



Amadeus - Experts in SAS



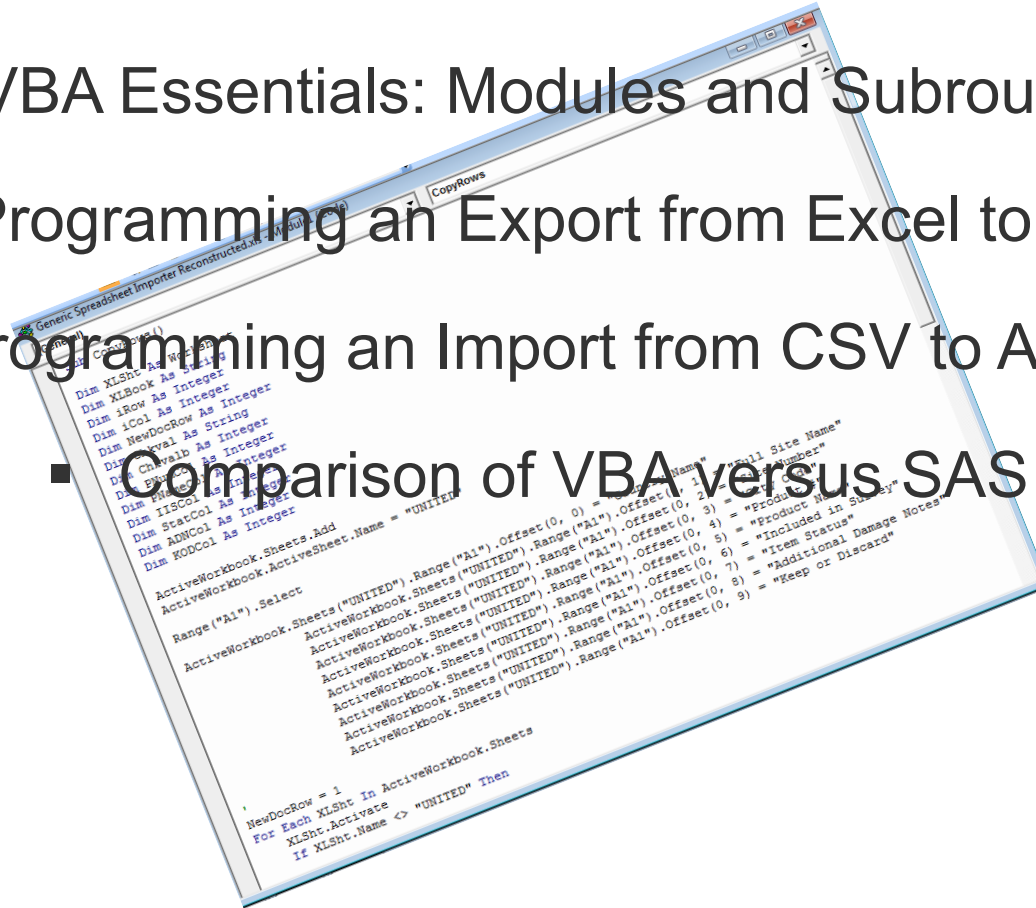
A Comparison of SAS versus Microsoft Excel and Access's Inbuilt VBA Functionality

Jozef Tarrant, Amadeus Software Ltd.



Overview

- What is VBA?
- VBA Essentials: Modules and Subroutines
- Programming an Export from Excel to CSV
- Programming an Import from CSV to Access
 - Comparison of VBA versus SAS





What is VBA?

