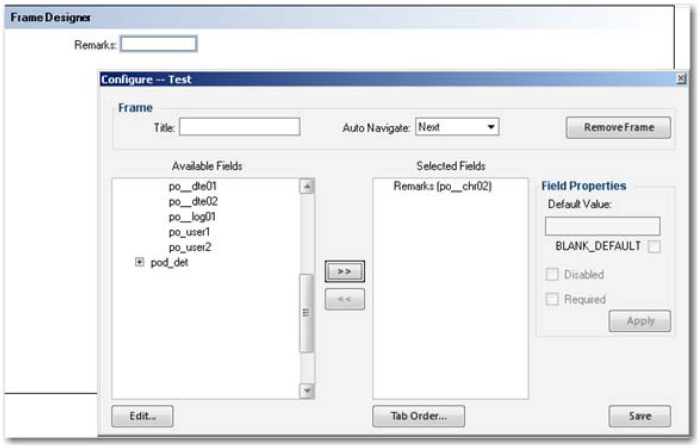
Using Added Fields in Character Code



Adding Frames

Adding Frames

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



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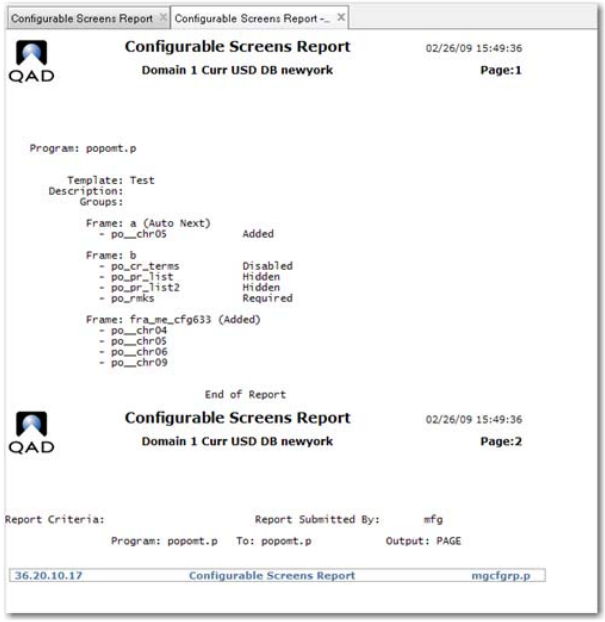
Configurable Screens Report

Configurable Screens Report

- All configured screens
- Details on individual fields



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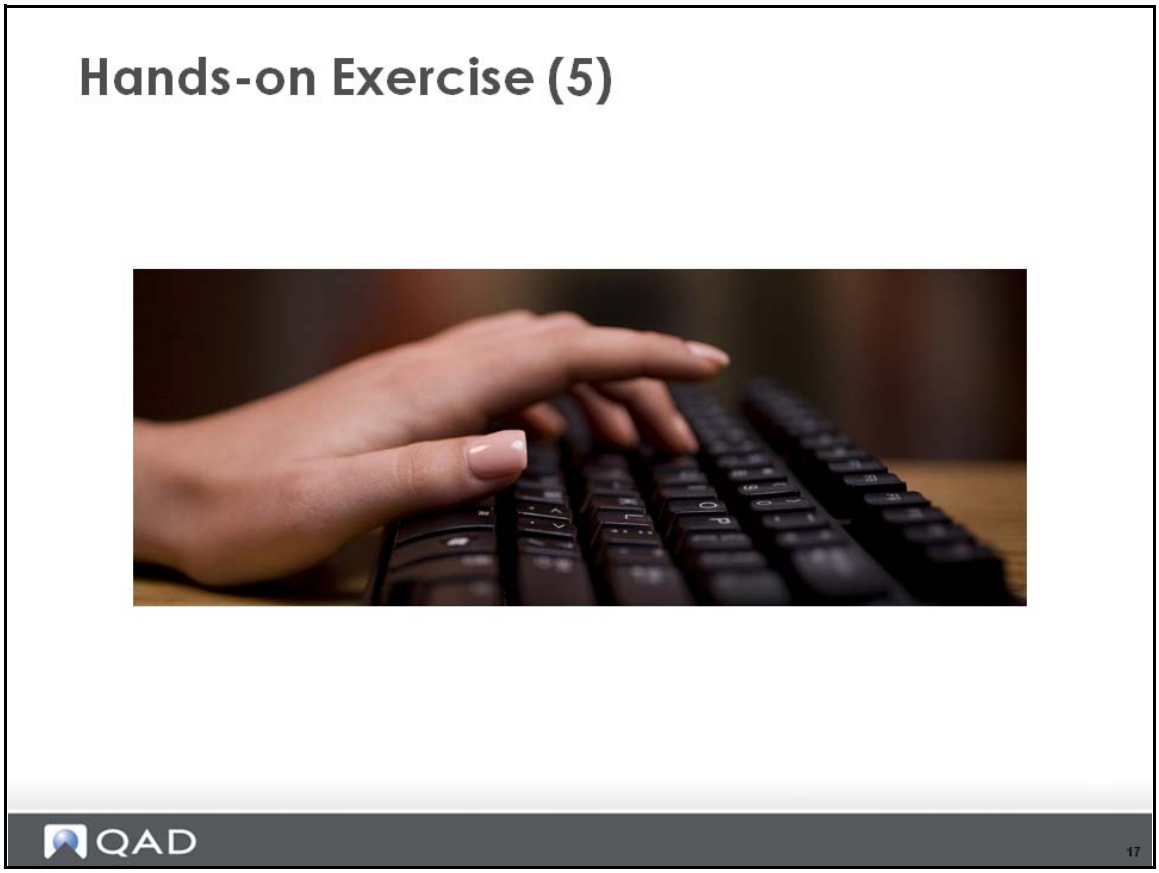
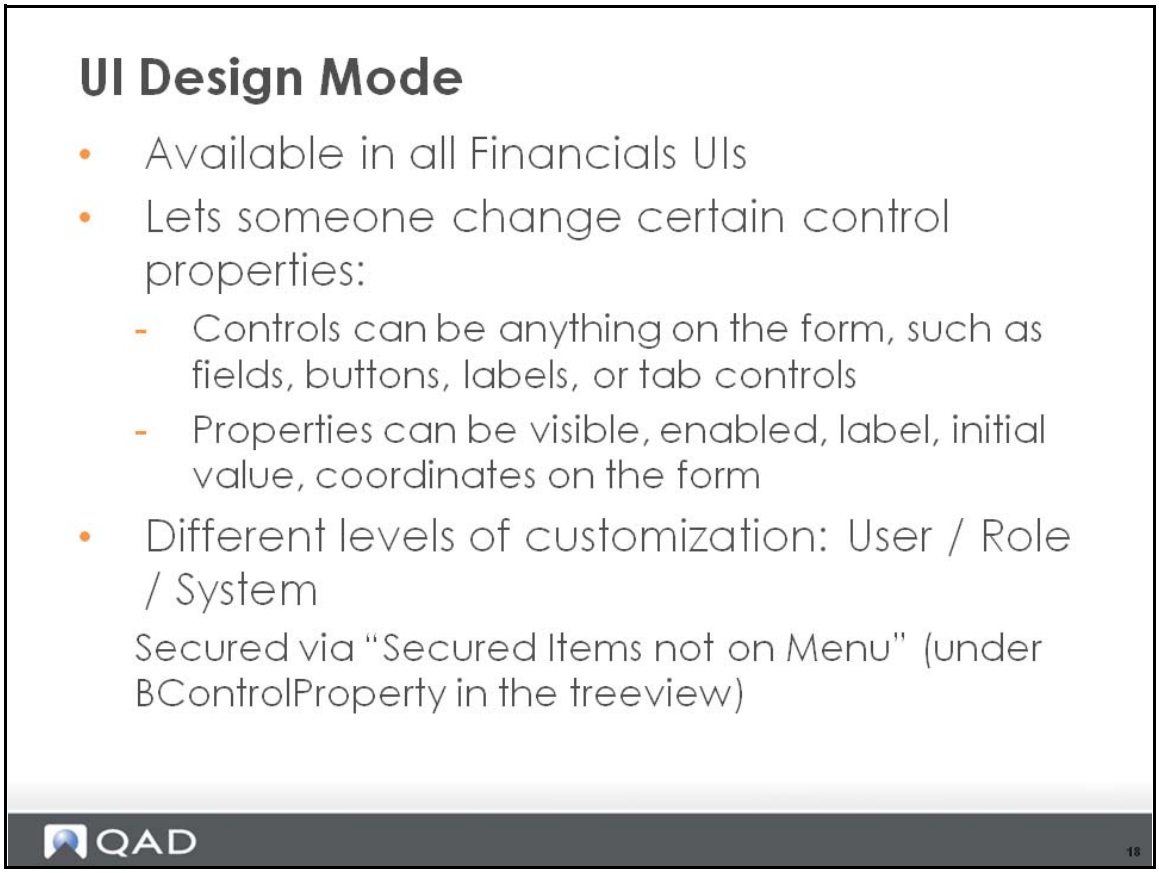
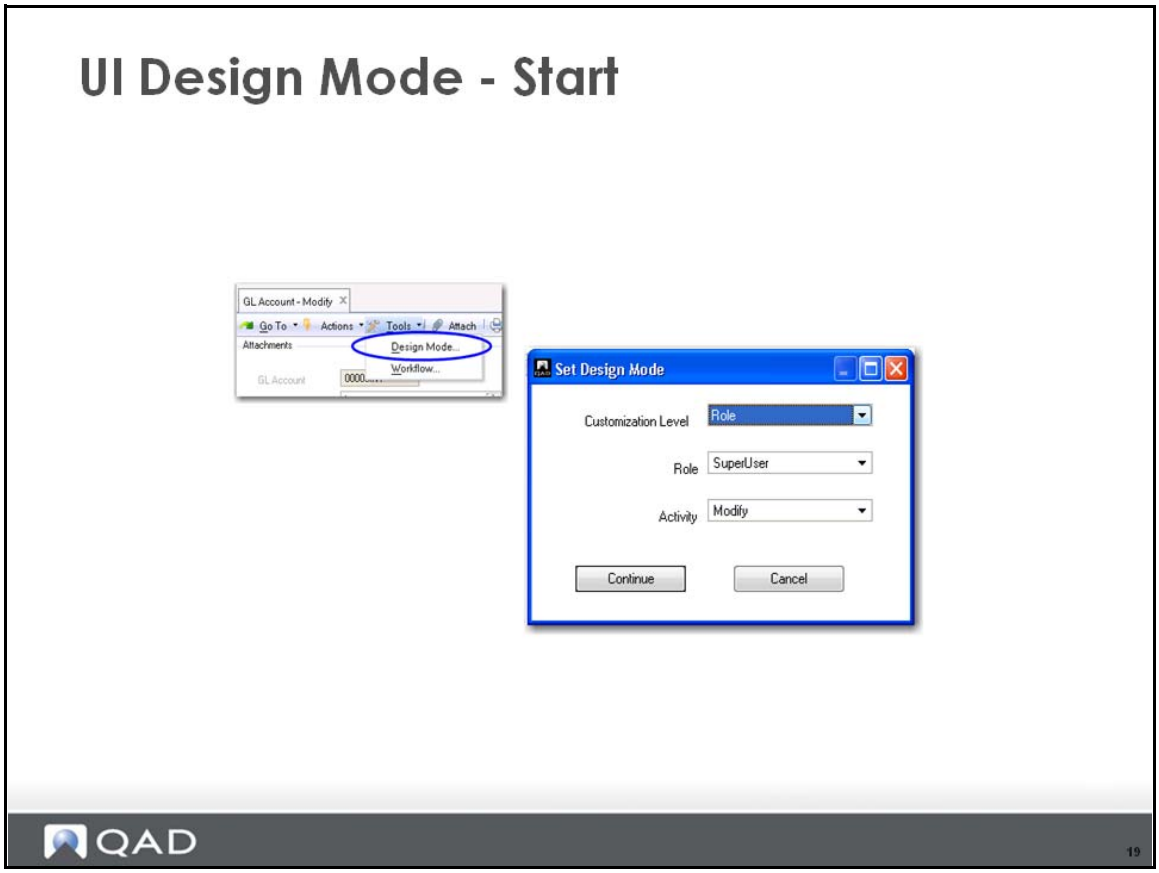
Hands-on Exercise (5)



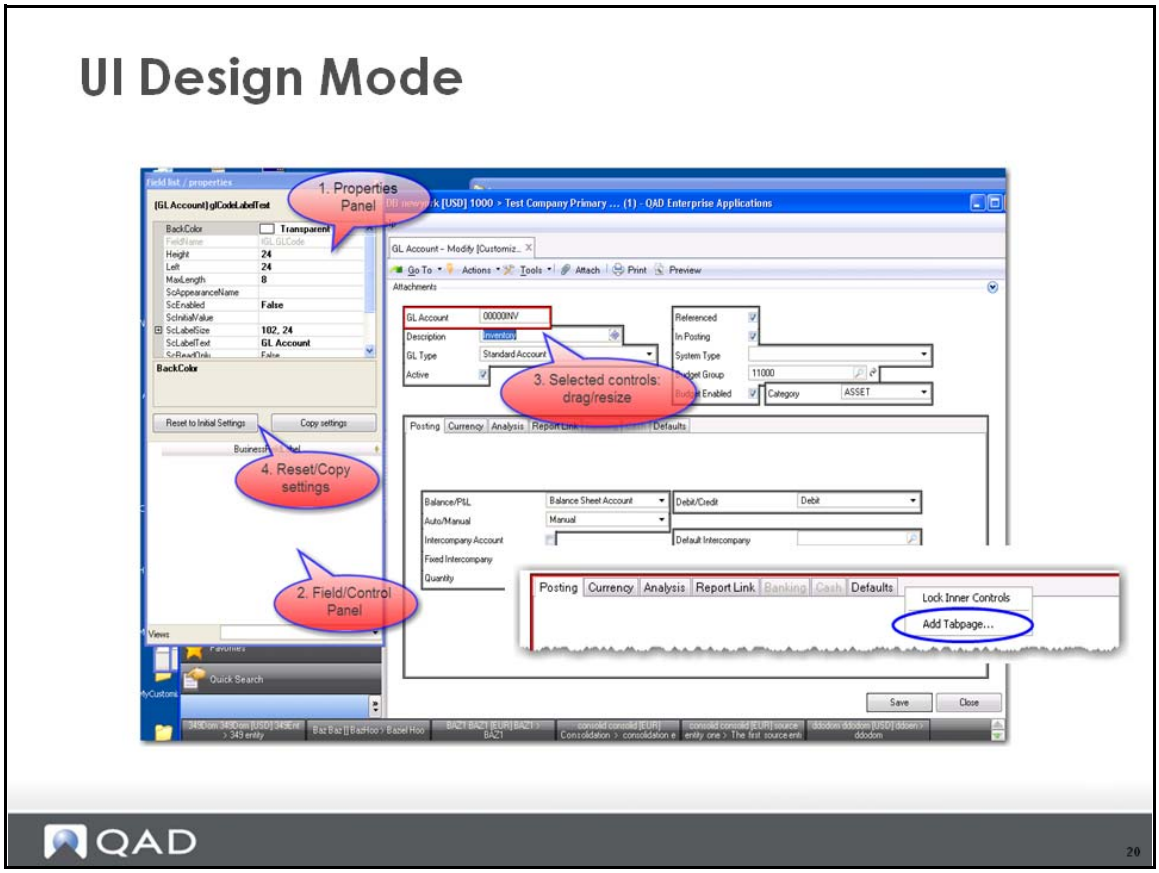
UI Design Mode



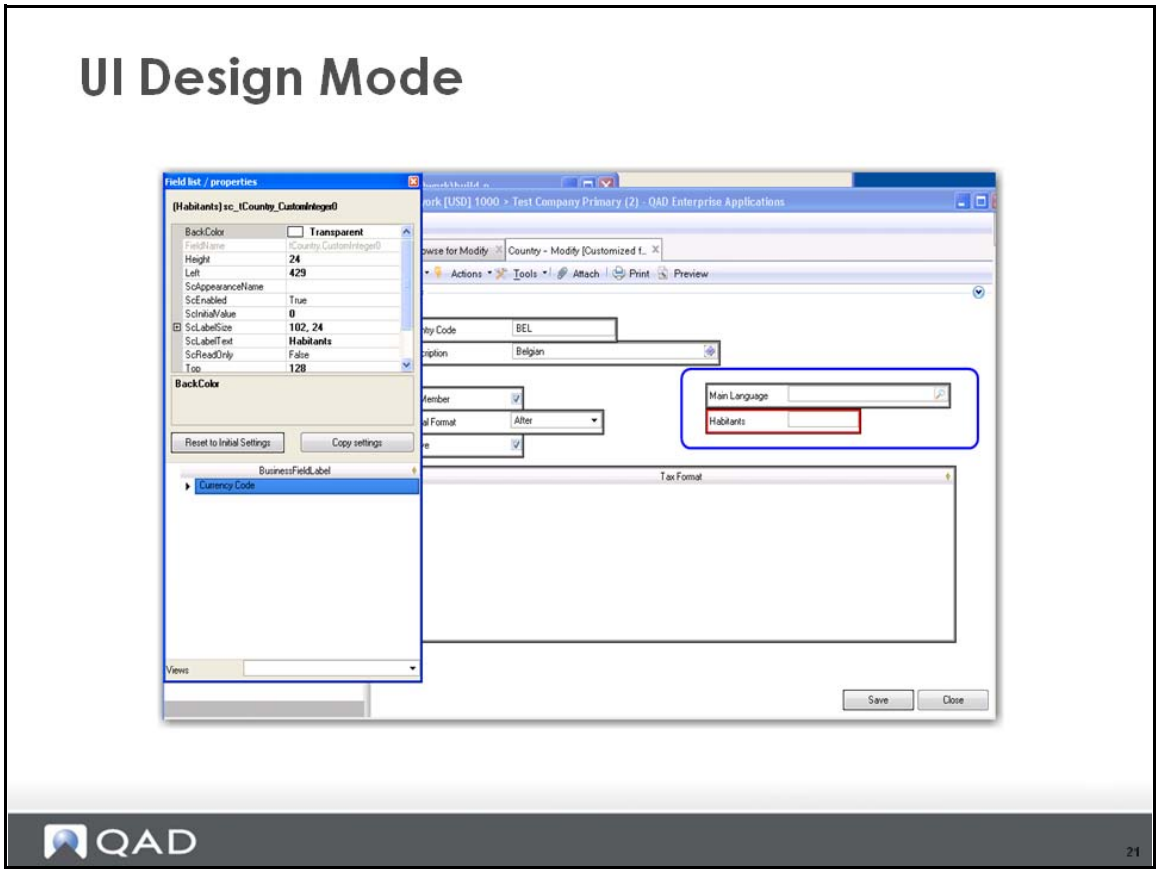
UI Design Mode 2



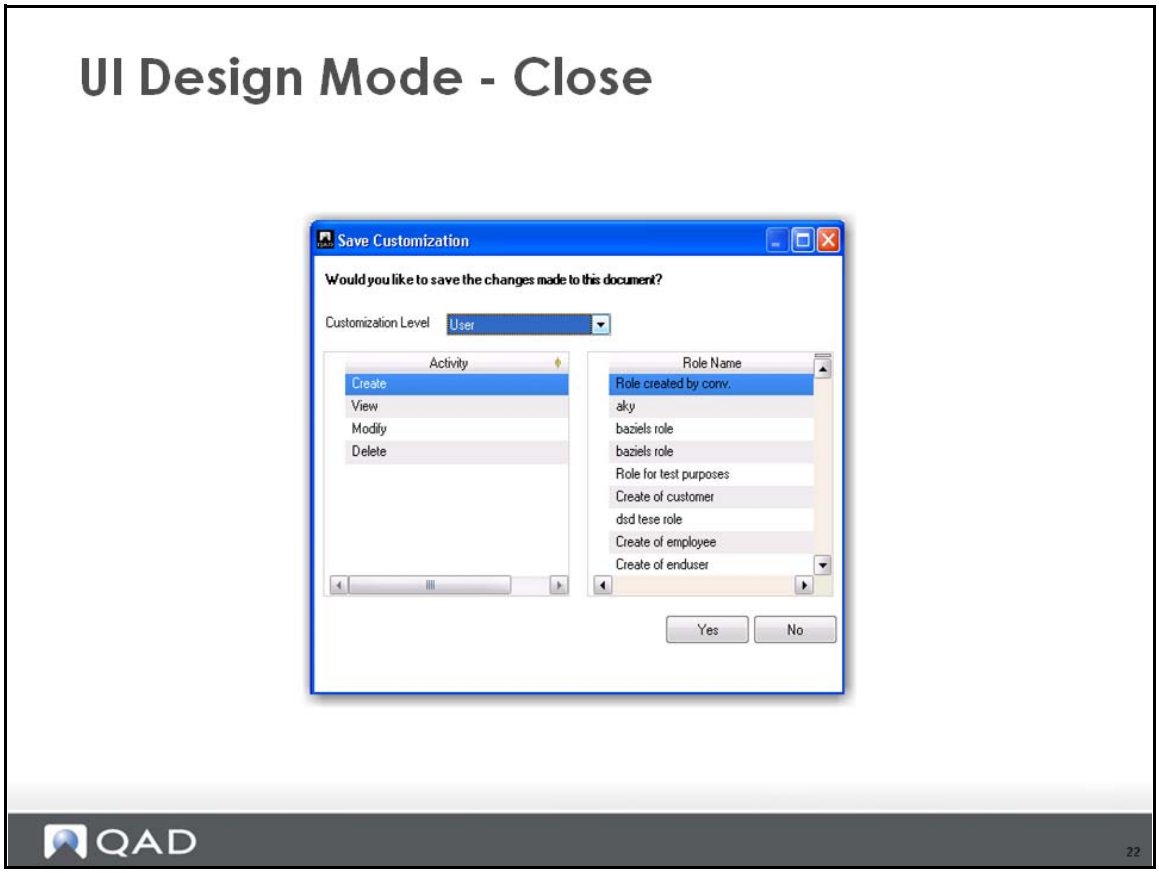
UI Design Mode 3



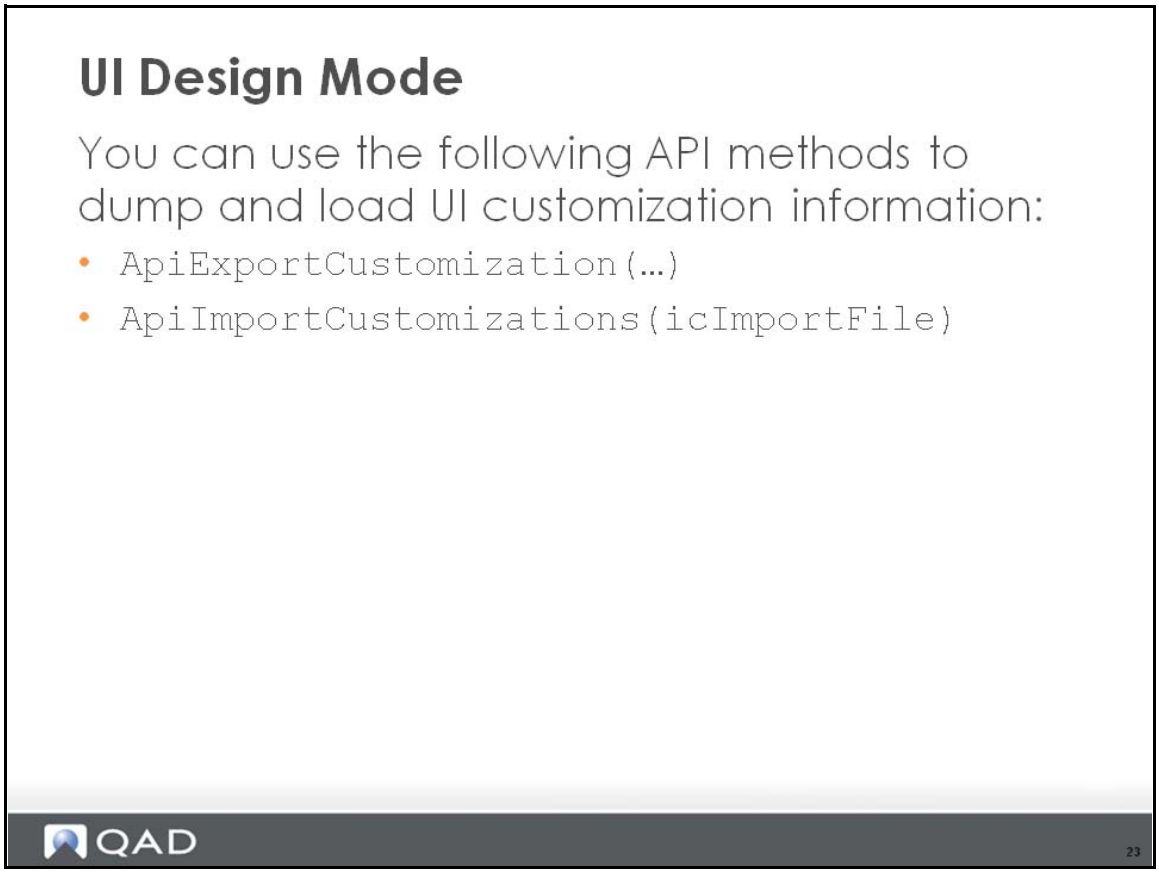
UI Design Mode 4



UI Design Mode 5



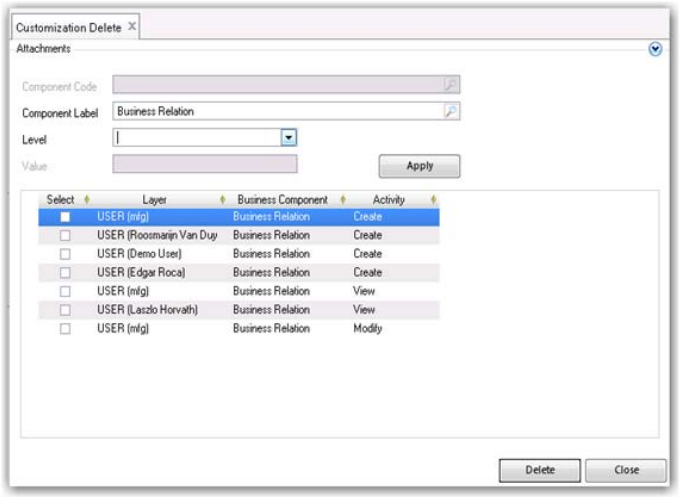
UI Design Mode 6



UI Design Mode 7

UI Design Mode - Maintenance

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



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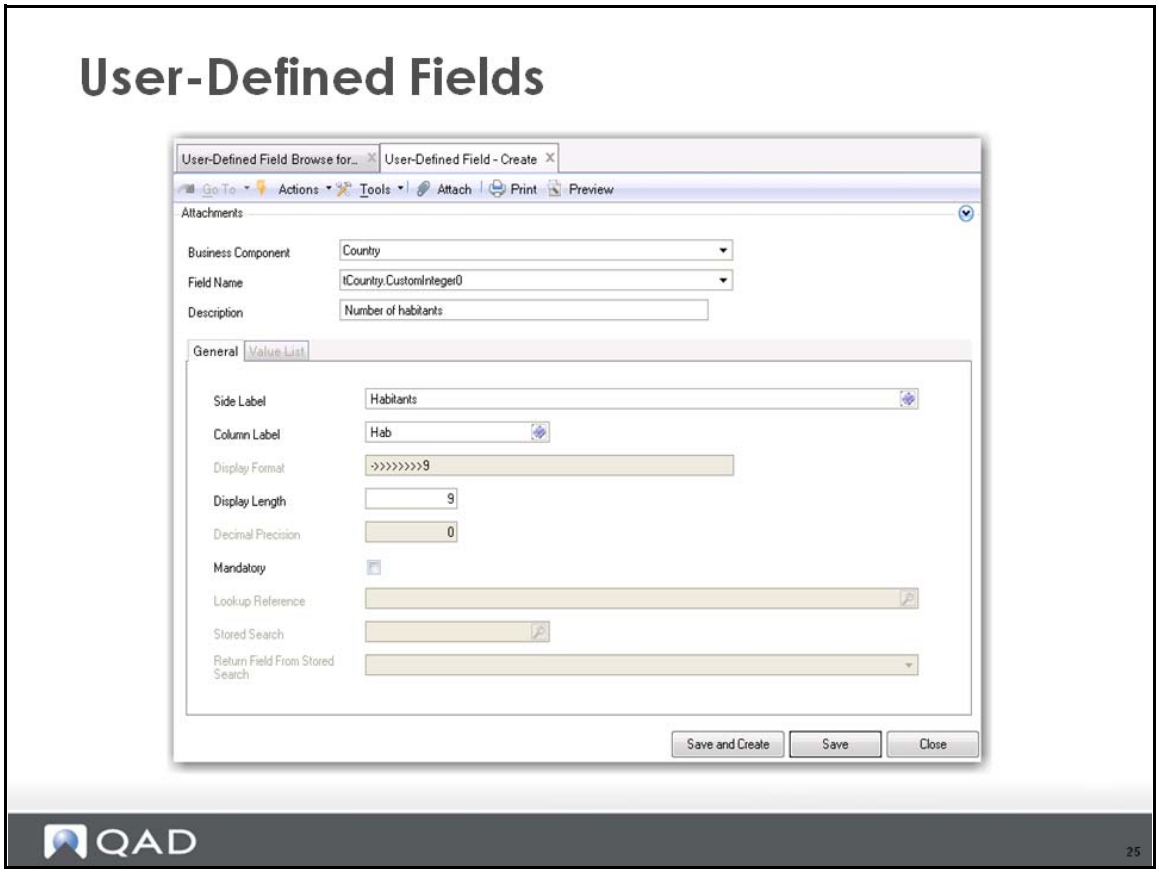
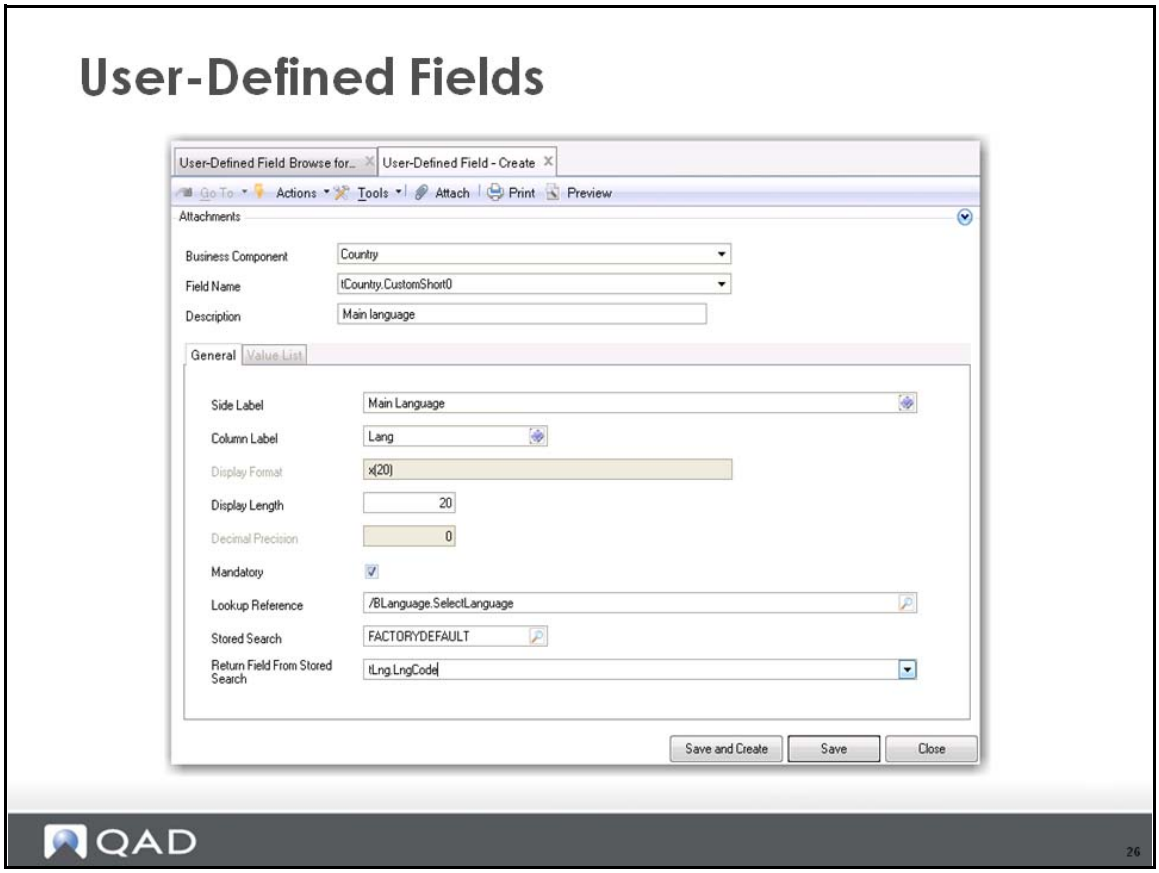
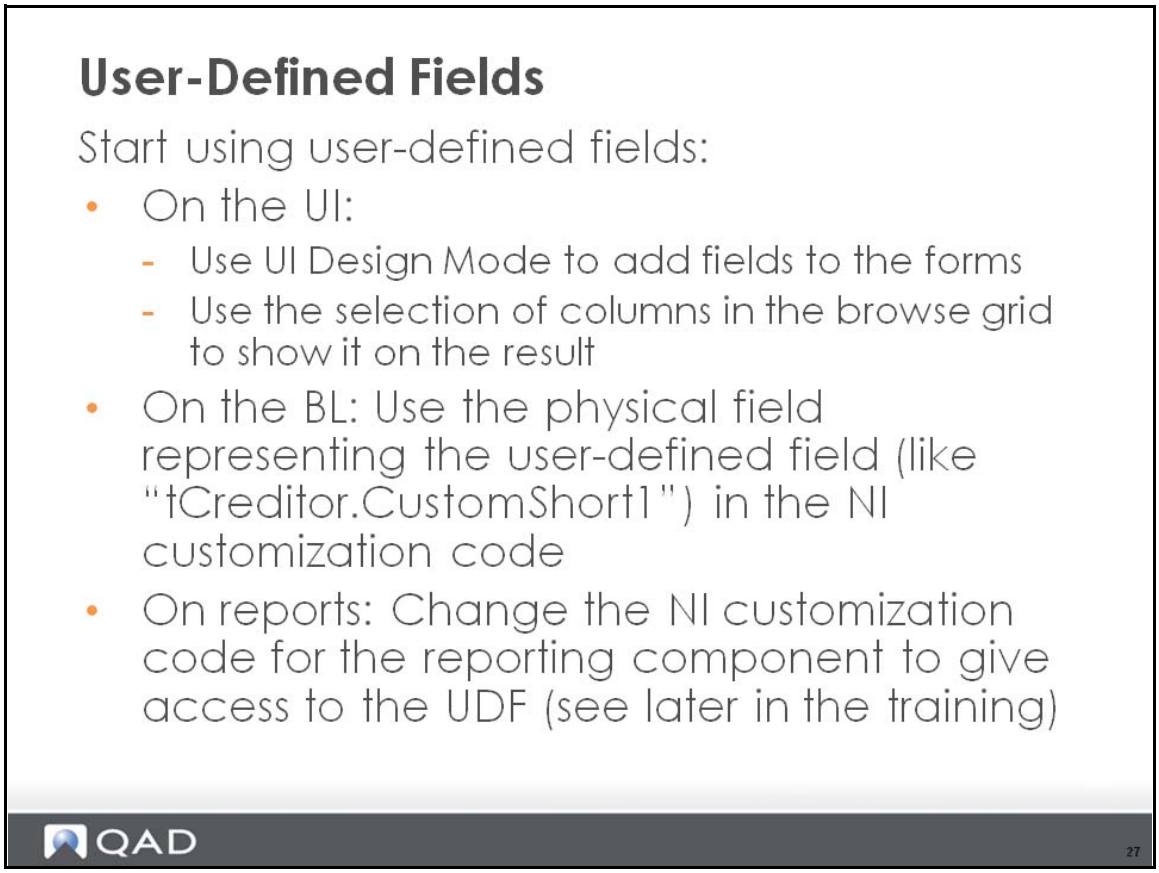
User-Defined Fields



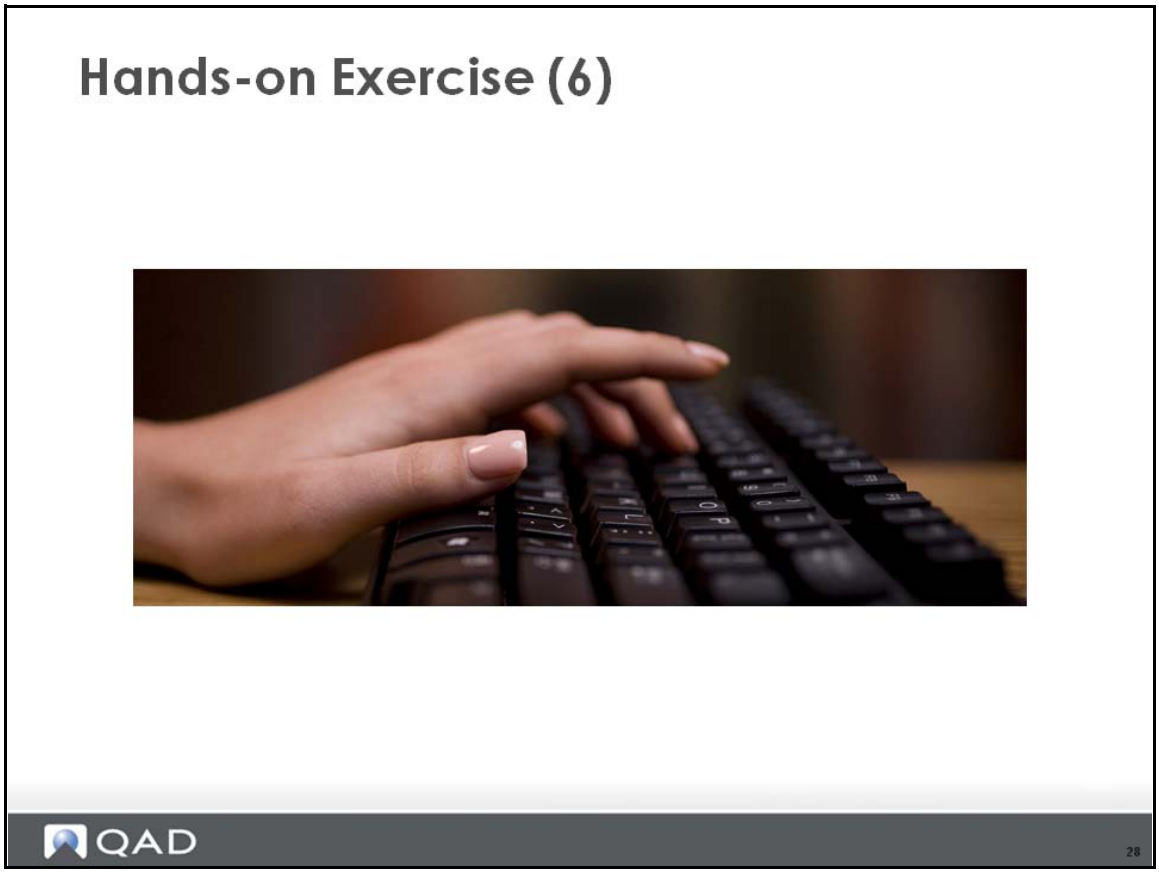
User-Defined Fields 2



User-Defined Fields 3



Hands-on Exercise (6)



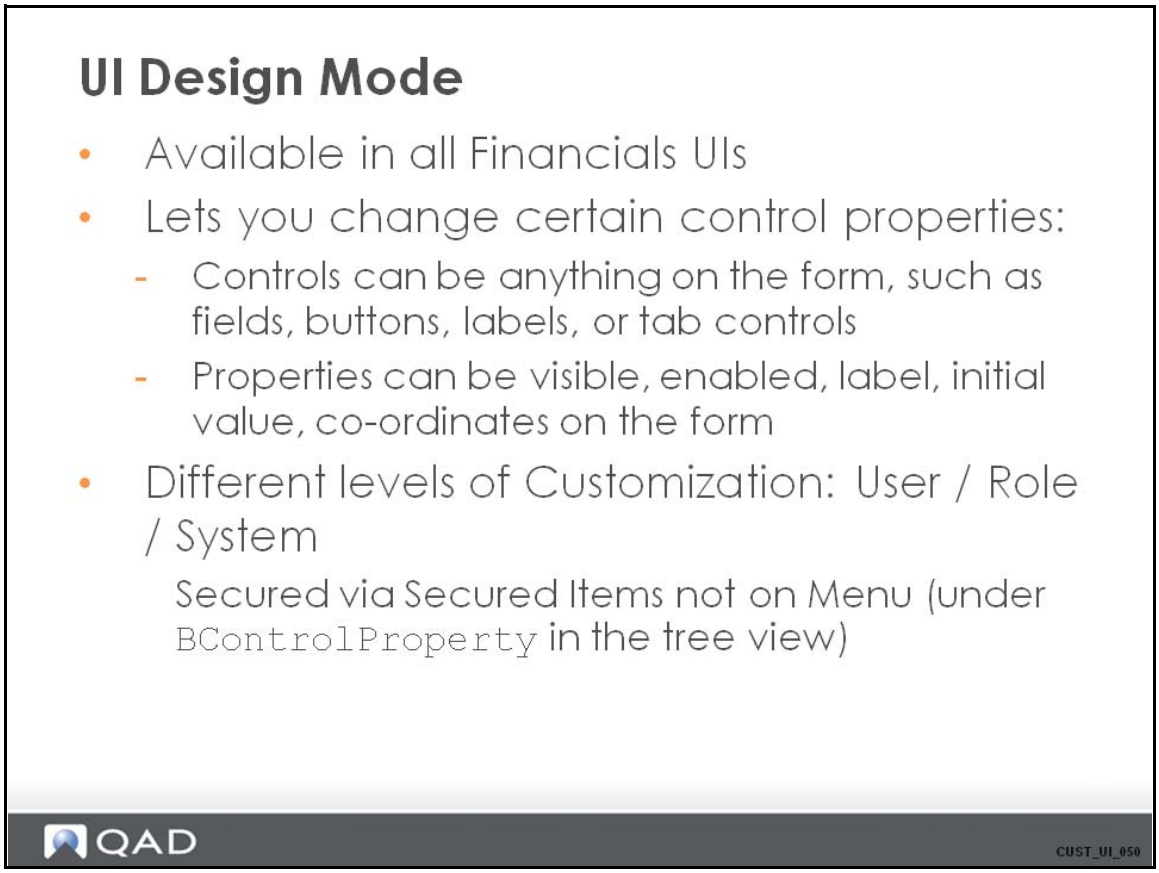
Chapter 4

Non-intrusive Customization of Enterprise Financials

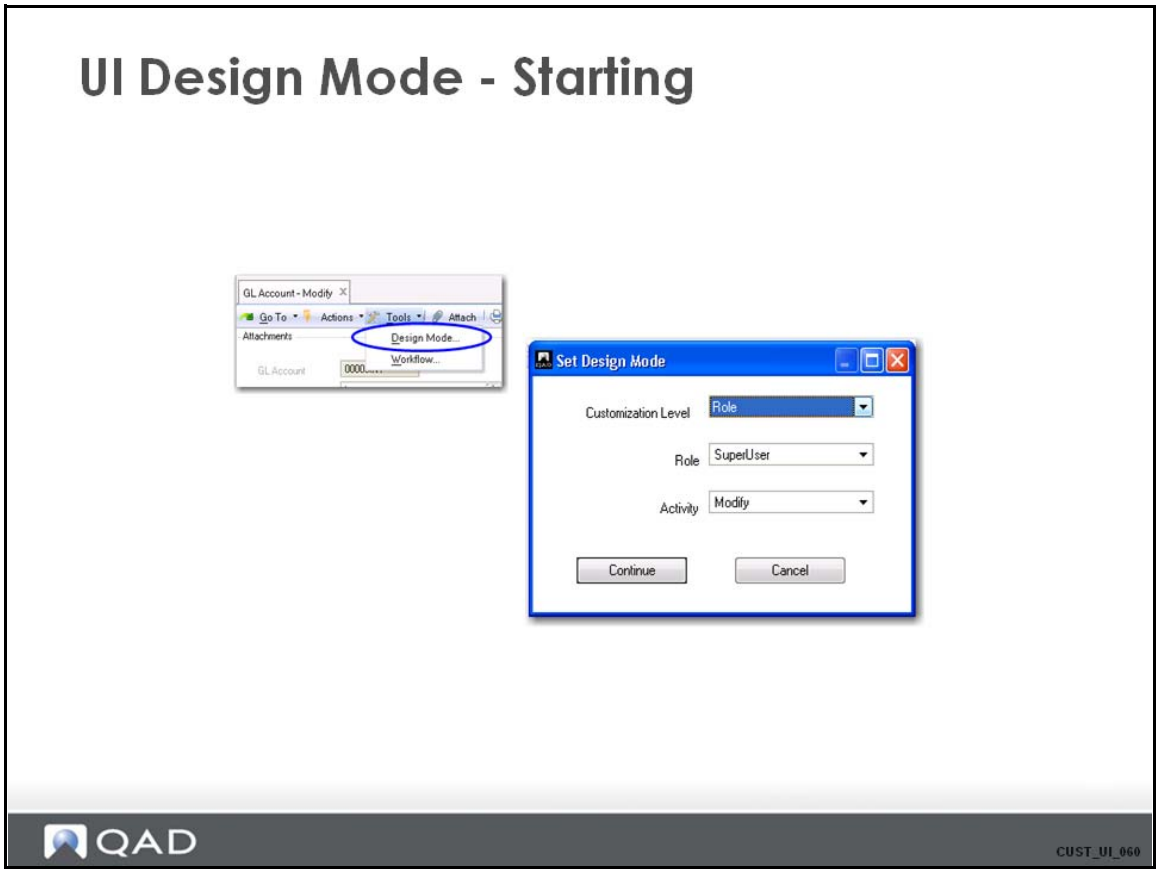
Non-intrusive Customizations of Enterprise Financials

Non-Intrusive Customization: UI Design

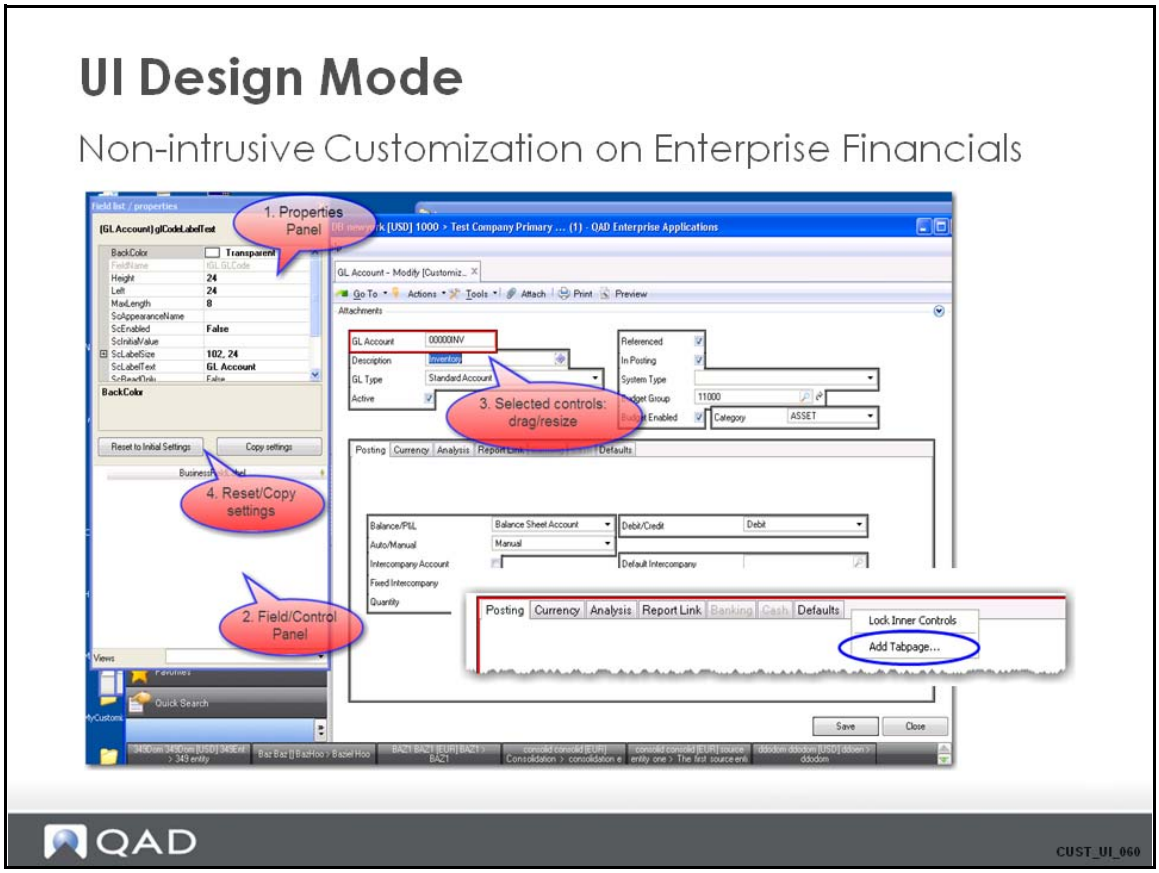
UI Design Mode



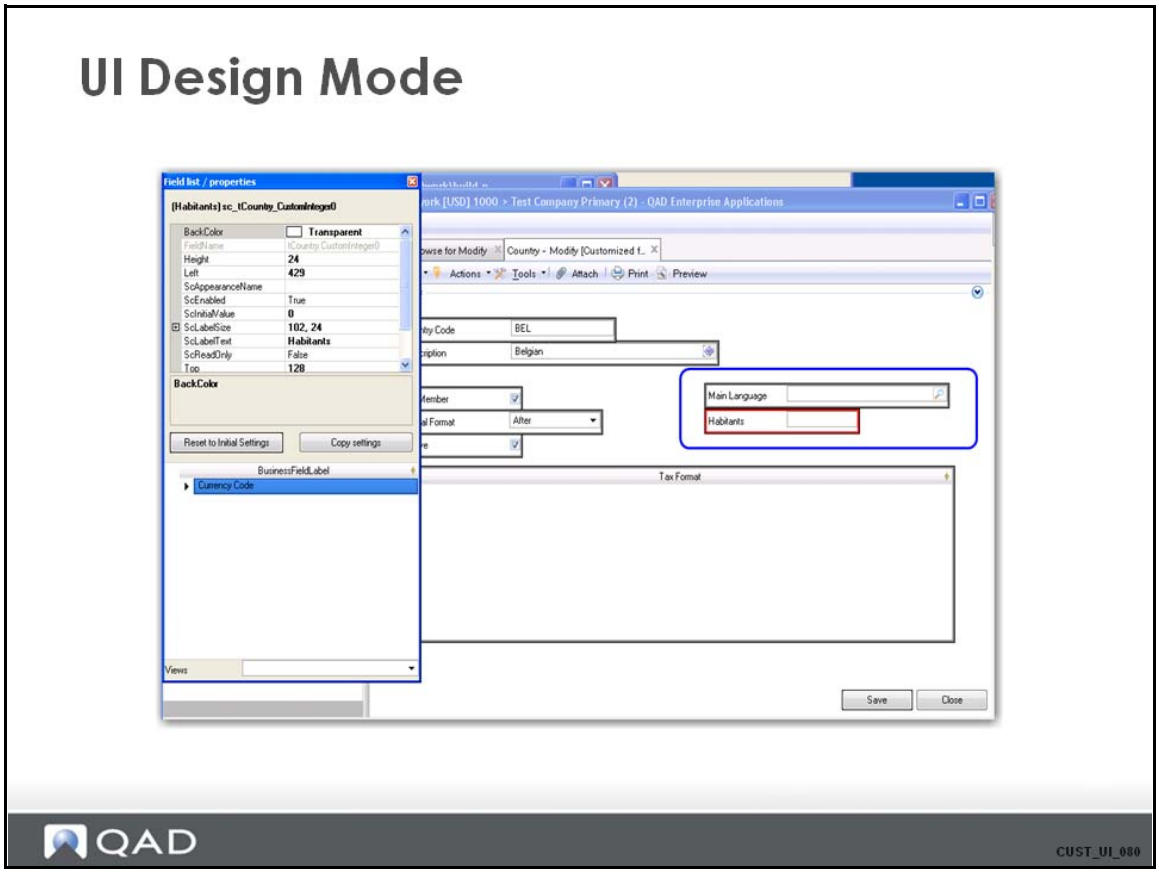
UI Design Mode 2



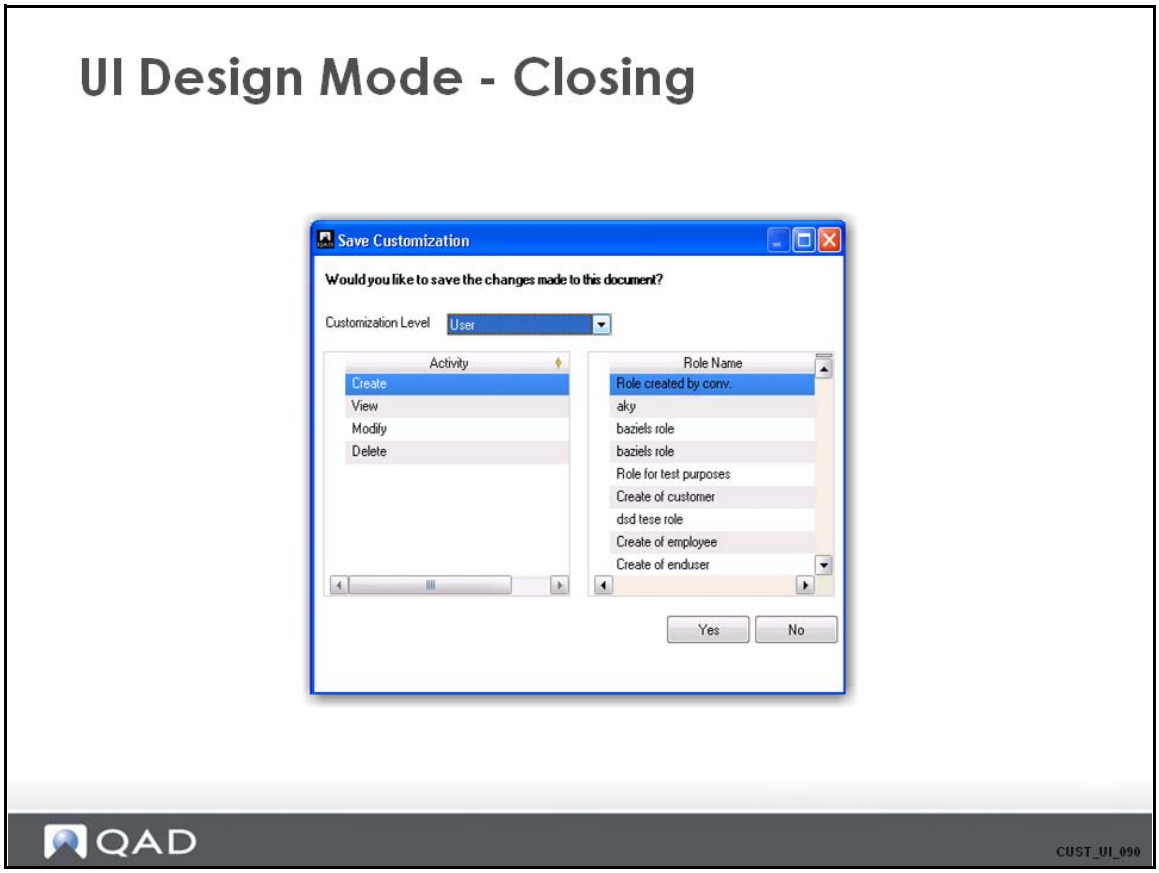
UI Design Mode 3



UI Design Mode 4



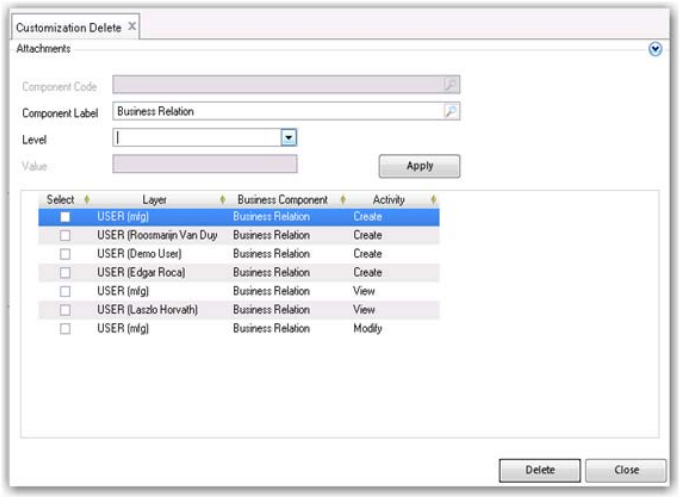
UI Design Mode 5



UI Design Mode 6

UI Design Mode - Maintenance

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



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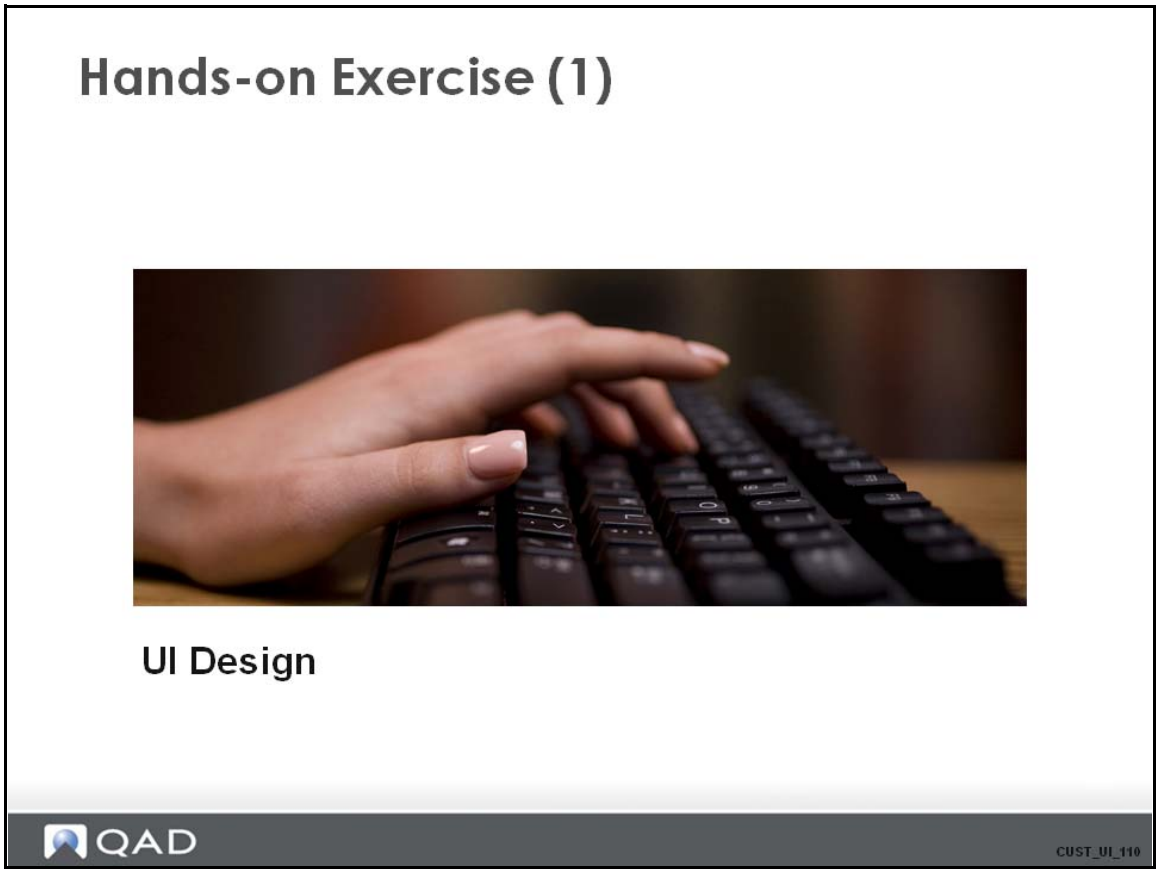
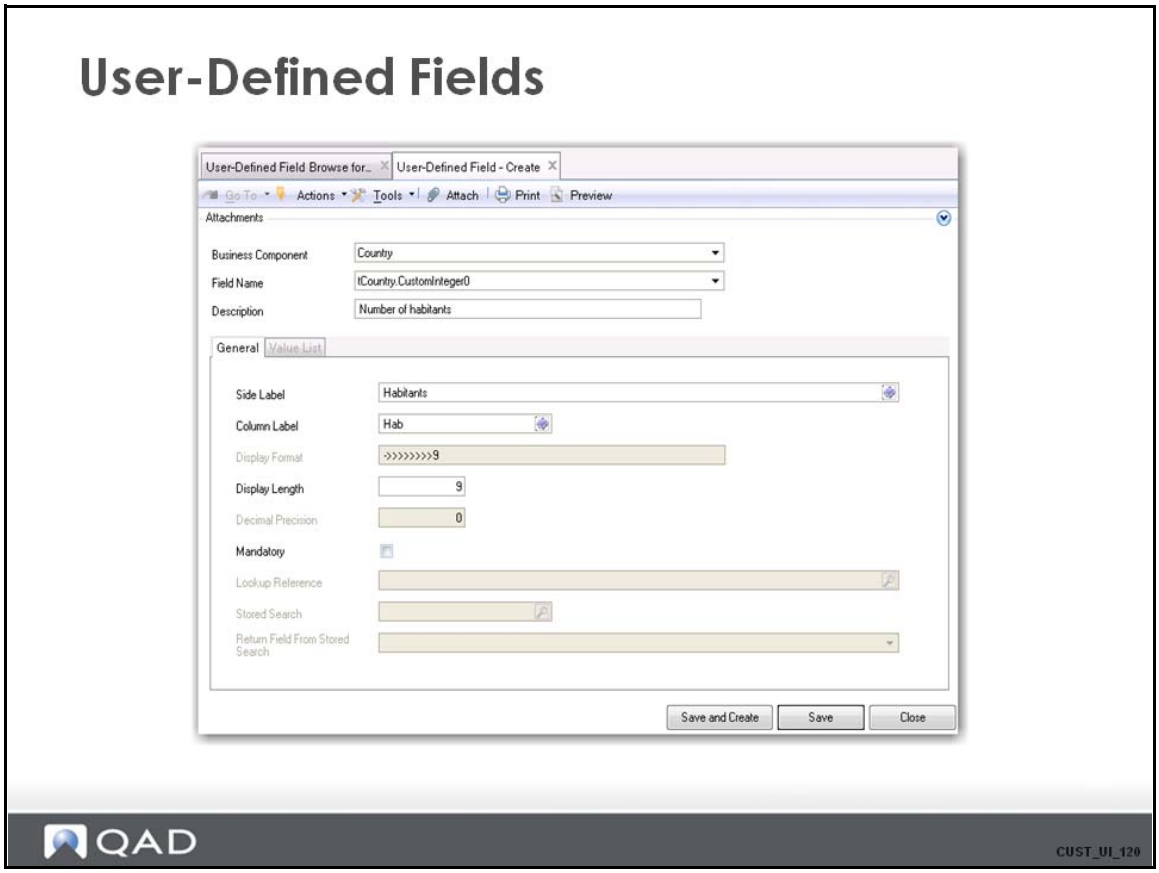
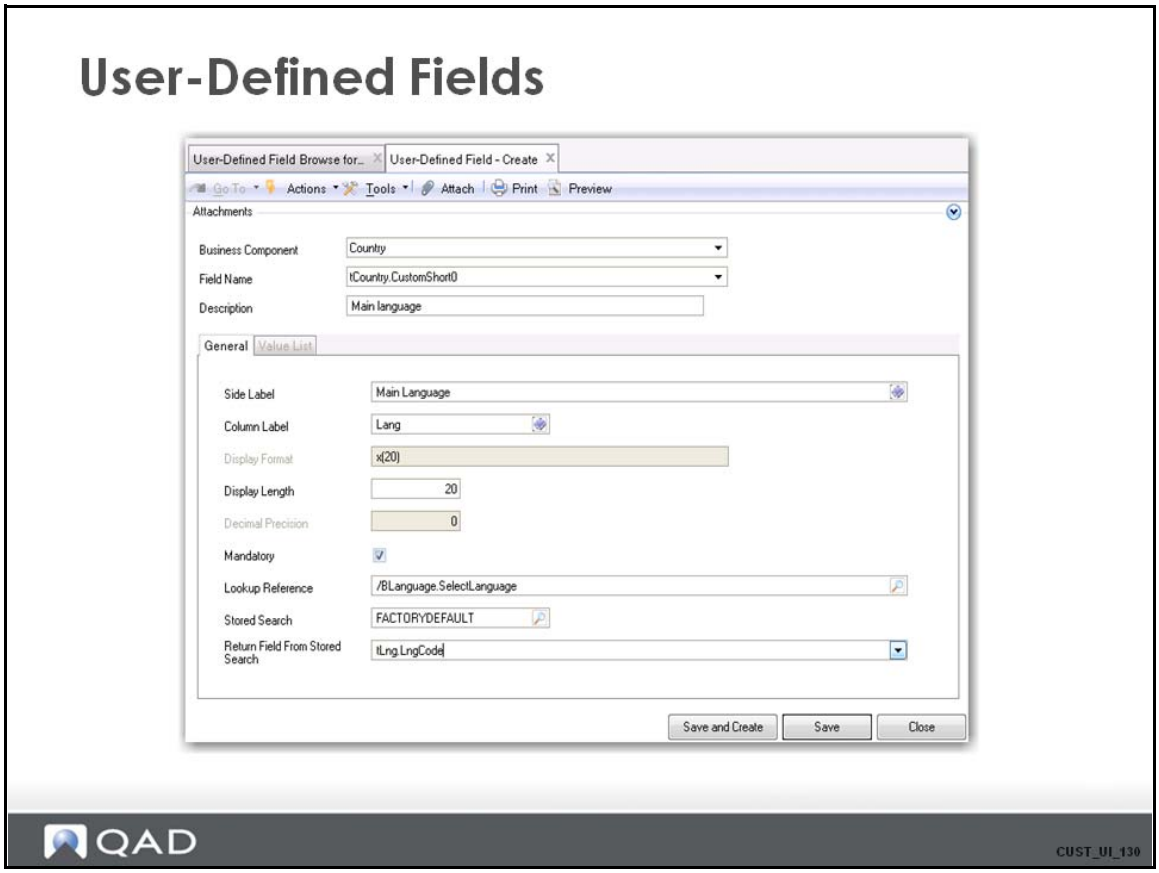
Hands-on Exercise (1)



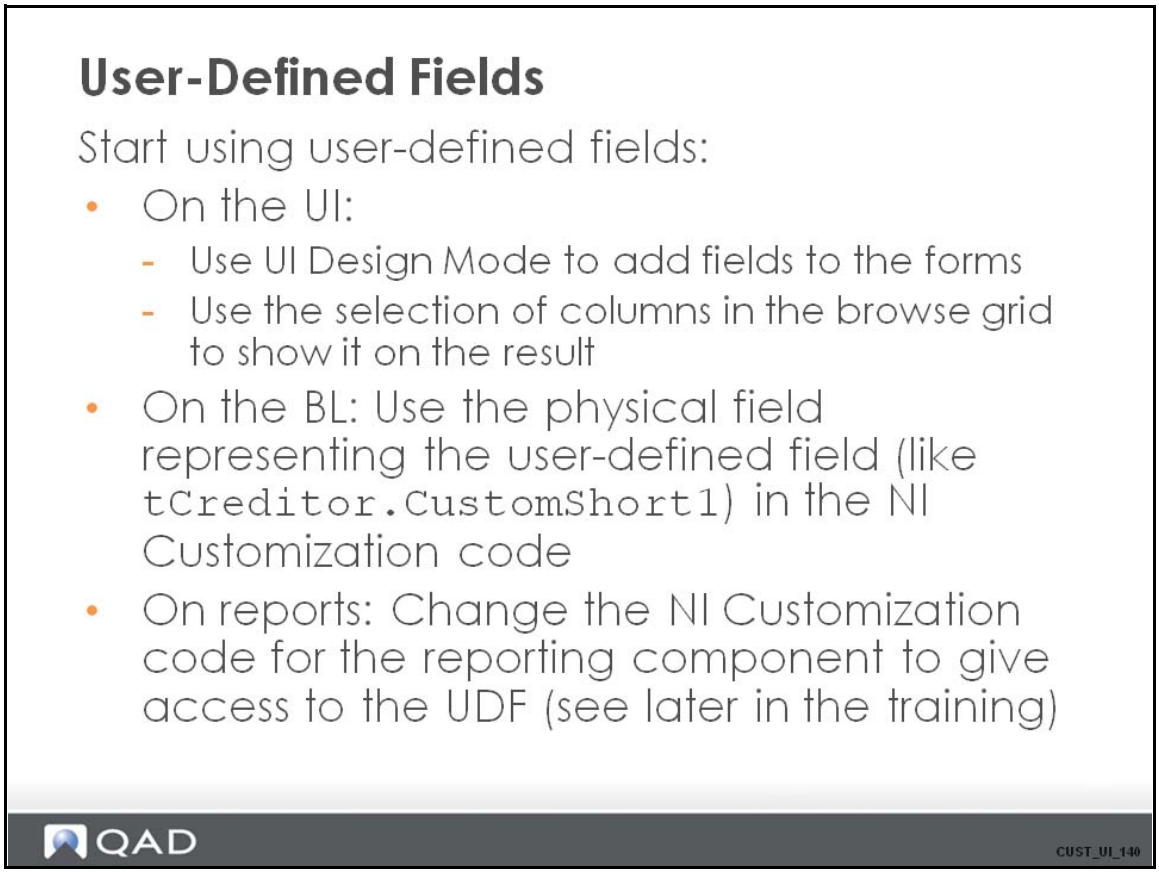
User-Defined Fields



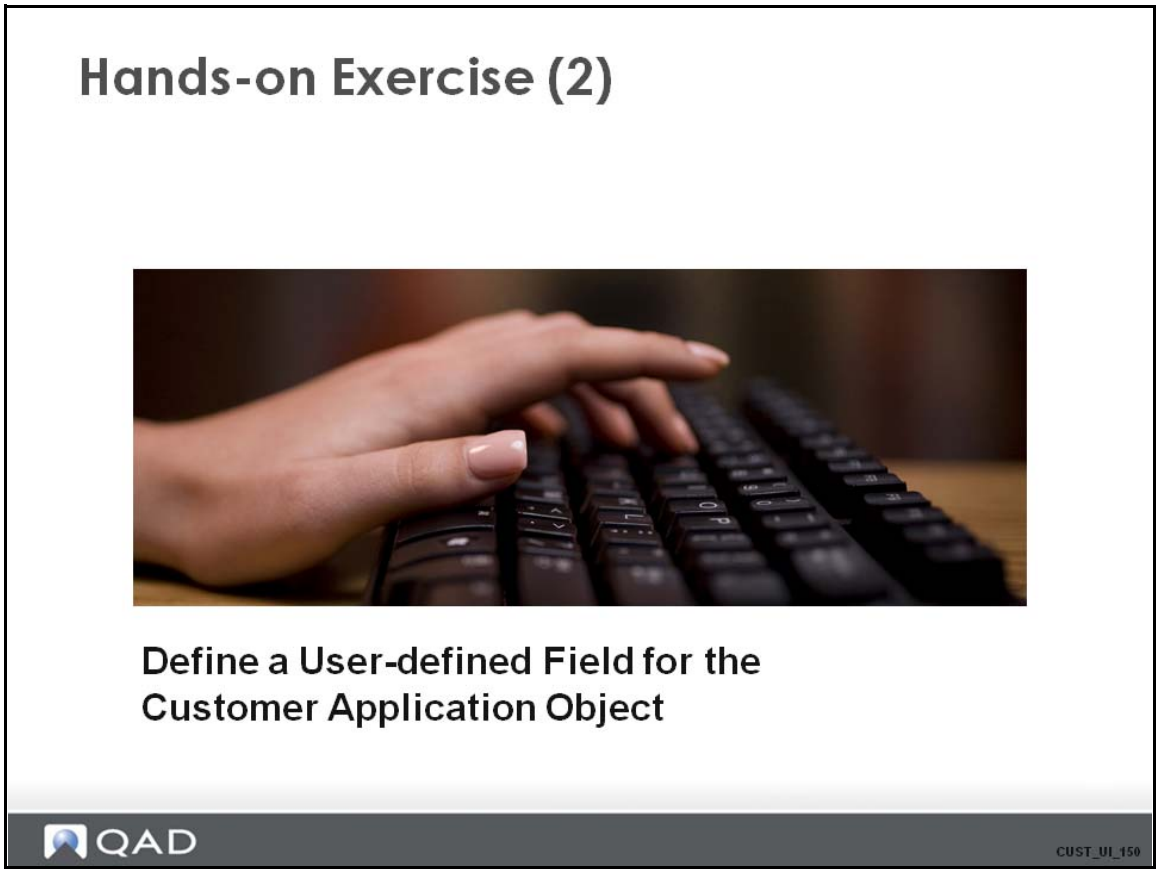
User-Defined Fields 2



User-Defined Fields 3

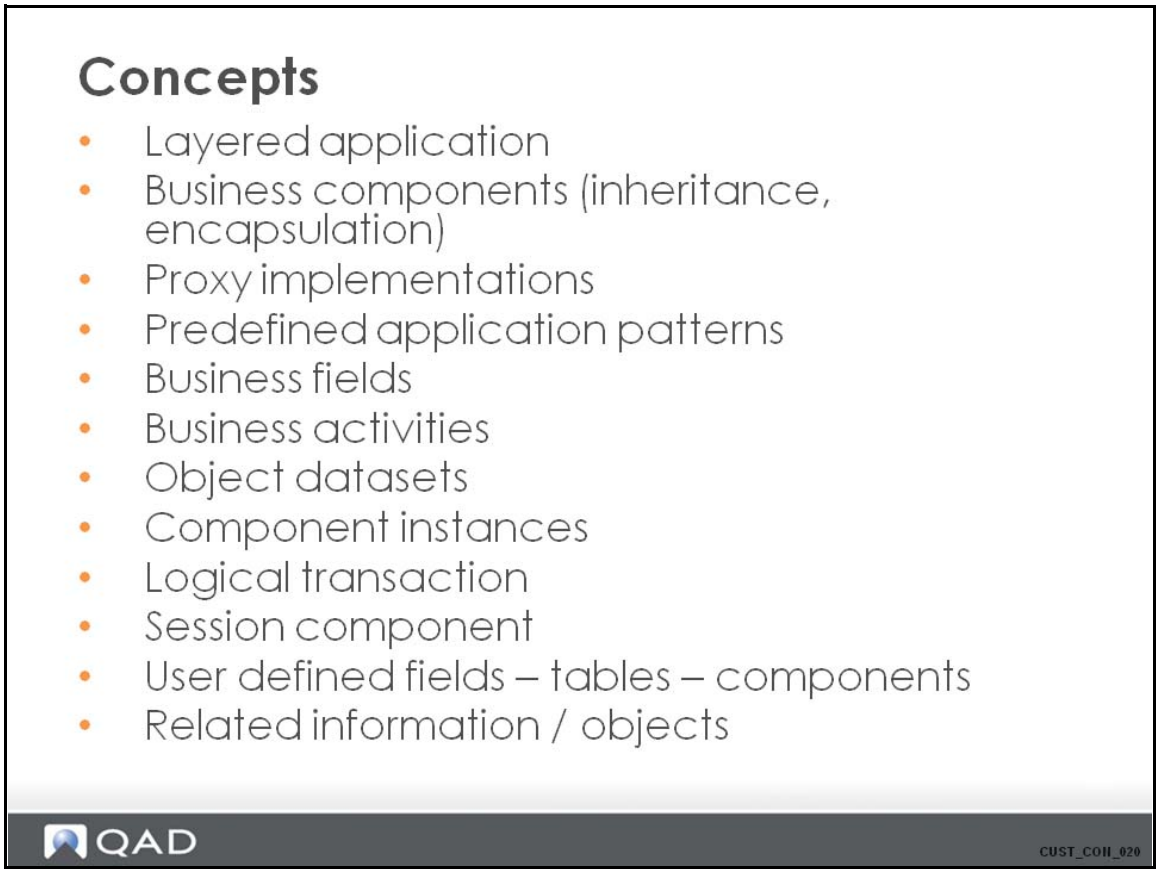


Hands-on Exercise (2)



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
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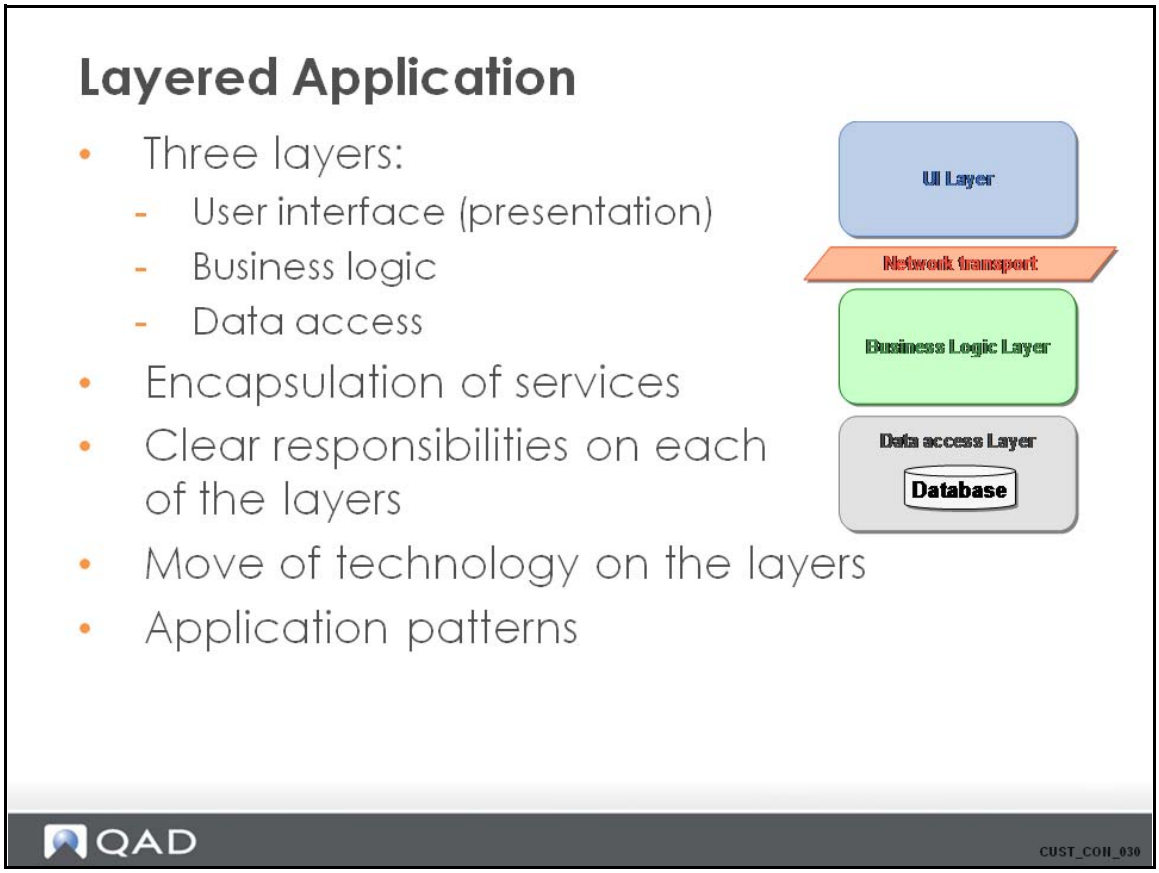
Layered Application

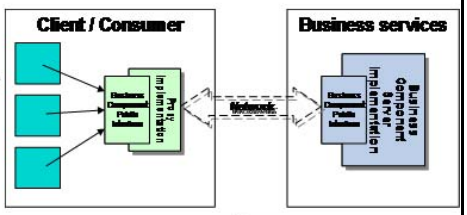


Business Components

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

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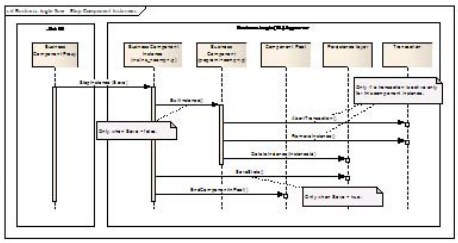
Predefined Application Patterns

Predefined Application Patterns

Provide predefined 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 of lower level patterns:
  - Instantiation of components
  - Error processing

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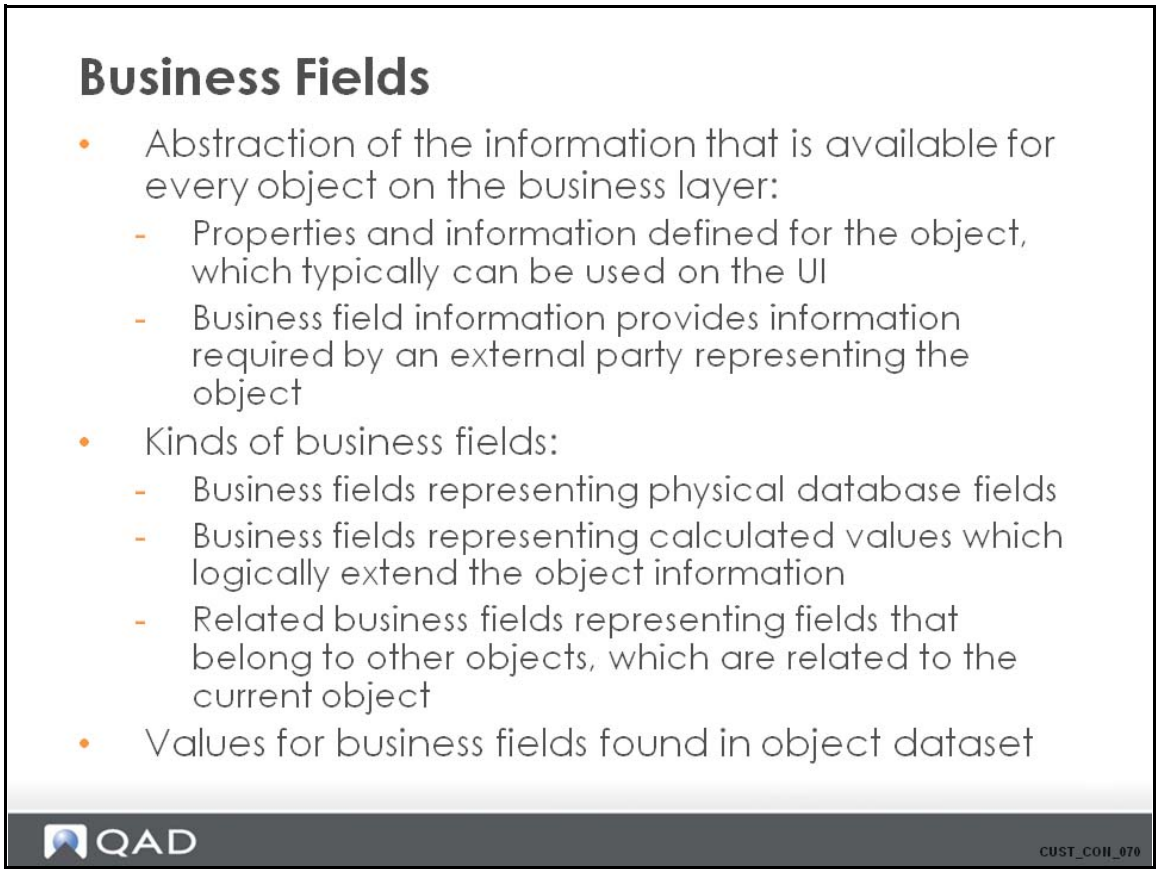
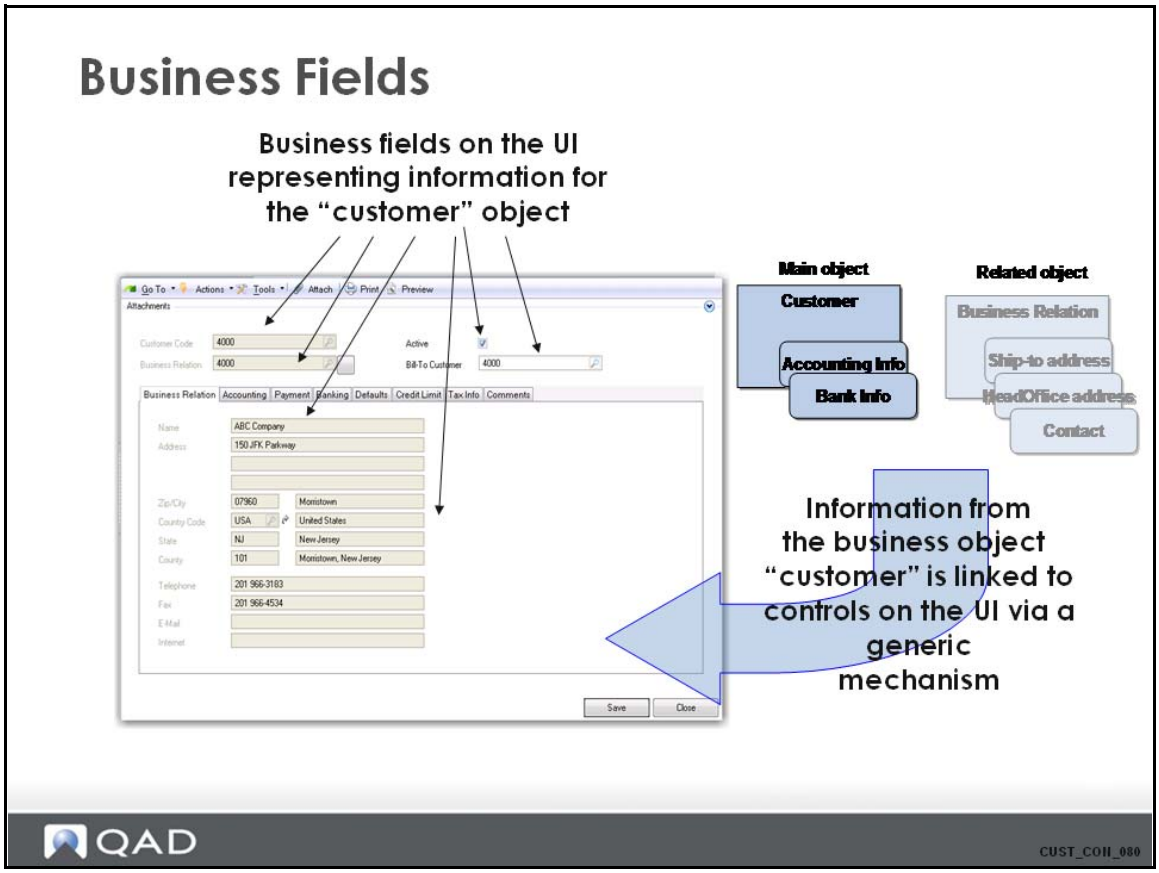
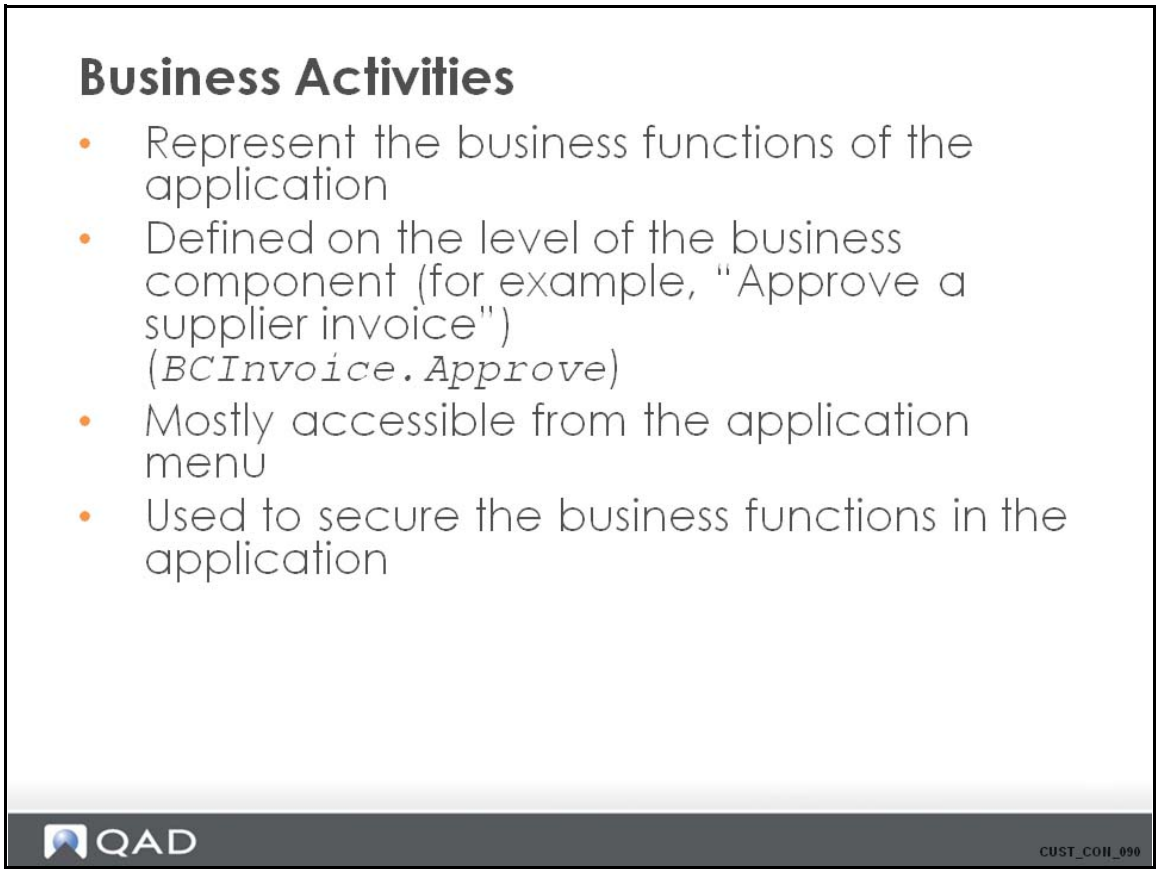
Business Fields



Business Fields 2



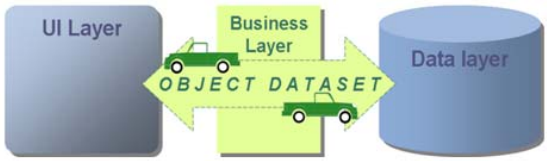
Business Activities



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...)

