

Web Development Programme



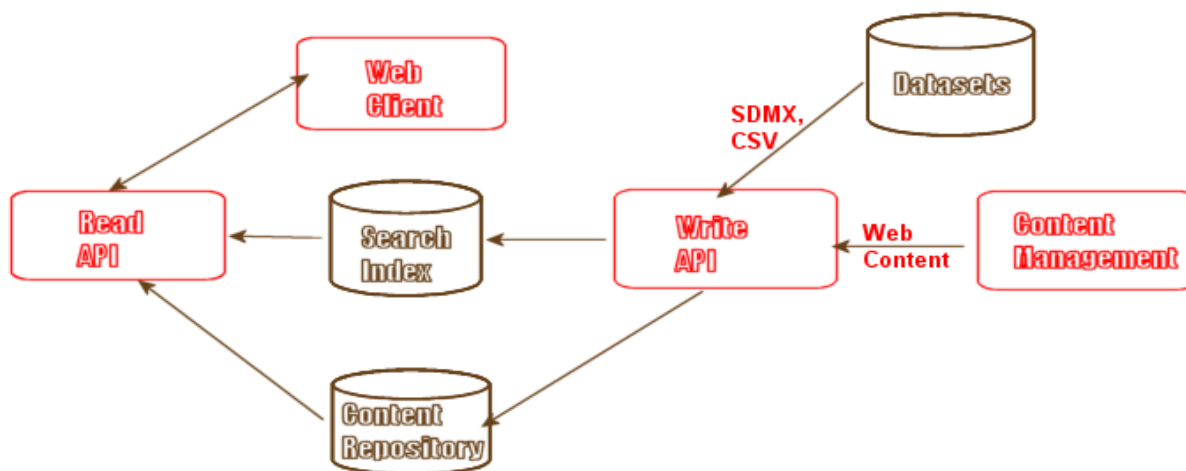
FR3 Read API Instructions

Project	Web Development Programme
Prepared By	Richard Smith API Development Lead Richard.M.Smith@ons.gov.uk
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1. Introduction

The WDP system will ultimately contain sophisticated RESTful APIs for reading a writing data and website content. It is intended that the Read API will be opened to the public, so it will be used to drive many websites, including ONS's own.

The FR3 version does not contain the full functionality, but is considerably more advanced than the initial FR1 release. The FR4 version will contain all the functionality required to drive WDP's Data Explorer, and a further release beyond that will fully support Census 2011.



The WDP API has been implemented via the modern RESTful approach as defined by Roy Fielding¹.

The main concept of a REST API is stateless interaction with a hierarchical structure of resources addressed using Uniform Resource Identifiers (URIs) and only the use of the verbs GET, PUT, POST and DELETE (and to a lesser extent TRACE, HEAD and OPTIONS).

In addition to the general principals of REST, the document Designing URI Sets for the Public Sector² provides further guidance detail around the structure to be implemented by public sector interfaces, and this was taken to be the foundation on which the API design was built. Much of this is intended to facilitate the use of RDF, but even though we won't be fully supporting RDF initially, it is a sensible framework to follow.

The service also supports the "discovery" of its own resources. To this end its responses include references to related resources such that all resources can be discovered from the base URI entry point. Note that the discovery functionality is not fully developed in FR3 so both the queries and responses are likely to be different in the FR4 version.

1. Roy T. Fielding dissertation on REST
http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm
2. Designing URI Sets for the UK Public Sector, version 1.0, October 2009
http://www.cabinetoffice.gov.uk/cio/chief_technology_officer/public_sector_ia.aspx

2. The FR3 API Definition

2.1 ABNF Definition

ABNF is a method of concisely defining the URI structure. Below is the URL structure with annotations.

```

READAPIURI = "http://" domain context [version] pathToRes [pathInRes] [repName] [repType] ["?"
query]

domain      = host                ; e.g. www.statistics.gov.uk
context     = "/" 1*pchar         ; e.g. /data
** NOT IN FR3 version = "/" 1*DIGIT ; e.g. v01 **
pathToRes   = 1*("/") concept ["/" reference]) ; e.g. contenttype/dataset/id/C3
pathInRes   = 1*("/") concept ["/" reference]) ; e.g. contentpart/dimension/id/sex
repType     = 1*(".") 1*ALPHA    ; representation extension e.g. .cross.sdmx.xml
query       = queryParam *("&" queryParam)
queryParam  = pagingParam / structParam / fieldParam
pagingParam = ("noofpages" / "noofRows" / "noofcols") "=" 1*DIGIT
pagingParam =/ ("pageoffset" / "rowoffset" / "columnoffset") "=" 1*DIGIT
structParam = ("page" / "col" / "row") "=" field *(", " field); [page ignored IN FR3]
fieldParam  = queryType "/" field "=" refTerm *(", " refTerm) ; metadata = list of values
queryType   = ("reft" / "prft" / "raft") ; required, prohibited or ranking
field       = (ALPHA *(DIGIT / ALPHA)) / "body" ; other characters may be allowed
concept     = (ALPHA *(DIGIT / ALPHA)) ; metadata or dimension name
reference   = (ALPHA *(DIGIT / ALPHA)) ; metadata or dimension value
refTerm    = *pchar ; a search term to match against 'reference's

```

2.2 Domain

Test server at Landmark =

2.3 Context

/data

2.4 Version

Not supported in FR3.

2.5 PathToRes

All resources can be identified using two Concept / Reference pairs

Pair 1

Concept: contenttype

Reference: { *dataset*, *contentitem*, *contentview*, *page*, *contentmeta*, *binary* }

(no other options in FR3)

If the reference is omitted then a list of content types is returned (in RDFa, an extension to XHTML)

Pair 2

Concept: id

Reference: id of item, e.g. a datasetid or a the CMS key of a publication
(no other options in FR3)

If the reference is omitted then a list of items is returned (in RDFa, an extension to XHTML)

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id>

or

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id.html>

2.6 PathInRes

Currently only used for subcomponents of dataset definitions. Slices of datasets are be obtained using query string parameters rather than this section.

Pair 3 (for datasets only in FR3)

Concept: contentpart

Reference: { *all, definition, data, dimension, concept, codelist* }

This is used to subset the SDMX output for a dataset

all: All SDMX artefacts

definition: The Data Structure Definition (DSD)

data: The data

dimension: One or more dimensions used by the dataset

concept: One or more concepts used by the dataset

codelist: One or more codelists used by the dataset

Pair 4

Concept: id

Reference: id of item, e.g. the name of a particular codelist, concept, or dimension, e.g. [contentpart/codelist/id/occupation01](#). The keyword "all" is used to request all of the items held for that content part, e.g. [contentpart/codelist/id/all](#) or [contentpart/data/id/all](#).
(no other options in FR3)

2.7 RepType

Supported formats are

XML - For datasets this is SDMX-ML - can say *.xml* or *.sdmx* or *.sdmx.xml* - the default is cross-sectional format for FR3, though compact can also be requested using an additional qualifier, i.e. *compact.sdmx* or *cross.sdmx*. Website content such as publications gets returned in plain XML for now, though it is intended to offer NLM so that the API can be used for the production of printed outputs.

HTML - Data slices can be rendered in HTML (not currently SDMX artefacts like codelists). Discovery calls (e.g. lists of items) are always returned in an extended version of XHTML called RDFa.

JSON - Data slices and SDMX artefacts can be returned in JSON format.

CSV - For data slices only.

If no format is supplied, XML is the default except for discovery calls which default to HTML (RDFa).

2.8 Query

The Query part of the URI, which follows the question mark has three distinct uses

- 1) To control the output from a dataset
 - a) take a slice of the data using dimension item values
 - b) instruct the API to structure the returned data in a particular way
 - c) chunk up a large response (pagination)
- 2) To obtain content items matching a "TCMURI" (content management system identifier)
- 3) Query the search engine to return matching content items

2.8.1 Data Slices

There are four types of terms that can be used.

1) Required Filter Terms

These are indicated using the keyword "reft" followed by a forward slash, then a dimension item name, then a comma-delimited list of values.

Example: [reft/Area=20UE,35UE](#) (include Durham and Castle Morpeth)

Wildcards ? and * can be used, where ? is a single character and * is an indeterminate number of characters.

Examples: [reft/Area=20UE??](#) (all wards in Durham - 20UEGB, 20UEGC etc.)

Examples: [reft/Area=20UE*](#) (all areas whose code starts with 20UE including Durham itself)

Multiple filter terms are ANDed. Example: [reft/Area=20UE,35UE&reft/Sex=M](#)

2) Prohibited Filter Terms

These are indicated using the keyword "prft" followed by a forward slash, then a dimension item name, then a comma-delimited list of values.

Example: [prft/Sex=M](#) (exclude males)

3) Structure Parameters

Each the dimensions in a dataset is attached to the "page" (a.k.a. "wafer"), "row" or "column". Users of the API can let the CORD system decide, or override this using the col

and row structure parameters. Use a comma to delimit multiple dimension names. Any unreferenced dimensions will go in the page.