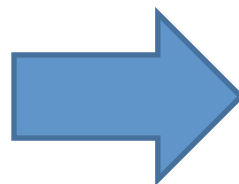
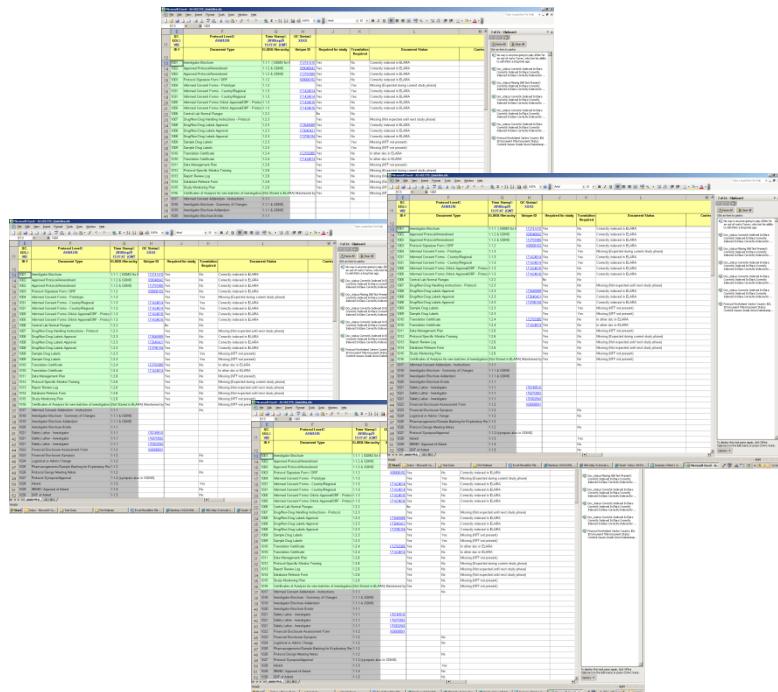
- VBA (Visual Basic for Applications) is an event-driven programming language built into most Microsoft Office applications, often informally referred to as 'Macro'.
- It allows us to script and automate almost any procedure that can be done manually.
- It lends itself to any procedure that the user finds themselves having to do repetitively.
- Or to any task that an administrator would prefer to be automatic and not subject to user input and associated error.

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△



The Principle



ID	Country Nar	Full Site Name	Site Number	City Code	Product #	Product Name	Included in	Item Status	Additional I	Keep or Disc
1	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Present	Nothing Select	Keep
2	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Missing - Lost	Fire Damage	Discard
3	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Present	Nothing Select	Keep
4	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Missing - Stolen	Nothing Select	Discard
5	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Present	Nothing Select	Keep
6	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Present	Nothing Select	Keep
7	United Kingdom	1001 LON	1001	LON	104	Alloy Wheels	Yes	Incorrectly Lab	Nothing Select	Discard
8	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
9	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
10	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Missing - Lost	Nothing Select	Discard
11	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
12	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
13	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
14	United Kingdom	1001 LON	1001	LON	106	Air Freshener	Yes	Present	Nothing Select	Keep
15	United Kingdom	1001 LON	1001	LON	106	Air Freshener	Yes	Present	Nothing Select	Keep
16	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Present	Nothing Select	Keep
17	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Missing - Lost	Fire Damage	Discard
18	United Kingdom	1001 LON	1001	LON	101	Steering Wheel	Yes	Present	Nothing Select	Keep
19	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Missing - Stolen	Nothing Select	Discard
20	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Present	Nothing Select	Keep
21	United Kingdom	1001 LON	1001	LON	103	Cup Holder	Yes	Present	Nothing Select	Keep
22	United Kingdom	1001 LON	1001	LON	104	Alloy Wheels	Yes	Incorrectly Lab	Nothing Select	Discard
23	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
24	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
25	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Missing - Lost	Nothing Select	Discard
26	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
27	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
28	United Kingdom	1001 LON	1001	LON	105	Decals	Yes	Present	Nothing Select	Keep
29	United Kingdom	1001 LON	1001	LON	106	Air Freshener	Yes	Present	Nothing Select	Keep
30	United Kingdom	1001 LON	1001	LON	106	Air Freshener	Yes	Present	Nothing Select	Keep
31	United Kingdom	1002 BRM	1002	BRM	101	Steering Wheel	Yes	Missing - Lost	Nothing Select	Discard
32	United Kingdom	1002 BRM	1002	BRM	102	Furry Dice	Yes	Incorrectly Lab	User Damage	Discard
33	United Kingdom	1002 BRM	1002	BRM	102	Furry Dice	Yes	Present	Nothing Select	Keep
34	United Kingdom	1002 BRM	1002	BRM	102	Furry Dice	Yes	Present	Excess Wear at	Discard
35	United Kingdom	1002 BRM	1002	BRM	105	Decals	Yes	Present	Nothing Select	Keep
36	United Kingdom	1002 BRM	1002	BRM	106	Air Freshener	Yes	Present	Nothing Select	Keep
37	United Kingdom	1002 BRM	1002	BRM	106	Air Freshener	Yes	Missing - Stolen	Nothing Select	Discard
38	United Kingdom	1002 BRM	1002	BRM	106	Air Freshener	Yes	Present	Nothing Select	Keep