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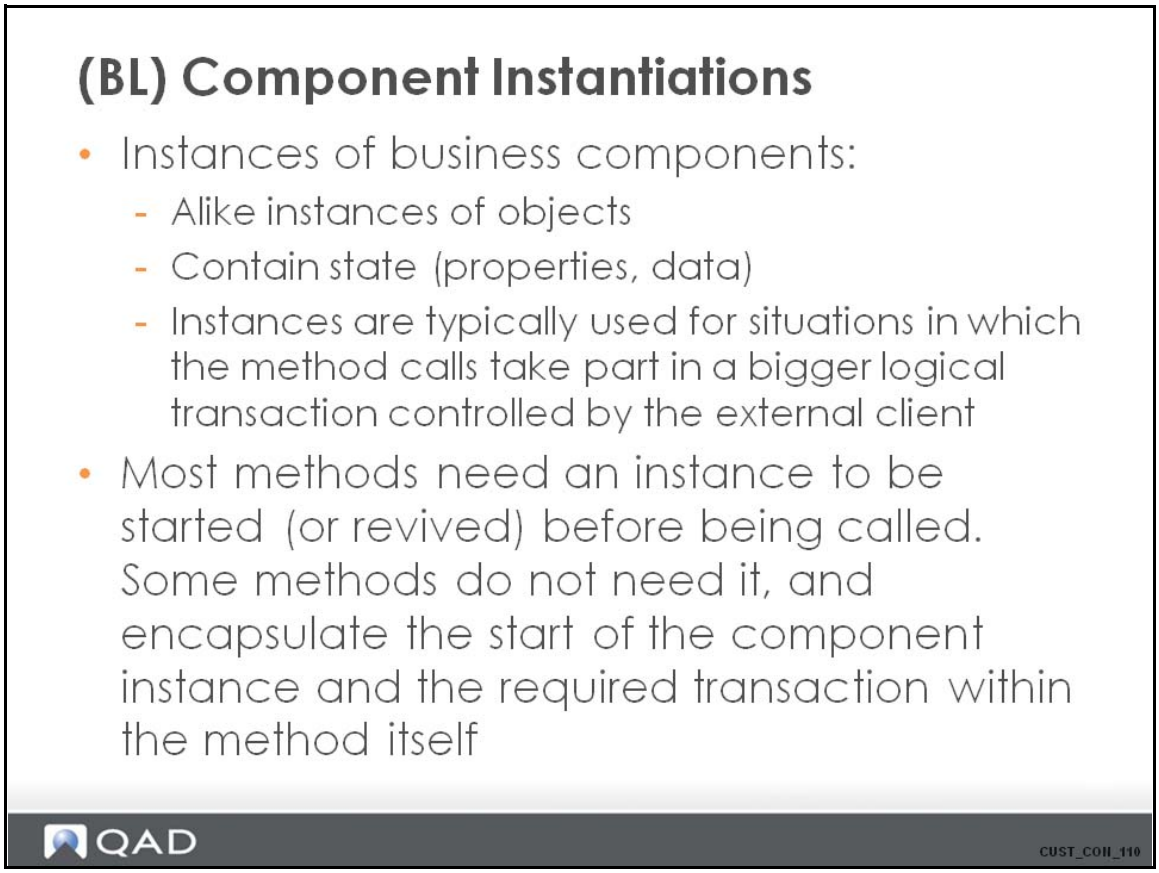
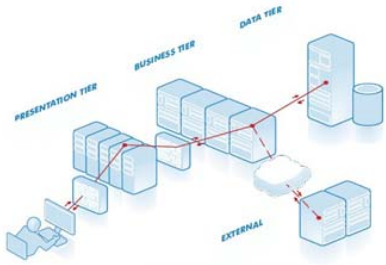
(BL) Component Instantiations



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

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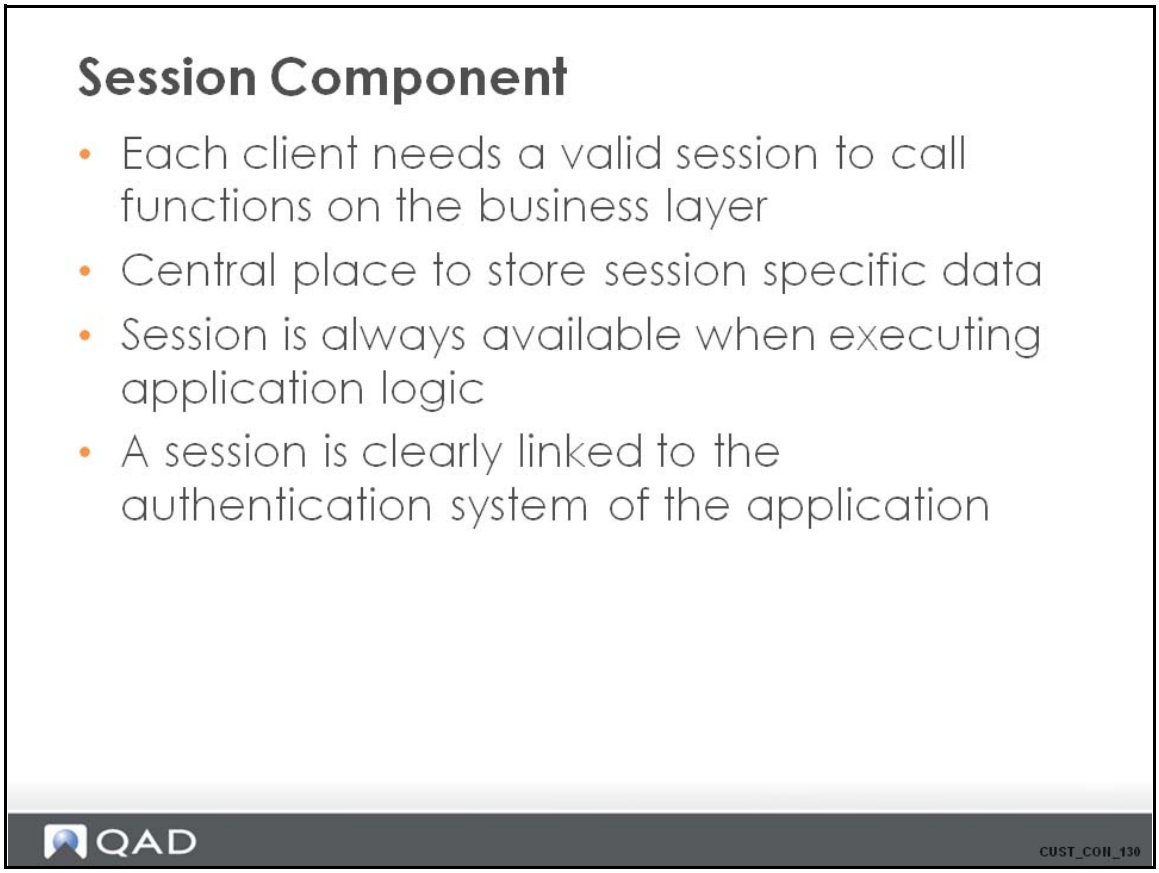
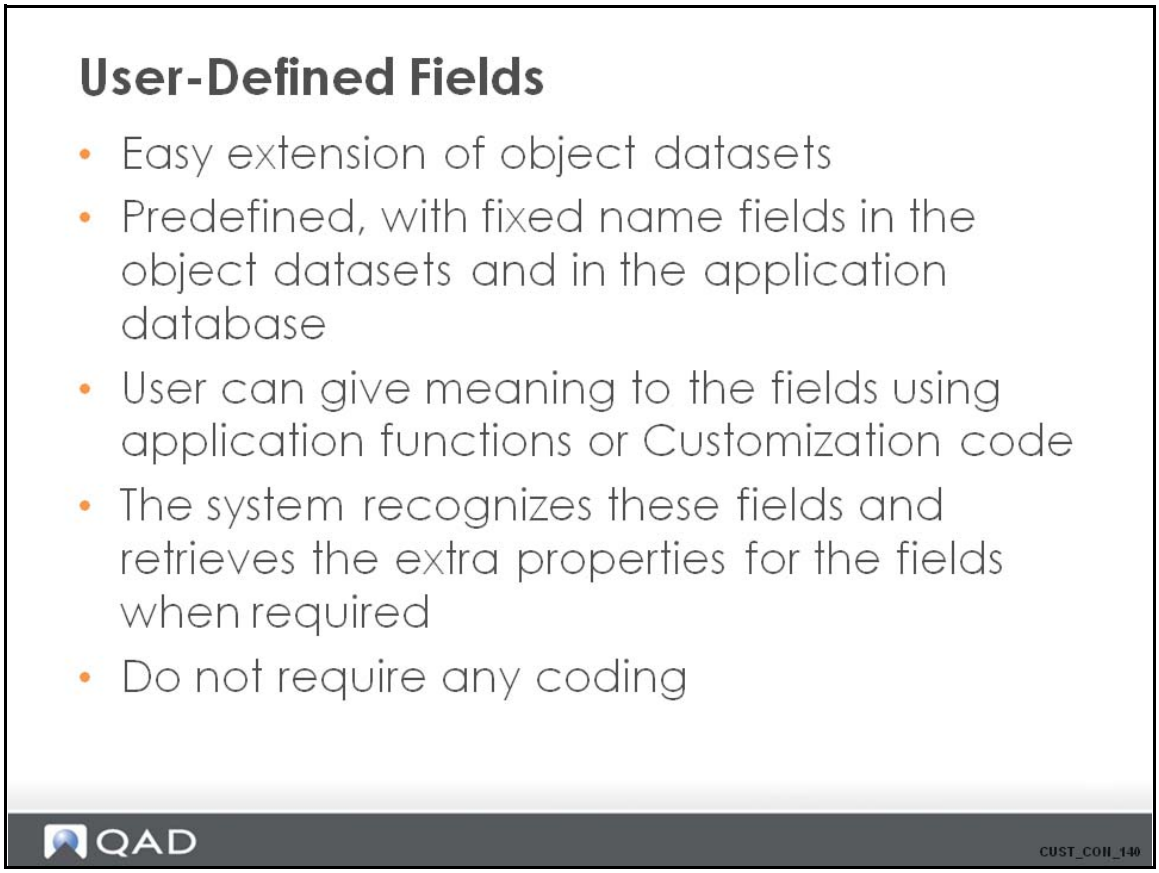
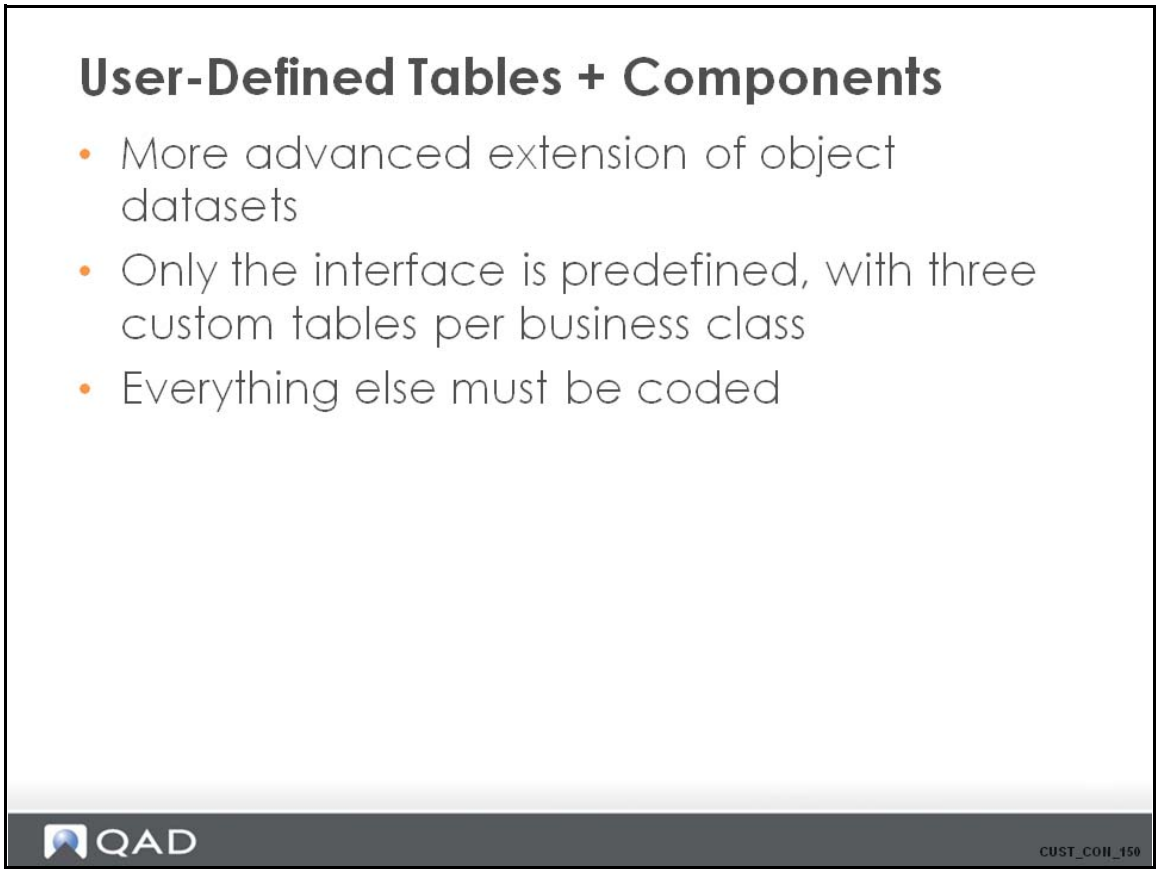
Session Component



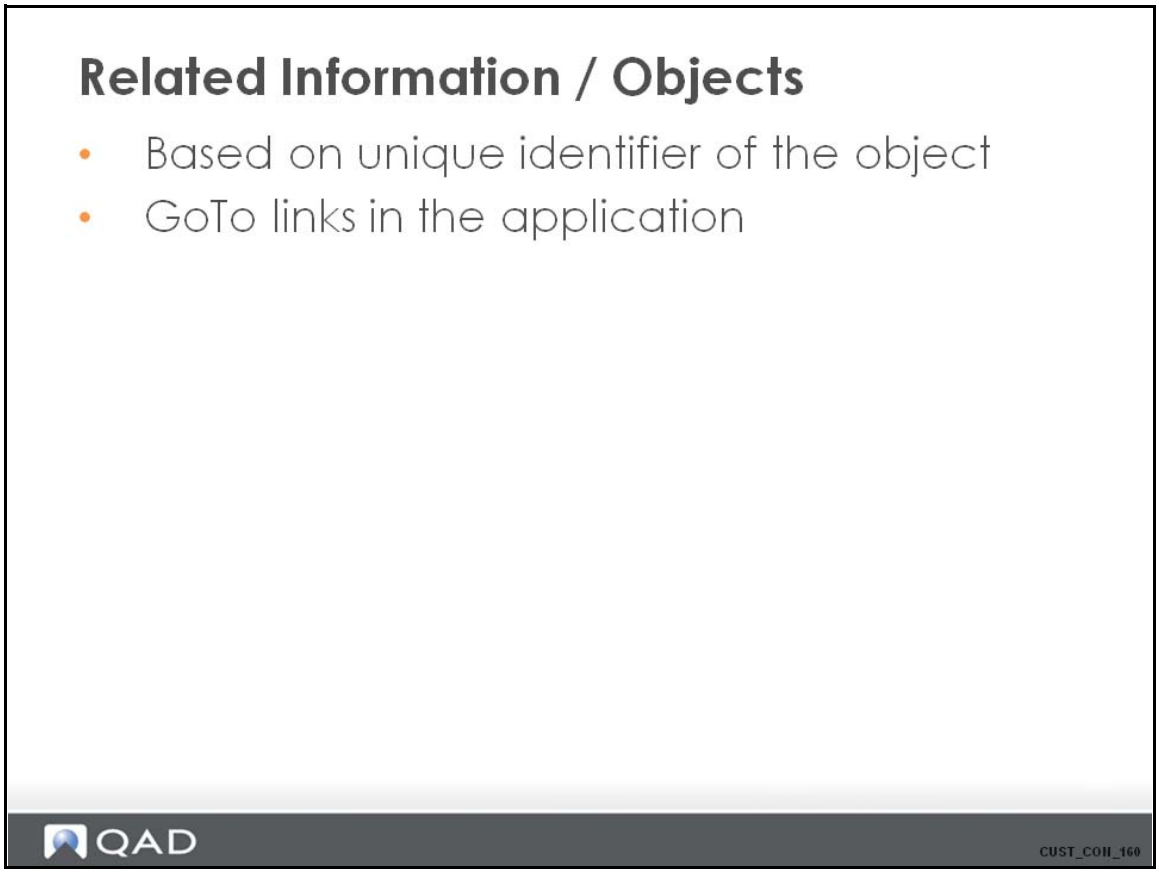
User-Defined Fields



User-Defined Tables + Components

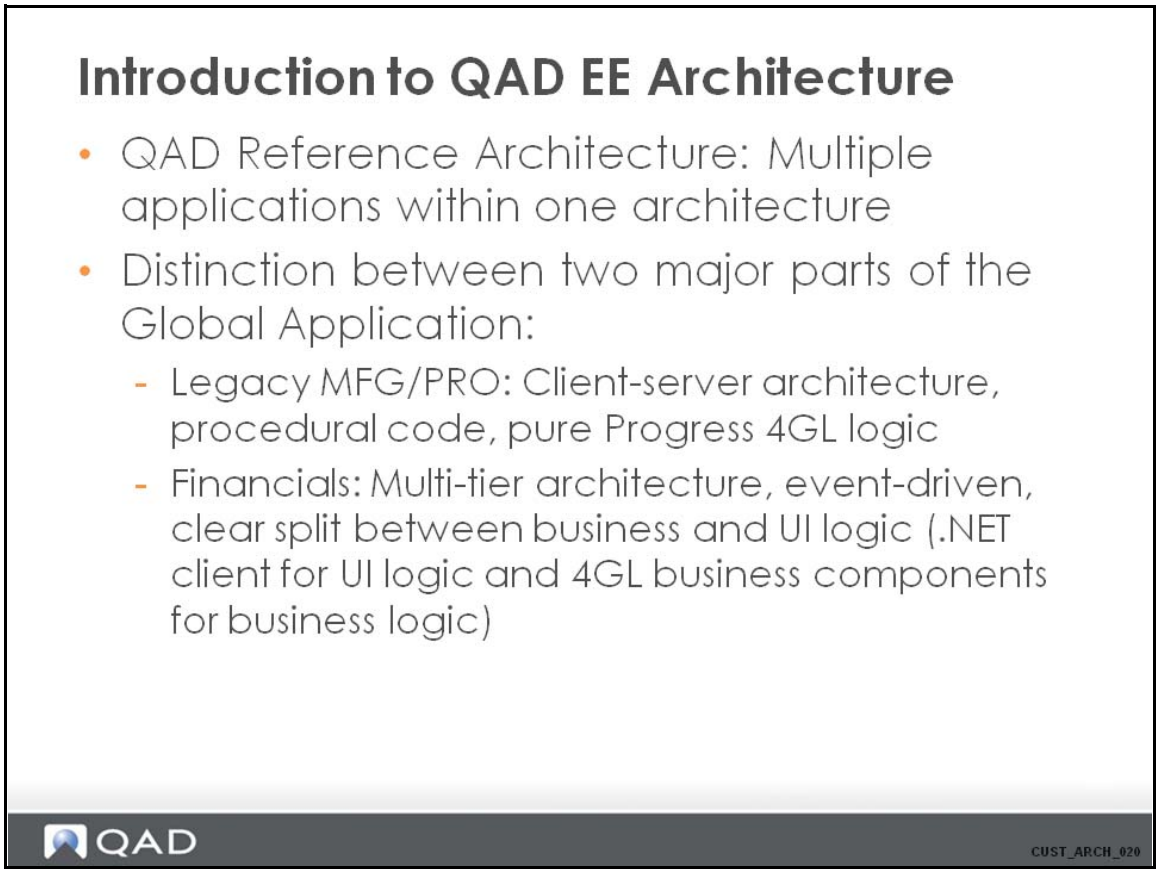


Related Information / Objects

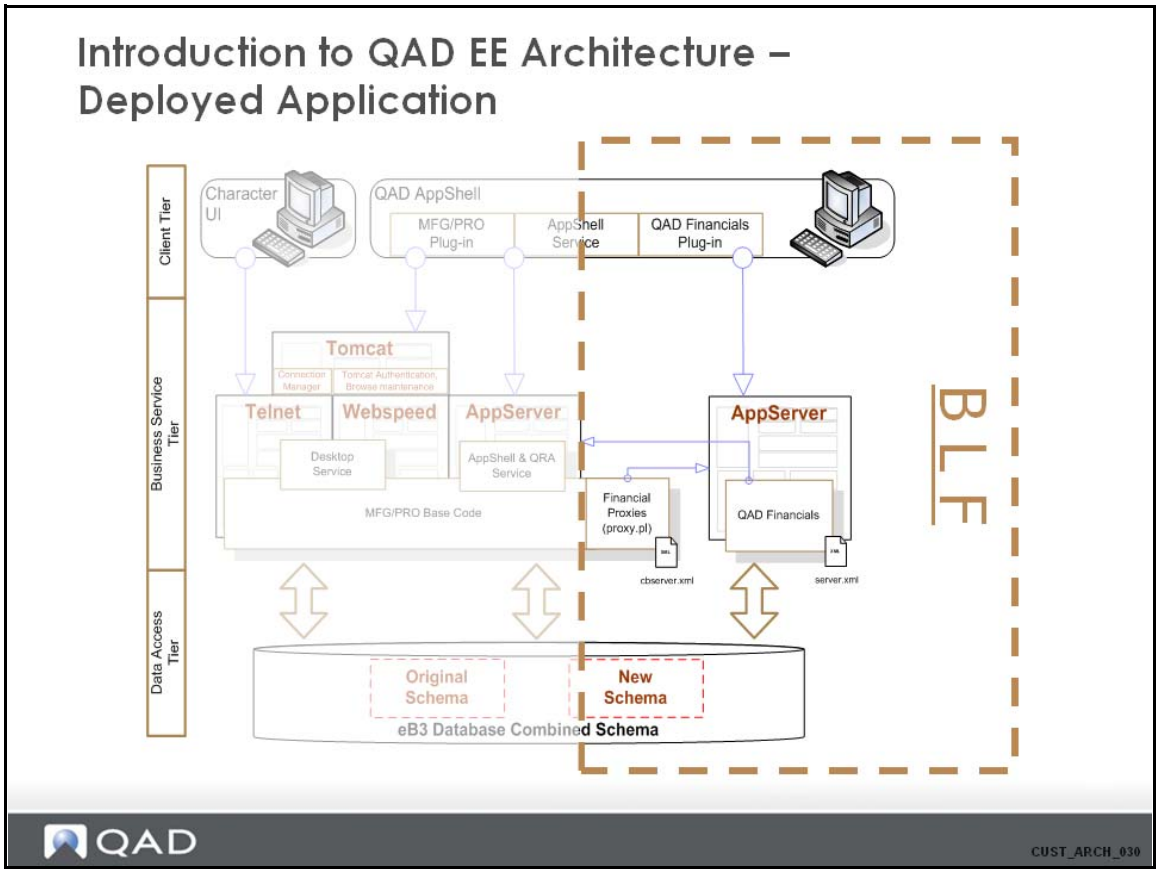


Non-instrusive Customization: Architecture

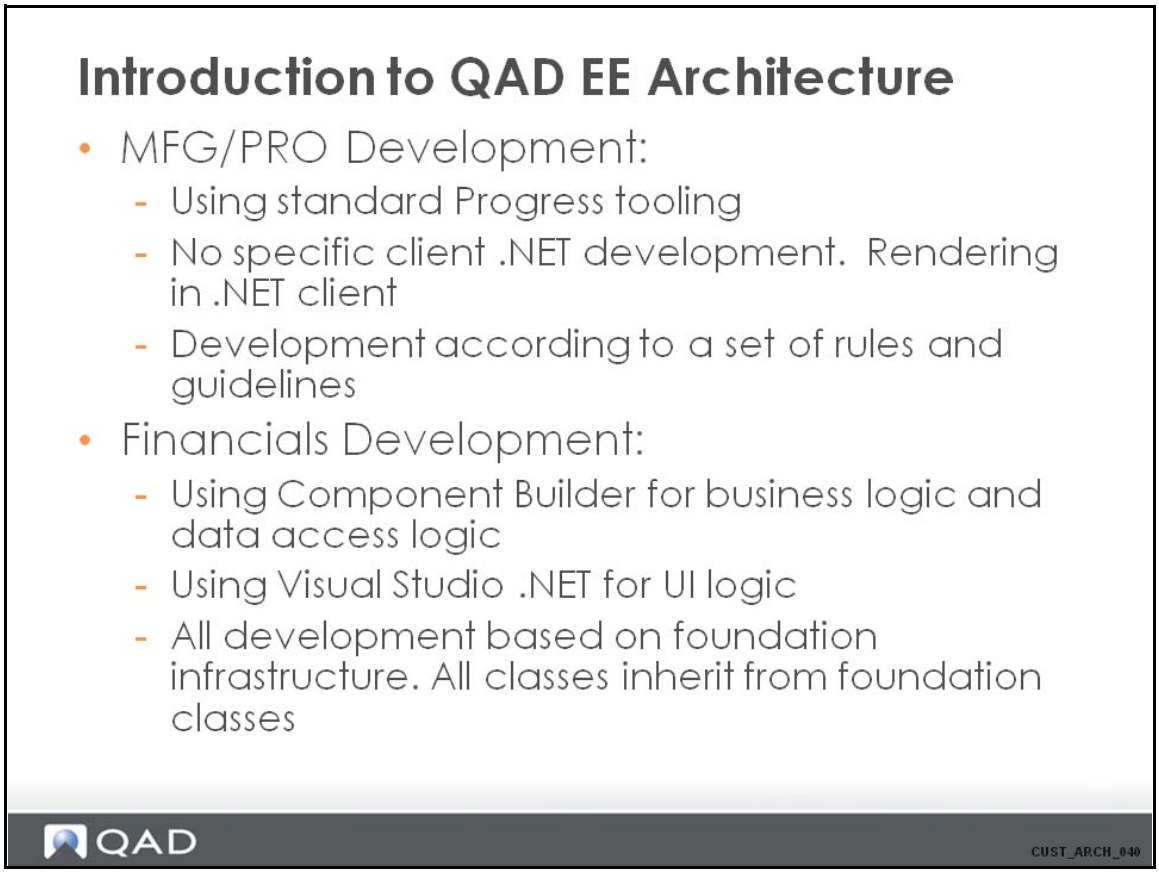
Introduction to QAD EE Architecture



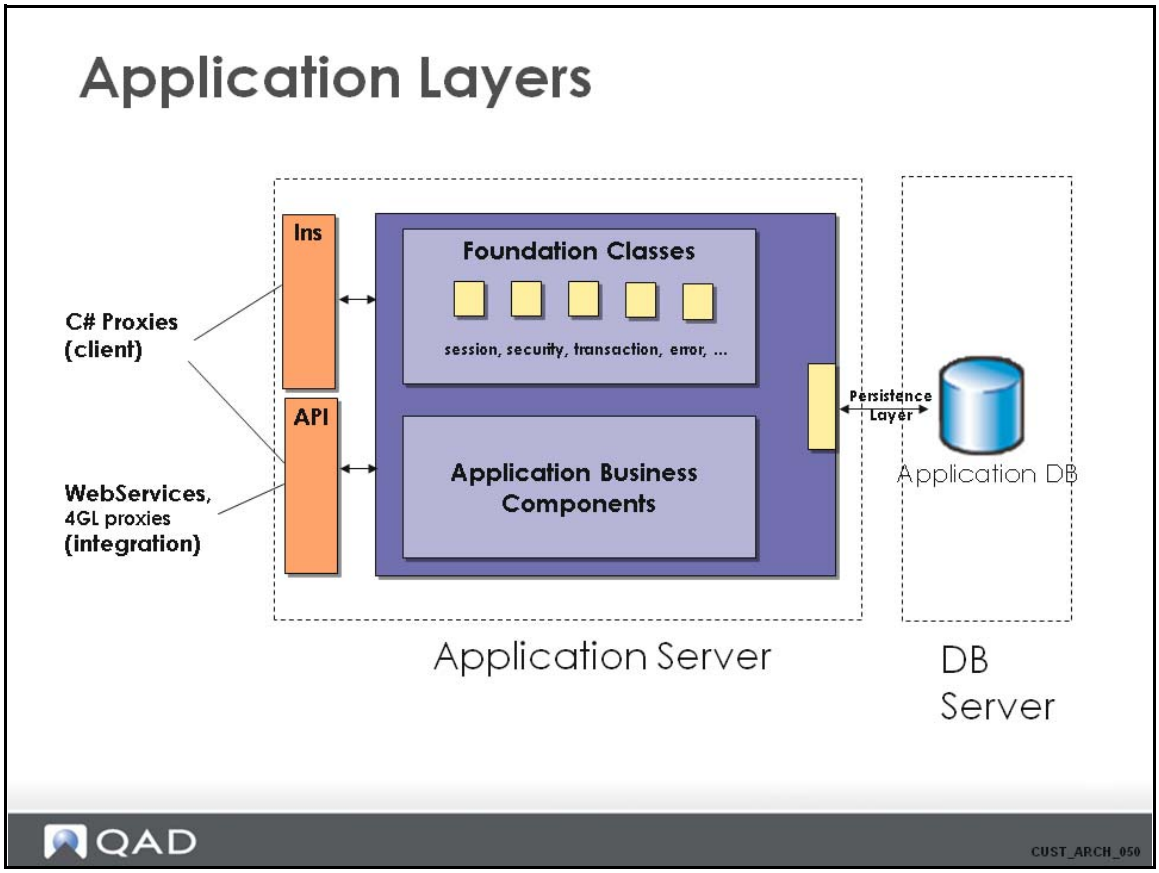
Introduction to QAD EE Architecture 2



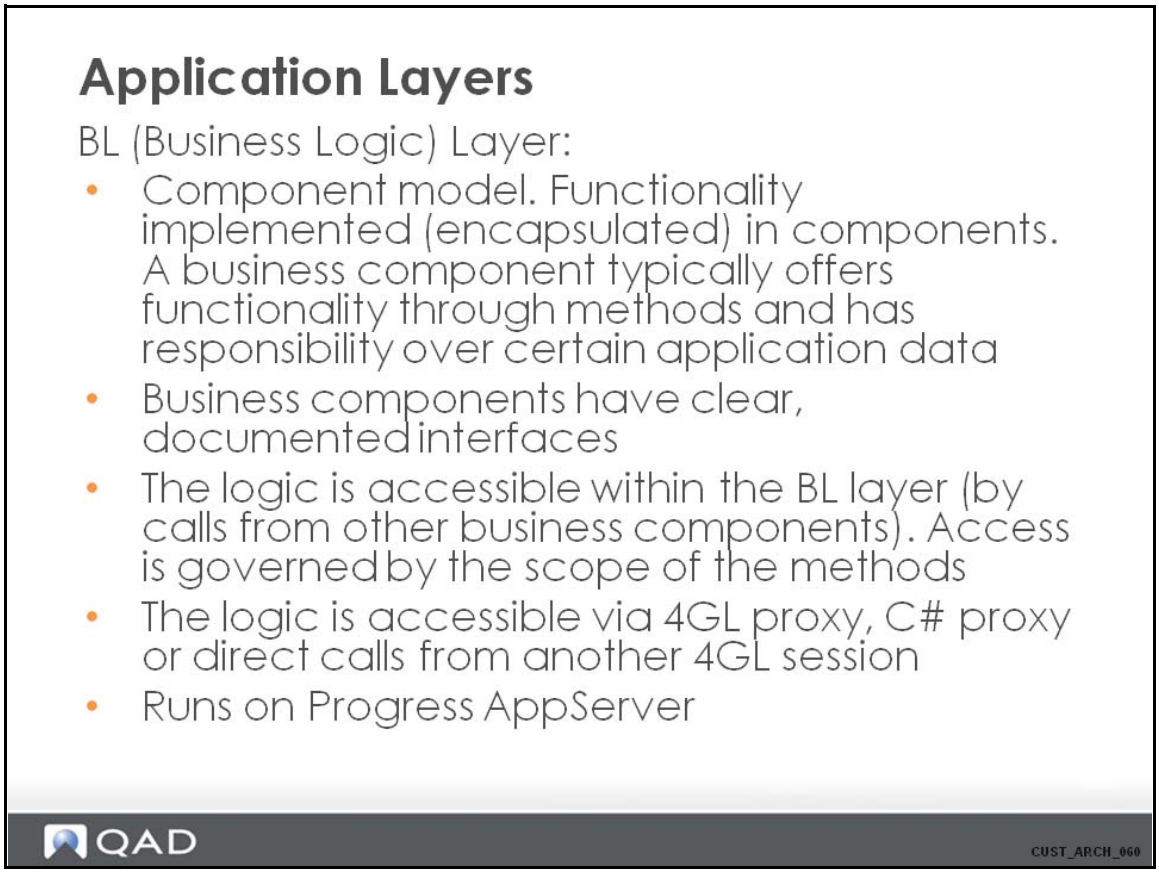
Introduction to QAD EE Architecture 3



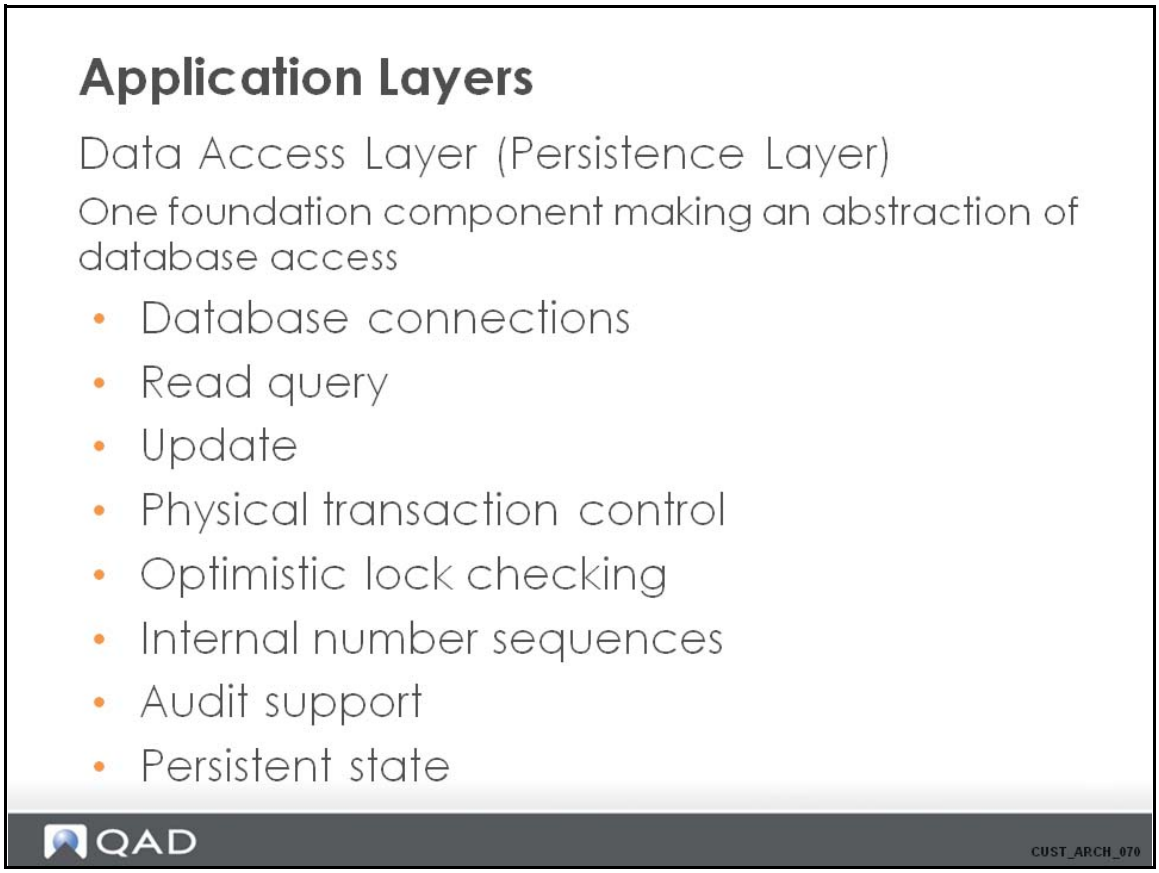
Application Layers



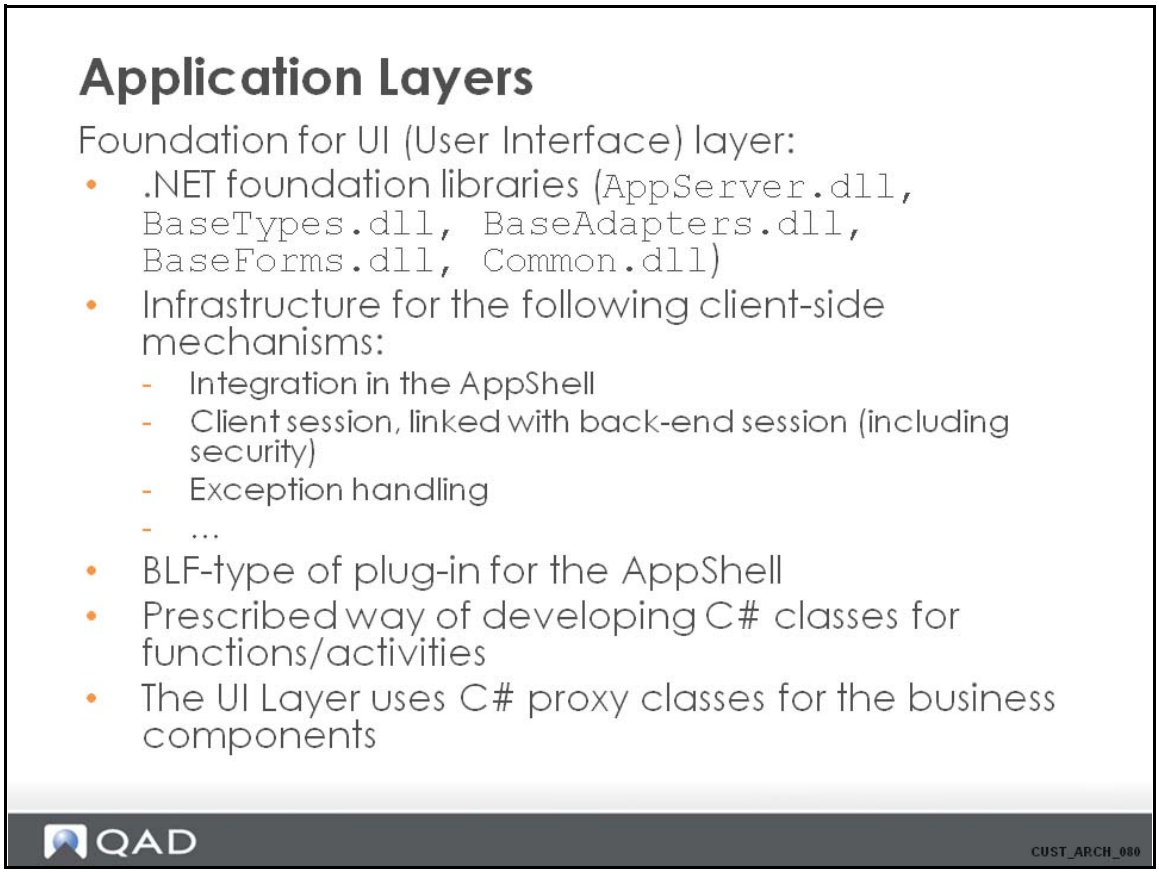
Application Layers 2



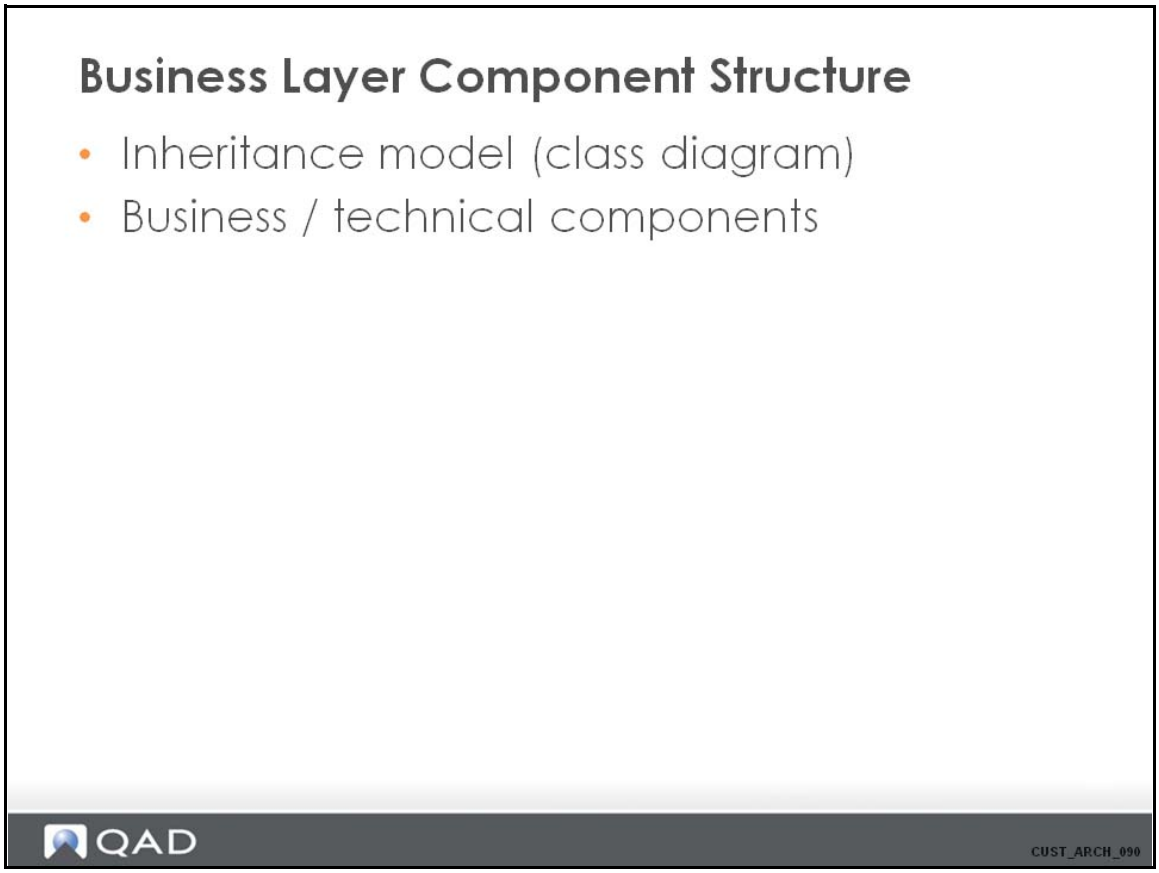
Application Layers 3



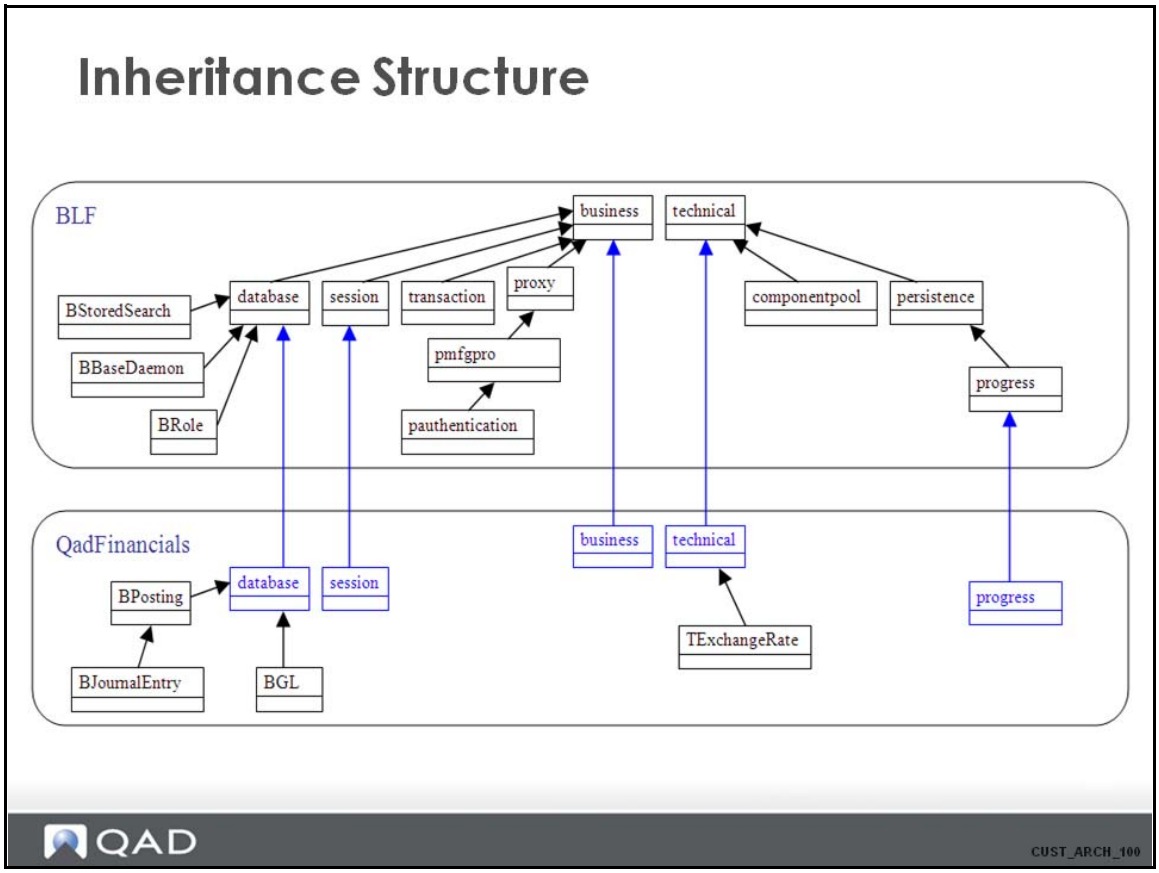
Application Layers 4



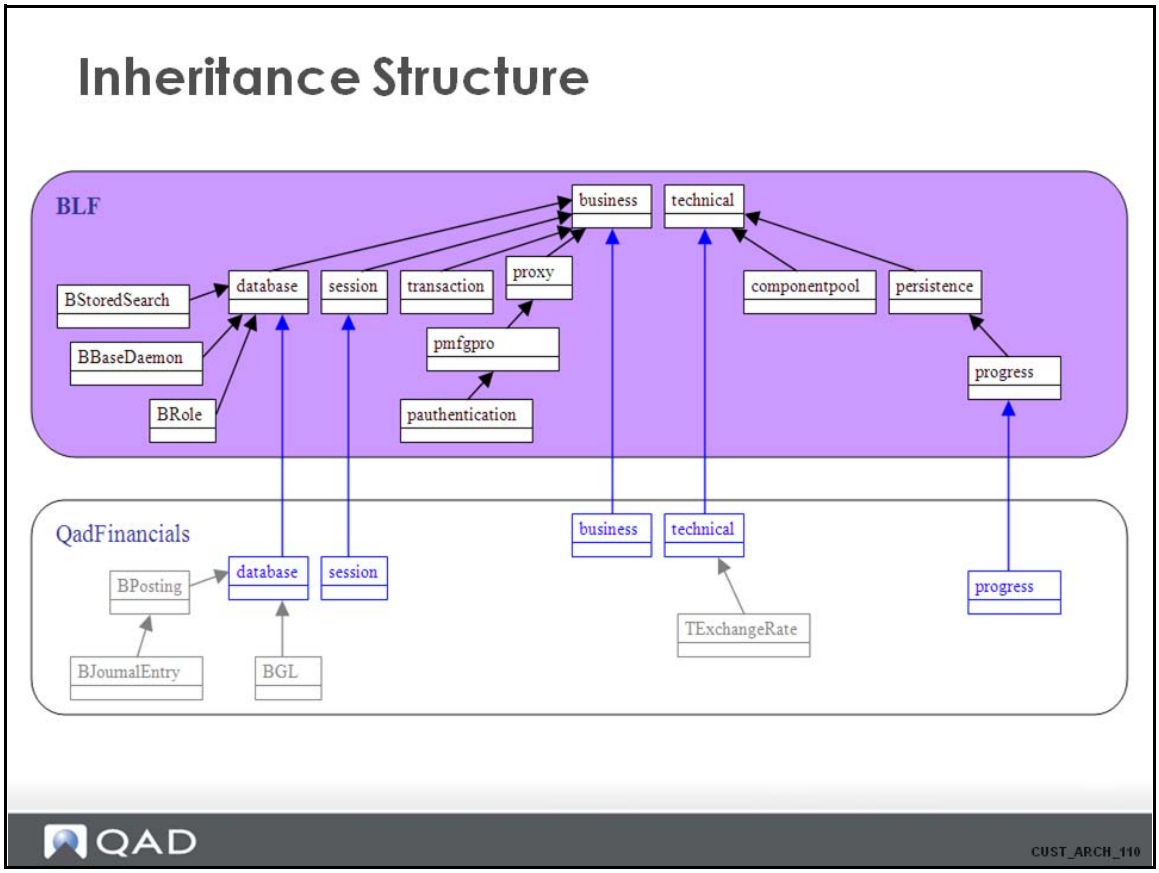
Business Layer Component Structure



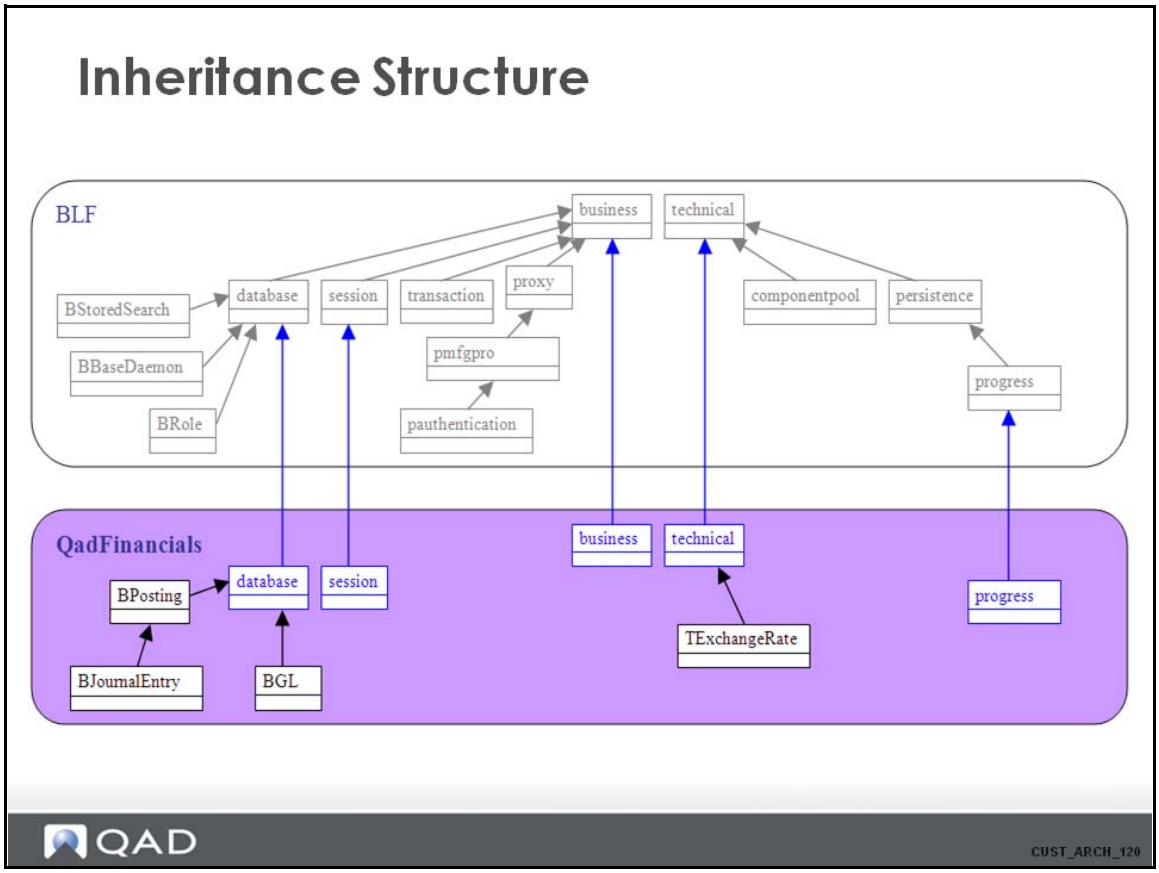
Inheritance Structure



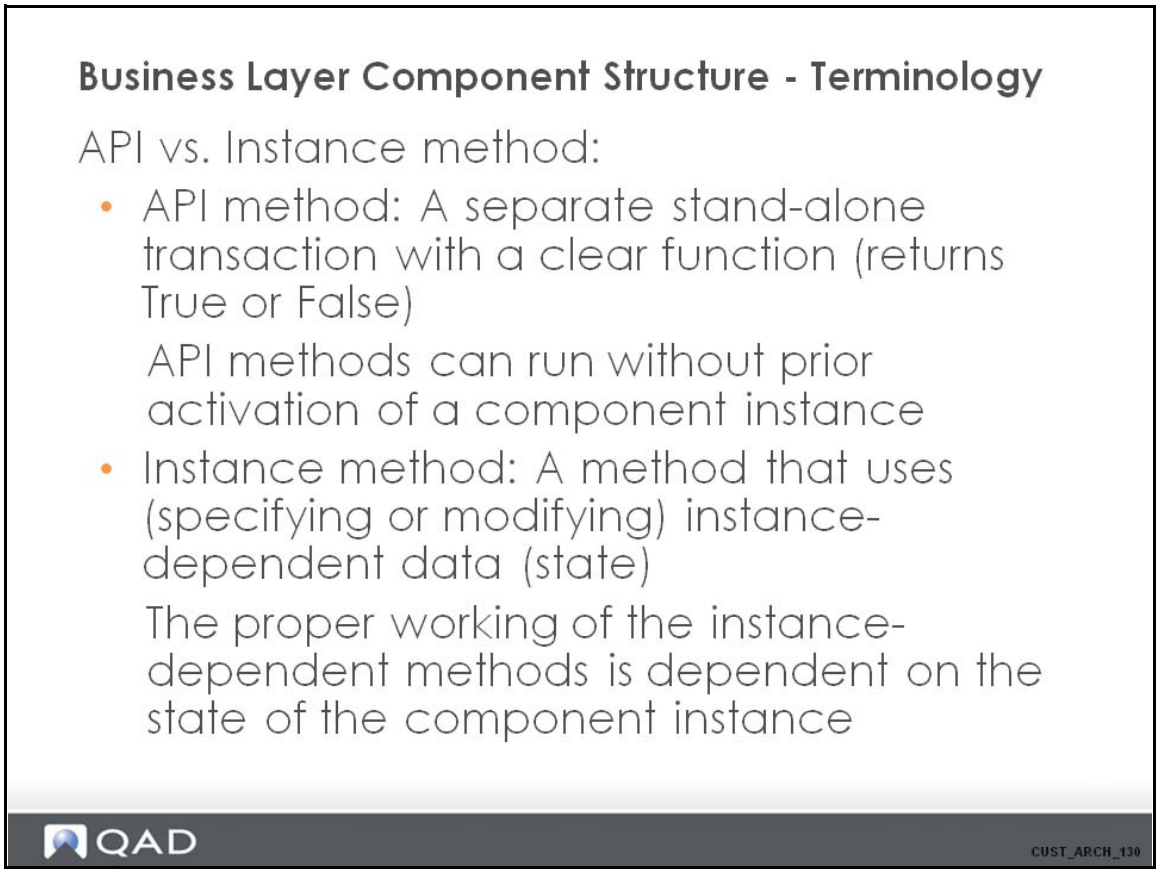
Inheritance Structure 2



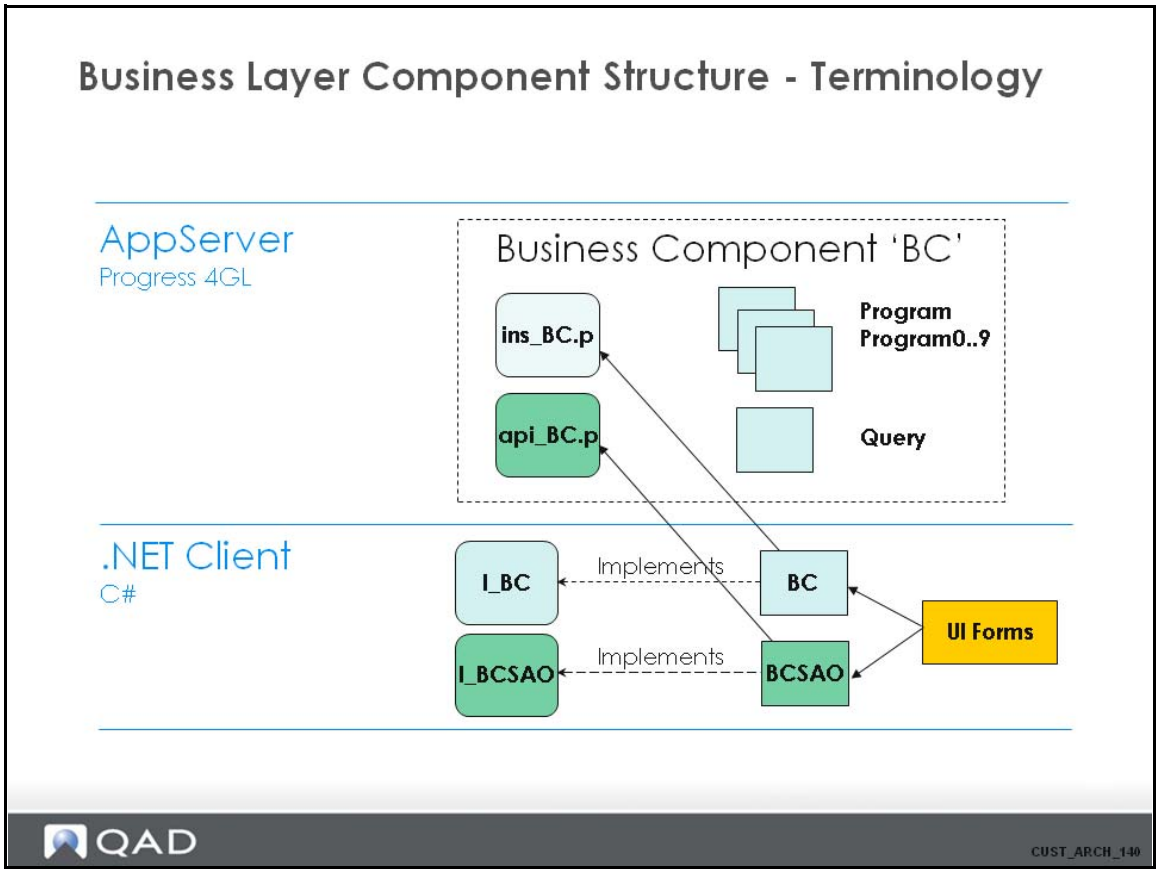
Inheritance Structure 3



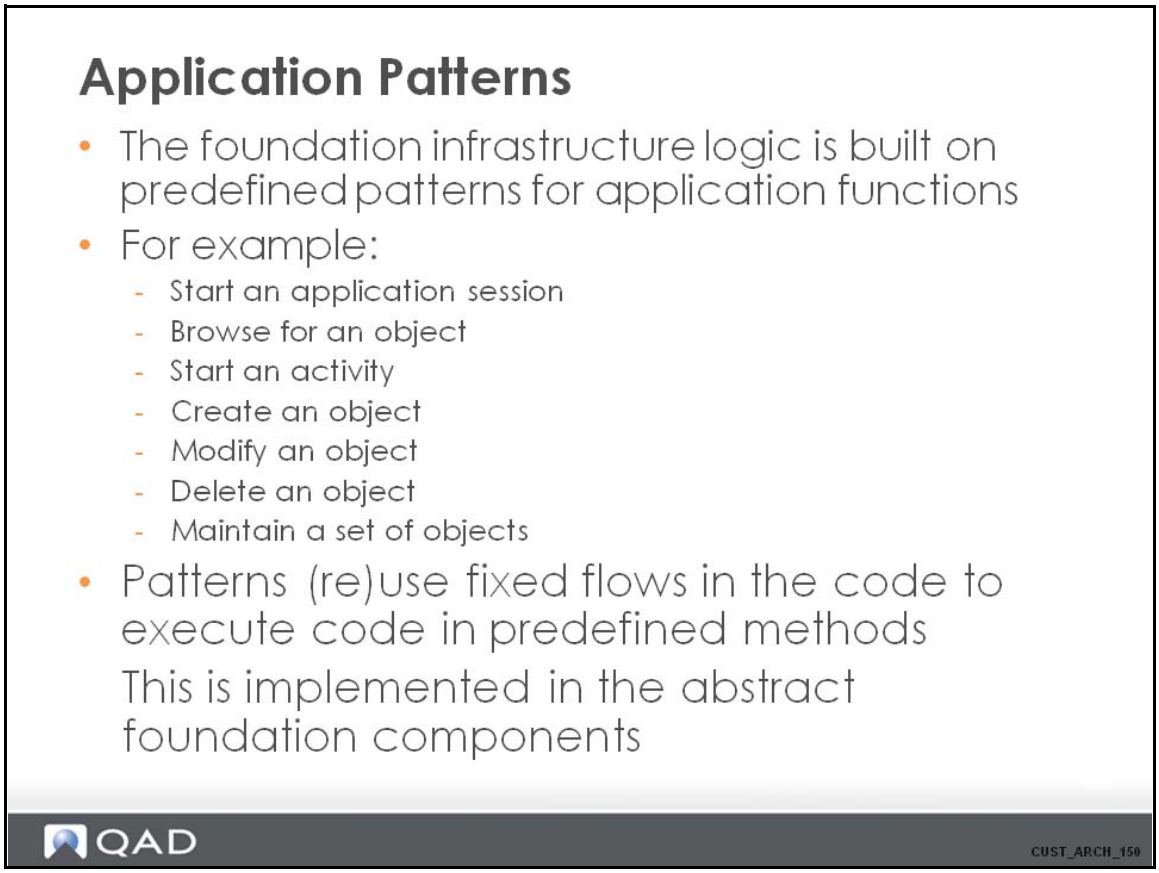
Business Layer Component Structure - Terminology



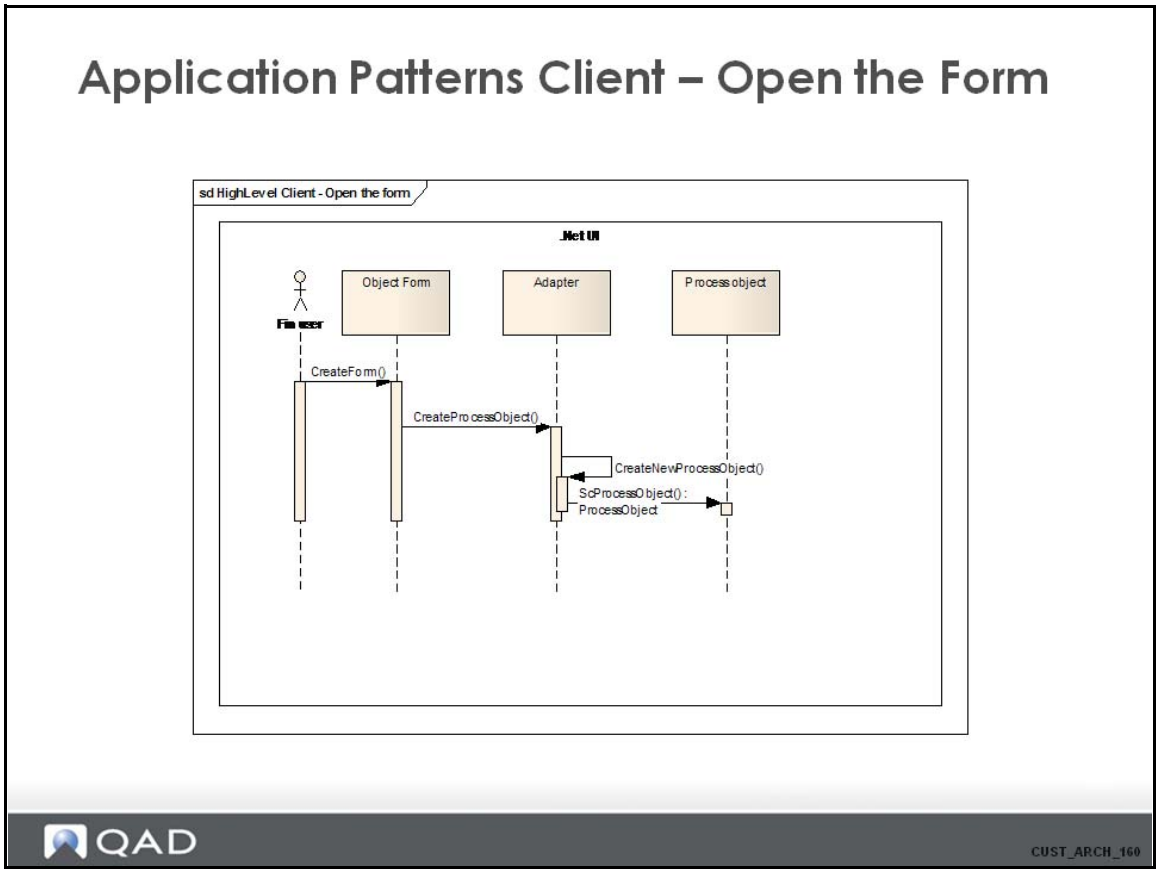
Business Layer Component Structure - Terminology 2



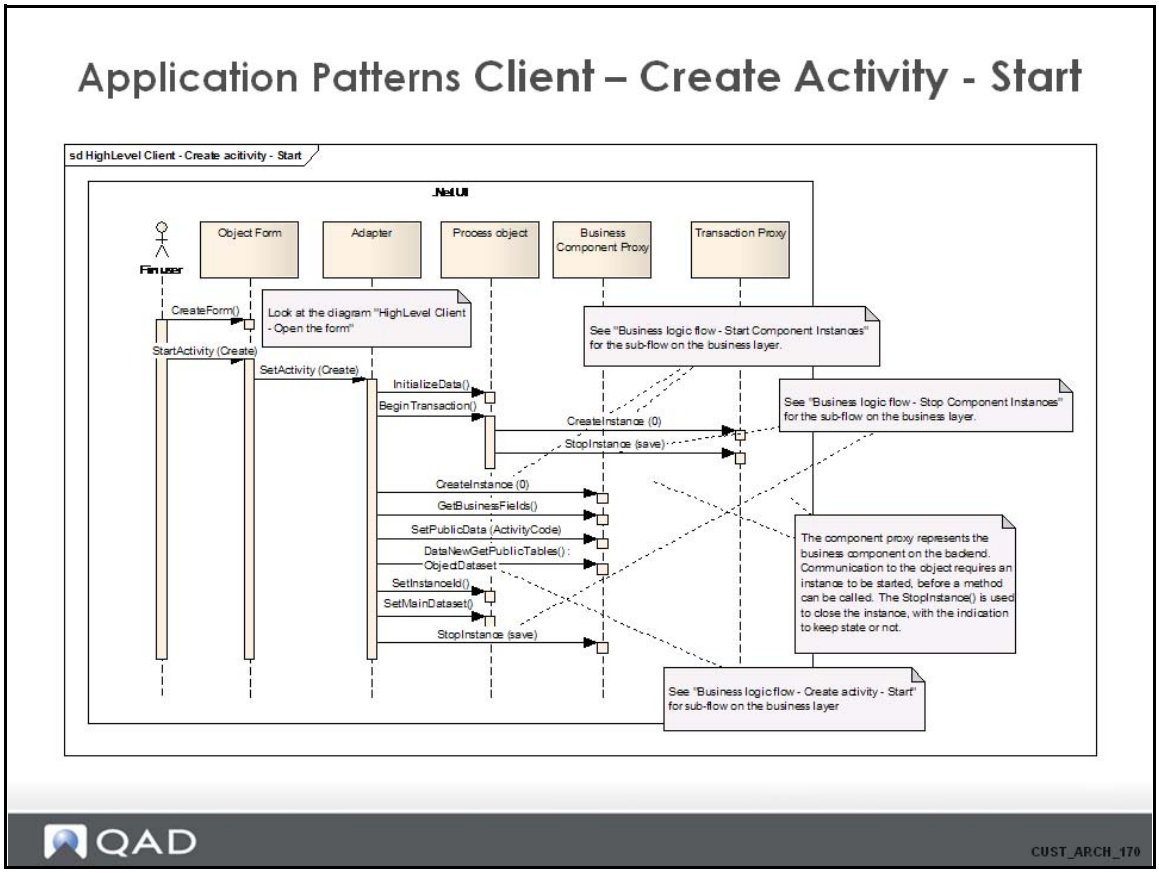
Application Patterns Overview



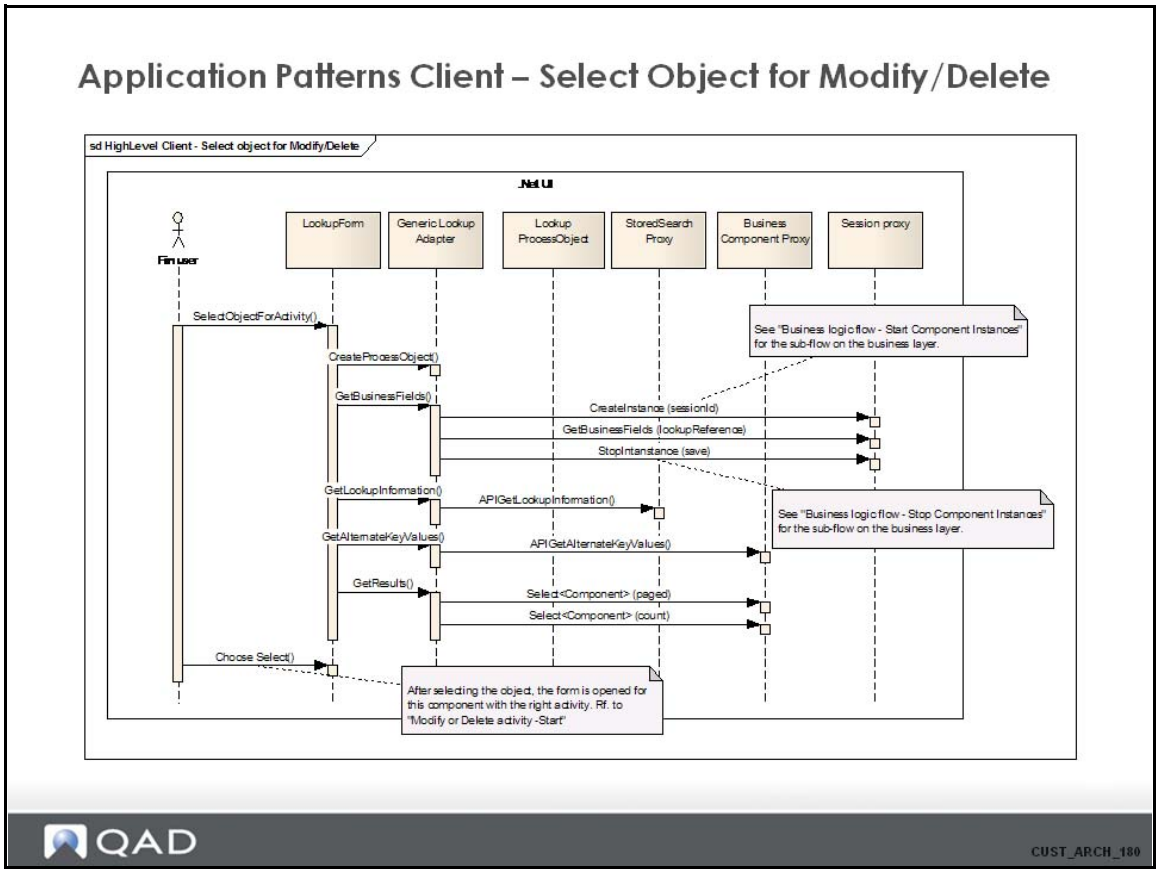
Application Patterns Client



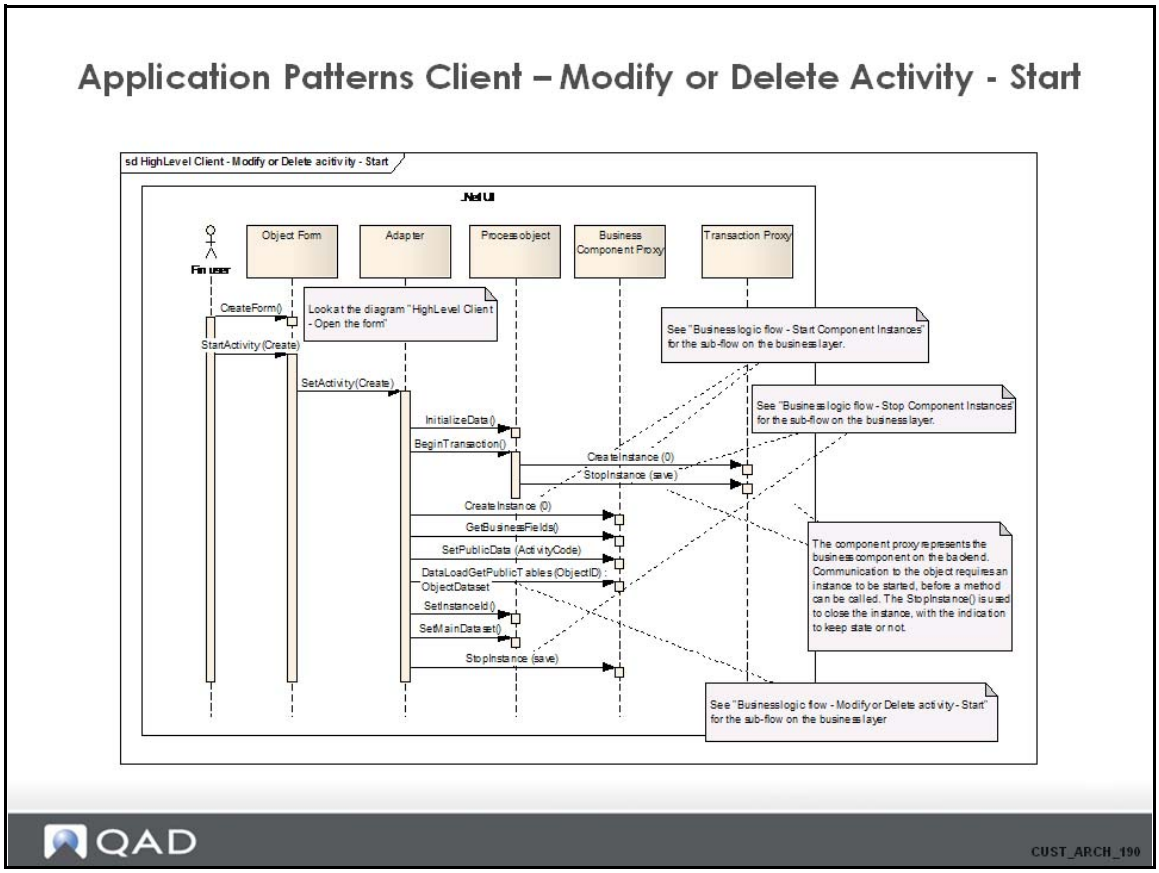
Application Patterns Client 2



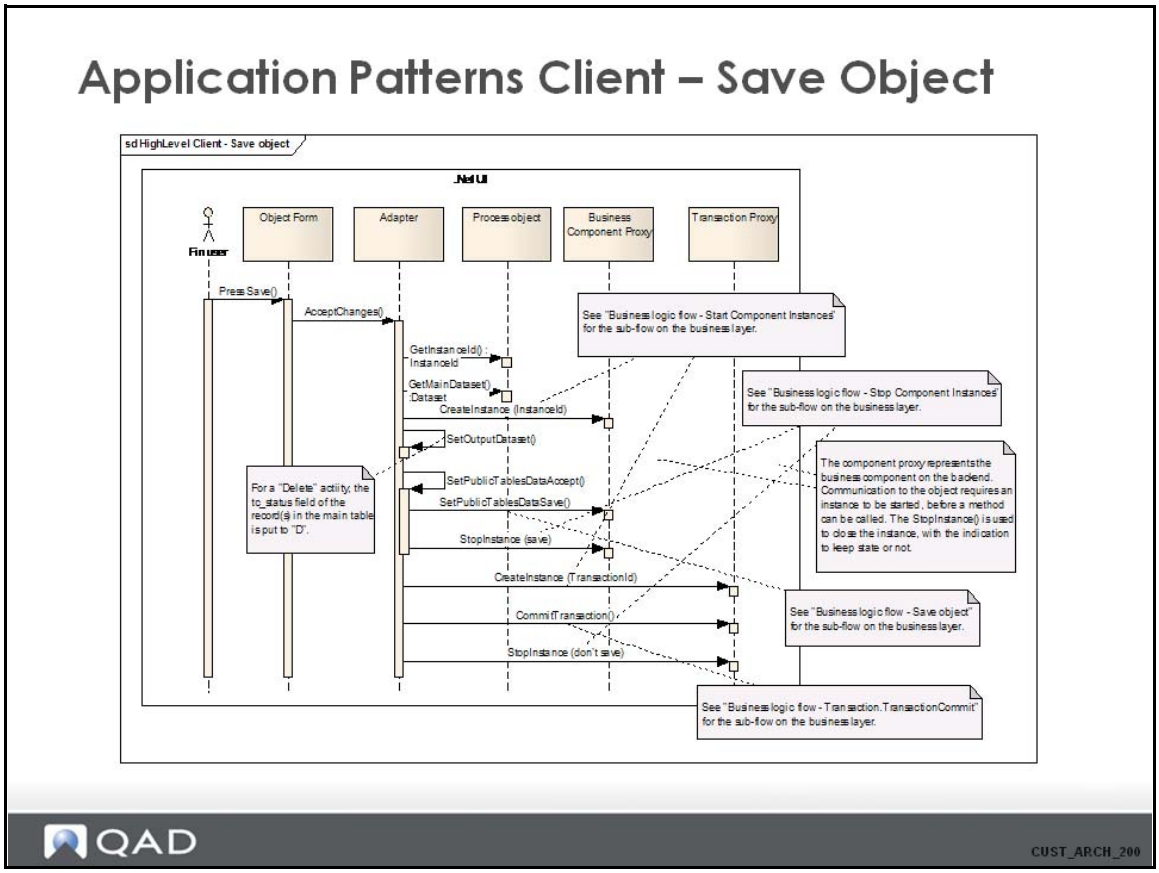
Application Patterns Client 3



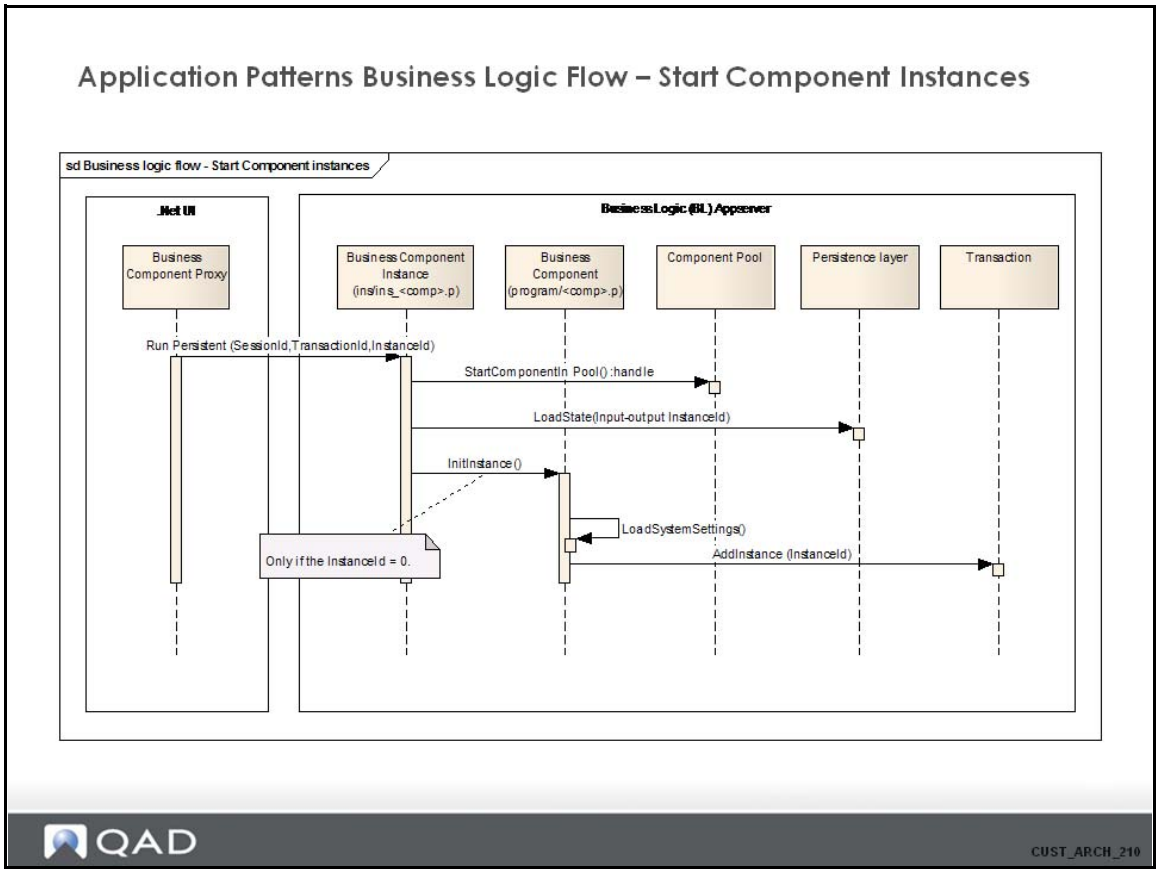
Application Patterns Client 4



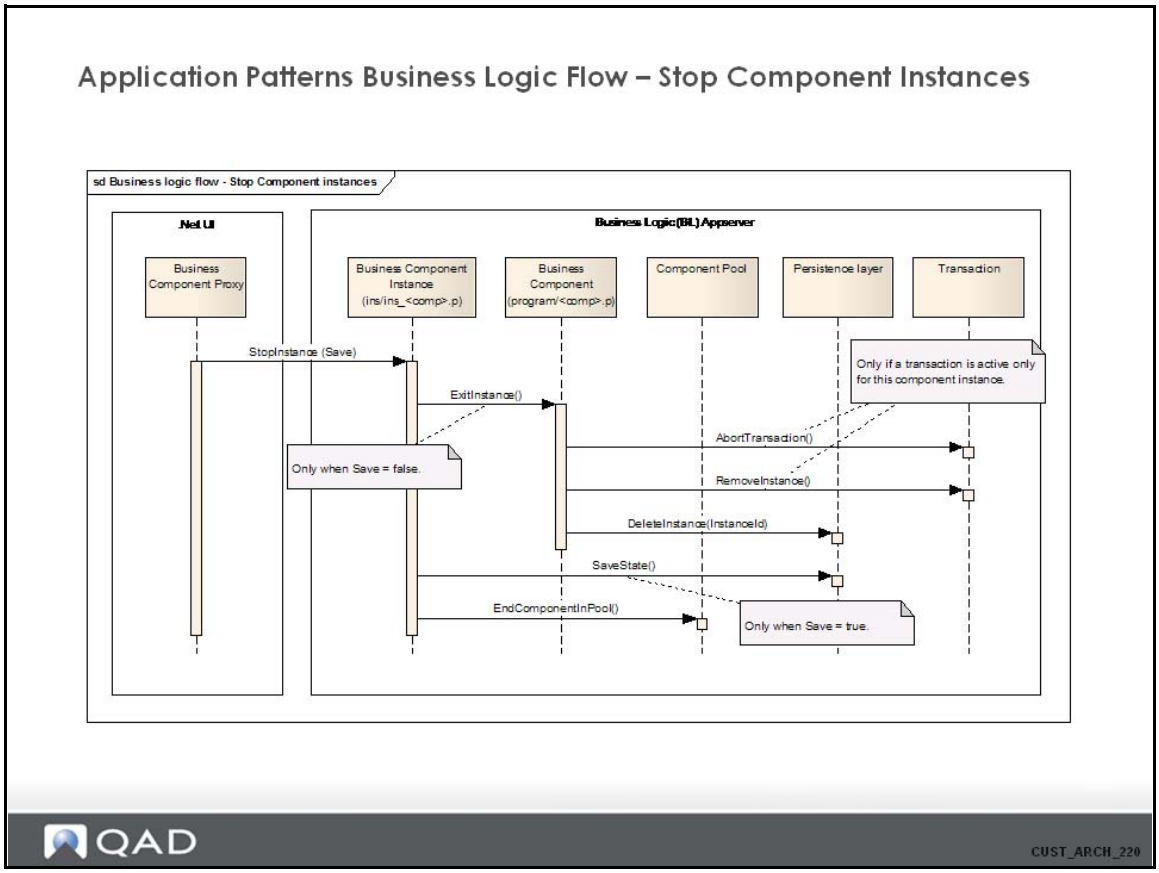
Application Patterns Client 5



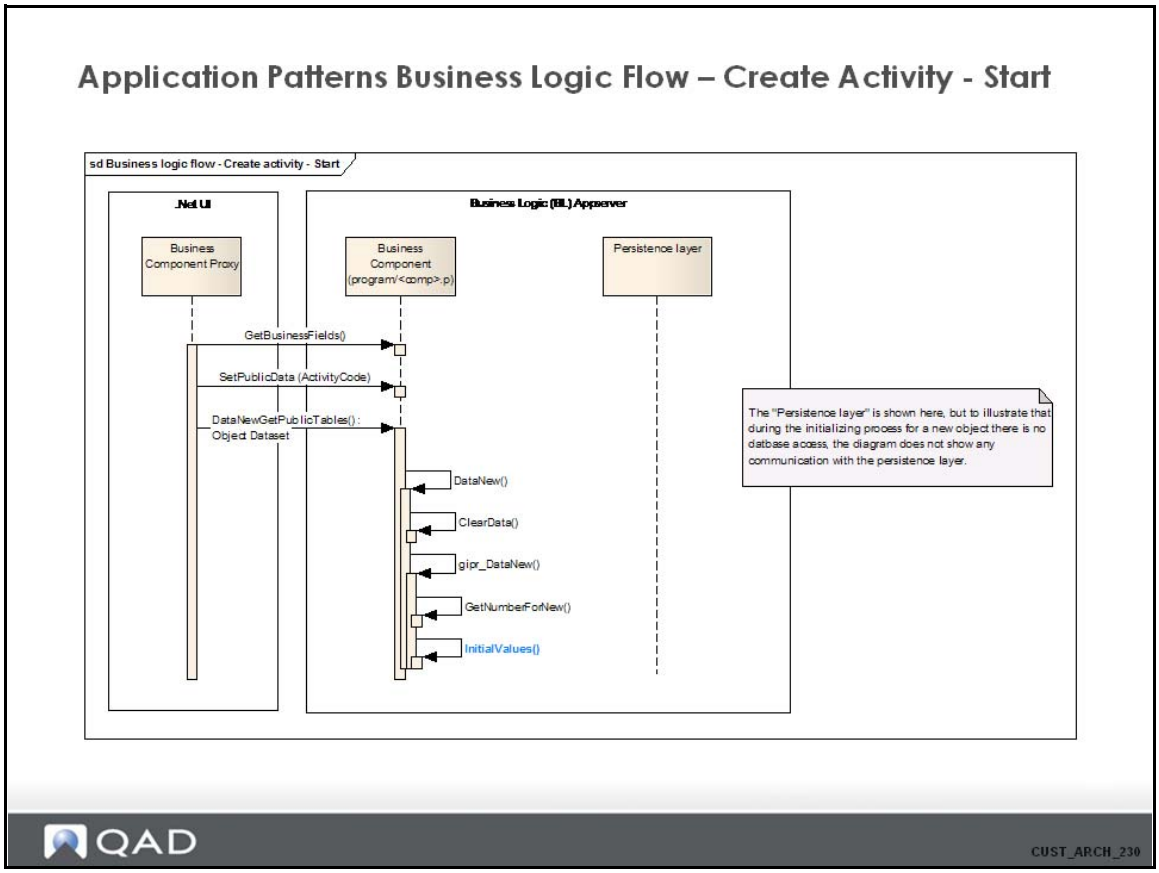
Application Patterns Business Logic Flow