Example: [row=Area&col=Age,Occupation](#)

These parameters refer to the tabular structure of an HTML table. For SDMX output, they can be mapped as follows (cross-sectional format)

Page = Group
Row = Section
Col = Observation

4) Paging Parameters

Data results can be “chunked” for better performance and manageability.

noofrows - number of rows to return, maximum 10000, default 100
noofcols - number of columns to return, maximum 10000, default 100
noofpages - number of pages to return, maximum 10000, default 1
rowoffset - number of rows to skip, maximum 9999 default 0
coloffset - number of columns to skip, maximum 9999 default 0
pageoffset - number of pages to skip, maximum 9999 default 0

The defaults are for the current test deployment, these will be reviewed. For example the system could calculate the actual number of cells and there could be an override to get the whole dataset.

Note that for SDMX output, where the output has been restricted using these parameters, the header in the DATA section will have the flag TRUNCATED = TRUE.

2.8.2 Content Item Match

Content items have a unique URL which is normally used to deliver them

Example: [/data/contenttype/contentitem/id/article26.xml](#)

In some cases, the ONS web site requires an alternative get which works on the CMS identifier. This can return more than one content item.

Example: [/data/contenttype/contentitem/id/?name=tcm-123](#)

return all content items with a cms identifier of tcm-123.

[tbd: this may change as it's inconsistent]

2.8.3 Search

When content items are stored in the WDP Repository, their details are mirrored in a search engine index. For queries against all non-dataset content, this search index is used. In FR4 datasets will be searchable too via the index.

The ONS web site accepts search queries from a user input box. It then applies ONS's business rules to this. The modified query is then presented to the API which passes it on to

the search engine. Any settings not specified will then be defaulted by the search engine (currently Lucene).

Required Filter Terms

This is the main query in terms of field / search text pairs. Required filter terms are always ANDed, you can only use OR within the same field. OR is only one of the operators can be used within the search text of a field. See the Lucene Query Parser documentation http://lucene.apache.org/java/2_4_0/queryparsersyntax.html

Example: `/data/contenttype/contentitem/id?reft/title=population&reft/body=projection&reft/publicationdate=[20100101 TO 20100630]`

Look for content items with "population" in the document's title field, and "projection" in its body. Also only return documents published between January 1st 2010 and June 30th 2010.

Prohibited Filter Terms

The same as Required Filter Terms but with an implicit NOT operator

Example: `?prft/title=estimate`

return all documents which do not have estimate in the title

Example: `?reft/title=population&reft/body=projection&reft/date=[20100101 TO 20100630]&prft/body=estimate`

Look for "population" in the document's title field, and "projection" in its body. Also only return documents published between January 1st 2010 and June 30th 2010. Exclude from the list any documents with "estimate" in the body.

Ranking Filter Terms

Additional terms to influence the ranking of results.

Optional search terms boost results which match an additional condition

Example: `?raft/description=national`

boost results containing "national" in the description

3. Examples

(full output files in WDPOutputs.zip)

3.1 Datasets

List of Datasets

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id>

(see Appendix A for how to interpret the output)

Whole dataset (or default chunk) as SDMX

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion.xml>

(see Appendix B for sample SDMX output)

Whole dataset (or default chunk) as HTML

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion.html>

Whole dataset (or default chunk) as JSON

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.json

Whole dataset (or default chunk) as CSV

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion.csv>

Slice of dataset (xml)

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion.xml?reft/Area=20UB>

Chunk of dataset (xml)

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.xml?noofrows=10&noofcols=10&noofpages=10

Restructured dataset (xml)

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.xml?reft/Area=20UB&noofcols=10&noofpages=10&col=Religion,Gender&row=Area,Observation Status,Unit Multiplier

Slice of dataset (html)

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.html?reft/Area=20UB

Chunk of dataset (html)

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.html?noofrows=10&noofcols=10&noofpages=10

Restructured dataset (html)

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1_Gender_by_Religion.html?reft/Area=20UB&noofcols=10&noofpages=10&col=Religion,Gender&row=Area,Observation Status,Unit Multiplier

SDMX - All Artefacts

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion/contentpart/ALL.xml>

SDMX - DSD only

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion/contentpart/DEFINITION.xml>

SDMX - Data only

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion/contentpart/DATA.xml>

SDMX - Codelists only

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion/contentpart/CODELIST.xml>

SDMX - One particular codelist

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/C1%20Gender%20by%20Religion/contentpart/CODELIST/id/Area.xml>

3.2 Web Content

Discovery

List of Content Items (RDFa) with population in the title

<http://http://wdpcatapp1/WDPDSM/data/contenttype/contentitem/id.html?ref=title=population>

(note that in FR3 the contenttype in the URL is not honoured by the search engine)

Delivery

Retrieve a Content Item

<http://wdpcatapp1/WDPDSM/data/contenttype/contentitem/id.xml/tcm:77-31218>

Content items are the XML for a piece of content such as a publication. The NS online web site also retrieves a stylesheet used to render the XML, plus optionally metadata and binary attachments (pdfs, ppts, etc.)

3.3 Node Structure

As well as looking in this manual, it is possible to discover the allowed node structure of the API's URLs. If a URL with a completed concept / reference pair is submitted, and this node is an "intermediate node", i.e. it does not correspond to a deliverable item, a node report is returned. As a general rule, if the last concept is id, something will be delivered rather than a node report.

This report comprises a description, a parent node, and one or more child nodes.

<http://wdpcatapp1/WDPDSM/data>

The root node. This will give you no parent, description text containing some general stuff about the web service plus a link to the user guide. The only child node is contenttype.

<http://wdpcatapp1/WDPDSM/data/contenttype.html>

This is an incomplete pair, so a list of contenttypes used is displayed (discovery).

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset.html>

This is an intermediate node whose parent is contenttype, only child is id, and has a description field which tells you what the definition of a dataset is.

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id.html>

This provides links to deliver the content of each dataset, and also to continue to navigate to nodes defining the internal structure of each dataset.

3.4 Orchestrated Examples







3.4.1 Data Explorer

Start Page

Our start point will be the list of datasets available.

e.g. <http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id.html>

The XHTML (RDFa) this returns (see appendix A) is transformed into an HTML page like this

	<u>id</u>	<u>Name</u>	<u>Release Date</u>	<u>Supplier</u>
 	uv09	Ethnic Group 	01/04/2001	Census
 	pproj1	Population Projections 	01/01/2009	NPP

If the user clicks on one of the “i” buttons the explorer will retrieve selected information about the dataset, possibly using more than one API call. Example, get the

the SDMX DSD

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09/contentpart/definition.xml>

The output could also include links to further discoverable information, such as the codelists used by the dataset. E.g.

http://wdpcatapp1/WDPDSM/data/contenttype/data/id/uv09/contentpart/codelist/id/CL_Ethnic_Grp.xml

Download

If the user clicks on Download, then he will be prompted for the required format (SDMX, CSV, XLS etc.). XML will be the default XML format (SDMX).

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09.sdmx.xml>

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09.csv>

Note that the current version of the API does not give you the complete dataset with the above calls as unless the dataset is very small, due to default (modest) numbers of rows and columns and pages being applied. Currently, very large numbers have to be set for the paging parameters,

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09.xml?noofpages=9999&noofrows=9999&noofcols=9999>

but there may be an "all" keyword in FR4.

Explore

If the user clicks on Explore, he is presented with a list of dimensions to pick from.

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09/contentpart/dimensions.xml>

Selecting a dimension causes an item picker to be generated using the output from

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09/contentpart/codelist/id/ethnic_grp.xml

If the codelist is a hierarchical in nature the explorer has to use the parent code attribute on the returned codes to create and expandable multi-level picker.

The dimension item lists will be driven from the codelists associated with the dataset, which only contain populated values. (Not in FR3) A master codelist is also available containing all the values, so the explorer could grey out rather than omit unused values.

Additionally, the query string can be used to restrict the dimension item values offered to those which have data for the previous dimension's selections. E.g. For UV09, the user has already chosen two geographic areas, and we can use these when creating the ethnic group picker.

http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09/contentpart/codelist/clid/cl_ethnic_grp.xml?reft/geography=064,220

Note that it is possible that the codelist returned from such a query could be completely empty, particularly in a sparse cube. In this case the explorer could indicate that the corresponding dimension cannot be selected.

On completion of dimension item selection, the explorer can put together the "delivery" slice:

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09.html?reft/geography=064,220&reft/ethnicgroup=EG1,EG2,EG3>

In the above HTML has been requested

<http://wdpcatapp1/WDPDSM/data/contenttype/dataset/id/uv09.sdmx.xml?reft/geography=064,220&reft/ethnicgroup=EG1,EG2,EG3>

This one asks for cross-sectional SDMX.

