

## Session 1

### Overview

In this session we will take an introductory look at Clarity's data model, how to create new attributes, and how to configure views with Clarity Studio. After the discussions there are some exercises.

### Data model

The Clarity data model is an amalgamation of its original products' data models, and sometimes finding your round it can be difficult. Clarity's Technical Manual is the only documentation released by CA, but it omits a lot of the tables that people would like to know more about whilst including redundant tables that used to hold data for features long since abandoned.

This section contains details of the main tables we will use in the course and provides the links between them. The complete table layouts are in Appendix A. Further details may be found in the CA Clarity Technical Manual.

The tables that hold custom attributes (ODF\_CA\_xxxx) are omitted from the diagrams to avoid cluttering them. They are discussed under Clarity Objects.

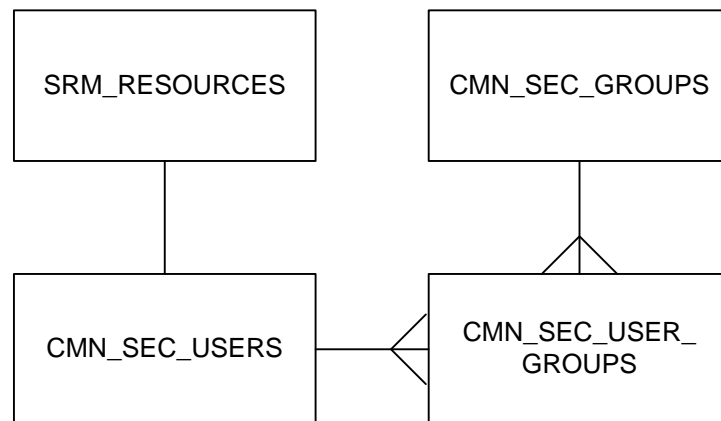
## Resources & Users

Table SRM\_RESOURCES (R) holds every resource (human, equipment, material, expense), in the system, together with resource roles.

Table CMN\_SEC\_USERS (U) holds details for every user of the system. A user is always a resource, but a resource isn't necessarily a user. There is an overlap of data between this table and SRM\_RESOURCES

Table CMN\_SEC\_GROUPS (G) holds the details of Clarity's security groups.

Table CMN\_SEC\_USER\_GROUPS (UG) holds the users that comprise each group



R.USER\_ID = U.ID

G.ID = UG.GROUP\_ID

U.ID = UG.USER\_ID

## Projects, Teams, Tasks & Assignments

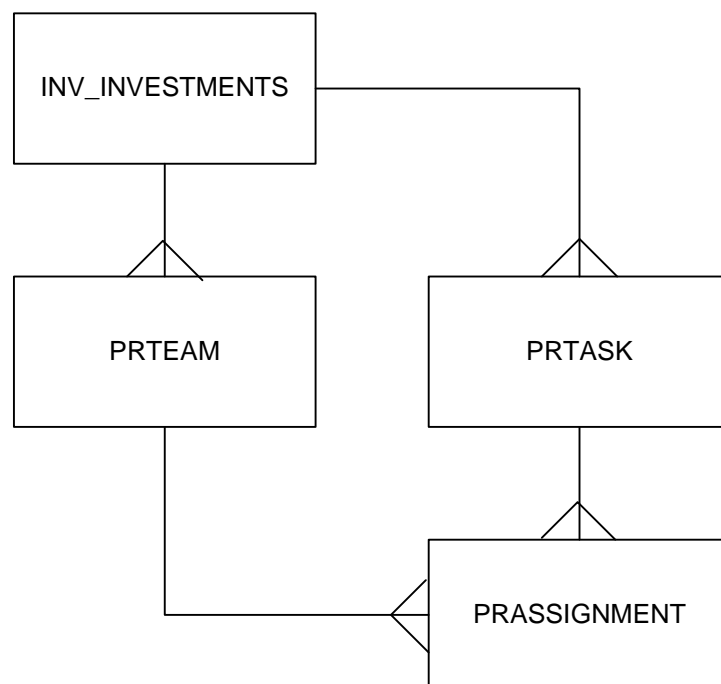
INV\_INVESTMENTS (I) holds details of every project (and also other investment types).