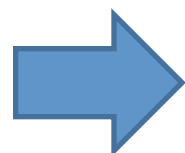
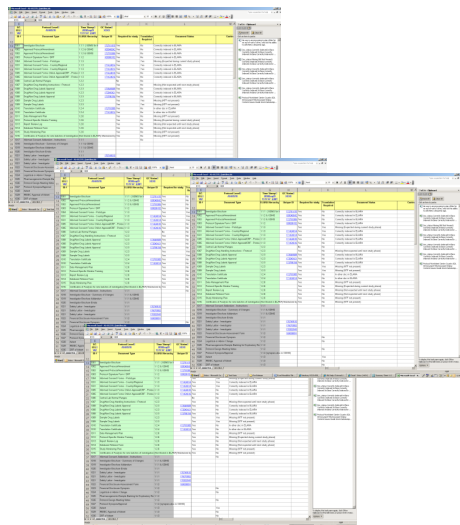
Multiple Excel worksheets and workbooks

read and consolidated into

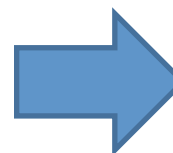
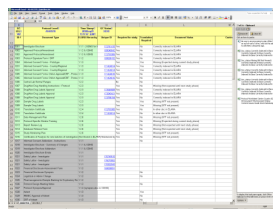
Single Access database



The Practice



*consolidated
into*



*exported
to*

	Country Name	Full time hrs	Time Number	City Code	Product #	Product Name	Included in	Print Status	Additional L	Company ID#
1	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
2	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
3	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
4	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
5	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
6	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
7	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
8	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
9	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
10	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
11	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
12	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
13	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
14	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
15	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
16	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
17	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
18	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
19	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
20	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
21	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
22	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
23	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
24	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
25	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
26	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
27	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
28	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
29	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
30	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
31	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
32	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
33	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
34	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
35	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
36	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
37	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	
38	United Kingdom	3000	1076	101		Overseas When Yes	Present		Nothing Select Keep	

Multiple Excel worksheets and
workbooks

Single Excel
worksheet

Access database



Example of source spreadsheets

Example Study Report B [Compatibility Mode] - Microsoft Excel

	A	B	C	D	E	F	G	H
1		USA	Trial Master File Reconciliation Project 2011					
	Document Number	Document Name	Responsible Study Team Member	Unique Document ID	Included In Survey	Item Status	Additional Damage Notes	Keep Discard
2								
3	101	Study Protocol	Director of Clinical Activities	0168	Yes	Present		Keep
4	101	Study Protocol	Director of Clinical Activities	0169	Yes	Missing - Lost	Fire Damage	Discard
5	101	Study Protocol	Director of Clinical Activities	0170	Yes	Present		Keep
6	102	Protocol Amendment	Clinical Team Leader	0171	No	Present	Water Damage	Discard
7	103	Informed Consent Form	Clinical Trial Associate	0172	No	Present		Keep
8	103	Informed Consent Form	Clinical Trial Associate	0173	Yes	Missing - Stolen		Discard
9	103	Informed Consent Form	Clinical Trial Associate	0174	Yes	Present		Keep
10	103	Informed Consent Form	Clinical Trial Associate	0175	Yes	Present		Keep
11	104	Translation Certificate	CT Administrator	0176	Yes	Incorrectly Labelled		Discard
12	105	Adverse Event Reporting	Study Nurse	0177	Yes	Present		Keep
13	105	Adverse Event Reporting	Study Nurse	0178	Yes	Present		Keep
14	105	Adverse Event Reporting	Study Nurse	0179	No	Present	Fire Damage	Discard
15	105	Adverse Event Reporting	Study Nurse	0180	Yes	Missing - Lost		Discard
16	105	Adverse Event Reporting	Study Nurse	0181	Yes	Present		Keep
17	105	Adverse Event Reporting	Study Nurse	0182	Yes	Present		Keep
18	105	Adverse Event Reporting	Study Nurse	0183	Yes	Present		Keep
19	106	Serious AE Reporting	Study Nurse	0184	Yes	Present		Keep
20	106	Serious AE Reporting	Study Nurse	0185	Yes	Present		Keep
21	107	Data Management Plan	Clinical Data Manager	0186	Yes	Present		Keep



Demonstration of Process



Defining Variables with DIM Statements

```
Dim anyname1 as Integer
Dim anyname2 as String
Dim anyname3 as Worksheet
Dim anyname4 as Database
Dim anyname5 as TableDef
Dim anyname6 as Boolean
Dim anyname7 as Object
Dim anyname8 as DAO.Database
Dim anyname9 as DAO.Recordset
Dim anyname10 as DAO.Field
Dim anyname11
```