4. Developing Clients

(code also in WDPClients.zip)

The WDP API can be used to build many clients, big and small. These can run by getting small slices of data at runtime for immediate use ("hunters"), or larger amounts of data held in a local datastore ("gatherers").

Any language that supports HTTP GET can be used. This document contains examples in AJAX, Java and Adobe Flex.

A client has to obtain responses from the API and parse them. Because the API supports content negotiation, for data slices you can choose XML, HTML, JSON or CSV, whichever is easiest for you. The SDMX XML format is quite complex and variable in structure so is not too easy to parse. However, you can use the structure parameters to control which dimensions go on the group, section and observations to make it more predictable.

4.1 Ajax

4.1.1 Simple View Dataset application

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<title>Run WDP API</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
  <script language="JavaScript">
    var endpoint = "http://wdpcatappl/WDPDSM";
    var initialInputURL;
    var req; // global variable to hold request object
    var outputXML;
    var dsid= "dataset1";
    function runGET(dsid,epoint)
    {
      endpoint = epoint;
      initialInputURL = '/data/contenttype/dataset/id/dataset1.xml';
      inputURL = endpoint + initialInputURL.replace("dataset1.xml",dsid);
      alert(inputURL);
      loadXMLDoc(inputURL);
    }

    function loadXMLDoc(url)
    {
      if(window.XMLHttpRequest) {
        try {
          req = new XMLHttpRequest();
        } catch(e) {
          req = false;
        }
      } else if(window.ActiveXObject) {
        try {
          req = new ActiveXObject("Msxml2.XMLHTTP");
        } catch(e) {
          try {
            req = new ActiveXObject("Microsoft.XMLHTTP");
          } catch(e) {
            req = false;
          }
        }
      }
    }
  }
</script>
</head>
</html>
```


4.1.2 Google Visualizer API

This demo requires Native JSON to be available, so will only run on new versions of browsers (Firefox 3.5, Internet Explorer 8, Opera 10.5, Google Chrome 4, Safari 4)



```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
    <title>Google Visualisation</title>

    <script type="text/javascript" src="http://www.google.com/jsapi"></script>
    <script type="text/javascript">
function GoogleVisUtils(jsonDataset){

// The JSON Object containing the Dataset from a Read API call
this.jsonDataset = jsonDataset;
this.convertDatasetToJson = function(){
  var cols = createColumns(this.jsonDataset);
  var rows = createRows(this.jsonDataset);
  var jsonObject = {};
  jsonObject.cols = cols;
  jsonObject.rows = rows;
  return jsonObject;
};
}

function createRows(jsonObject){
  var descriptions = populateDescriptions(jsonObject);
  var rows = [];
  var sections =
jsonObject.ons$dataPackage.CrossSectionalData.wdp$DataSet.wdp$Group.wdp$Section;
  for(i=0; i< sections.length; i++){
    var section = sections[i];
    rows.push(createRow(section, jsonObject, descriptions));
  }

  return rows;
}

function rowData(col1, col2){
  return {"c" : [dataItem(col1) , dataItem(col2)]};
}

function dataItem(value){
  return {"v" : value};
}

function createRow( section, jsonObject, descriptions){
  var row = {"c" : []};
  var sectionProp = getProperties(section);

  for(col = 0; col<sectionProp.length; col++){
    var prop = sectionProp[col];
    var currentProp = section[prop];
    var currentType = typeof(currentProp);
    if (currentType == "object" ){
      currentProp = currentProp["value"];
    }else{
      var description = getDescription(prop, section, descriptions);
      currentProp = description;
    }
    row.c.push(dataItem(currentProp));
  }
}
```

```

    }
    return row;
}

function populateDescriptions(jsonObject){
    var descriptions = {};

    var codelists = jsonObject.ons$dataPackage.Structure.CodeLists.structure$CodeList;
    for( i = 0; i < codelists.length; i++){
        var codelist = codelists[i];
        var currList = {};
        descriptions[codelist.id] = currList;
        var codes = codelist.structure$Code;
        for( j = 0; j < codes.length; j++){
            currList[codes[j].value] = codes[j].structure$Description.$t;
        }
    }

    return descriptions;
}

function getDescription(prop, section, descriptions){
    var description = descriptions[prop][section[prop]];
    return description;
}

function createColumns(jsonObject){
    var cols = [];
    var headers = getColumnHeaders(jsonObject);
    for( i = 0; i < headers.length; i++){
        cols.push(createHeader(headers[i], headers[i], "string"));
    }

    return cols;
}

function createHeader(id, label, type){
    var header = {"id" : id, "label" : label, "type" : type};
    return header;
}

function getColumnHeaders(jsonObject){
    var dimensions =

    jsonObject.ons$dataPackage.Structure.KeyFamilies.structure$KeyFamily.structure$Components.structure$Dimension ;

    var measureCodelist;
    var headers = new Array();

    for(i = 0; i < dimensions.length; i++){
        if(dimensions[i].isMeasureDimension){
            measureCodelist = dimensions[i].codelist;
        }else{
            headers[headers.length] = dimensions[i].conceptRef;
        }
    }

    var codelists = jsonObject.ons$dataPackage.Structure.CodeLists.structure$CodeList;
    for(j = 0; j < codelists.length; j++){
        if(codelists[j].id == measureCodelist){
            var codes = codelists[j].structure$Code;
            for(k = 0; k < codes.length; k++){
                headers[headers.length] = codes[k].structure$Description.$t;
            }
        }
    }
    return headers;
}

function getProperties(jsonObject){
    var props = new Array();
    for (var prop in jsonObject){
        if (typeof(jsonObject[prop]) != "function") {
            props[props.length] = prop;
        }
    }
}

```

```

    }
  }
  return props;
}

function RestfulResource(resource_url){
  this.resource_url = resource_url;
  this.xmlhttp = null;

  if (window.XMLHttpRequest) {
    this.xmlhttp = new XMLHttpRequest();
  } else {
    this.xmlhttp = new ActiveXObject("Microsoft.XMLHTTP");
  }
  if (this.xmlhttp == null) {
    alert("Your browser doesn't support XMLHttpRequests.");
  }

  this.retrieve = function(){
    var url = this.resource_url;
    var self = this;
    this.xmlhttp.onreadystatechange=function(){
      if (self.xmlhttp.readyState==4){
        if (self.xmlhttp.status==200){
          self.onRetrieveSuccess.call(self,self.xmlhttp.responseText);
        }else{
          self.onRetrieveError.call(self,self.xmlhttp.statusText);
        }
      }
    };

    this.xmlhttp.open("GET",url,true);
    this.xmlhttp.send(null);

    /** The method called when a resource is successfully retrieved.*/
    this.onRetrieveSuccess = function(responseText){
      alert("override the function onRetrieveSuccess");
    };

    /** The method called when a resource is not created.*/
    this.onRetrieveError = function(statusText){
      alert("override the function onRetrieveError");
    };
  }

  </script>
  <script type="text/javascript">
    // Load the Visualization API and the piechart package.
    google.load('visualization', '1', {'packages':['table', 'corechart']});
    // Set a callback to run when the Google Visualization API is loaded.
    google.setOnLoadCallback(loaded);

    function loaded(){
      document.getElementById('jsonTextArea').value = "";
      document.getElementById('createTableBtn').disabled = false;
    }
  </script>

  <script type="text/javascript">
    function reset(){
      var jsonTA = document.getElementById('jsonTextArea');
      jsonTA.value = '';
      var jsonDiv = document.getElementById('jsonDiv');
      jsonDiv.style.display = '';
      var chartDiv = document.getElementById('chart_div');
      var nodeList = chartDiv.childNodes;
      for ( var id = 0; id < nodeList.length; id++) {
        chartDiv.removeChild(nodeList.item(id));
      }
    }

    function populateTextArea(){

```

```

var selectedDatasetName = document.getElementById('selectDS').value;
if (navigator.appName != 'Microsoft Internet Explorer')
{
try
{
netscape.security.PrivilegeManager.enablePrivilege("UniversalBrowserRead");
} catch (e) {
alert("Permission UniversalBrowserRead denied.");
}
}
var url = "http://localhost:8888/data/contenttype/dataset/id/" + selectedDatasetName
+ ".json";
var resource = new RestfulResource(url);
resource.onRetrieveSuccess = function(responseText){
document.getElementById('jsonTextArea').value = responseText;
}
resource.retrieve();
}

function validateJson(alertUser){
try{
var jsonObject = JSON.parse(document.getElementById('jsonTextArea').value);
if(alertUser){
alert("Valid JSON");
}
return jsonObject;
}catch(error){
alert("Validation failed with error: "+error);
}
}

function createTable(){
var jsonObject = validateJson(false);
if(jsonObject == null){
return;
}
var googleUtils = new GoogleVisUtils(jsonObject);
var visualisationData = googleUtils.convertDatasetToJson();
var chart = new google.visualization.Table(document.getElementById('chart_div'));
var dataTable = new google.visualization.DataTable(visualisationData, 0.6);
var jsonDiv = document.getElementById('jsonDiv');
jsonDiv.style.display = 'none';
chart.draw(dataTable, {width: 1200, height: 800, alternatingRowStyle: true, is3D:
true, title: 'My Daily Activities'});
document.getElementById('chart_div').style.visibility = 'visible';
}
</script>
</head>
<body>
<input type="button" onclick="populateTextArea();" value="Populate Test Data" title="Click on
this button to populate the text area with test data."/>
<input id="createTableBtn" type="button" onclick="createTable();" disabled="disabled"
value="Create Table" title="Create the Google Visualisation Data Table." />
<input type="button" onclick="reset();" value="reset" title="Clear the text area." />
<br />
<div id="jsonDiv">
<br/>
<select id="selectDS" onchange="populateTextArea();">
<option value="dataset1">Dataset 1</option>
<option value="dataset4">Dataset 4</option>
</select>
<br/>
<br/>
<textarea id="jsonTextArea" rows="20" cols="80" ></textarea>
</div>
<br />
<!--Div that will hold the pie chart-->
<div id="chart_div"></div>
</body>
</html>

```

4.2 Java

