Economic Census Metadata and Instrument Design

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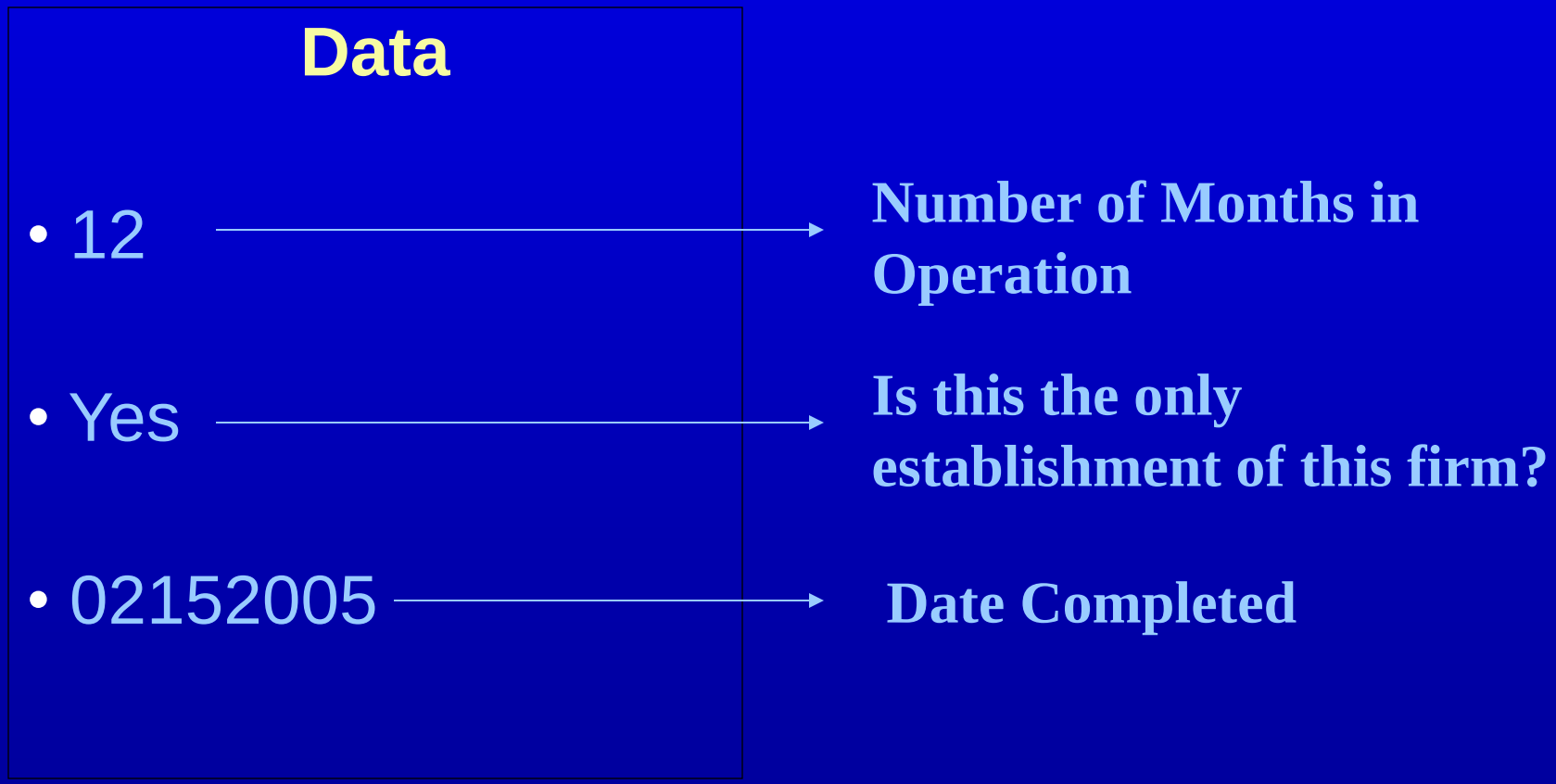
What is Metadata?