<i>Name</i>	<i>Type</i>
anyname1	Numeric variable
anyname2	Character variable or string
anyname3	Excel worksheet
anyname4	ODBC database
anyname5	Table view or editing interface
anyname6	Boolean variable
anyname7	Any other object
anyname8	DAO (Data Access Object) enabled database
anyname9	DAO (Data Access Object) enabled recordset
anyname10	DAO (Data Access Object) enabled field
anyname11	Call to application, no type needs to be specified



Code Module 1 Highlights

Generic Spreadsheet Importer Reconstructed.xls - Module1 (Code)

(General) CopyRows

```

Sub CopyRows ()

Dim XLSht As Worksheet
Dim XLBook As String
Dim iRow As Integer
Dim iCol As Integer
Dim NewDocRow As Integer
Dim Chkval As String
Dim Chkvalb As Integer
Dim PNumCol As Integer
Dim PNameCol As Integer
Dim IISCol As Integer
Dim StatCol As Integer
Dim ADNCol As Integer
Dim KODCol As Integer

ActiveWorkbook.Sheets.Add
ActiveWorkbook.ActiveSheet.Name = "UNITED"

Range("A1").Select

ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 0) = "Country Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 1) = "Full Site Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 2) = "Site Number"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 3) = "City Code"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 4) = "Product #"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 5) = "Product Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 6) = "Included in Survey"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 7) = "Item Status"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 8) = "Additional Damage Notes"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 9) = "Keep or Discard"

NewDocRow = 1
For Each XLSht In ActiveWorkbook.Sheets
    XLSht.Activate
    If XLSht.Name <> "UNITED" Then

```



Code Module 1 Highlights

```
Generic Spreadsheet Importer Reconstructed.x
(General)

Sub CopyRows ()

Dim XLSht As Worksheet
Dim XLBook As String
Dim iRow As Integer
Dim iCol As Integer
Dim NewDocRow As Integer
Dim Chkval As String
Dim Chkvalb As Integer
Dim PNumCol As Integer
Dim PNameCol As Integer
Dim IISCol As Integer
Dim StatCol As Integer
Dim ADNCol As Integer
Dim KODCol As Integer
```



Code Module 1 Highlights

```
ActiveWorkbook.Sheets.Add
ActiveWorkbook.ActiveSheet.Name = "UNITED"

Range("A1").Select

ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 0) = "Country Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 1) = "Full Site Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 2) = "Site Number"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 3) = "City Code"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 4) = "Product #"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 5) = "Product Name"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 6) = "Included in Survey"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 7) = "Item Status"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 8) = "Additional Damage Notes"
    ActiveWorkbook.Sheets("UNITED").Range("A1").Offset(0, 9) = "Keep or Discard"
,
NewDocRow = 1
For Each XLSht In ActiveWorkbook.Sheets
    XLSht.Activate
    If XLSht.Name <> "UNITED" Then
```



Code Module 2 Highlights

The screenshot shows a SAS Code Editor window titled 'Generic Spreadsheet Importer Reconstructed.xls - Module2 (Code)'. The editor has a tab labeled '(General)' and a dropdown menu showing 'CombineWorkbooks'. The code is as follows:

```
Sub CombineWorkbooks ()
  Dim FilesToOpen
  Dim x As Integer
  Dim GrabFileName As String
  Dim XLSht As Worksheet

  On Error GoTo ErrHandler
  Application.ScreenUpdating = False

  FilesToOpen = Application.GetOpenFilename _
    (FileFilter:="Microsoft Excel Files (*.xls), *.xls", _
    MultiSelect:=True, Title:="Protocols to Combine")

  If TypeName(FilesToOpen) = "Boolean" Then
    MsgBox "No Files were selected"
    GoTo ExitHandler
  End If

  x = 1
  While x <= UBound(FilesToOpen)
    Workbooks.Open Filename:=FilesToOpen(x)

    GrabFileName = ThisWorkbook.Name

    For Each XLSht In ActiveWorkbook.Sheets
      XLSht.Activate
    Next XLSht

    Sheets().Move After:=ThisWorkbook.Sheets _
      (ThisWorkbook.Sheets.Count)
    x = x + 1
  Wend
```



Code Module 2 Highlights



Generic Spreadsheet Importer Reconstructed.xls - Module2 (Code)