PRTEAM (TM) holds the resources on a project's team.

PRTASK (TK) holds the tasks for a project.

PRASSIGNMENT (A) holds the resources assigned to tasks.

SRM\_RESOURCES (R) is the same table as above.



I.ID = TM.PRPROJECTID

I.ID = TK.PRPROJECTID

A.PRTASKID = TK.PRID

A.TEAM\_ID = TM.PRID

TM.PRRESOURCEID = R.ID

A.PRRESOURCEID = R.ID

I.MANAGER\_ID = R.USER\_ID = U.ID

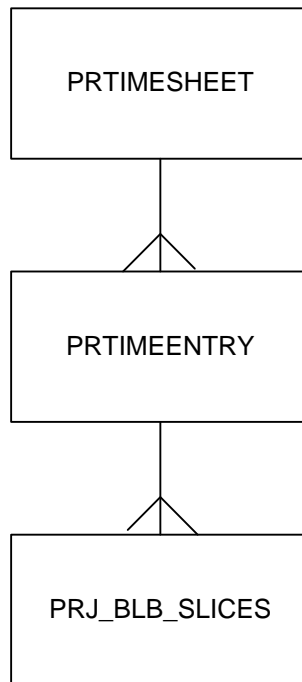
There is also a view SRM\_PROJECTS (SP) that will be encountered. This used to be a table, but was migrated to a view to ensure existing code wouldn't break when the shift to investments was made in Clarity 8.1. The link is SP.ID = I.ID (= TM.PRPROJECTID, = TK.PRPROJECTID).

### Timesheets, Time Entries, Time Slices

PRTIMESHEET (S) holds basic timesheet data

PRTIMEENTRY (E) holds the data for a timesheet row in BLOB form

PRJ\_BLB\_SLICES (B) holds data for time entries (and several other entities) in relational form



E.PRTIMESHEETID = S.PRID

B.PRJ\_OBJECT\_ID = E.PRID where slice request ID indicates a time entry

S.PPRESOURCEID = R.ID

E.PRASSIGNMENTID = A.PRID

Several tables contain BLOB (binary large object) columns to hold the so-called time curves. The format of them is not readily available and without special programming they cannot be manipulated. The time slice table PRJ\_BLB\_SLICES and its various siblings contains the slice data in relational format, and it is normally these tables that are queried to find time slice data.

## Organisational Breakdown Structure (OBS)

Clarity represents the hierarchy of an organisation using OBSs. These are ad-hoc tree structures with as many nodes and branches as are required to define the organisation's structure. Several OBSs can be defined, though for performance reasons CA recommend a maximum of 5 for use with the datamart.

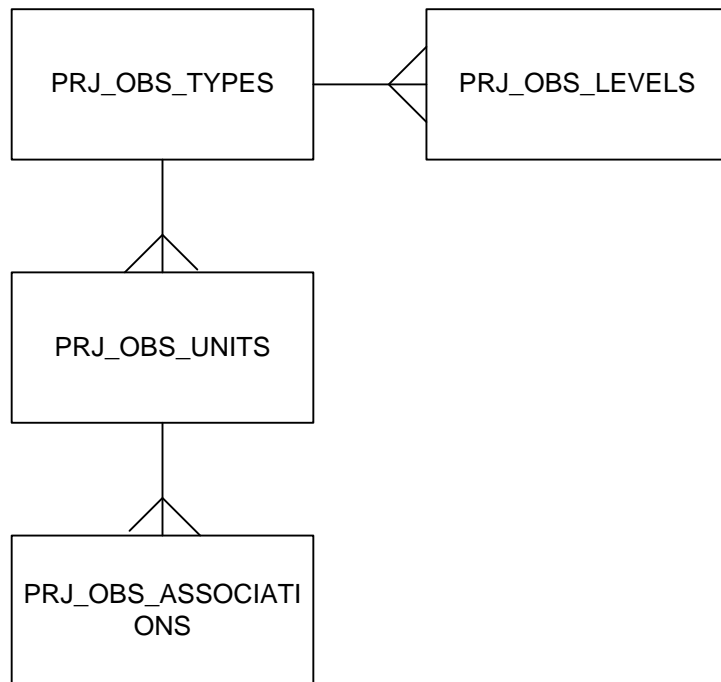
Data such as investments or resources can be associated to any node, and this allows data to be retrieved by level.