Questionnaire Design - 1997

Before Reusable Metadata:

- Each trade worked independently
- Inconsistent layout practices
- No standards for content or design
- Design of each paper questionnaire one page at a time
- A handful of custom coded computerized questionnaires

Examples of Inconsistencies from 1997 – Question Numbering

SECTOR	*EMPLOYMENT*	*PAYROLL*	*FRINGE BENEFITS*
Construction	Item 5	Item 6	Item 8
Mining Long	Item 2	Item 3A	Item 3C
Mining Short	Item 2	Item 3A	N/A
Annual Survey of Manufactures	Item 2	Item 3A	Item 3C
Manufacturing Long	Item 2	Item 3A	N/A
Manufacturing Short	Item 2	Item 3	N/A
Retail Long	Item 6	Item 5a	N/A
Retail Short	N/A	N/A	N/A
Service Long	Item 7	Item 6a	N/A
Service Short	N/A	N/A	N/A
Wholesale Long	Item 6a	Item 5a	N/A
Wholesale Short	Item 5a	Item 4a	N/A
Transportation/Utilities Long	Item 6	Item 5a	N/A
Transportation Short	N/A	N/A	N/A
Finance Long	Item 6	Item 5a	N/A
Finance Short	N/A	N/A	N/A
Auxiliaries	Item 7	Item 6	N/A

Questionnaire Design - 2002

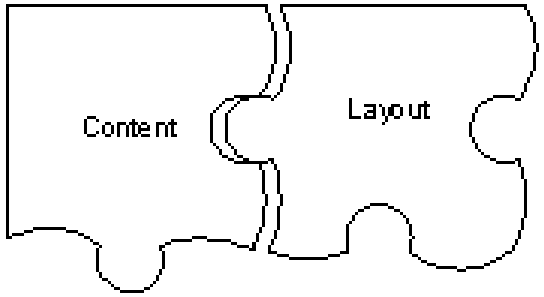
After Reusable Metadata:

- Each trade worked only trade-specific questions
- Established standards for questions and layouts
- Design of each question once, allowing for re-use across all questionnaires
- Introduced a generalized system to offer computerized questionnaires to all respondents

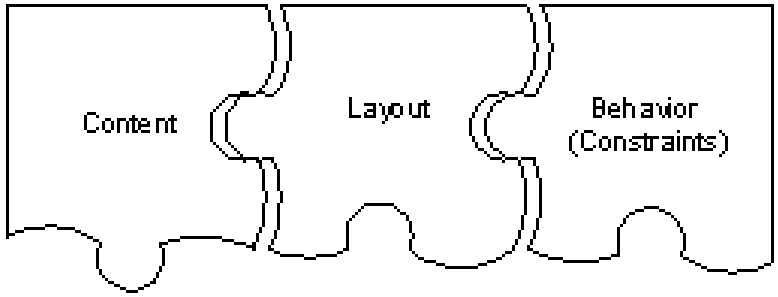
Instrument Design

Key to Reusability – segment questionnaires into Content, Layout, and Behavior

Paper Forms



Electronic Forms



Content:
- Questions
- Answers
- Related text and Instructions

Layout:
- Position (coordinates on the page)
- Font, Font size, Color
- Appearance (graphics)

Behavior or Constraints:
- Item comparisons, edits
- Permissible answer values
- Error and warning messages
- Navigation

Metadata versus Layouts

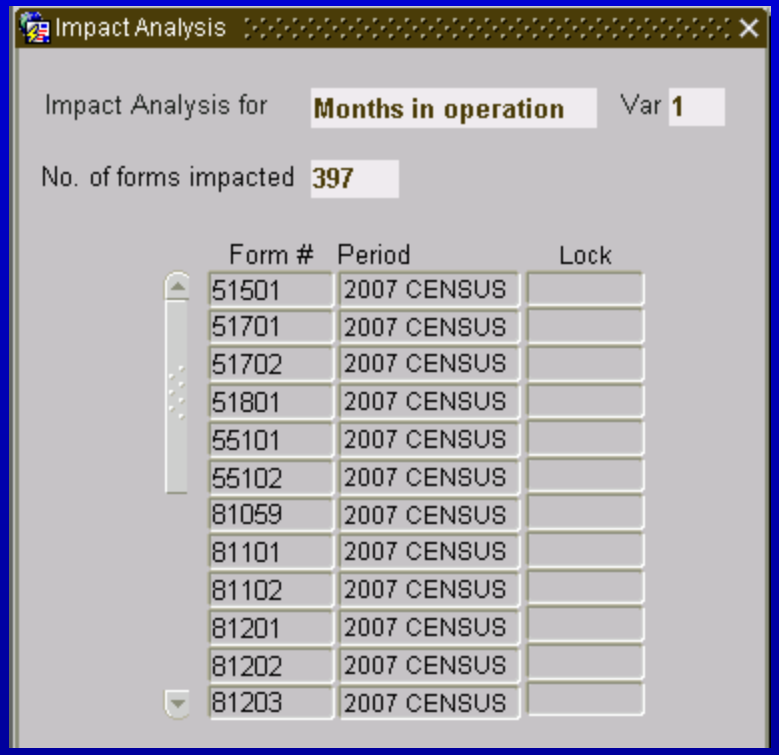
- Multiple layouts can be associated with one content (example: electronic and paper)
- Changes to content automatically flow into layout via software process
- Layout characteristics can be changed without changing content
- Many layouts can be automatically generated