```
import java.io.*;
import java.net.*;
import java.io.IOException;

public class RunWDP
{
    public static void main(String[] args)
    {
        String addr = "http://wdpcatappl/WDPDSM/data/contenttype/dataset/id/dataset1.xml";

        try
        {
            URL url = new URL(addr);
            HttpURLConnection conn = (HttpURLConnection) url.openConnection();

            // required if using proxy server to connect
            System.setProperty("java.net.useSystemProxies", "true");

            conn.setRequestMethod("GET");
            conn.connect();
            InputStream in = conn.getInputStream();
            StringBuffer sb = new StringBuffer();
            int c;
            while ((c = in.read()) != -1) sb.append((char) c);
            String document = sb.toString();
            System.out.println(document);
            conn.disconnect();
        }
        catch(IOException ex)
        {
            ex.printStackTrace();
        }
    }
}
```

4.3 Adobe Flex

4.3.1 Simple Chart Application

<simplify this example!>

Simple application (save with suffix .MXML)

```
<?xml version="1.0" encoding="utf-8"?>
<mx:Application xmlns:mx="http://www.adobe.com/2006/mxml" backgroundColor="#CCCCCC"
scriptTimeLimit="240" layout="absolute">
    <mx:Script>
        <![CDATA[
            import mx.rpc.events.FaultEvent;
            import mx.collections.ArrayCollection;
            import mx.rpc.events.ResultEvent;

            [Bindable]
            private var dp:Array = new Array();
            [Bindable]
            private var chartdp:Array = new Array();

            [Bindable] private var sex:ArrayCollection =
            new ArrayCollection([ {Name:"All People", id:"S0"},
            {Name:"Male", id:"S1"},
            {Name:"Female", id:"S2"}]);
```

```

[Bindable] private var age:ArrayCollection =
new ArrayCollection([{Name:"All People", id:"A0"},
{Name:"Age 16 to 17", id:"A1"},
{Name:"Age 18 to 19", id:"A2"},
{Name:"Age 20 to 24", id:"A3"},
{Name:"Age 25 to 29", id:"A4"},
{Name:"Age 30 to 39", id:"A5"},
{Name:"Age 40 to 49", id:"A6"}]);

[Bindable] private var areas:ArrayCollection =
new ArrayCollection([{Name:"Tynedale", id:"35UF"},
{Name:"Castle Morpeth", id:"35UE"},
{Name:"Blyth Valley", id:"35UD"},
{Name:"Berwick-upon-Tweed", id:"35UC"},
{Name:"Alnwick", id:"35UB"},
{Name:"Wansbeck", id:"35UG"}]);

[Bindable] private var occupation:ArrayCollection =
new ArrayCollection([{Name:"1. Managers and Senior Officials", id:"O1"},
{Name:"2. Professional Occupations", id:"O2"},
{Name:"3. Associate Professional and Technical Occupations", id:"O3"},
{Name:"4. Administrative and Secretarial Occupations", id:"O4"},
{Name:"5. Skilled Trades Occupations", id:"O5"},
{Name:"6. Personal Service Occupations", id:"O6"},
{Name:"7. Sales and Customer Service Occupations", id:"O7"},
{Name:"8. Process, Plant and Machine Operatives", id:"O8"},
{Name:"9. Elementary Occupations", id:"O9"}]);

private var wdp:Namespace = new
Namespace("urn:sdmx:org.sdmx.infomodel.keyfamily.KeyFamily=ONS:WDP033:1.0:cross");

private function httpServiceResultEventHandler(ev: ResultEvent):void
{
trace ('httpServiceResultEventHandler: ' + ev.result);
var myXML:XML = XML(ev.result);
var nodList:XMLList =myXML.children().children();
var gender:String = "Not Found";
var agegroup:String = "Not Found";
var area:String = "Not Found";
var value:String = "Not Found";
var allItems:Array = new Array();
var chartItems:Array = new Array();
var nlen:uint = nodList.length();
for (var n:uint; n < nlen; n++)
{
var curgroup:XML = nodList[n];
var lname:String = curgroup.localName().toString();
if (lname == "Group")
{
gender = curgroup.@Gender;
agegroup = curgroup.@Age;
var items:XMLList = curgroup.children();
var len:uint = items.length();
for (var i:uint=0; i < len; i++)
{
area = lookupArea(items[i].@Area);
var valList:XMLList = items[i].children();
value = valList[0].@value;
allItems.push({Gender:gender, Agegroup:agegroup, Area:area,
Value:value});
}
}
}
dp = allItems;
sexorageChanged();
urival.text = "ready";
}

```

```

private function httpServiceFaultEventHandler(ev:FaultEvent):void
{
    trace("web service call failed");
}

private function sexorageChanged():void
{
    var chartItems:Array = new Array();
    var sexId:String = "";
    var ageId:String = "";
    var selectedSexId:String = cmbSex.selectedItem.id;
    var selectedAgeId:String = cmbAge.selectedItem.id;
    var selectedSexName:String = cmbSex.selectedItem.Name;
    var selectedAgeName:String = cmbAge.selectedItem.Name;
    var len:uint = dp.length;
    for (var i:uint; i < len; i++) {
        sexId = dp[i].Gender;
        ageId = dp[i].Agegroup;
        if (sexId == selectedSexId && ageId == selectedAgeId)
        {
            chartItems.push({Gender:dp[i].Gender, Agegroup:dp[i].Agegroup,
Area:dp[i].Area, Value:dp[i].Value});
        }
    }
    chartdp = chartItems;
    areaAxis.title = "GENDER = " + selectedSexName + "      AGE GROUP = " +
selectedAgeName;
}

private function occupationChanged():void
{
    var selDSId:String = cmbOccupation.selectedItem.id;
    urival.text="loading data, please wait...";

    httpService.url="http://wdpcatappl/WDPDSM/data/contenttype/dataset/dsid/WDP033%20Northumberlan
d%20Wards/contentpart/data.xml?noofpages=50&row=Area&col=Occupation&reft/Occupation=" + selDSId +
"&reft/Area=35UB,35UC,35UD,35UE,35UF,35UG&reft/Gender=S0,S1,S2&reft/Age=A0,A1,A2,A3,A4,A5,A6"
    httpService.send();
}

private function lookupArea(aid:String):String
{
    var aname:String = "Not Found";
    var alen:uint = areas.length;
    for (var a:uint=0; a < alen; a++)
    {
        if (areas[a].id == aid)
        {
            aname = areas[a].Name;
        }
    }
    return aname;
}

]]>
</mx:Script>
<mx:ApplicationControlBar dock="true" >
    <mx:Label text="WDP API Sample Visualisation" fontSize="14" fontWeight="bold"/>
    <mx:Label text="Dataset: WDP033" fontSize="14" fontWeight="bold"/>
    <mx:Label text="Area: Northumberland" fontSize="14" fontWeight="bold"/>
</mx:ApplicationControlBar>

<mx:SolidColor id="colourBar" color="#75A9EF" alpha=".8"/>

<mx:HTTPService id="httpService"
url="http://wdpcatappl/WDPDSM/data/contenttype/dataset/dsid/WDP033%20Northumberland%20Wards/cont

```