(General)



CombineWorkbooks

```
Sub CombineWorkbooks()  
    Dim FilesToOpen  
    Dim x As Integer  
    Dim GrabFileName As String  
    Dim XLSht As Worksheet  
  
    On Error GoTo ErrHandler  
    Application.ScreenUpdating = False  
  
    FilesToOpen = Application.GetOpenFilename _  
        (FileFilter:="Microsoft Excel Files (*.xls), *.xls", _  
        MultiSelect:=True, Title:="Protocols to Combine")  
  
    If TypeName(FilesToOpen) = "Boolean" Then  
        MsgBox "No Files were selected"  
        GoTo ExitHandler  
    End If
```



Code Module 2 Highlights

```
x = 1
While x <= UBound(FilesToOpen)
    Workbooks.Open Filename:=FilesToOpen(x)

    GrabFileName = ThisWorkbook.Name

    For Each XLSht In ActiveWorkbook.Sheets
        XLSht.Activate
    Next XLSht

    Sheets().Move After:=ThisWorkbook.Sheets _
        (ThisWorkbook.Sheets.Count)
    x = x + 1
Wend
```



... The halfway stage

Generic TMF Importer Reconstructed [Compatibility Mode] - Mi

Home Insert Page Layout Formulas Data Review View Developer

Visual Basic Macros Record Macro Use Relative References Macro Security Code

Insert Design Mode Properties View Code Controls

Source Map Properties Import Expansion Packs Export XML Document Panel Modify

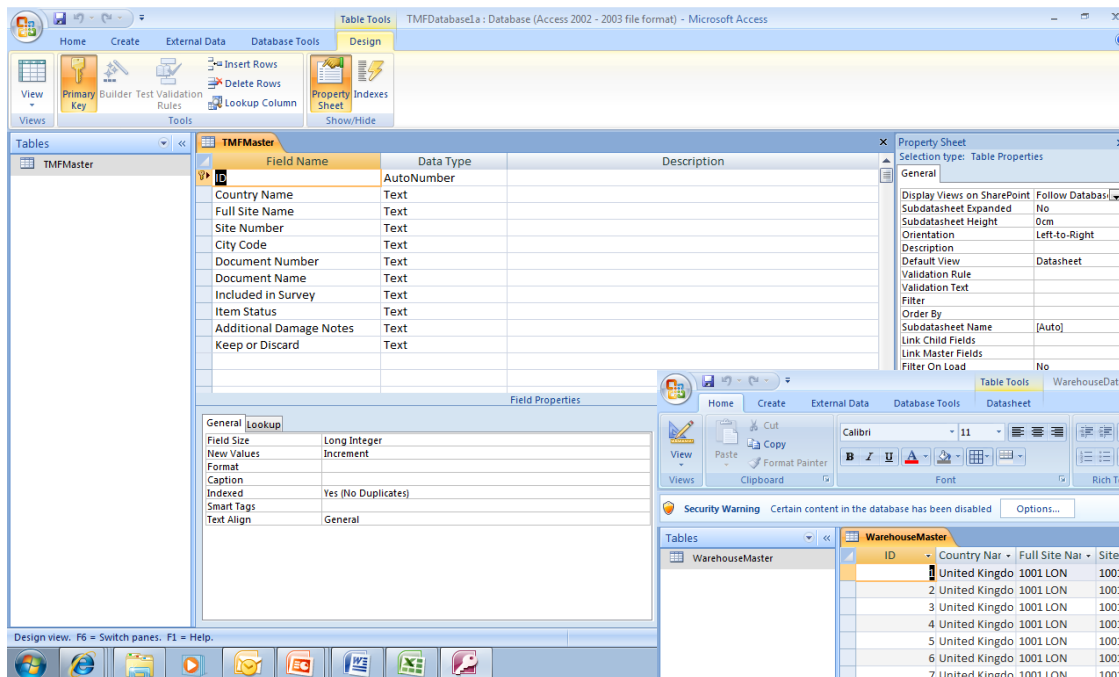
A1 Country Name

	A	B	C	D	E	F	G	H	I	J	K	L
1	Country Name	Full Site Name	Site Number	City Code	Document Number	Document Number	Included	Item Status	Additional Information	Keep or Discard		
2	United Kingdom	1001 LON	1001 LON		101	101	Yes	Present	Nothing S	Keep		
3	United Kingdom	1001 LON	1001 LON		101	101	Yes	Missing - I	Fire Damage	Discard		
4	United Kingdom	1001 LON	1001 LON		101	101	Yes	Present	Nothing S	Keep		