Argument for Metadata

Year	*Questionnaires*	*Pages*	*Unique Questions*
1997	460	1923	~1500
2002	545	4598	555

Reusable Content - Questions

1 MONTHS IN OPERATION	Mark "X" if None	2002 Number of months
Number of months in operation during 2002 *(If none, mark "X" and go to 2.)* 0002	☐	



Reusable Content - Headers

Mark "X" if None	2002			
	$ Bil.	Mil.	Thou.	Dol.

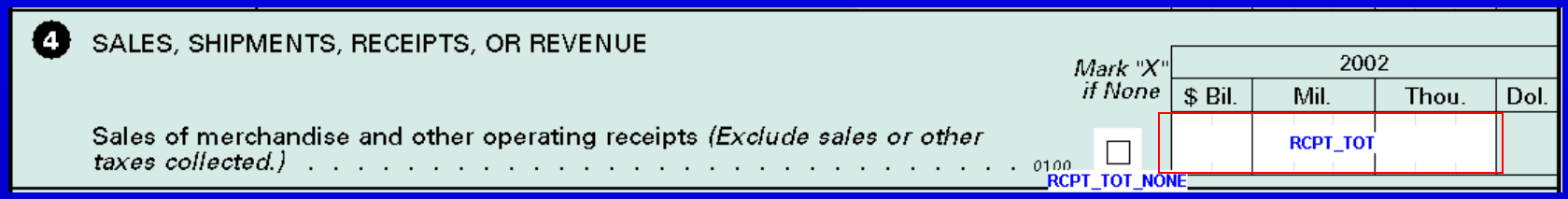
IMPACT_WINDOW

Header ID: 041

Number of Questions: 275

Form Number	Period	Category
AE-71301	2002 CENSUS	Sales
AE-71301	2007 CENSUS	Sales
AE-71301	2002 CENSUS	Dollar reporting instruction
AE-71301	2007 CENSUS	Dollar reporting instruction
AF-72101	2002 CENSUS	Sales
AF-72101	2007 CENSUS	Sales
AF-72101	2002 CENSUS	Dollar reporting instruction
AF-72101	2007 CENSUS	Dollar reporting instruction
AS-56101	2002 CENSUS	Sales
AS-56101	2007 CENSUS	Sales
AS-56101	2002 CENSUS	Employment and payroll
AS-56101	2007 CENSUS	Employment and payroll
AS-56101	2002 CENSUS	Dollar reporting instruction
AS-56101	2007 CENSUS	Dollar reporting instruction
AS-56102	2002 CENSUS	Sales

Reusable Content – Data Elements



RCPT_TOT:

- Appears on nearly every Economic Census form.
- In 46 different questions

Content Type
QUESTION_STANDARD

Text Type	Text
QUEST_TITLE	SALES, SHIPMENTS, RECEIPTS, OR REVENUE

ITEMS

Text Type	Text
ITEM_WORDING	Sales of merchandise and other operating receipts
ITEM_INSTRUCTIONS	*(Exclude sales or other taxes collected.)*

Form Number	Form Name
RT-45401	$$00 ECONOMIC CENSUS
RT-44101	$$00 ECONOMIC CENSUS
AF-72101	$$00 ECONOMIC CENSUS
AF-72101	$$00 ECONOMIC CENSUS
RT-44101	$$00 ECONOMIC CENSUS
RT-45401	$$00 ECONOMIC CENSUS

Key Lessons Learned from 2002

- Improve usability and performance for external customers.
- Improve the quality of the software and develop automated testing techniques.
- Establish a change control process.
- Integrate electronic and paper questionnaires.
- Simplify the database model and tools to support only questionnaire design.
- Simplify between system communications and reduce the number of hand-offs between the systems.
- Provide Census with more access to their questionnaire content metadata.
- Streamline user role security.