```

ntpart/data.xml?noofpages=50&row=Area&col=Occupation&ref/Occupation=01&ref/Area
=35UB,35UC,35UD,35UE,35UF,35UG&ref/Gender=S0,S1,S2&ref/Age=A0,A1,A2,A3,A4,A5,A6"
result="httpServiceResultEventHandler(event)"
    fault="httpServiceFaultEventHandler(event)" resultFormat="e4x" />
<mx:Canvas creationComplete="httpService.send()" width="100%" height="100%">
    <mx:HDividedBox borderThickness="1" width="100%" height="100%">
        <mx:Grid width="414" height="100%">
            <mx:GridRow width="100%" height="20">
                <mx:GridItem width="100%" height="100%">
                    <mx:Label text=" " />
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="20">
                <mx:GridItem width="100%" height="100%">
                    <mx:Label text="Occupation:" fontSize="12" fontWeight="bold"/>
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="100">
                <mx:GridItem width="100%" height="100%">
                    <mx:ComboBox id="cmbOccupation" dataProvider="{occupation}" labelField="Name"
change="occupationChanged()"></mx:ComboBox>
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="20">
                <mx:GridItem width="100%" height="100%">
                    <mx:Label text="Sex:" fontSize="12" fontWeight="bold"/>
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="100">
                <mx:GridItem width="100%" height="100%">
                    <mx:ComboBox id="cmbSex" dataProvider="{sex}" labelField="Name"
change="sexorageChanged()"></mx:ComboBox>
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="20">
                <mx:GridItem width="100%" height="100%">
                    <mx:Label text="Age Group:" fontSize="12" fontWeight="bold"/>
                </mx:GridItem>
            </mx:GridRow>
            <mx:GridRow width="100%" height="100">
                <mx:GridItem width="100%" height="100%">
                    <mx:ComboBox id="cmbAge" dataProvider="{age}" labelField="Name"
change="sexorageChanged()" />
                </mx:GridItem>
            </mx:GridRow>
        </mx:Grid>
        <mx:Canvas width="100%" height="100%">
            <mx:ColumnChart id="columnChart" dataProvider = "{chartdp}" height="444" width="504"
showDataTips="true">
                <mx:horizontalAxis>
                    <mx:CategoryAxis id="areaAxis" categoryField="Area" title="" />
                </mx:horizontalAxis>
                <mx:verticalAxis>
                    <mx:LinearAxis id="valueAxis" />
                </mx:verticalAxis>
                <mx:horizontalAxisRenderers>
                    <mx:AxisRenderer axis="{areaAxis}" showLine="false" />
                </mx:horizontalAxisRenderers>
                <mx:verticalAxisRenderers>
                    <mx:AxisRenderer axis="{valueAxis}">
                        <mx:axisStroke>
                            <mx:Stroke color="#888888" />
                        </mx:axisStroke>
                    </mx:AxisRenderer>
                </mx:verticalAxisRenderers>
                <mx:series>
                    <mx:ColumnSeries id="series2" yField="Value" fill="{colourBar}" />
                </mx:series>
            </mx:ColumnChart>

```

```

        </mx:Canvas>
    </mx:HDividedBox>
    <mx:Label color="red" id="urival" text="loading data, please wait..."/>
</mx:Canvas>
<!--<mx:Style source="css.css"/>-->
</mx:Application>

```

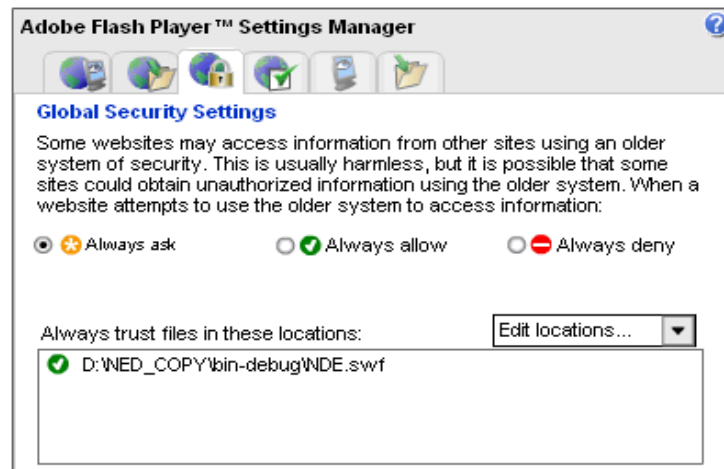
4.3.2 Security

The web service now has a crossdomain.xml file which permits universal access to the web service from Flash applications deployed to web sites. The settings are very permissive so you should not get security errors. If so, please report them to ONS.

When running locally, you may need to set `-use-network=false` on the compiler: Properties, Flex Compiler, Additional compiler arguments.

It is also likely that the client will have to be "trusted". When running inside Adobe Flex, applications are automatically trusted. However, when running the compiled SWF locally, the user may well have to explicitly trust the SWF file using the web-based Flash Player settings manager...

http://www.macromedia.com/support/documentation/en/flashplayer/help/settings_manager04.html



Appendix A RDFa Discovery Format

References

1. Modularised XHTML 1.1 syntax <http://www.w3.org/TR/xhtml11/doctype.html>
2. RDF http://en.wikipedia.org/wiki/Resource_Description_Framework
3. RDFa Primer <http://www.w3.org/TR/xhtml1-rdfa-primer/>
4. RDFa DTD <http://www.w3.org/MarkUp/DTD/xhtml1-rdfa-1.dtd>
5. RDFa syntax <http://www.w3.org/TR/rdfa-syntax>
6. XHTML+RDFa validator <http://validator.w3.org/>
7. RDFa browser plugins <http://rdfa.info/wiki/Tools>

Overview

As follows RESTful principles XHTML will be used to represent discovery information for a URL which doesn't match a resource. This makes use of the standard XHTML constructs provided by the Modularised XHTML 1.1 syntax as described by ref. 1.

This allows a generic machine readable schema which is also viewable by a browser. However in order to enhance machine readability and to take a step towards the possible future requirement of providing RDF (see ref. 2) the RDFa extension to XHTML will be used. A good overview of RDFa is described in ref. 3. This will maintain user navigation by standard browsers and also provides extended machine readable syntax. The XHTML returned must match the DOCTYPE defined by XHTML1.1+RDFa DTD (see ref. 4). An example is shown in the XHTML Samples section later.

XHTML Tag usage

Structure

Data which is truly tabular such as a dataset slice will be displayed using the XHTML Table Module. However all other discovery output should not use table but use the List Module along with the Text Module and Hypertext Module (the complete output will also be wrapped in the Structure Module). This means data is presented as ordered/unordered lists and/or nested divs and spans. CSS style sheets can then be used to present this information as required (see examples).

Relationships

All relationships will be expressed using the Hypertext Module (i.e. the Anchor tag). In addition the attributes 'rel' and 'rev' will be used to define relationship types (again see examples).

RDFa attributes

RDFa attributes are defined in ref. 5. The common extra attributes are: property, datatype, about, resource and typeof. Also 'rev' and 'rel' attributes can use ontological references to types available on the web (such as FOAF (<http://xmlns.com/foaf>) and DBpedia (<http://dbpedia.org>) or to other definitions described elsewhere via the Read API (such as DSDs, code lists, concepts).

All SDMX types shall be annotated using the SDMX ontologies at the following URL's:

```
xmns:sdmx="http://purl.org/linked-data/sdmx#"
xmns:sdmxattr="http://purl.org/linked-data/sdmx/2009/attribute#"
xmns:sdmxcode="http://purl.org/linked-data/sdmx/2009/code#"
xmns:sdmxdim="http://purl.org/linked-data/sdmx/2009/dimension#"
```

Child Resources as RDFa

An ontology is required for the general resource description used to list child resources. It is anticipated that an ONS ontology type will be created for this stipulating the properties required for the resource description. The example Dataset Discovery assumes such an ontology exists and describes this node as the class 'resource' and be published at <http://www.ons.gov.uk/linked-data#resource>.

This may define the resource as requiring title, description, source and date from the Dublin Core ontology and references to a dataset and a DSD from the SDMX ontology. These are all defined using the 'rel' attribute of the anchor tag. Also there may be a number of child relationships with the same association but with different formats defined eg HTML and XML. These can be listed using the anchor 'type' attribute giving the mime type.

Parent Resource as RDFa

The parent of the URL context will be defined by an anchor tag with a 'rev' property defining this resource's relationship to its parent (a 'rel' could also be used to define the parent relationship to this resource).

All this is demonstrated in the later section XHTML Examples 2. Dataset Discovery. This includes query syntax examples for extracting data using XPath and JQuery.

Validation and Interaction Tools

All RDFa generated can be validated using the W3C XHTML validation service at ref. 6. Various browser plugins and editors are available at ref. 7.

XHTML Examples

1. Generic RDFa

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
      xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
      xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
      xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
      xmlns:cc="http://creativecommons.org/ns#"
      xmlns:dc="http://purl.org/dc/elements/1.1/"
      xmlns:foaf="http://xmlns.com/foaf/0.1/">
  <head profile="http://www.w3.org/1999/xhtml/vocab">
    <title>Alice in Semantic Wonderland</title>
    <base href="http://example.com/alice"></base>
    <link rel="stylesheet" type="text/css" href="http://www.w3.org/TR/2008/NOTE-xhtml-rdfa-primer-20081014/style.css" />
  </head>
  <body>
    <div about="http://dbpedia.org/resource/Albert_Einstein">
      <span property="foaf:name">Albert Einstein</span>
      <span property="dbp:dateOfBirth" datatype="xsd:date">1879-03-14</span>
      <div rel="dbp:birthPlace" resource="http://dbpedia.org/resource/Germany">
        <span property="dbp:conventionalLongName">Federal Republic of Germany</span>
      </div>
    </div>
  </body>
</html>
```