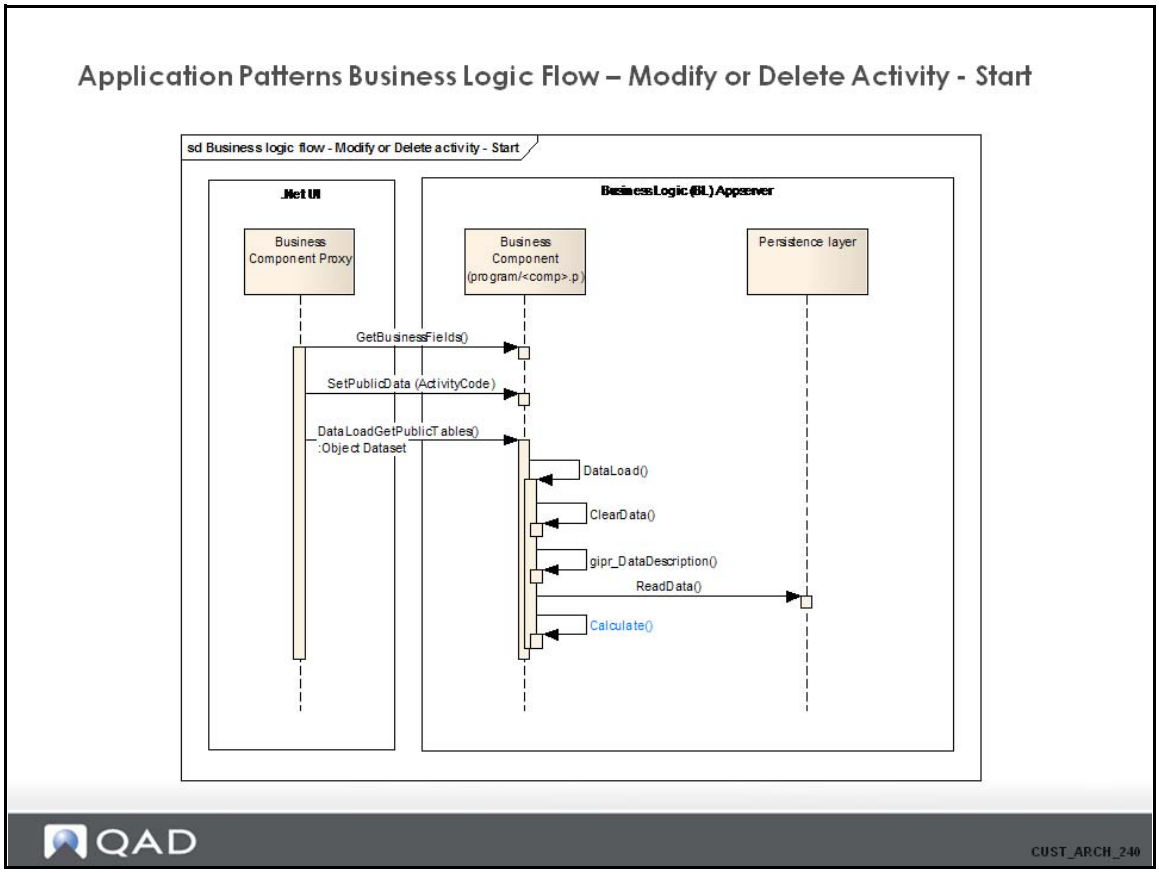
Application Patterns Business Logic Flow 2



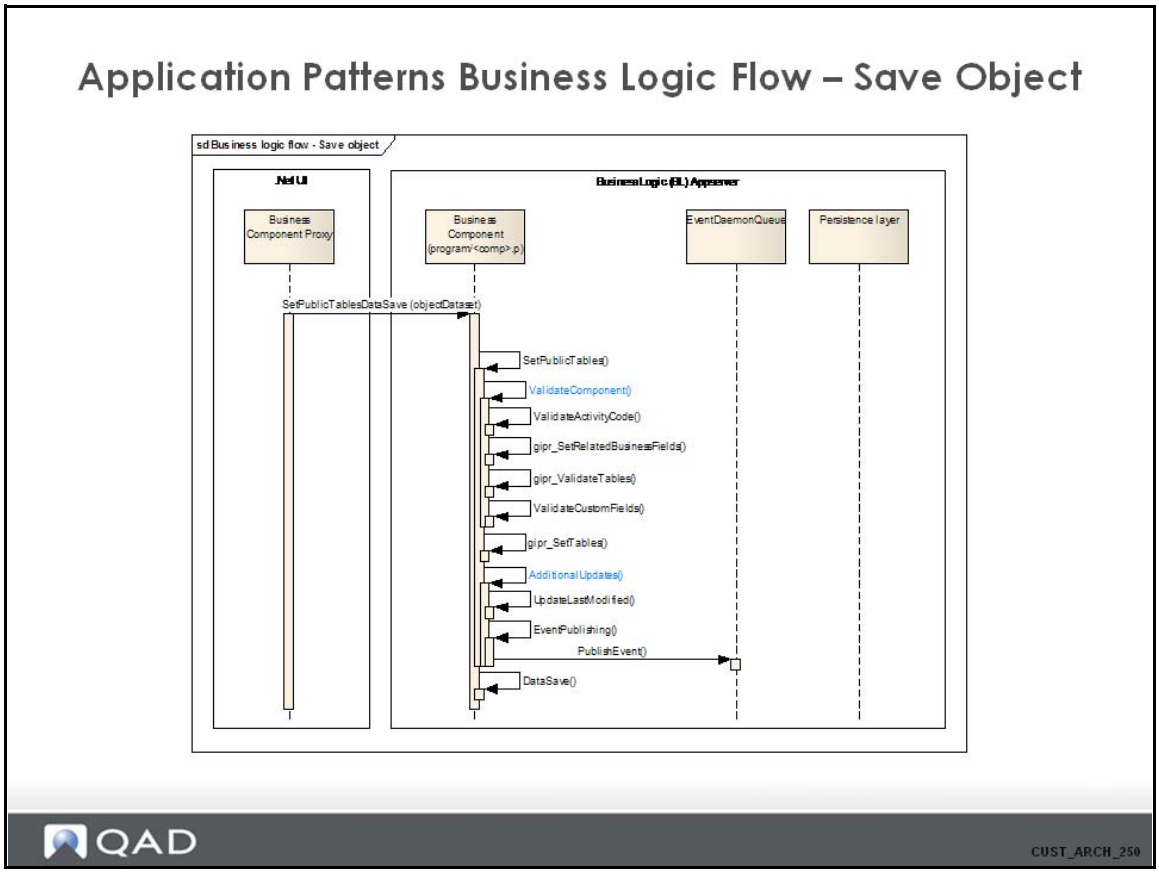
Application Patterns Business Logic Flow 3



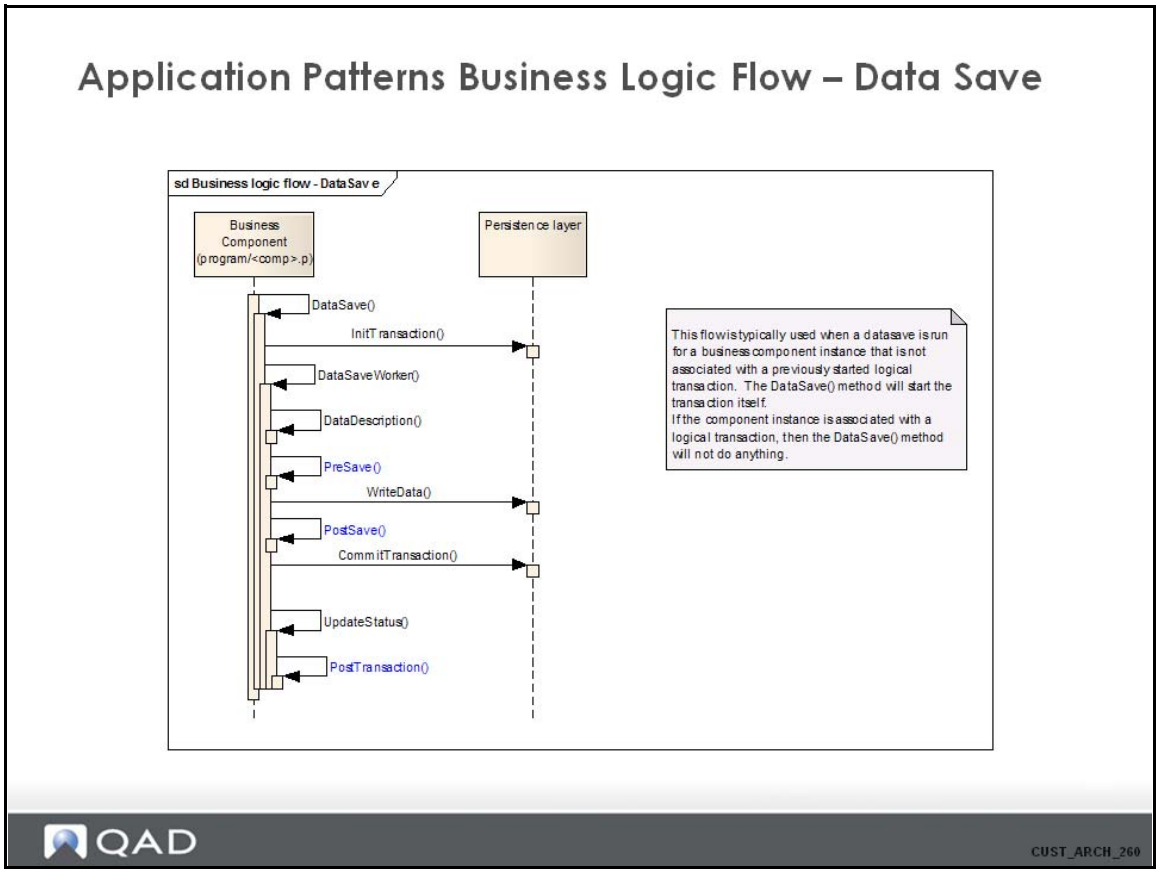
Application Patterns Business Logic Flow 4



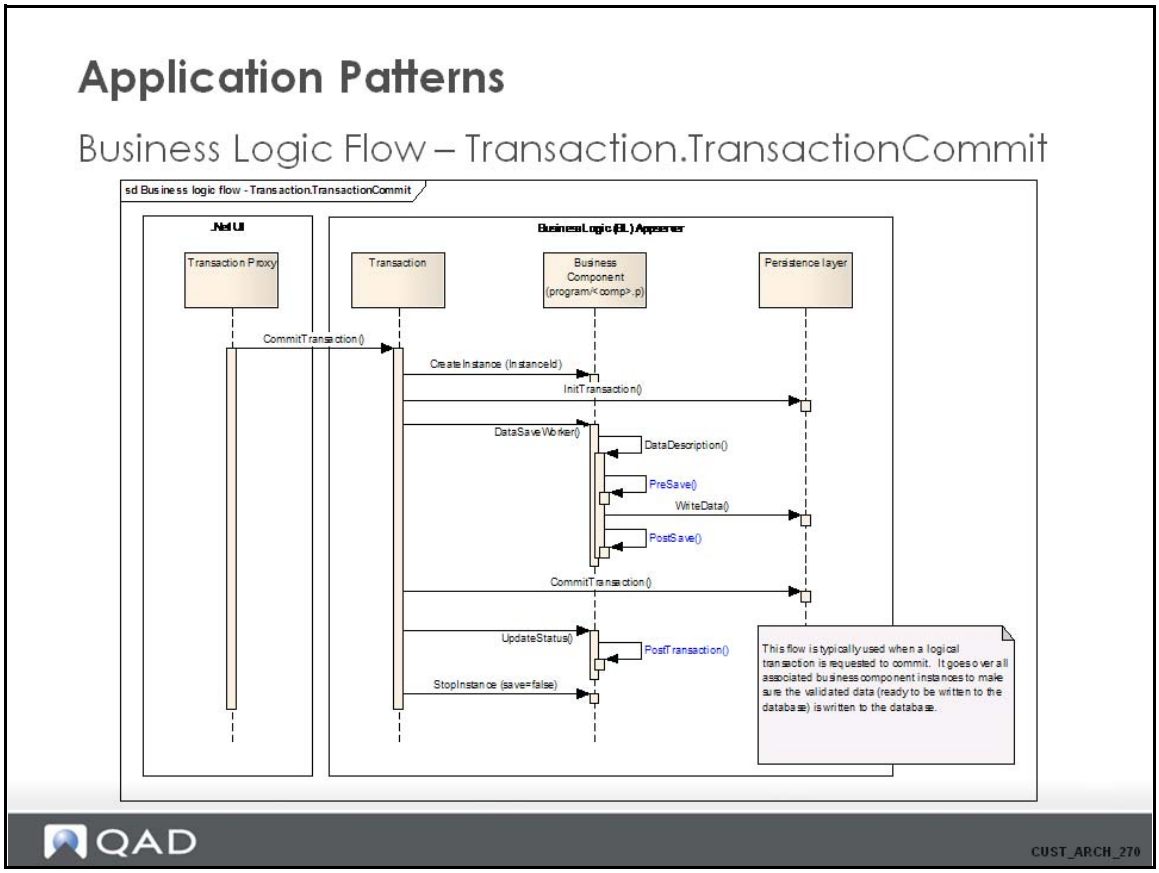
Application Patterns Business Logic Flow 5



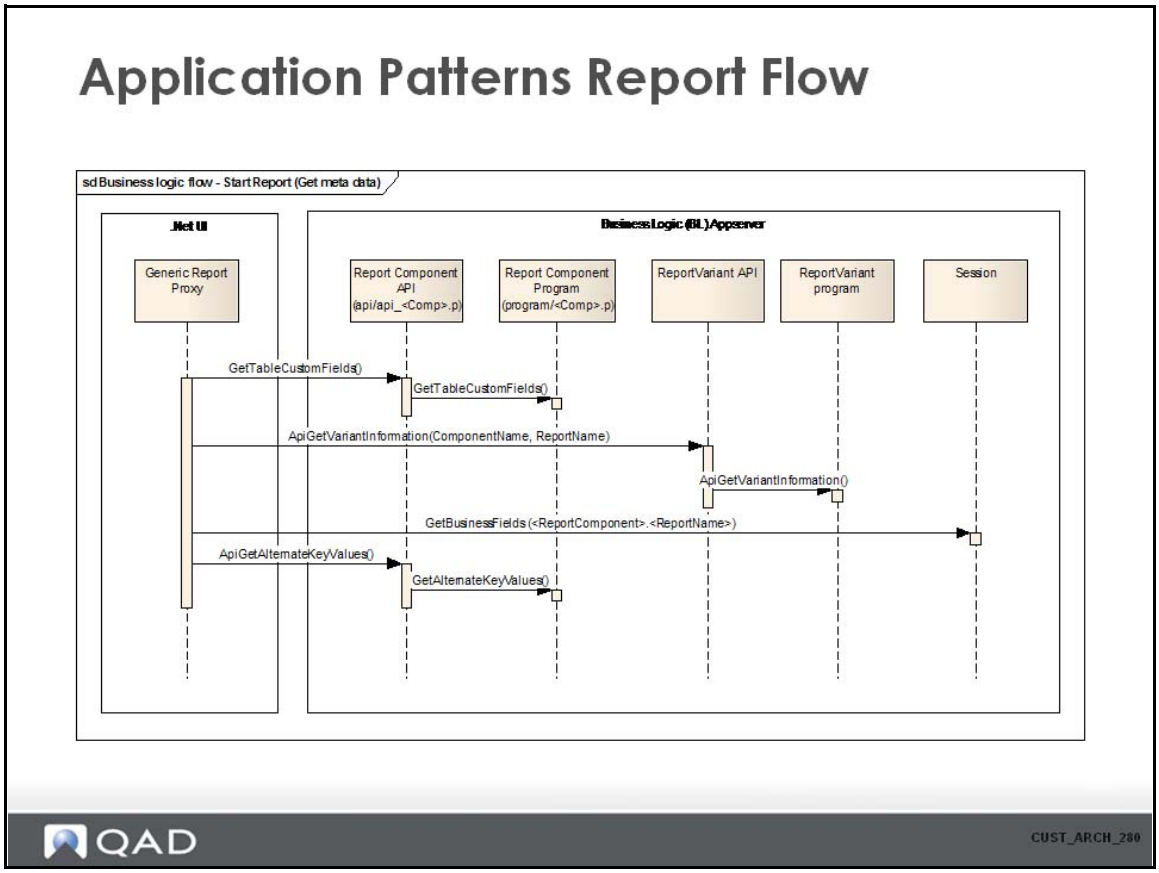
Application Patterns Business Logic Flow 6



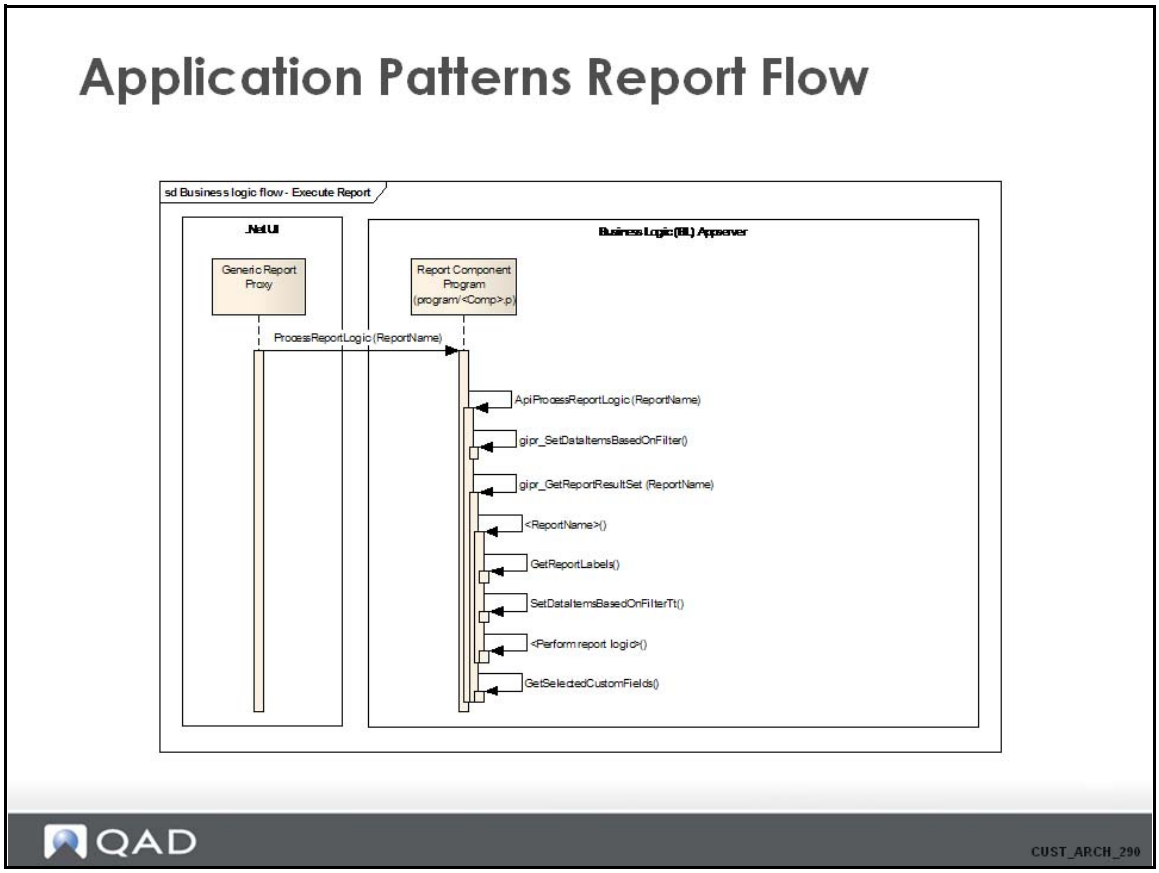
Application Patterns Business Logic Flow 7



Application Patterns Report Flow



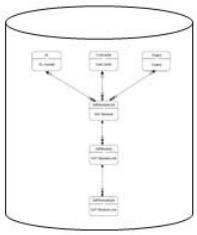
Application Patterns Report Flow 2



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

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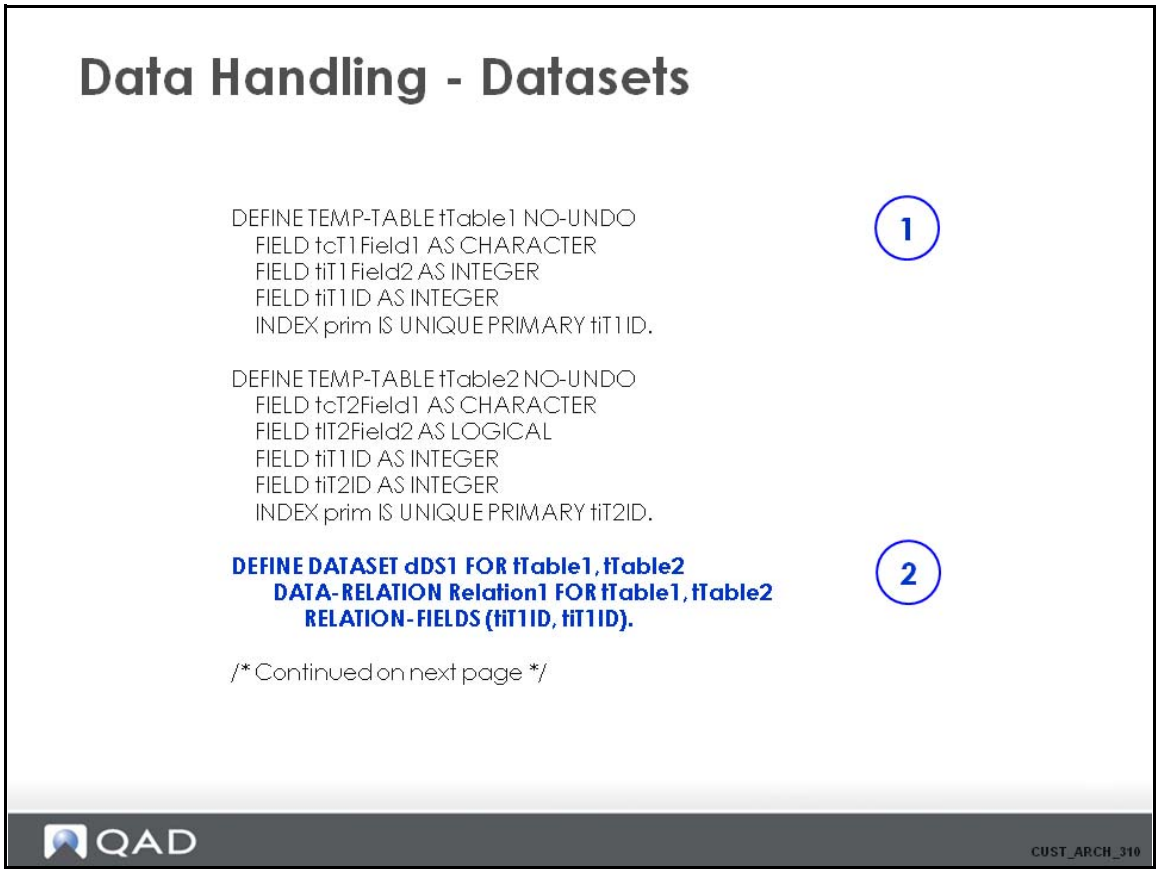
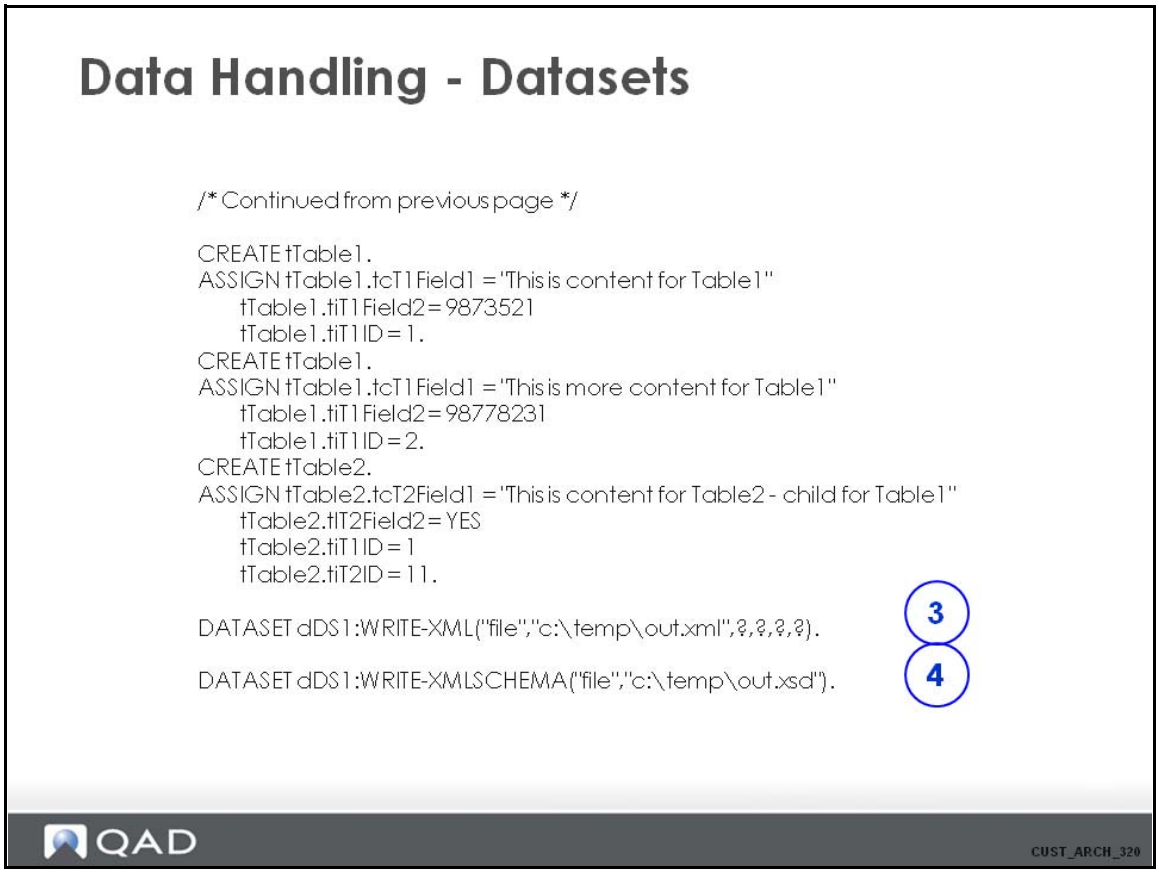
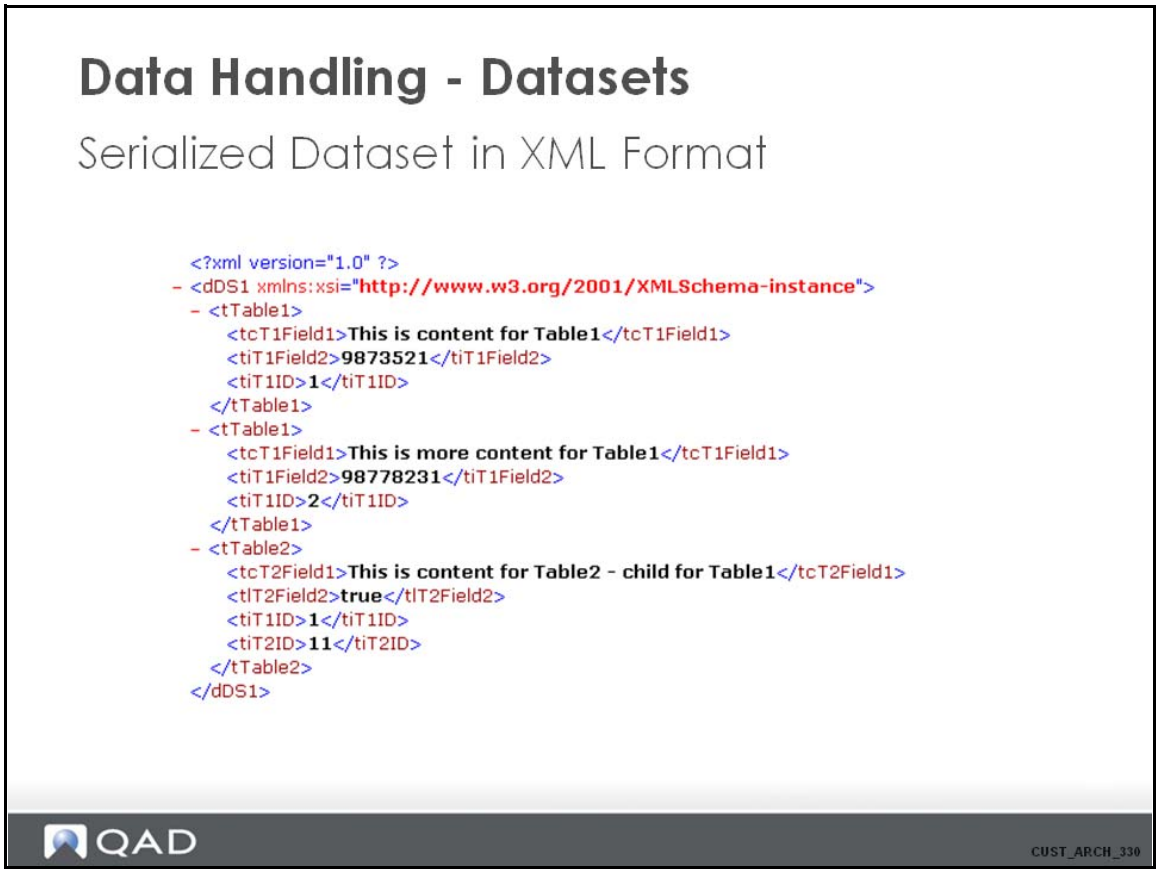
Data Handling - Datasets 2



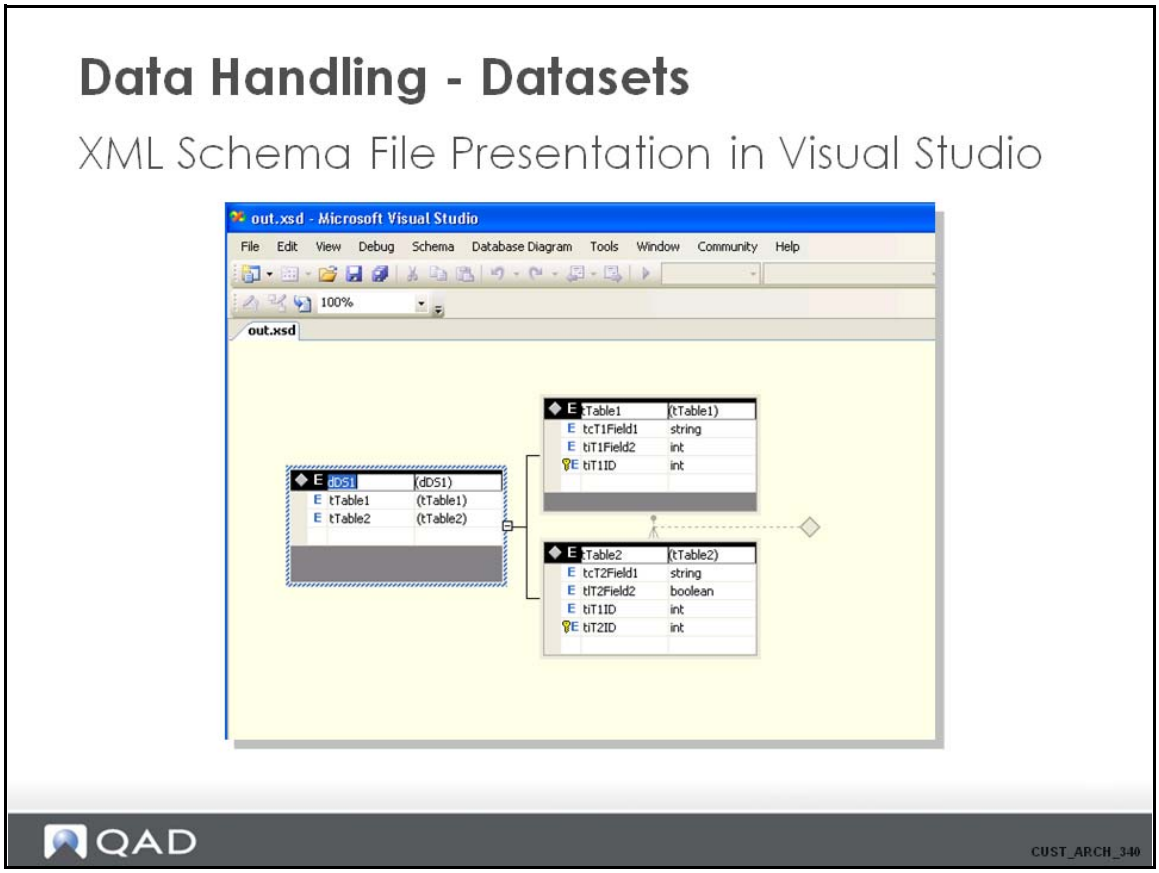
Data Handling - Datasets 3



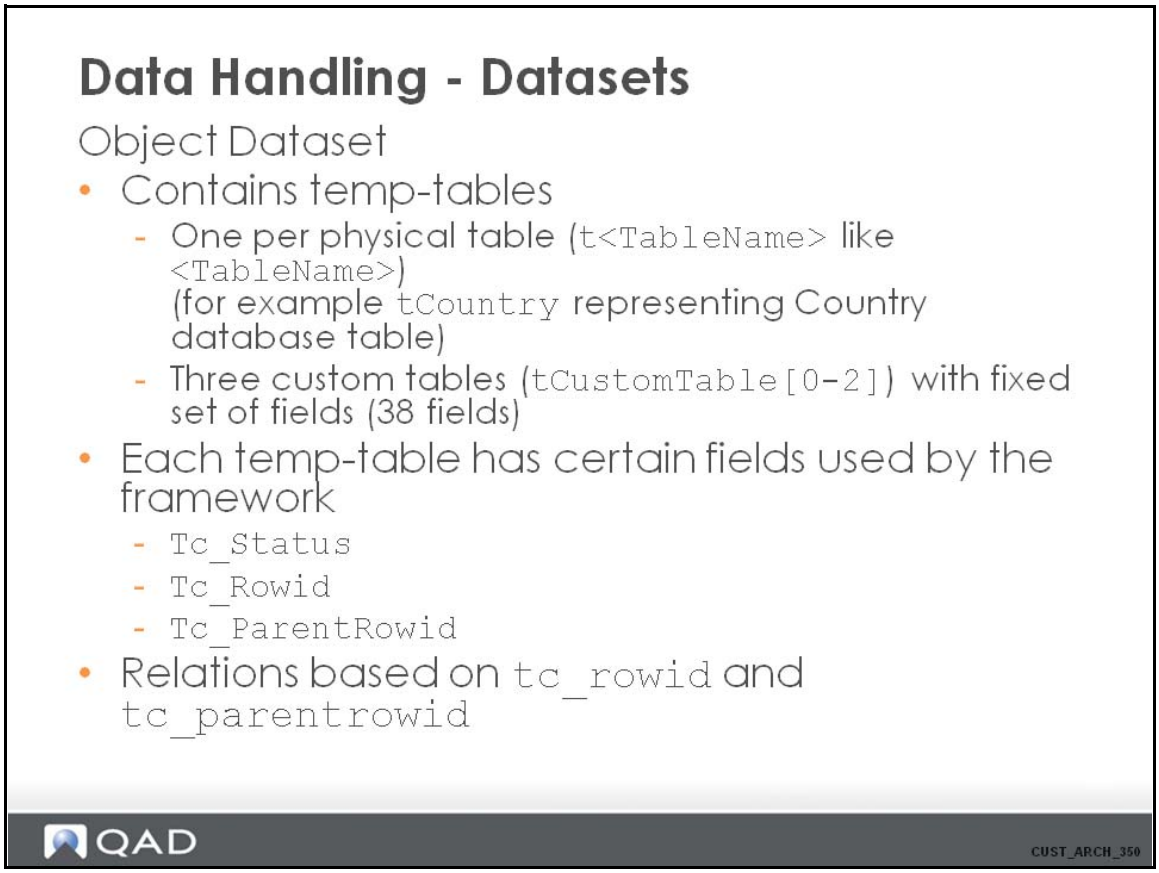
Data Handling - Datasets 4



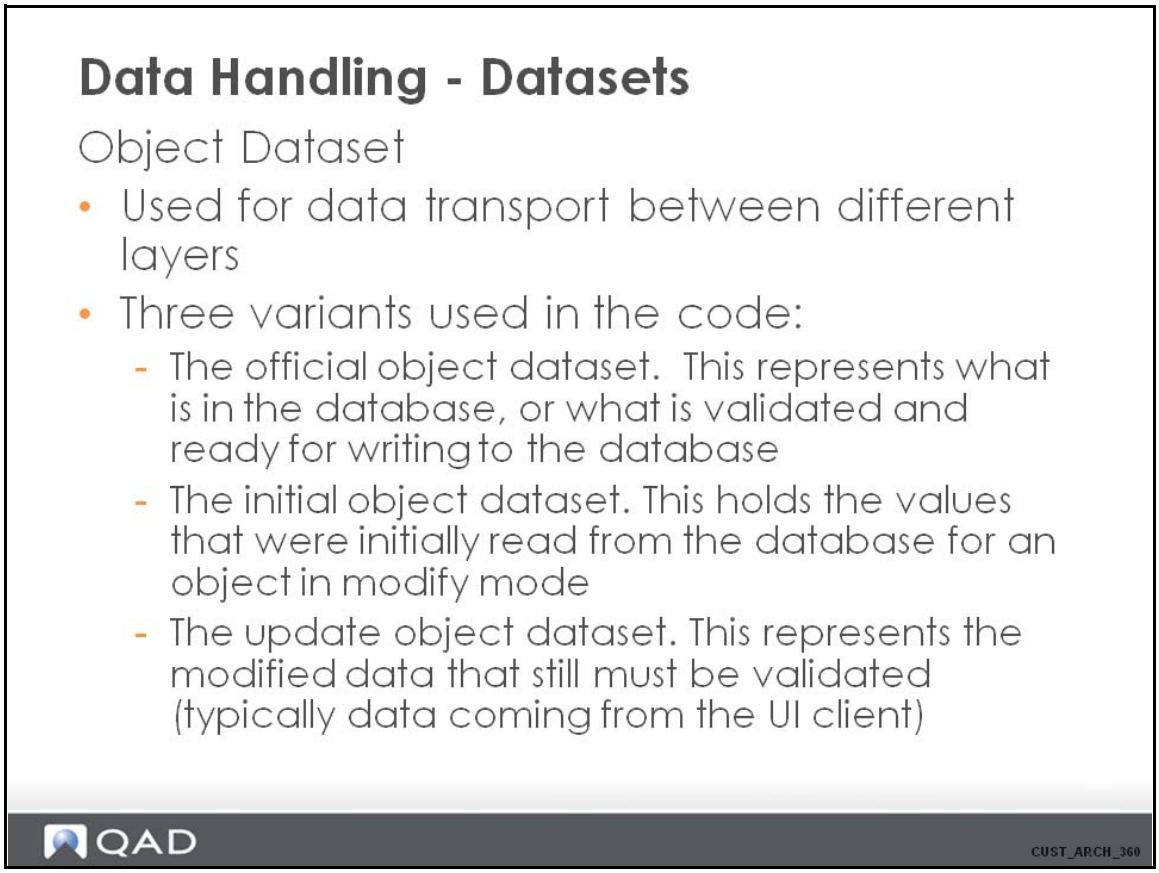
Data Handling - Datasets 5



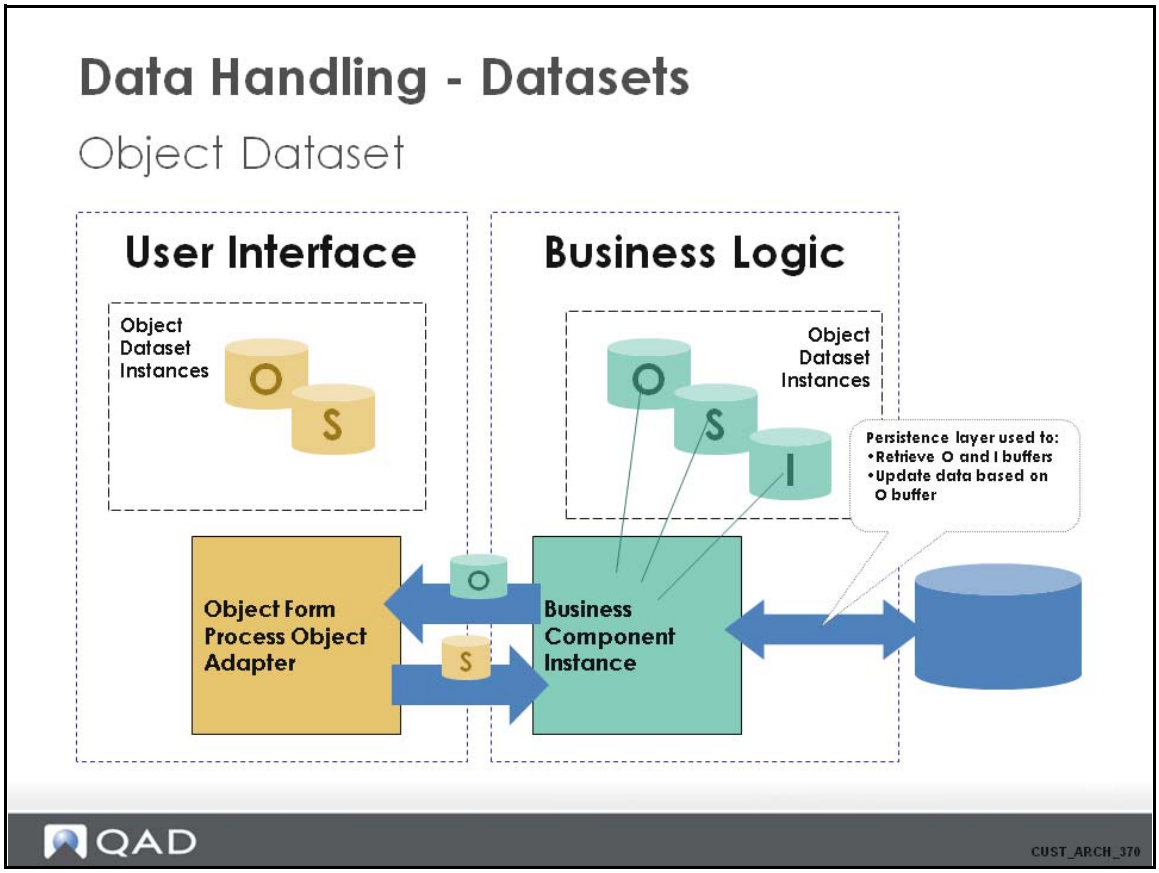
Data Handling - Datasets 6



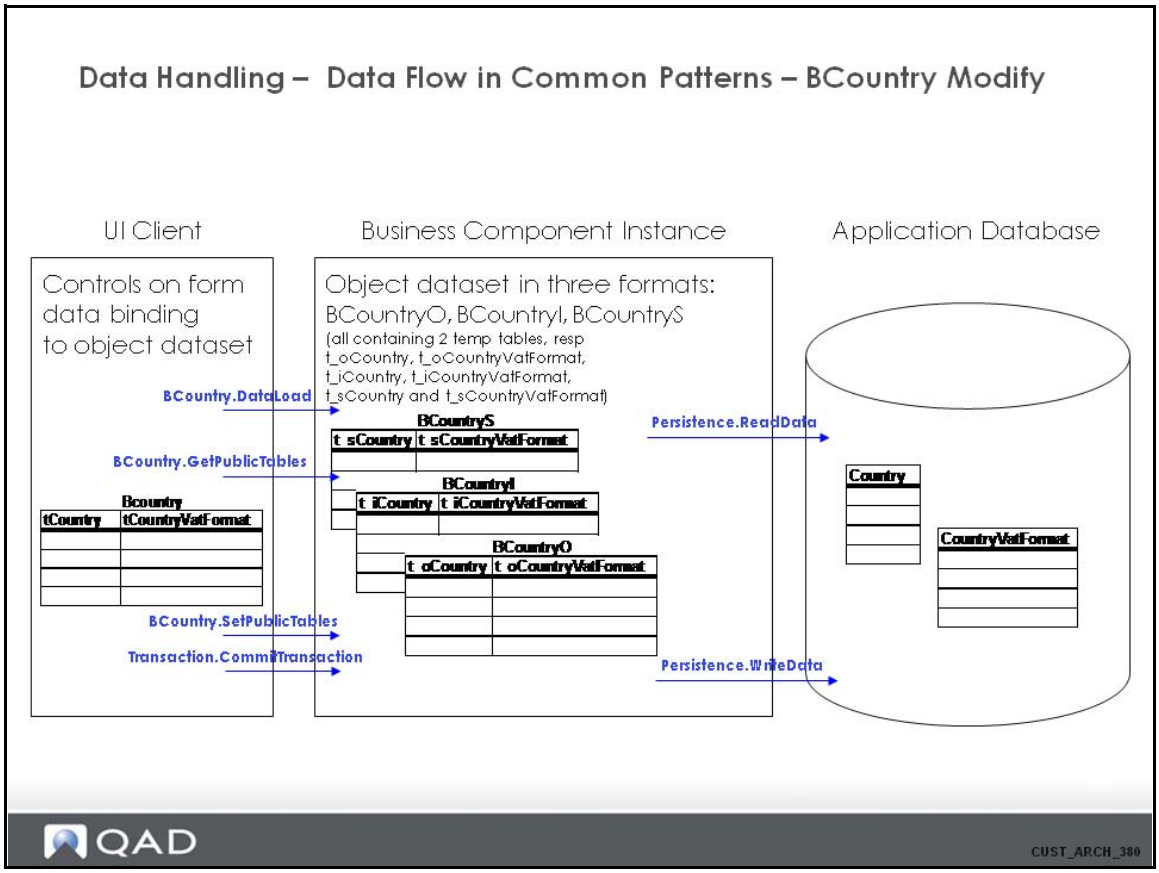
Data Handling - Datasets 7



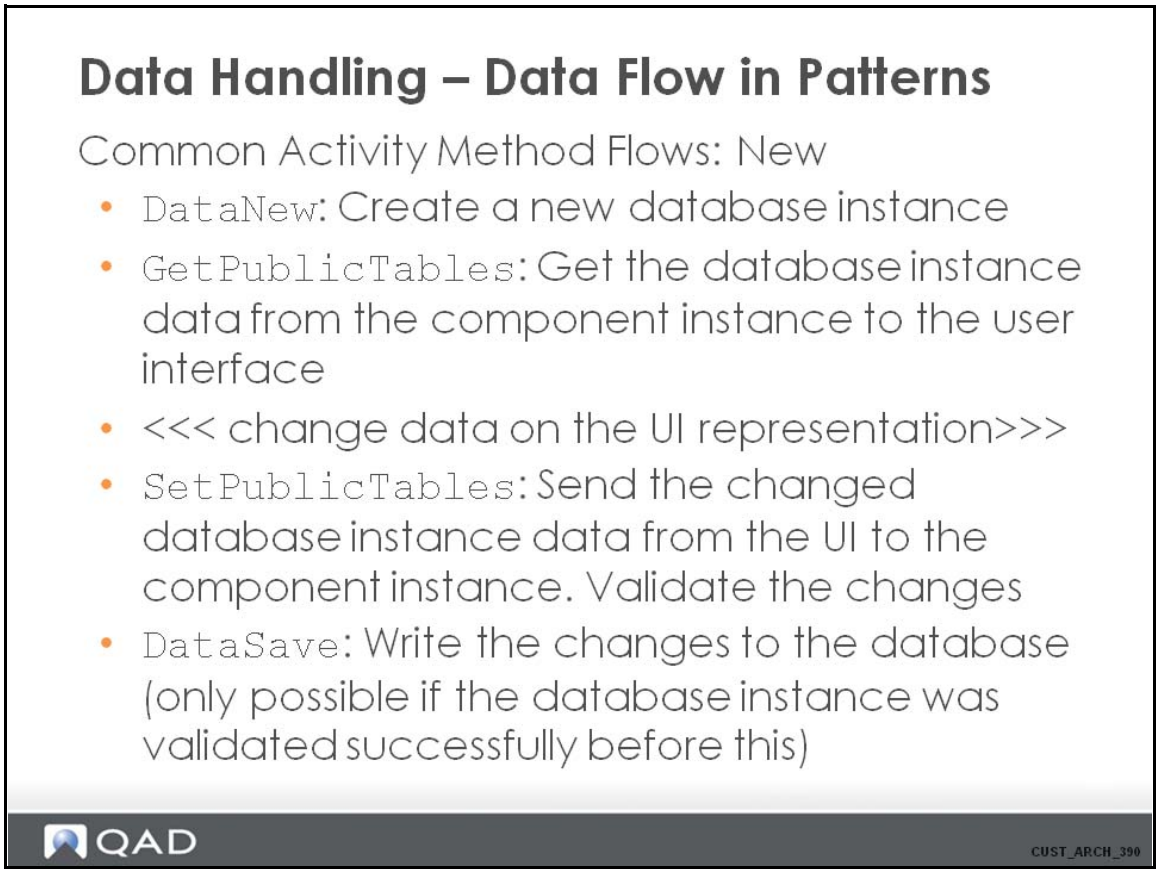
Data Handling - Datasets 8



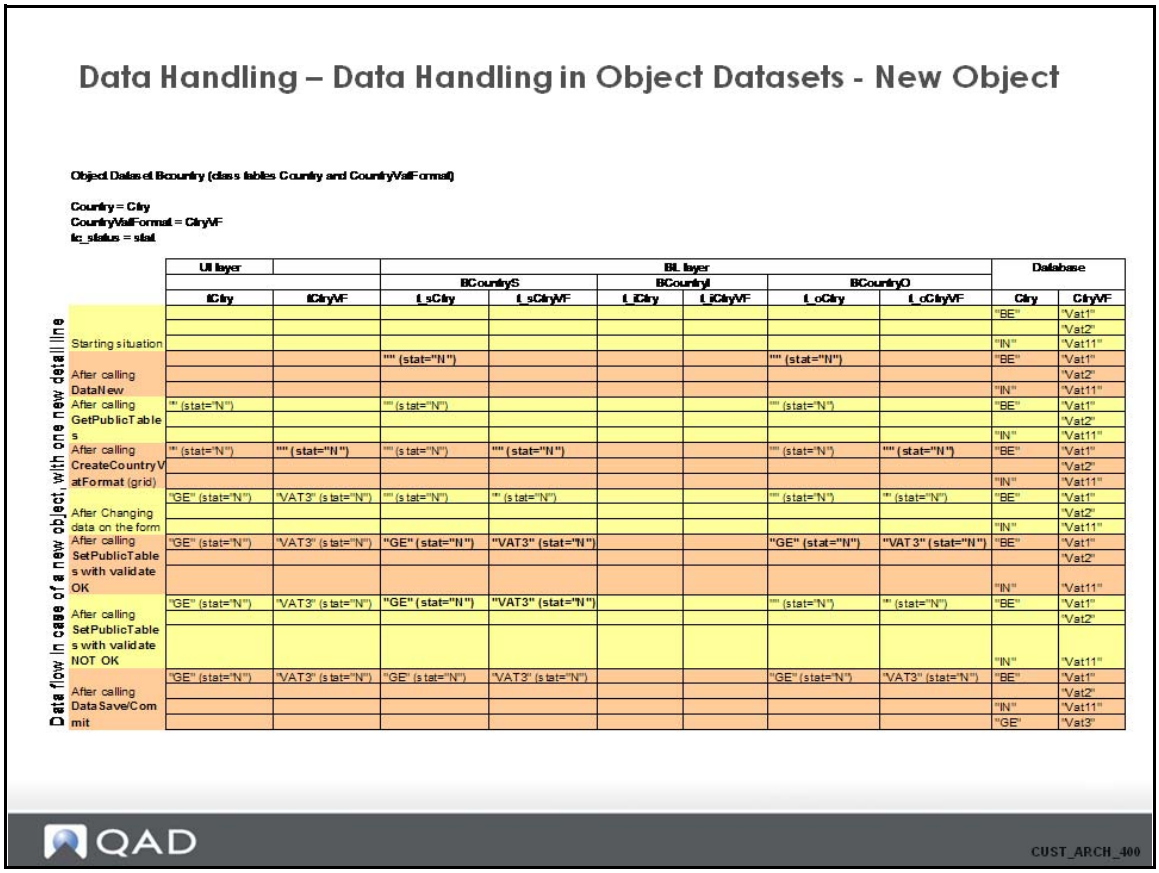
Data Handling - Data Flow In Common Patterns



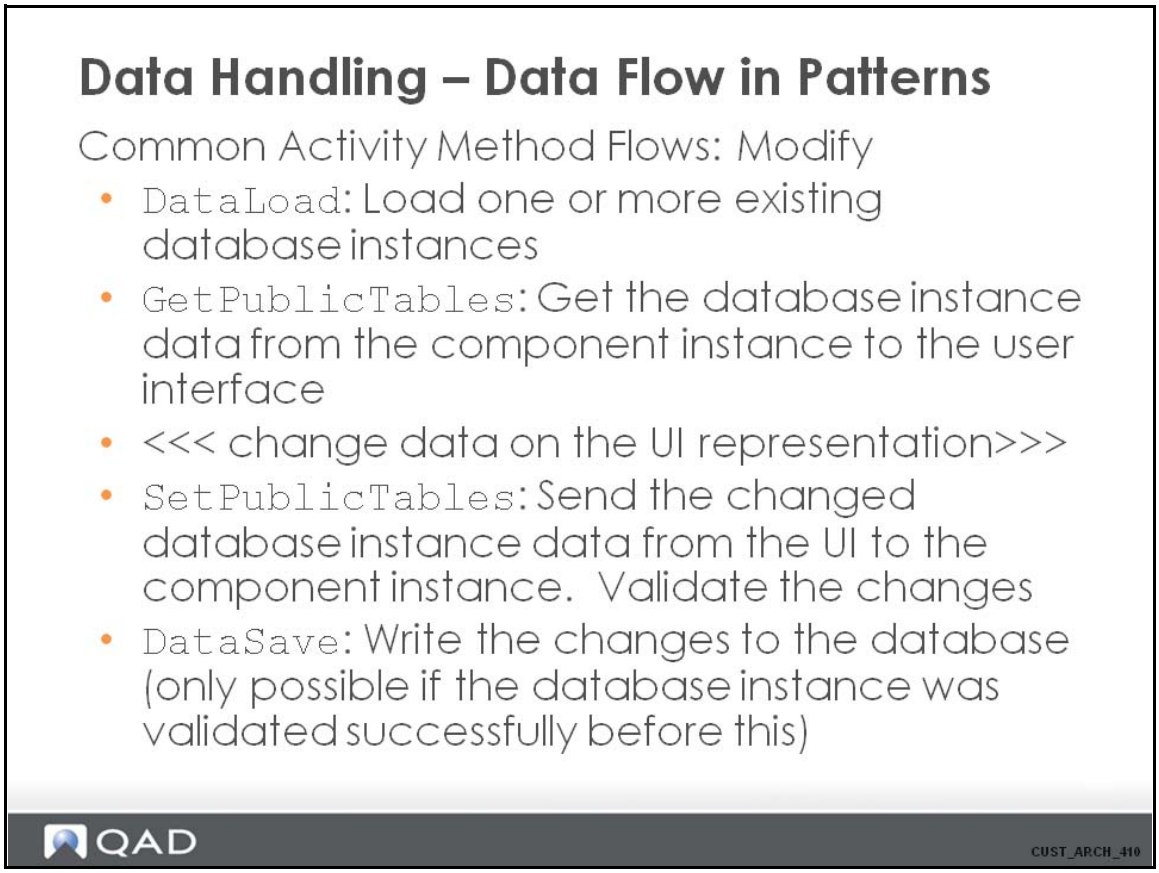
Data Handling - Data Flow in Patterns



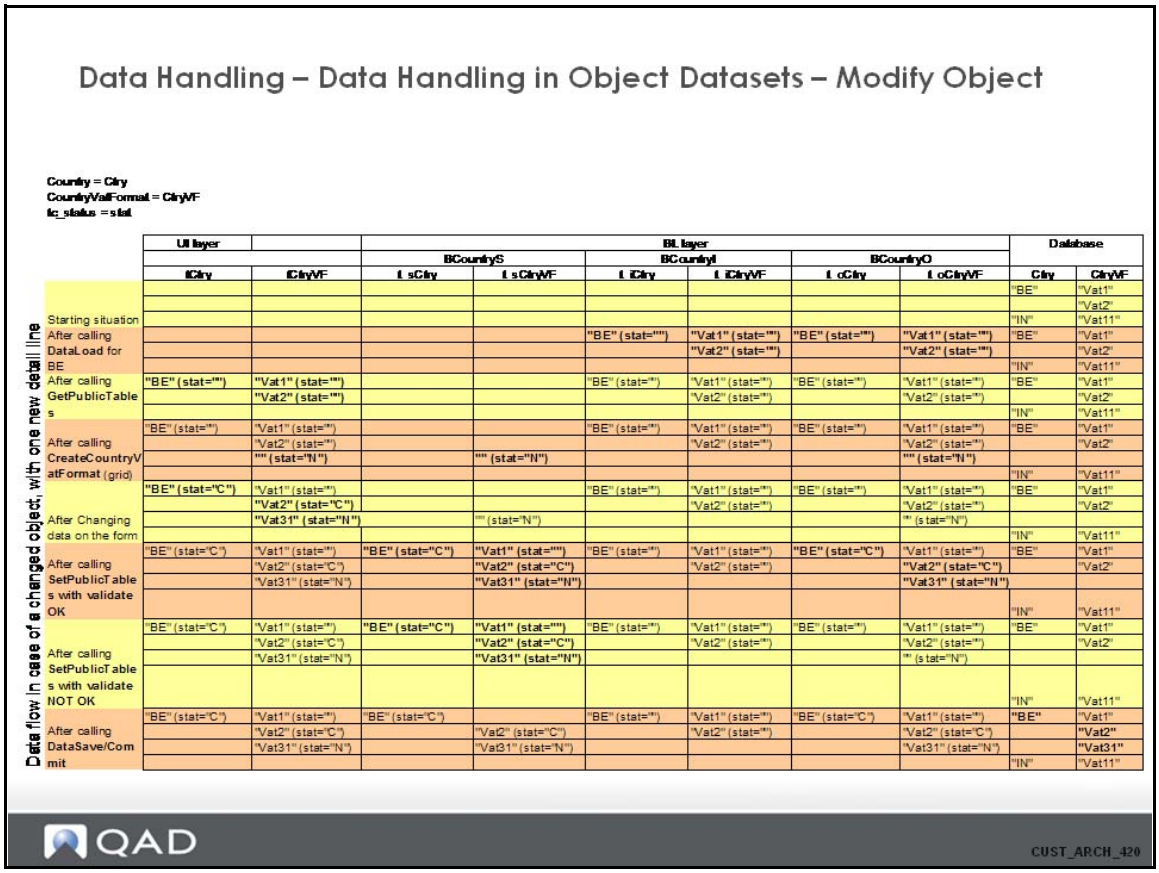
Data Handling - Data Handling in Object Datasets - New Object



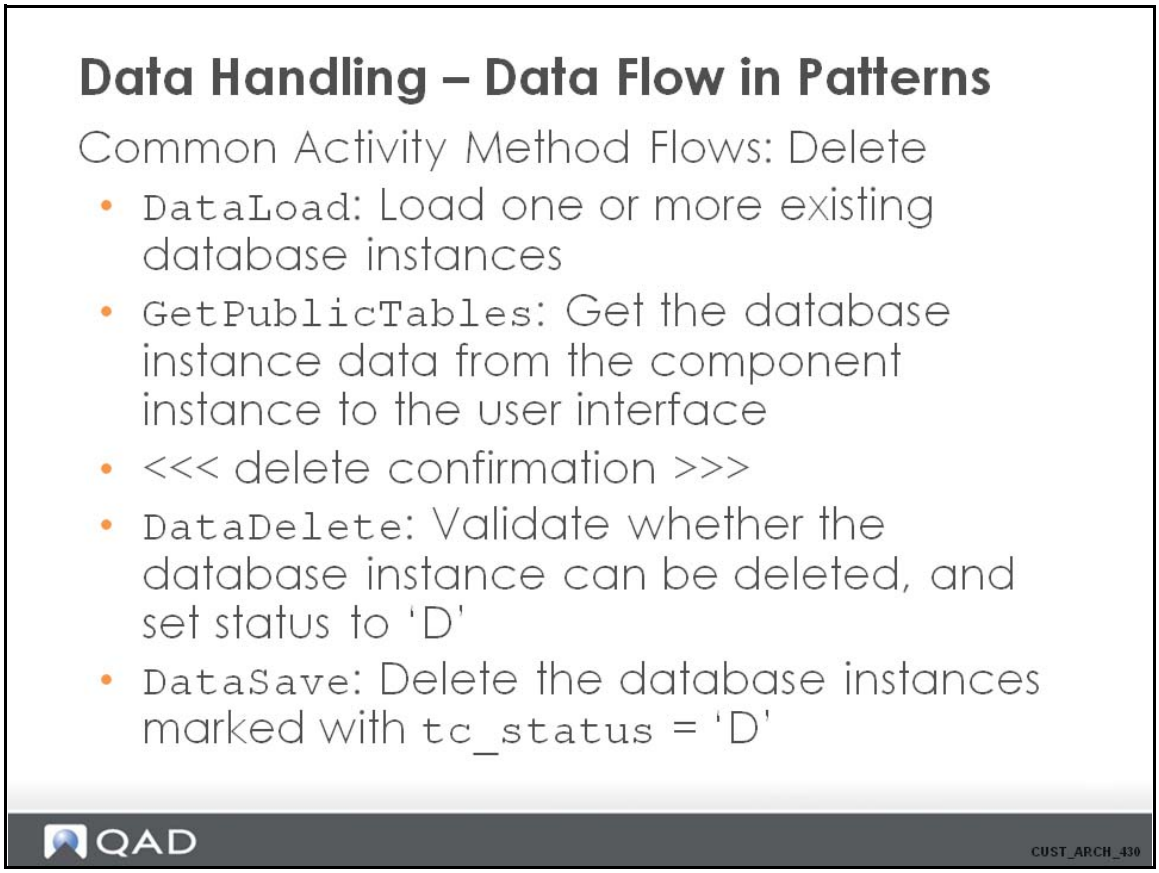
Data Handling - Data Flow in Patterns



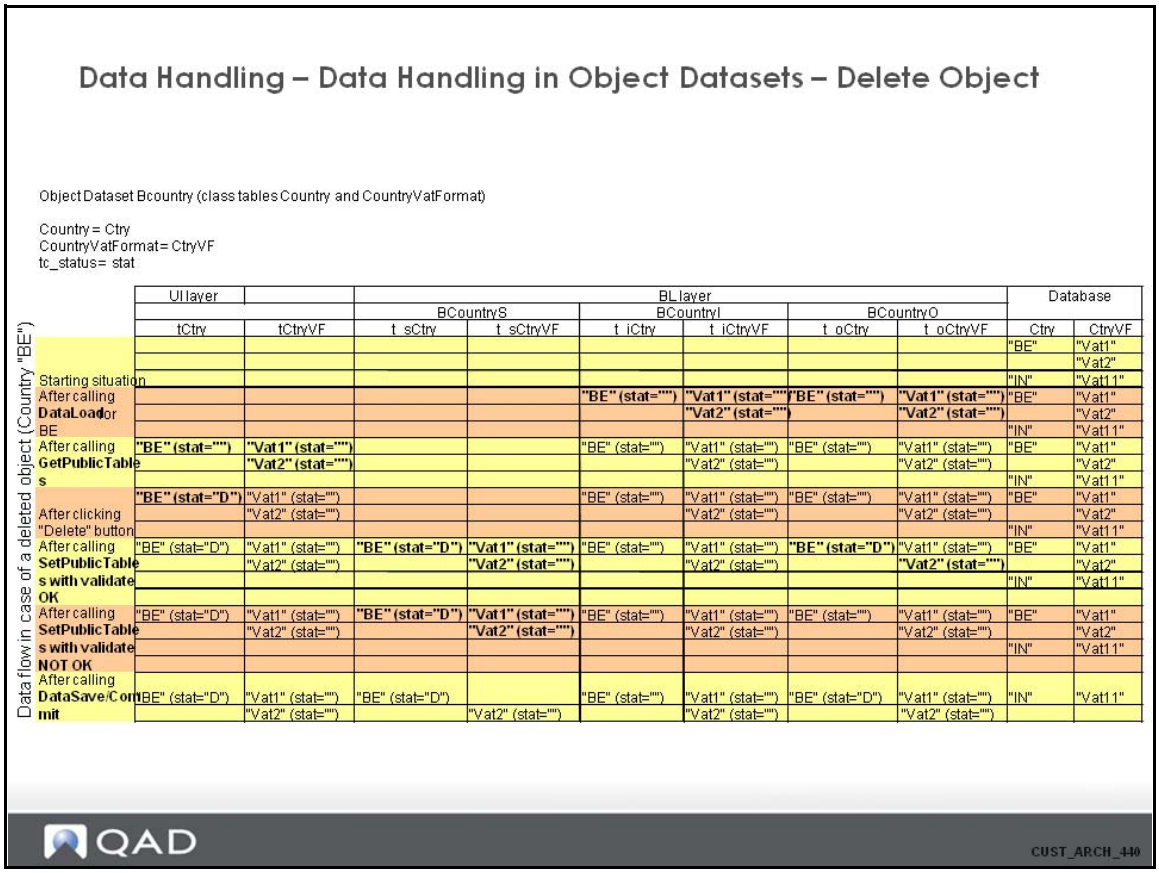
Data Handling - Data Handling in Object Datasets - Modify Object



Data Handling - Data Flow in Patterns



Data Handling - Data Handling in Object Datasets - Delete Objects



Data Handling – Data Handling in Object Datasets – Delete Object

Object Dataset Bcountry (class tables Country and CountryVatFormat)

Country = Ctry
CountryVatFormat = CtryVF
tc_status = stat

Data flow in case of a deleted object (Country "BE")

	UI layer		BL layer						Database	
			BCountryS		BCountryI		BCountryO			
	tCtry	tCtryVF	t_sCtry	t_sCtryVF	t_iCtry	t_iCtryVF	t_oCtry	t_oCtryVF	Ctry	CtryVF
									"BE"	"Vat1"
										"Vat2"
Starting situation									"IN"	"Vat11"
After calling **DataLoad**or BE					**"BE" (stat="")**	**"Vat1" (stat="")**	**"BE" (stat="")**	**"Vat1" (stat="")**	"BE"	"Vat1"
						"Vat2" (stat="")		**"Vat2" (stat="")**		"Vat2"
									"IN"	"Vat11"
After calling **GetPublicTable**	**"BE" (stat="")**	**"Vat1" (stat="")**			"BE" (stat="")	"Vat1" (stat="")	"BE" (stat="")	"Vat1" (stat="")	"BE"	"Vat1"
s		**"Vat2" (stat="")**				"Vat2" (stat="")		"Vat2" (stat="")		"Vat2"
									"IN"	"Vat11"
After clicking "Delete" button	**"BE" (stat="D")**	"Vat1" (stat="")			"BE" (stat="")	"Vat1" (stat="")	"BE" (stat="")	"Vat1" (stat="")	"BE"	"Vat1"
		"Vat2" (stat="")				"Vat2" (stat="")		"Vat2" (stat="")		"Vat2"
									"IN"	"Vat11"
After calling **SetPublicTable**	"BE" (stat="D")	"Vat1" (stat="")	**"BE" (stat="D")**	**"Vat1" (stat="")**	"BE" (stat="")	"Vat1" (stat="")	**"BE" (stat="D")**	"Vat1" (stat="")	"BE"	"Vat1"
s with validate		"Vat2" (stat="")		**"Vat2" (stat="")**		"Vat2" (stat="")		**"Vat2" (stat="")**		"Vat2"
OK									"IN"	"Vat11"
After calling **SetPublicTable**	"BE" (stat="D")	"Vat1" (stat="")	**"BE" (stat="D")**	**"Vat1" (stat="")**	"BE" (stat="")	"Vat1" (stat="")	"BE" (stat="")	"Vat1" (stat="")	"BE"	"Vat1"
s with validate		"Vat2" (stat="")		**"Vat2" (stat="")**		"Vat2" (stat="")		"Vat2" (stat="")		"Vat2"
NOT OK									"IN"	"Vat11"
After calling **DataSave/Com**	"BE" (stat="D")	"Vat1" (stat="")	"BE" (stat="D")		"BE" (stat="")	"Vat1" (stat="")	"BE" (stat="D")	"Vat1" (stat="")	"IN"	"Vat11"
mit		"Vat2" (stat="")		"Vat2" (stat="")		"Vat2" (stat="")		"Vat2" (stat="")		

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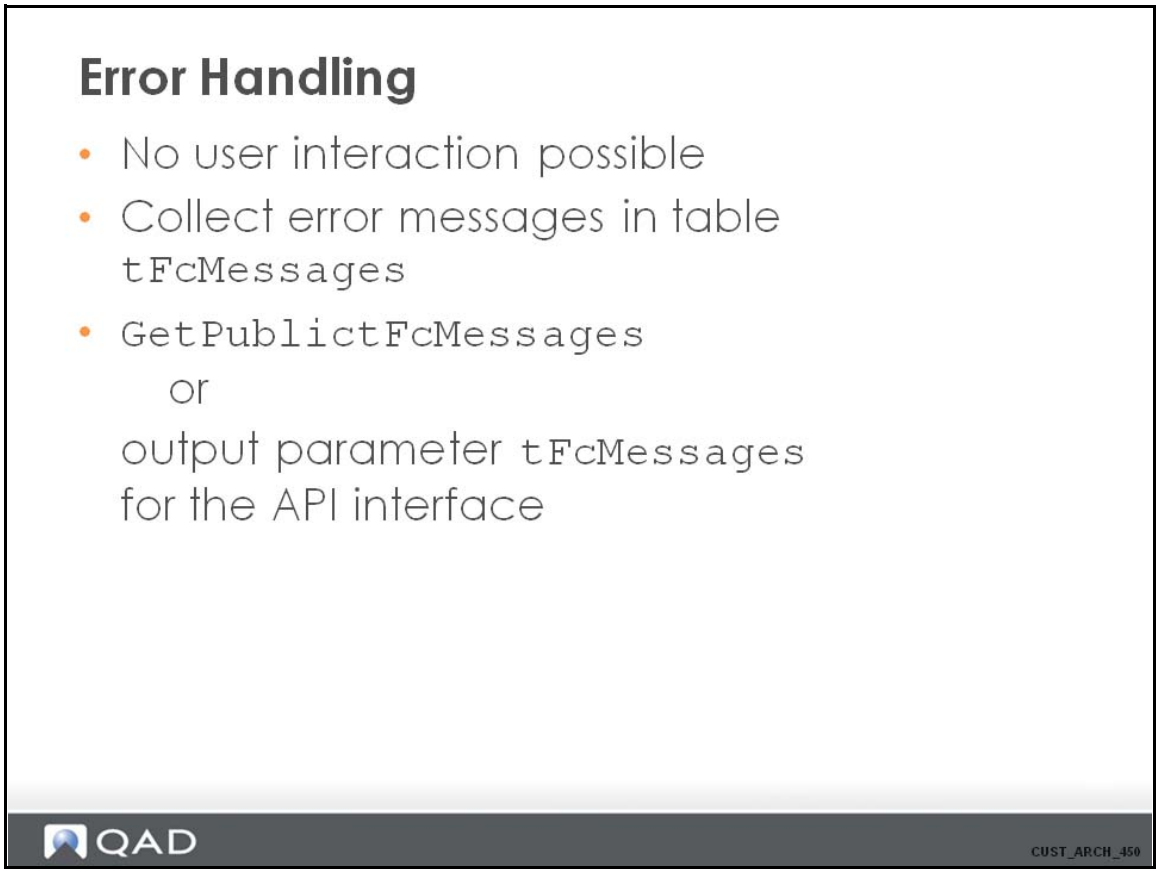
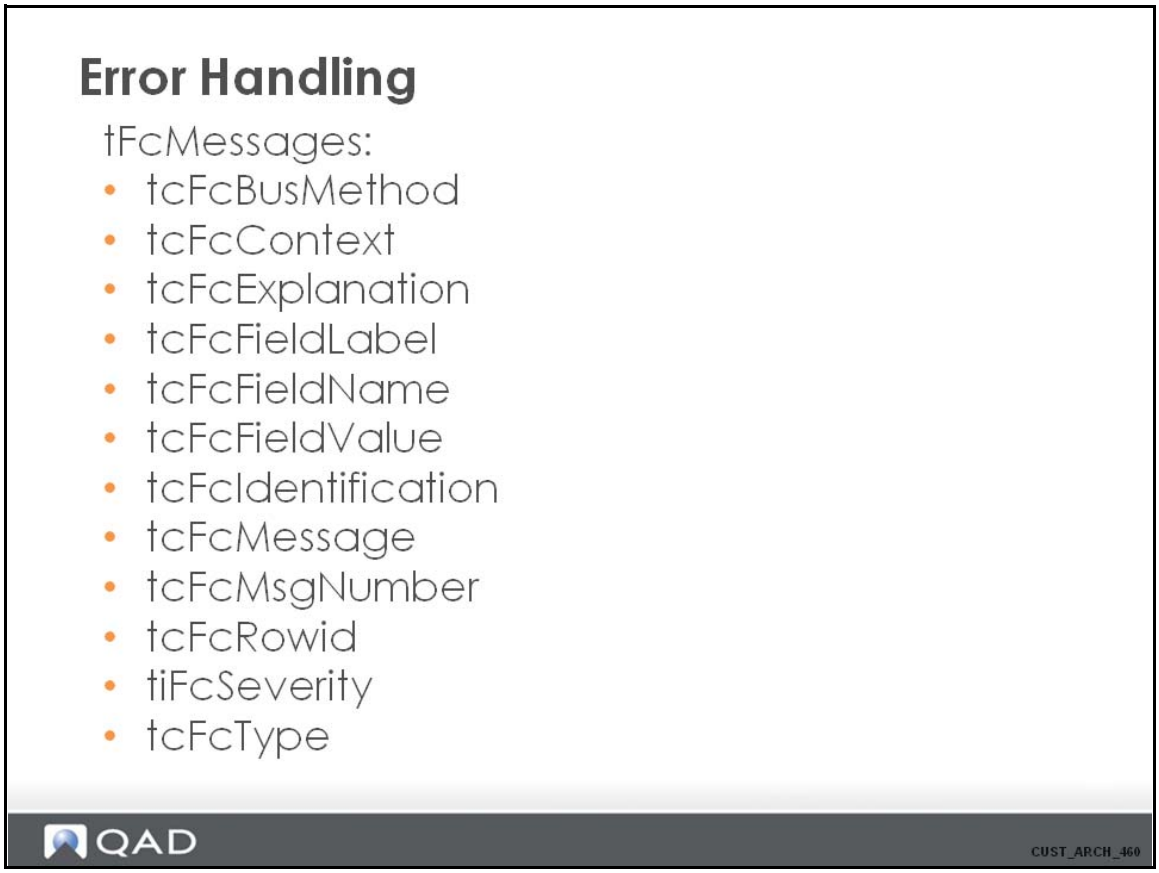
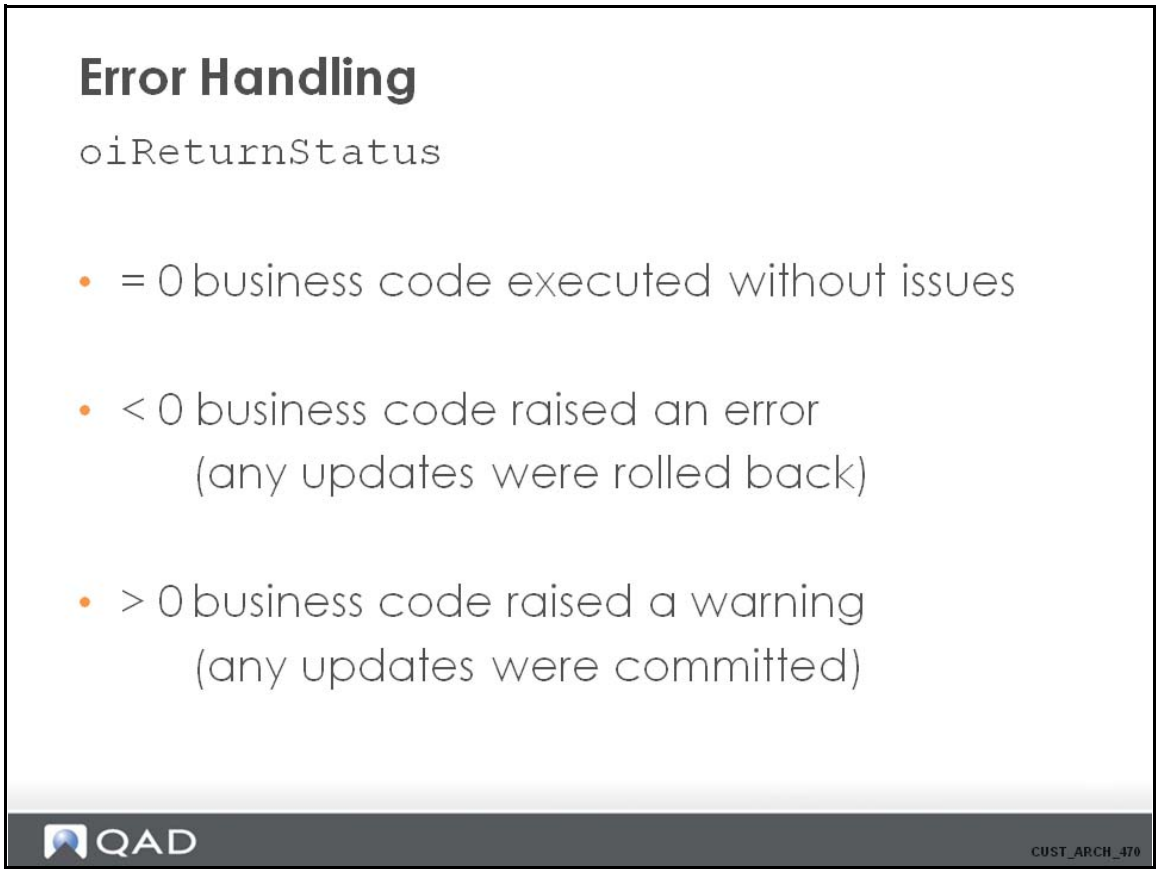
Error Handling