Plans for 2007

- Redesign the EMR database to streamline processes and improve performance
- Provide electronic questionnaires early for advance customer outreach program
- Integrate the tools and foster contiguous development of paper and electronic questionnaires

Where to start?
- Requirement Identification

Sources

- Lessons learned
- Deferred change requests
- Scorecards
- User release notes
- Developer configuration management notes
- Email archives
- Business plan
- Launch presentation

Evaluating and Prioritizing

- Getting team members involved and encouraging participation (elaborators and collaborators)
- User vs. Developer priority
- Establishing review process
- Planning for traceability
- Deciding where to make cuts

Evaluating and Prioritizing – cont.

UserRequirementForm	
User Requirement ID:	
Implementation Decision:	UNKNOWN
Date Approved (by SP):	
Date Created:	18 Aug 2005
Created By:	SheilaProudfoot
Initiated By:	
Assigned Elaborator:	UNKNOWN
Assigned Collaborator:	UNKNOWN
Abstract:	[a one-sentence description of the request]
Project:	?
Component:	UNKNOWN
RedesignCategory:	?
User Priority:	UNKNOWN
Developer Recommendation:	NONE YET
Keywords:	
State:	written

User Requirement

Description

[a paragraph describing the new feature]

Example Scenario

[how would this be used?]

Software Components affected by Requirement

[what part of the system is affected?]

List External and Internal Dependencies (if applicable)

[are there other requirements that either 1) this requirement depends on or 2) depend on this requirement?]

Elaboration

[discussion, clarification, etc]

Functional Requirements For SampleUserRequirement? HELP

ID	Topic	Abstract	Responsibility	Component	Keywords	Last Editor	Last Date

Number of topics: **0**

Functional Requirements and Test Cases

- Tracing user requirements to functional requirements
- Standards, status, and the review process
- Grouping requirements by software component
- Establishing intermediate milestones
- Creating test cases (verifiable conditions)

Functional Requirements and Test Cases – cont.

FunctionalRequirementForm	
Functional Requirement ID:	
Date Created:	18 Aug 2005
Created By:	SheilaProudfoot
Responsibility:	UNKNOWN
Reviewer:	UNKNOWN
Status:	In Progress
Stakeholder:	
Priority:	high
Abstract:	
Purpose:	
Project:	?
Integration Point:	?
Component:	UNKNOWN
RedesignCategory:	FunctionalRequirement
Keywords:	
UserRequirements:	

Description

[Goal to be acheived by use case]

Actors

[List of actors involved in use case]

Assumptions/Preconditions

[Conditions that must be true for use case to terminate successfully]

Expected Inputs:

Optional

Process/Steps

[Interactions between actors and system that are necessary to acheive goal]

Variations:

[Any variations in the steps of a use case]

Verifiable Conditions/Expected Outputs:

[Condition that can be tested after function is executed]

Other functions:

[List of non-functional requirements that the use case must meet]

Issues:

[List of issues that remain to be resolved]