PRJ\_OBS\_TYPES (PT) holds the OBS definitions (name etc)

PRJ\_OBS\_LEVELS (PL) defines the levels for each OBS in PRJ\_OBS\_TYPES

PRJ\_OBS\_UNITS (PU) holds the units by type

PRJ\_OBS\_ASSOCIATIONS (PA) holds the links between projects, resources etc., and OBS units



PU.TYPE\_ID = PT.ID

PL.TYPE\_ID = PT.ID

PA.UNIT\_ID = PU.ID

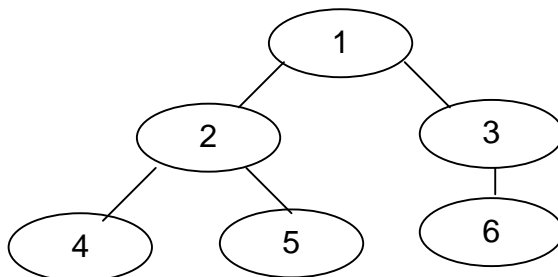
OBS units are associated with data (such as resources and projects) by their IDs and table names. So, to associate a resource with a unit:

PA.RECORD\_ID = R.ID and PA.TABLE\_NAME = 'SRM\_RESOURCES'

To associate a project with a unit we use the original table name for projects (which is now a view):

PA.RECORD\_ID = SP.ID and PA.TABLE\_NAME = 'SRM\_PROJECTS'

Each row in PRJ\_OBS\_UNITS indicates that row's unit's immediate parent (if any). The complete hierarchy of each OBS is held in table PRJ\_OBS\_UNITS\_FLAT. A unit (UNIT\_ID) is listed as a descendant of all of its ancestors (each BRANCH\_UNIT\_ID) and also itself. So, for the following structure:



PRJ\_OBS\_UNITS\_FLAT would have the following:

UNIT_ID	BRANCH_UNIT_ID
1	1
2	1
3	1
4	1
5	1
6	1
2	2
4	2
5	2
3	3
6	3

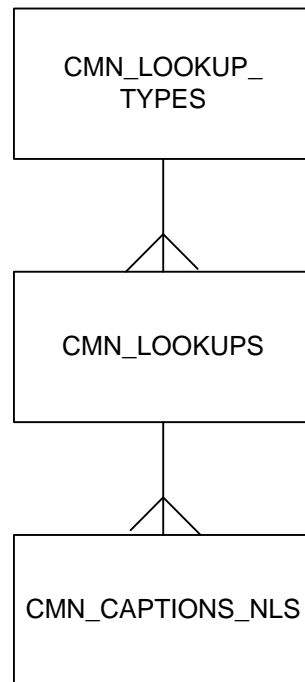
## Lookups

Clarity has two types of lookups, those that are static lists and those that are based on queries. Because it's a very frequent set of joins, there is a view that collects the values for a static lookup together. It is CMN\_LOOKUPS\_V (LV) (which combines tables CMN\_CAPTIONS\_NLS and CMN\_LOOKUPS).

CMN\_LOOKUP\_TYPES (LT) holds the basic information about a lookup

CMN\_LOOKUPS (L) holds the internal values for each item in a lookup

CMN\_CAPTIONS\_NLS (CN) holds the translations of the lookup names (as well as other translations)



LT.LOOKUP\_TYPE = L.LOOKUP\_TYPE

CN.TABLE\_NAME = 'CMN\_LOOKUPS' and CN.PK\_ID = L.ID

### Exercise 1.1

Create a query that lists investment names, codes, types, and their internal numeric ID.

### Exercise 1.2

Create a query that returns projects, tasks and their internal numerical IDs.