Error Handling 2

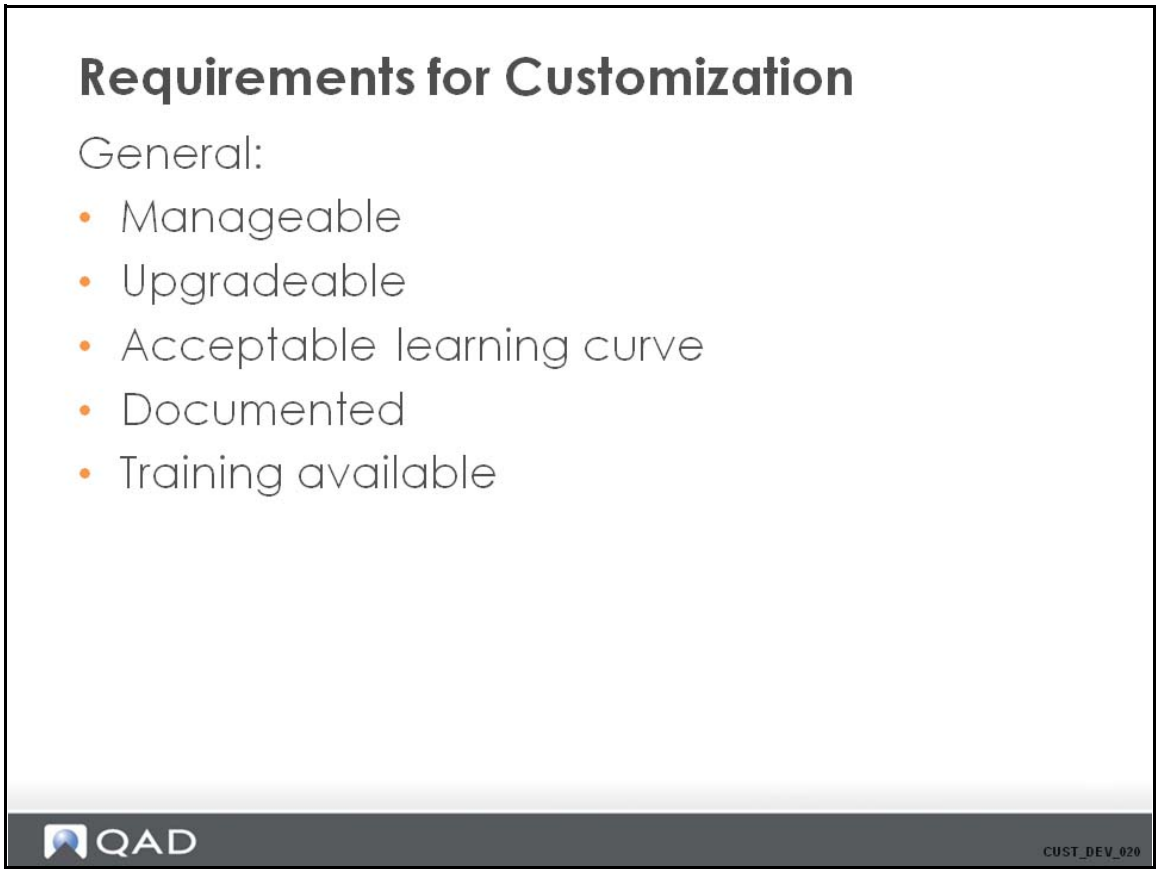


Error Handling 3

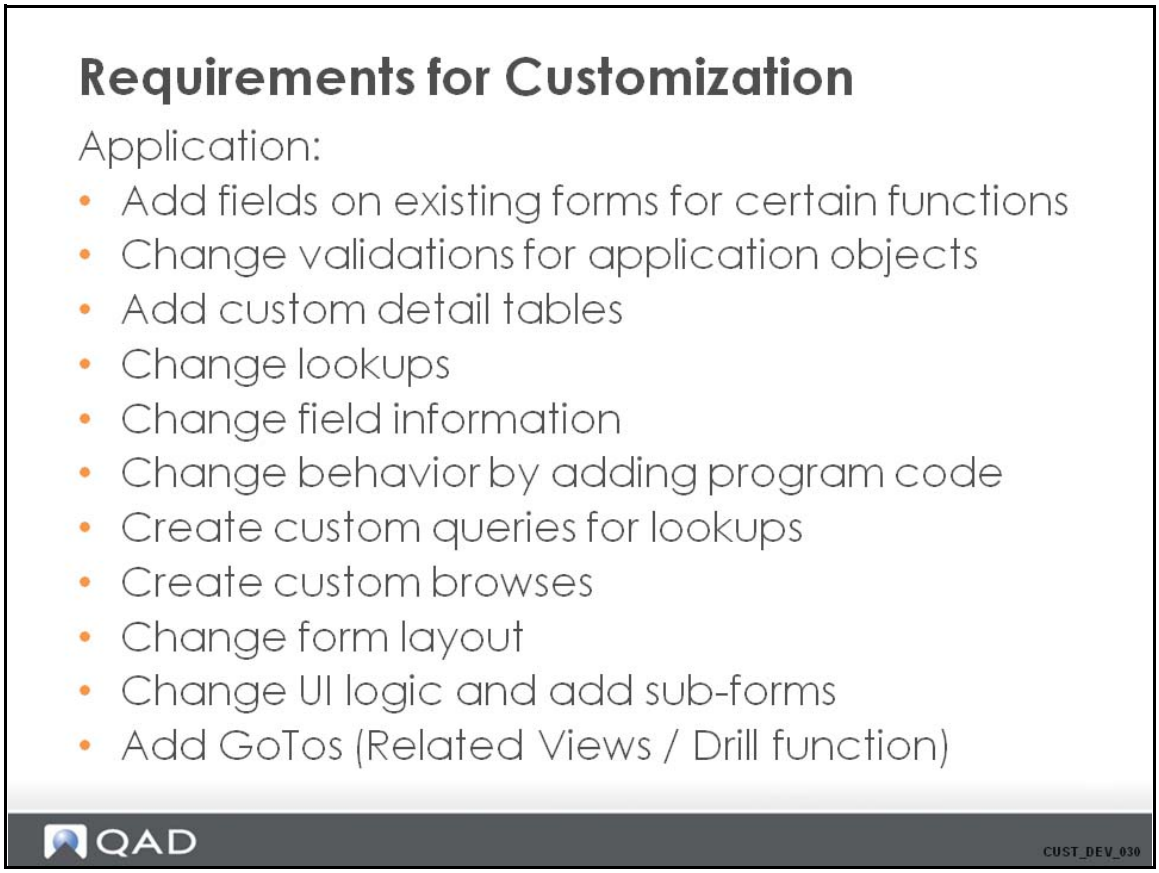


Non-intrusive Customization: Development

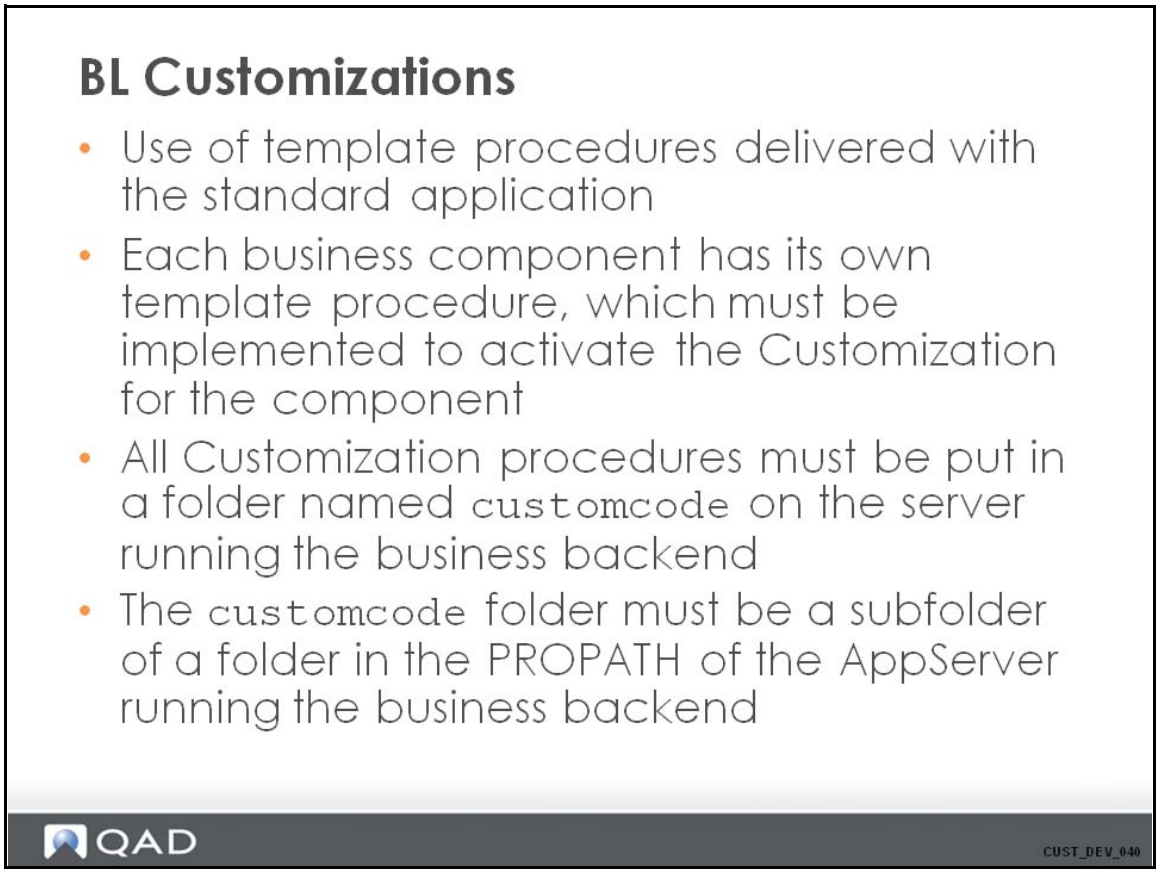
Requirements for Customization



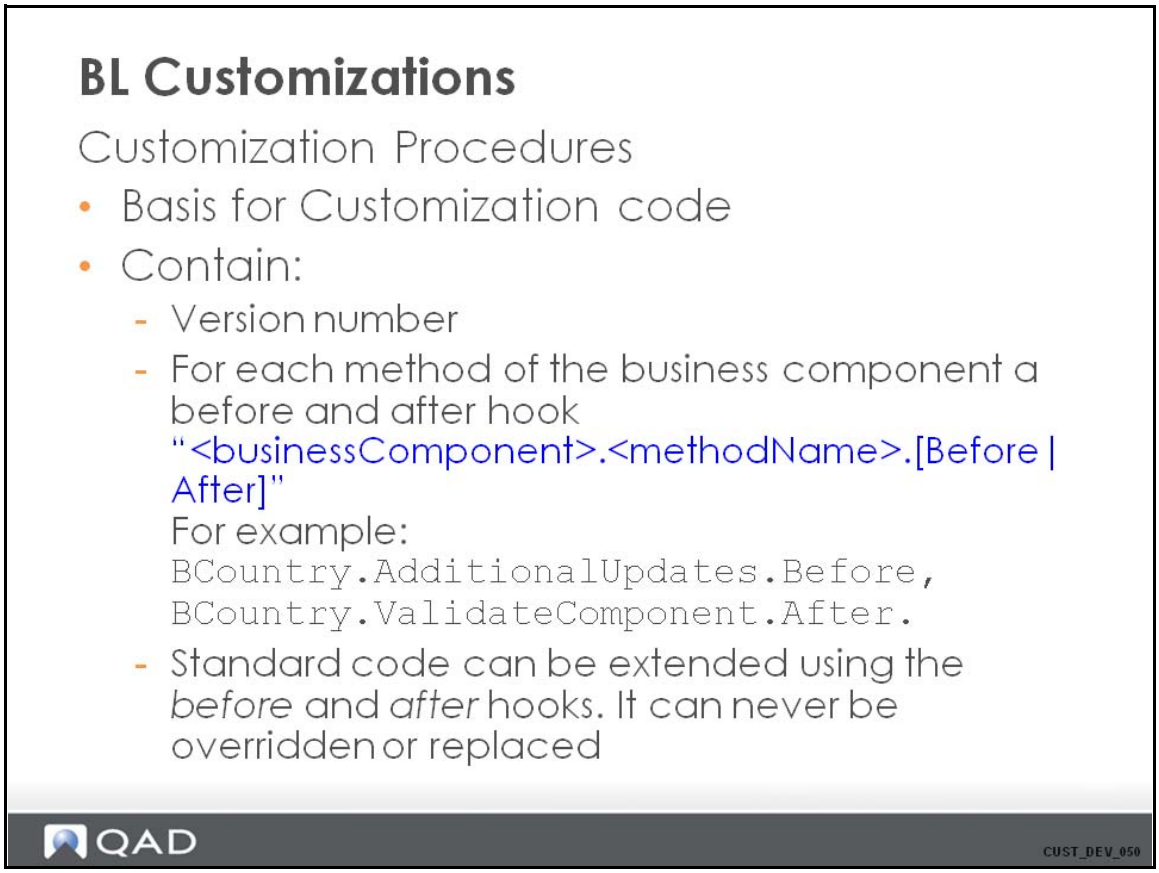
Requirements for Customization 2



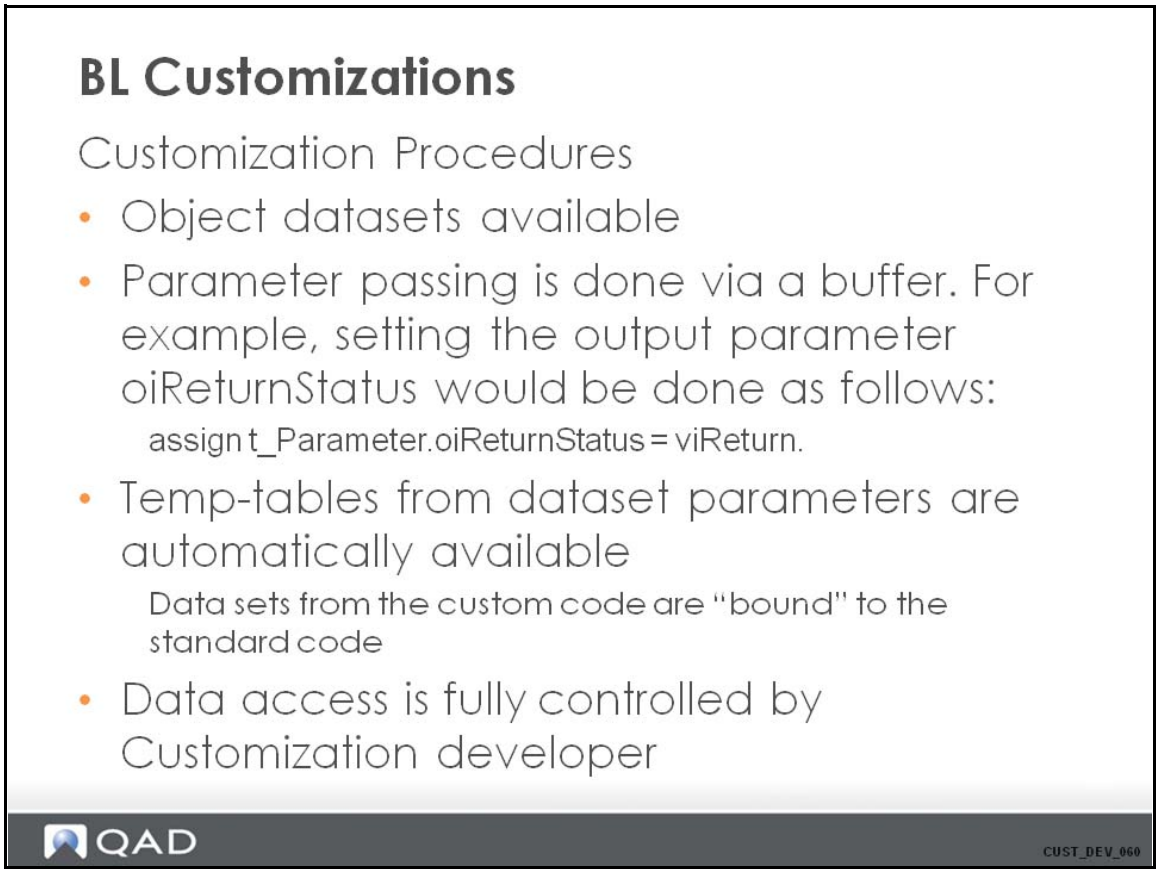
BL Customizations



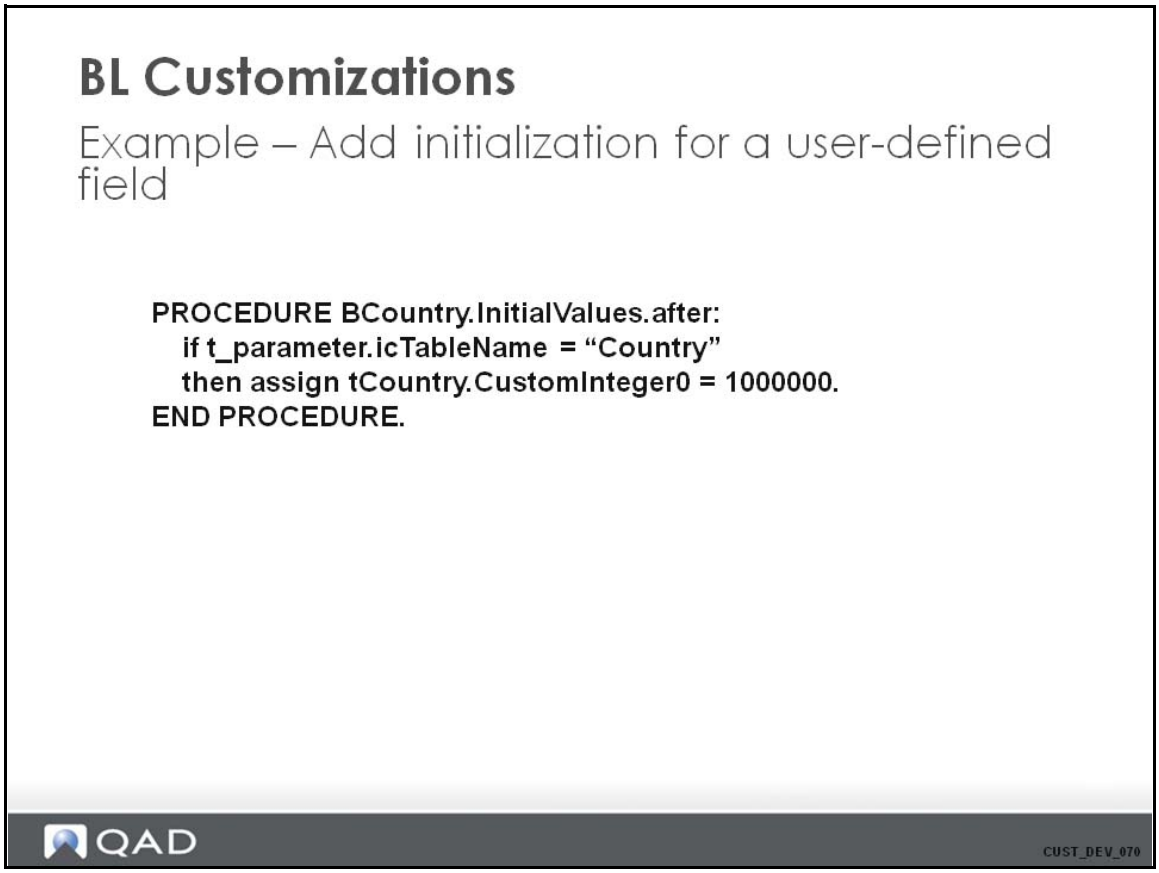
BL Customizations 2



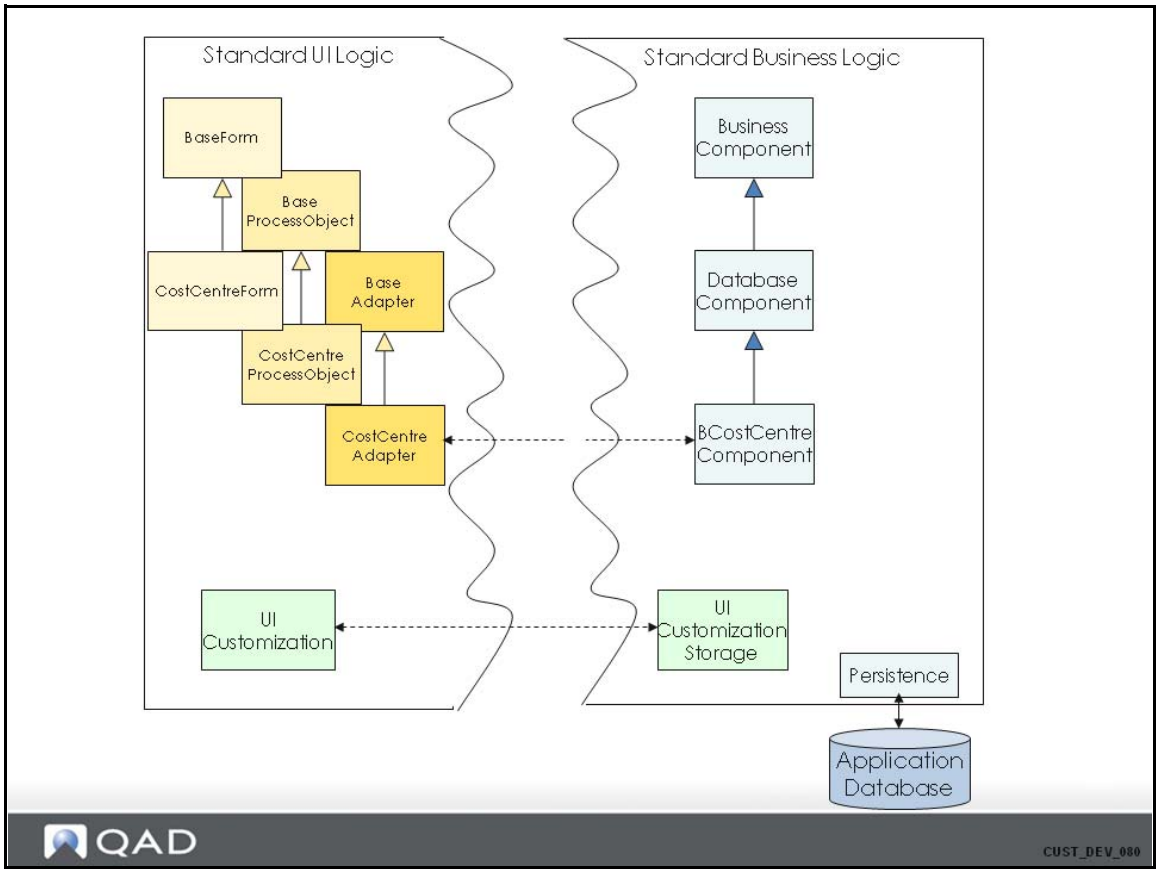
BL Customizations 3



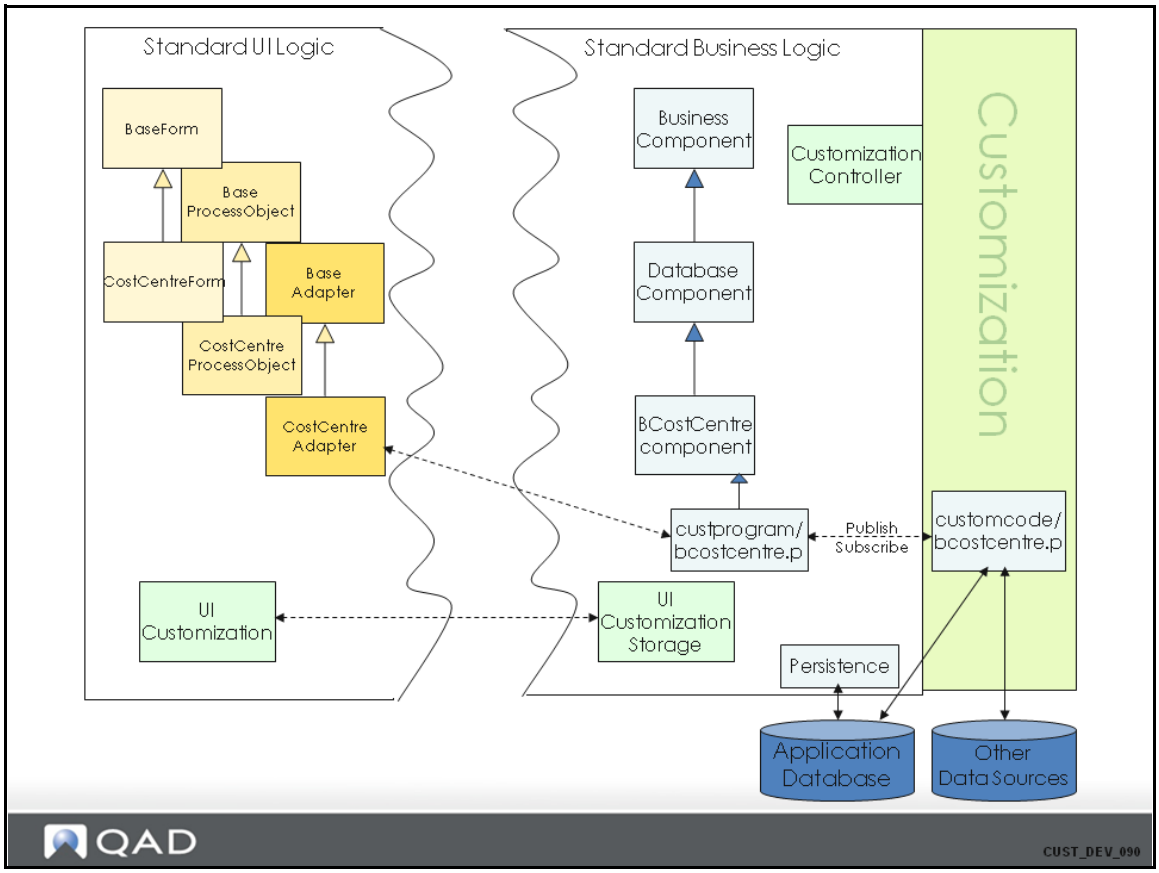
BL Customizations 4



Customization Diagram

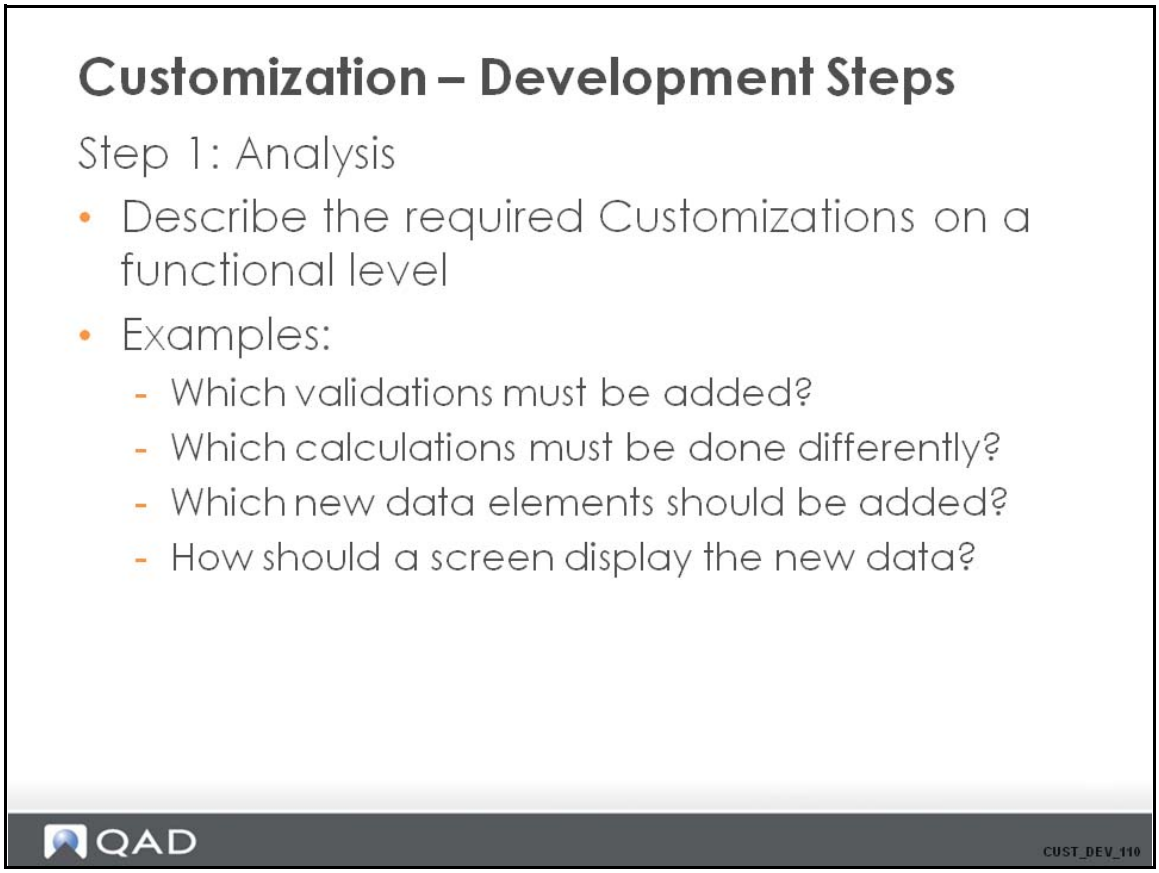


Customization Diagram 2



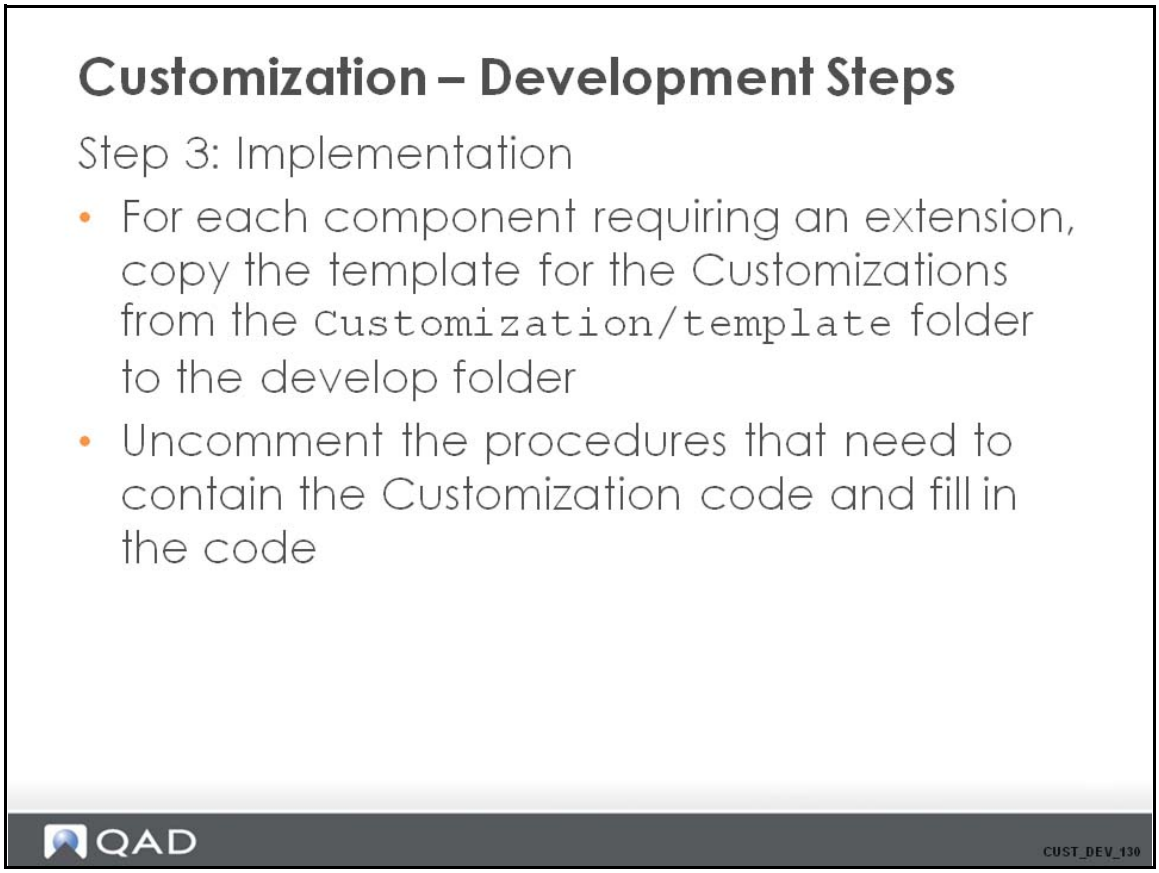
Customization - Development Steps

Customization - Development Steps 2

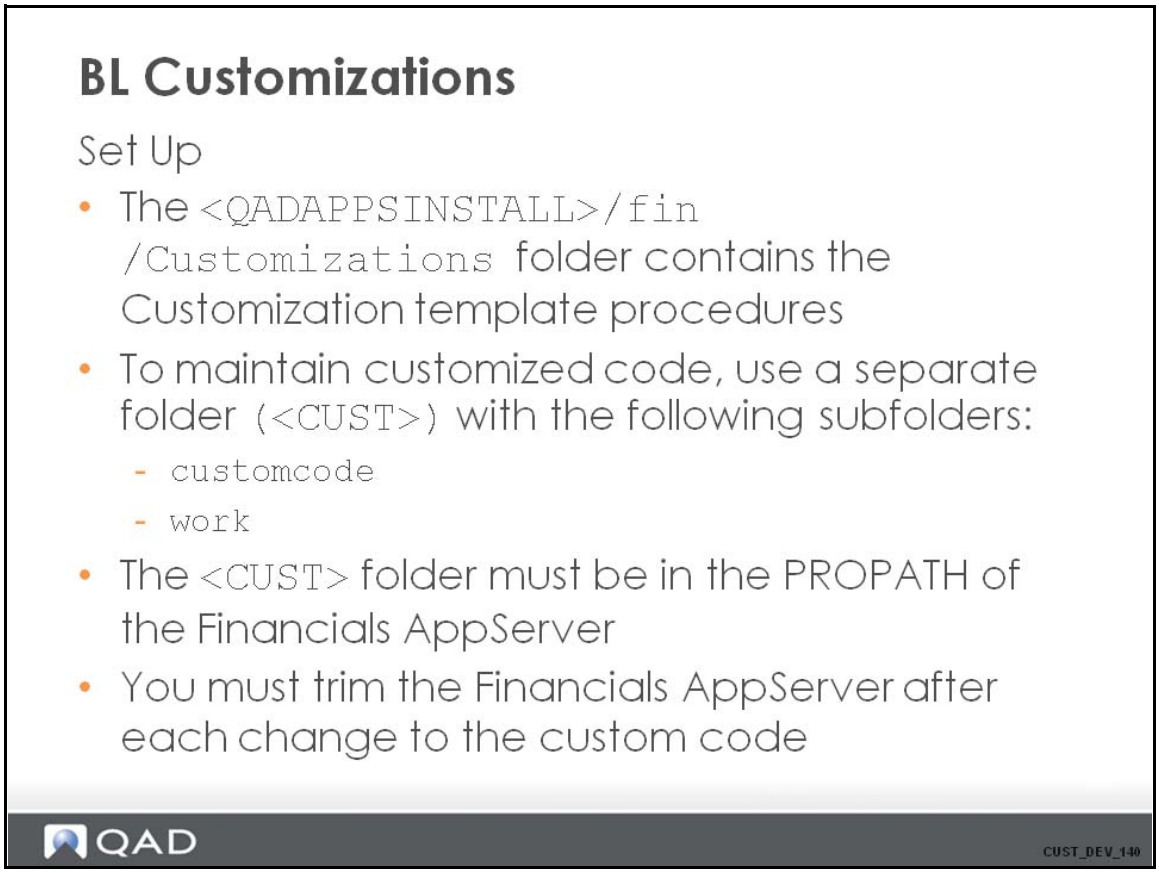


Customization - Development Steps 3

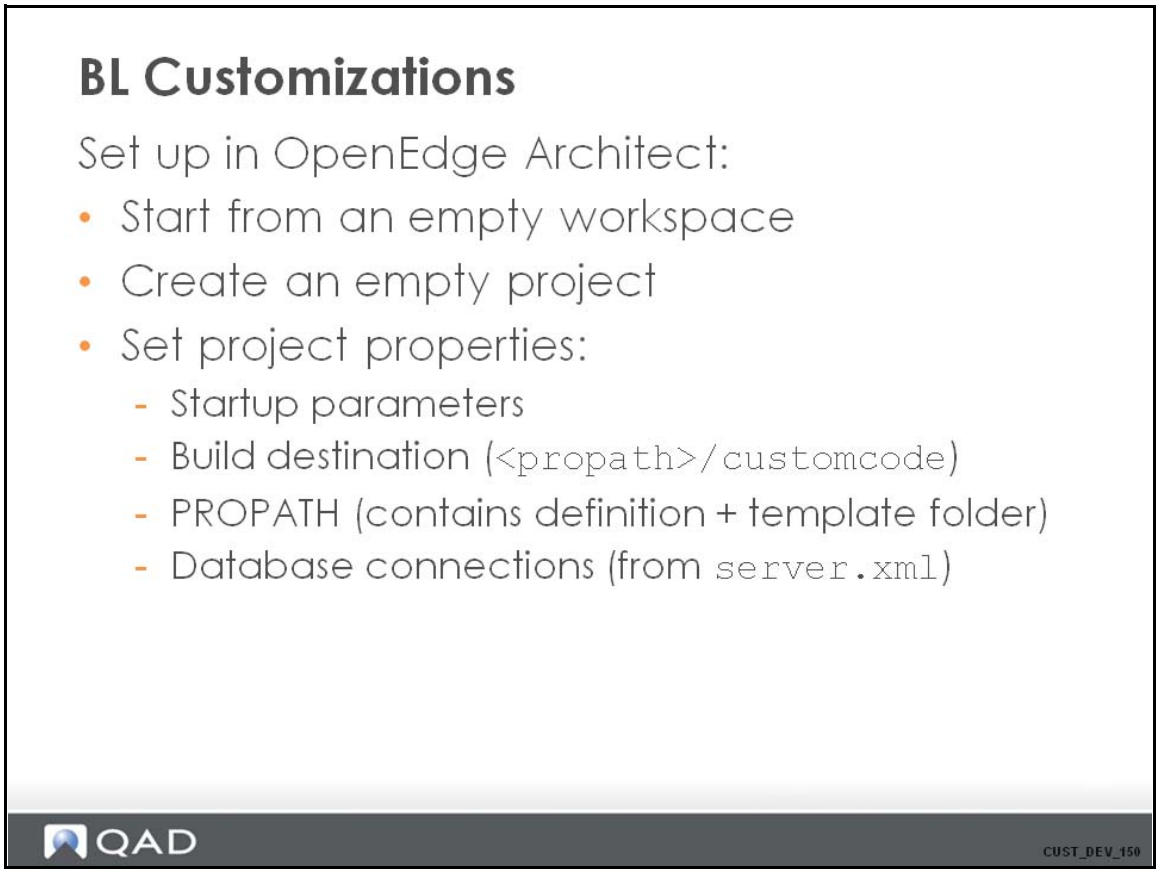
Customization - Development Steps 4



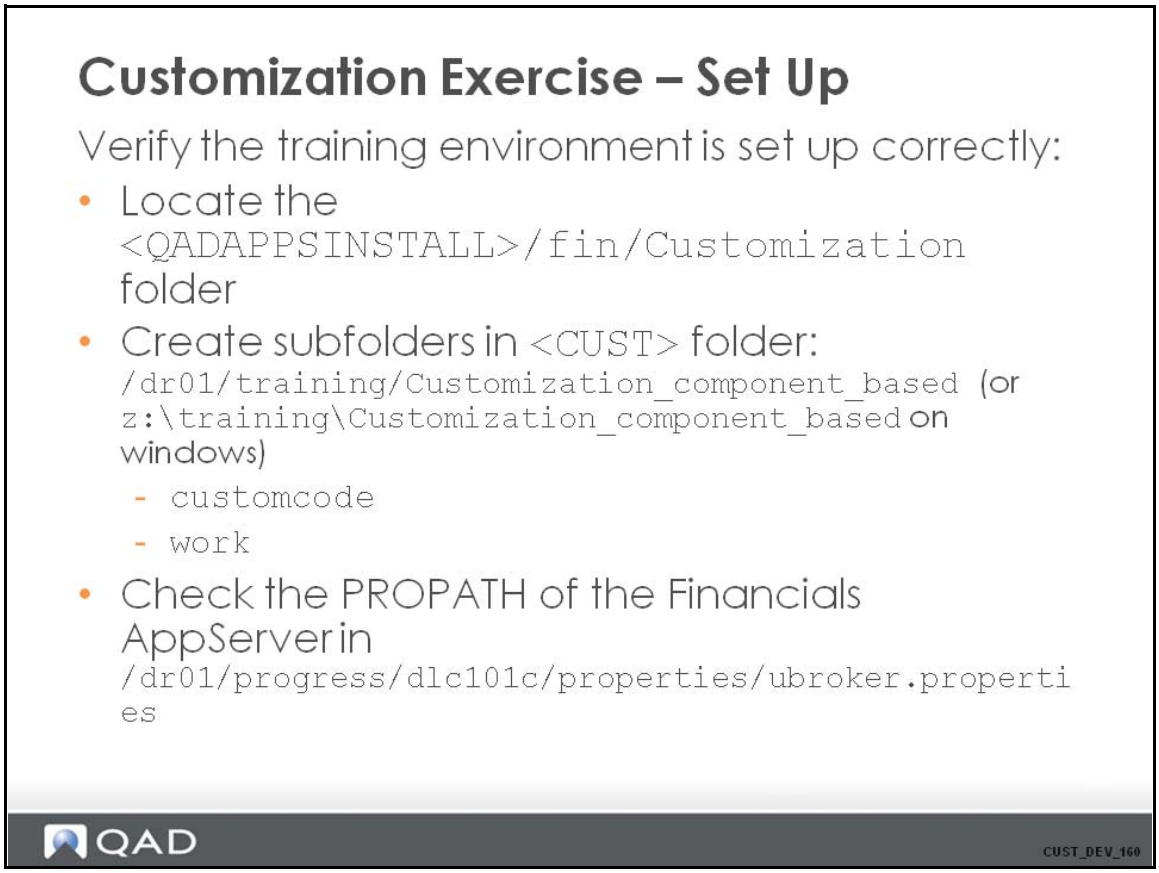
BL Customizations



BL Customizations 2



Customization Exercise - Set Up



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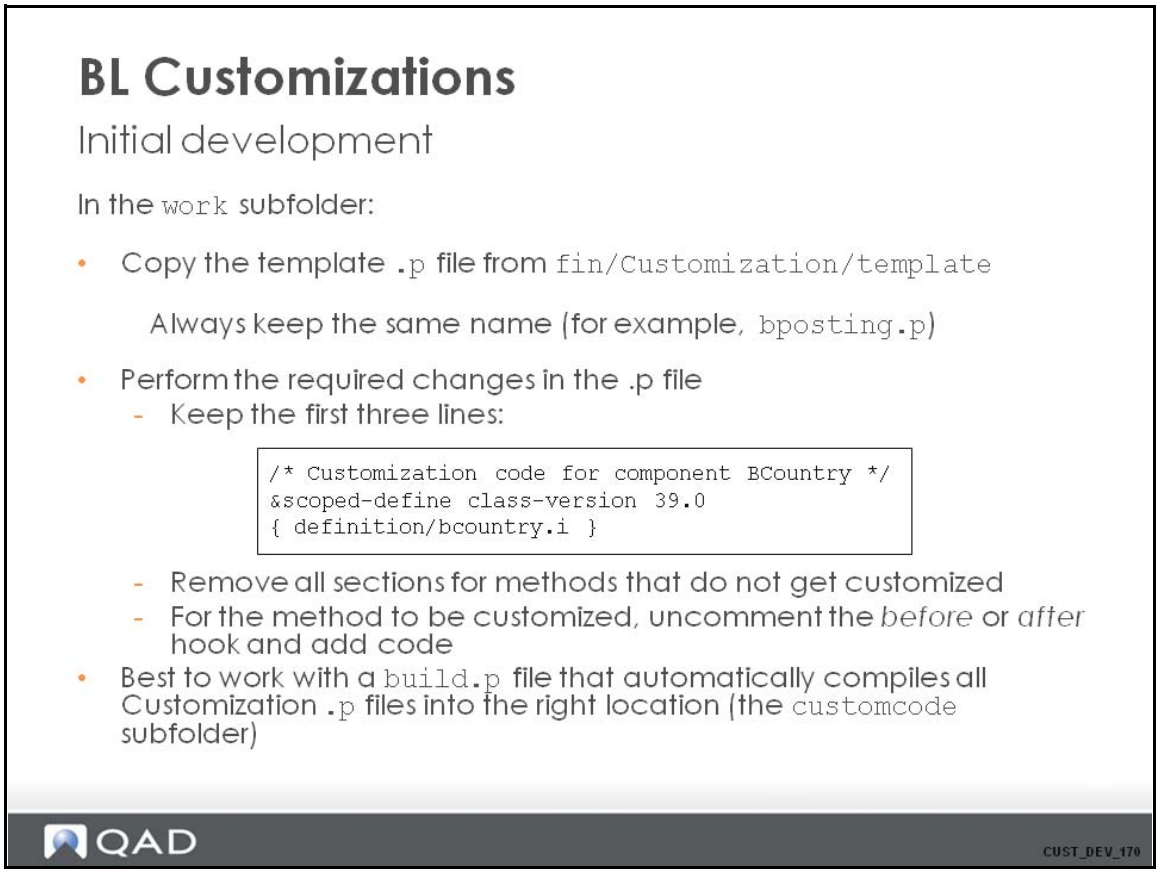
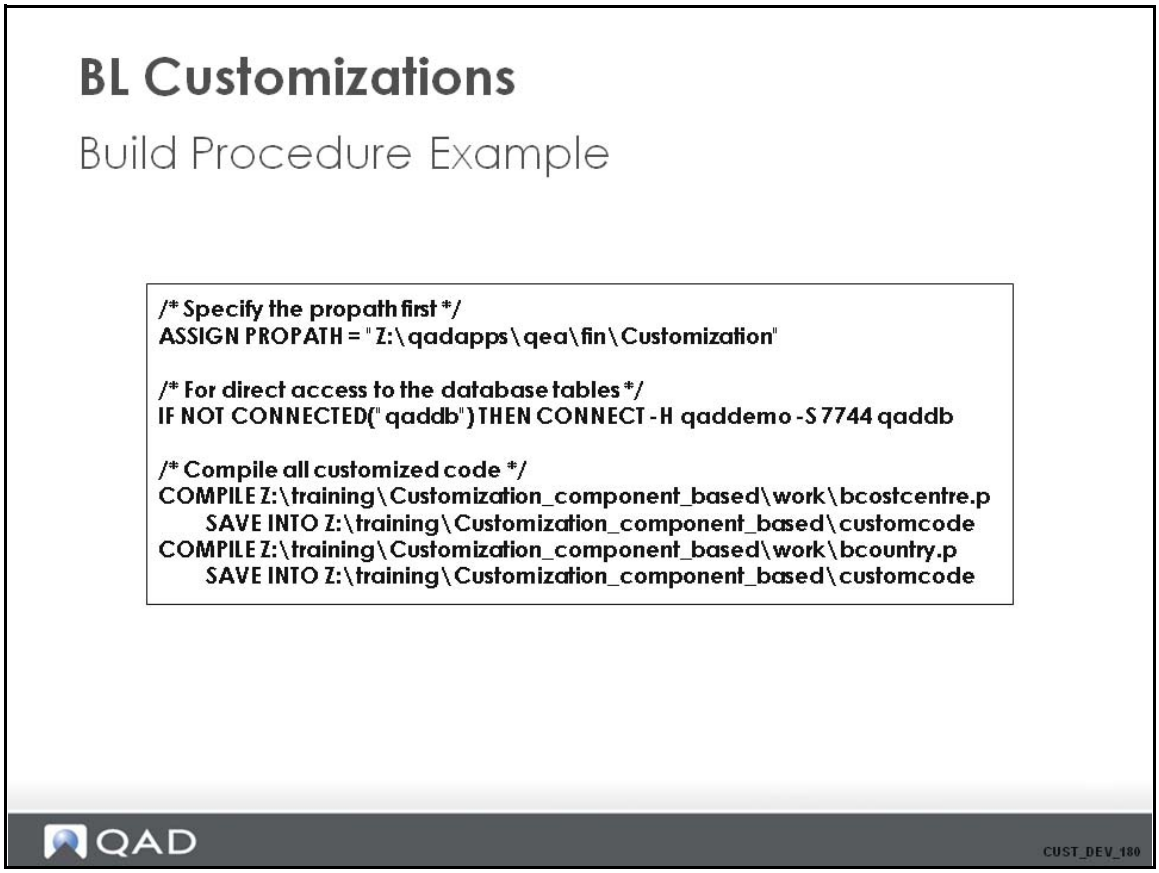
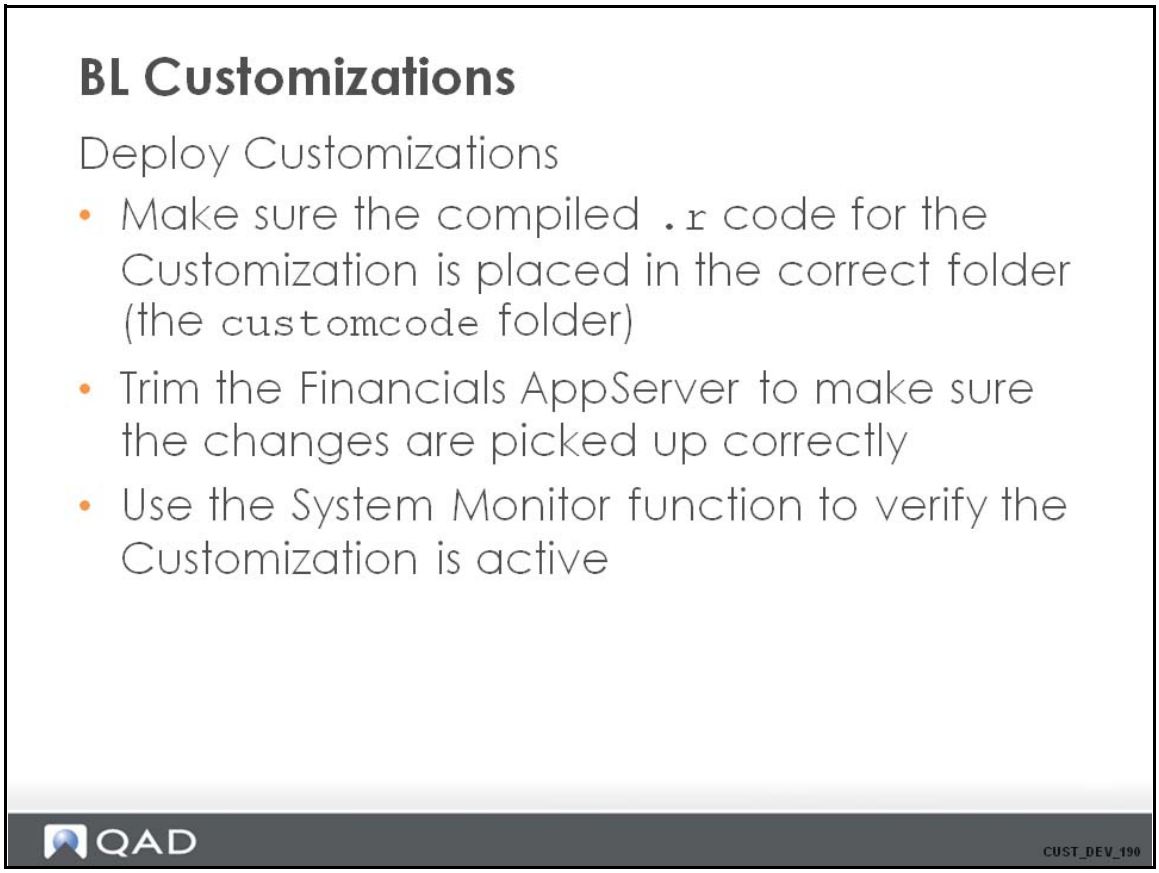


BL Customizations 2



BL Customizations 3

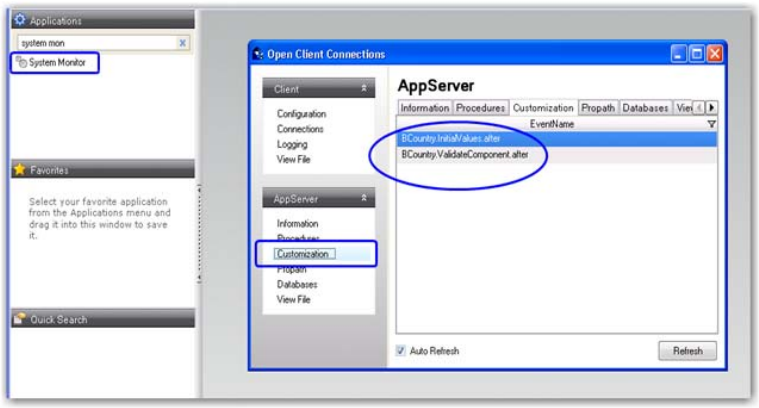


BL Customizations 4

BL Customizations

Use System Monitor to check:

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



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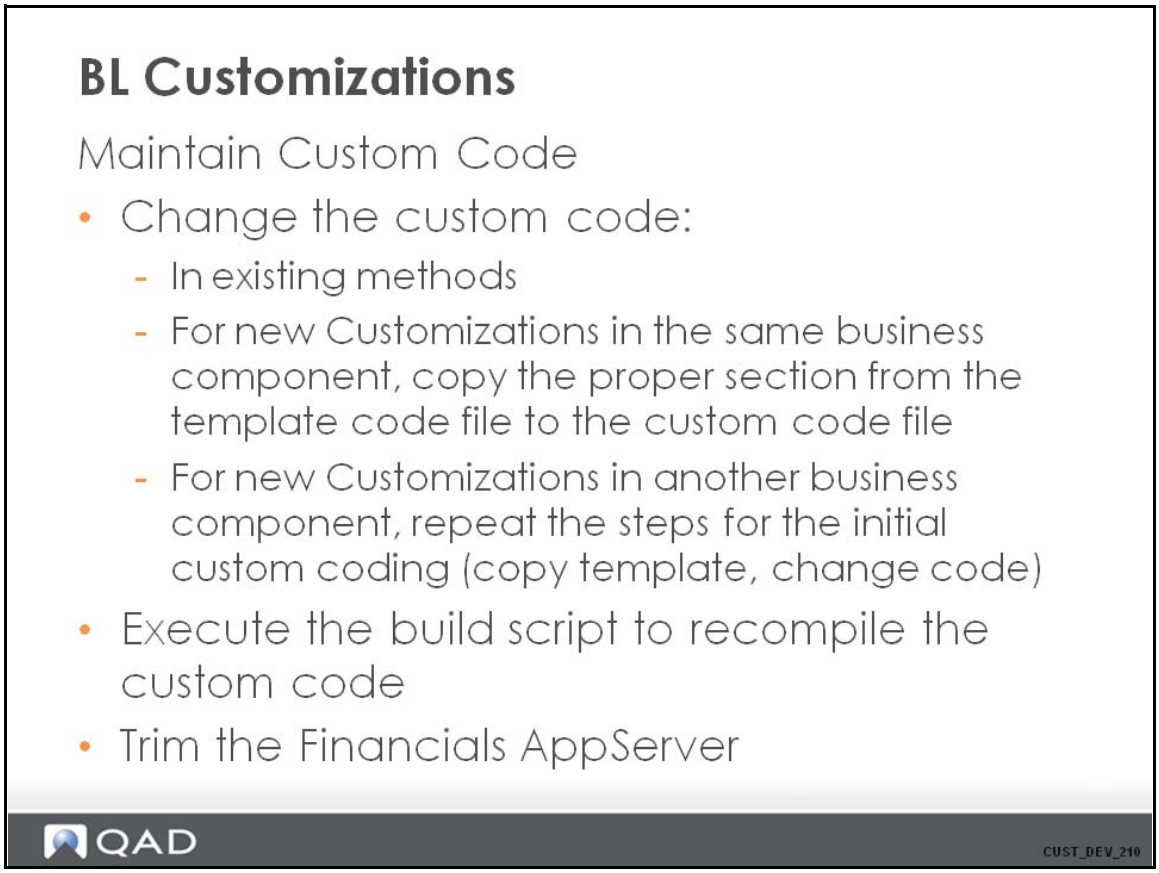
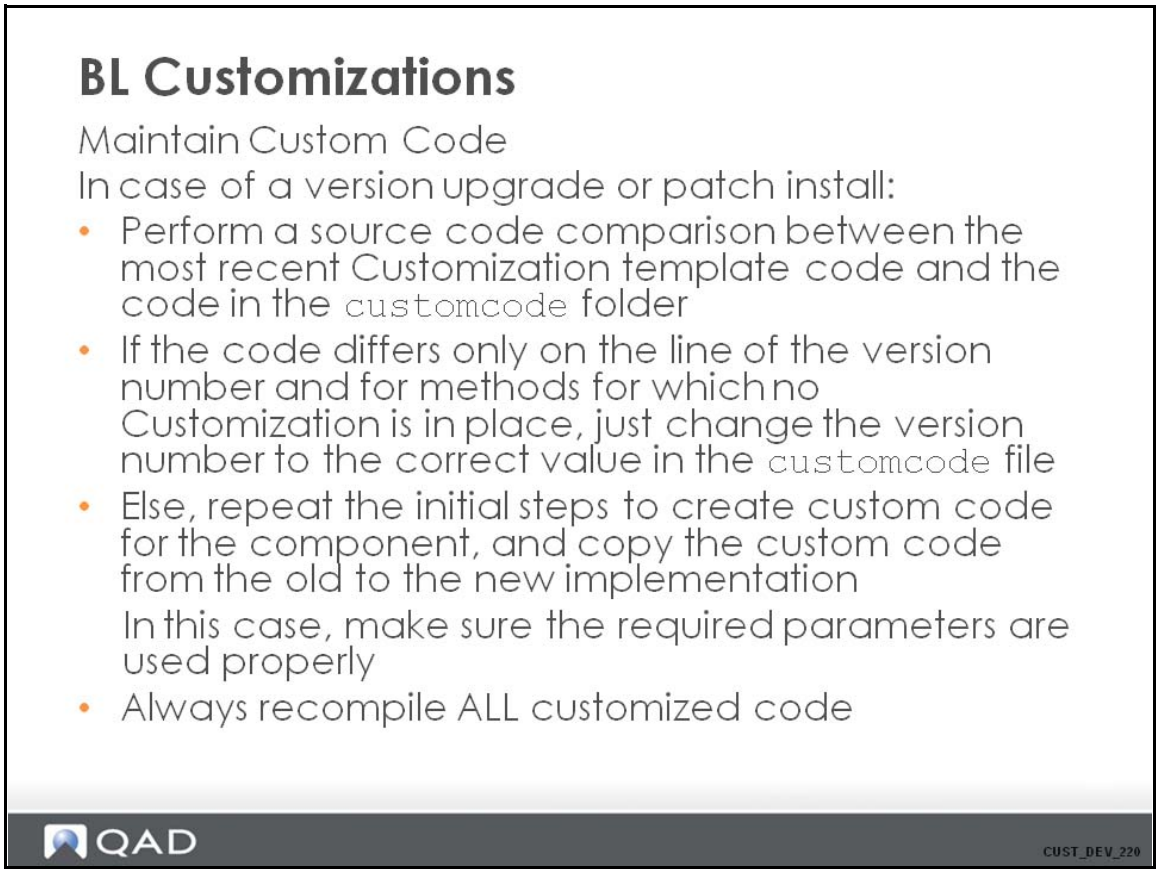
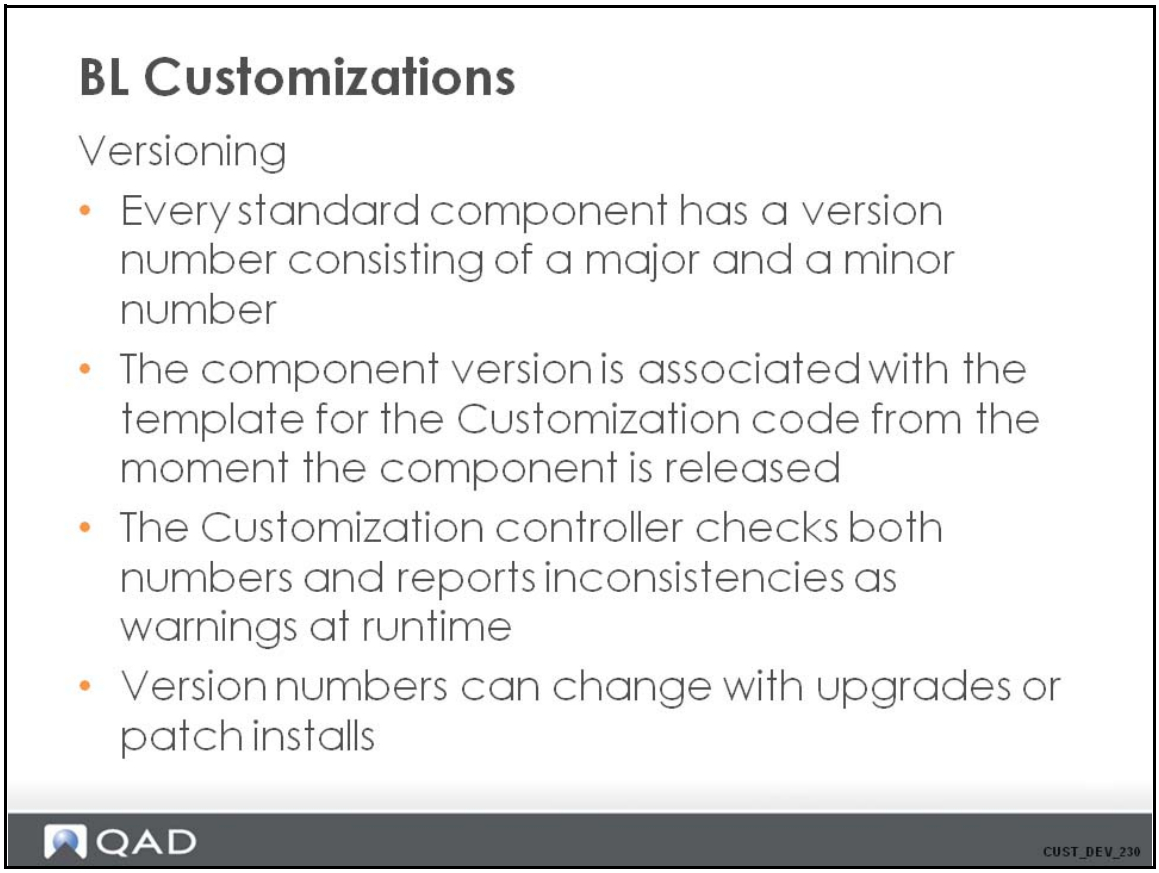
BL Customizations 5



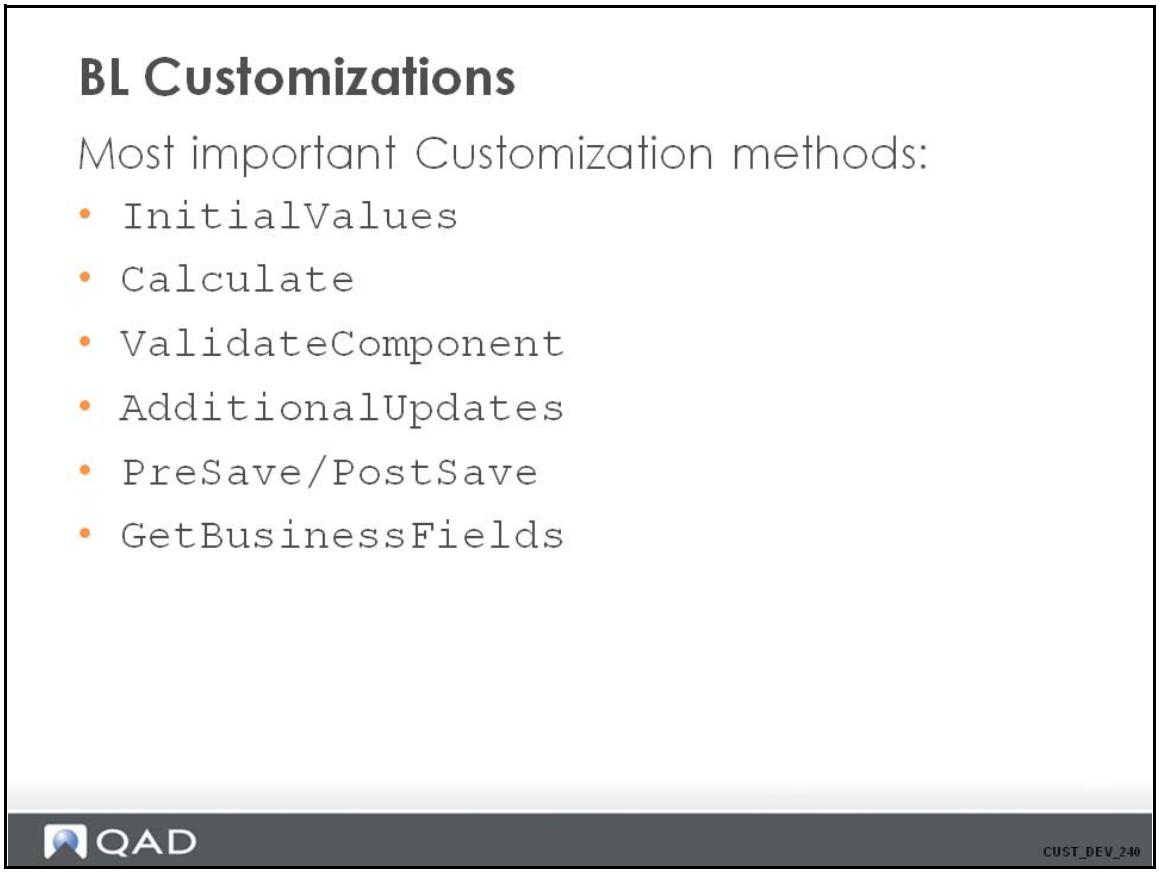
BL Customizations 6



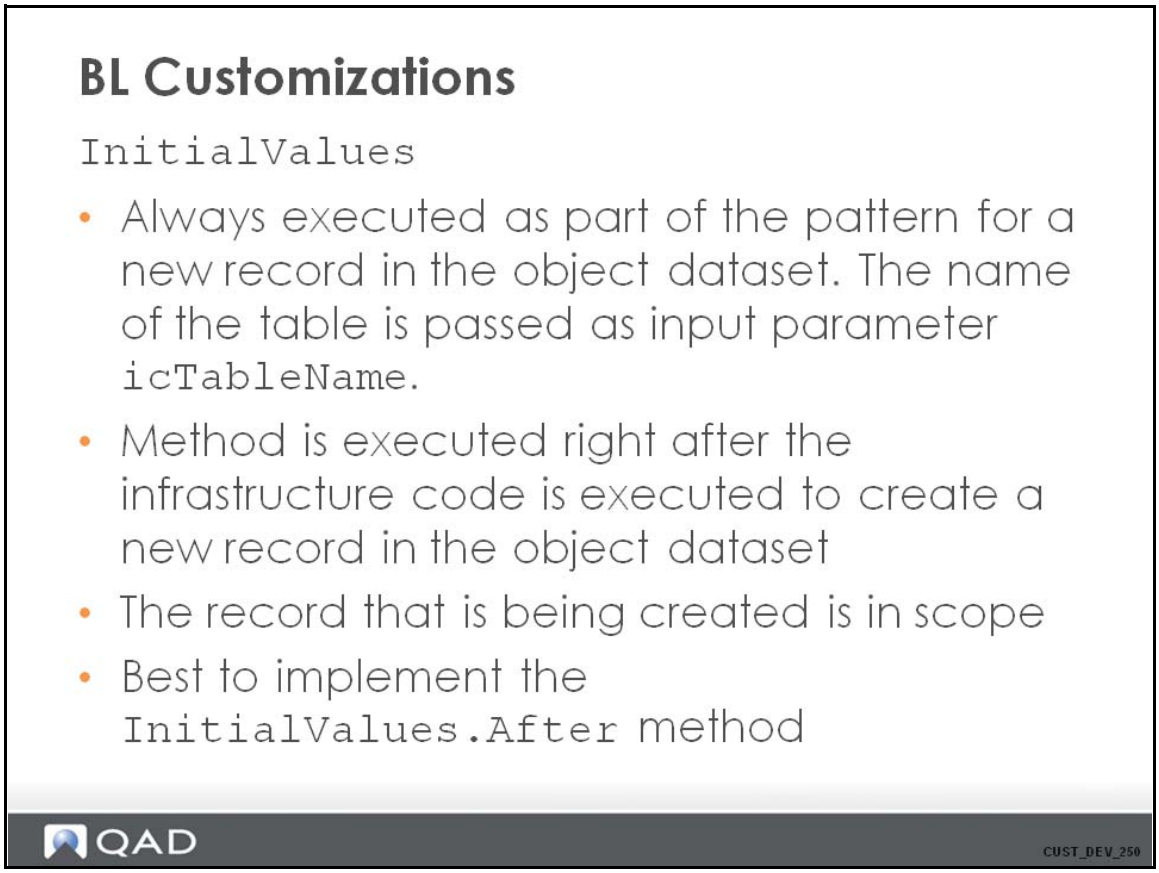
BL Customizations 7



BL Customizations 8



BL Customizations - InitialValues



BL Customizations - InitialValues 2

BL Customizations

InitialValues - Example

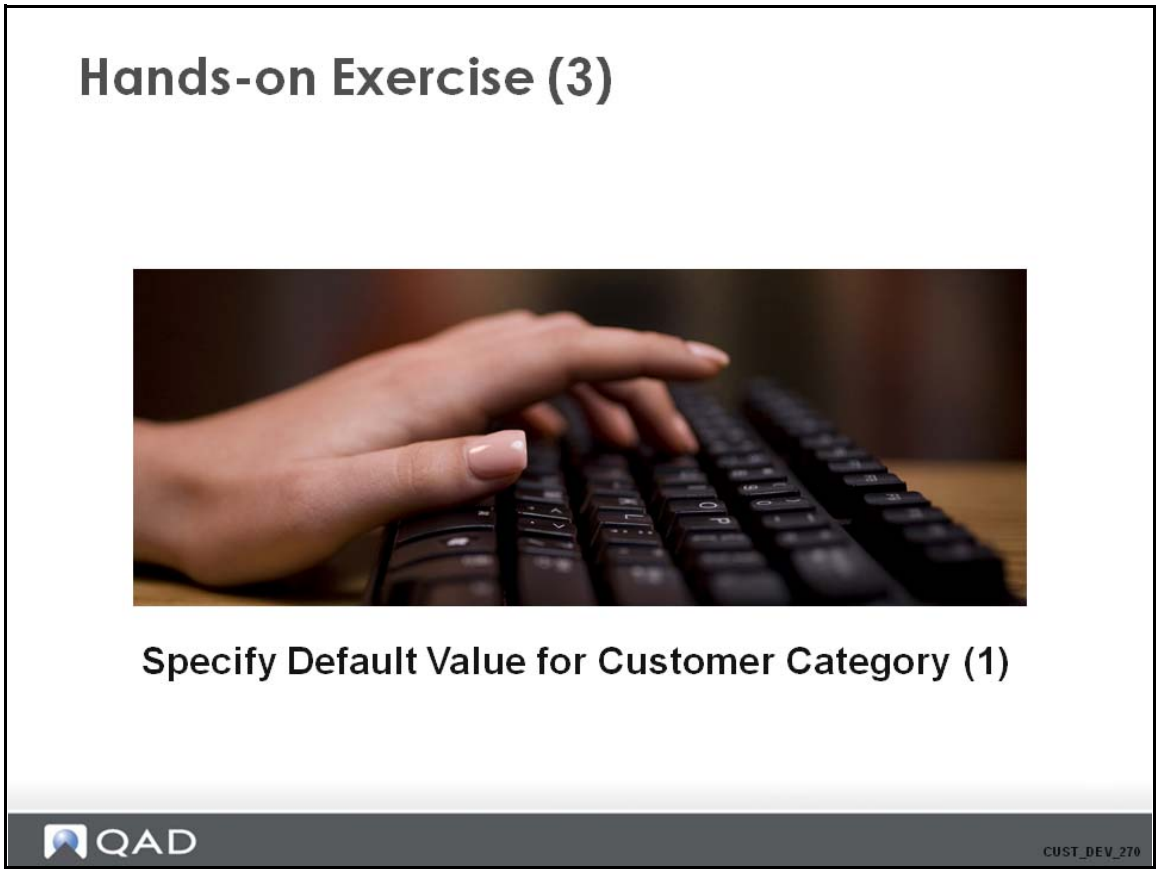
```
/*
Procedure: InitialValues
Description:
Add code here to initialize the calculated fields of a 'new' record (= a record that must be created in the
application database) in a class temp-table.
Parameters:
input icTableName
    (Name of the database table of which a record is created in the class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

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

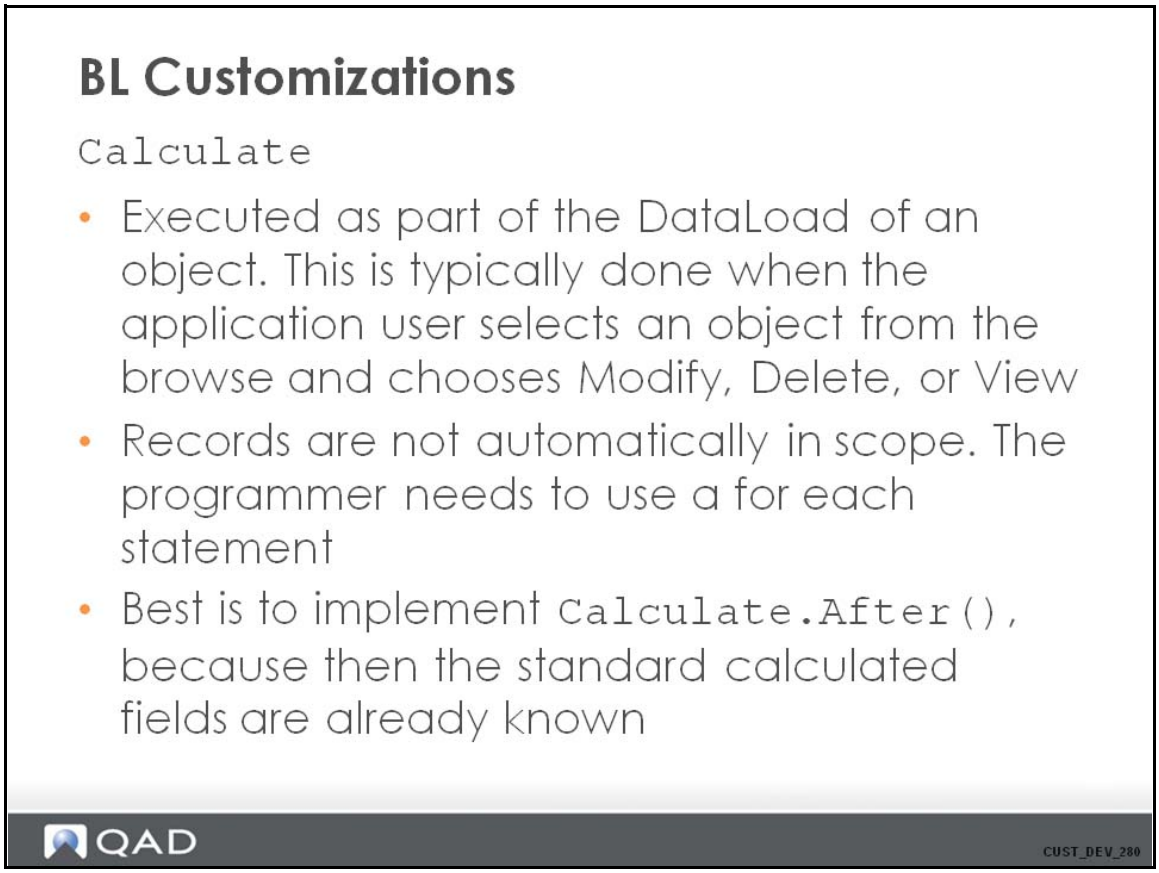
QAD

CUST_DEV_260

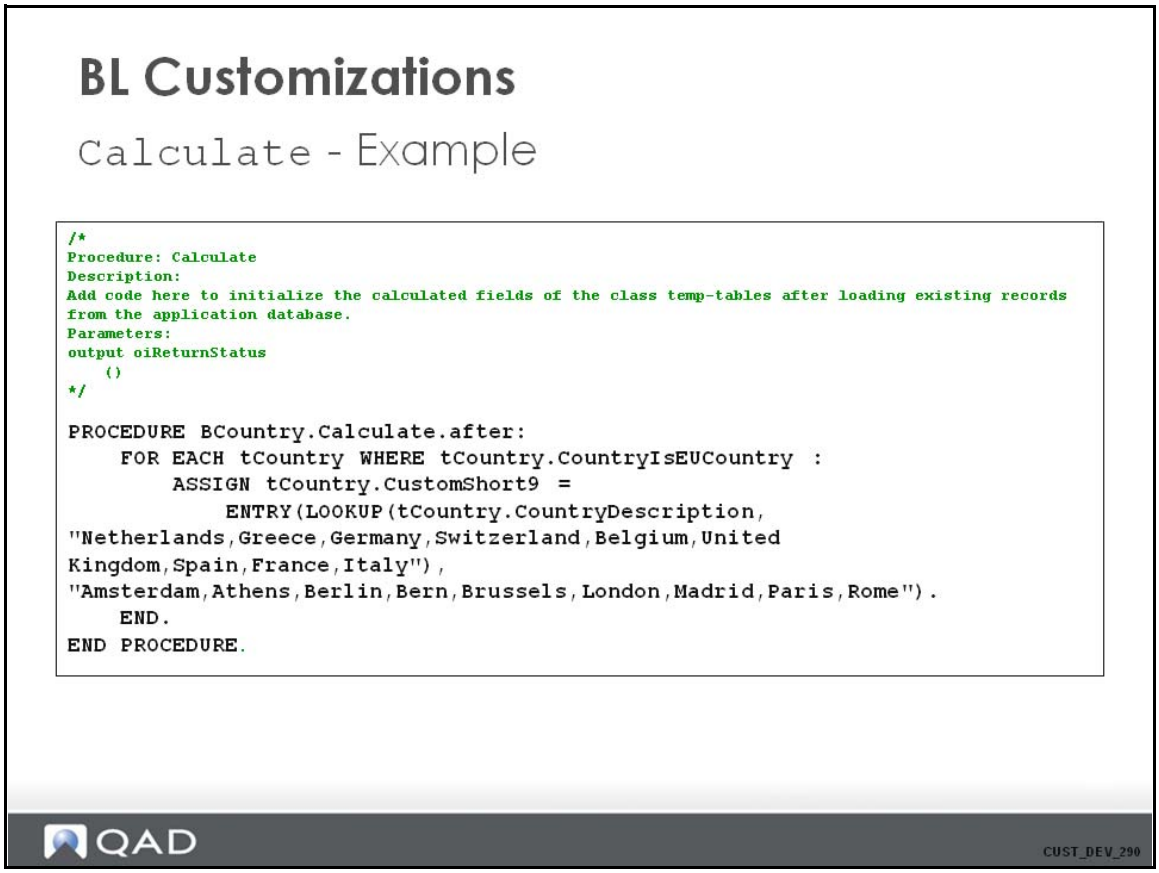
Hands-on Exercise (3)



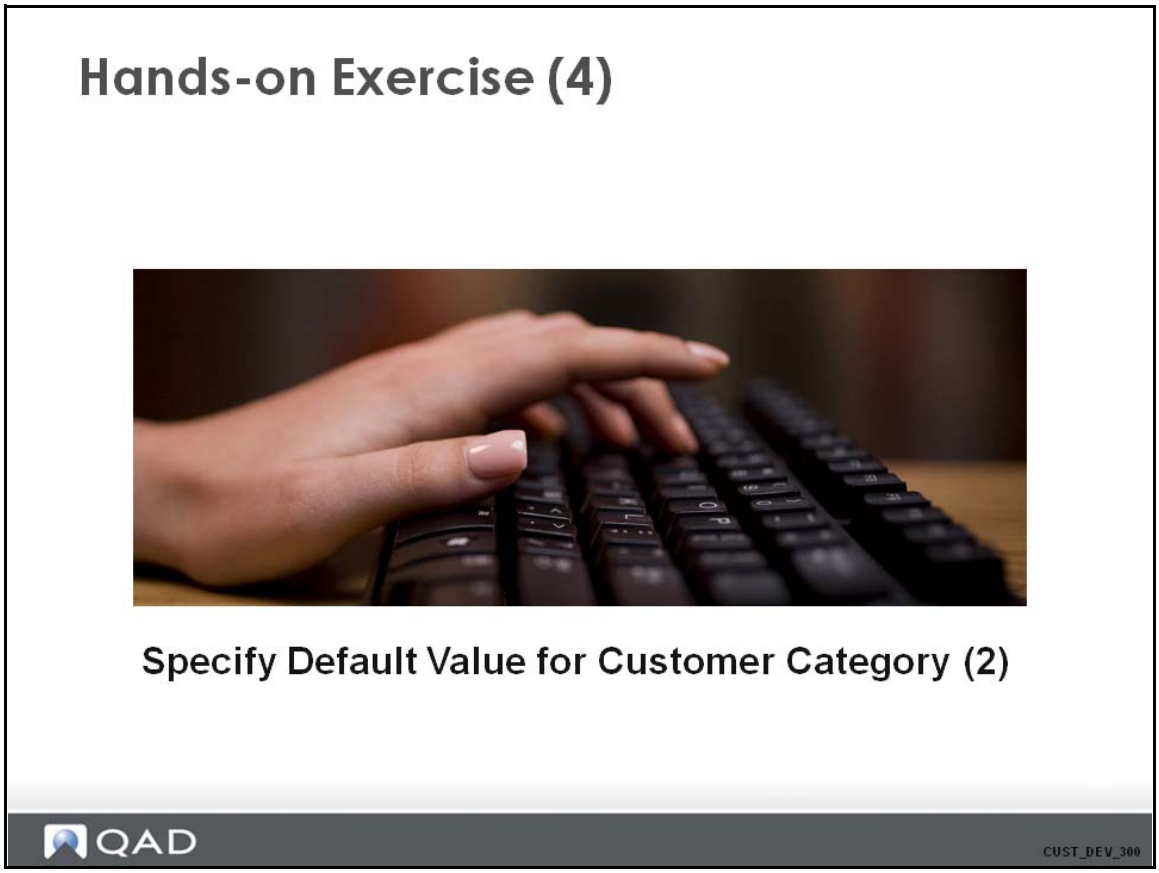
BL Customizations - Calculate



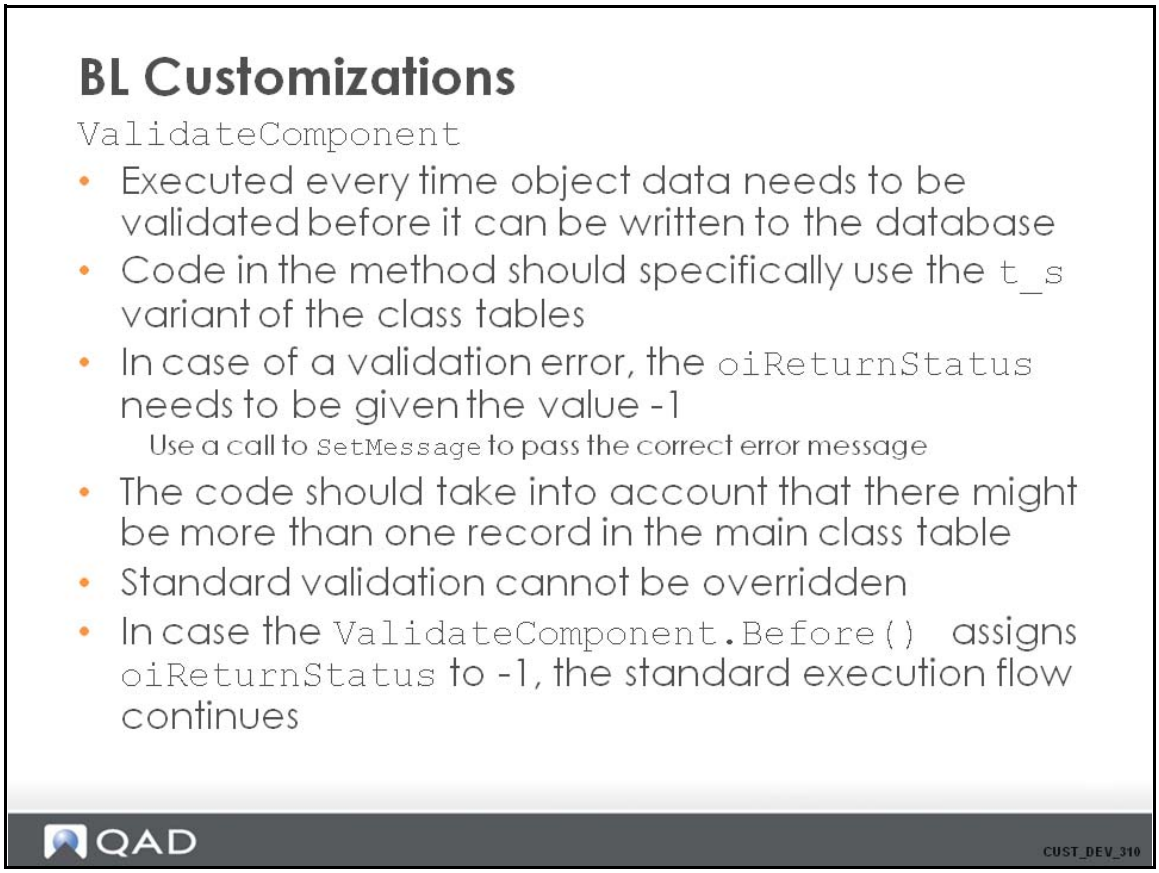
BL Customizations - Calculate 2



Hands-on Exercise (4)



BL Customizations - ValidateComponent



BL Customizations - ValidateComponent 2

BL Customizations

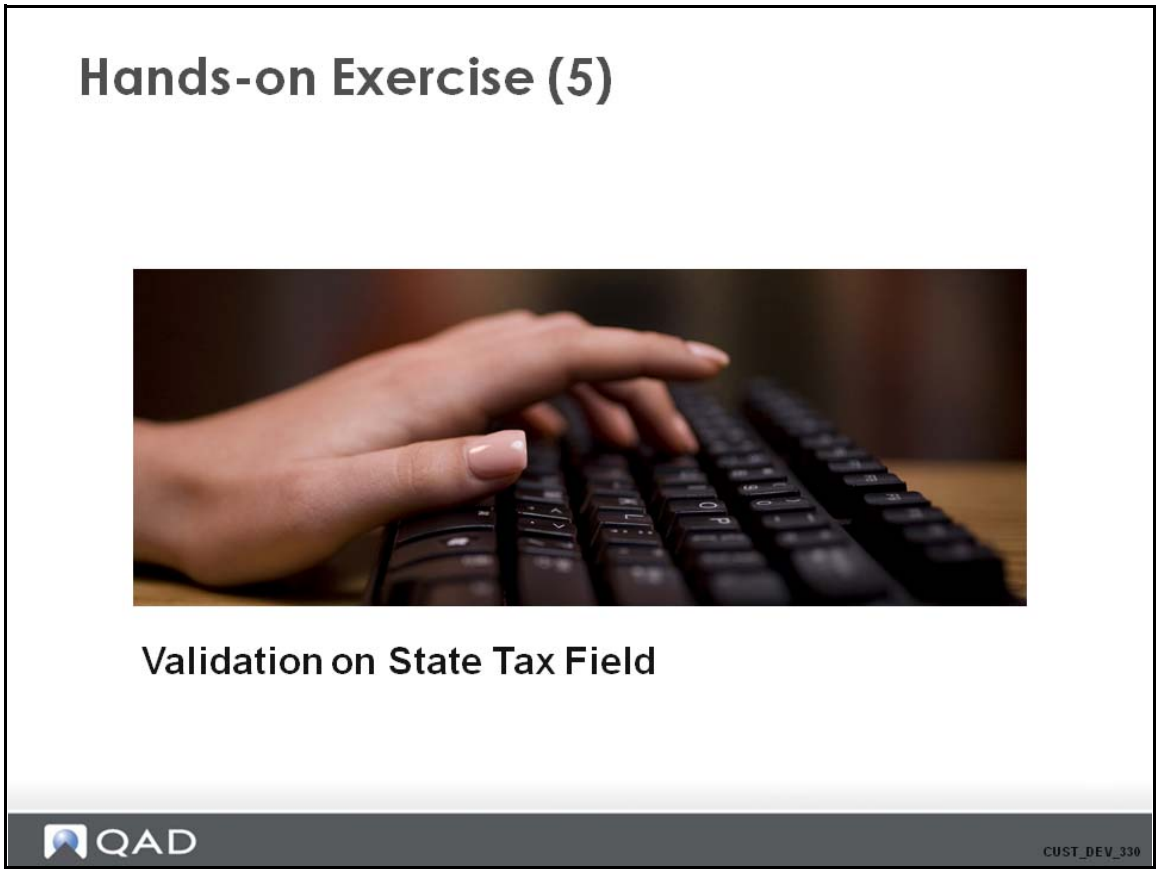
ValidateComponent - Example