2. Dataset Discovery

```
<?xml version="1.0" encoding="UTF-8"?><!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN"
"http://www.w3.org/MarkUp/DTD/xhtml-rdfa-1.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-
ns#" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#
xmlns:xsd="http://www.w3.org/2001/XMLSchema#"xmlns:cc="http://creativecommons.org/ns#"
xmlns:dc="http://purl.org/dc/elements/1.1/"
xmlns:foaf="http://xmlns.com/foaf/0.1/"
xmlns:sdmx="http://purl.org/linked-data/sdmx#"
xmlns:sdmxattr="http://purl.org/linked-data/sdmx/2009/attribute#"
xmlns:sdmxcode="http://purl.org/linked-data/sdmx/2009/code#"
xmlns:sdmxdim="http://purl.org/linked-data/sdmx/2009/dimension#"
xmlns:ons="http://www.ons.gov.uk/linked-data#">
  <head profile="http://www.w3.org/1999/xhtml/vocab">
    <title>List of Datasets</title>
    <base href="http://www.statistics.gov.uk/data/contenttype/dataset/id" />
  </head>
  <body typeof="ons:resourcelist">
    <div class="title" property="dc:title">List of Datasets</div>
    <div class="parent"><a rev="ons:resourcelist" href="/WDPDSM/data/contenttype/dataset">(what
is a Dataset?)</a></div>
    <ul class="children">
      <li about="Car%20Sales%20by%20Region" typeof="ons:resource">
        <div class="title" property="dc:title">Car Sales by Region</div>
        <div class="details">
          <p class="description" property="dc:description">Sales figures for car sales by UK
region.</p>
          <a rel="sdmx:DataSet" type="application/sdmx+xml"
href="Car%20Sales%20by%20Region.xml">Download as SDMX</a> |
          <a rel="sdmx:DataSet" type="application/xhtml+xml"
href="Car%20Sales%20by%20Region.html">View as HTML</a> |
          <a rel="sdmx:DataStructureDefinition" type="application/xhtml+xml"
href="Car%20Sales%20by%20Region/contentpart/definition.xml">Data Structure Definition</a>
          <p class="infolist">
            <span property="dc:source">National Accounts</span> | <span property="dc:date"
datatype="xsd:date" content="2010-09-16T14:13:20">16/09/2010 2:13:20 PM</span>
          </p>
        </div>
      </li>
      <li about="NPP%20December" typeof="ons:resource">
        <div class="title" property="dc:title">NPP December</div>
        <div class="details">
          <p class="description" property="dc:description">National Population Projections for
December.</p>
          <a rel="sdmx:DataSet" type="application/sdmx+xml" href="NPP%20December.xml">Download
as SDMX</a> |
          <a rel="sdmx:DataSet" type="application/xhtml+xml" href="NPP%20December.html">View
as HTML</a> |
          <a rel="sdmx:DataStructureDefinition" type="application/xhtml+xml"
href="NPP%20December/contentpart/definition.xml">Data Structure Definition</a>
          <p class="infolist">
            <span property="dc:source">NPP</span> | <span property="dc:date" datatype="xsd:date"
content="2010-09-17T16:14:10">17/09/2010 4:14:10 PM</span>
          </p>
        </div>
      </li>
      <li about="C1%20Gender%20by%20Religion" typeof="ons:resource">
        <div class="title" property="dc:title">C1 Gender by Religion</div>
        <div class="details">
          <p class="description" property="dc:description">Gender against Religion breakdown
for the UK.</p>
          <a rel="sdmx:DataSet" type="application/sdmx+xml"
href="C1%20Gender%20by%20Religion.xml">Download as SDMX</a> |
          <a rel="sdmx:DataSet" type="application/xhtml+xml"
href="C1%20Gender%20by%20Religion.html">View as HTML</a> |
          <a rel="sdmx:DataStructureDefinition" type="application/xhtml+xml"
href="C1%20Gender%20by%20Religion/contentpart/definition.xml">Data Structure Definition</a>
          <p class="infolist">
            <span property="dc:source">Census 2001</span> | <span property="dc:date"
datatype="xsd:date" content="2010-10-26T20:23:40">26/10/2010 8:23:40 PM</span>
          </p>
        </div>
      </li>
    </ul>
  </body>
</html>
```

```

    </div>
  </li>
</ul>
</body>
</html>

```

3. Nodes Example

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-
rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:cc="http://creativecommons.org/ns#"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:sdmx="http://purl.org/linked-data/sdmx#"
  xmlns:sdmxattr="http://purl.org/linked-data/sdmx/2009/attribute#"
  xmlns:sdmxcode="http://purl.org/linked-data/sdmx/2009/code#"
  xmlns:sdmxdim="http://purl.org/linked-data/sdmx/2009/dimension#"
  xmlns:ons="http://www.ons.gov.uk/linked-data#">
  <head profile="http://www.w3.org/1999/xhtml/vocab">
    <title>Node: contenttype/dataset</title>
    <base href="http://www.statistics.gov.uk/data/" />
  </head>
  <body typeof='ons:resourcelist'>
    <div class="title" property="dc:title">Node: contenttype/dataset</div>
    <div class="details">
      <p class="description" property="dc:description">A dataset is a multidimensional cube
of data, usually about a single topic (e.g. unemployment). When represented in SDMX, it
consists of two parts - structure and data. The structure part can be further broken down into
dimensions, codelists, metadata etc.</p>
    </div>
    <div class="parent">
      <div class="title" property="dc:title">Parent Node: contenttype </div>
      <a rev="ons:resourcelist" href="contenttype">(List of contenttypes)</a>
    </div>
    <ul class="children">
      <li about="id" typeof="ons:resource">
        <div class="child">
          <div class="title" property="dc:title">Child Node: contenttype/dataset/id </div>

          <a rev="ons:resourcelist" href="contenttype/dataset/id">(List of ids)</a>
        </div>
      </li>
    </ul>
  </body>
</html>

```

4. Search Example

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML+RDFa 1.0//EN" "http://www.w3.org/MarkUp/DTD/xhtml-
rdfa-1.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
  xmlns:cc="http://creativecommons.org/ns#"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:sdmx="http://purl.org/linked-data/sdmx#"
  xmlns:sdmxattr="http://purl.org/linked-data/sdmx/2009/attribute#"
  xmlns:sdmxcode="http://purl.org/linked-data/sdmx/2009/code#"
  xmlns:sdmxdim="http://purl.org/linked-data/sdmx/2009/dimension#"

```

```

xmlns:ons="http://www.ons.gov.uk/linked-data#">
  <head profile="http://www.w3.org/1999/xhtml/vocab">
<title>Search Results</title>
<base href="http://www.statistics.gov.uk/data/" />
  </head>
  <body typeof='ons:resourcelist'>
<div class="title" property="dc:title">Search Results</div>
<div class="details">
  <p class="title" property="dc:title">Time Used</p><p class="timeused"
property="ons:timeused">1.35</p>
  <p class="title" property="dc:title">Maximum Rank</p> <p class="maxrank"
property="ons:maxrank">2</p>
  <p class="title" property="dc:title">Total Hits</p><p class="totalhits"
property="ons:totalhits">2</p>
  <p class="title" property="dc:title">Query Text</p> <p class="originalquery"
property="ons:originalquery">redundancies AND sector</p>
  </div>
  <div class="title" property="dc:title">Hits</div>
  <ul class="searchresults">
    <li about="hit 1" typeof="ons:resource"><div class="title" property="dc:title">Hit
1</div>
      <div class="fields">
        <p class="title" property="dc:title">Content Title</p><p class="title">Redundancies
in the Public Sector 2010</p>
        <p class="title" property="dc:title">Content URL</p><p
class="url">redundacy_public_10.xml</p>
        <p class="title" property="dc:title">Body</p><p class="body">Blah Balh Blah</p>
        <p class="title" property="dc:title">Size in bytes</p><p class="size">123456</p>
        <p class="title" property="dc:title">Date Last Updates</p><p
class="datemodified">01/01/2011</p>
      </div>
    </li>
    <li about="hit 2" typeof="ons:resource"> <div class="title" property="dc:title">Hit
2</div>
      <div class="fields">
        <p class="title" property="dc:title">Content Title</p><p
class="title">Redundancies in the Private Sector 2010</p>
        <p class="title" property="dc:title">Content URL</p><p
class="url">redundacy_private_10.xml</p>
        <p class="title" property="dc:title">Body</p><p class="body">Blah Balh Blah</p>
        <p class="title" property="dc:title">Size in bytes</p><p class="size">123496</p>
        <p class="title" property="dc:title">Date Last Updated</p><p
class="datemodified">01/01/2011</p>
      </div>
    </li>
  </ul>
  <div class="title" property="dc:title">Categories</div>
  <ul class="categories">
    <li about="hit 1" typeof="ons:resource">
      <p class="title" property="dc:title">Coverage</p><p class="coverage"
property="ons:coverage">England and Wales</p>
      <p class="title" property="dc:title">Content Type</p><p class="contenttype"
property="ons:contenttype">statistical bulletin</p>
      <p class="title" property="dc:title">Rank</p><p class="rank"
property="ons:rank">1</p>
    </li>
    <li about="hit 1" typeof="ons:resource">
      <p class="title" property="dc:title">Coverage</p><p class="coverage"
property="ons:coverage">England and Wales</p>
      <p class="title" property="dc:title">Content Type</p> <p class="contenttype"
property="ons:contenttype">statistical bulletin</p>
      <p class="title" property="dc:title">Rank</p><p class="rank"
property="ons:rank">2</p>
    </li>
  </ul>
  <div class="title" property="dc:title">Suggestions</div>
  <ul class="suggestions">

