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Dynamic Web-Enabled Data Collection



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Introduction

- ⇒ Web-based Data Collection Forms
- ⇒ Error Trapping
 - ⇒ Server Side Validation
 - ⇒ Client Side Validation
- ⇒ Dynamic generation of web pages with Scripting
- ⇒ Using SAS to write HTML and JavaScript "on-the-fly"
- ⇒ FILESRV Utility

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Overview

- ⇒ Thin client (browser-based) collection of information
- ⇒ Traditionally, SAS has relied on server-side processing
- ⇒ More efficient to pre-process on the client-side and post-process on the server-side
- ⇒ Technologies reviewed:
 - ⇒ SAS/IntrNet, HTML, JavaScript

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Typical Browser Form Header

```
<FORM name="TheForm" method="POST"
      action="http://some-server/cgi-bin/broker.exe"
>
<INPUT type=hidden name="_service" value="default">
<INPUT type=hidden name="_program" value="saspgm">
<INPUT type=hidden name="_debug" value="0">

    Form Fields Go Here

<INPUT type=submit value="Submit Data">
</FORM>
```

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Common Field Types

⇒ Text Entry Field

```
<INPUT type=text name=company size=30 maxlength=60>
```

⇒ SAS sees:

```
%global company ;

company = symget('company') ;
```

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Common Field Types

⇒ Radio Button

```
<INPUT name=Q01 type=radio value=1 checked> Text A
<INPUT name=Q01 type=radio value=2> Text B
<INPUT name=Q01 type=radio value=3> Text C
```

- ⇒ Returns a single *name-value* pair
 - ⇒ One variable - Q01
 - ⇒ Possible values 1, 2, or 3
 - ⇒ *checked* is optional - defines a default button

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Common Field Types

⇒ Check Boxes

```
<INPUT name=Q03a type=checkbox value=1> Text A  
<INPUT name=Q03b type=checkbox value=1> Text B  
<INPUT name=Q03c type=checkbox value=1> Text C
```

⇒ Returns multiple *name-value* pairs

- ⇒ Multiple variables
- ⇒ Only those variables checked are returned
- ⇒ Use %global to include all variables
- ⇒ Use CHECKED to pre-select check boxes

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Dynamic SAS HTML Template

```
DATA _null_ ;  
FILE _webout ;  
IF (_n_ eq 1) then do ;  
  PUT 'content-type: text/html' ;  
  PUT ;  
  PUT '<HEAD><TITLE>some title goes here</TITLE>'  
    / '<some more html goes here>'  
    / '</HEAD>'  
    / '<FORM action = " ' "%superq(_url)" ' ">'  
    / '<INPUT type=hidden name="_service"  
      value = " ' "%superq(_service)" ' ">'  
END ;
```

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Typical SAS Program Flow

```
DATA _null_ ;  
  validate inputs  
  generate error page if appropriate  
RUN ;  
DATA steps & PROC steps  
  - process inputs  
  - run reports  
  - generate feedback to user  
RUN ;
```

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Macro Program Control

```
%local errorflag ;
DATA _null_ ;
  validate inputs
  generate error page if appropriate
  %let errorflag = Y ;
RUN ;
%IF &errorflag ne Y %THEN %DO ;
DATA steps & PROC steps
  - process inputs
  - run reports
  - generate feedback to user
RUN ;
%END
```

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RUN Cancel ;

```
%let cancel = ;
DATA _null_ ;
  validate inputs
  generate error page if appropriate
  call symput('cancel','cancel') ;
RUN ;
DATA steps & PROC steps
  - process inputs
  - run reports
  - generate feedback to user
RUN &cancel ;
```

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Client Side Validation

- ⇒ Scripting Languages
 - ⇒ JavaScript
 - ⇒ VBScript
- ⇒ Language implementation is different across different browsers
- ⇒ Browsers may turn scripting off

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The SCRIPT Tag

External JavaScript

```
<HTML><HEAD>  
  <SCRIPT language = "JavaScript"  
    src = "http://url/MyScriptFile.js">  
  </SCRIPT>  
</HEAD>  
<BODY>  
  
</BODY></HTML>
```

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The SCRIPT Tag

InStream JavaScript

```
<HTML><HEAD>  
  <SCRIPT language = "JavaScript">  
    <!-- hide this from non-JavaScript browsers  
      function init() {  
        }  
    // -->  
  </SCRIPT>  
</HEAD>  
<BODY>  
</BODY></HTML>
```