```
/*
Procedure: ValidateComponent
Description: …
*/
PROCEDURE BCountry.ValidateComponent.After:
    DEFINE VARIABLE viReturn AS INTEGER NO-UNDO.
    FOR EACH t_sCountry:
        IF t_sCountry.CustomInteger0 = 0 THEN DO:
            ASSIGN t_parameter.oiReturnStatus = -102.
            run SetMessage ('The number of habitants ($1) must be greater than 0.',
                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.
```

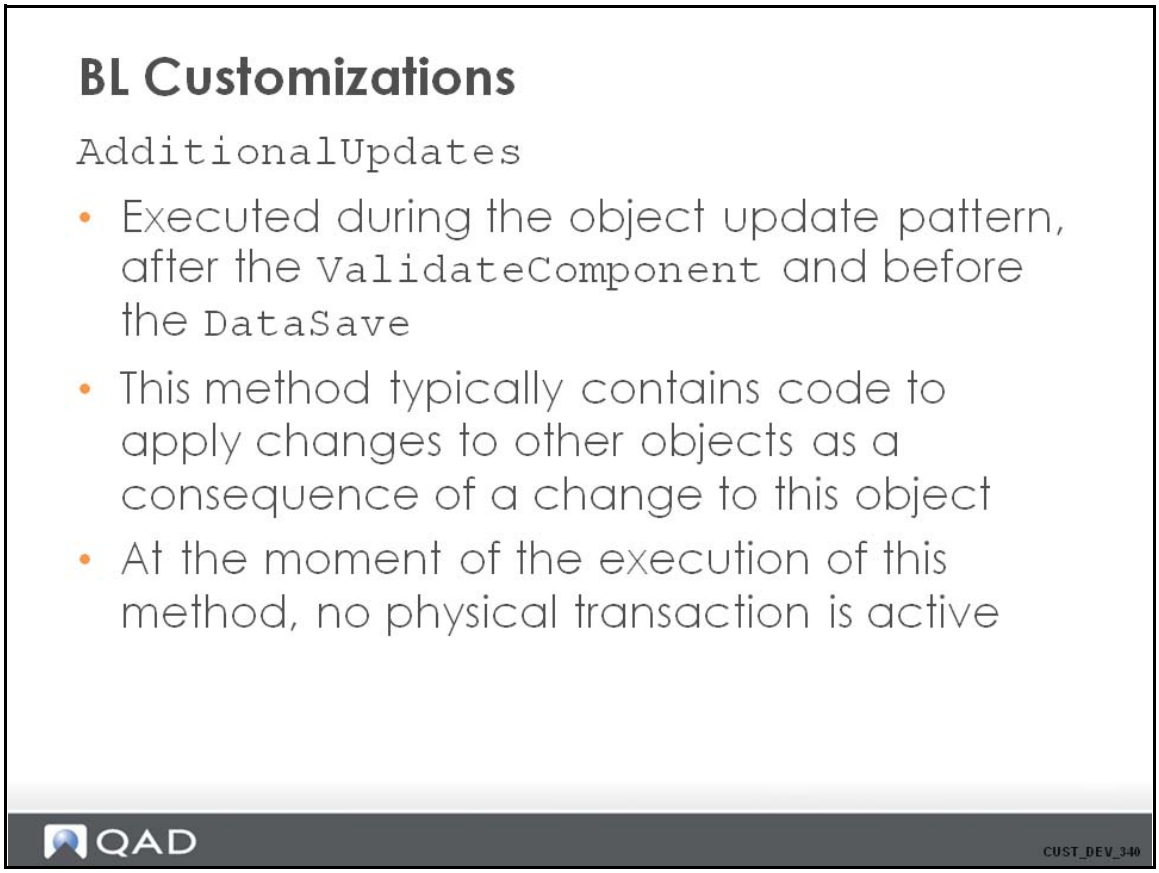
QAD

CUST_DEV_320

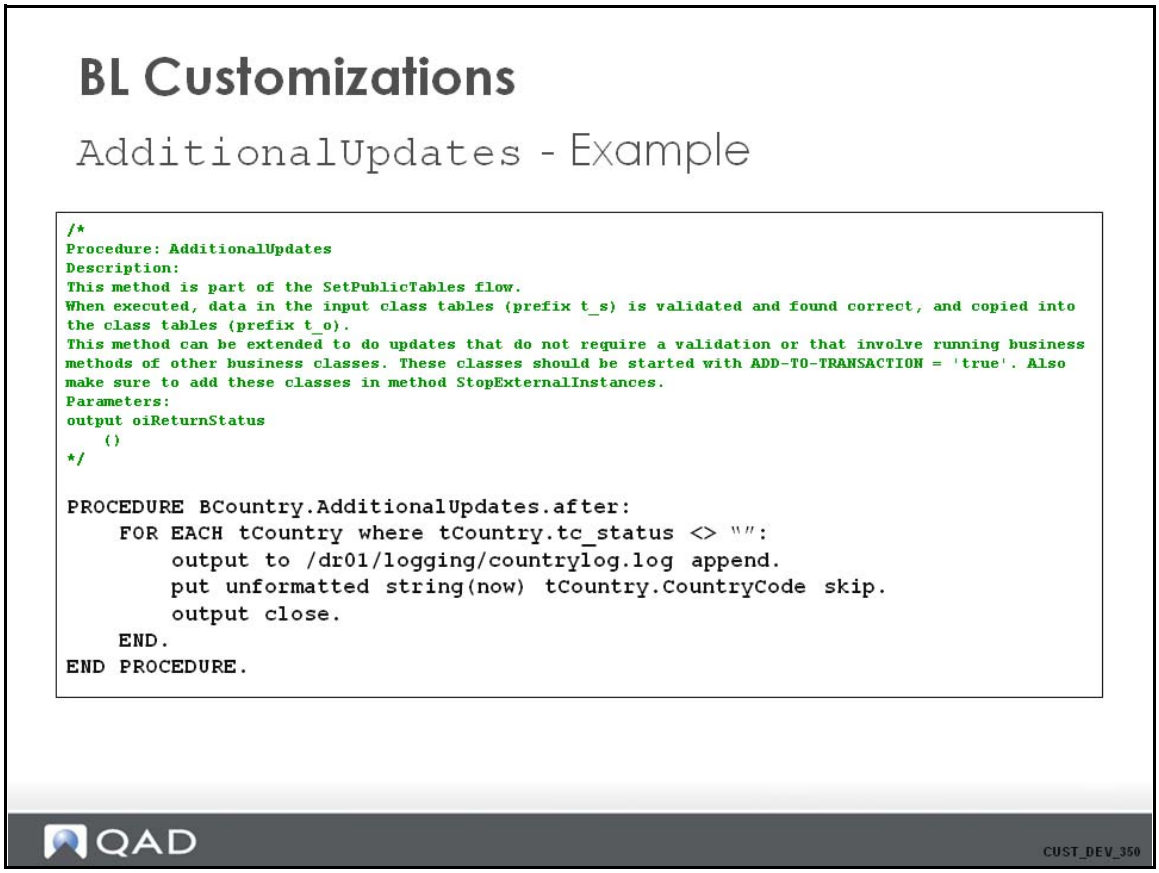
Hands-on Exercise (5)



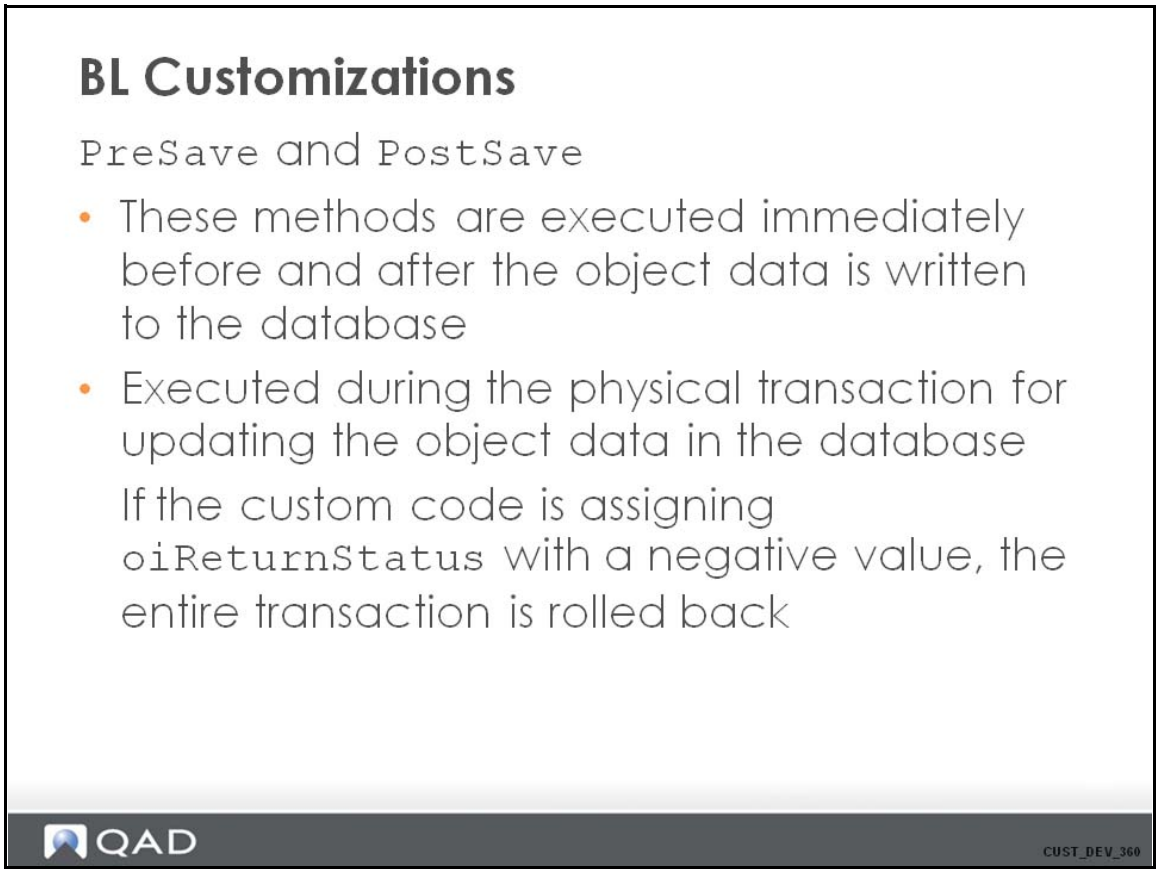
BL Customizations - AdditionalUpdates



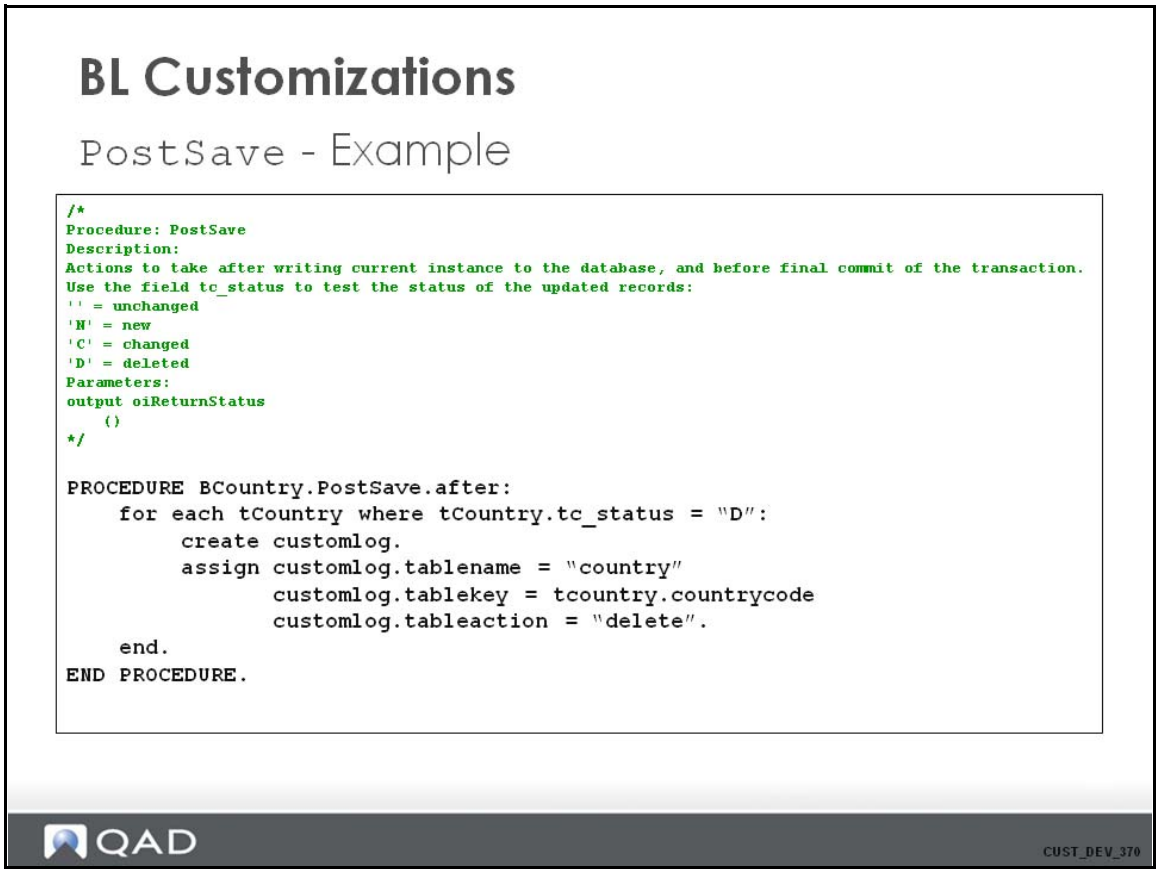
BL Customizations - Additional Updates 2



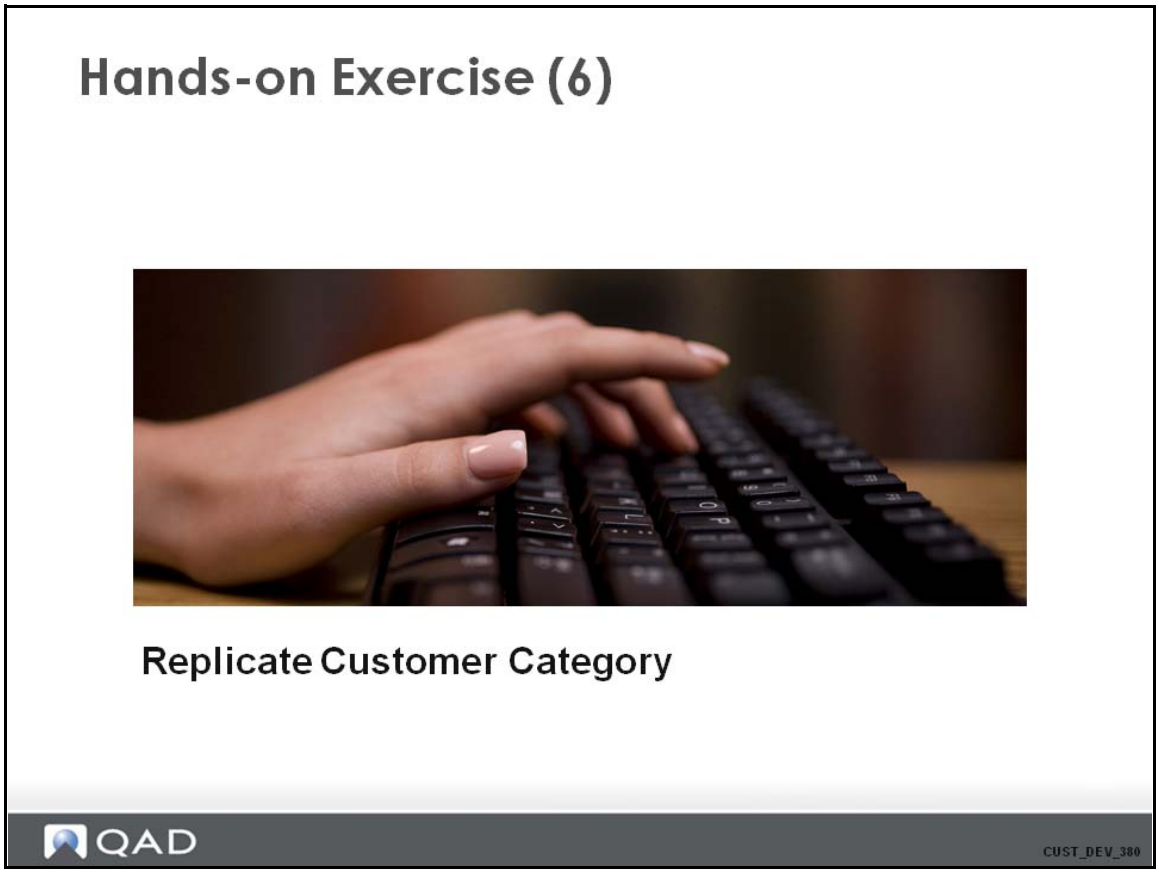
BL Customizations - PreSave and PostSave



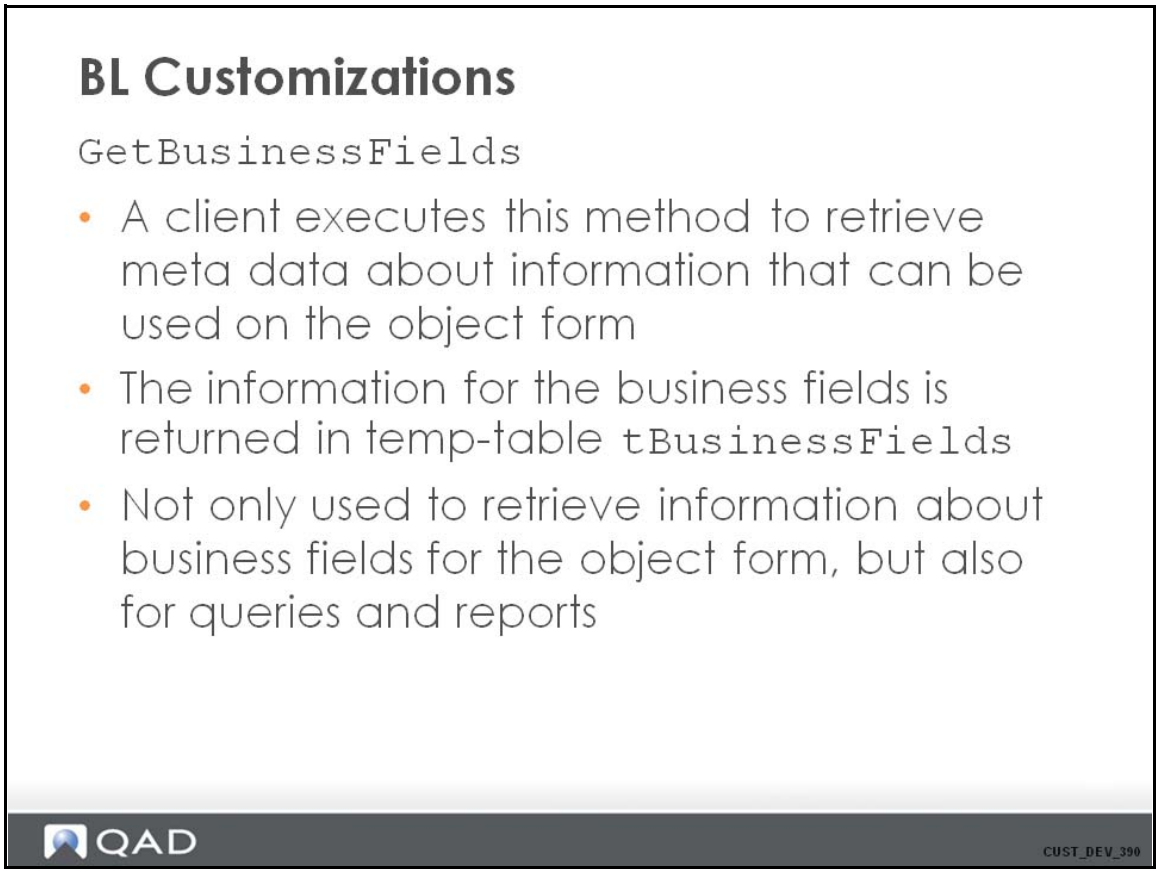
BL Customizations - PostSave



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.

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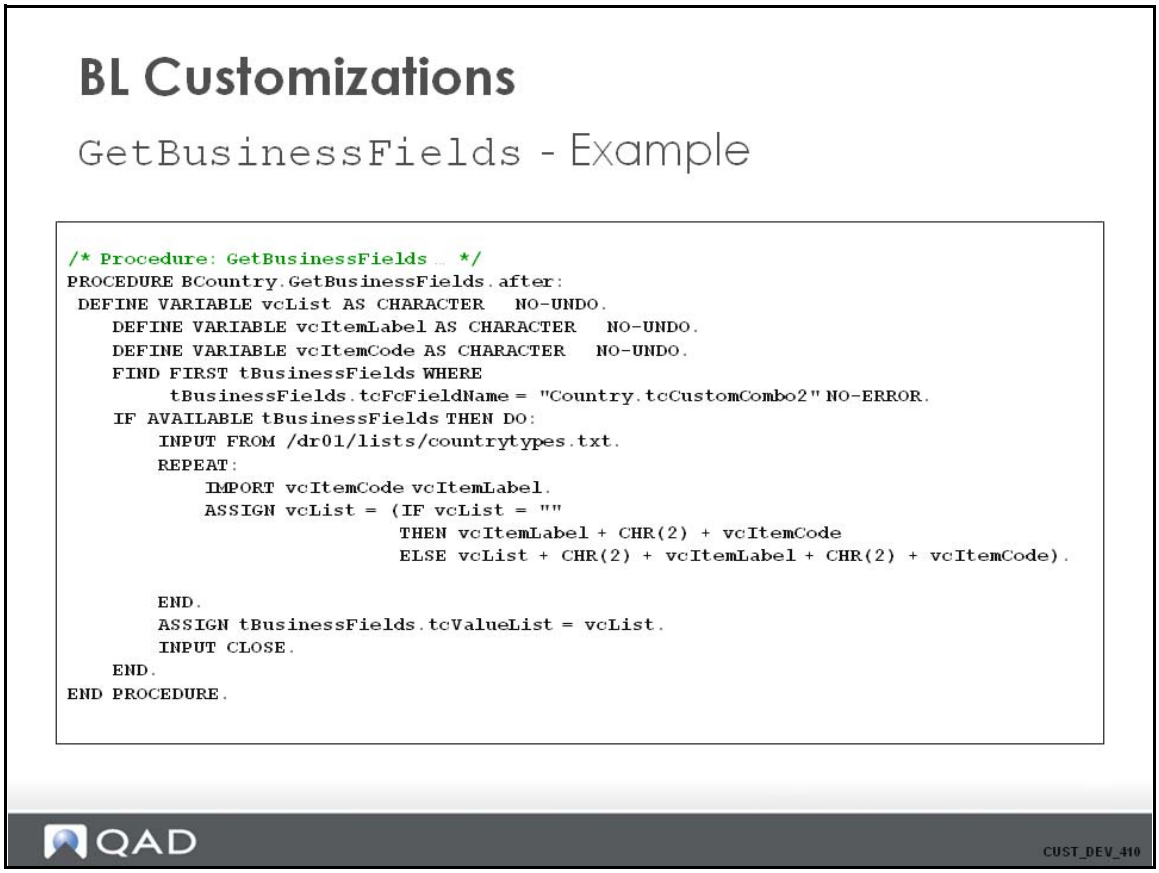
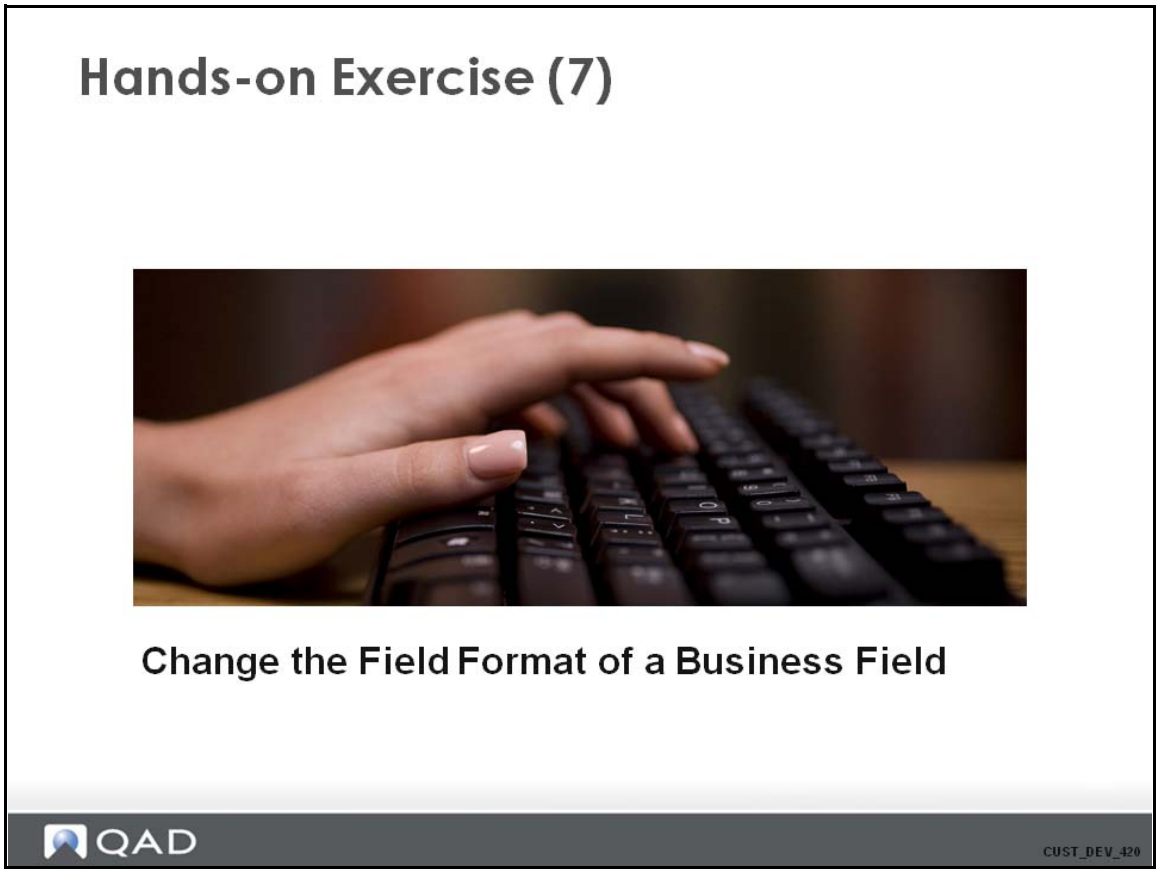
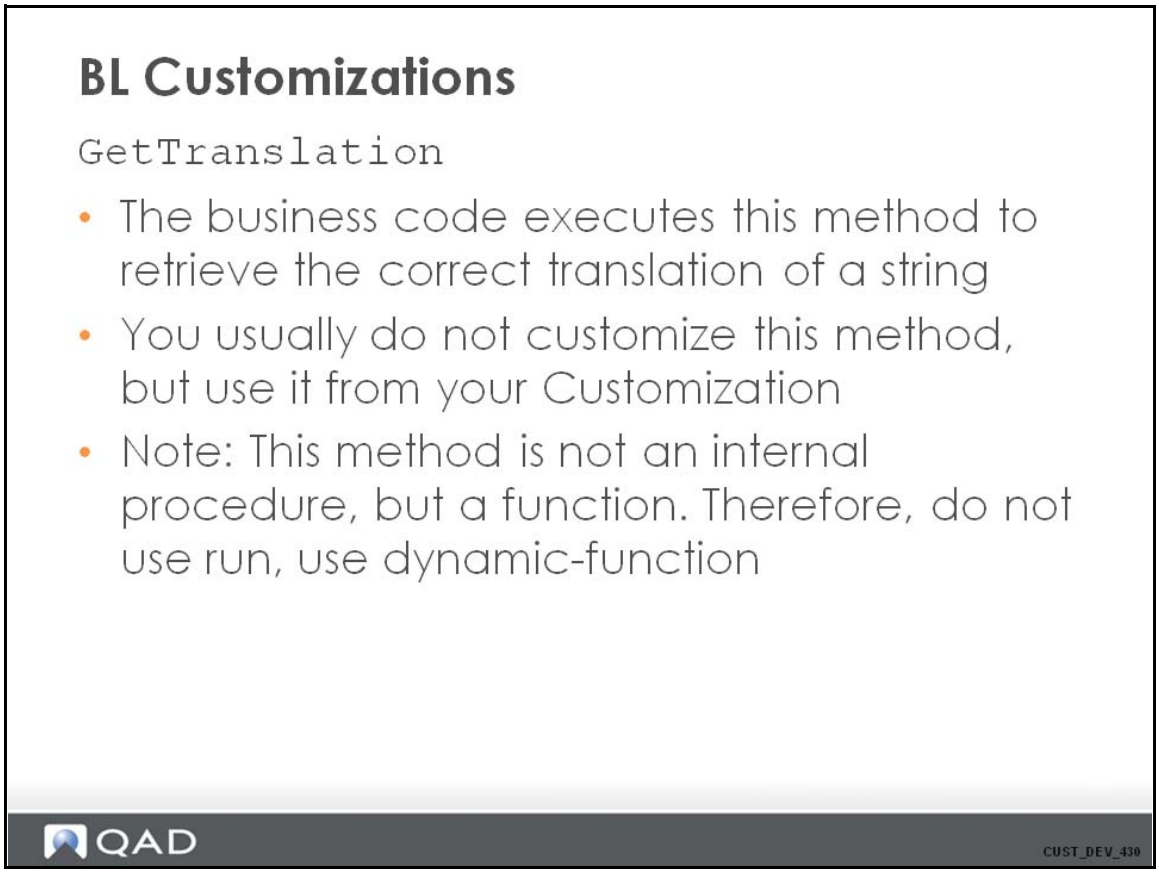
BL Customizations - GetBusinessFields



Hands-on Exercise (7)



BL Customizations - GetTranslation



BL Customizations - GetTranslation 2

BL Customizations

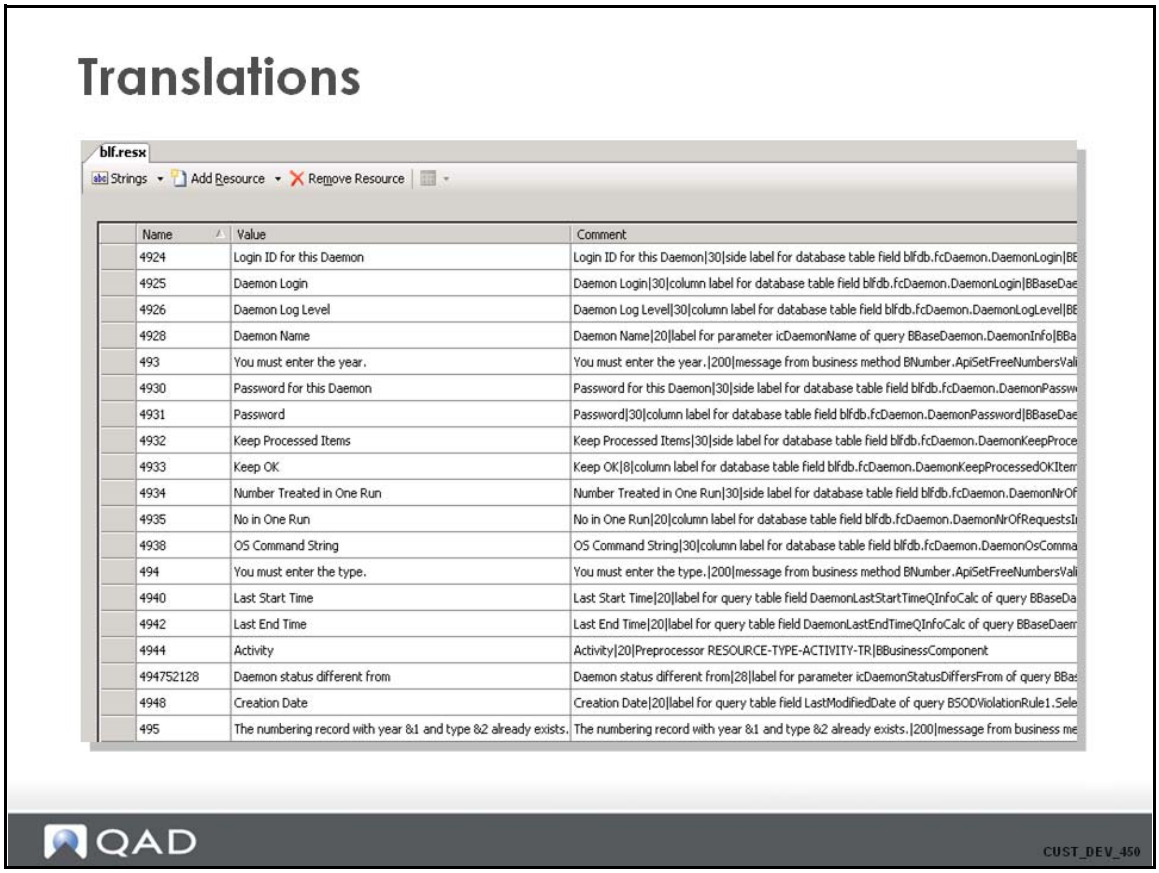
GetTranslation - Example

```
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.
```

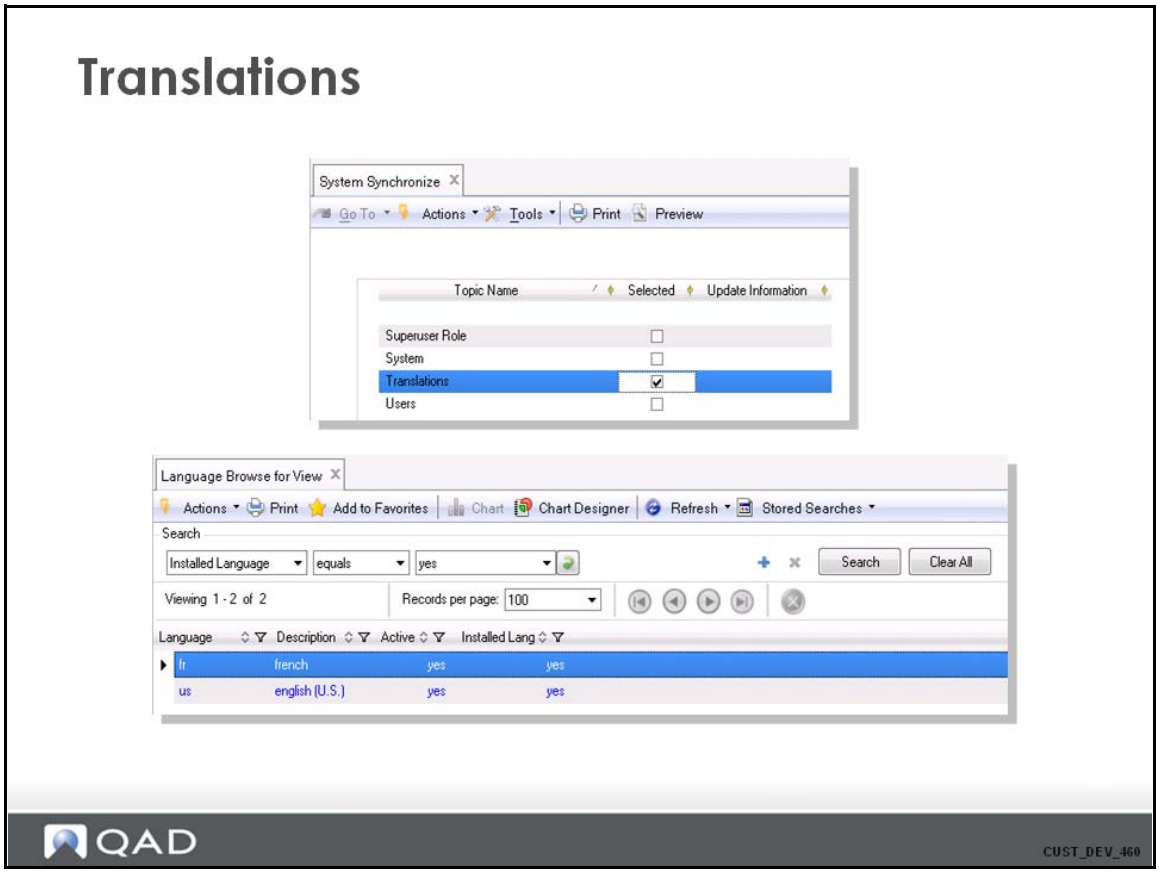
QAD

CUST_DEV_440

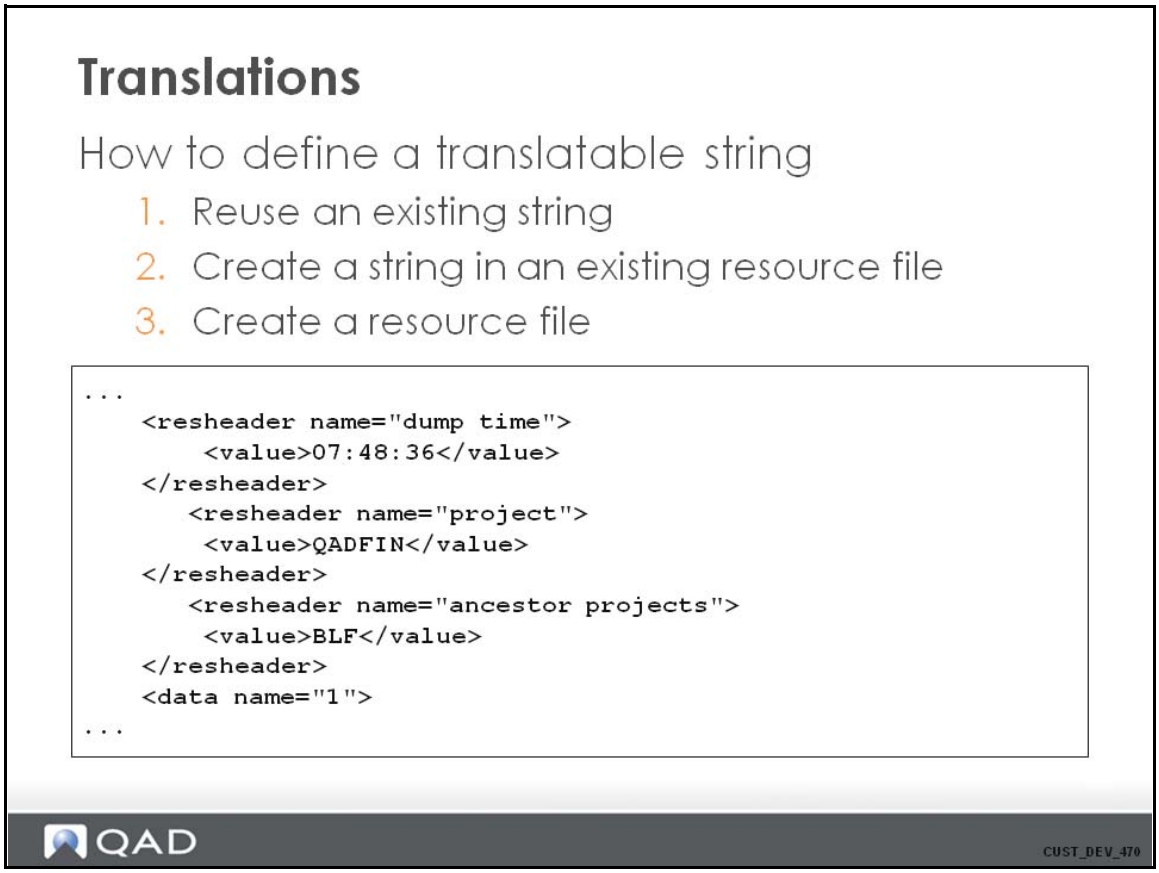
Translations



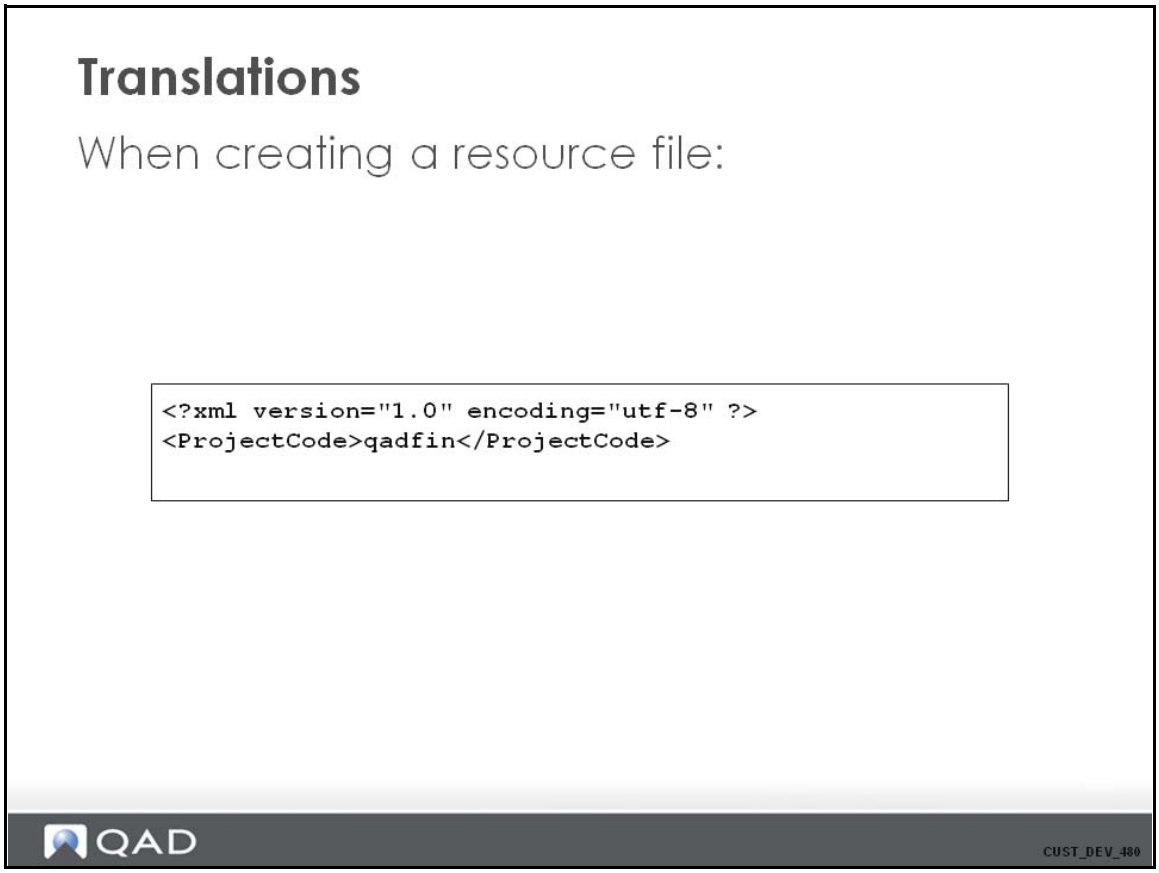
Translations 2



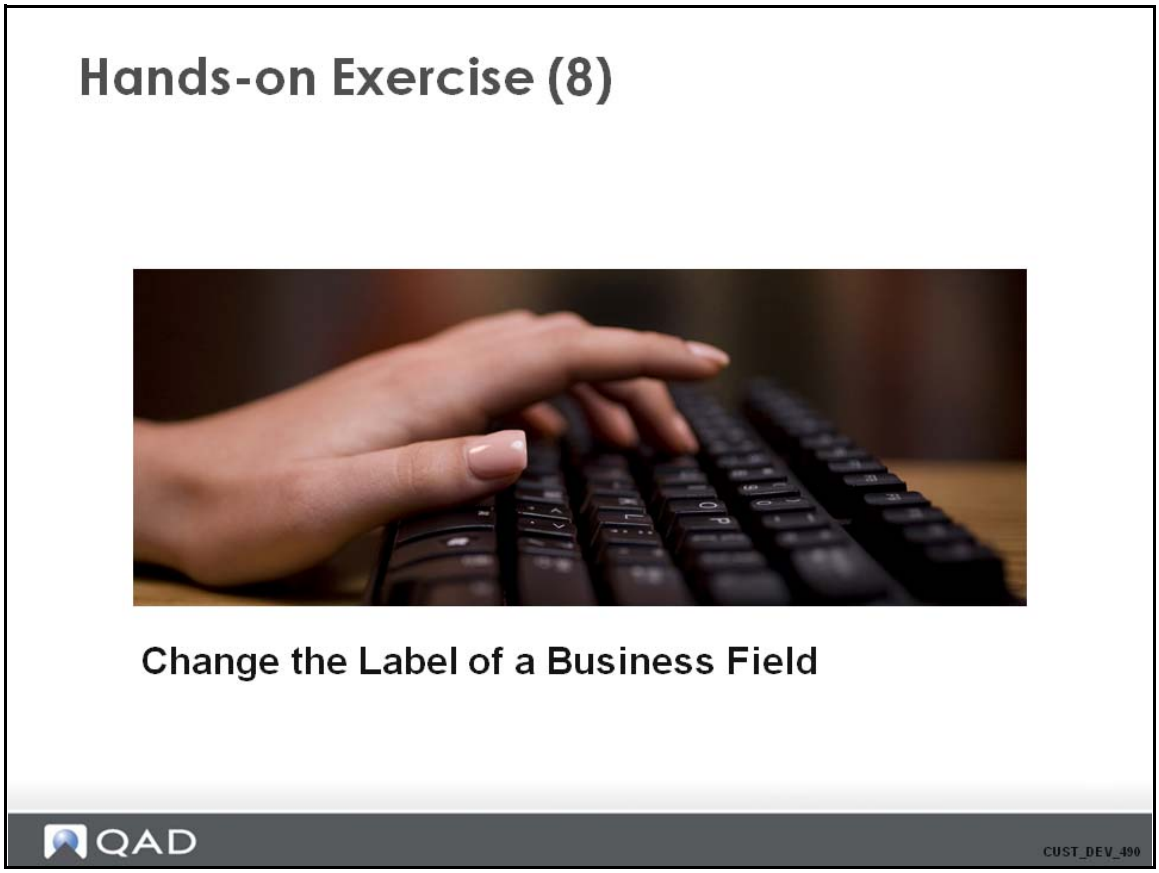
Translations 3



Translations 4



Hands-on Exercise (8)

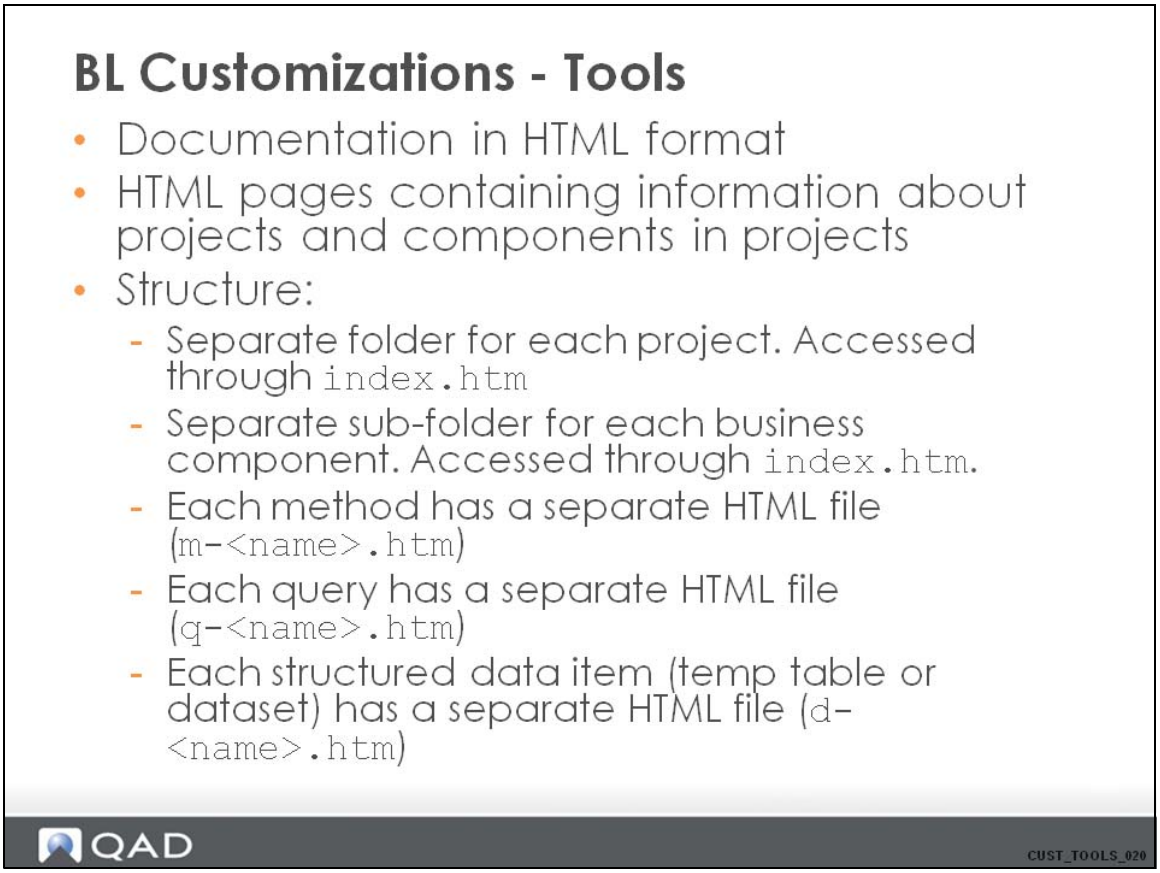


Chapter 5

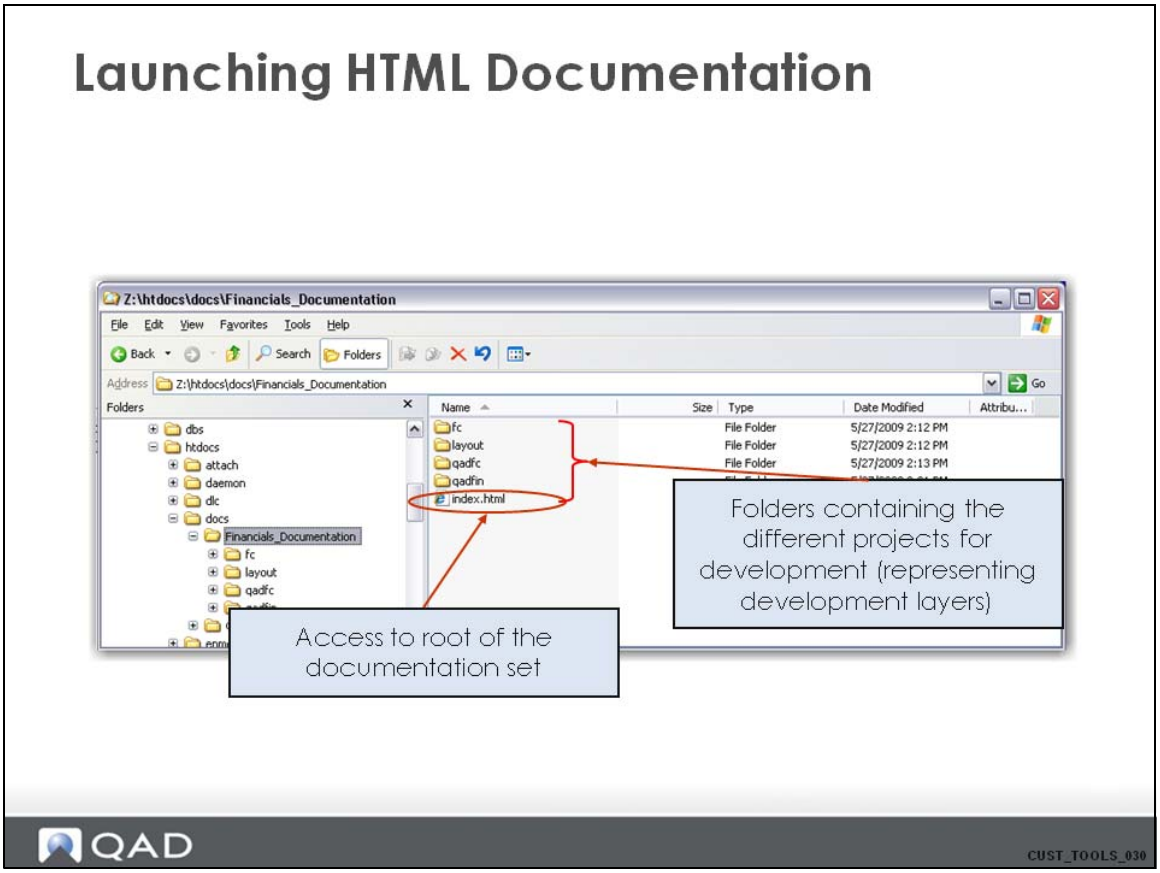
Non-intrusive Customization: Supporting Tools

Non-intrusive Customization: Supporting Tools

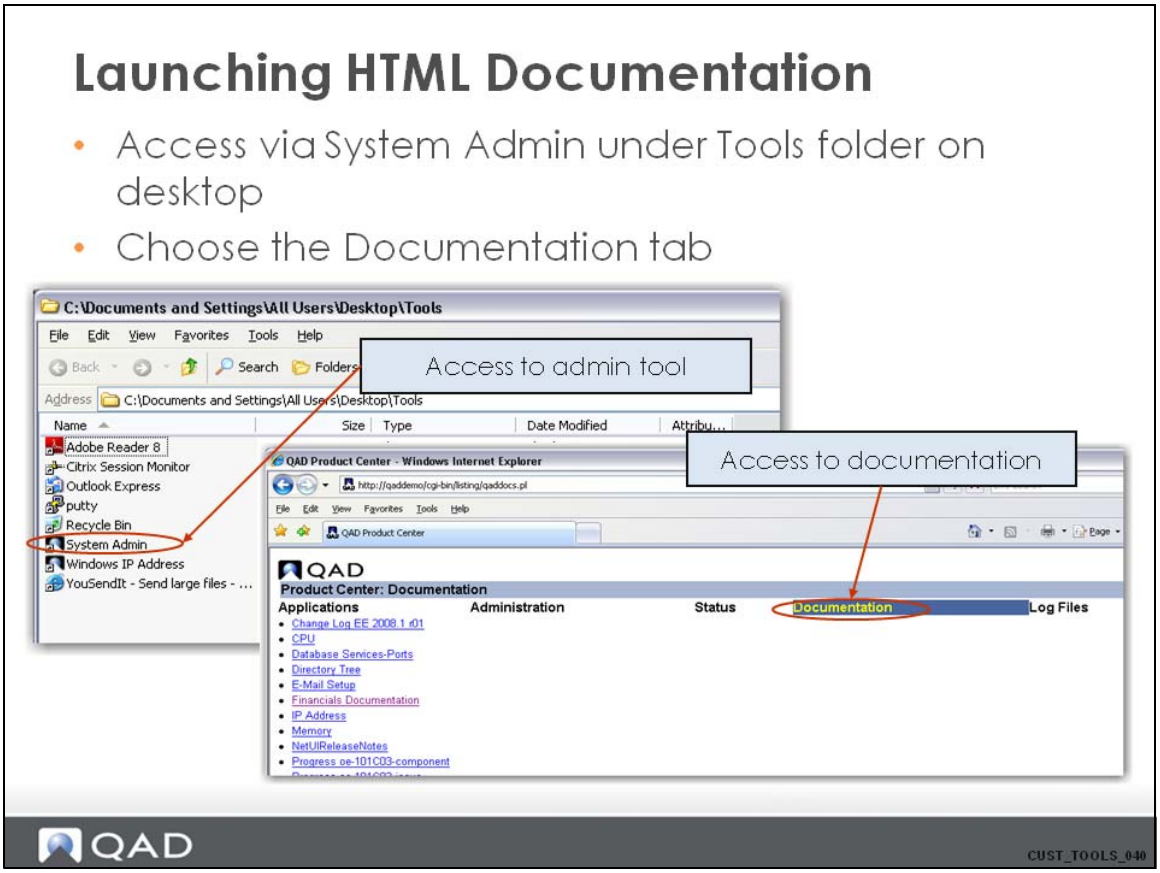
BL Customization - Tools



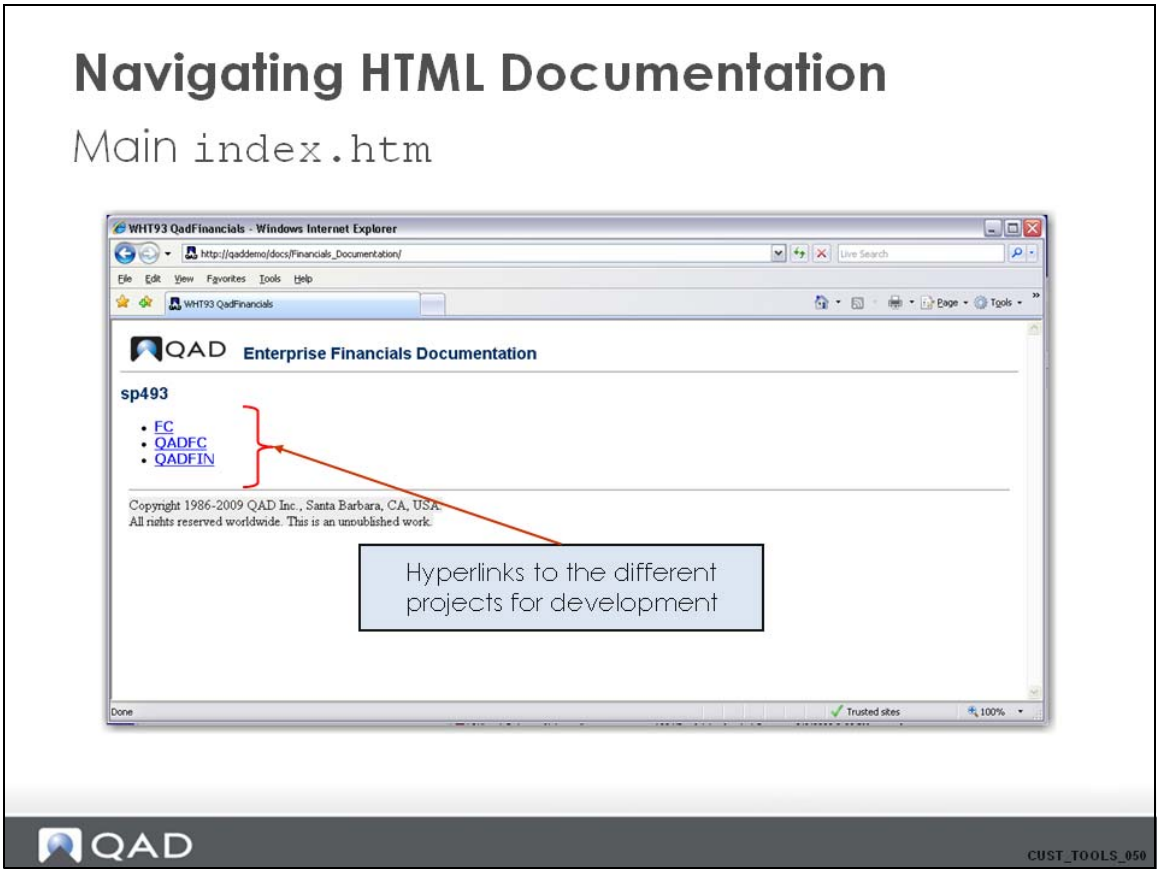
Launching HTML Documentation



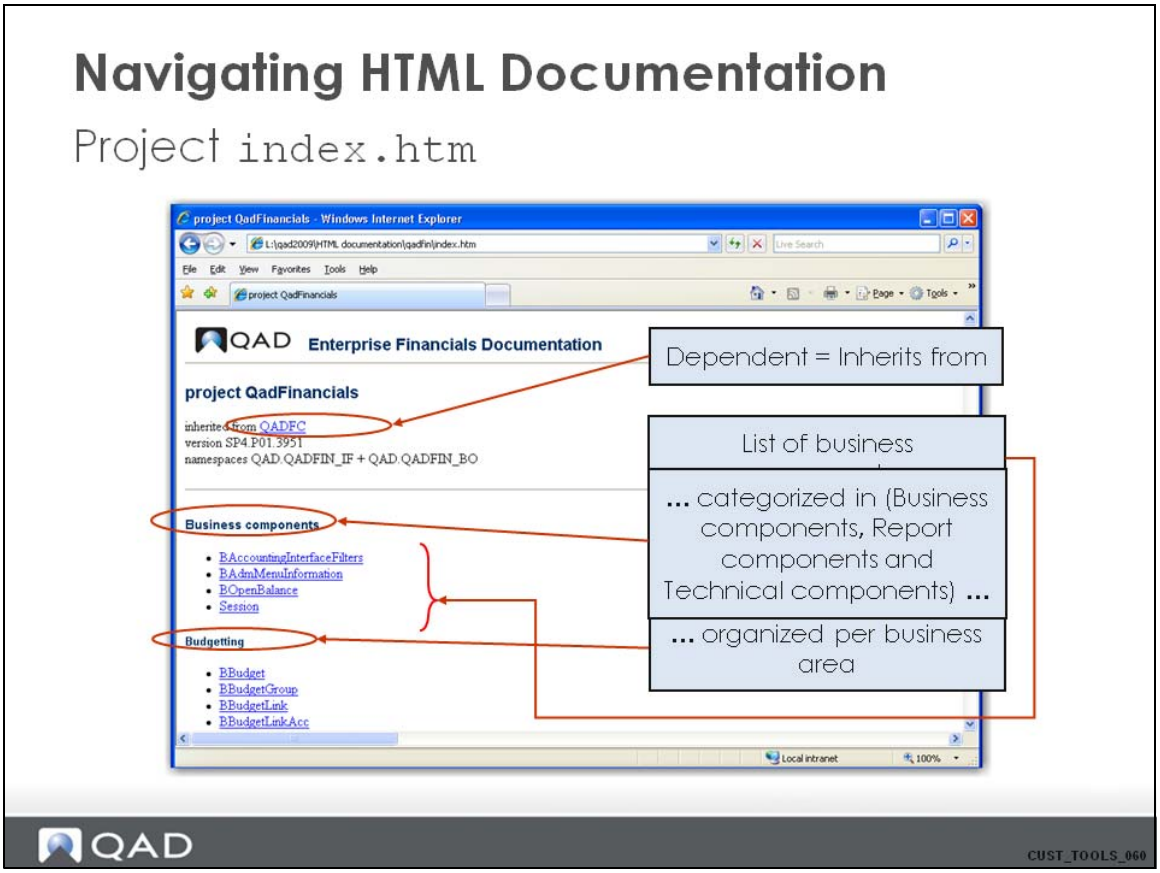
Launching HTML Documentation 2



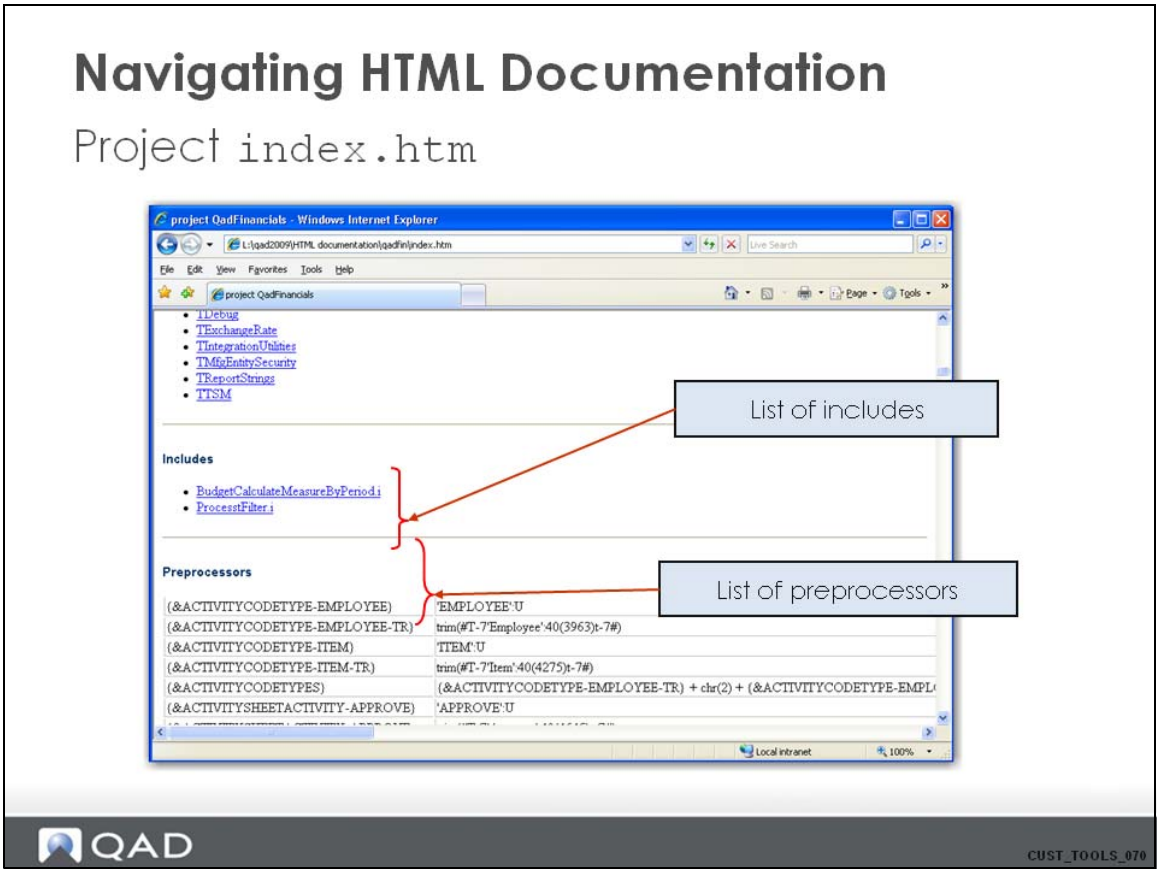
Navigating HTML Documentation 3



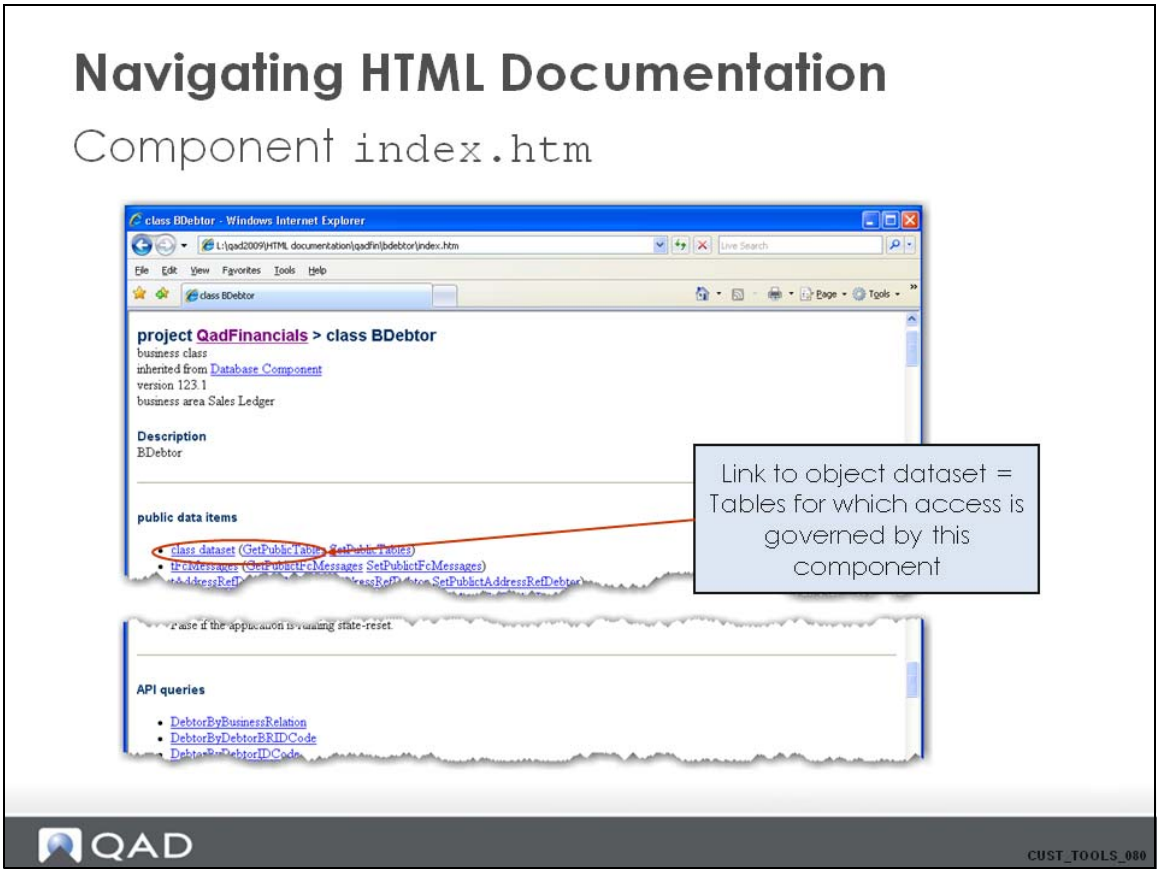
Navigating HTML Documentation 4



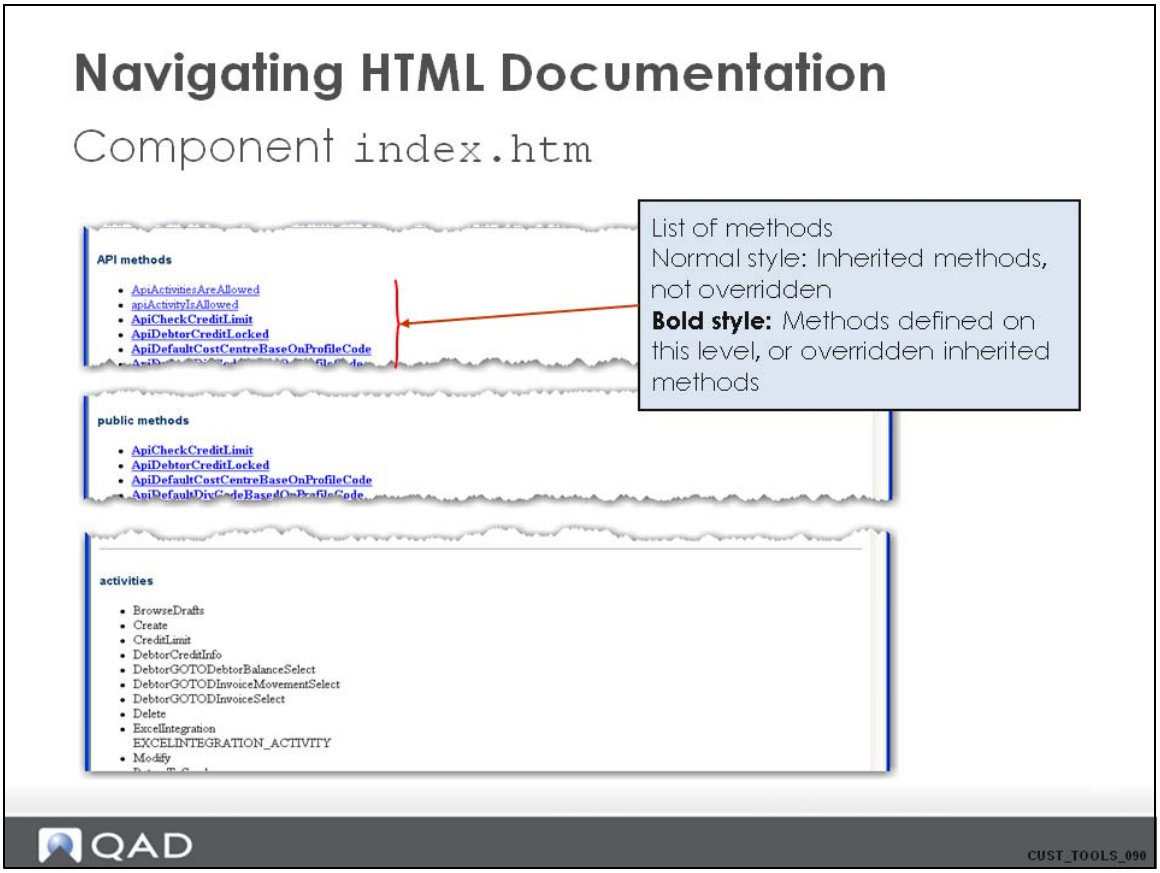
Navigating HTML Documentation 5



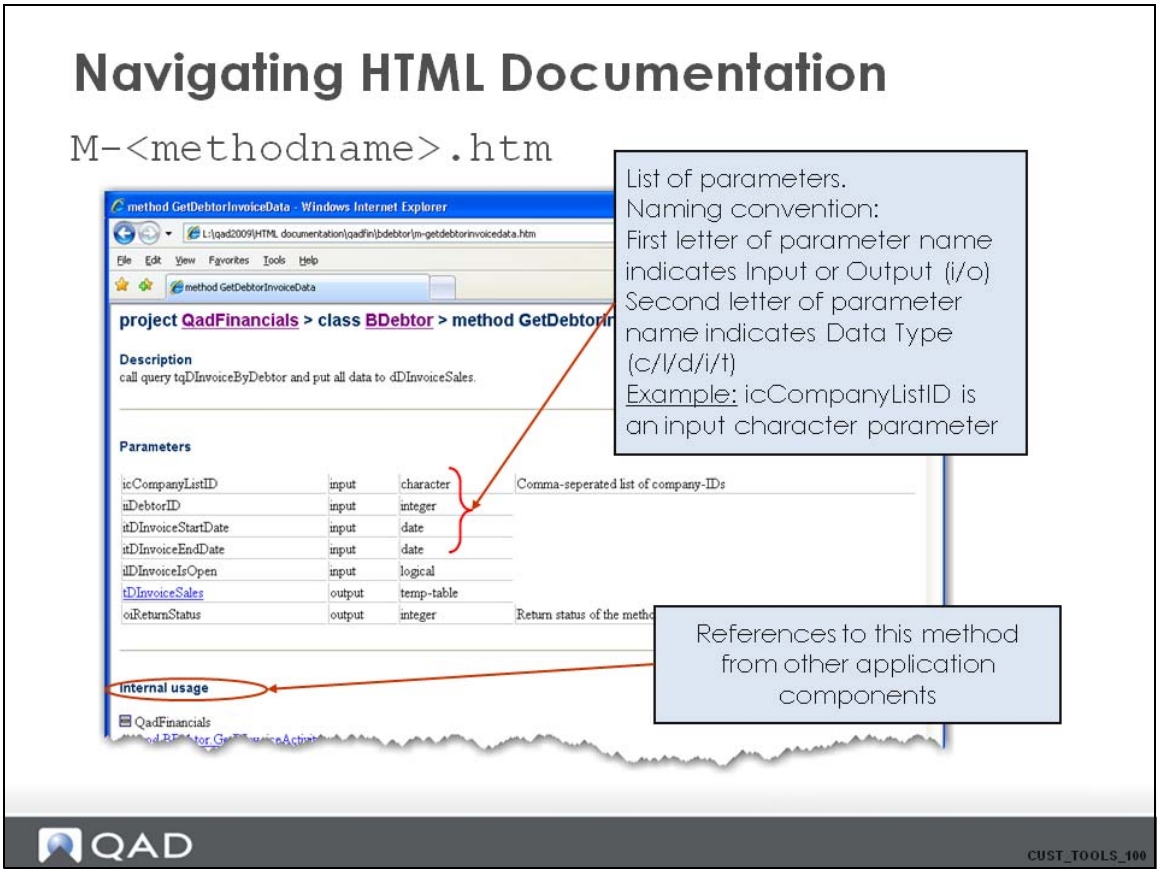
Navigating HTML Documentation 6



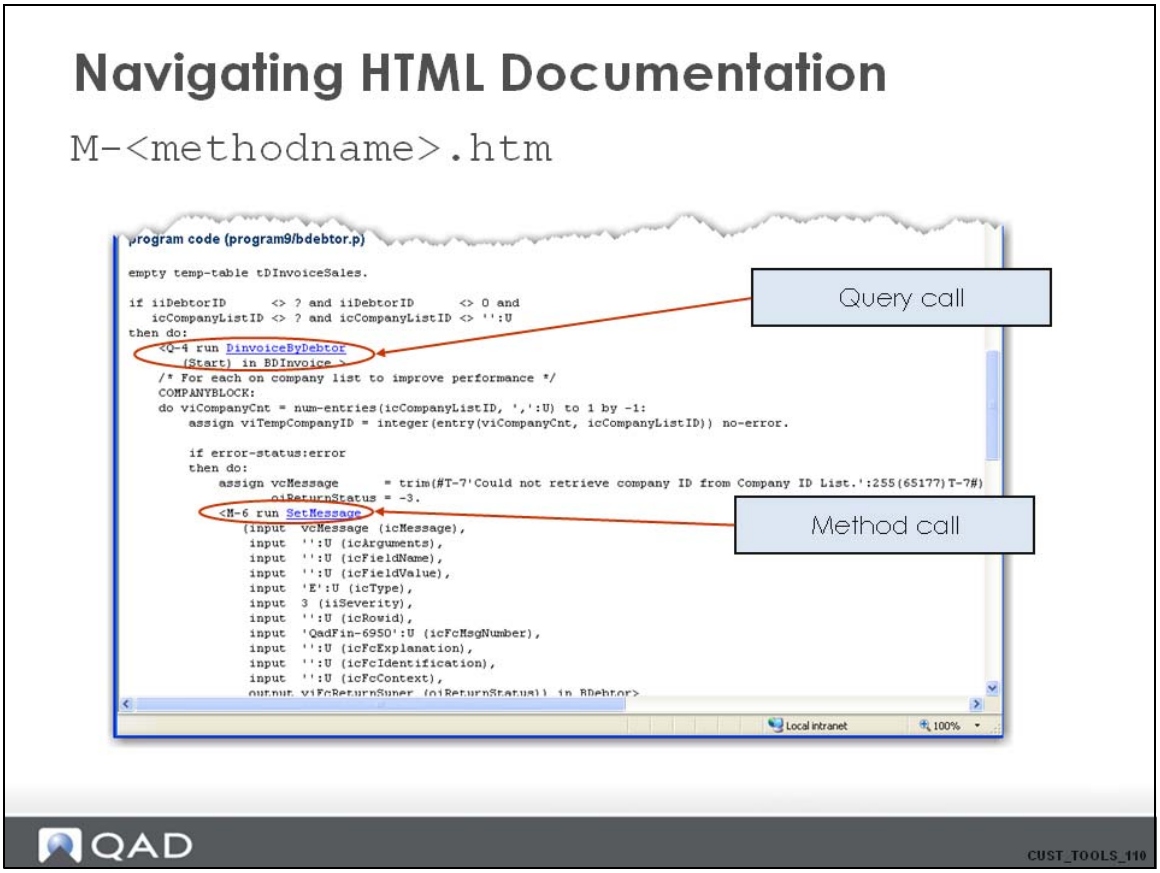
Navigating HTML Documentation 7



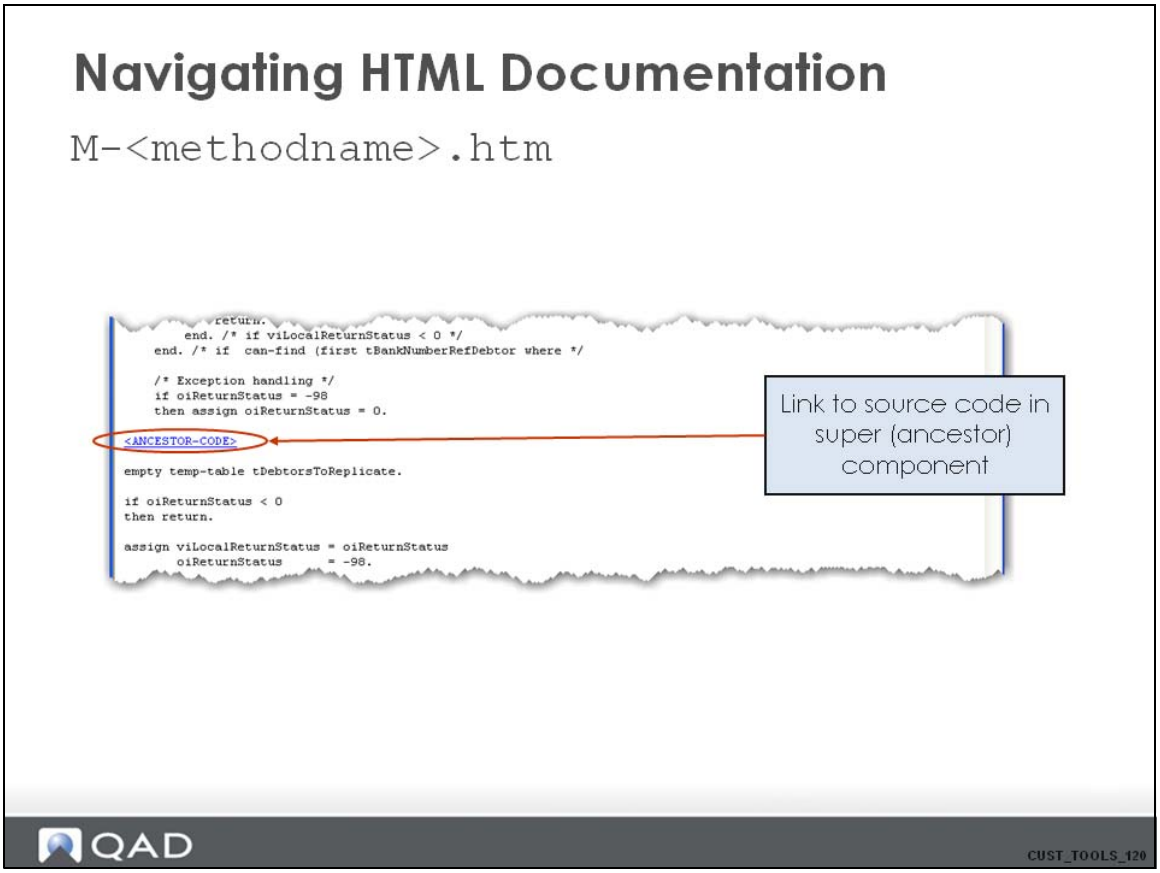
Navigating HTML Documentation 8



Navigating HTML Documentation 9



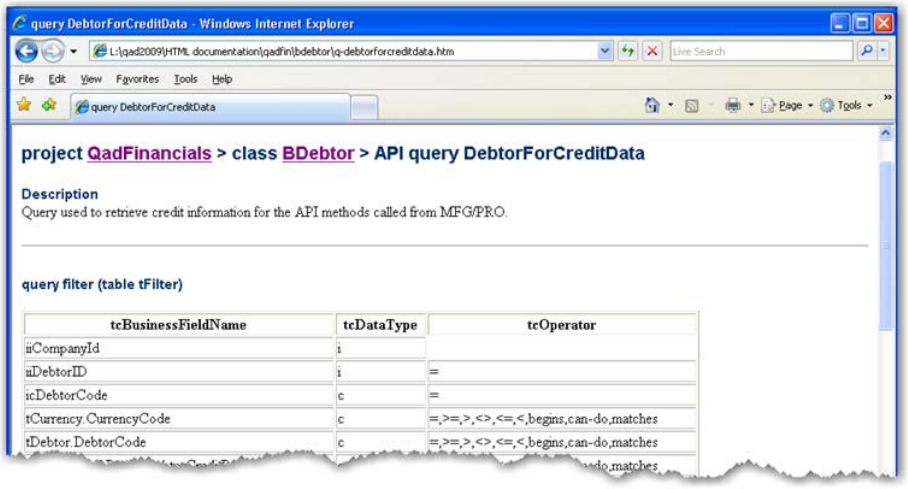
Navigating HTML Documentation 10



Navigating HTML Documentation 11

Navigating HTML Documentation

Q-<queryname>.htm



QAD

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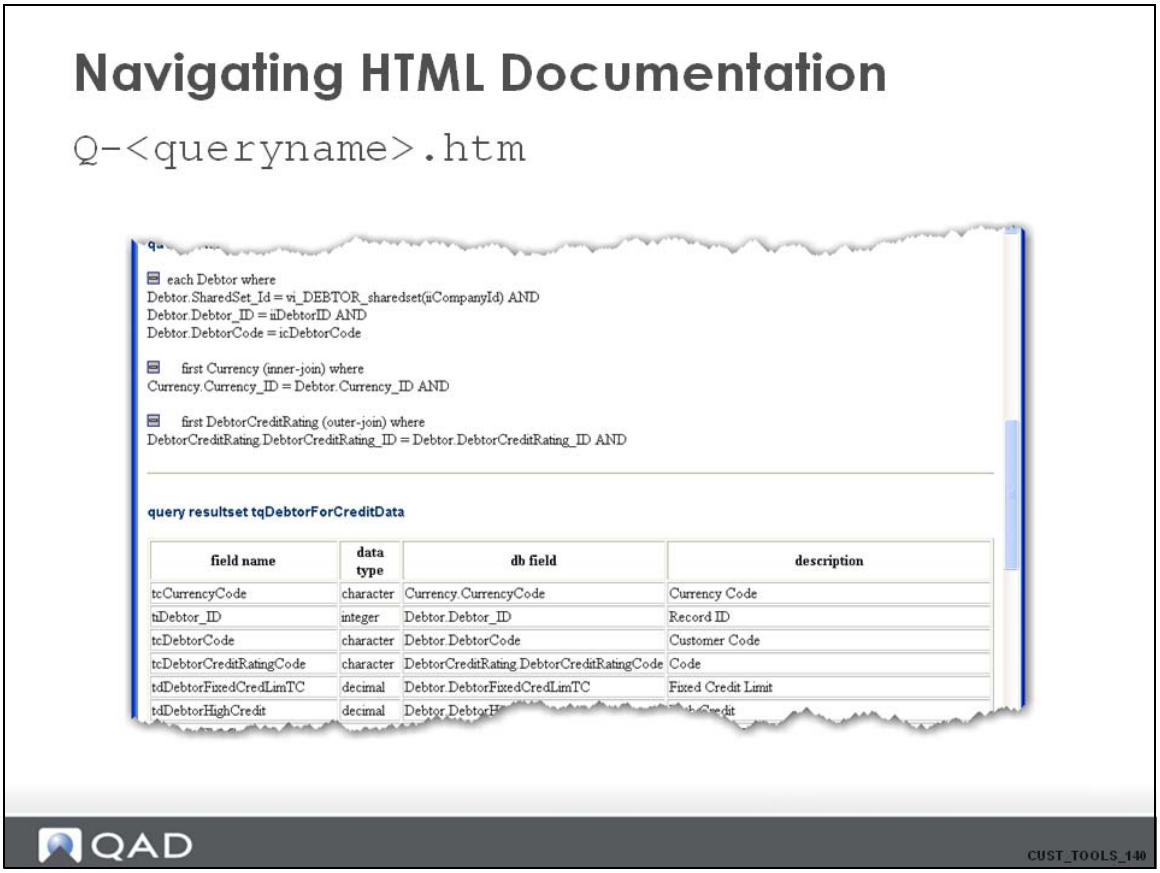
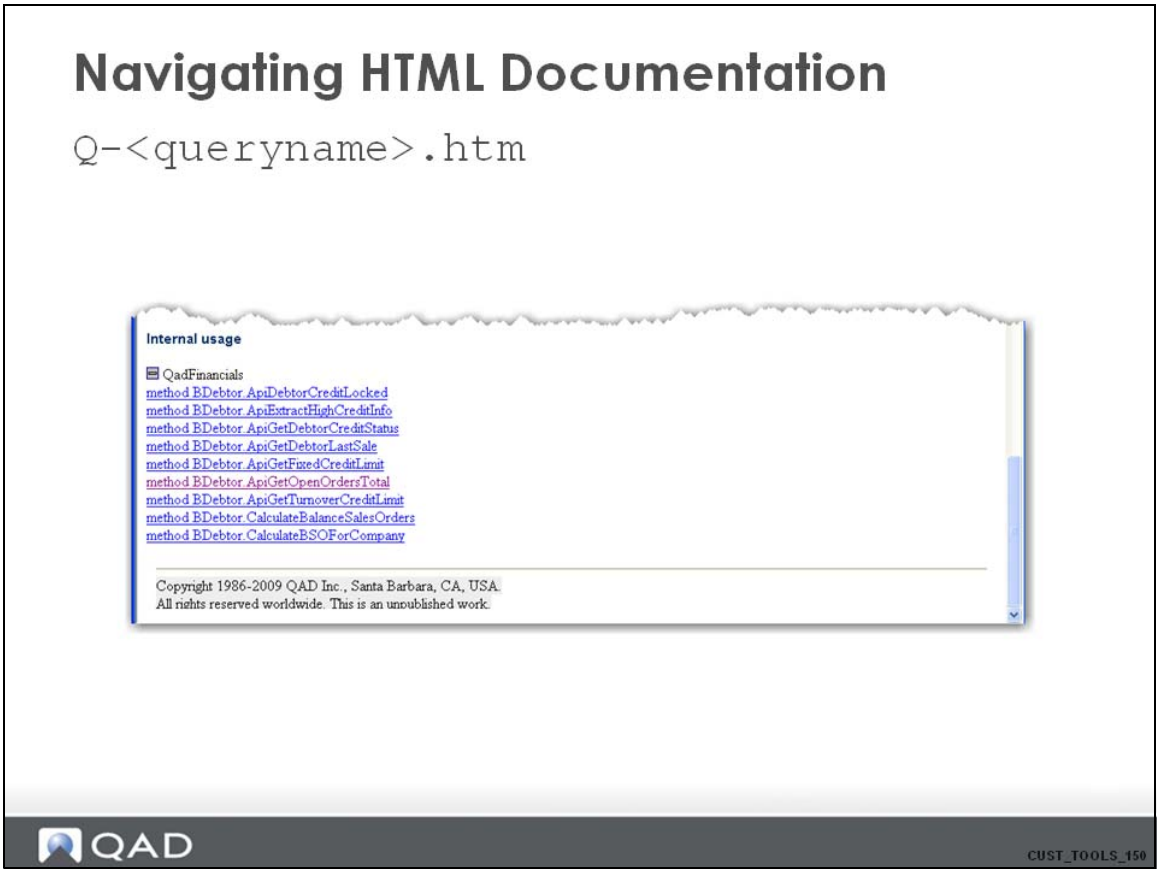
Navigating HTML Documentation 12



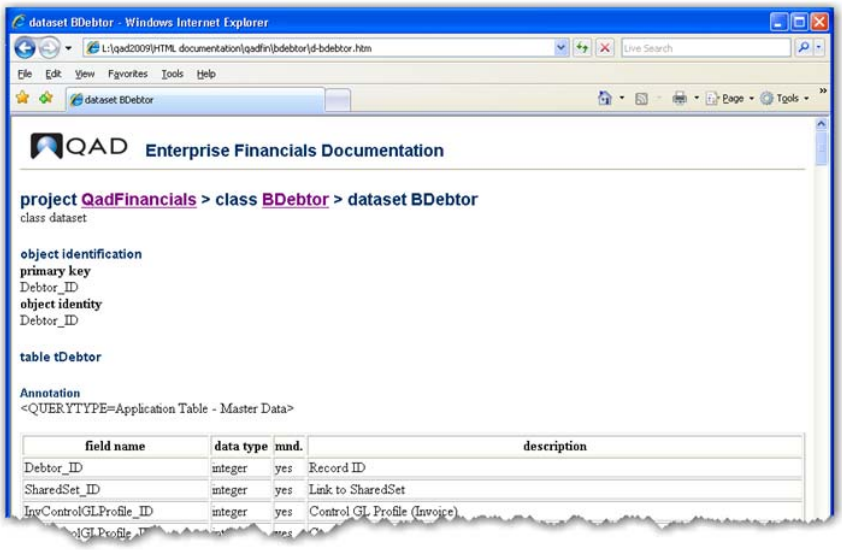
Navigating HTML Documentation 13



Navigating HTML Documentation 14

Navigating HTML Documentation

D-<datasetName>.htm



QAD

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Navigating HTML Documentation 15

Navigating HTML Documentation

D-<datasetName>.htm

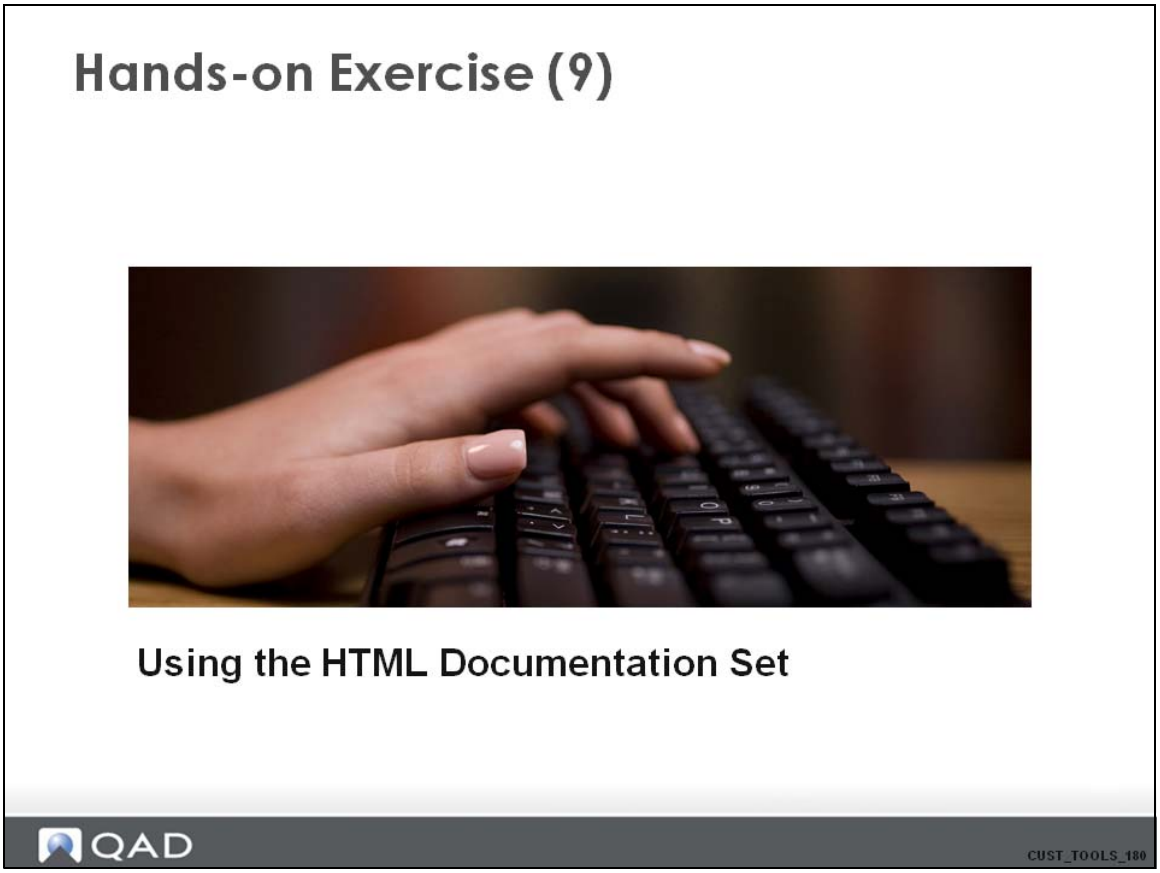
table tDebtorSafDefault

field name	data type	mnd.	description
DebtorSafDefault_ID	integer	yes	Record ID
Debtor_ID	integer	yes	Link to Debtor
SafConcept_ID	integer	yes	SAF Concept Code
Saf_ID	integer	yes	SAF Code
tcSafConceptCode	character	no	SAF Concept Code
tcSafCode	character	no	SAF Code
LastModifiedDate	date	no	Last Modified Date
LastModifiedTime	integer	no	Last Modified Time
LastModifiedUser	character	no	Last Modified User
tc_Rowid	character	yes	primary index
tc_ParentRowid	character	yes	= tDebtor.tc_Rowid
tc_Status	character	no	update status

QAD

CUST_TOOLS_170

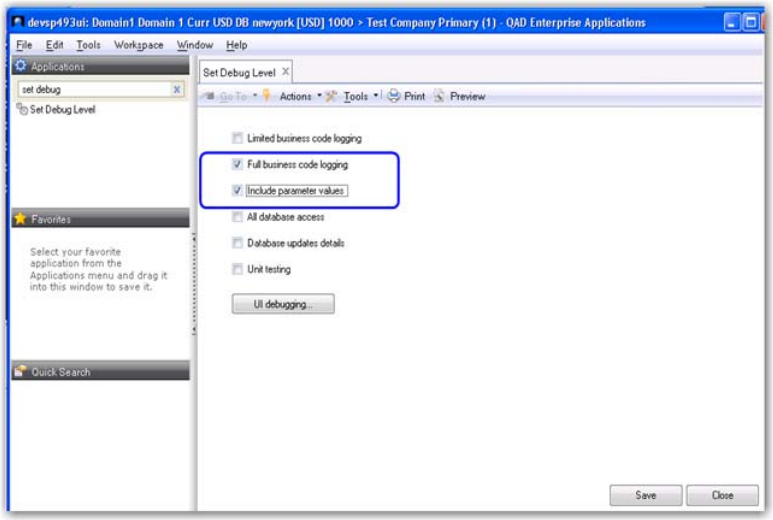
Hands-on Exercise (9)



BL Customizations - Tools

BL Customizations – Tools

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



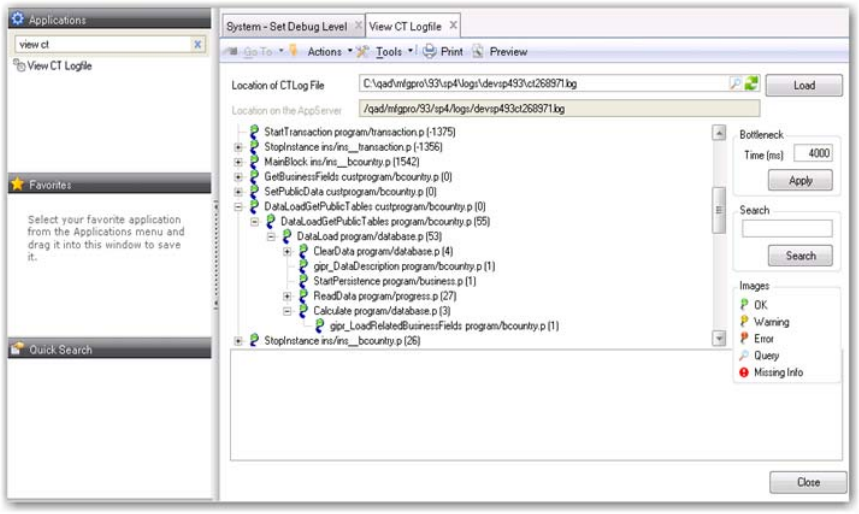
QAD

CUST_TOOLS_190

BL Customizations - BL Code Tracing

BL Customizations – BL Code Tracing

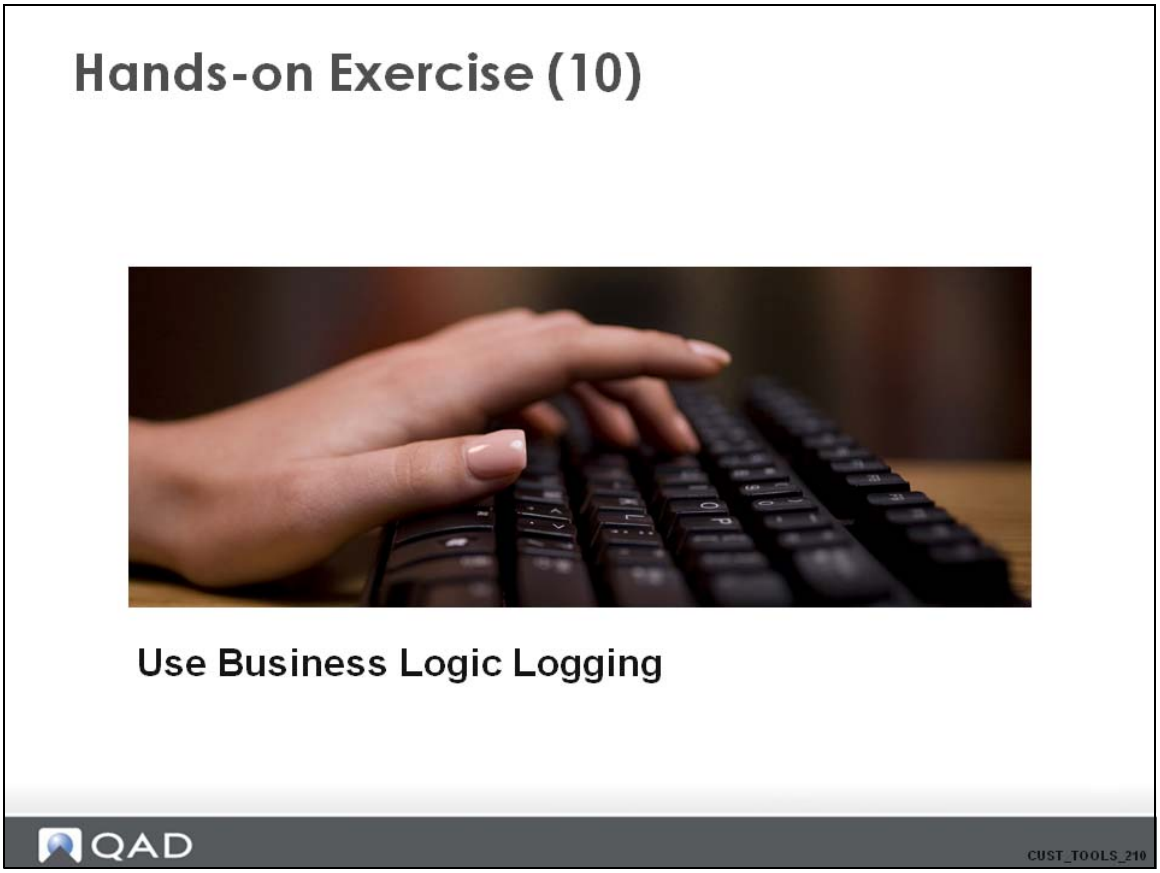
Use View CT Logfile



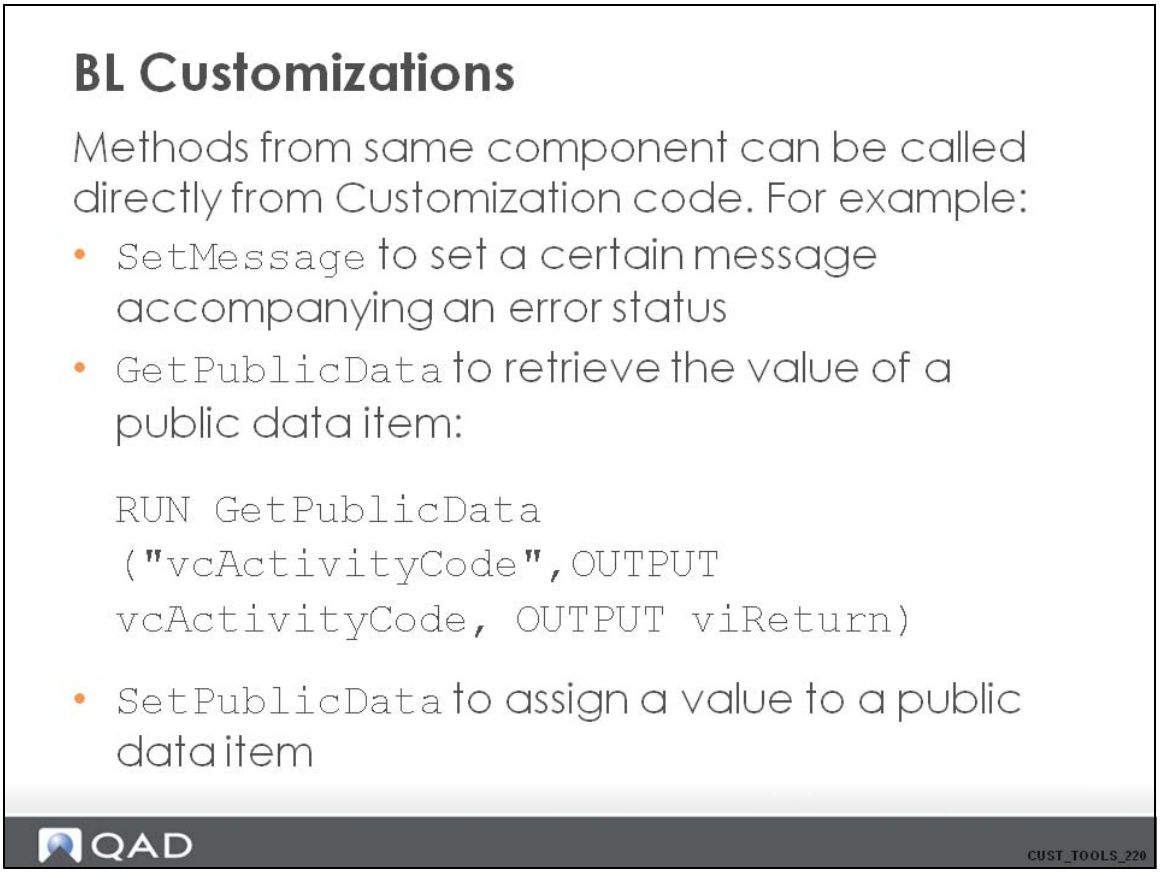
QAD

CUST_TOOLS_200

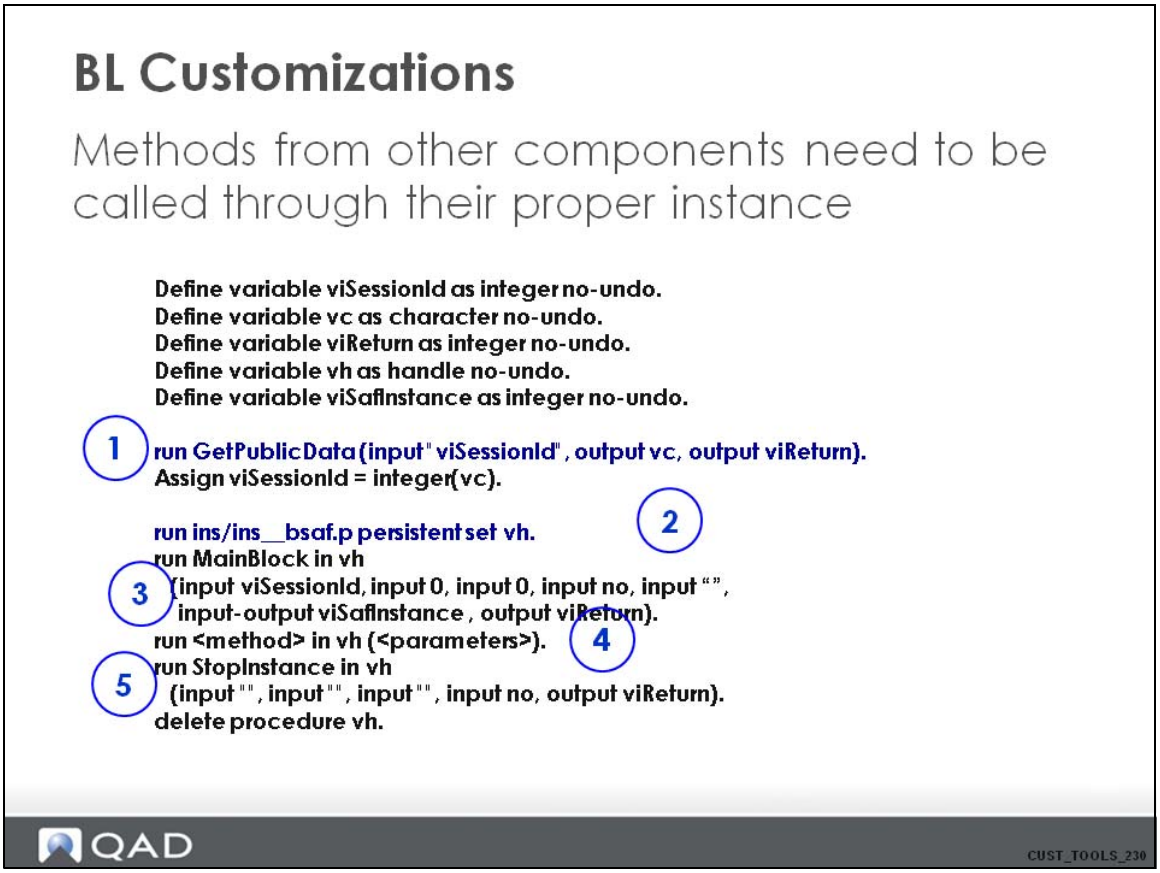
Hands-on Exercise (10)



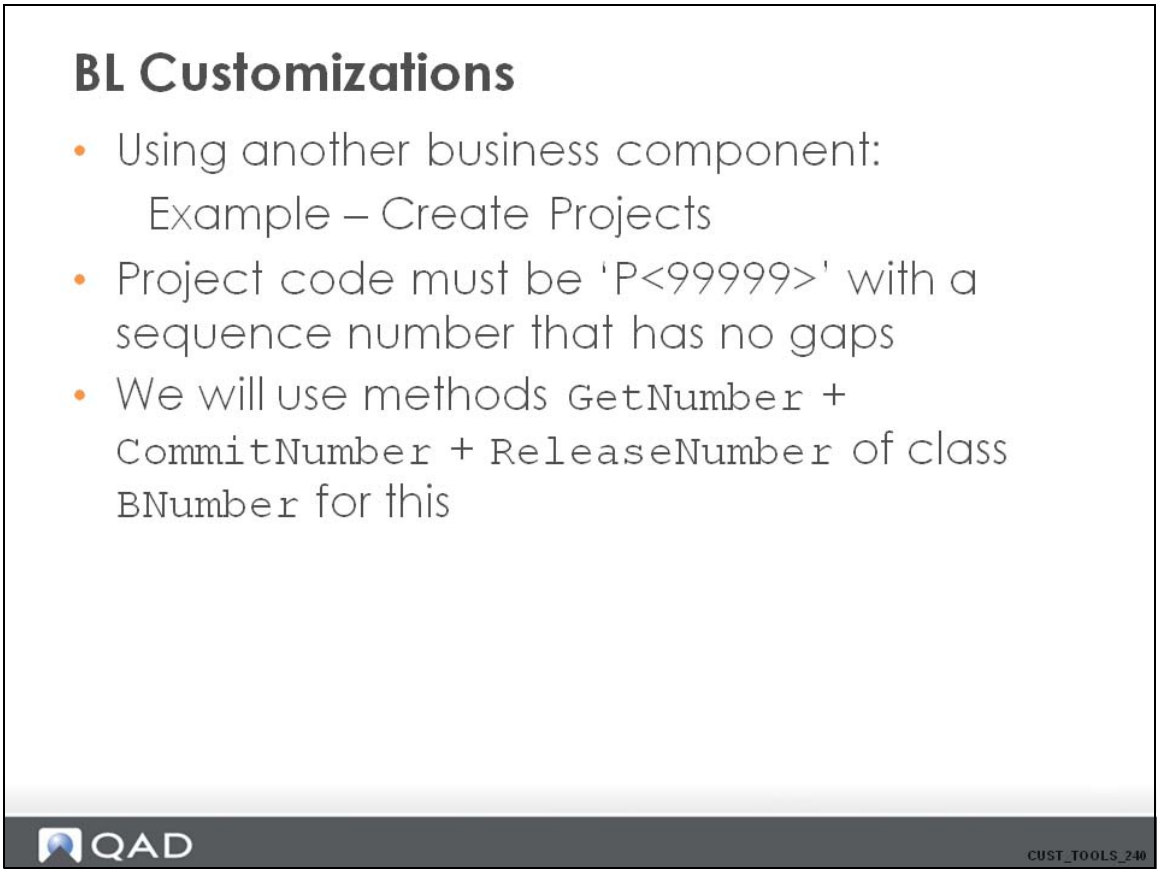
BL Customizations



BL Customizations 2

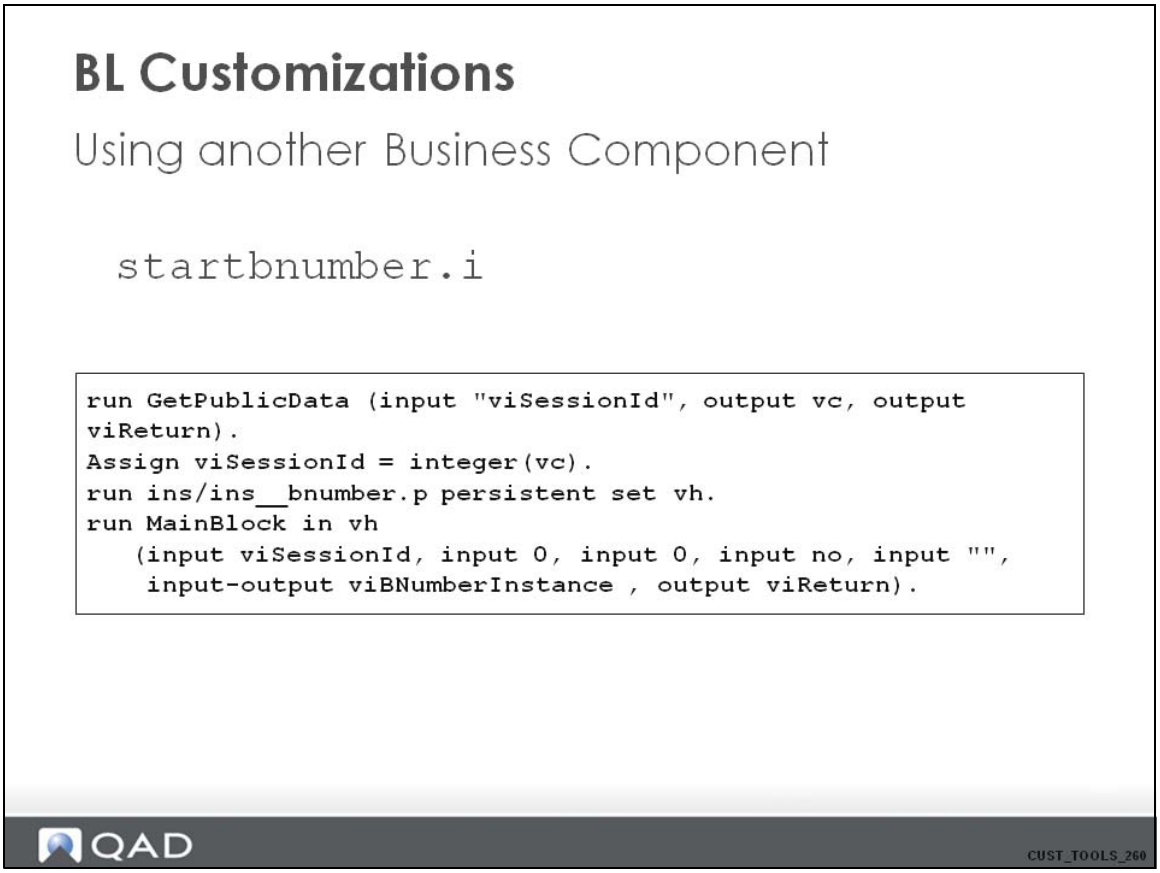


BL Customizations 3

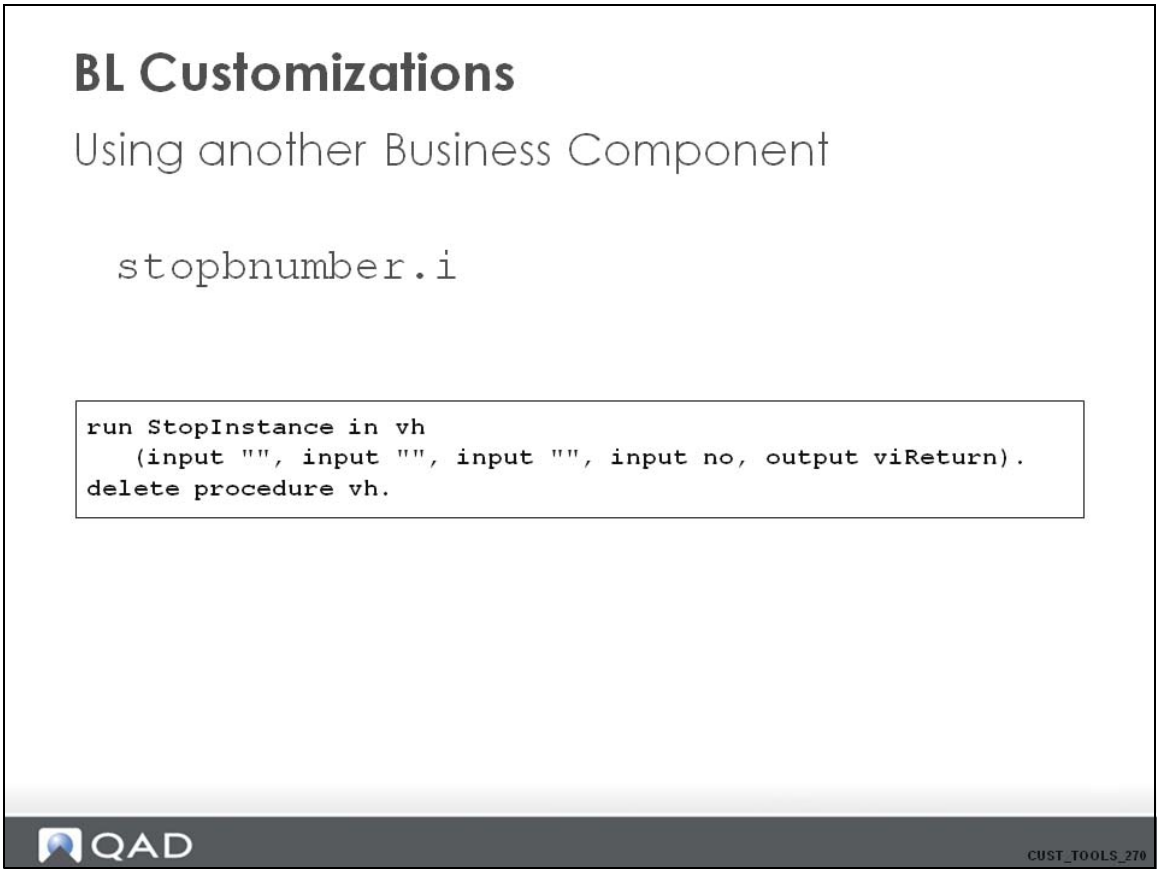


BL Customizations 4

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.
```