```

```

    <li about="Suggestion 1" typeof="ons:resource"><div class="title"
property="dc:title">Suggestion 1</div>
    <p class="title" property="dc:title">Did you mean</p><p class="didyoumean"
typeof="ons.resource">redundacies AND sex</p>
    </li>
  </ul>
</body>
</html>

```

Query Syntax

XPATH Examples for Dataset Discovery

Resource title:

```
//body[@typeof='ons:resourcelist']/div[@property='dc:title']
```

Resource parent URL:

```
//*[typeof='ons:resourcelist']/*[@rev='ons:resourcelist']/@href
```

Resource children:

```
//*[typeof='ons:resourcelist']/*[@typeof='ons:resource']
```

First child title:

```
//*[typeof='ons:resourcelist']/li[@typeof='ons:resource'][1]/*[@property='dc:title']
```

First child description:

```
//*[typeof='ons:resourcelist']/*[@typeof='ons:resource'][1]/*[@property='dc:description']
```

First child source:

```
//*[typeof='ons:resourcelist']/li[@typeof='ons:resource'][1]/*[@property='dc:source']
```

First child publish date:

```
//*[typeof='ons:resourcelist']/*[@typeof='ons:resource'][1]/*[@property='dc:date']/@content
```

First child dataset as SDMX URL:

```
//*[typeof='ons:resourcelist']/li[@typeof='ons:resource'][1]//a[@rel='sdmx:DataSet' and
@type='application/sdmx+xml']/@href
```

First child dataset as XHTML URL:

```
//*[typeof='ons:resourcelist']/*[@typeof='ons:resource'][1]/*[@rel='sdmx:DataSet' and
@type='application/xhtml+xml']/@href
```

First child dataset structure definition URL:

```
//*[typeof='ons:resourcelist']/li[@typeof='ons:resource'][1]//a[@rel='sdmx:DataStructureDefi
nition']/@href
```

JQuery Examples for Dataset Discovery

Resource title:

```
$("#body div[property='dc\\:title']")
```

Resource parent URL:

```
$("#*[typeof*='resourcelist' *[@rev*='resourcelist']").attr("href")
```

First child dataset as SDMX URL:

```
$("#body[typeof*='resourcelist' li[typeof*='resource']:first
a[rel='sdmx\\:DataSet'][type*='sdmx']").attr("href")
```

E4X Examples for Dataset Discovery

Resource title:

```
.xhtml::body.(attribute('typeof')='ons:resourcelist').xhtml::div.(attribute('property')='dc:
title');
```

Resource parent URL:

```
.html::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::a.(attribute('rev')== 'ons:resourcelist').@href;
```

Resource children:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::*.(attribute('typeof')== 'ons:resource');
```

First child title:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::div.(attribute('property')== 'dc:title');
```

First child description:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('property')== 'dc:description');
```

First child source:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('property')== 'dc:source');
```

First child publish date:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('property')== 'dc:date').@content;
```

First child dataset as SDMX URL:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('rel')== 'sdmx:DataSet' && attribute('type')== 'application/sdmx+xml').@href;
```

First child dataset as HTML URL:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('rel')== 'sdmx:DataSet' && attribute('type')== 'application/xhtml+xml').@href;
```

First child dataset structure definition URL:

```
.xhtml::body.(attribute('typeof')== 'ons:resourcelist')..xhtml::li[0].(attribute('typeof')== 'ons:resource')..xhtml::*.(attribute('rel')== 'sdmx:DataStructureDefinition').@href;
```

N.B the E4X examples were testing in Adobe Flex 3, requiring a namespace definition for XHTML: `private var xhtml:Namespace = new Namespace("http://www.w3.org/1999/xhtml");`

Appendix B SDMX Sample Output

```
<?xml version="1.0" encoding="UTF-8" ?>
<ons:dataPackage xmlns:ons="http://www.ons.gov.uk/schemas">
<Structure xmlns="http://www.SDMX.org/resources/SDMXXML/schemas/v2_0/message"
  xmlns:structure="http://www.SDMX.org/resources/SDMXXML/schemas/v2_0/structure"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.SDMX.org/resources/SDMXXML/schemas/v2_0/message SDMXMessage.xsd">
<Header>
  <ID>REGISTRY_RESPONSE</ID>
  <Test>true</Test>
  <Truncated>false</Truncated>
  <Prepared>2010-03-01T12:18:30</Prepared>
  <Sender id="ONS" />
  <Extracted>2010-10-04T12:57:34</Extracted>
</Header>
<CodeLists>
<structure:CodeList id="Date" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">Date</structure:Name>
<structure:Code value="2000Q1" urn="">
  <structure:Description xml:lang="en">2000Q1</structure:Description>
</structure:Code>
</structure:CodeList>
<structure:CodeList id="res_sector" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">res_sector</structure:Name>
<structure:Code value="S_11001" urn="">
  <structure:Description xml:lang="en">Public non-financial corporatio</structure:Description>
</structure:Code>
<structure:Code value="S_11PR" urn="">
  <structure:Description xml:lang="en">Private non-financial corporati</structure:Description>
</structure:Code>
<structure:Code value="S_125" urn="">
  <structure:Description xml:lang="en">Insurance corporations and pens</structure:Description>
</structure:Code>
<structure:Code value="S_1311" urn="">
  <structure:Description xml:lang="en">Central government</structure:Description>
</structure:Code>
<structure:Code value="S_1313" urn="">
  <structure:Description xml:lang="en">Local government</structure:Description>
</structure:Code>
<structure:Code value="S_14" urn="">
  <structure:Description xml:lang="en">Households</structure:Description>
</structure:Code>
<structure:Code value="S_15" urn="">
  <structure:Description xml:lang="en">NPISH (non-profit institutions</structure:Description>
</structure:Code>
<structure:Code value="S_2" urn="">
  <structure:Description xml:lang="en">Rest of the world</structure:Description>
</structure:Code>
</structure:CodeList>
<structure:CodeList id="transaction" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">transaction</structure:Name>
<structure:Code value="D_91N1" urn="">
  <structure:Description xml:lang="en">Inheritance tax</structure:Description>
</structure:Code>
<structure:Code value="D_91N2" urn="">
  <structure:Description xml:lang="en">Tax on other capital transfers</structure:Description>
</structure:Code>
<structure:Code value="D_91N3" urn="">
  <structure:Description xml:lang="en">Development land tax and other</structure:Description>
</structure:Code>
<structure:Code value="D_92N1" urn="">
  <structure:Description xml:lang="en">Grants from EU regional develop</structure:Description>
</structure:Code>
<structure:Code value="D_92N2" urn="">
  <structure:Description xml:lang="en">Grants from EU agricultural gua</structure:Description>
```