## Clarity Objects

### Stock Objects

Most objects in Clarity (timesheets are the major exception) can have custom attributes added to them using Clarity Studio. Navigate to Objects, select one and then click on Attributes followed by 'New'

The screenshot shows the 'Object Definition: Attributes' page in the Clarity PPM Administration Tool. The page title is 'Object Definition: Attributes (Object: Project)'. The left-hand navigation menu includes sections for 'Organization and Access', 'Resources', 'CA Clarity Studio', and 'Data Administration'. The 'Attributes' tab is selected in the central configuration area. Below the tabs, there are options for 'Full View', 'Resource', 'Group', and 'OBS Unit'. A legend indicates that a right-pointing arrow means 'Current', a white box means 'No Data', a grey box means 'Data Entered', and a white box with a border means 'Not Yet Available'. The 'Attributes Filter' section shows 'Attribute Display' set to 'All Attributes' and 'Partition' set to 'System'. Below this are buttons for 'Filter', 'Show All', and 'Clear'. A toolbar contains 'New', 'Delete', 'Deactivate', and 'Exit' buttons. The main table lists three attributes:

	Attribute	Partition	Partition Association Mode	Description
<input checked="" type="checkbox"/>	% Complete	System	Partition, ancestors and descendants	Percent Complete
	% Complete Calculation Method	System	Partition, ancestors and descendants	Percent Complete Calculation Method
	% Expended	System	Partition, ancestors and descendants	Percent complete for project

**Object Attribute** ( Object: Project | Attribute: )

---

Save | Submit | Cancel

\* Attribute Name

\* + # Attribute ID   
( ID must be alphanumeric, underscore is permitted. It must not be a SQL or Clarity reserved word. )

Partition

Partition Association Mode

Description

+ Data Type

Default Value

Maximum Size

Populate Null Values with the Default

Value Required

Presence Required

Read-Only   
( In order to make an attribute read-only a default must be selected )

---

Save | Submit | Cancel

\* = Required    + = Enter Once    # = Unique

Fill in the screen with the attribute’s attributes. If the new attribute is to be based on a lookup select the correct one, but take care as this cannot be altered later by standard means. Lookups come in two flavours, single valued and multiple valued.

When an attribute is added to an object, the object’s underlying database tables and views are altered. For example a new task attribute would be added to the ODF\_CA\_TASK table, a new project attribute would be added to ODF\_CA\_PROJECT. The exception to this is when an attribute is based on a multi-valued lookup. In these cases the attribute is stored outside the main object in table ODF\_MULTI\_VALUED\_LOOKUPS, which holds the selected values when the attribute is given its values.

Once the attribute is created it can be placed on one of the object’s pages, for example the Project Overview or Task Overview page. This is done by clicking on ‘Views’ whilst in the object definition, selecting the appropriate view and then dragging the attribute to the correct place:

**Object Definition: Views** ( Object: Project )

Partition: System

Publish Restore Defaults Exit

View	Category	Setup
Project Properties	Properties	[Layout: Create] [Layout: Edit]
Program Properties	Properties	[Layout: Create] [Layout: Edit]
Project List	List Column	[Layout] [Options] [Aggregation]
Program List	List Column	[Layout] [Options] [Aggregation]
Subproject List	List Column	[Layout] [Options] [Aggregation]
Project Template List	List Column	[Layout] [Options] [Aggregation]
Project Filter	List Filter	[Layout]
Program Filter	List Filter	[Layout]
Subproject Filter	List Filter	[Layout]
Project Template Filter	List Filter	[Layout]
Project Release Link Filter	List Filter	[Layout]
Project Requirement List Filter	List Filter	[Layout]

Publish Restore Defaults Exit

**Administration Tool**

**Property Layout** ( Object: Project | Partition: System | View: Project Properties | Mode: Edit )

Top

Subpage > Section	Level
[General]	Subpage
General	Section

Create Sections Move Delete Back

Click on the Section Properties icon and pull the new attribute across:

**Section Properties** ( Object: Project | Partition: System | View: Project Properties | Mode: Edit )

Layout

Required fields are marked with an asterisk (\*)  
Hidden fields are marked with an tilde (~)

Available	Selected (Left Column)	Selected (Right Column)
Budgeted Benefit	Description	Goal
Budgeted Benefit Finish	Project Manager	Alignment
Budgeted Benefit Start	Page Layout	Status
Budgeted Breakeven	Originating Idea	Stage
Budgeted Capex current FY		Active
Budgeted Cost		Program
Budgeted Cost Finish		Template
Budgeted Cost Start		
Budgeted NPV		
Budgeted Opex current FY		

Add Field Move Field Move Field

Then save everything.