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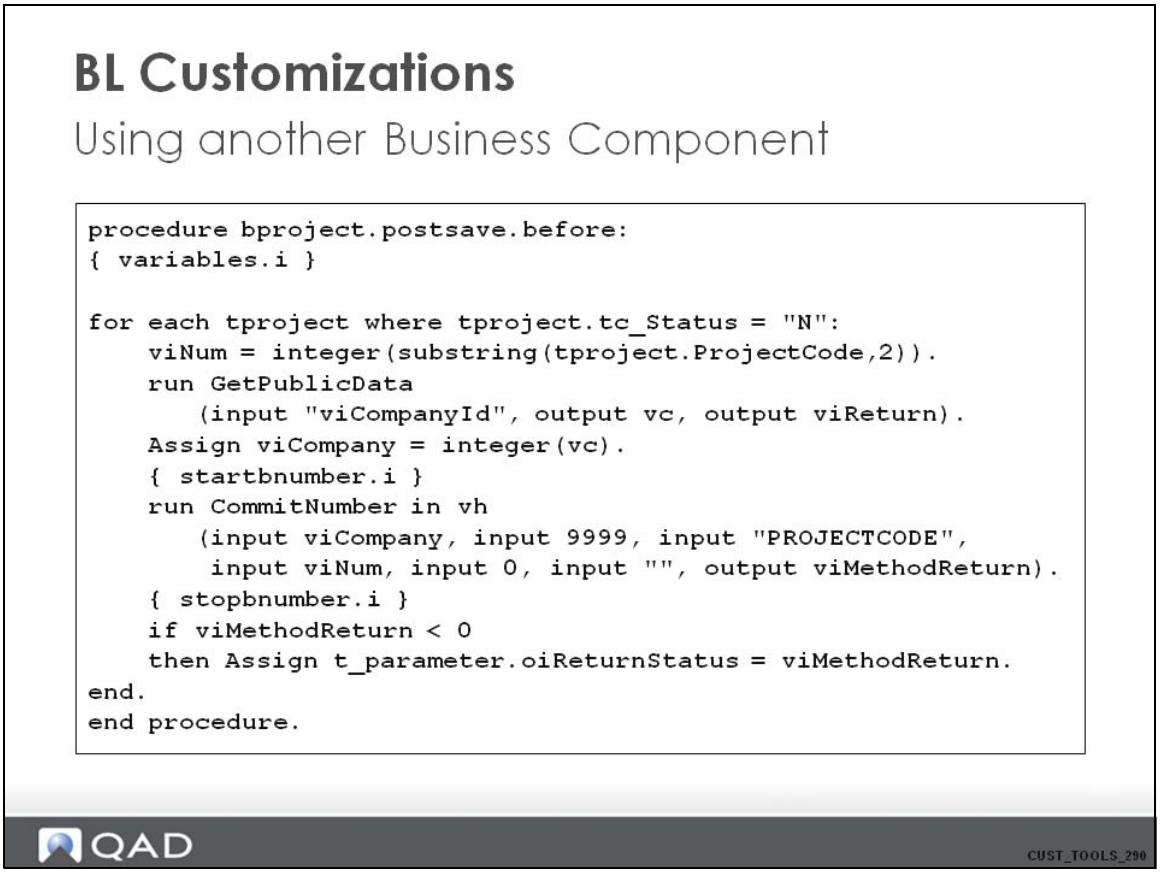
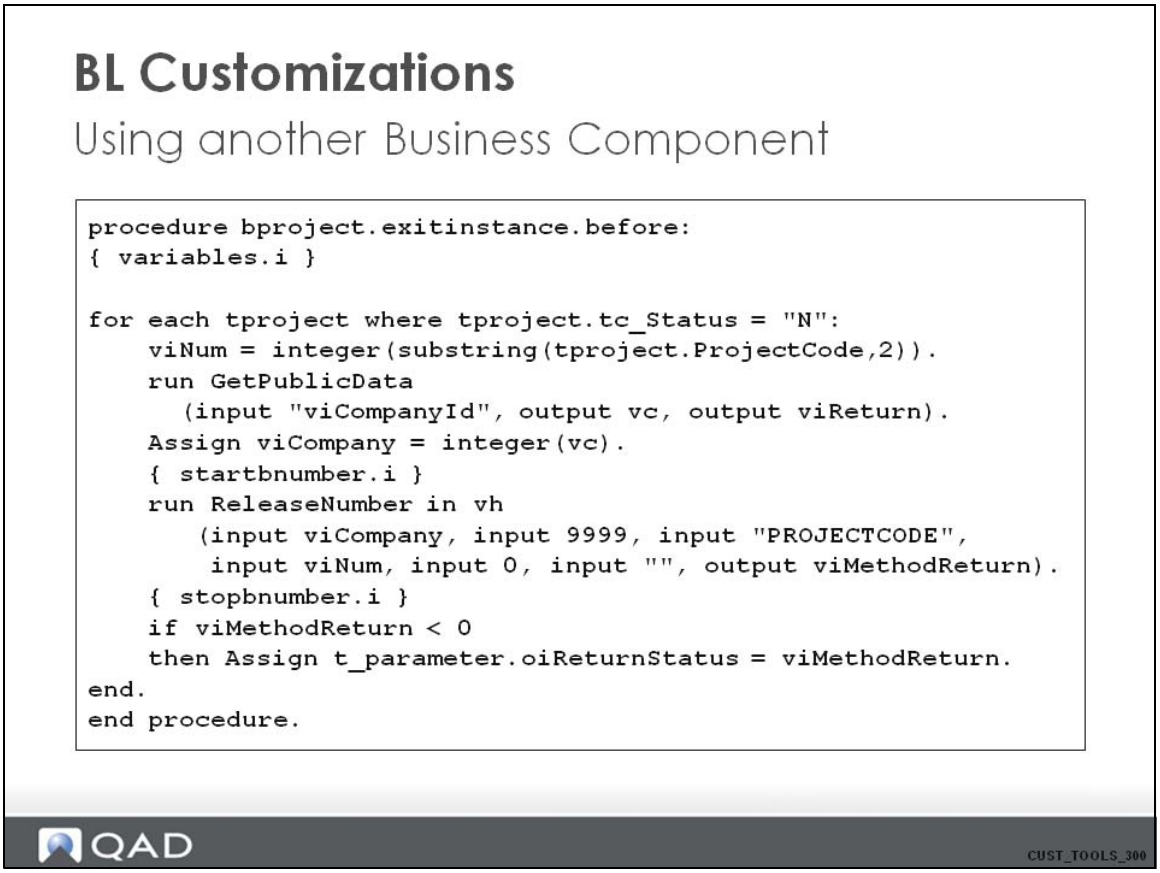
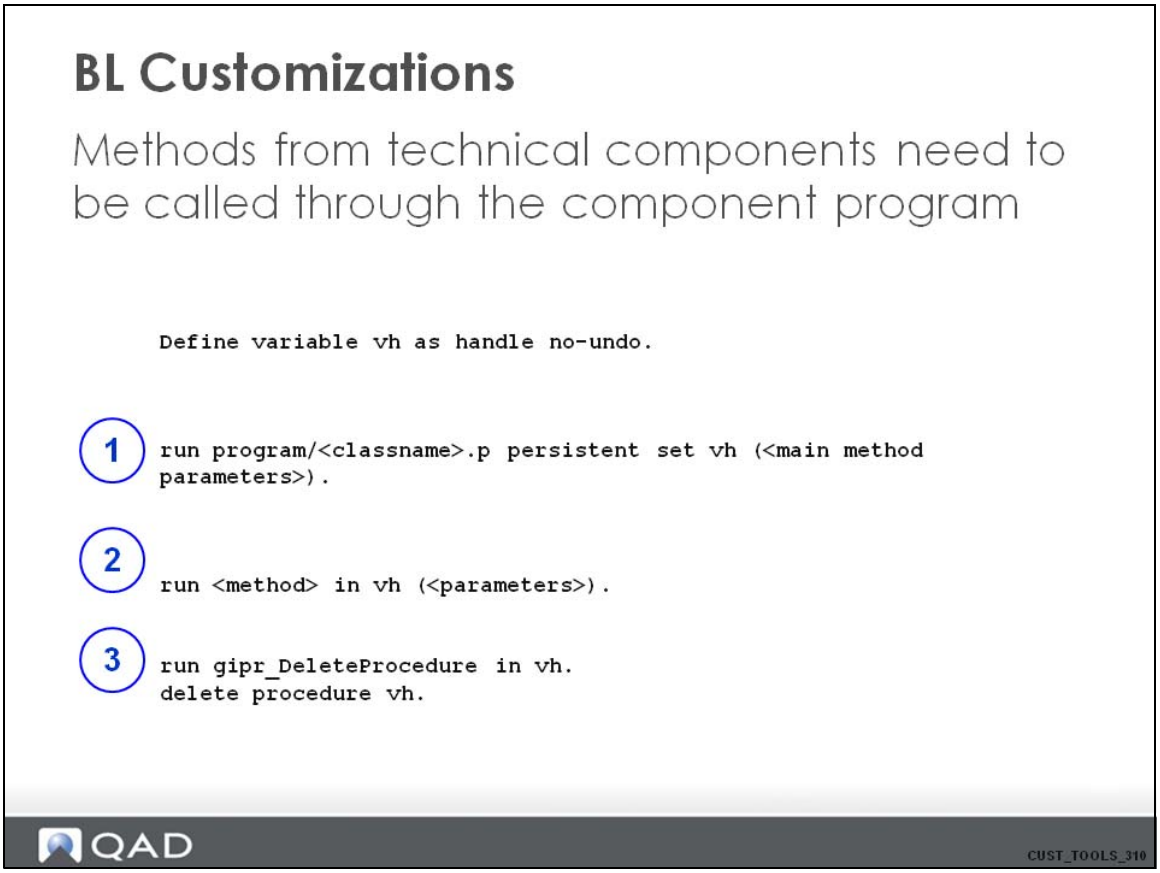
BL Customizations 8



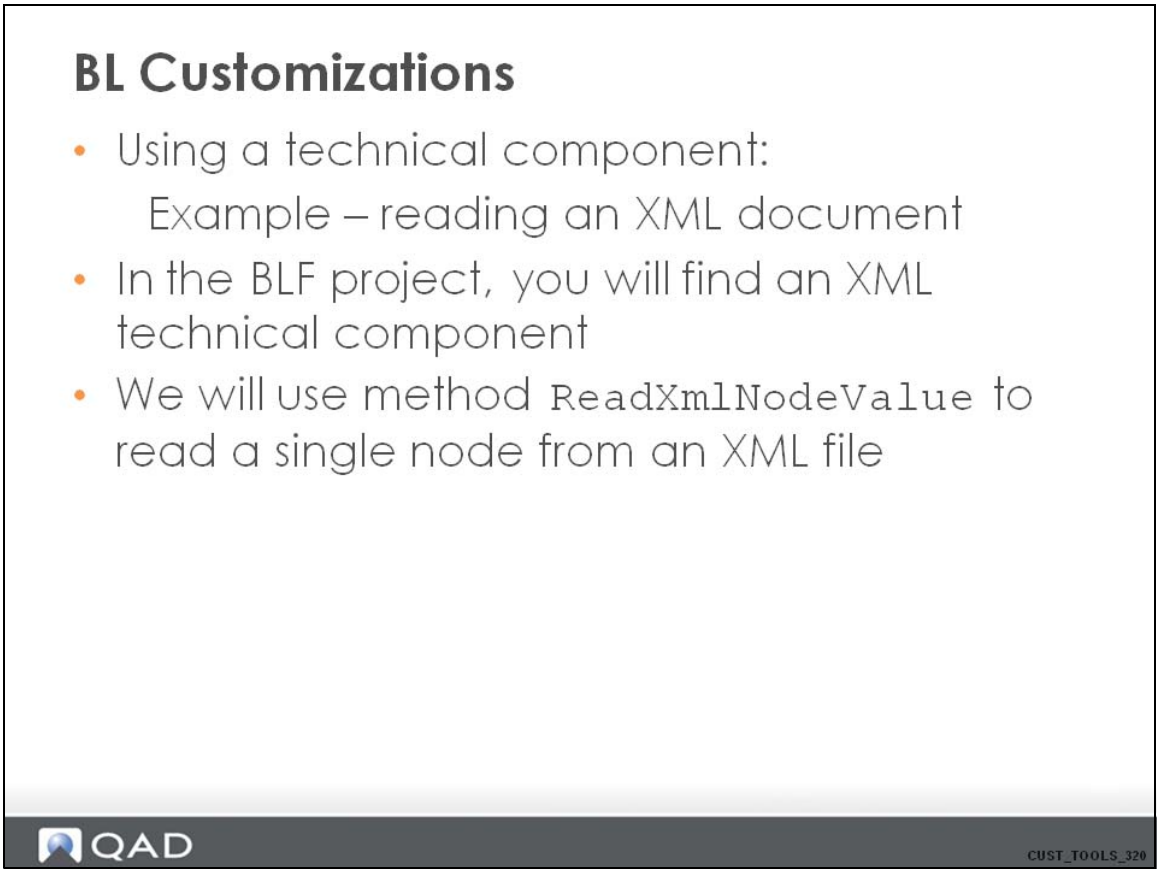
BL Customizations 9



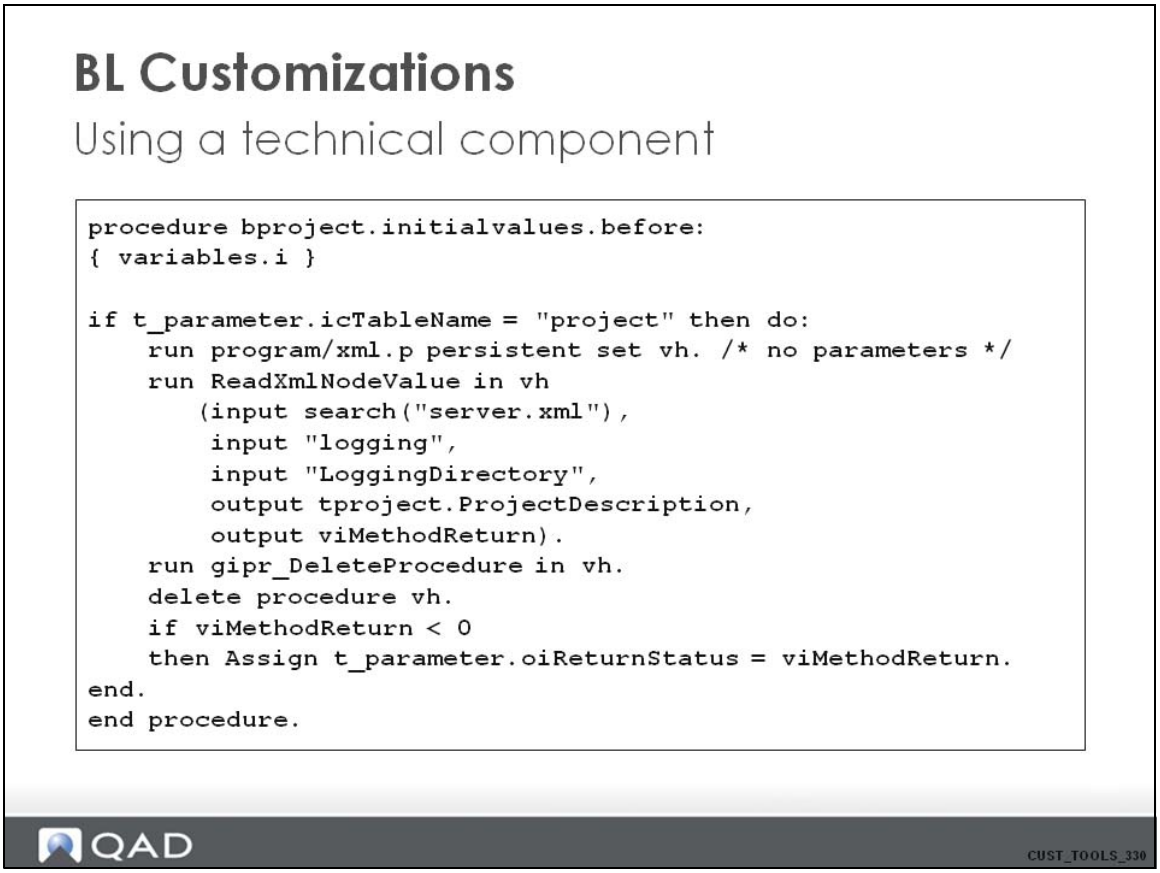
BL Customizations 10



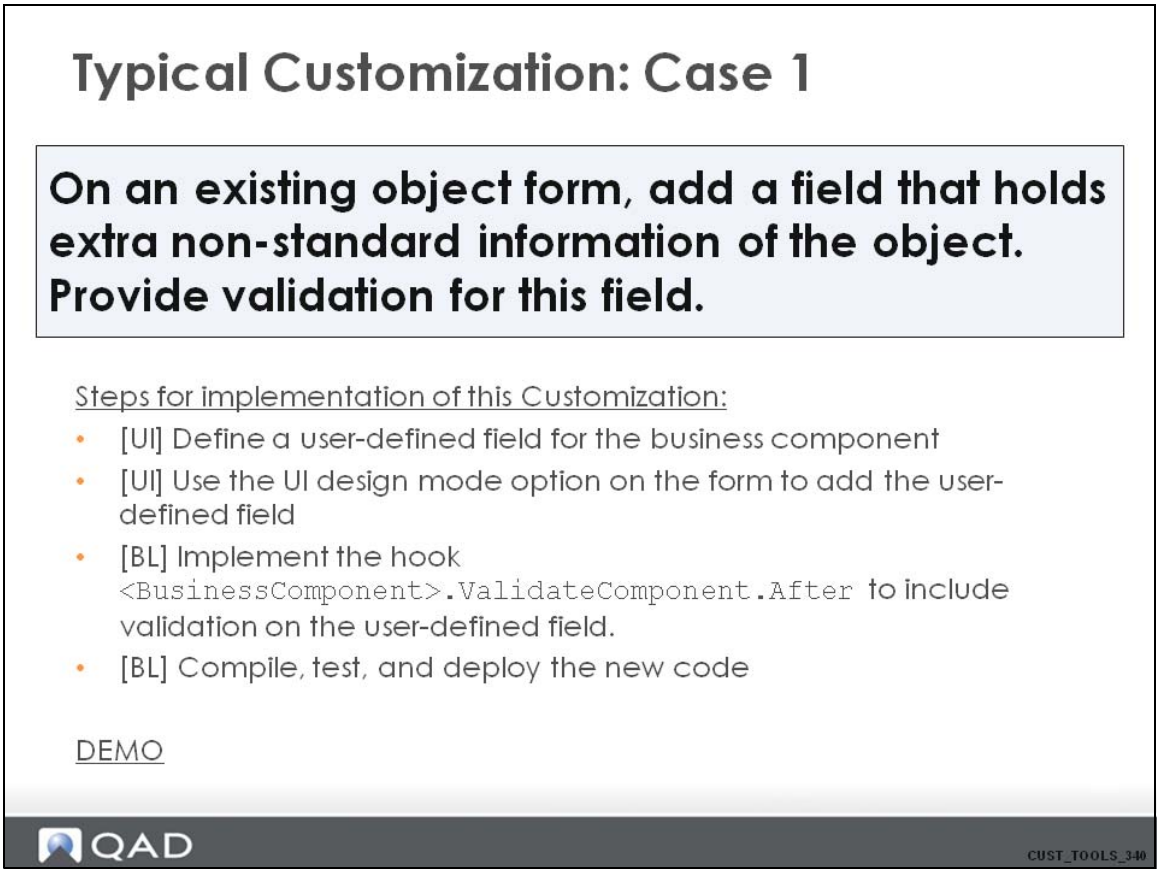
BL Customizations 11



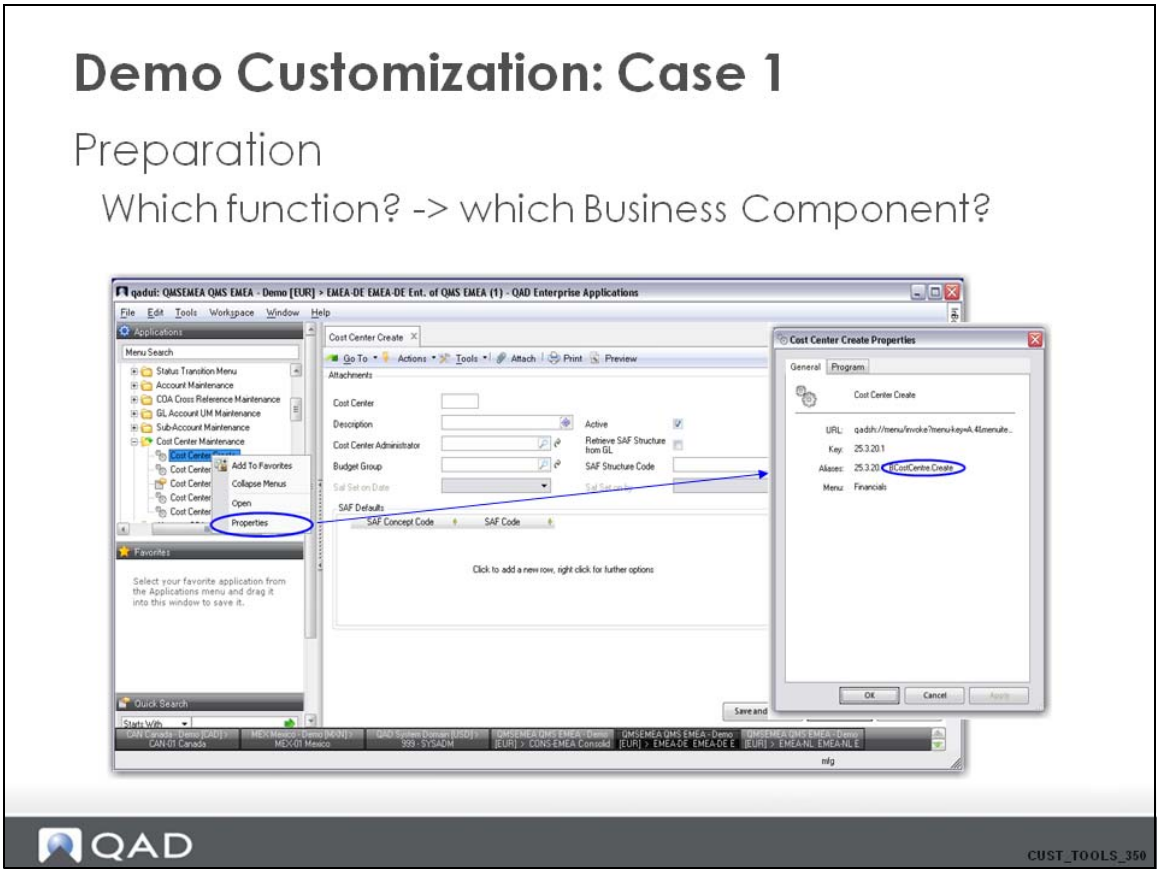
BL Customizations 12



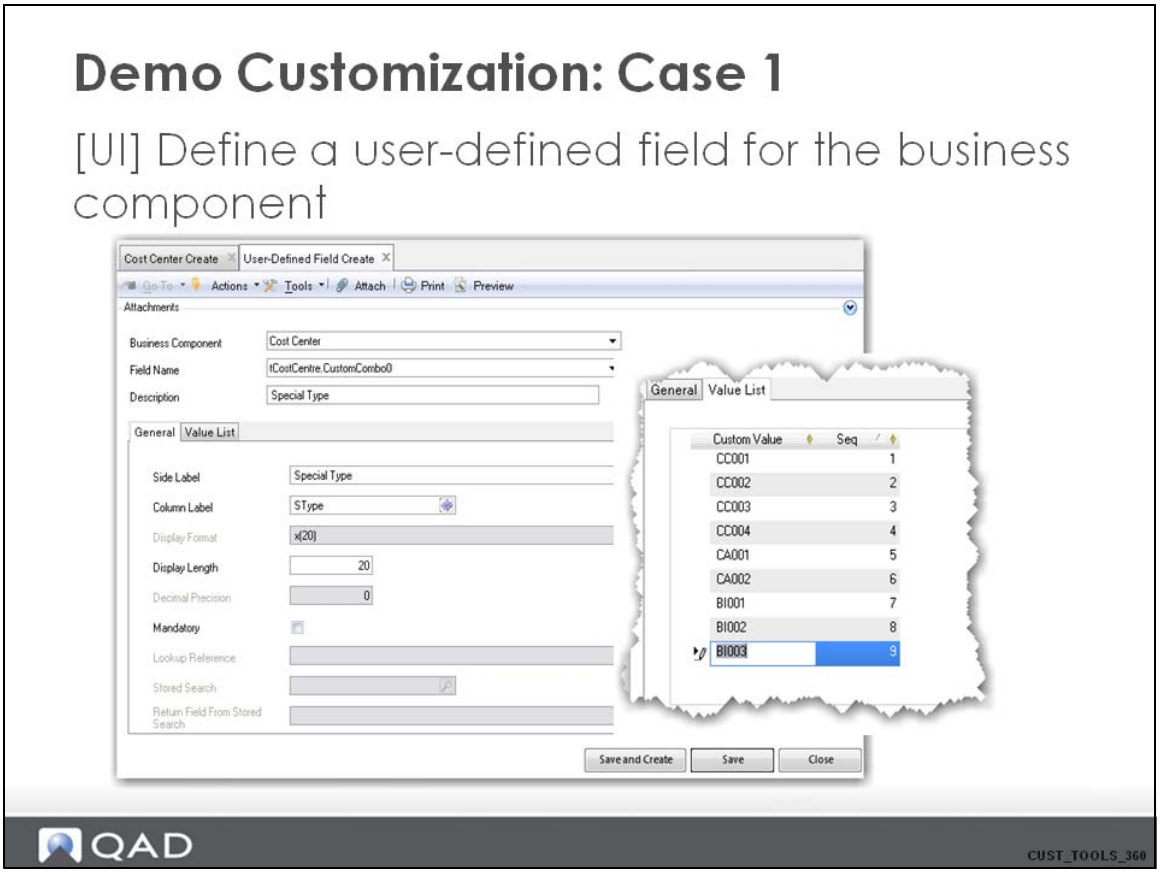
Typical Customization: Case 1



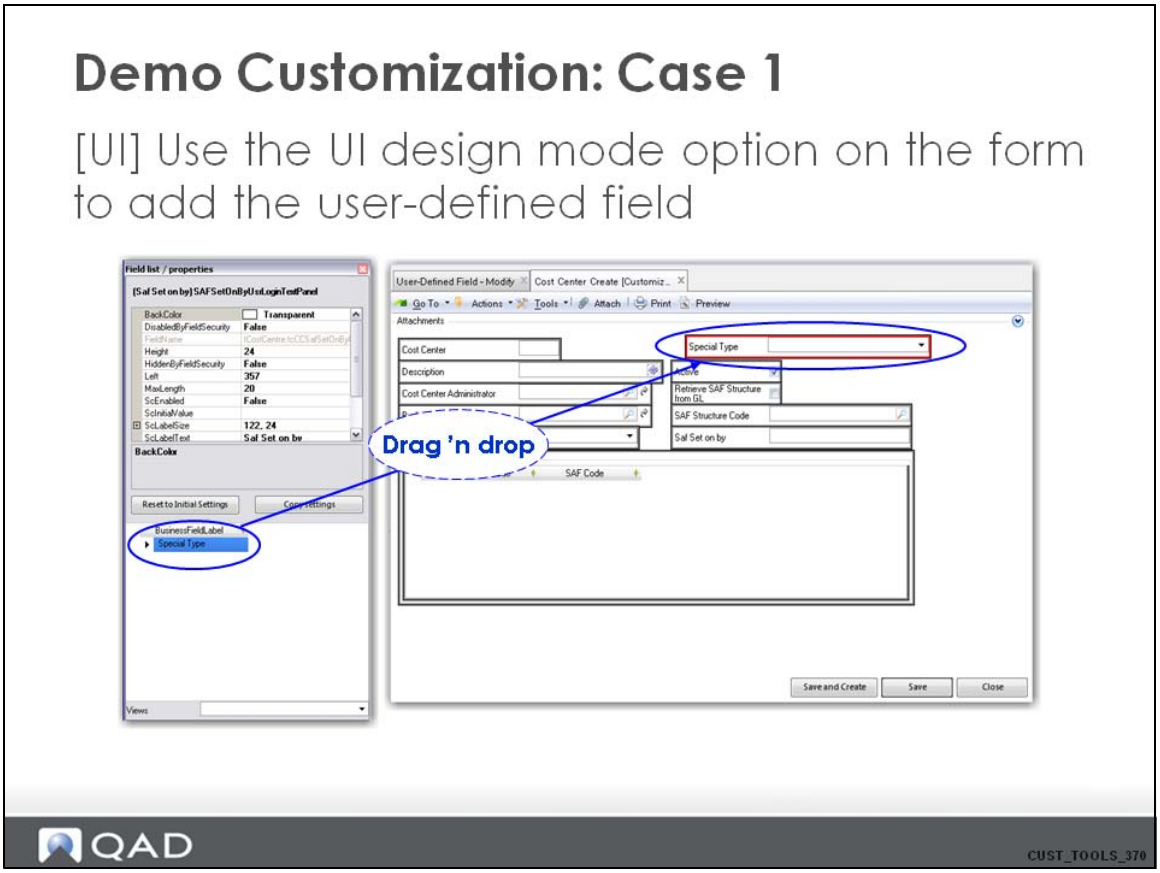
Demo Customization: Case 1



Demo Customization: Case 1 (2)



Demo Customization: Case 1 (3)

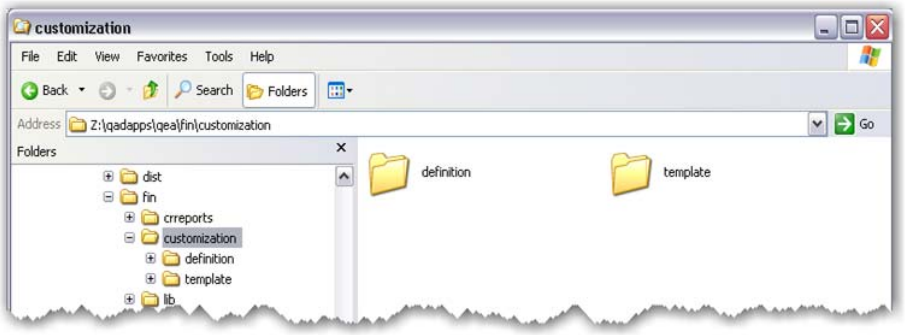


Demo Customization: Case 1 (4)

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



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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

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Demo Customization: Case 1 (6)

Demo Customization: Case 1

Edit `bcostcentre.p` and add code in `ValidateComponent`

```
END PROCEDURE.
**/
PROCEDURE BCostCentre.ValidateComponent.after:
    DEFINE VARIABLE viReturn AS INTEGER NO-UNDO.
    FOR EACH t_sCostCentre WHERE can-do("N,C",t_sCostCentre.tc_status):
        IF t_sCostCentre.CustomCombo0 = "CC004" AND
           t_sCostCentre.tcUsrLogin <> "mfg"
        THEN DO :
            ASSIGN t_parameter.oiReturnStatus = -1.
            run SetMessage
               (input "The specific type ($1) can only be set for cost centers with admi
                input t_sCostCentre.CustomCombo0 + CHR(2) + t_sCostCentre.tcUsrLogin,
                input "Special Type",
                input t_sCostCentre.CustomCombo0,
                input "E",
                input 3,
                input t_sCostCentre.tc_Rowid,
                input "CUST-001",
                input "",
                input "",
                input "",
                output viReturn).
        END.
    END.
END PROCEDURE.
```

1
2
3

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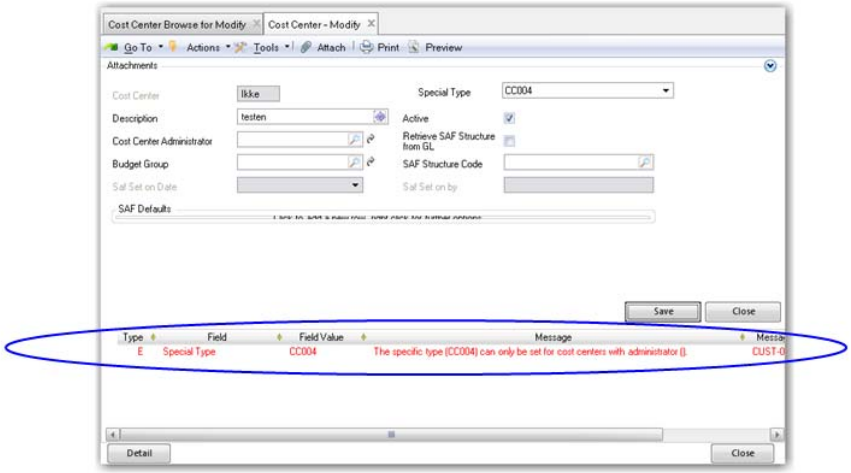
Demo Customization: Case 1 (7)

Demo Customization: Case 1

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



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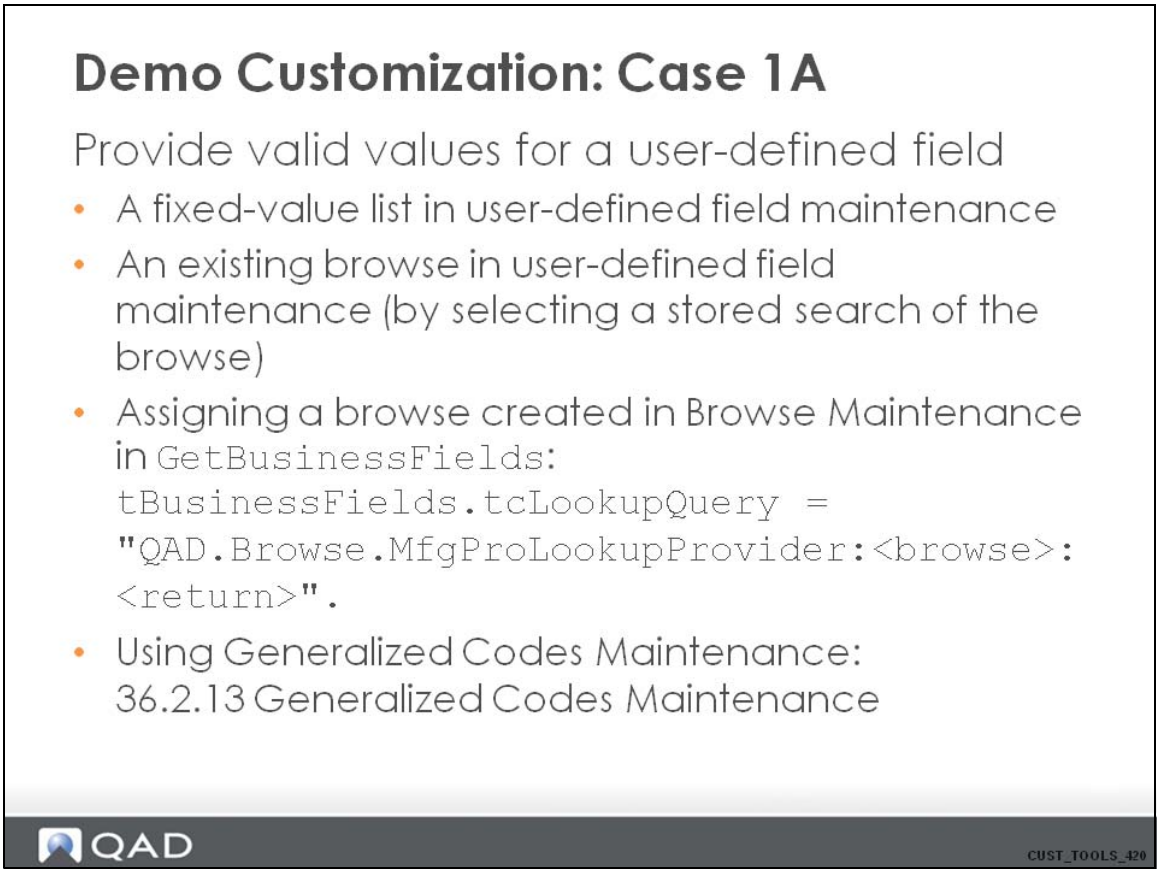
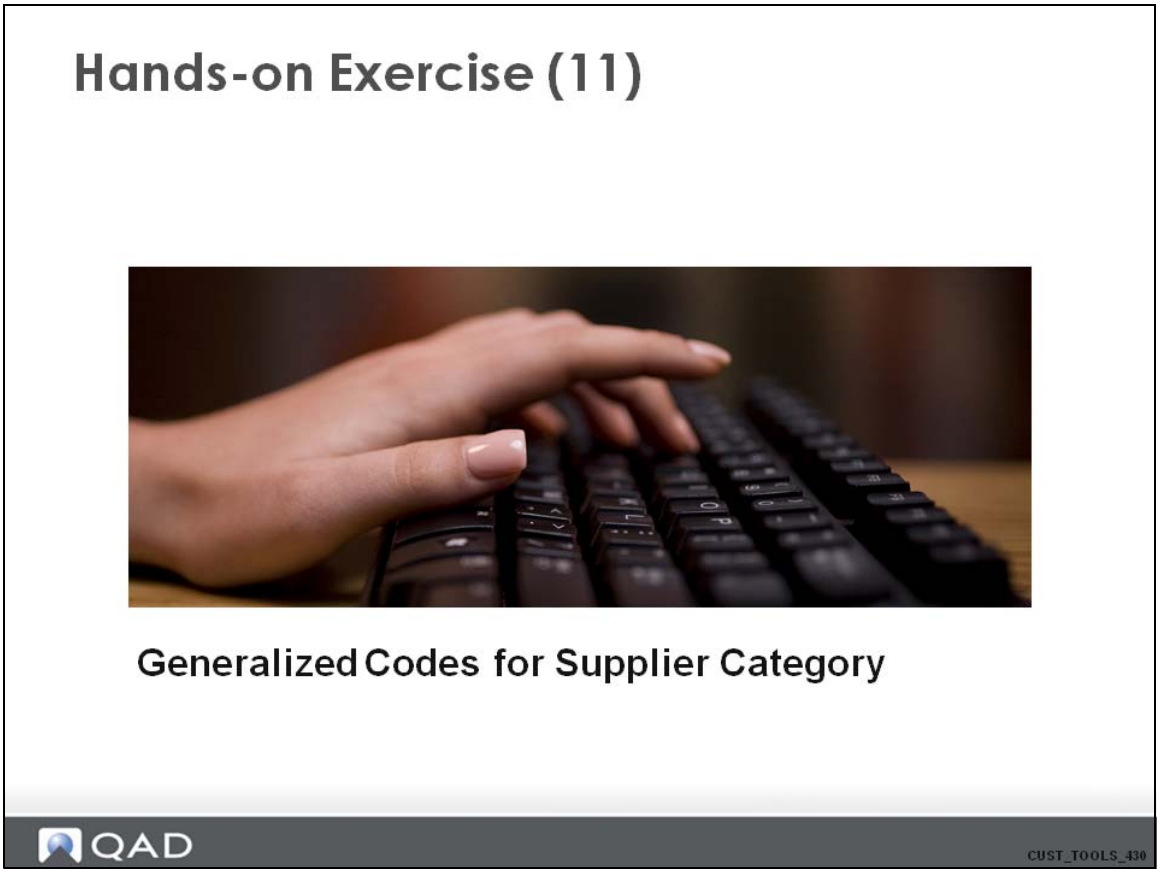
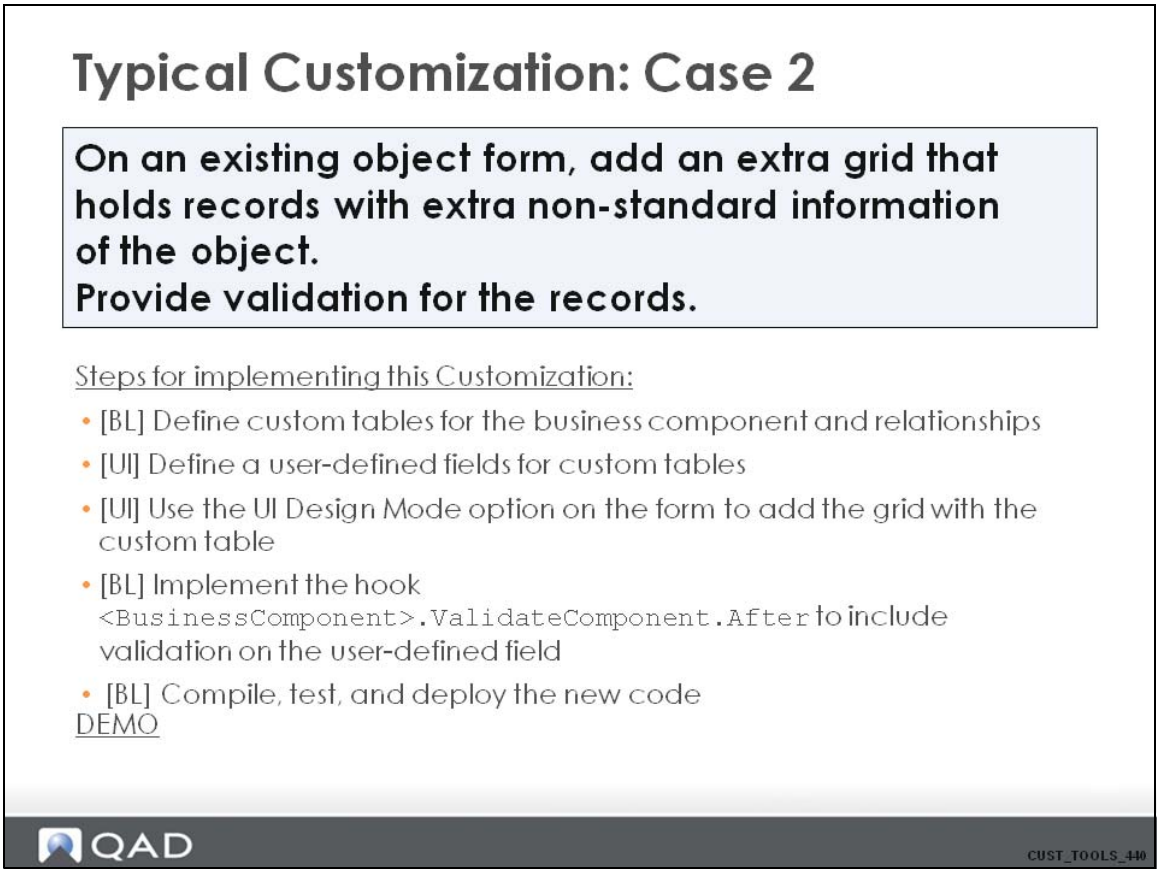
Demo Customization: Case 1A