Implementation

Detail-Level Design (DLD) documentation

DLD Inspection and Baseline

Coding and developer testing

Code reviews and inspections

Change Requests & Controls

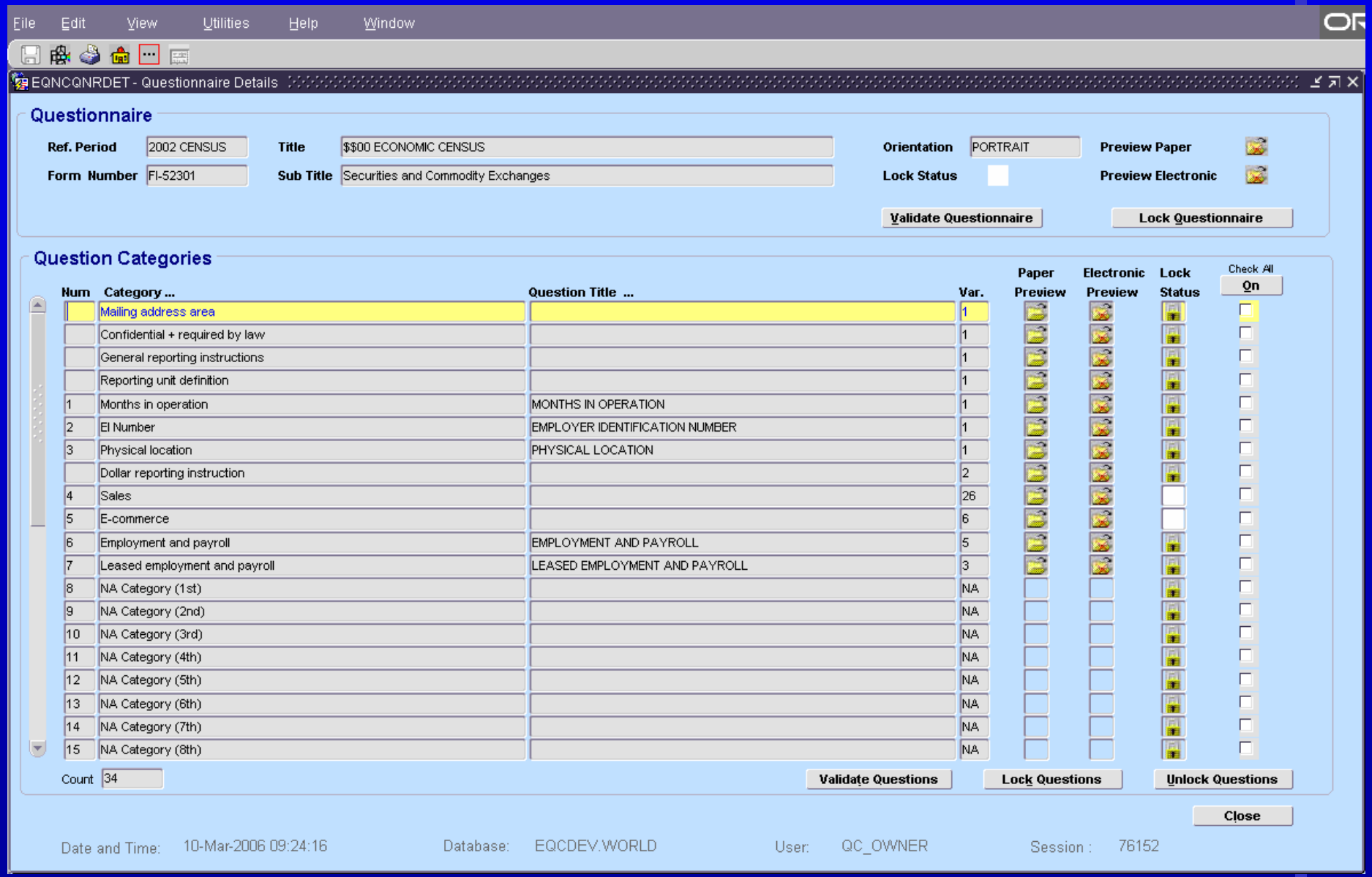
Integration checkpoints

Developer System Integration testing

Acceptance testing

Regression testing / Automated testing

High Quality results


File Edit View Utilities Help Window
EQNCQNRDET - Questionnaire Details
Questionnaire
Ref. Period 2002 CENSUS
Title $$00 ECONOMIC CENSUS
Orientation PORTRAIT
Preview Paper
Form Number FI-52301
Sub Title Securities and Commodity Exchanges
Lock Status
Preview Electronic
Validate Questionnaire
Lock Questionnaire
Question Categories
Num Category ... Question Title ... Var. Paper Preview Electronic Preview Lock Status Check All On
Mailing address area 1
Confidential + required by law 1
General reporting instructions 1
Reporting unit definition 1
1 Months in operation MONTHS IN OPERATION 1
2 EI Number EMPLOYER IDENTIFICATION NUMBER 1
3 Physical location PHYSICAL LOCATION 1
Dollar reporting instruction 2
4 Sales 26
5 E-commerce 6
6 Employment and payroll EMPLOYMENT AND PAYROLL 5
7 Leased employment and payroll LEASED EMPLOYMENT AND PAYROLL 3
8 NA Category (1st) NA
9 NA Category (2nd) NA
10 NA Category (3rd) NA
11 NA Category (4th) NA
12 NA Category (5th) NA
13 NA Category (6th) NA
14 NA Category (7th) NA
15 NA Category (8th) NA
Count 34
Validate Questions
Lock Questions
Unlock Questions
Close
Date and Time: 10-Mar-2006 09:24:16
Database: EQCDEV.WORLD
User: QC_OWNER
Session : 76152

Questions