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JavaScript Event Handlers

- ⇒ **onChange**
 - ⇒ when a field is changed
- ⇒ **onClick**
 - ⇒ when a CheckBox or Radio Button is clicked
- ⇒ **onSubmit**
 - ⇒ invoked when Form is submitted
- ⇒ **onFocus**
 - ⇒ when user enters a field
- ⇒ **onLoad**
 - ⇒ when web page is loaded or refreshed

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Using Event Handlers

⇒ Text Entry

```
< INPUT type=text name=phone  
      onChange="verifyMe(phone.value)" >
```

⇒ Radio Button or CheckBox

```
< INPUT type=radio name=price value=100  
      onClick="this.form.total.value=calcAmt( )" >
```

⇒ Form

```
< FORM name="TheForm" method="POST"  
      onLoad = "init( )" onSubmit="return validate( )" >
```

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Text onChange Event

```
< INPUT type=text name=q02  
      onChange="document.TheForm.q02g.value=CalcTot( )" >
```

```
function CalcTot( ) {  
  subtot = 0  
  if (document.TheForm.q02a.value > 0)  
    subtot = subtot + parseInt(document.TheForm.q02a.value)  
  if (document.TheForm.q02b.value > 0)  
    subtot = subtot + parseInt(document.TheForm.q02b.value)  
  ...  
  document.TheForm.q02.value = subtot  
  total = subtot  
  if (document.TheForm.q02f.value > 0)  
    total = total + parseInt(document.TheForm.q02f.value)  
  if (total > 100) alert("You can not have more than 100%")  
  else return total  
}
```

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CheckBox onClick Event

```
< INPUT type=CheckBox name=Q03a  
      onClick="checkMax(this.form )" >
```

```
function checkMax(form) {  
  var count = 0  
  if(form.Q03a.status == true) count += 1  
  if(form.Q03b.status == true) count += 1  
  ...  
  if(form.Q03k.status == true) count += 1  
  if (count > 3) alert ("Too many selected - max 3 items")  
}
```

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Form onSubmit Event

```
<FORM name="TheForm" method="POST"
  onLoad = "init()" onSubmit="return validate( )"
```

```
function validate() {
  var msg = "",msgText;
  if (document.TheForm.company.length == 0) msg+="* Name \n";
  if (document.TheForm.email.length == 0) msg+="* Email Address \n";

  if (msg.length<=2) return true;
  else {
    msgText = "- The following required field(s) are empty:\n";
    msgText+=msg;
    alert(msgText);
    return false;
  }
}
```

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Form onSubmit Event

➡ Problem:

➡ With SUBMIT button, some browsers automatically submit when the ENTER key is pressed

➡ One Solution:

```
<INPUT type= button value = "Submit Survey"
  onClick="validate( this.form )">
```

```
function validate( form ) {
  if (msg.length<=2) form.submit( ) ;
}
```

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Server-Side Processing

➡ Remember to re-validate on the Server Side

- ➡ Javascript may not have worked
- ➡ User might have by-passed edits with GET method instead of POST
- ➡ Additional power of SAS for more sophisticated edits and error-checking

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Server-Side Form Loading

```
< FORM name="TheForm" method="POST"
  onLoad = "init()" >
```

```
DATA _null_ ;
SET yourdataset end=eof ;
FILE _webout ;
IF (_n_ eq 1 ) THEN
  PUT ' <HTML><HEAD><SCRIPT language="JavaScript"> '
  /* <BR> function init() { ' ;
  PUT 'document.TheForm.A01.value = " a01 '"; '
  /* document.TheForm.A02.value = " a02 '"; '
  /* continue loading form values as appropriate */
IF (eof) THEN
  PUT ' } </SCRIPT></HEAD><BODY> '
  /* put the rest of your html page here */
```

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Check Boxes & Radio Buttons

⇒ Attribute CHECKED is true or false

```
document.TheForm.A06.checked = true
```

⇒ Radio buttons are arrays

⇒ always start with element zero

```
if (trim(A10) eq "Increase") then
  put 'document.TheForm.A10[0].checked = true ' ;
else if (trim(A10) eq "No Change") then
  put 'document.TheForm.A10[1].checked = true ' ;
else if (trim(A10) eq "Decrease") then
  put 'document.TheForm.A10[2].checked = true ' ;
```

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FILESRV Utility

⇒ Used to "serve up" external files

⇒ Version 8 SAS/IntrNet and Application Dispatcher

⇒ Files may be external or SAS catalog entries

⇒ Documentation with SAS V8 IntrNet

⇒ online at

<http://www.sas.com/rnd/web/intrnet/filesrv/filesrv.html>

⇒ Requires

⇒ an authorization dataset (provided by SAS)

⇒ an HTTP Headers dataset (provided by SAS)

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