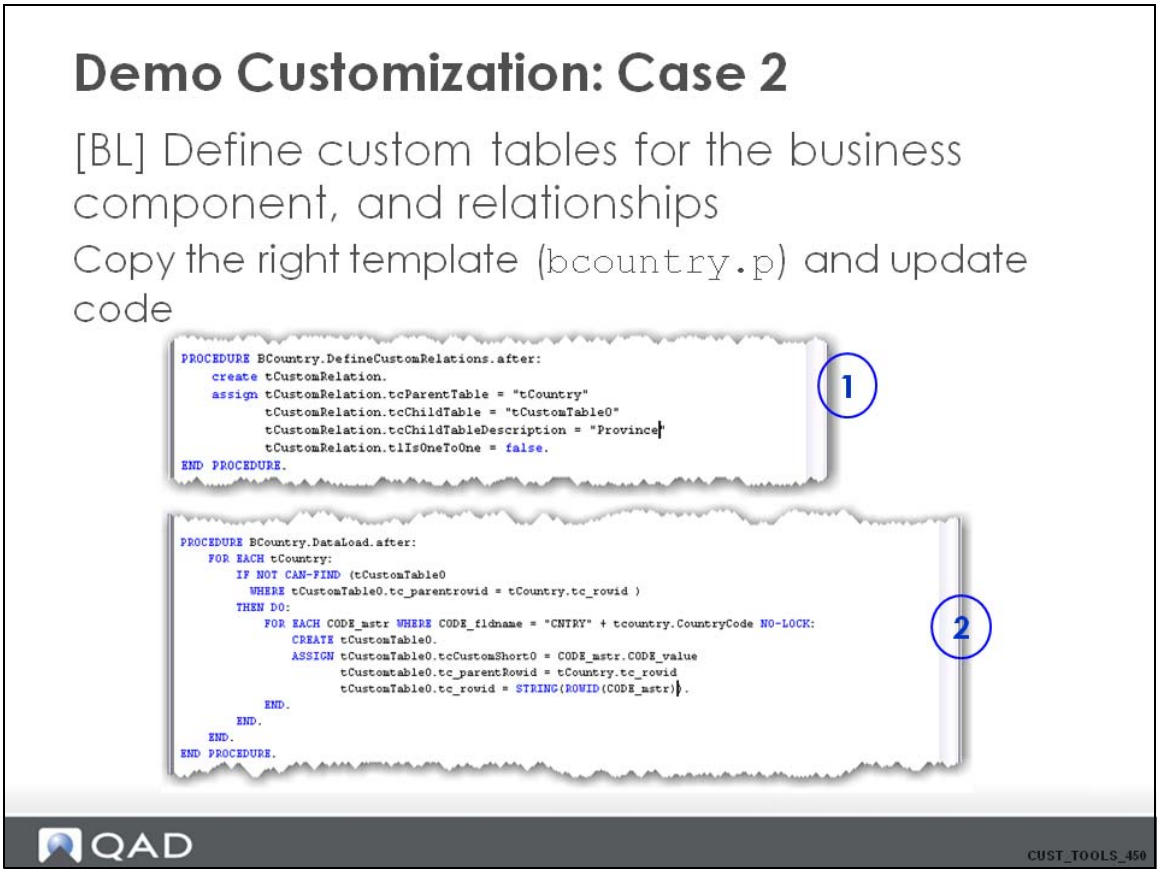
Hands-on Exercise (11)



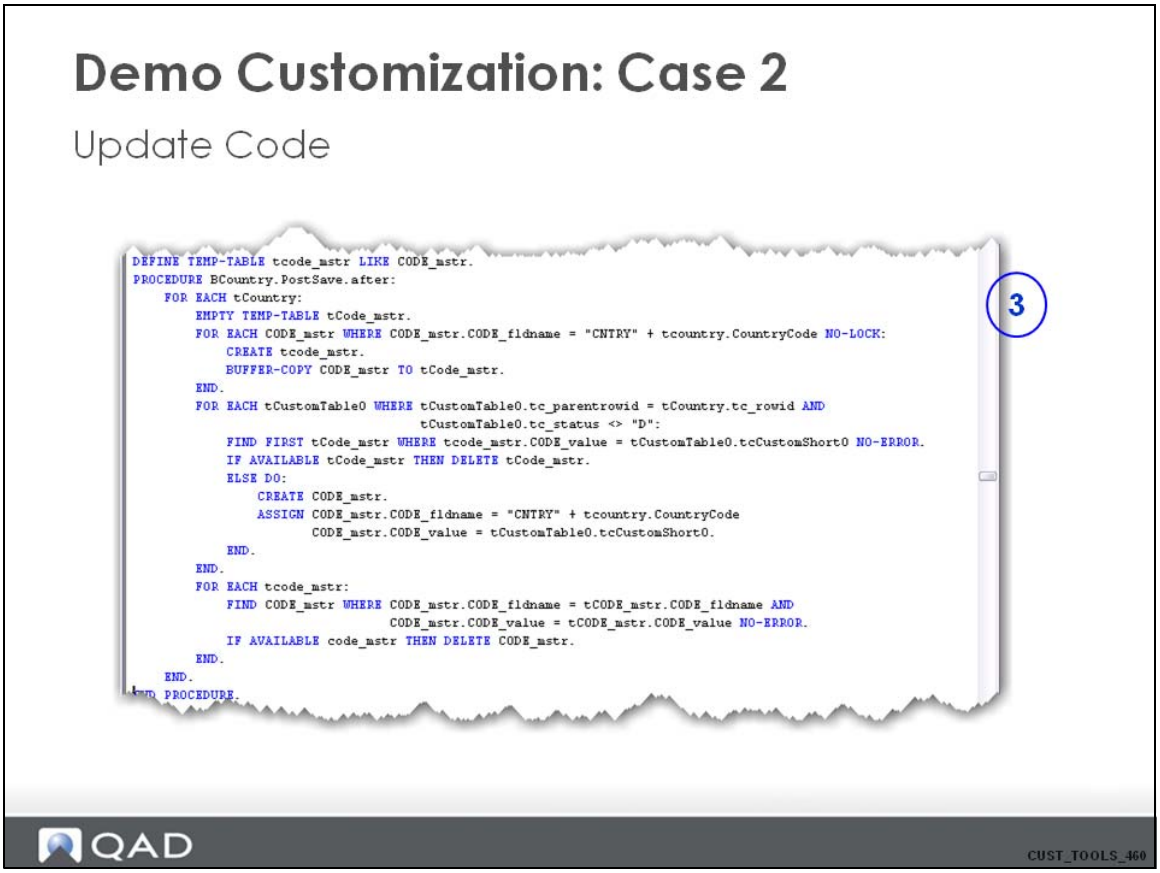
Typical Customization: Case 2



Demo Customization: Case 2



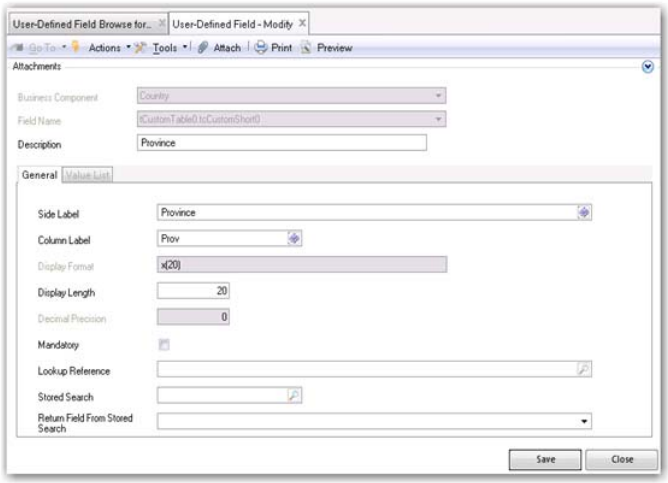
Demo Customization: Case 2 (2)



Demo Customization: Case 2 (3)

Demo Customization: Case 2

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



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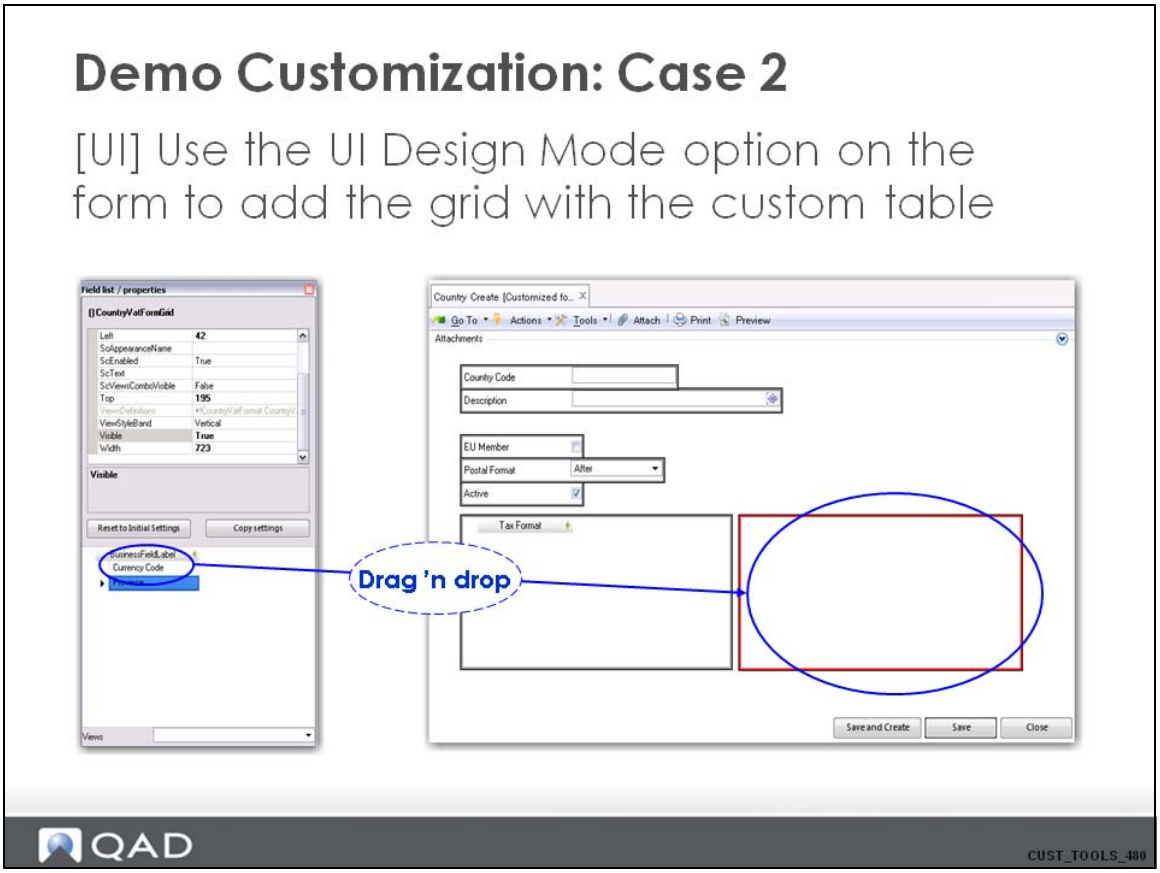
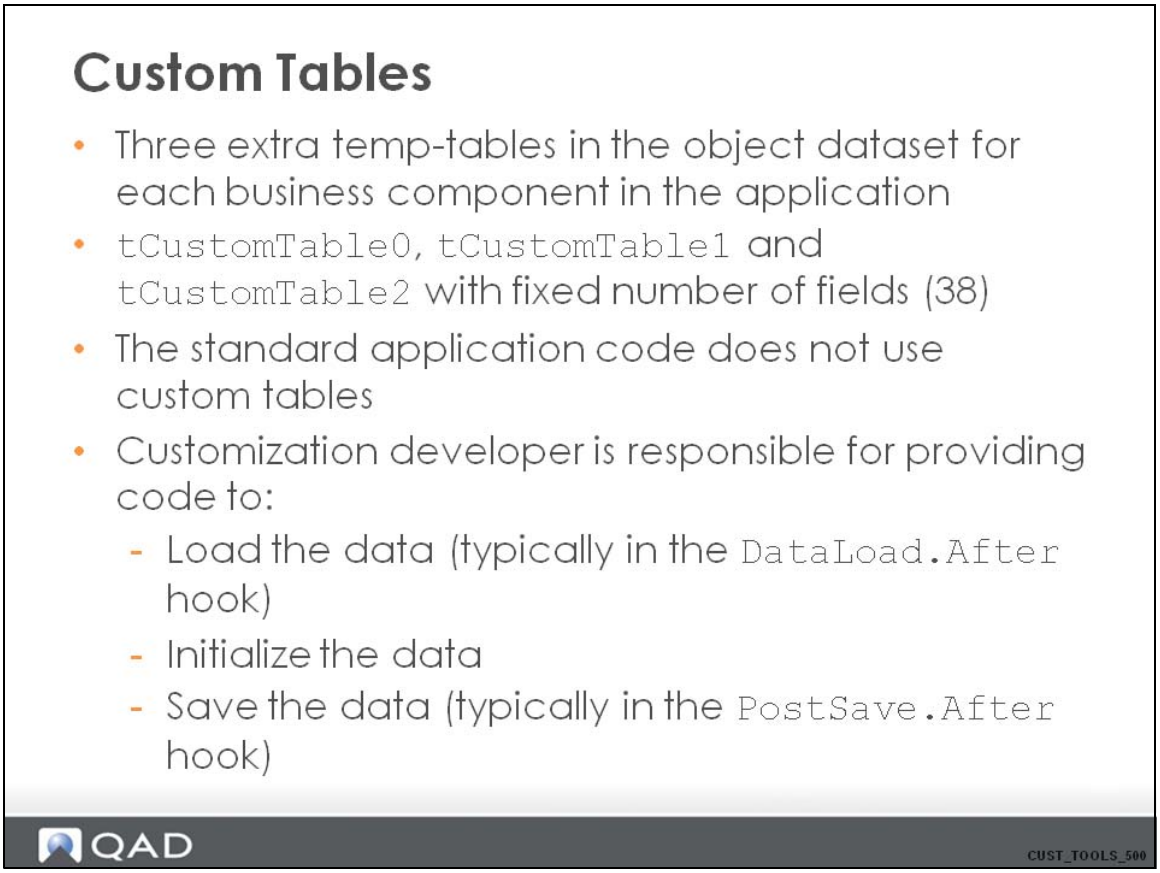
Demo Customization: Case 2 (4)



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

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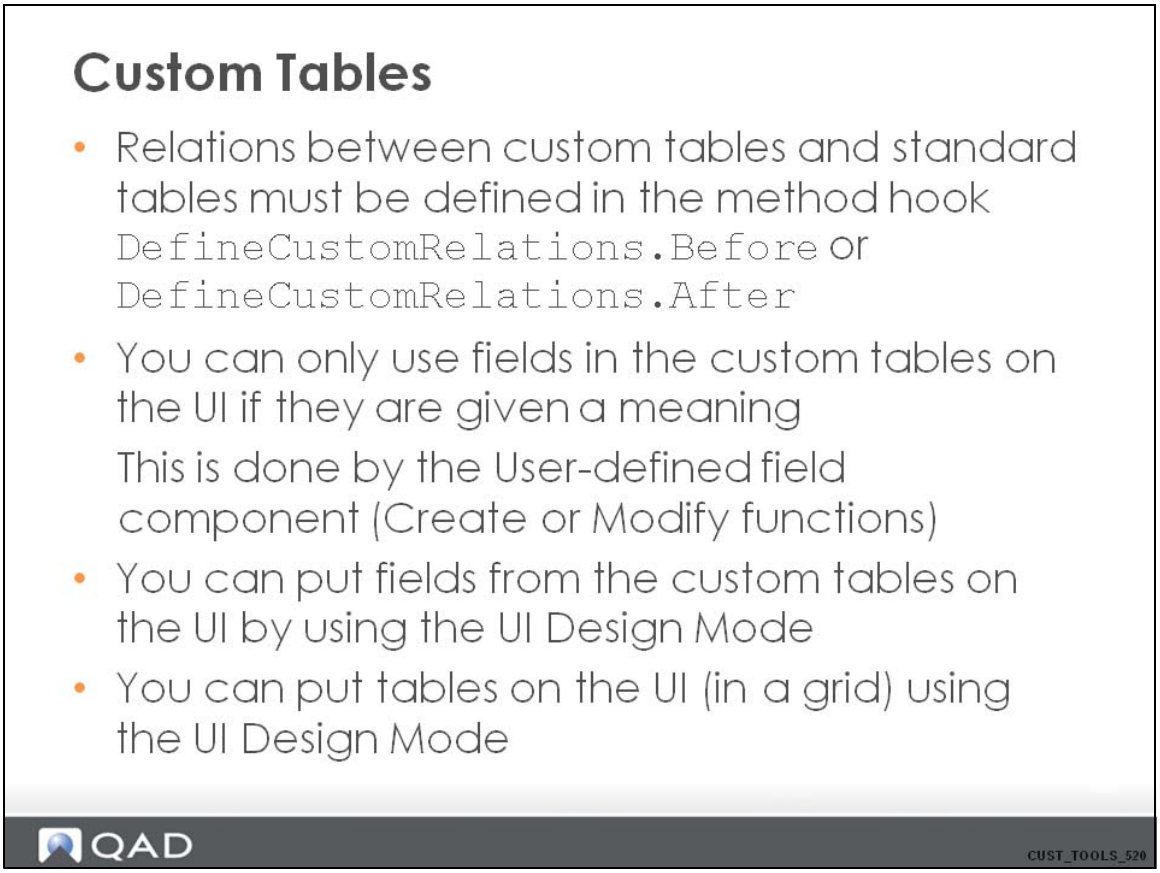
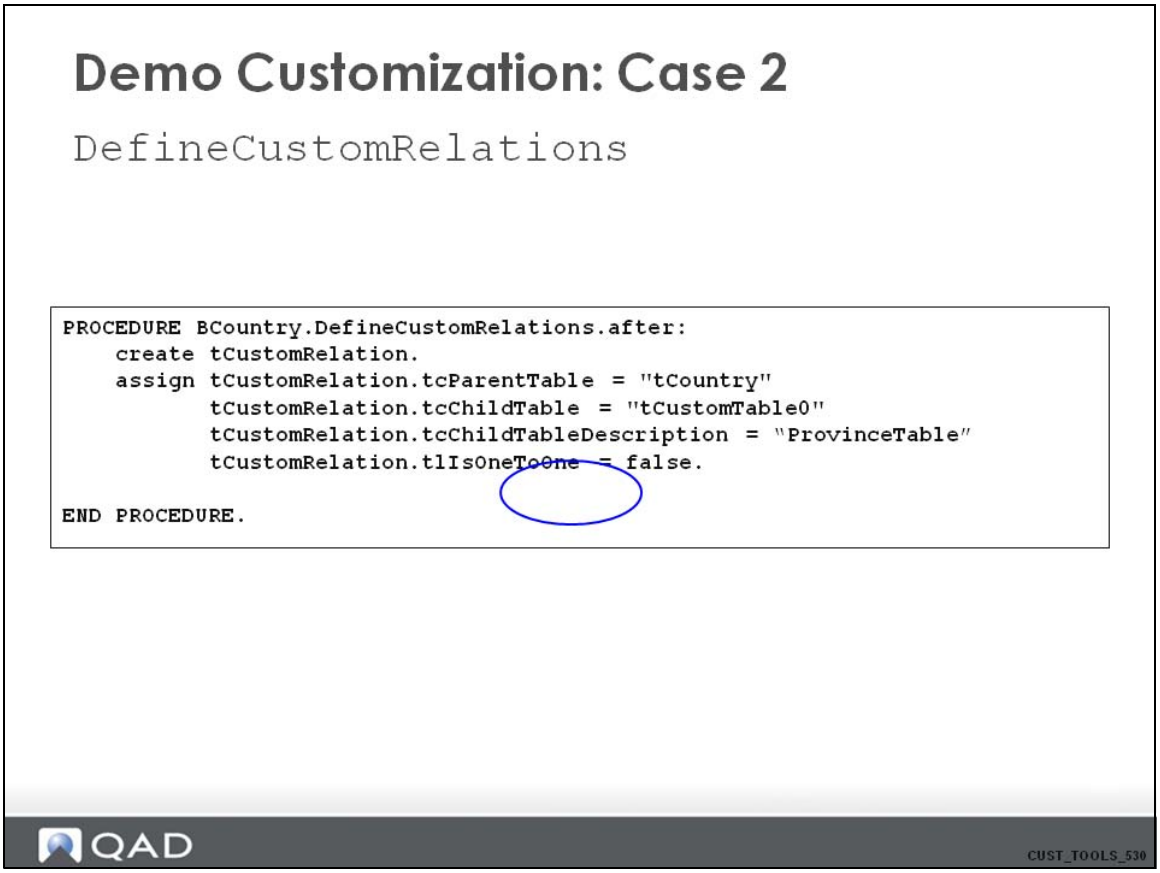
Custom Tables 3



Demo Customization: Case 2 - DefineCustomRelations



Demo Customization: Case 2 - DataLoad

Demo Customization: Case 2

DataLoad

```
PROCEDURE BCountry.DataLoad.after:
    DEFINE VARIABLE vcProvince AS CHARACTER   NO-UNDO.
    FOR EACH tCountry:
        FILE-INFO:FILE-NAME = "c:\temp\Country" + tCountry.CountryCode +
".txt"
                              NO-ERROR.
        IF FILE-INFO:FILE-CREATE-DATE <> ?
        THEN DO:
            INPUT FROM VALUE ("c:\temp\Country" + tCountry.CountryCode +
".txt").
                REPEAT:
                    IMPORT vcProvince.
                    CREATE tCustomTable0.
                    ASSIGN tCustomTable0.tcCustomShort0 = vcProvince
                           tCustomTable0.tc_parentRowid = tCountry.tc_rowid
                           tCustomTable0.tc_rowid = "rowid" + string(TIME).
            END.
            INPUT CLOSE.
        END.
    END.
END PROCEDURE.
```

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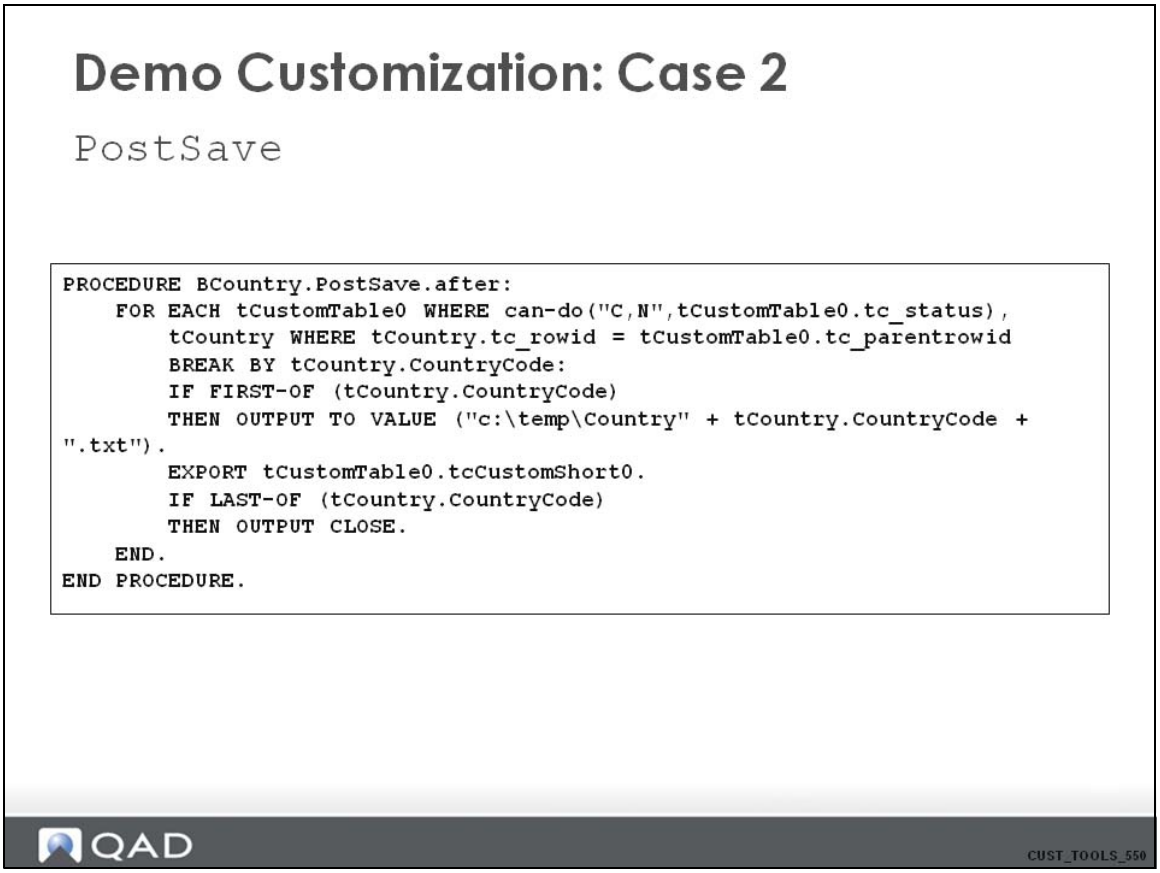
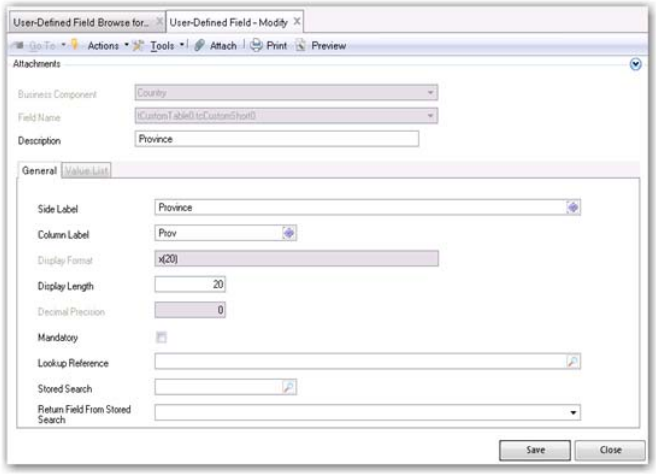
Demo Customization: Case 2 - PostSave



Demo Customization: Case 2 - Compile and Deploy

Demo Customization: Case 2

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



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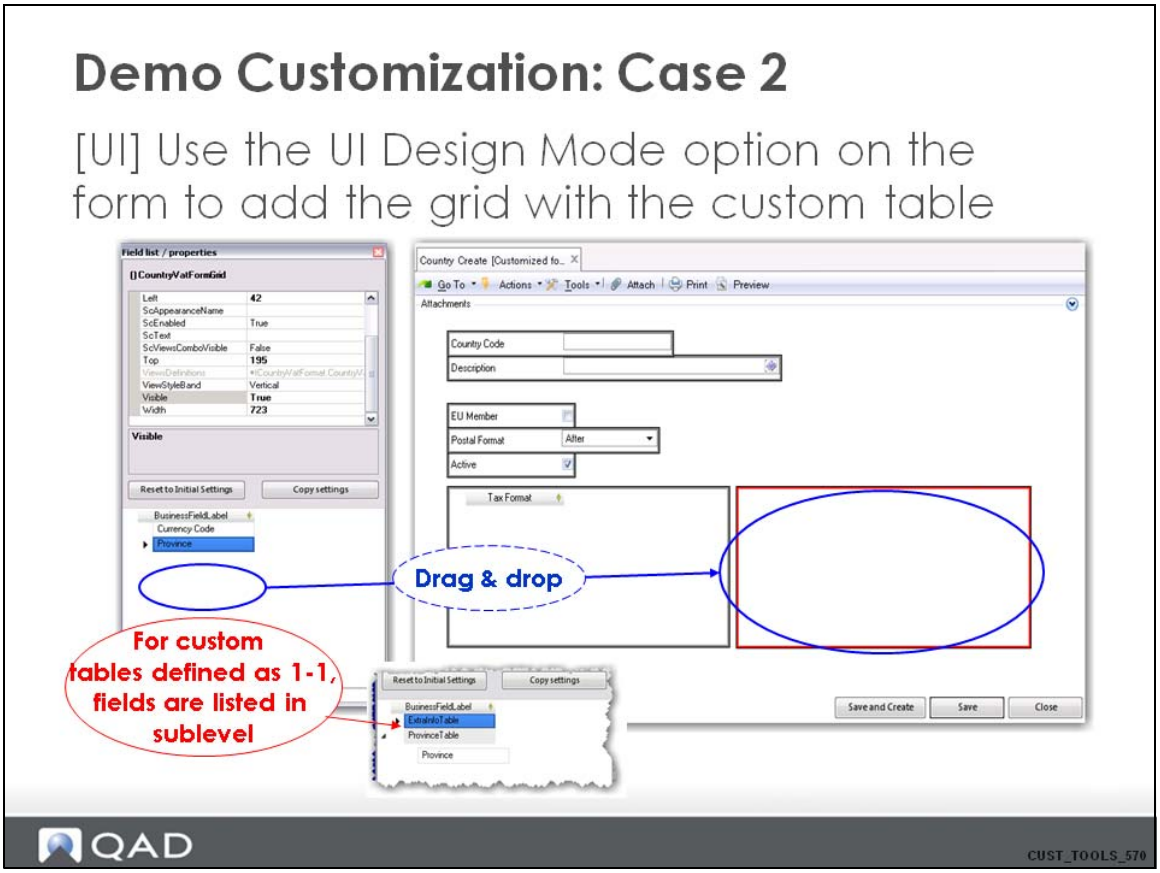
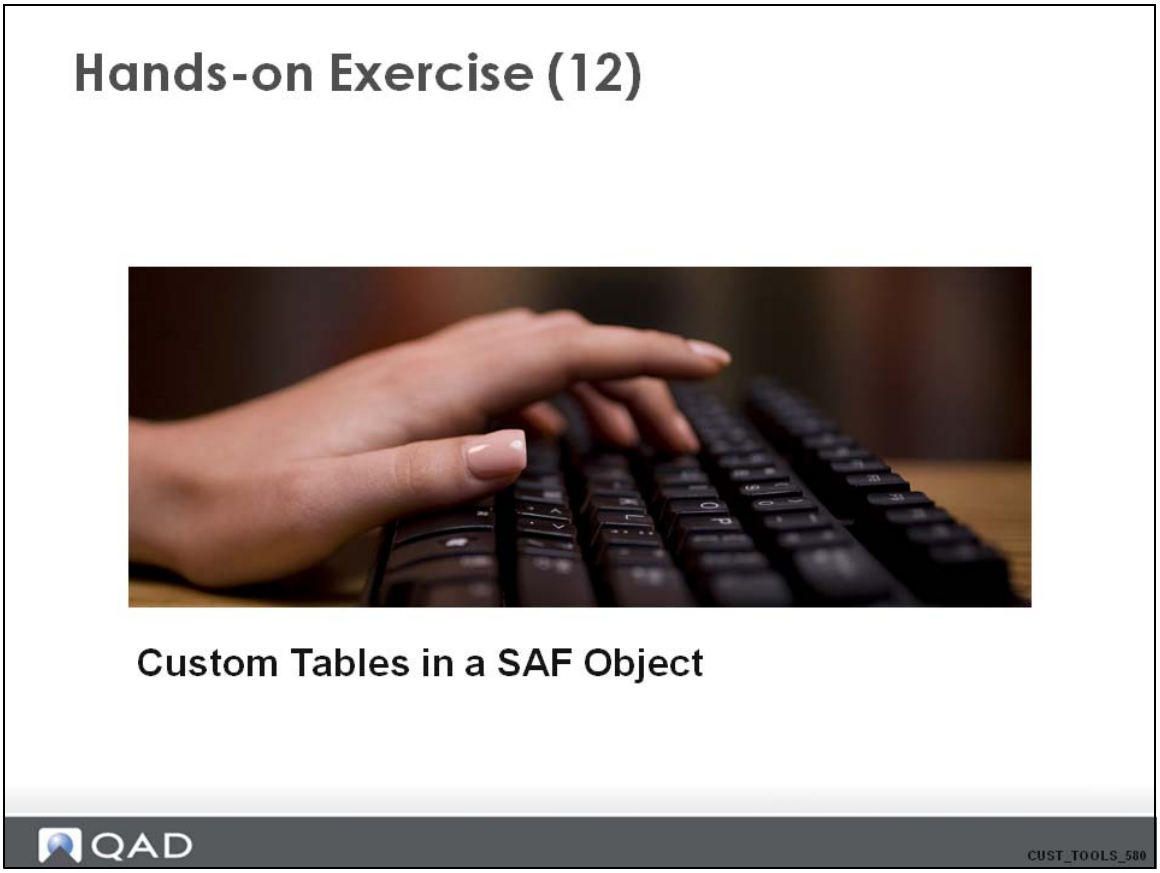
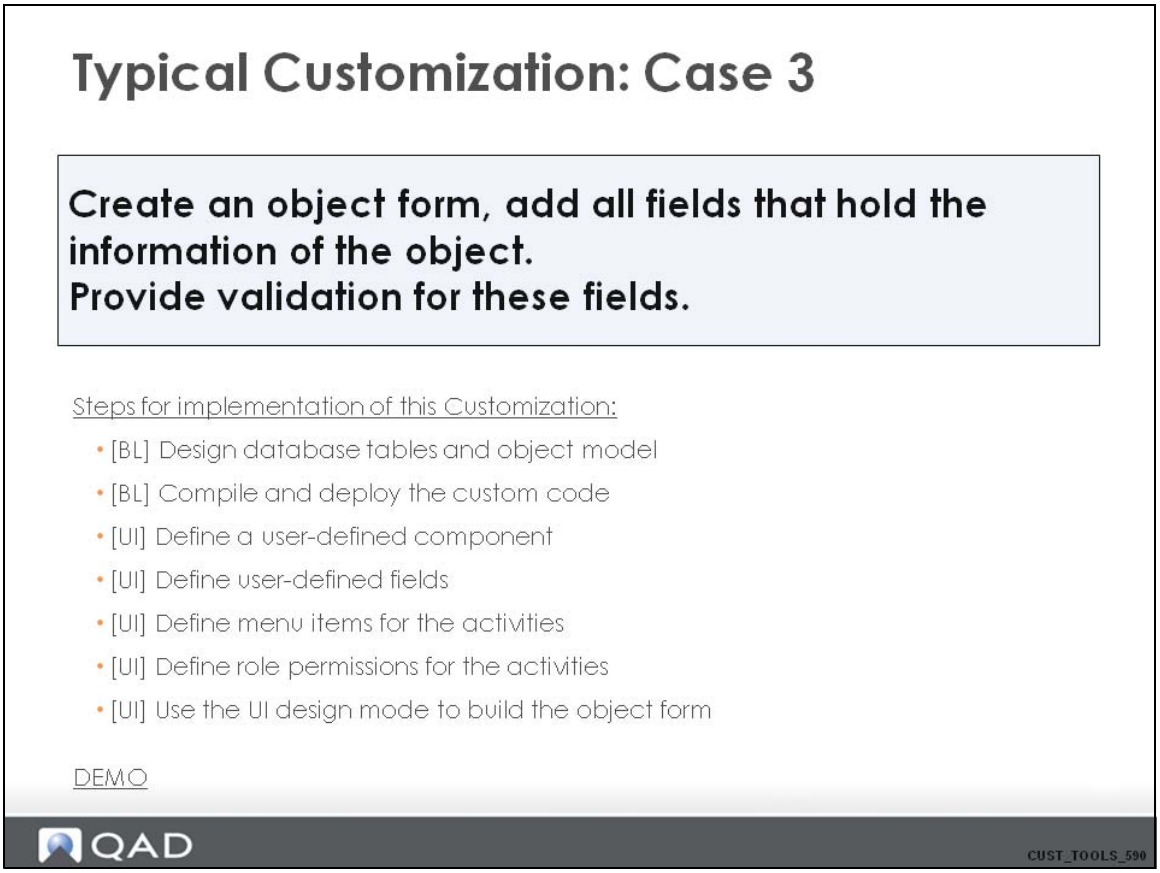
Demo Customization: Case 2 - Add Grid



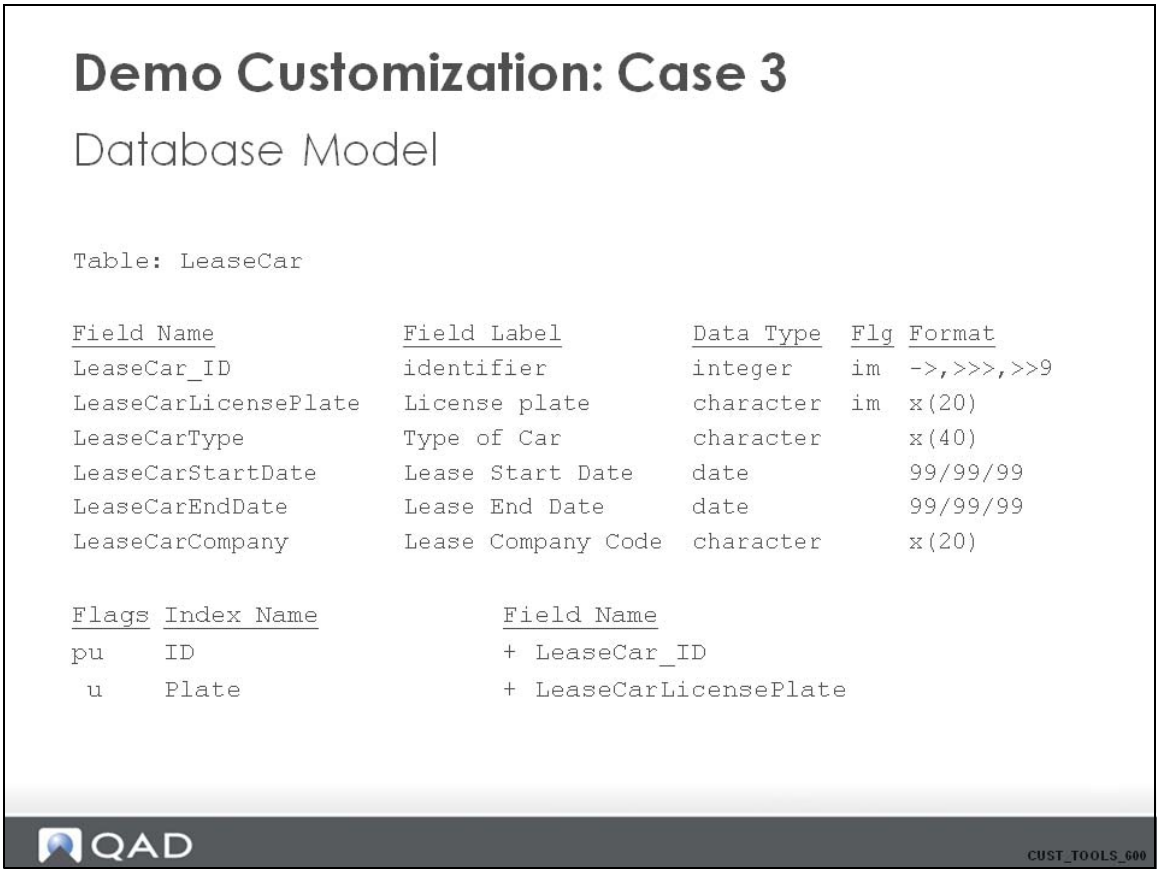
Hands-on Exercise (12)



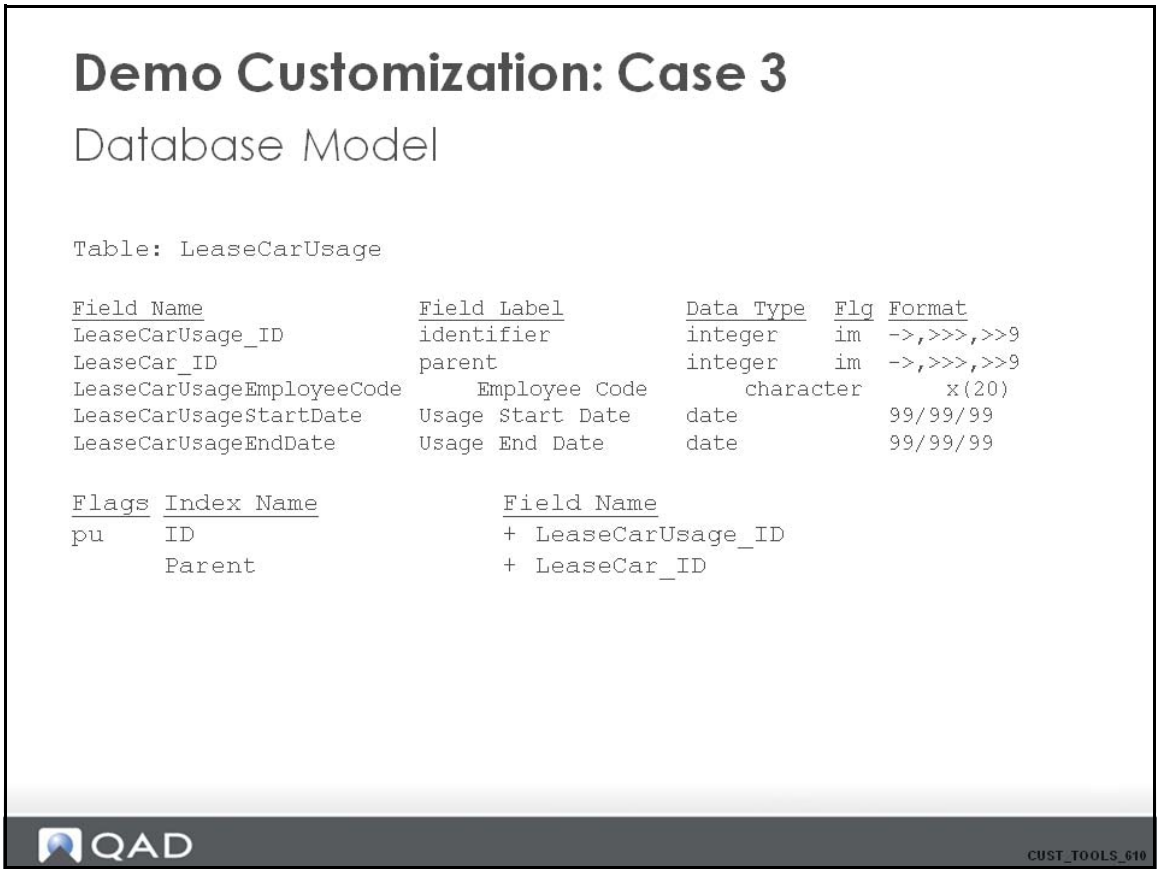
Typical Customization: Case 3



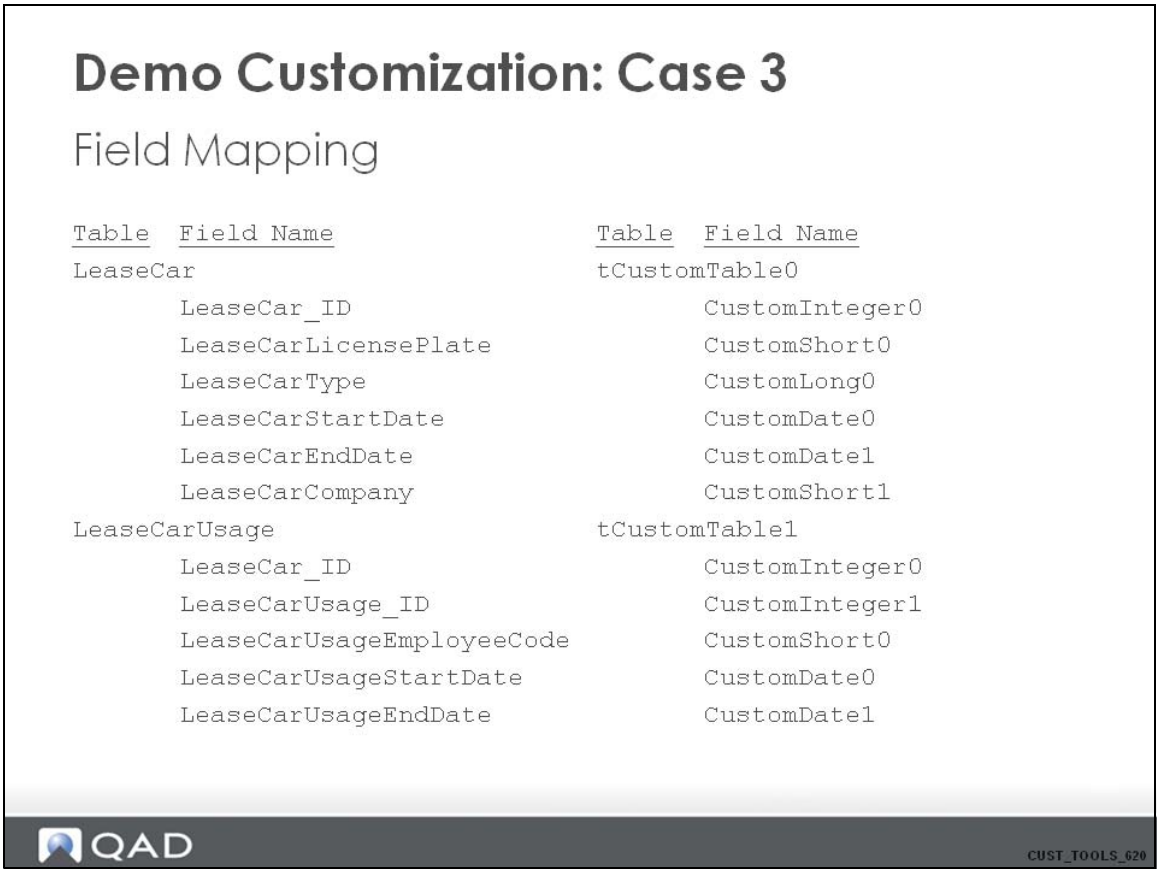
Demo Customization: Case 3 - Database Model



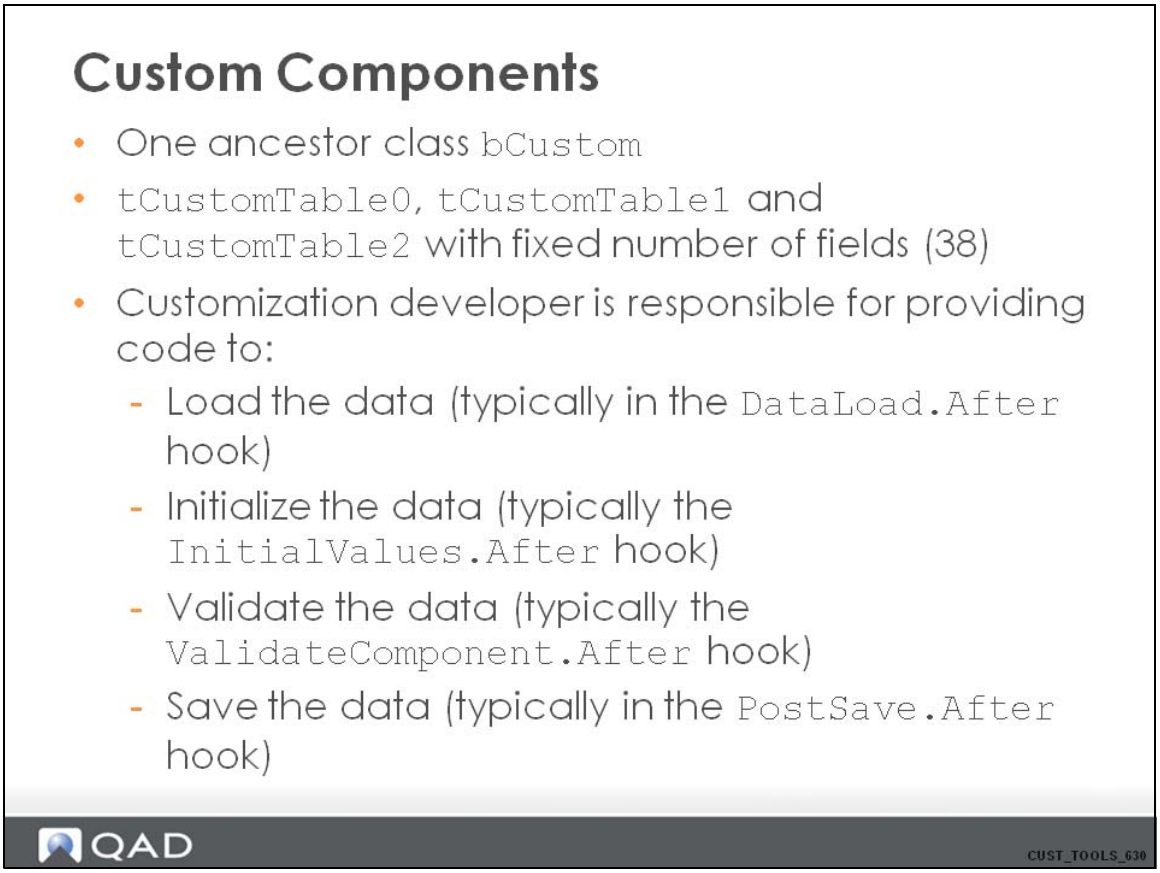
Demo Customization: Case 3 - Database Model 2



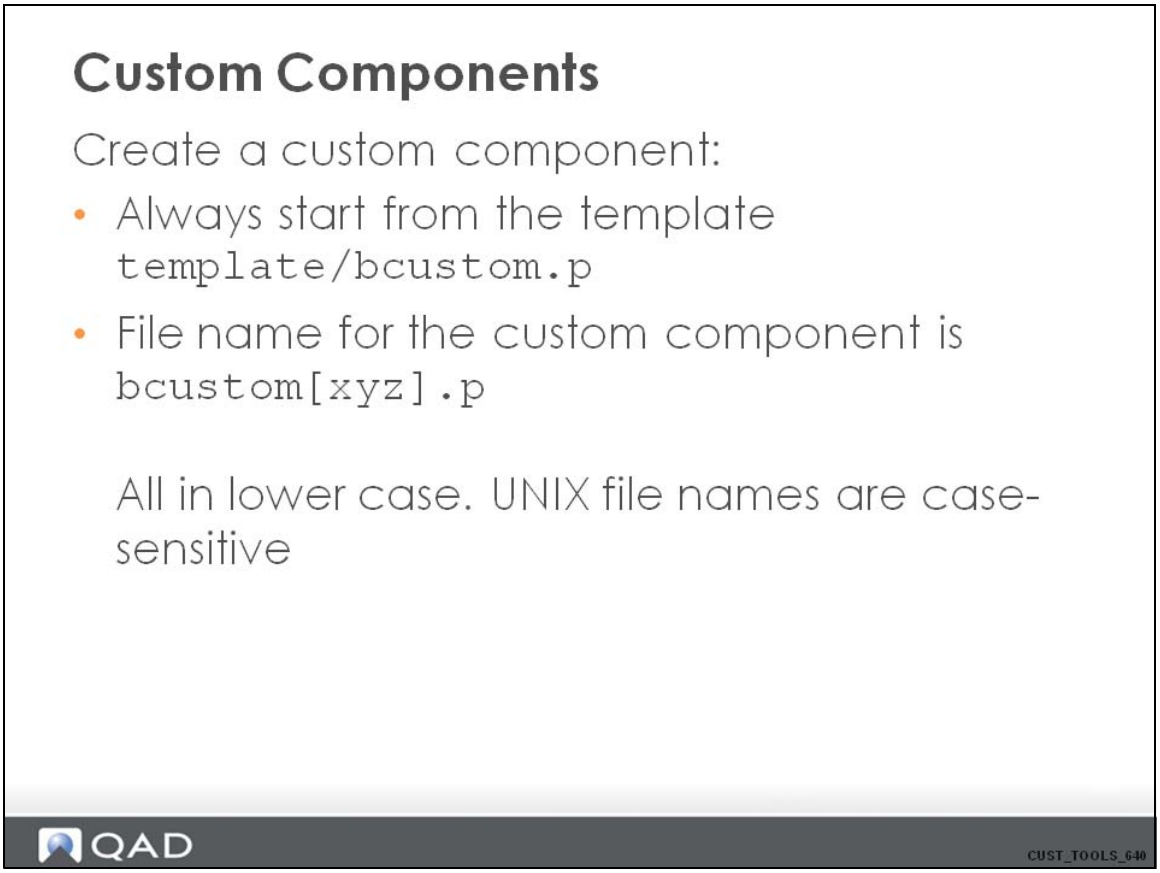
Demo Customization: Case 3 - Field Mapping



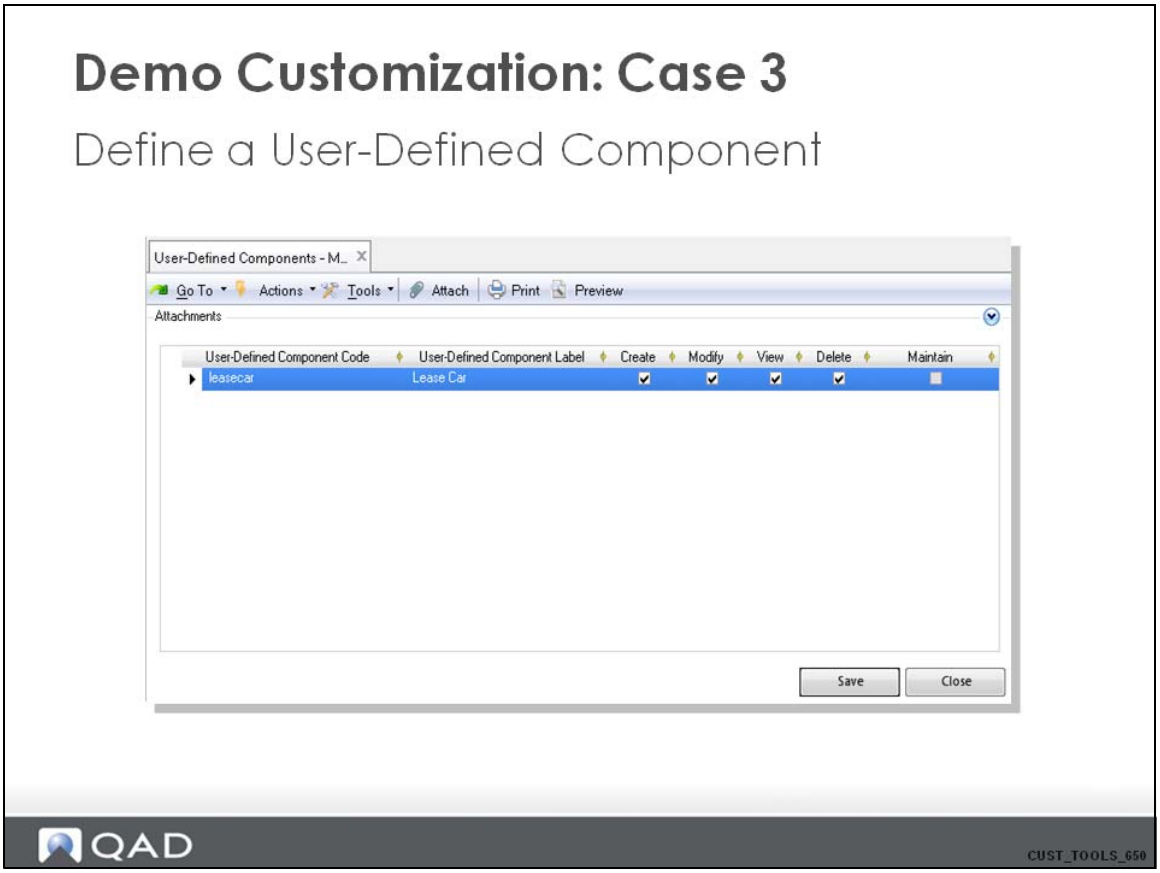
Custom Components



Custom Components 2

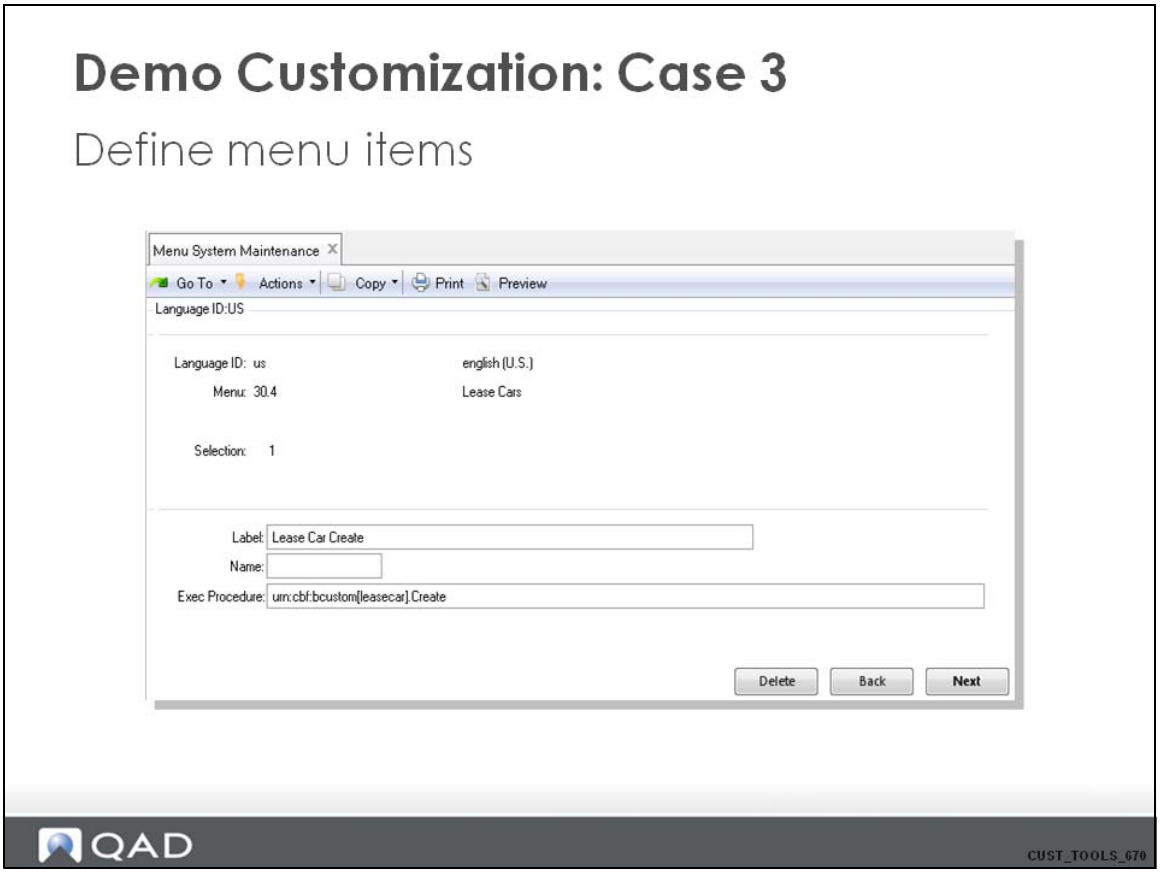


Demo Customization: Case 3 - Define User-Defined Component

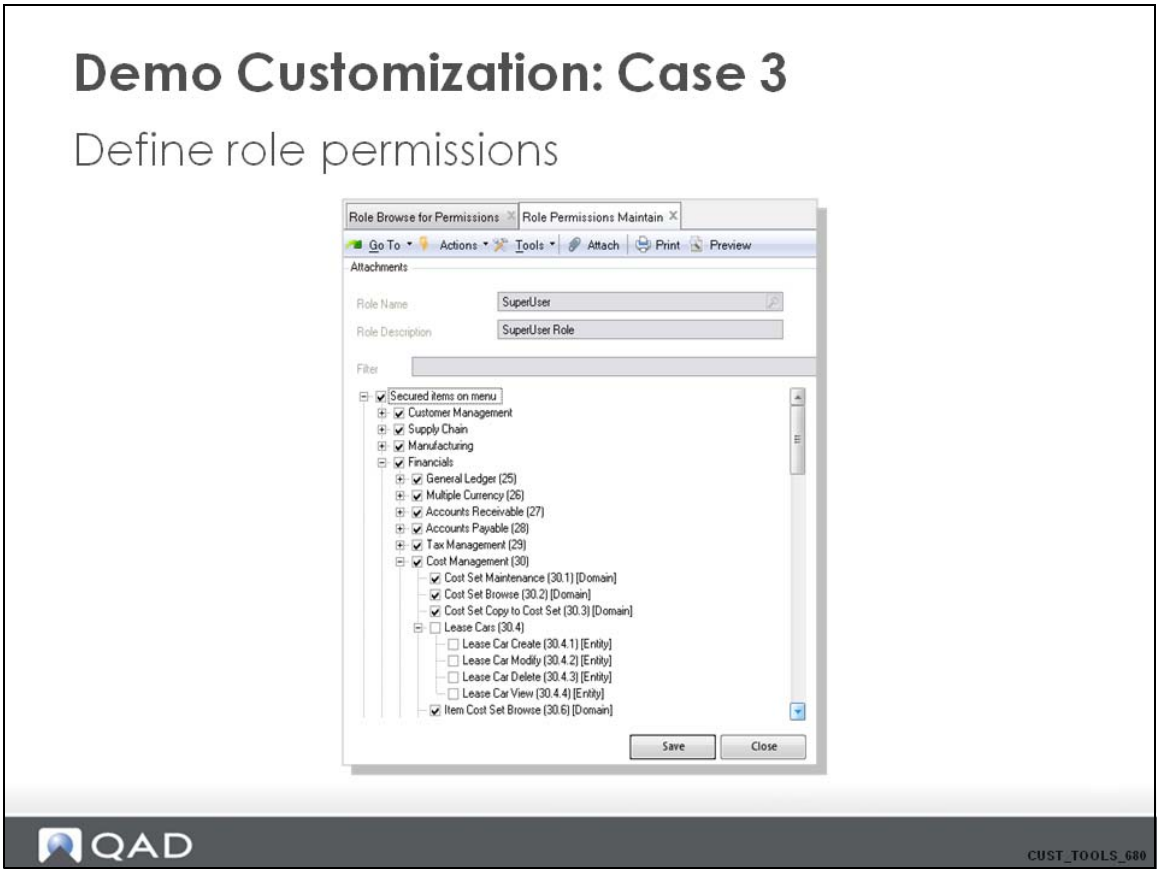


Demo Customization: Case 3 - Define User-Defined Fields

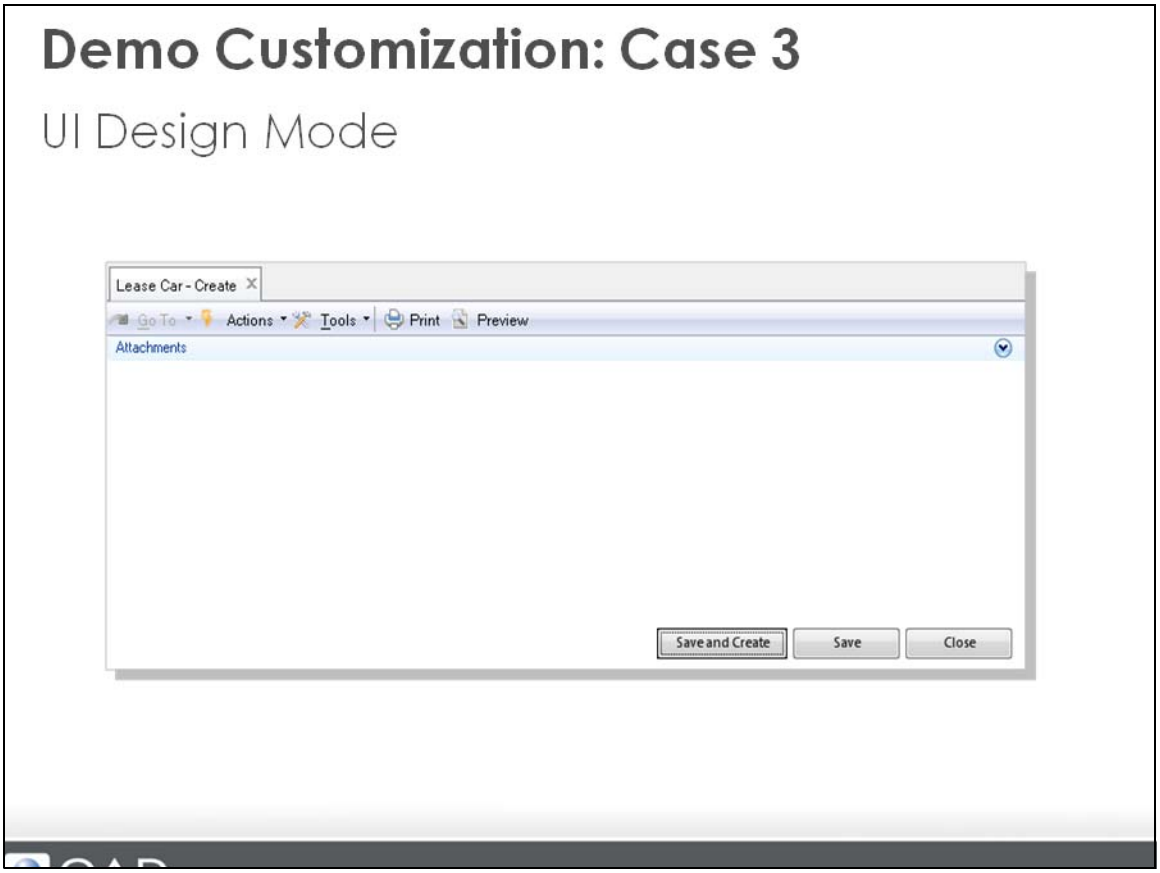
Demo Customization: Case 3 - Define Menu Items



Demo Customization: Case 3 - Define Role Permissions

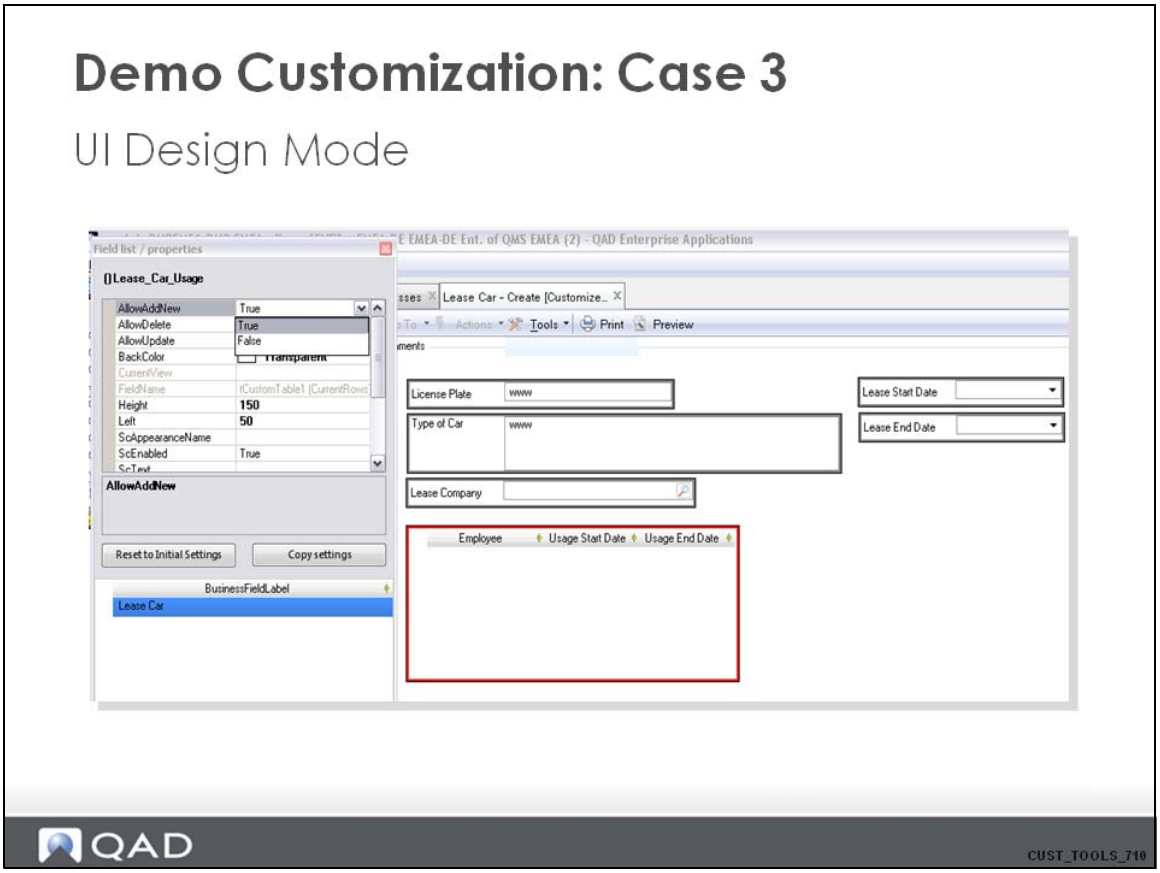


Demo Customization: Case 3 - UI Design Mode

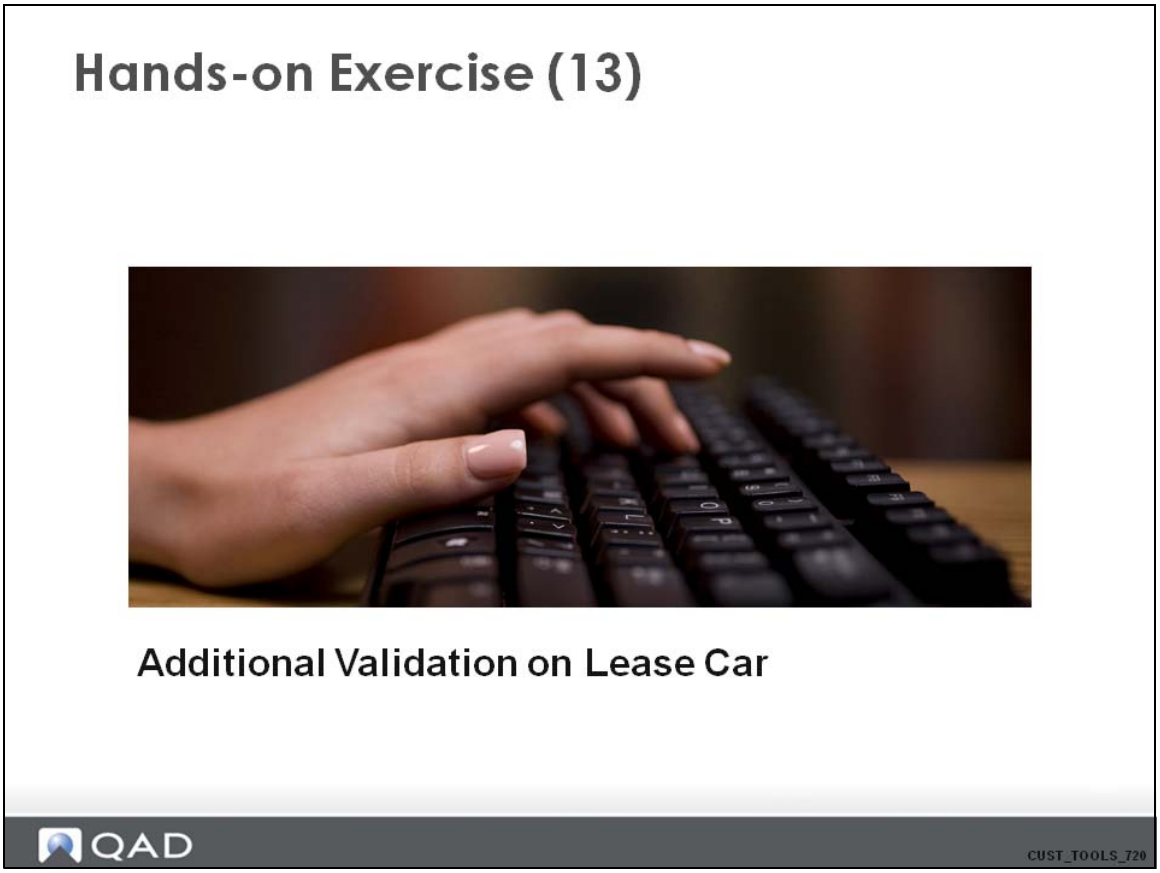


Demo Customization: Case 3 - UI Design Mode 2

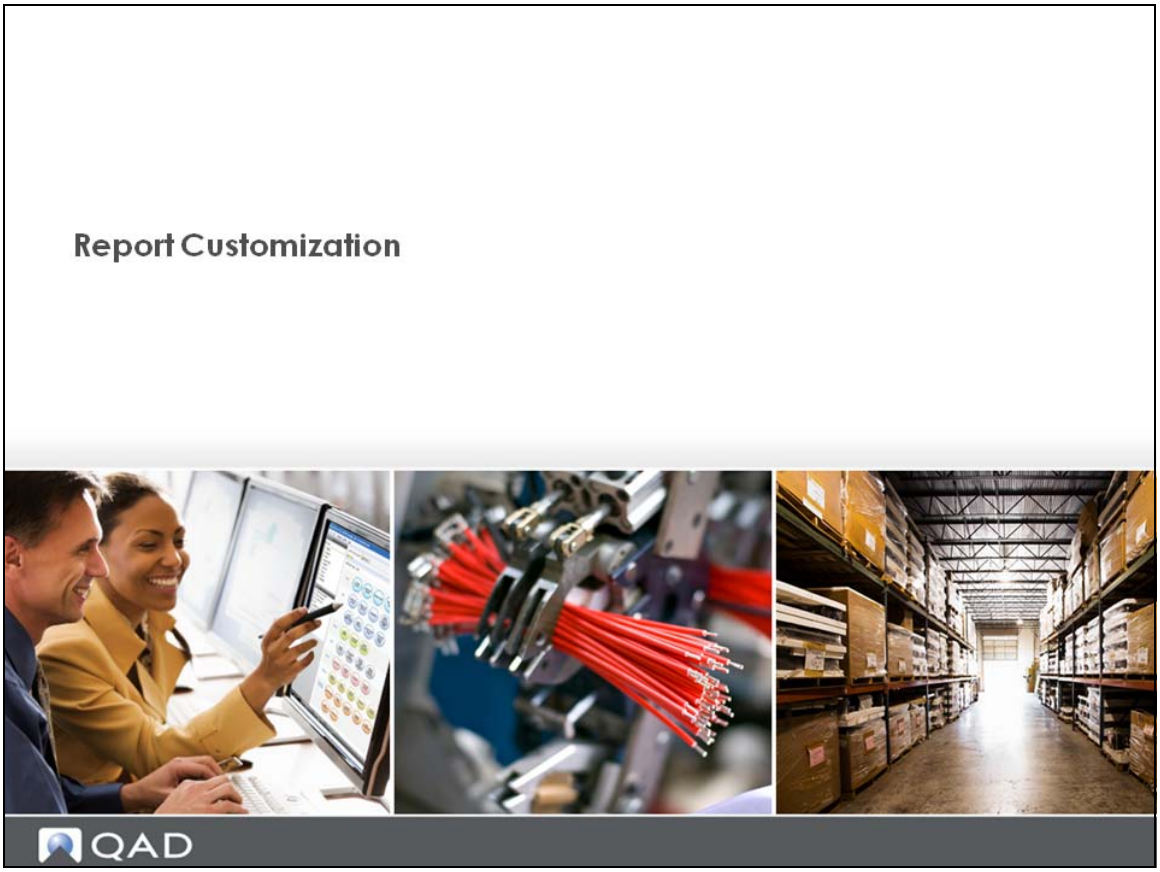
Demo Customization: Case 3 - UI Design Mode 3



Hands-on Exercise (13)



Report Customization



Report Framework for Financials Reports

Report Framework for Financials Reports 2

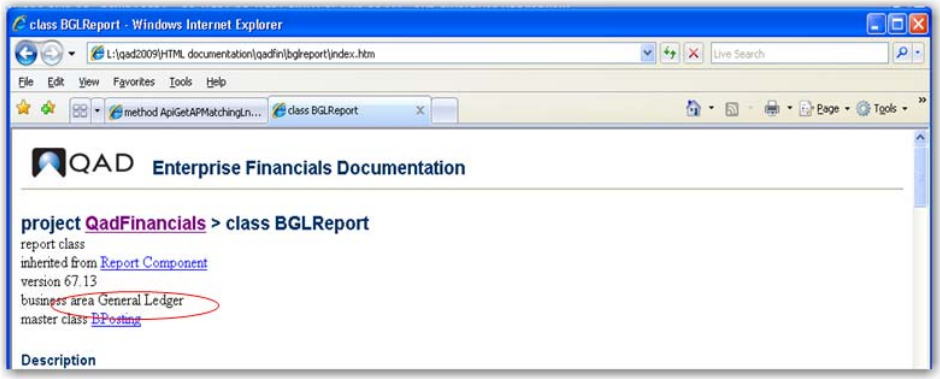
Report Framework for Financials Reports 3

Report Framework for Financials Reports

Report business component development

Inheritance from abstract foundation component

Report Component



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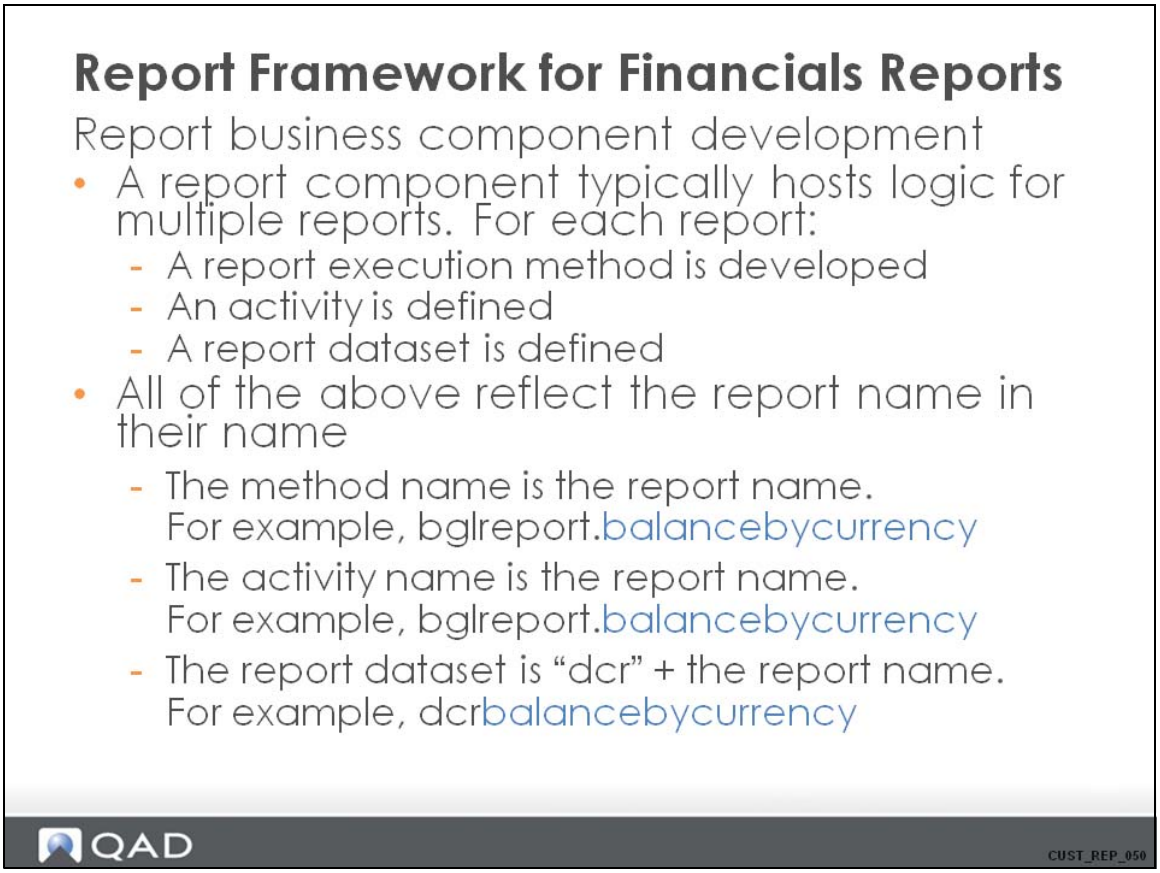
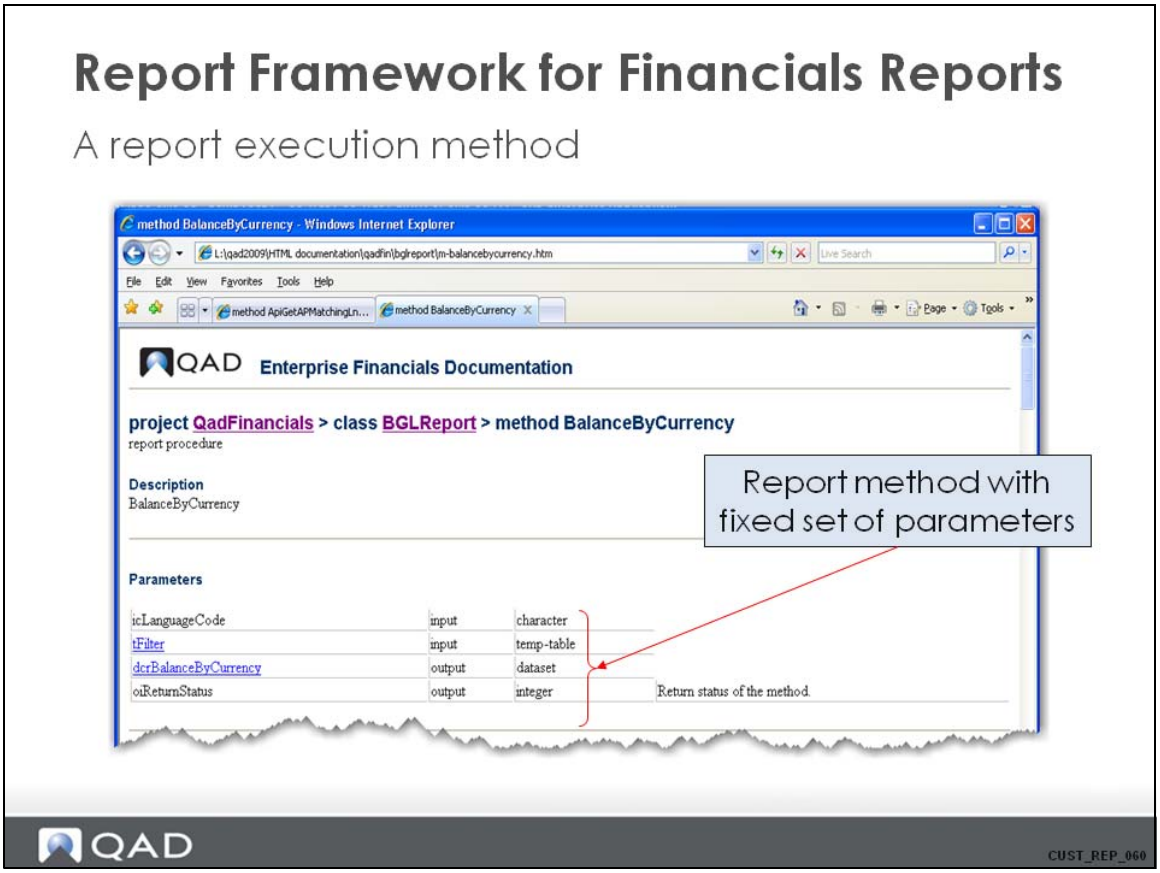
CUST_REP_040

Report Framework for Financials Reports 4



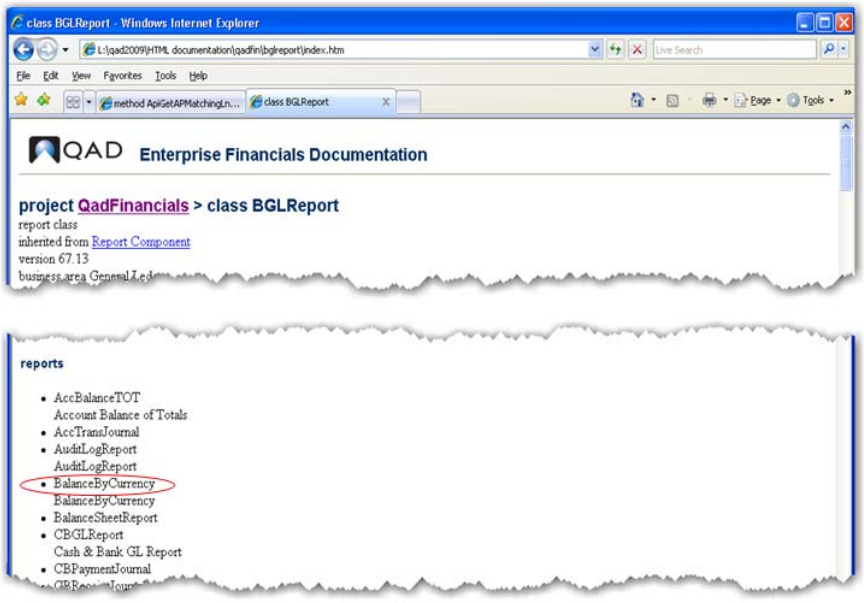
Report Framework for Financials Reports 5