**Exercise 1.3**

Create an attribute on the project object controlled by a single valued lookup and add it to the project overview page in the system partition

**Exercise 1.4**

Create an attribute on the project object controlled by a multi-valued lookup and add it to the project overview page in the system partition. Configure the field to accept multiple values.

**Custom Objects**

We can create new objects in Clarity. These can be stand-alone objects or sub-objects of existing objects. For example we could create a new object called Project Approvals. Behind the scenes this would have all its attributes in a new table called ODF\_CA\_PROJECT\_APPROVALS.

All custom object tables have the following basic attributes

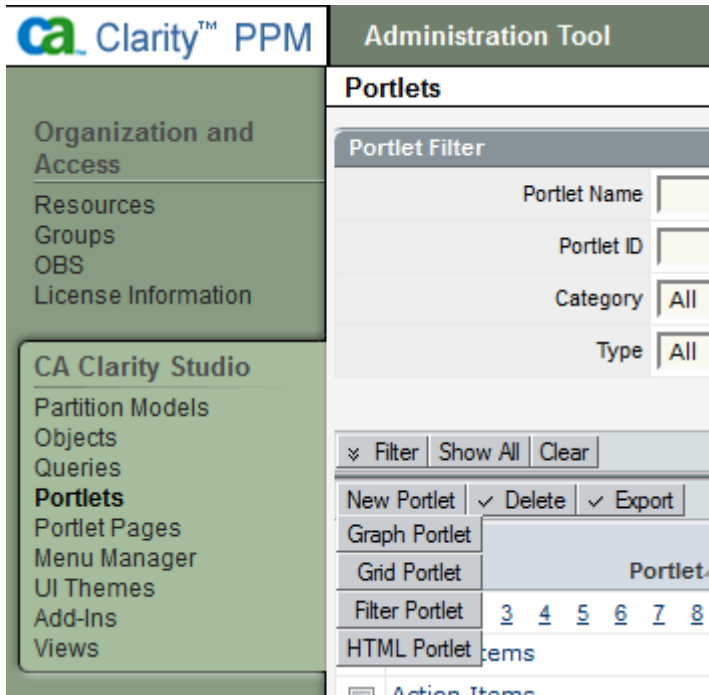
Column	Description
ID	Unique internal ID
CODE	Shown as 'ID' on screen
NAME	Shown as 'Name' on screen
PARTITION_CODE	The partition this object lives in (or NIKU.ROOT if global)
PAGE_LAYOUT	The default layout of this object on screen
CREATED_BY	ID from CMN_SEC_USERS
CREATED_DATE	The date the instance was created
LAST_UPDATED_BY	ID from CMN_SEC_USERS
LAST_UPDATED_DATE	The date the instance was last updated

If the object is a sub-object of another object the following columns will also be present to hold the link to the parent object:

Column	Description
ODF_PARENT_ID	ID of parent object instance
ODF_CNCRT_PARENT_ID	Concrete ID of parent object instance

## Portlets

A portlet is a means of displaying data from an NSQL query or a Clarity object. To create one go to Clarity Studio, click on portlets and then on 'New'



We'll create a new grid portlet based on the Project Object:

