GENERATING DYNAMIC INTERFACES

&

AUTOMATING DATA EXTRACTION

Presenters: Ron Elazar & Dharmik Jeena

SAS New South Wales User Group (SNUG) – 22nd May 2014
Audience Participation
Objectives

The focus of our presentation will be on:

1. Background
2. Benefits of using a dynamic interface
3. SAS interaction with Microsoft Excel
4. Automating data updates
5. Tips & tricks
6. Questions

Disclaimer:
Note that the views expressed in this presentation are the views of the authors and do not necessarily reflect the views and opinion of Westpac in any way.
**Background**

**Purpose**
*To get information from external sources in a quick and efficient manner, which is readily available for business use*

**Dynamic Interface**
*A tool allowing users to obtain any data they need, displayed in any way they want, as often as they like. In other words- tailor made to suit your needs!*
Benefits of using a Dynamic Interface

The advantages of using interfaces with automation to link data and insights are:

1. Alleviating stress
2. Reducing human error
3. Simplifying processes
4. Mitigating operational risks and reducing business costs
5. Improving response times to business stakeholders
6. Allows greater focus on insights and analysis

Dynamic interfaces are even better as they provide greater flexibility for users
SAS Interaction with Microsoft Excel – Part 1 (Process Flow)

Step 1

– Excel ‘pushes’ data to SAS and kick-starts SAS programs

I. Define your data in terms of Named Ranges in Excel

II. Establish connection between SAS and Excel

III. Write to SAS tables and submit code from Excel

Note that when the SAS connection closes, all temporary files are deleted
SAS Interaction with Internet – Part 1 (Process Flow)

Step 2

- SAS queries the internet using data ‘pushed’ to SAS

  ▪ **Filename** `web url “<website>” recfm = <> lrecl = <> proxy= <>;`

    (Data in <> obtained from Step 1)

  ▪ Direct download for nearly all file types including Rich Site Summary (RSS)

    Requires an XML map to read data from HTML to SAS
    (free software available online)
Step 3

- Internet responds by sending back data
  - **Filename** local “<file hyperlink>” recfm = <> lrecl = <>;
  - **Formatting and cleansing** data for use
Step 4

− Excel ‘pulls’ data from SAS and displays on Dashboard

  ▪ **SAS Add-in** for Microsoft Office and Pivot Tables
Automating Data Updates (Interface - Illustration)

## Input Data Sources

### Proxy Server

<table>
<thead>
<tr>
<th>Location</th>
<th>Host</th>
<th>Port</th>
<th>UNIX Username</th>
<th>UNIX Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Westpac</td>
<td>&lt;internal proxy server&gt;</td>
<td>&lt;port no&gt;</td>
<td>&lt;username&gt;</td>
<td>&lt;password&gt;</td>
</tr>
</tbody>
</table>

### Output

<table>
<thead>
<tr>
<th>Location</th>
<th>TableName</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;output library&gt;</td>
<td>&lt;output file name&gt;</td>
</tr>
</tbody>
</table>

### Website Direct Download

<table>
<thead>
<tr>
<th>No.</th>
<th>Detail</th>
<th>Website</th>
<th>WorkbookName</th>
<th>WorksheetName</th>
<th>ColumnDataName</th>
<th>ColumnValueName</th>
<th>OutputValueName</th>
<th>DateUpdated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RBA Cash Rate</td>
<td><a href="http://www.rba.gov">http://www.rba.gov</a></td>
<td>f01hist</td>
<td>Data</td>
<td>f1 INTEREST RATES AND YIELDS</td>
<td>f5</td>
<td>Cash_rate_90_days</td>
<td>22/05/2014</td>
</tr>
<tr>
<td>2</td>
<td>Gross Domestic Product</td>
<td><a href="http://www.rba.gov">http://www.rba.gov</a></td>
<td>g10hist</td>
<td>Data</td>
<td>G10 GROSS DOMESTIC PRODUC</td>
<td>f2</td>
<td>Gross_Domestic_Produ</td>
<td>22/05/2014</td>
</tr>
<tr>
<td>3</td>
<td>Consumer Price Index</td>
<td><a href="http://www.rba.gov">http://www.rba.gov</a></td>
<td>g02hist</td>
<td>Data</td>
<td>G2 CONSUMER PRICE INDEXn</td>
<td>f2</td>
<td>Consumer_Price_Index</td>
<td>22/05/2014</td>
</tr>
<tr>
<td>4</td>
<td>Unemployment Rate</td>
<td><a href="http://www.rba.gov">http://www.rba.gov</a></td>
<td>g07hist</td>
<td>Data</td>
<td>G7 LABOUR FORCEn</td>
<td>f9</td>
<td>Unemployment_Rate</td>
<td>22/05/2014</td>
</tr>
</tbody>
</table>