```

</structure:Code>
<structure:Code value="D_92N3" urn="">
  <structure:Description xml:lang="en">Other investment grants</structure:Description>
</structure:Code>
<structure:Code value="D_99N1" urn="">
  <structure:Description xml:lang="en">Migrants transfers</structure:Description>
</structure:Code>
<structure:Code value="D_99N2" urn="">
  <structure:Description xml:lang="en">Debt forgiveness</structure:Description>
</structure:Code>
<structure:Code value="D_99N3" urn="">
  <structure:Description xml:lang="en">Other capital transfers</structure:Description>
</structure:Code>
</structure:CodeList>
<structure:CodeList id="use_sector" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">use_sector</structure:Name>
<structure:Code value="S_11001" urn="">
  <structure:Description xml:lang="en">Public non-financial corporatio</structure:Description>
</structure:Code>
<structure:Code value="S_11PR" urn="">
  <structure:Description xml:lang="en">Private non-financial corporati</structure:Description>
</structure:Code>
<structure:Code value="S_12MF" urn="">
  <structure:Description xml:lang="en">Monetary financial corporations</structure:Description>
</structure:Code>
<structure:Code value="S_125" urn="">
  <structure:Description xml:lang="en">Insurance corporations and pens</structure:Description>
</structure:Code>
<structure:Code value="S_1311" urn="">
  <structure:Description xml:lang="en">Central government</structure:Description>
</structure:Code>
<structure:Code value="S_1313" urn="">
  <structure:Description xml:lang="en">Local government</structure:Description>
</structure:Code>
<structure:Code value="S_14" urn="">
  <structure:Description xml:lang="en">Households</structure:Description>
</structure:Code>
<structure:Code value="S_2" urn="">
  <structure:Description xml:lang="en">Rest of the world</structure:Description>
</structure:Code>
</structure:CodeList>
</CodeLists>
<Concepts>
<structure:ConceptScheme id="ONS_CROSS_DOMAIN_CONCEPTS" agencyID="ONS" version="1.0"
  isFinal="true">
  <structure:Name xml:lang="en">ONS Cross Domain Concept Scheme</structure:Name>
<structure:Concept id="Date">
  <structure:Name xml:lang="en">Time Period</structure:Name>
</structure:Concept>
</structure:ConceptScheme>
<structure:ConceptScheme id="dataset4_CONCEPTS" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">dataset4 concept Scheme</structure:Name>
<structure:Concept id="res_sector">
  <structure:Name xml:lang="en">res_sector</structure:Name>
</structure:Concept>
<structure:Concept id="transaction">
  <structure:Name xml:lang="en">transaction</structure:Name>
</structure:Concept>
<structure:Concept id="use_sector">
  <structure:Name xml:lang="en">use_sector</structure:Name>
</structure:Concept>
</structure:ConceptScheme>
<structure:ConceptScheme id="use_sector" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">use_sector concept scheme</structure:Name>
<structure:Concept id="S_11001">
  <structure:Name xml:lang="en">Public non-financial corporatio</structure:Name>
</structure:Concept>
<structure:Concept id="S_11PR">

```

```
<structure:Name xml:lang="en">Private non-financial corporati</structure:Name>
</structure:Concept>
<structure:Concept id="S_12MF">
  <structure:Name xml:lang="en">Monetary financial corporations</structure:Name>
</structure:Concept>
<structure:Concept id="S_125">
  <structure:Name xml:lang="en">Insurance corporations and pens</structure:Name>
</structure:Concept>
<structure:Concept id="S_1311">
  <structure:Name xml:lang="en">Central government</structure:Name>
</structure:Concept>
<structure:Concept id="S_1313">
  <structure:Name xml:lang="en">Local government</structure:Name>
</structure:Concept>
<structure:Concept id="S_14">
  <structure:Name xml:lang="en">Households</structure:Name>
</structure:Concept>
<structure:Concept id="S_2">
  <structure:Name xml:lang="en">Rest of the world</structure:Name>
</structure:Concept>
</structure:ConceptScheme>
</Concepts>
<KeyFamilies>
<structure:KeyFamily id="dataset4" agencyID="ONS" version="1.0" isFinal="true">
  <structure:Name xml:lang="en">dataset4</structure:Name>
<structure:Components>
  <structure:Dimension conceptRef="res_sector" conceptSchemeRef="dataset4_CONCEPTS"
  conceptSchemeVersion="1.0" conceptSchemeAgency="ONS" codelist="res_sector" codelistVersion="1.0"
  codelistAgency="ONS" crossSectionalAttachSection="true" />
  <structure:Dimension conceptRef="transaction" conceptSchemeRef="dataset4_CONCEPTS"
  conceptSchemeVersion="1.0" conceptSchemeAgency="ONS" codelist="transaction" codelistVersion="1.0"
  codelistAgency="ONS" crossSectionalAttachSection="true" />
  <structure:Dimension conceptRef="use_sector" conceptSchemeRef="dataset4_CONCEPTS"
  conceptSchemeVersion="1.0" conceptSchemeAgency="ONS" codelist="use_sector" codelistVersion="1.0"
  codelistAgency="ONS" crossSectionalAttachObservation="true" isMeasureDimension="true" />
  <structure:TimeDimension conceptRef="Date" conceptSchemeRef="ONS_CROSS_DOMAIN_CONCEPTS"
  conceptSchemeVersion="1.0" conceptSchemeAgency="ONS" codelist="Date" codelistVersion="1.0"
  codelistAgency="ONS" crossSectionalAttachGroup="true" />
  <structure:PrimaryMeasure conceptRef="OBS_VALUE" conceptSchemeRef="ONS_CROSS_DOMAIN_CONCEPTS"
  conceptSchemeVersion="1.0" conceptSchemeAgency="ONS" />
  <structure:CrossSectionalMeasure conceptRef="S_11001" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_11001"
  />
  <structure:CrossSectionalMeasure conceptRef="S_11PR" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_11PR"
  />
  <structure:CrossSectionalMeasure conceptRef="S_12MF" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_12MF"
  />
  <structure:CrossSectionalMeasure conceptRef="S_125" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_125"
  />
  <structure:CrossSectionalMeasure conceptRef="S_1311" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_1311"
  />
  <structure:CrossSectionalMeasure conceptRef="S_1313" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_1313"
  />
  <structure:CrossSectionalMeasure conceptRef="S_14" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_14" />
  <structure:CrossSectionalMeasure conceptRef="S_2" conceptSchemeRef="use_sector"
  conceptSchemeAgency="ONS" conceptSchemeVersion="1.0" measureDimension="use_sector" code="S_2" />
</structure:Components>
</structure:KeyFamily>
</KeyFamilies>
</Structure>
<CrossSectionalData xmlns="http://www.SDMX.org/resources/SDMXXML/schemas/v2_0/message"
  xmlns:wdp="urn:sdmx:org.sdmx.infomodel.keyfamily.KeyFamily=ONS:dataset4:1.0:cross"
```

```
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.SDMX.org/resources/SDMXML/schemas/v2_0/message_SDMXMessage.xsd
urn:sdmx:org.sdmx.infomodel.keyfamily.KeyFamily=ONS:false:1.0:cross_ONS_dataset4_Cross.xsd">
<Header>
  <ID>REGISTRY_RESPONSE</ID>
  <Test>>true</Test>
  <Truncated>>false</Truncated>
  <Name xml:lang="en">Trans46302</Name>
  <Prepared>2010-03-25T09:30:47-05:00</Prepared>
<Sender id="EN1">
  <Name xml:lang="en">Office for National Statistics</Name>
<Contact>
  <Name xml:lang="en">J Hibbert</Name>
  <Department xml:lang="en">Statistics</Department>
  <Role xml:lang="en">Director</Role>
  <Telephone>210 1111111</Telephone>
  <Fax>210 1110999</Fax>
  <URI>www.ons.gov.uk</URI>
  <Email>smith@sdmx.com</Email>
</Contact>
</Sender>
<DataSetAgency>ONS</DataSetAgency>
<DataSetID>dataset4</DataSetID>
<DataSetAction>Information</DataSetAction>
<Extracted>2010-10-04T12:57:34</Extracted>
</Header>
<wdp:DataSet>
  <wdp:Group Date="2000Q1">
    <wdp:Section res_sector="S_11001" transaction="D_91N1">
      <wdp:S_11001 value="" />
      <wdp:S_11PR value="10" />
      <wdp:S_12MF value="" />
      <wdp:S_125 value="" />
      <wdp:S_1311 value="73" />
      <wdp:S_1313 value="136" />
      <wdp:S_14 value="180" />
      <wdp:S_2 value="" />
    </wdp:Section>
    <wdp:Section res_sector="S_11001" transaction="D_91N2">
      <wdp:S_11001 value="" />
      <wdp:S_11PR value="11" />
      <wdp:S_12MF value="" />
      <wdp:S_125 value="" />
      <wdp:S_1311 value="74" />
      <wdp:S_1313 value="137" />
      <wdp:S_14 value="181" />
      <wdp:S_2 value="" />
    </wdp:Section>
    <!-- data omitted -->
    <wdp:Section res_sector="S_2" transaction="D_99N2">
      <wdp:S_11001 value="8" />
      <wdp:S_11PR value="" />
      <wdp:S_12MF value="53" />
      <wdp:S_125 value="" />
      <wdp:S_1311 value="134" />
      <wdp:S_1313 value="" />
      <wdp:S_14 value="204" />
      <wdp:S_2 value="" />
    </wdp:Section>
    <wdp:Section res_sector="S_2" transaction="D_99N3">
      <wdp:S_11001 value="9" />
      <wdp:S_11PR value="" />
      <wdp:S_12MF value="54" />
      <wdp:S_125 value="" />
      <wdp:S_1311 value="135" />
      <wdp:S_1313 value="" />
      <wdp:S_14 value="205" />
      <wdp:S_2 value="" />
    </wdp:Section>
  </wdp:Group>
</DataSet>

```

```
</wdp:Section>  
</wdp:Group>  
</wdp:DataSet>  
</CrossSectionalData>  
</ons:dataPackage>
```