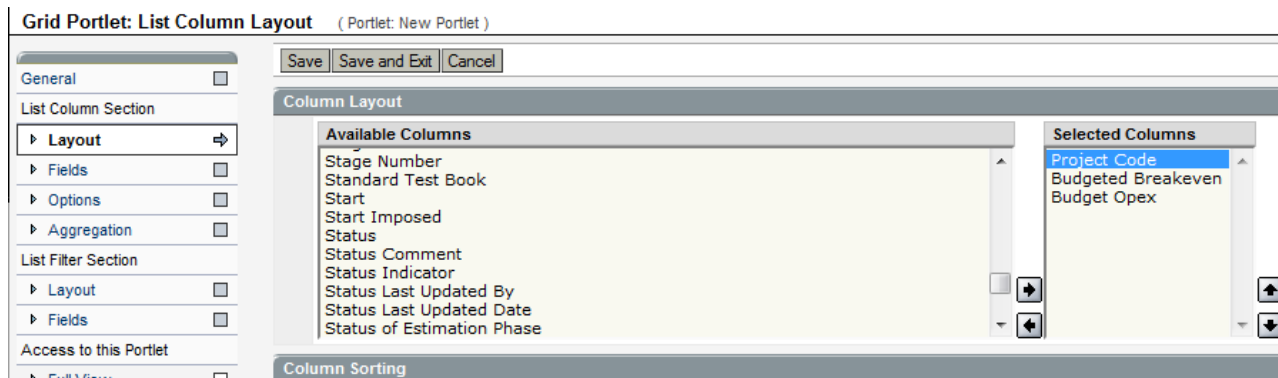
### Grid Portlet: General

General	
* Portlet Name	New Portlet
* + # Portlet ID	new_portlet
* Content Source	Customer
Category	Business Intelligence
Description	New example portlet
* + Instance Type	General
* + Data Provider	Project
Partition	System
Number of Dimensions	1
Number of Metrics	451

Next Cancel

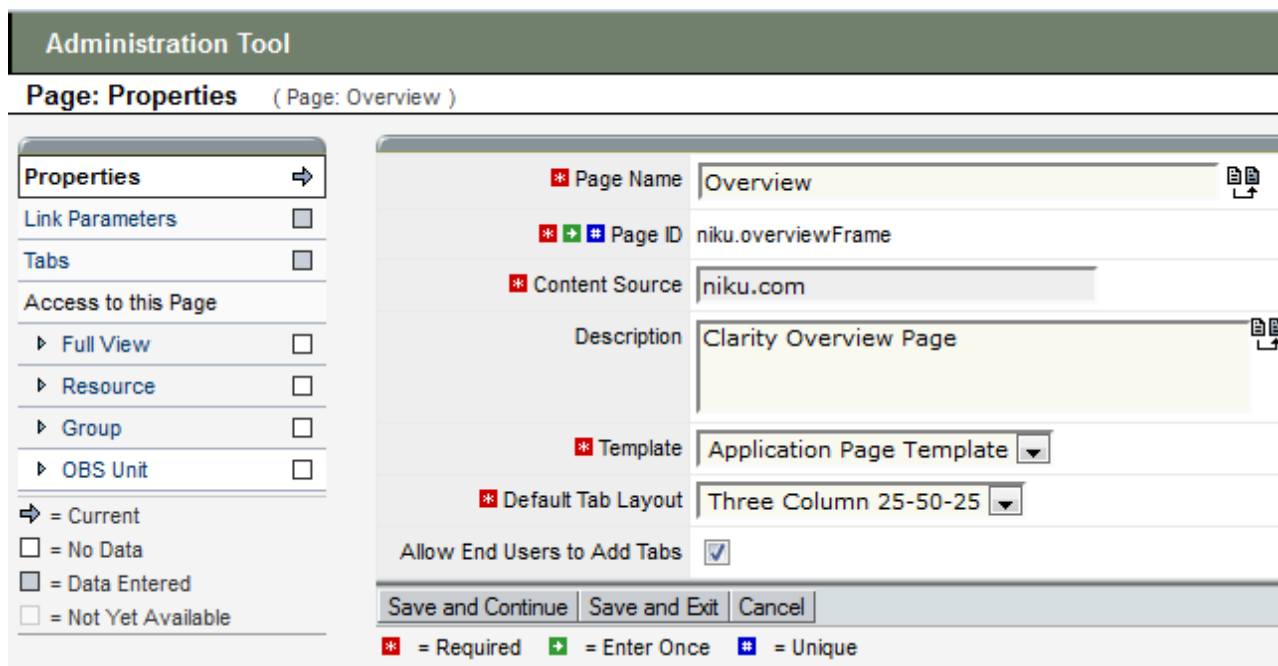
Click on 'Next', then 'Finish & Open' and finally on 'Layout'.

Select the columns for the portlet:



Click on Fields and tidy up the display parameters. Repeat for the Filter fields.