Report Framework for Financials Reports 6

Report Framework for Financials Reports

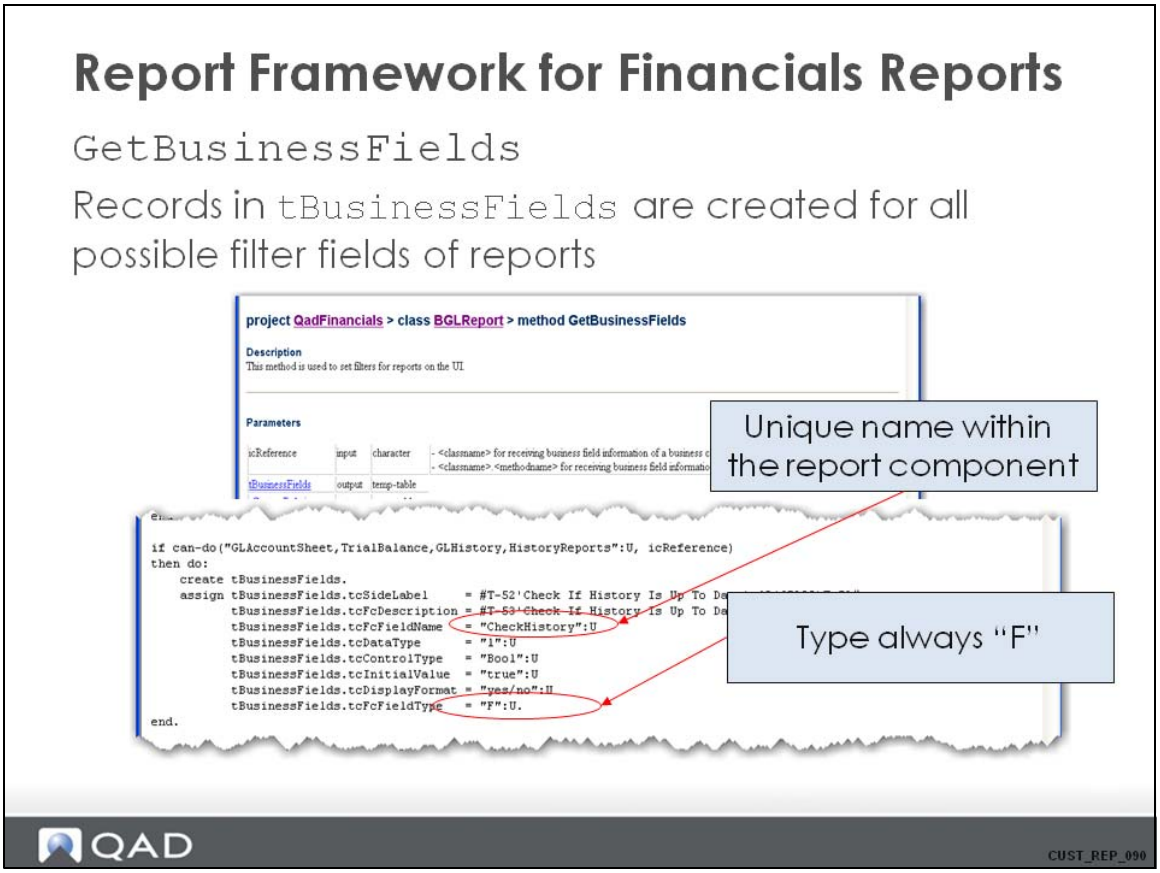
An activity



QAD CUST_REP_070

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.
```

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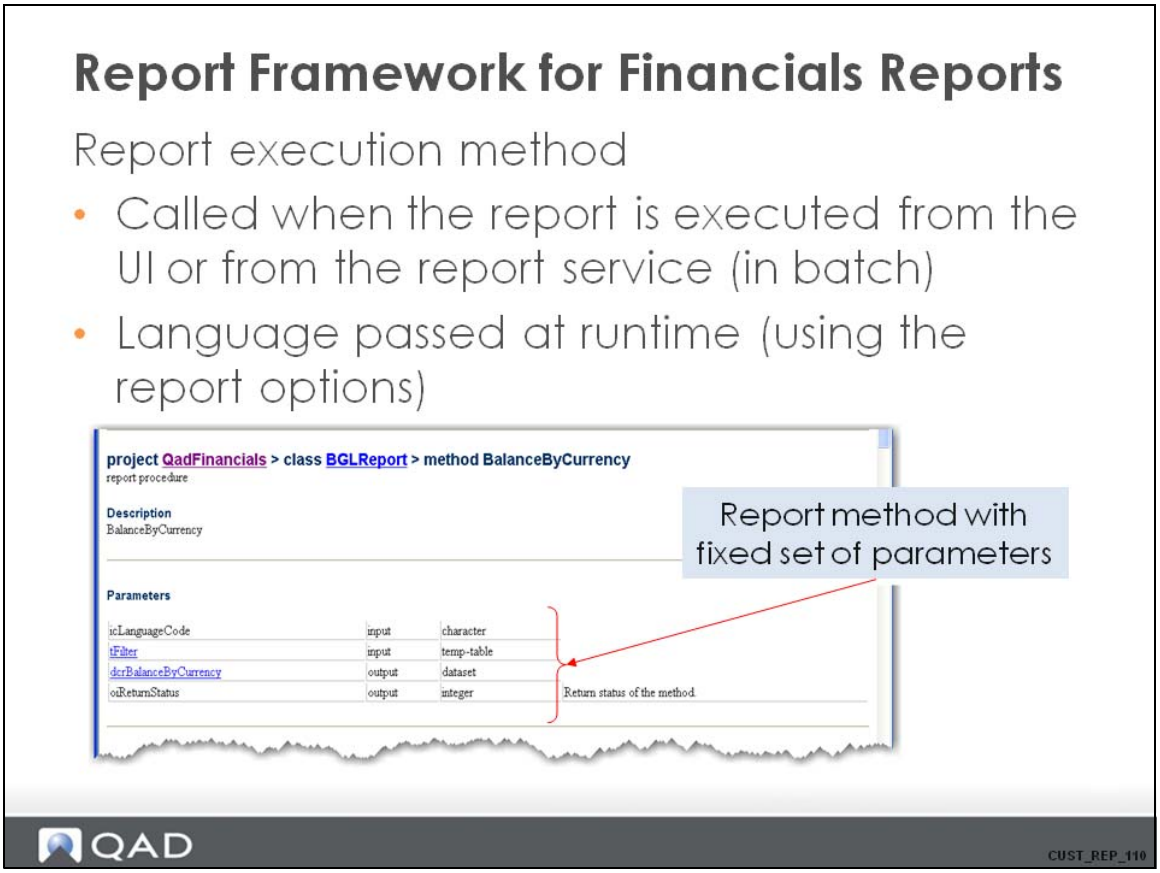
CUST_REP_100

Report Framework for Financials Reports 10

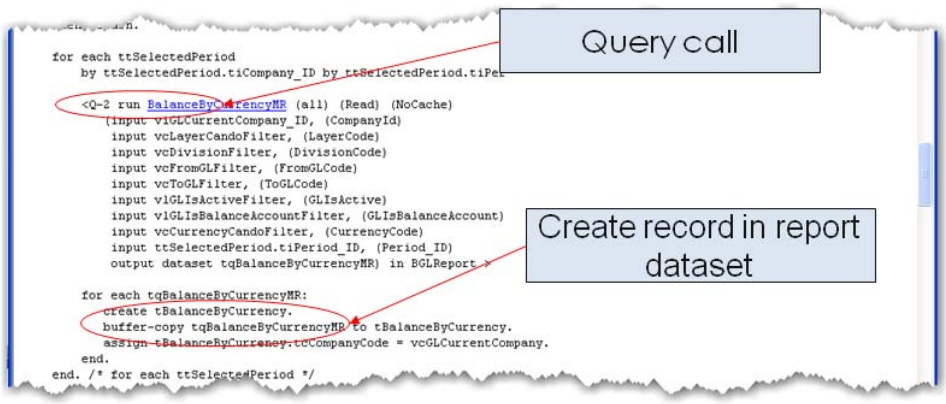


Report Framework for Financials Reports 11

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

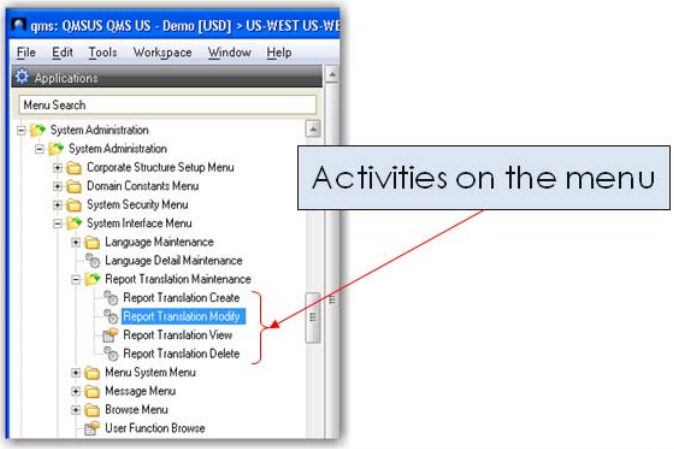
Report Framework for Financials Reports 12

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:



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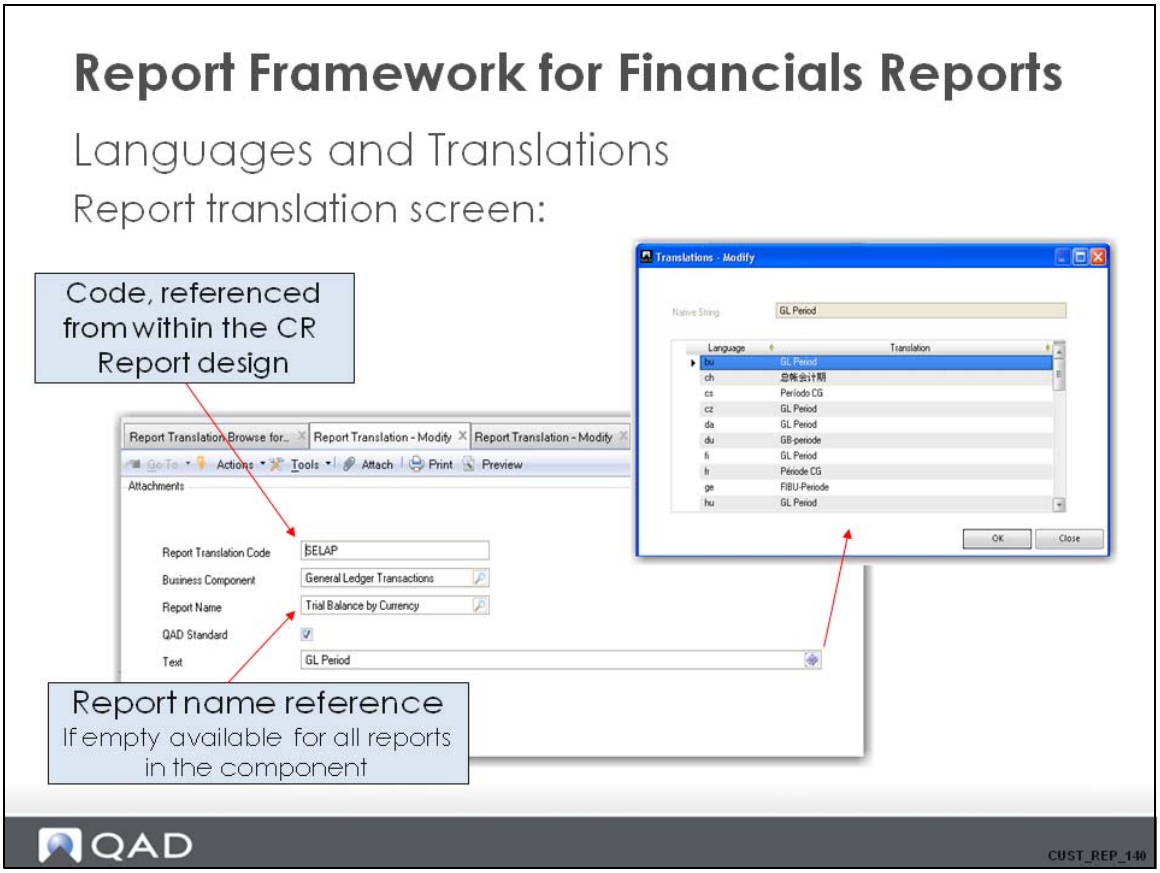
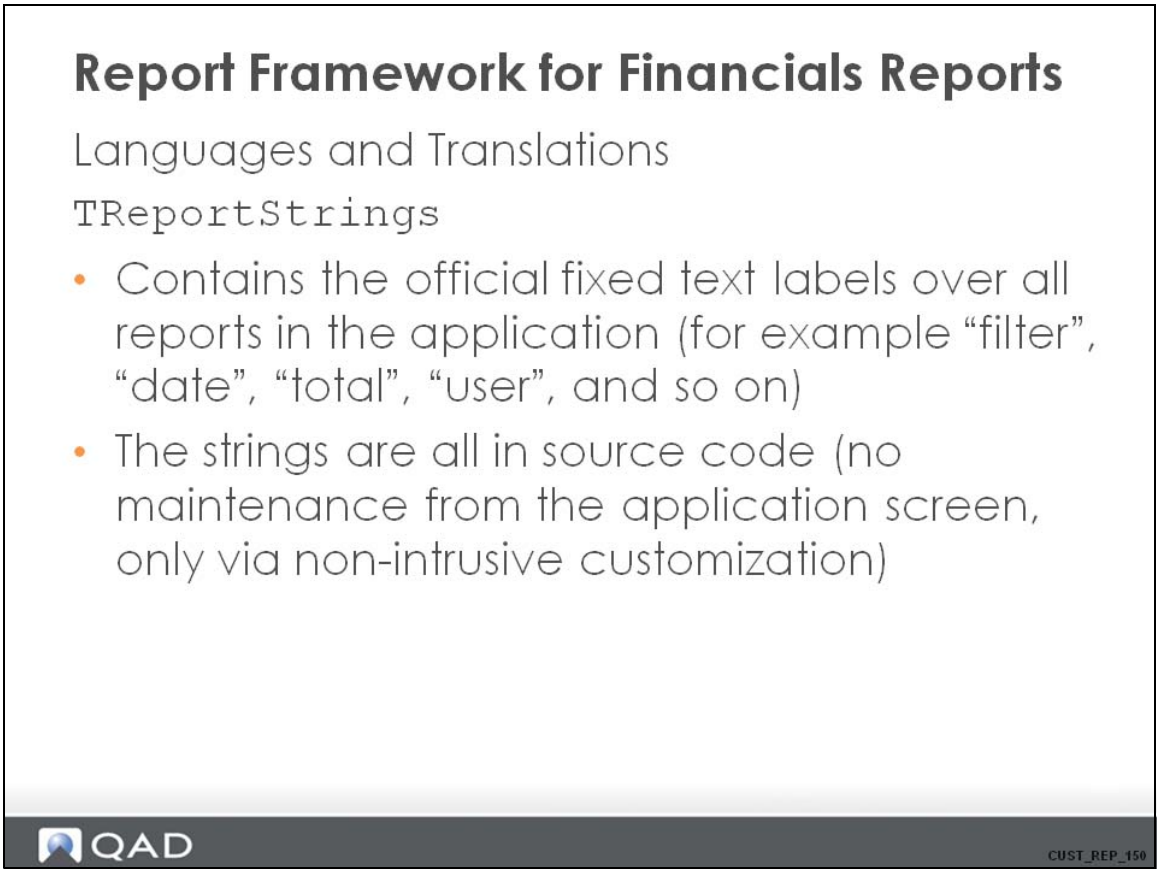
Report Framework for Financials Reports 13



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 are 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#
```

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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

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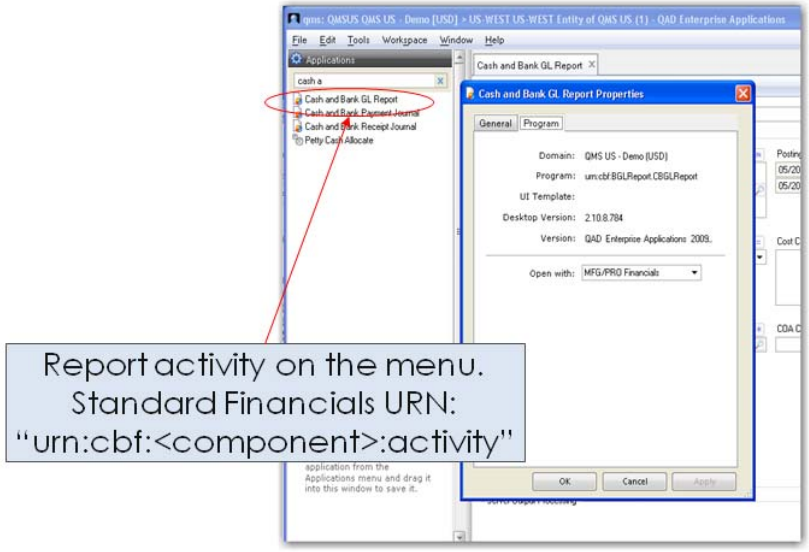
Report Framework for Financials Reports 17

Report Framework for Financials Reports

Report execution, report activities



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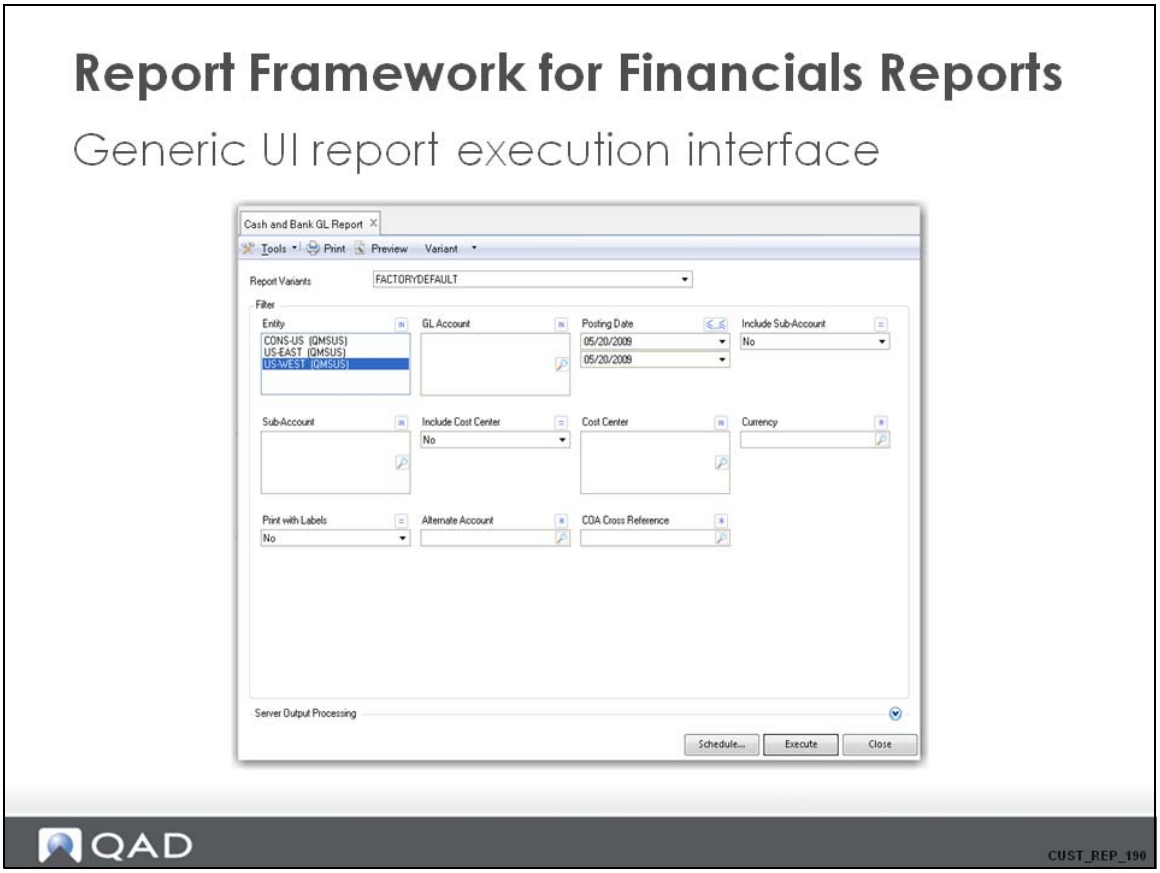
Report Framework for Financials Reports 18

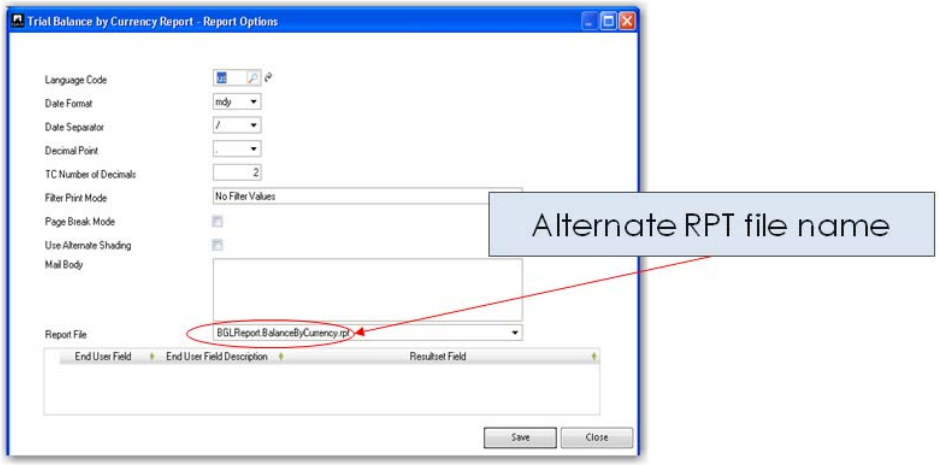


Report Framework for Financials Reports 19

Report Framework for Financials Reports

Generic UI report execution interface

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



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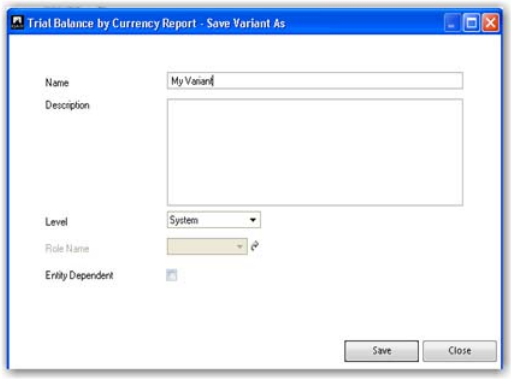
Report Framework for Financials Reports 20

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



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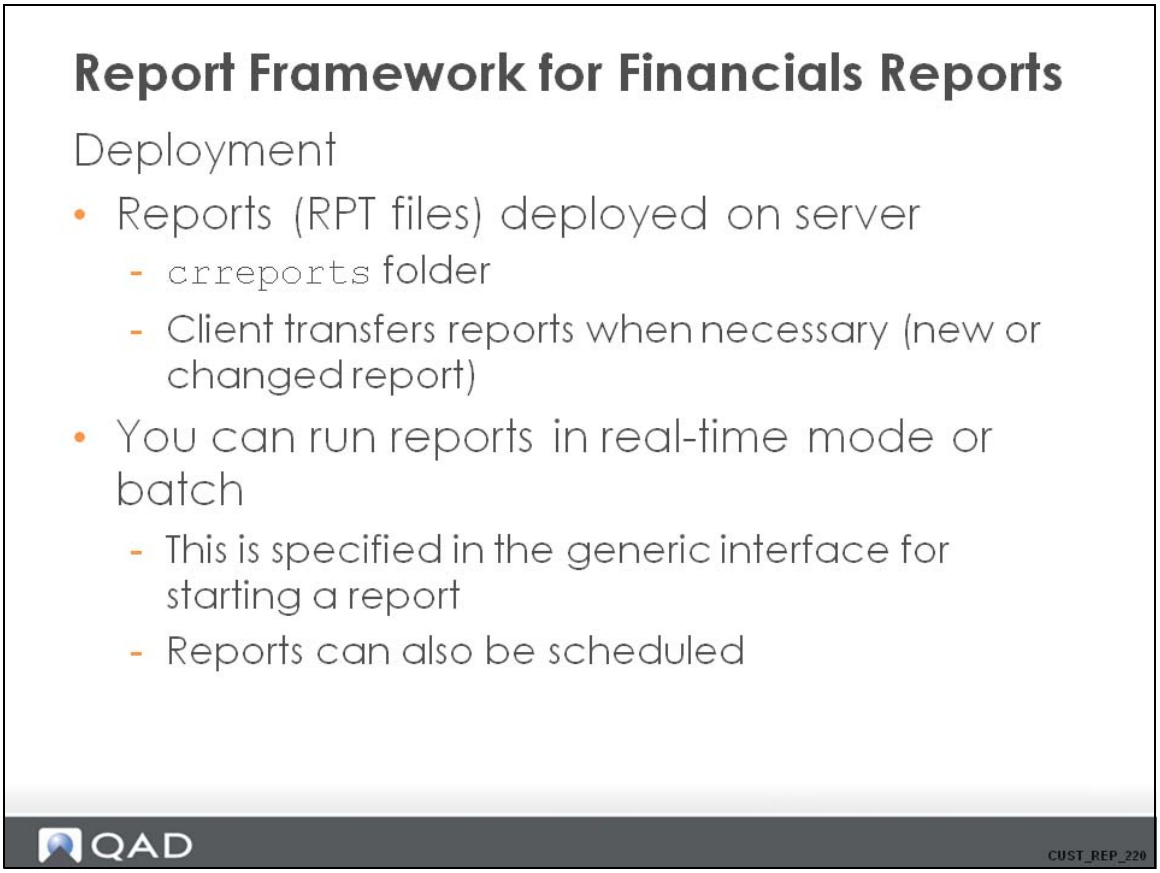
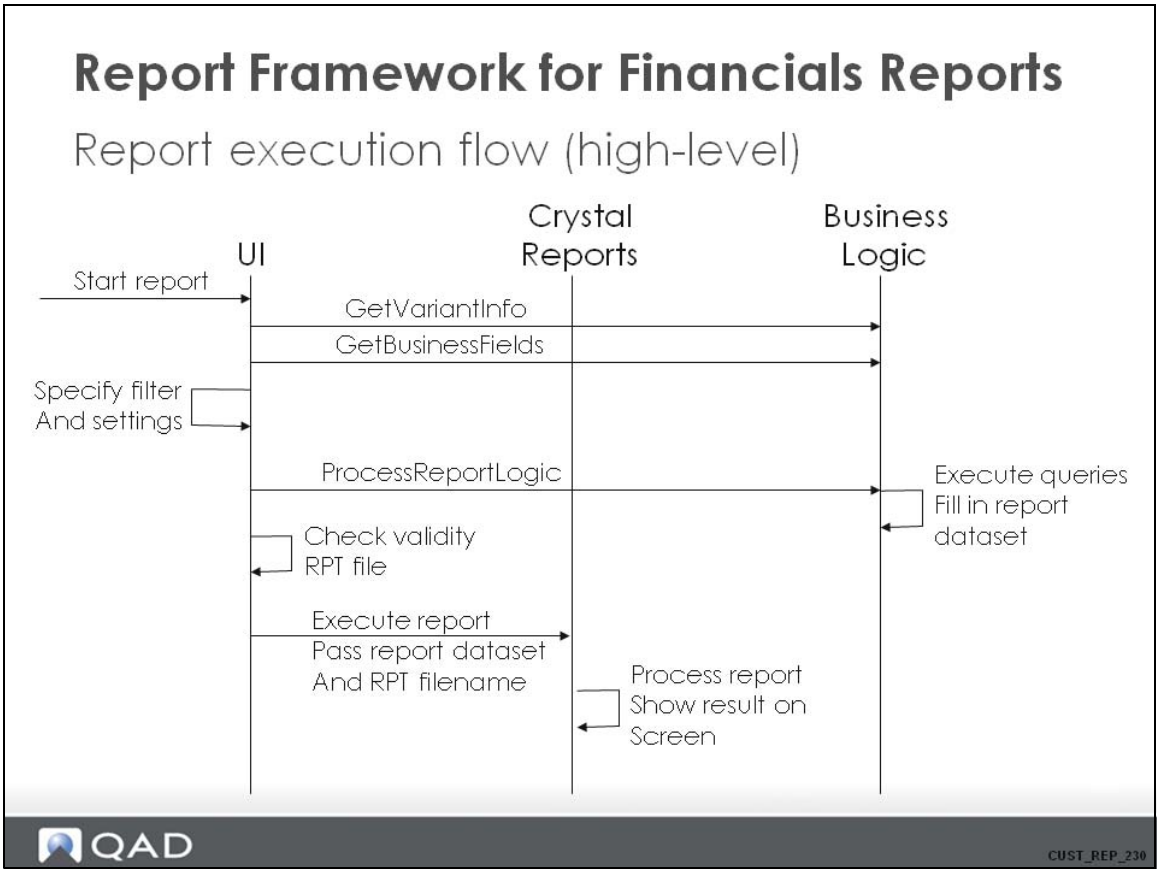
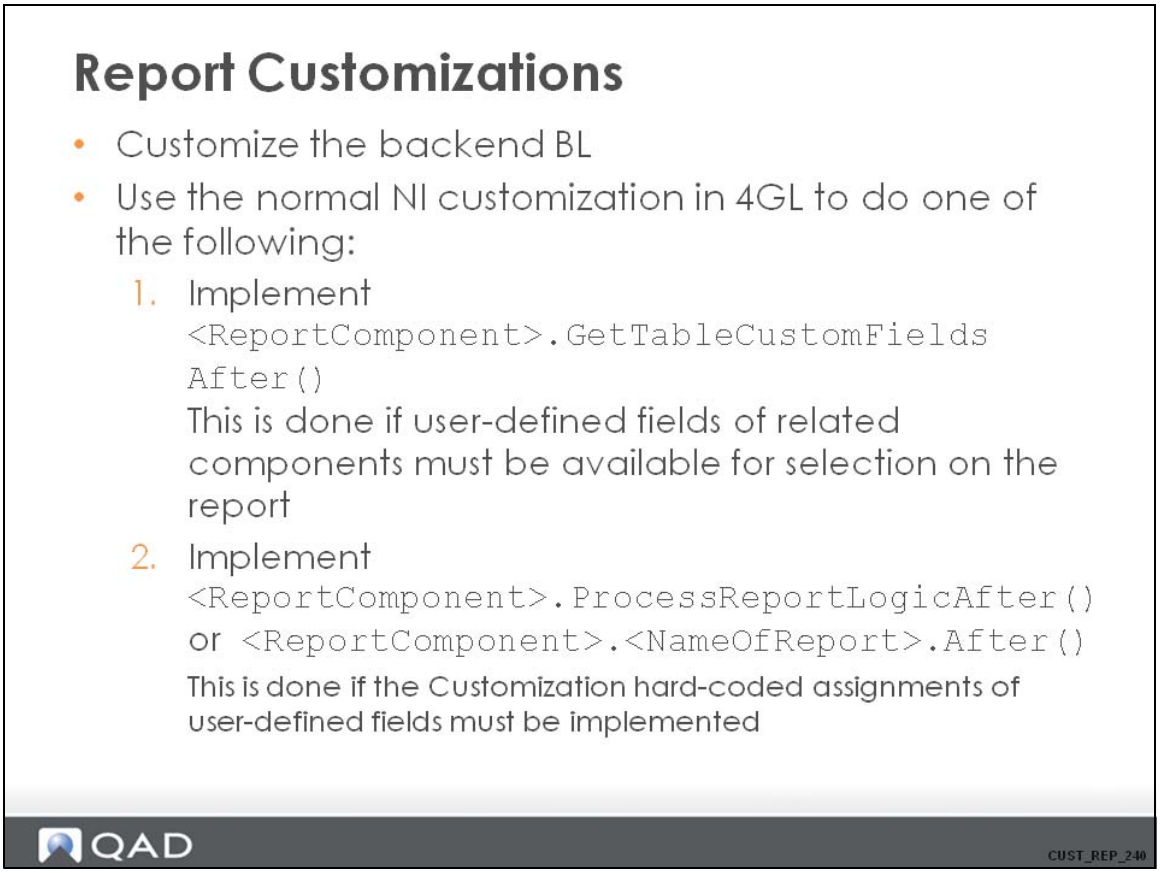
Report Framework for Financials Reports 21



Report Framework for Financials Reports 22



Report Customizations

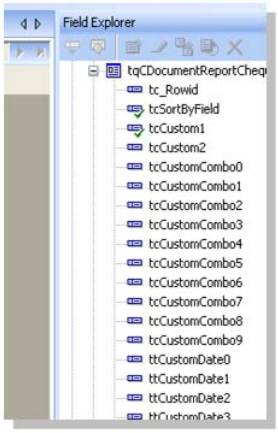


Report Customization - User-Defined Fields

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



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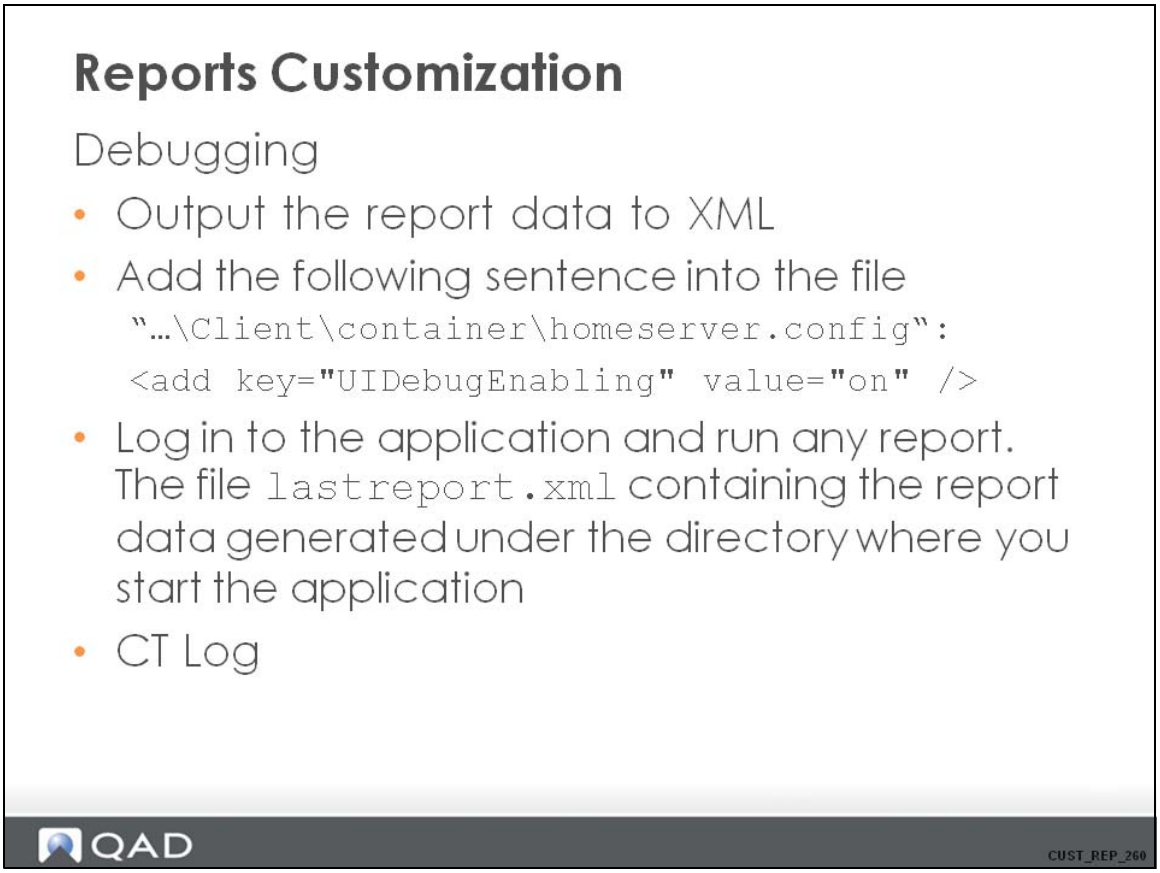
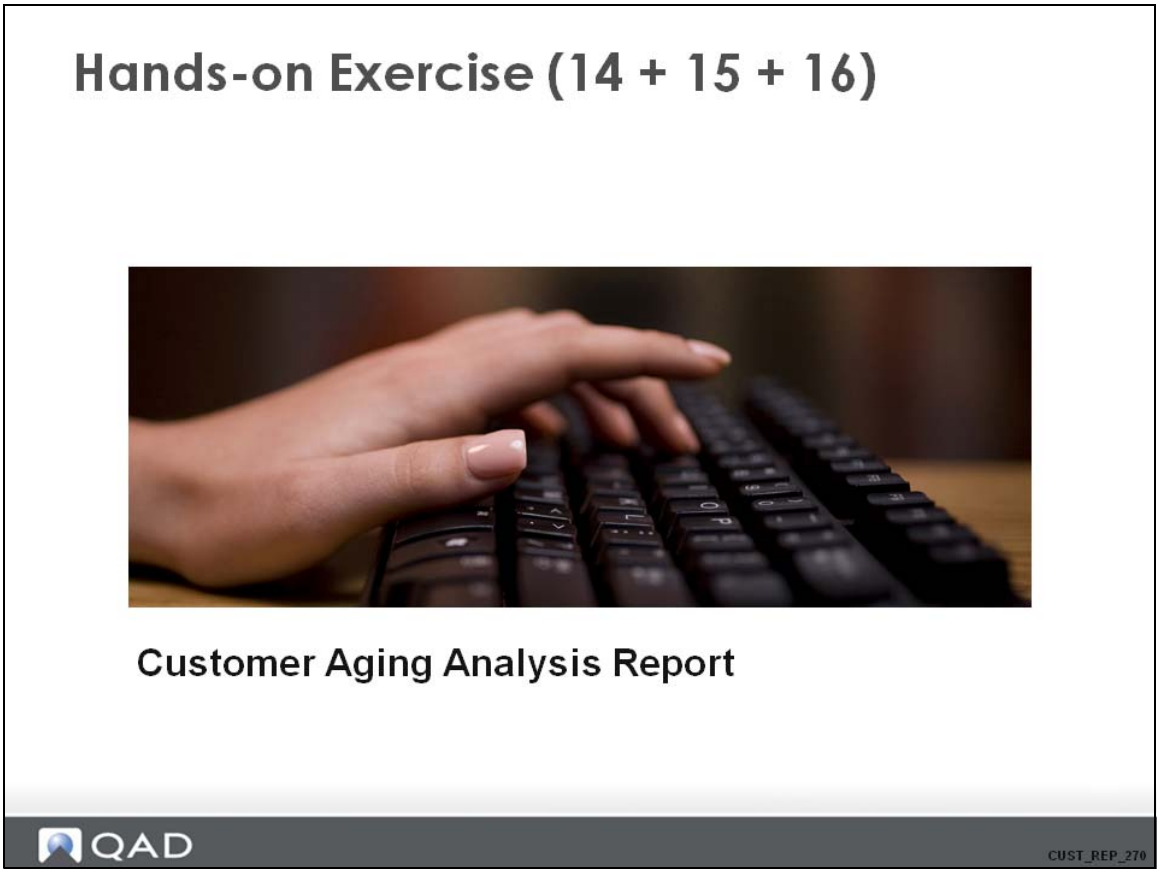
Report Customization - Debugging



Hands-on Exercise (14 + 15 + 16)

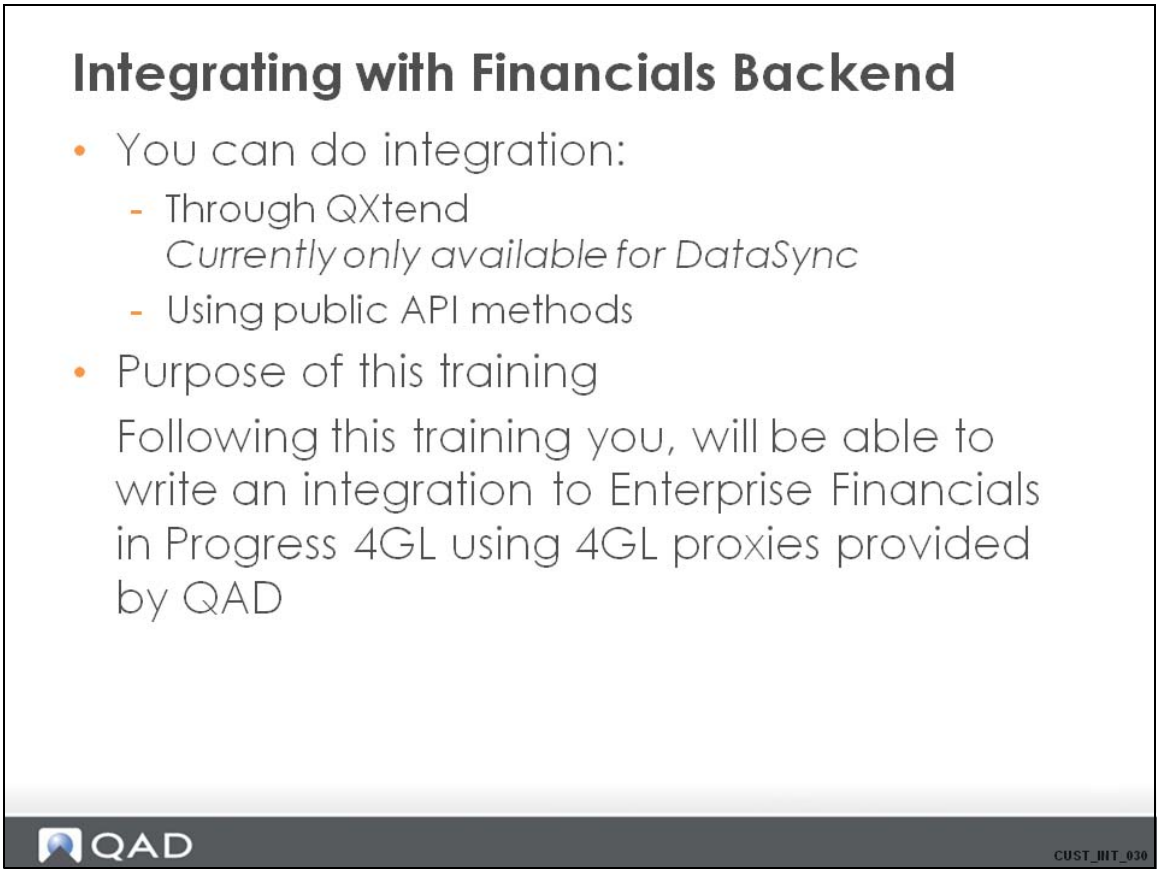


Chapter 6

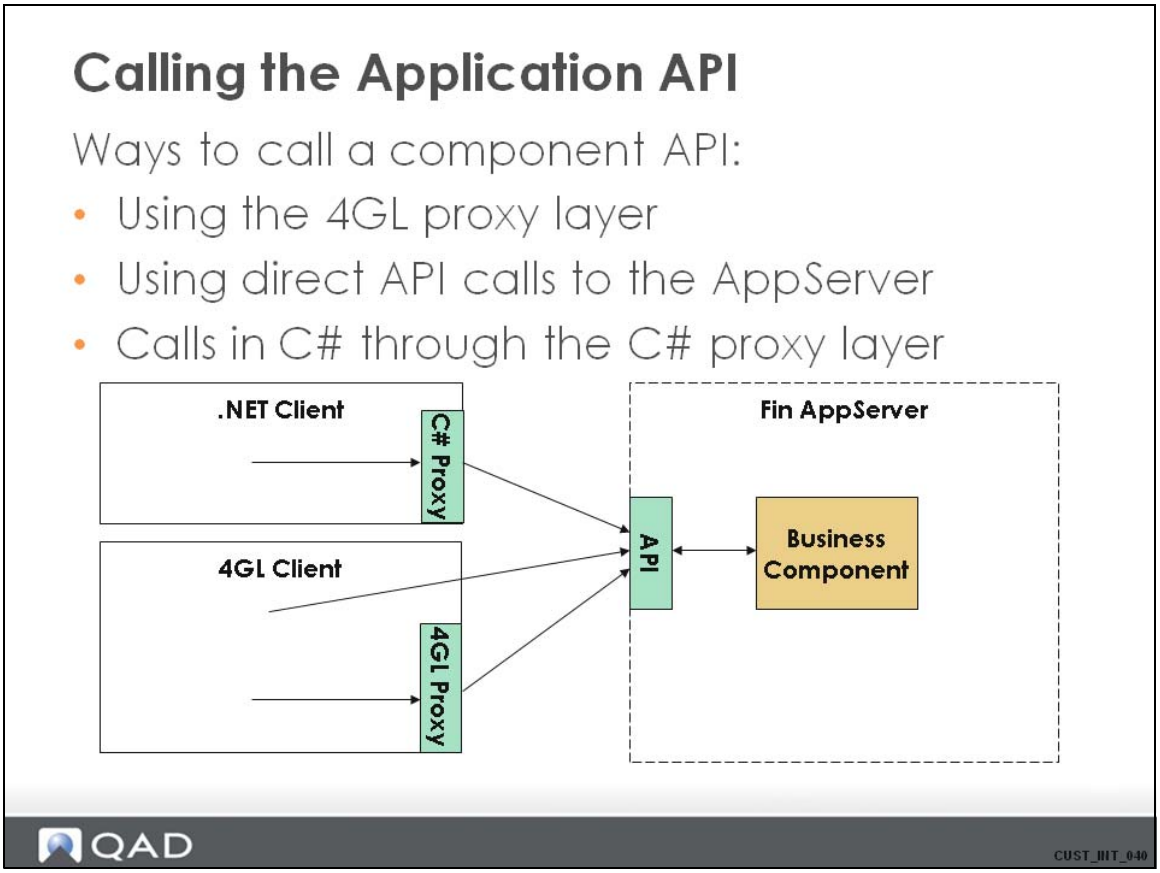
Integration with Enterprise Financials: Backend

Integration with Enterprise Financials: Backend

Integrating with Financials Backend



Calling the Application API 1

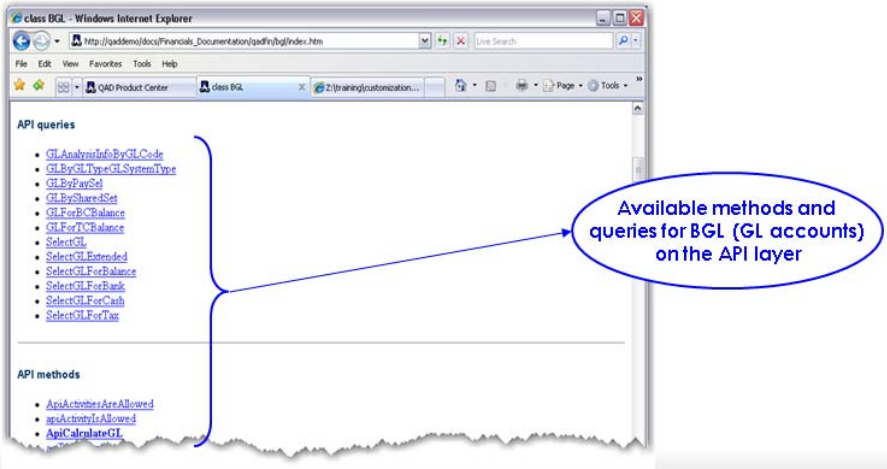


Calling the Application API 2

Calling the Application API

Available API methods:

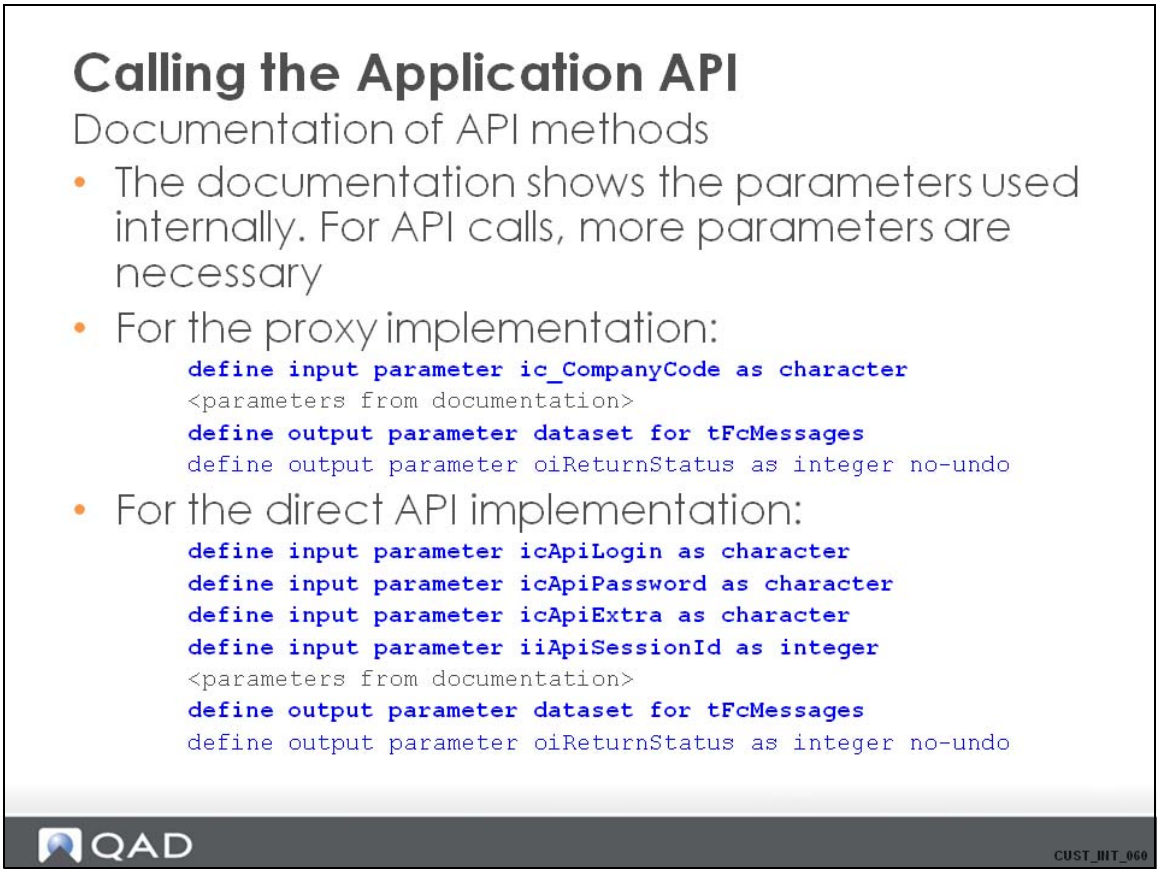
- Use HTML documentation
- Look for API queries and methods on the main page of a business component



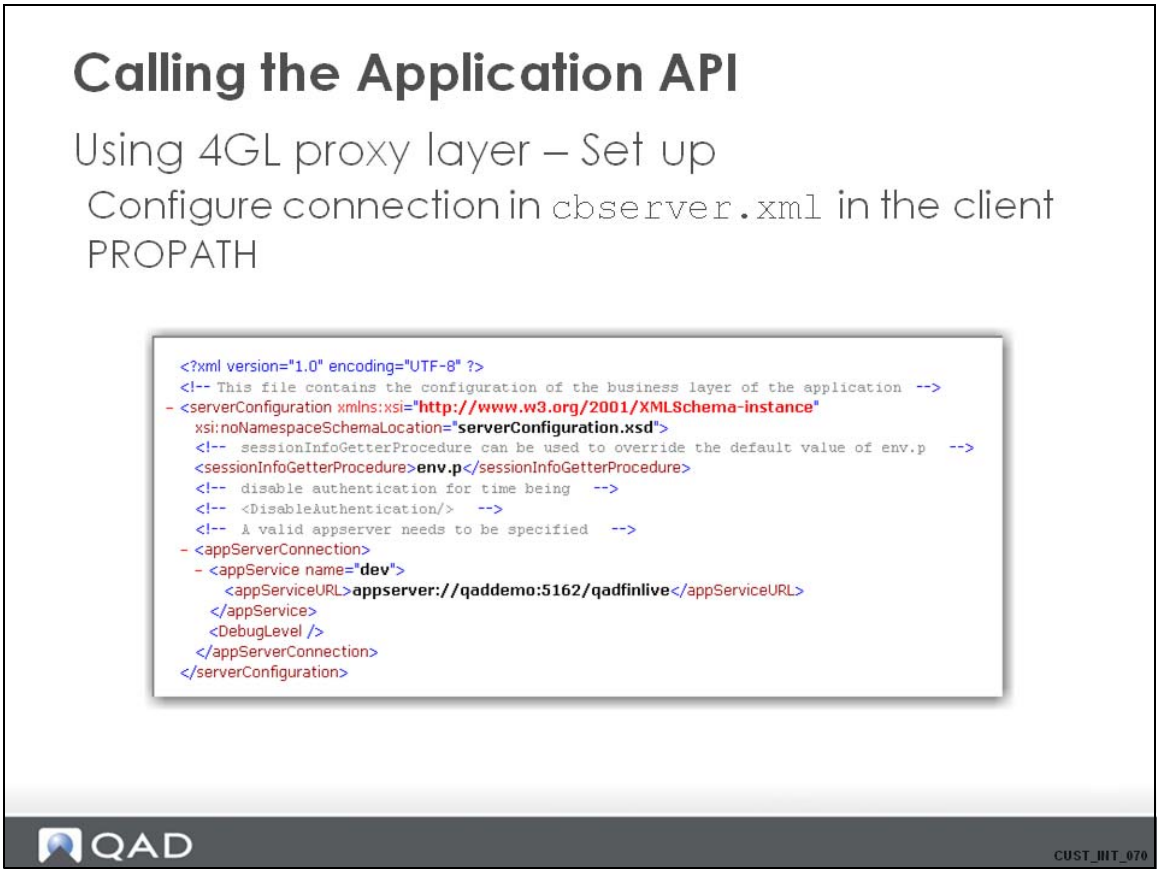
QAD

CUST_INT_050

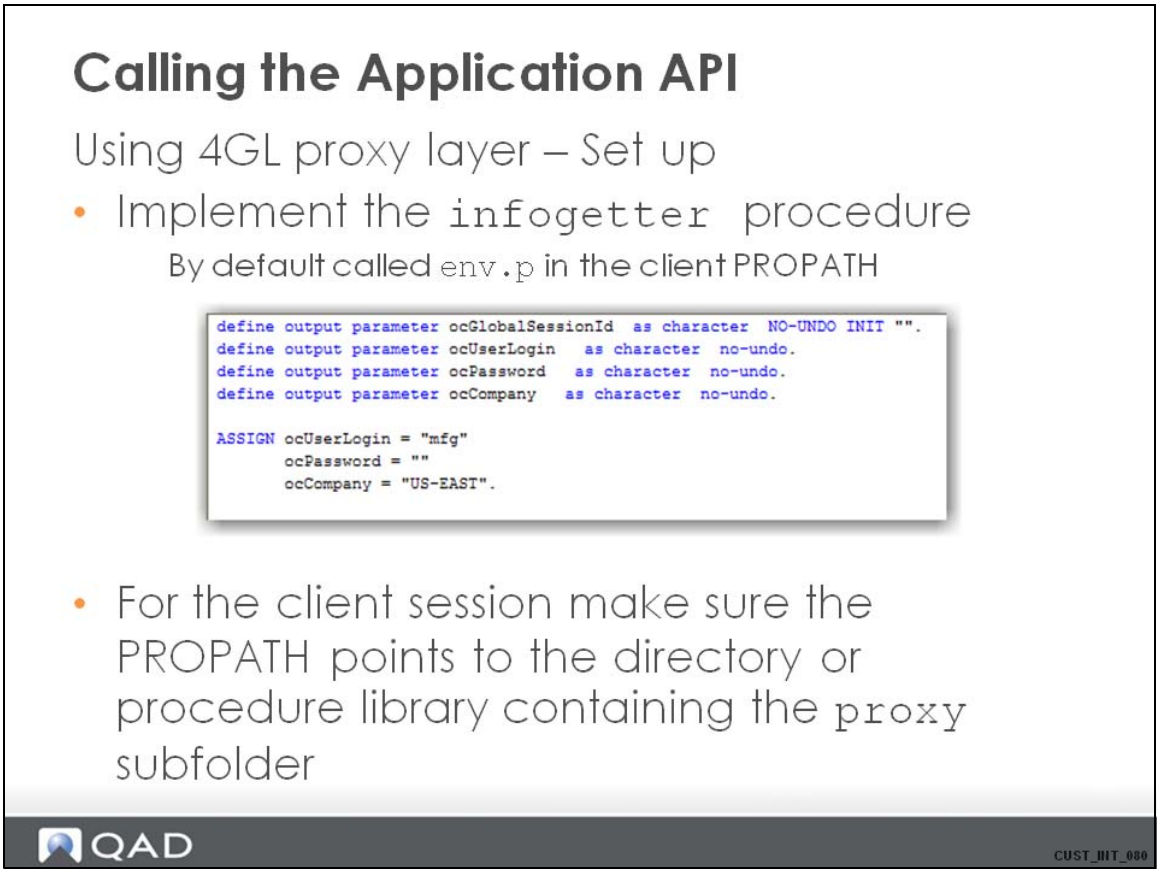
Calling the Application API 3



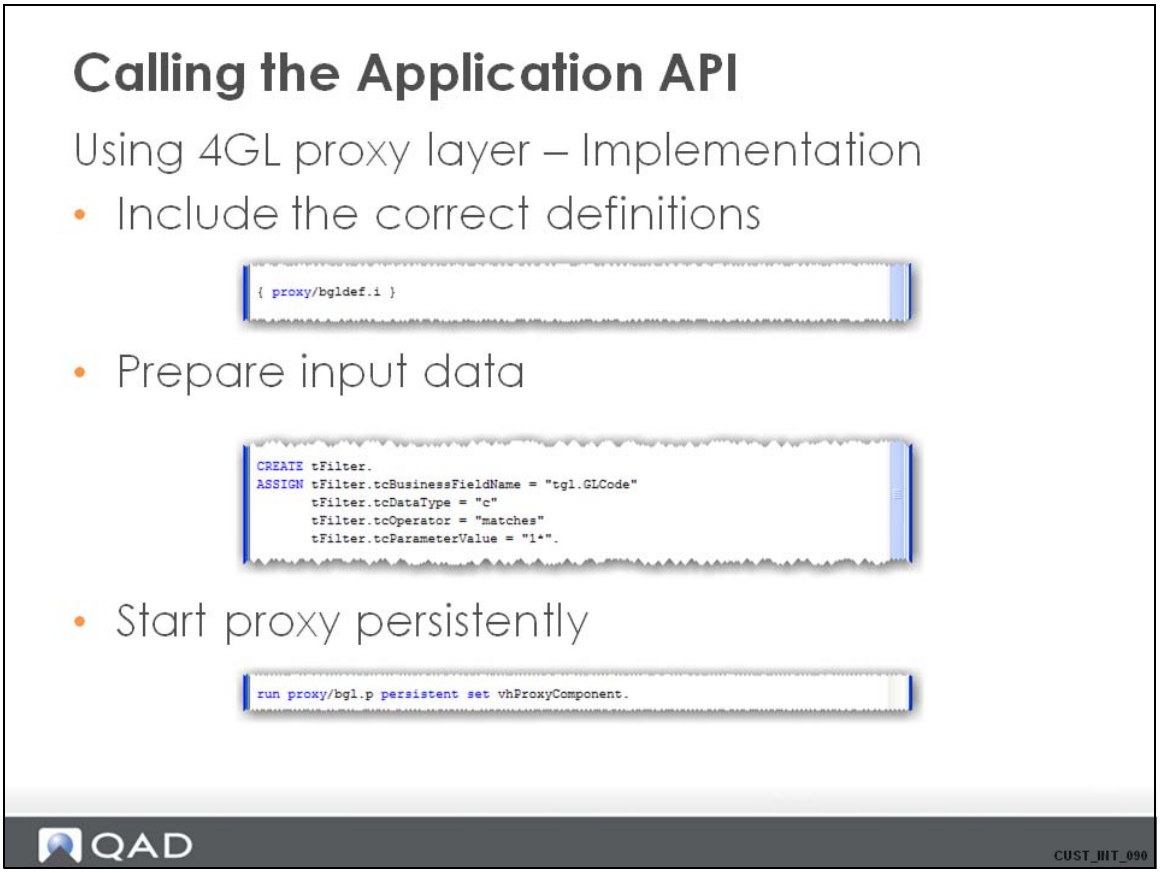
Calling the Application API 4



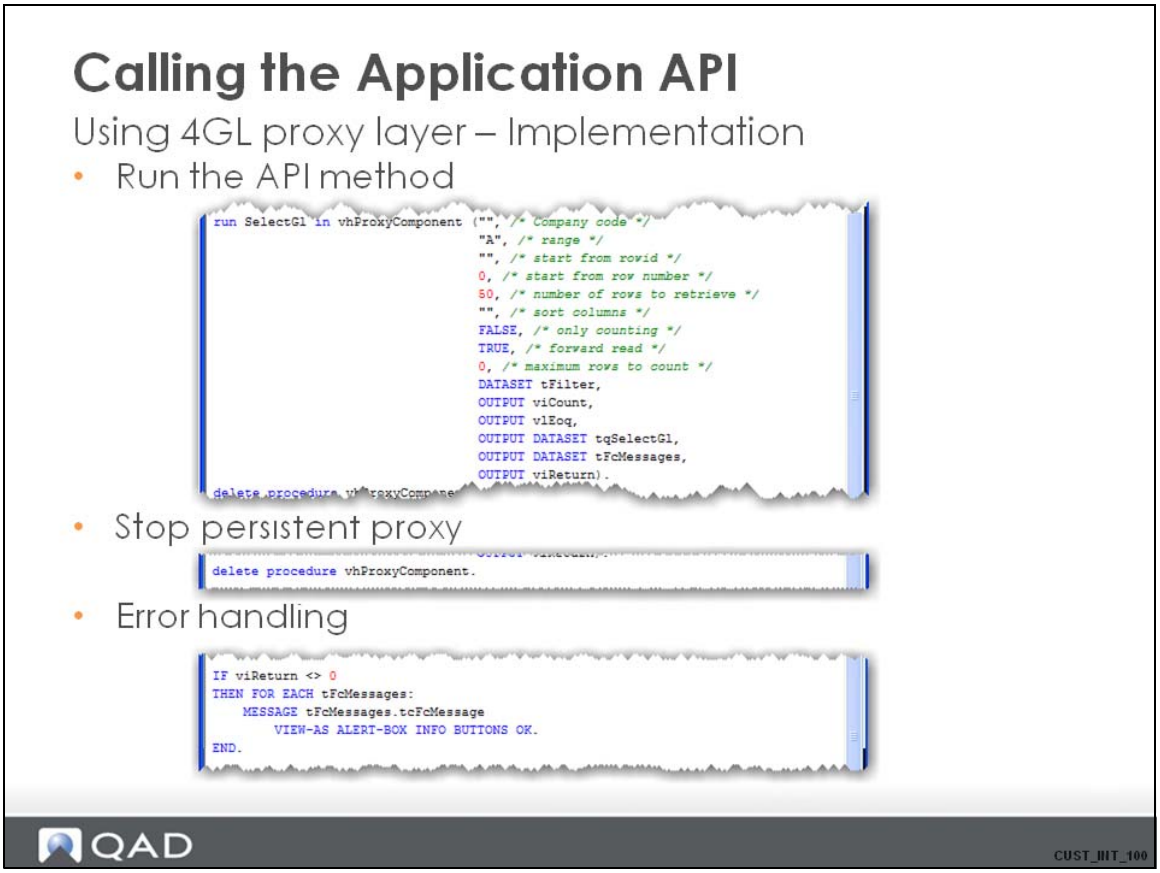
Calling the Application API 5



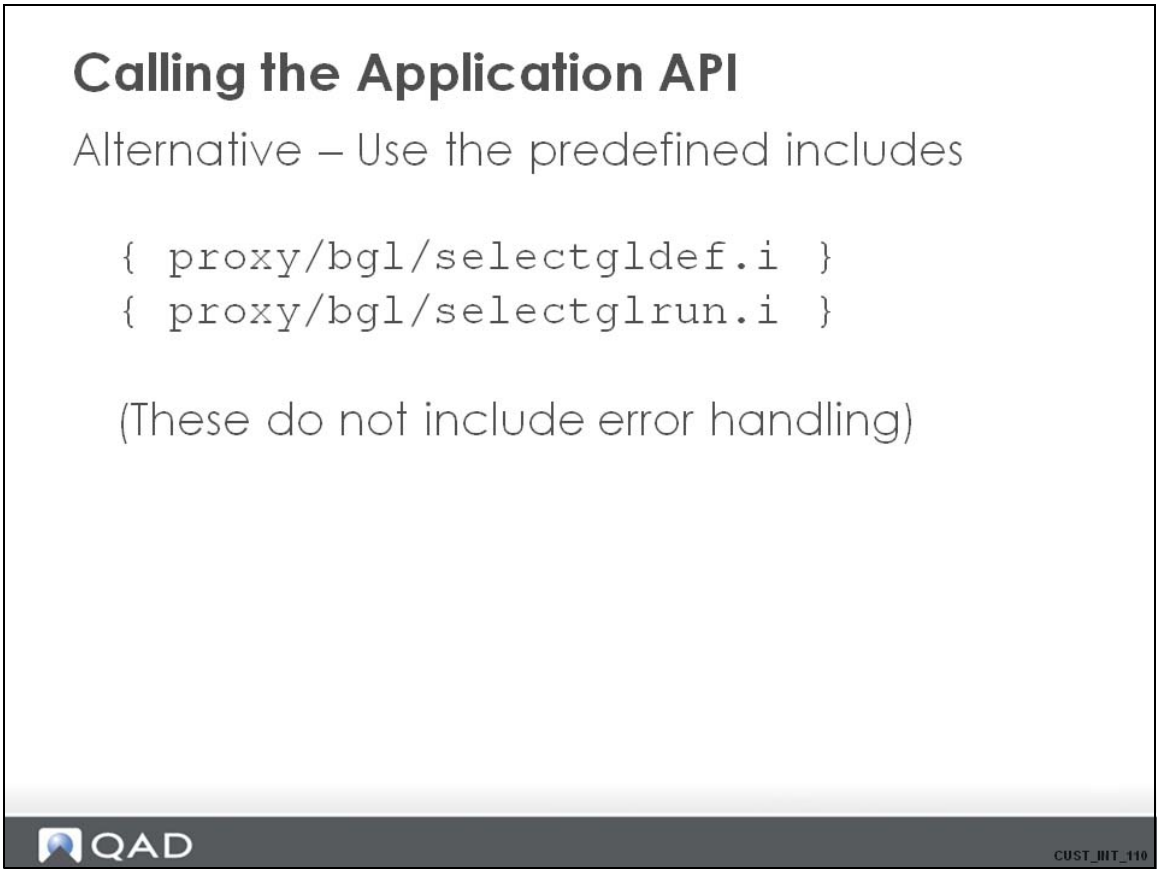
Calling the Application API 6



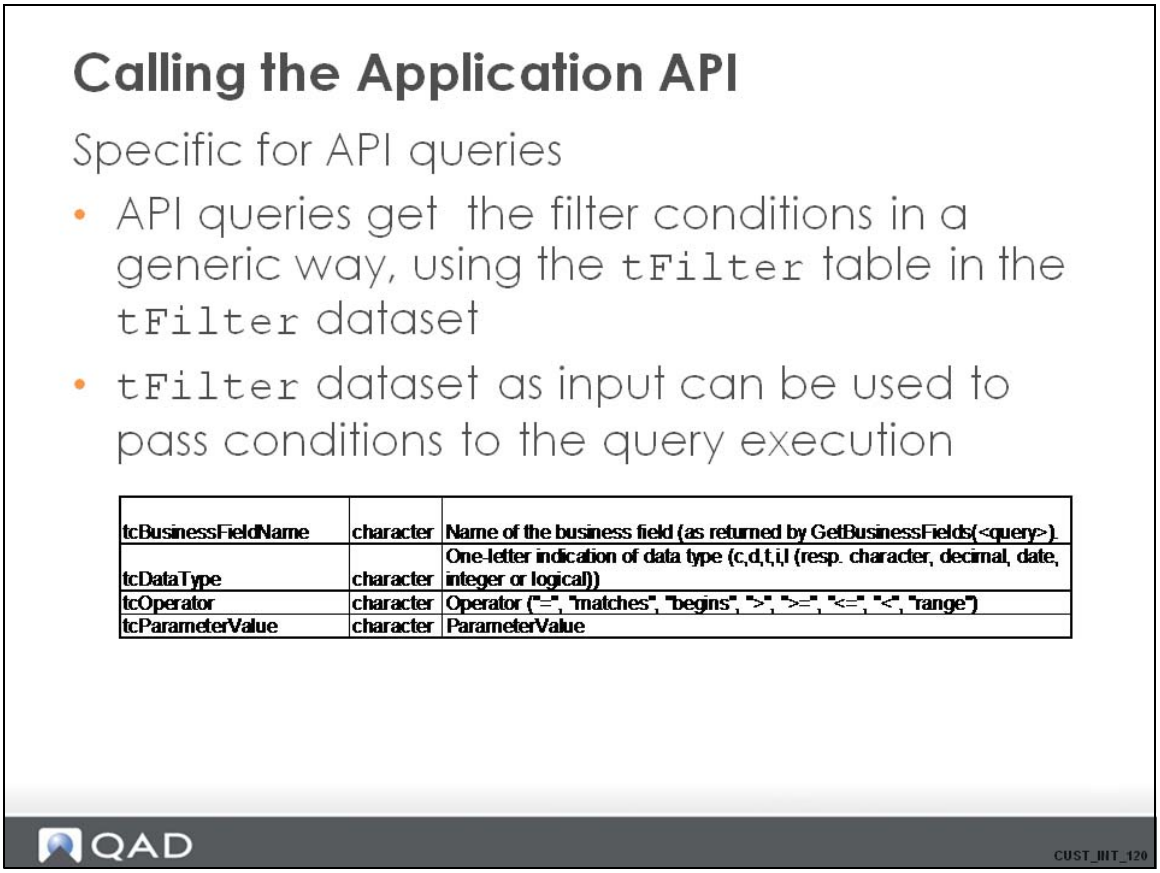
Calling the Application API 7



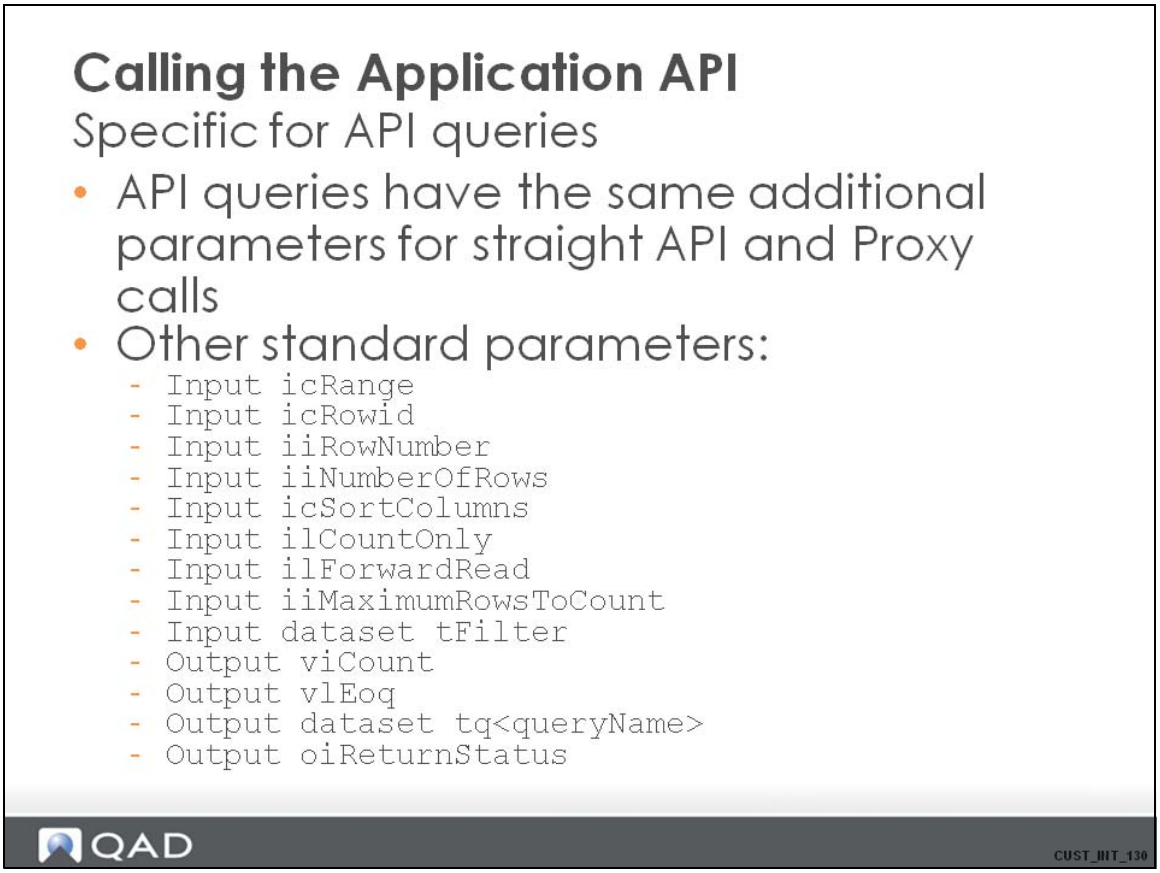
Calling the Application API 8



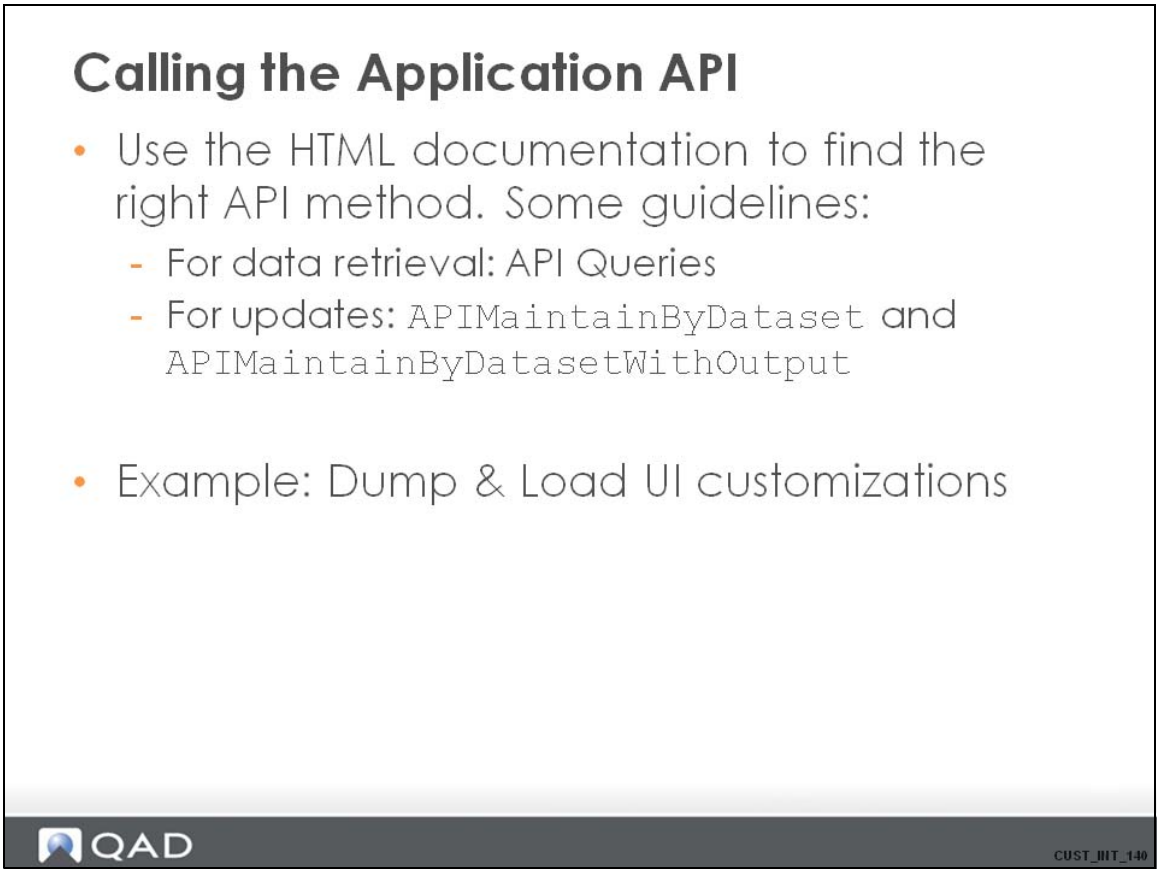
Calling the Application API 9



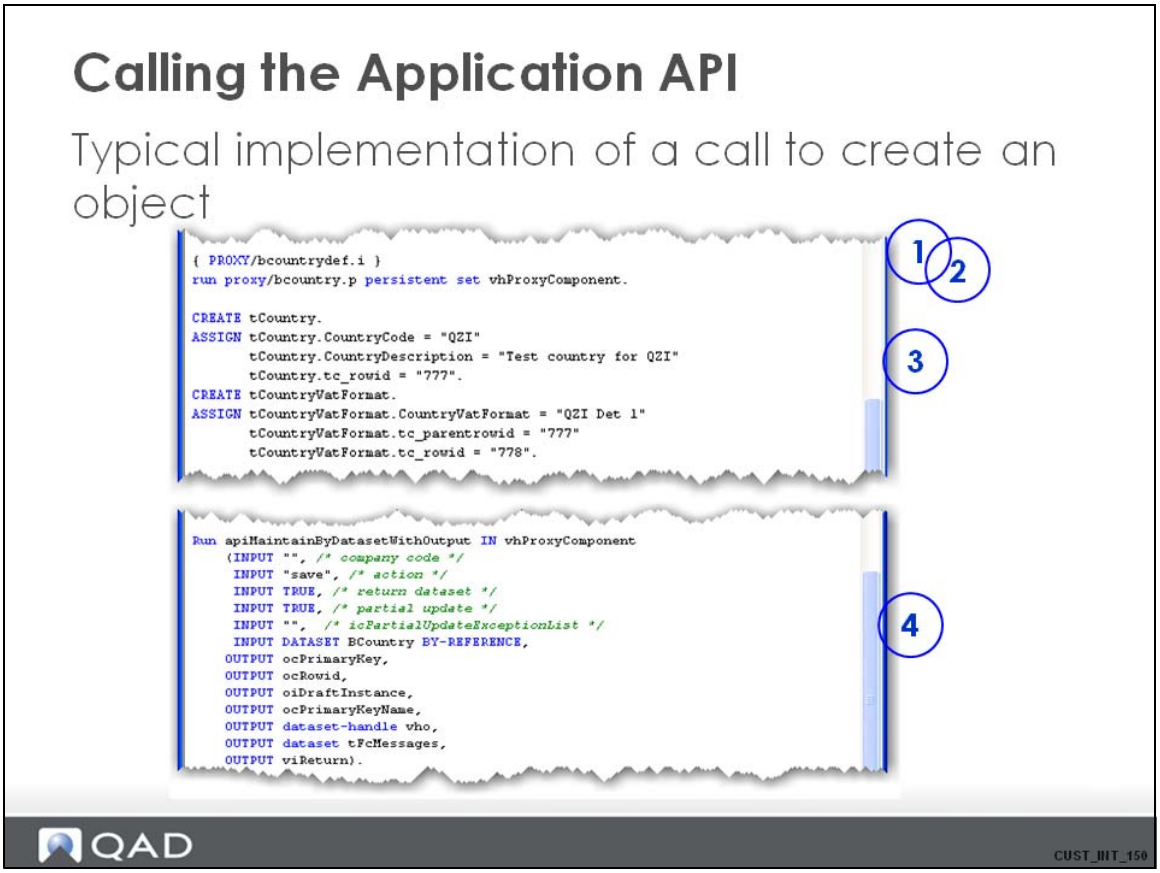
Calling the Application API 10



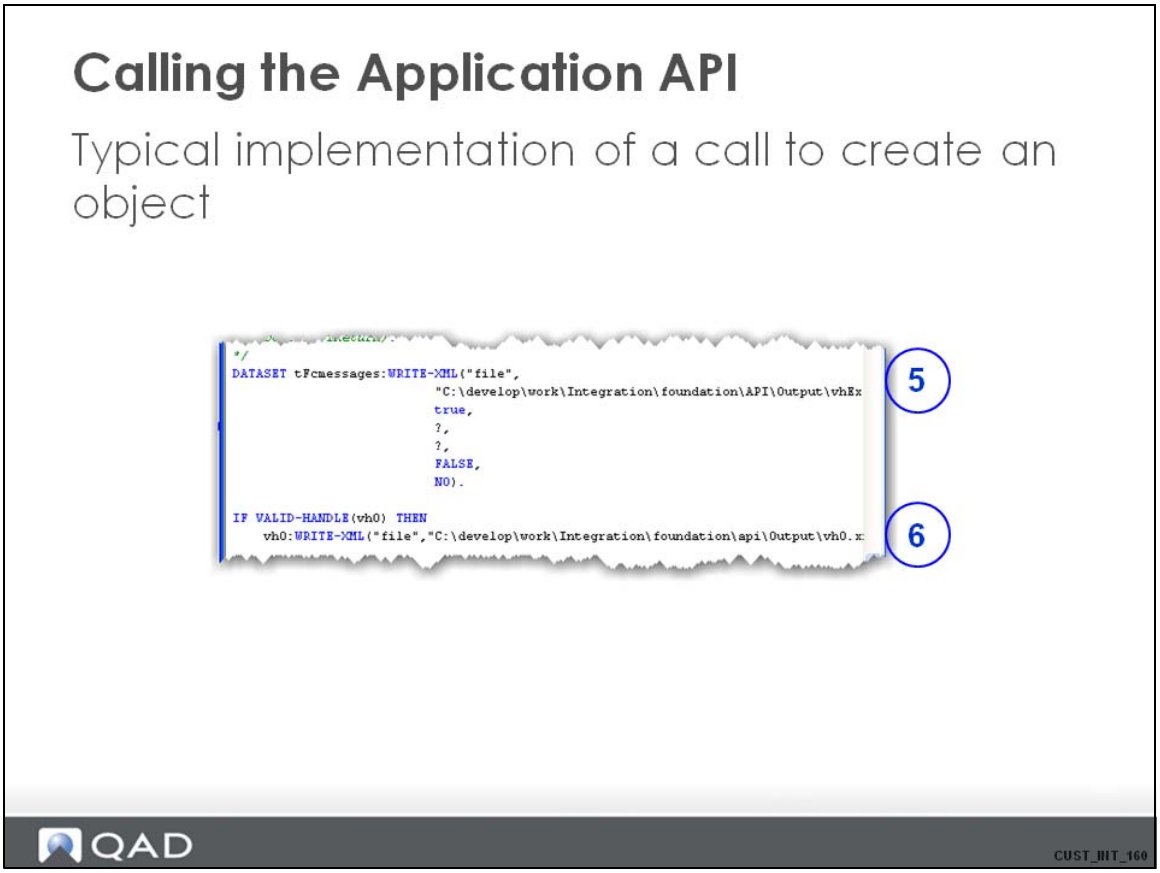
Calling the Application API 11



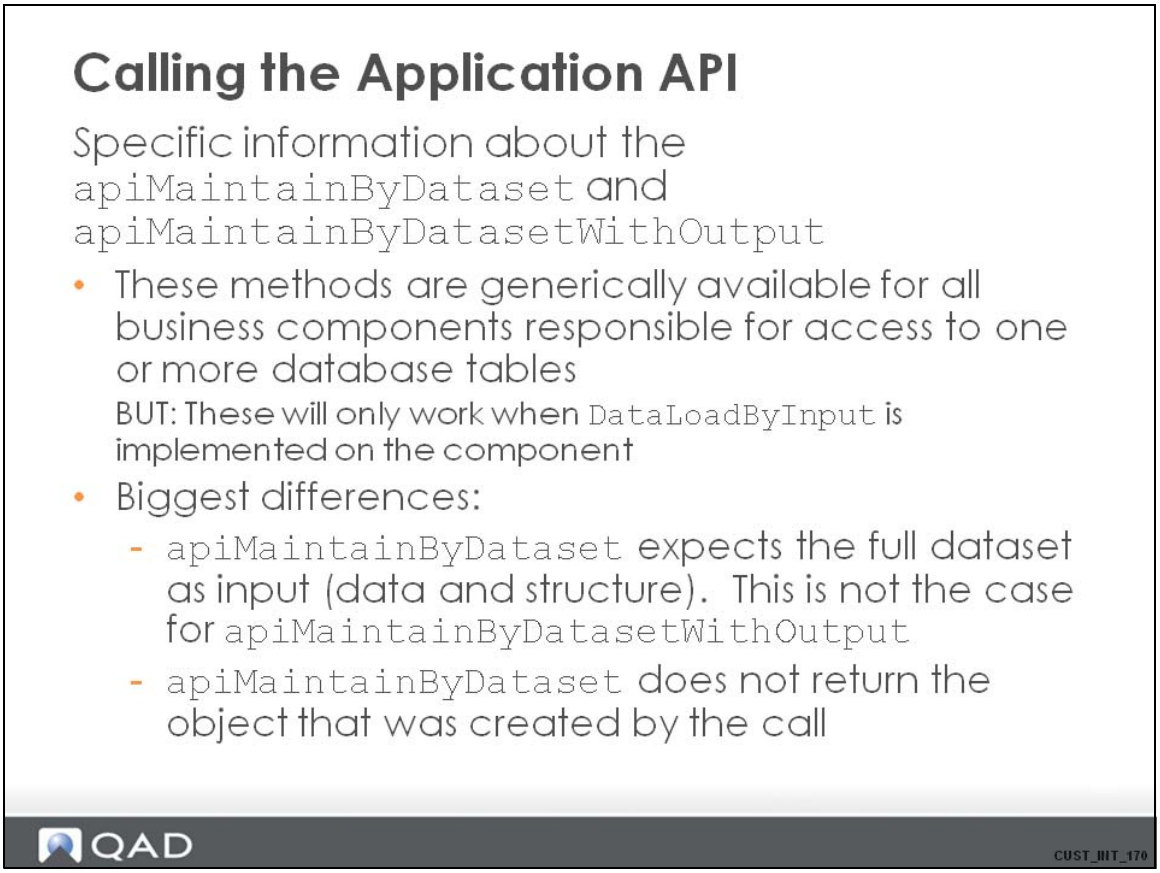
Calling the Application API 12



Calling the Application API 13



Calling the Application API 14



Calling the Application API 15