### Website Rich Site Summary (RSS) Download

<table>
<thead>
<tr>
<th>No.</th>
<th>Detail</th>
<th>Website</th>
<th>XMLMap</th>
<th>DateUpdated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Foreign Currency Exchange Rates</td>
<td><a href="http://www.rba.gov">http://www.rba.gov</a></td>
<td>&lt;text file with xml map&gt;</td>
<td>22/05/2014</td>
</tr>
</tbody>
</table>
Automating Data Updates (Interface - Components)

<table>
<thead>
<tr>
<th>No.</th>
<th>Macro</th>
<th>Code</th>
</tr>
</thead>
</table>
| 1   | Initialize | libname _all_ clear; %include 'C:\Documents and Settings\Initialize.sas';
|     |            | %let user= <username>;
|     |            | %let pwd = <password>;
|     |            | %let server = <internal proxy server>:<port no>;
|     |            | %put &user. &pwd. &server. global;                                   |
1. Click on the “SAS” tab
2. Select “SAS Data”
3. Click “Browse” and find the location of your SAS output set
4. Choose to show the SAS output either in full form in a worksheet or summarised in a pivot table
5. Click OK!
Automating Data Updates (Interface - Results)

**Results**

<table>
<thead>
<tr>
<th>No.</th>
<th>Country</th>
<th>Economic Indicator</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Australia</td>
<td>Unemployment Rate</td>
<td>Change</td>
</tr>
<tr>
<td>2</td>
<td>USA</td>
<td>Unemployment Rate</td>
<td>Change</td>
</tr>
</tbody>
</table>

**Change in Unemployment Rate - Australia**

**Change in Unemployment Rate - United States**
# Tips & Tricks

We have included some useful tips & tricks to assist with troubleshooting issues.

<table>
<thead>
<tr>
<th>No.</th>
<th>Tip &amp; Trick</th>
<th>Issue</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Extracting web data</td>
<td>Additional authentication data required when accessing website data from a work computer</td>
<td>Enter details of proxy server, workplace username and password and computer domain in SAS query</td>
</tr>
</tbody>
</table>

```sas
%Macro web_xls_import(user=,pwd=);  
%let user= <workplace username>;  
%let pwd= <workplace password>;  
%let server = "<proxy server>:<proxy server port>/";  
%let website = <website link to file>;  
%let file = <website file name>;  
%let output = <location to save file>;  
%let comp-domain = <domain>;  

filename web url "&website." recfm=n lrecl=32756 proxy=&server user="&user." pass="&pwd." puser="&comp-domain."&user." ppass="&pwd.";
filename out "&output."&file..xls" recfm=n lrecl=32756;

data _null_;  
   infile web;  
   file out;  
   input;  
   put _infile_ ;
run;
%Mend web_xls_import; %web_xls_import;
```
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<thead>
<tr>
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<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Log files</td>
<td>SAS Workspace Manager removes temporary files when SAS closed</td>
<td>Use <code>logFile</code> and <code>writeLog</code> methods in the Excel VBA code that opens SAS</td>
</tr>
</tbody>
</table>

```vba
logFile = Range("out_path").Value & "\LOG " & Format(Now, "DD.MMM.YYYY HH.MM.SS.AM/PM") & ".log"
writeLog obWS.LanguageService.FlushLog(100000)
```
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<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Automation</td>
<td>Once process set up in SAS EG can automate code runs especially for daily web data extraction</td>
<td>Use SAS Management Console using the schedule manager to deploy SAS programs automatically</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>No.</th>
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<th>Issue</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Excel – SAS Interaction</td>
<td>Configuration requirements in Excel-VBA and SAS</td>
<td>Enable/ declare the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Excel VBA References: SAS IOM, ActiveX Data Objects (ADO)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- SASWorkspaceManager</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- ADODB.Connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- ADODB.Recordset</td>
</tr>
</tbody>
</table>
Questions