Portlets are only visible once they are on a Portlet Page. We'll put the portlet onto a 'Test' tab on the Overview page. Select Portlet Pages then Overview then the 'Test' tab:



Click on Tabs, and then Test:

**Tab: Properties** (Page: Overview | Tab: test)

<b>Properties</b> →	<b>* Tab Name</b> test
Link Parameters <input type="checkbox"/>	<b>* + # Tab ID</b> test
<b>Content</b> <input type="checkbox"/>	<b>* Content Source</b> Customer
Page Filters <input type="checkbox"/>	Description
Layout <input type="checkbox"/>	Personalizable <input type="checkbox"/>
<b>Access to this Tab</b>	Linkable <input type="checkbox"/>
▶ Full View <input type="checkbox"/>	
▶ Resource <input type="checkbox"/>	
▶ Group <input type="checkbox"/>	
▶ OBS Unit <input type="checkbox"/>	

⇒ = Current  
 = No Data

\* = Required    + = Enter Once    # = Unique

Save and Continue   Save and Exit   Publish   Cancel

Then add the portlet to the page:

**Tab: Content** (Page: Overview | Tab: test)

<b>Properties</b> <input type="checkbox"/>	There is no content to display. Click Add to add content.
Link Parameters <input type="checkbox"/>	<input checked="" type="checkbox"/> <b>Content</b> <b>Category</b>
<b>Content</b> →	No Maximized Portlet
Page Filters <input type="checkbox"/>	Add   Continue   Exit
Layout <input type="checkbox"/>	
<b>Access to this Tab</b>	
▶ Full View <input type="checkbox"/>	
▶ Resource <input type="checkbox"/>	
▶ Group <input type="checkbox"/>	
▶ OBS Unit <input type="checkbox"/>	

⇒ = Current  
 = No Data  
 = Data Entered  
 = Not Yet Available

CA Clarity PPM :: Select Content - Mozilla Fire

https://.../niku/app

**Clarity™ PPM**

**Select Content**

**Content Filter**

Title: New Portlet

Content ID:

Category: All

Description:

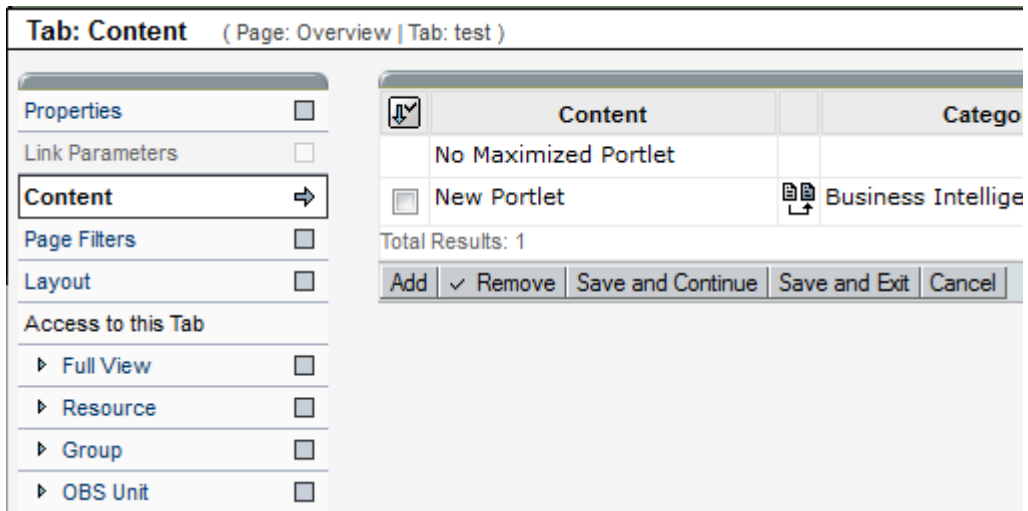
Type: All

Filter   Show All   Clear

<input checked="" type="checkbox"/>	Content	ID	Type
<input checked="" type="checkbox"/>	New Portlet	new_portlet	Grid   Bus

Total Results: 1

✓ Add   ✓ Add and Select More   Close



To see the portlet, go the Overview page and click on the Test tab.

### Exercise 1.5

Create an object-based portlet that displays Resources (names, emails etc). Add it to a new tab on the overview page.