5	United Kingdom	1001 LON	1001 LON		103	103	Yes	Missing - S	Nothing S	Discard		
6	United Kingdom	1001 LON	1001 LON		103	103	Yes	Present	Nothing S	Keep		
7	United Kingdom	1001 LON	1001 LON		103	103	Yes	Present	Nothing S	Keep		
8	United Kingdom	1001 LON	1001 LON		104	104	Yes	Incorrectly	Nothing S	Discard		
9	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
10	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
11	United Kingdom	1001 LON	1001 LON		105	105	Yes	Missing - I	Nothing S	Discard		
12	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
13	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
14	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
15	United Kingdom	1001 LON	1001 LON		106	106	Yes	Present	Nothing S	Keep		
16	United Kingdom	1001 LON	1001 LON		106	106	Yes	Present	Nothing S	Keep		
17	United Kingdom	1001 LON	1001 LON		101	101	Yes	Missing - S	Nothing S	Discard		
18	United Kingdom	1001 LON	1001 LON		102	102	Yes	Present	Nothing S	Keep		
19	United Kingdom	1001 LON	1001 LON		103	103	Yes	Present	Nothing S	Keep		
20	United Kingdom	1001 LON	1001 LON		103	103	Yes	Incorrectly	Nothing S	Discard		
21	United Kingdom	1001 LON	1001 LON		103	103	Yes	Present	Nothing S	Keep		
22	United Kingdom	1001 LON	1001 LON		103	103	Yes	Present	Nothing S	Keep		
23	United Kingdom	1001 LON	1001 LON		105	105	Yes	Missing - I	Nothing S	Discard		
24	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		
25	United Kingdom	1001 LON	1001 LON		105	105	Yes	Present	Nothing S	Keep		

Sheet19 1001 LON 1002 BRM 1003 MCH UNITED 1001 NYC 1002 WAS

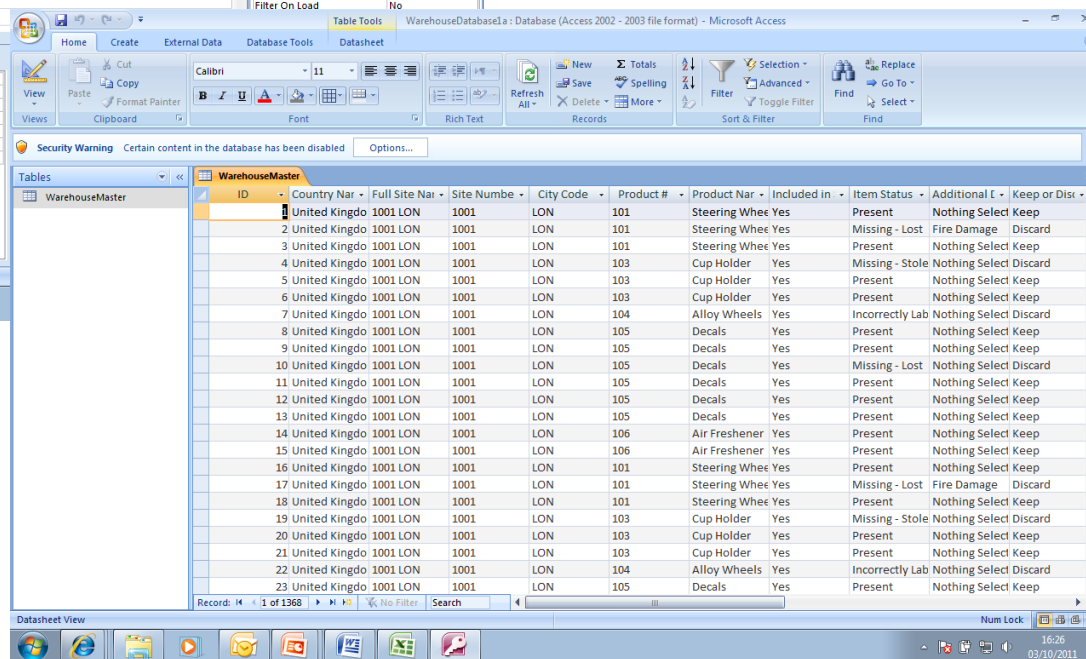


Creating tables in Access



■ Design view

■ Data view



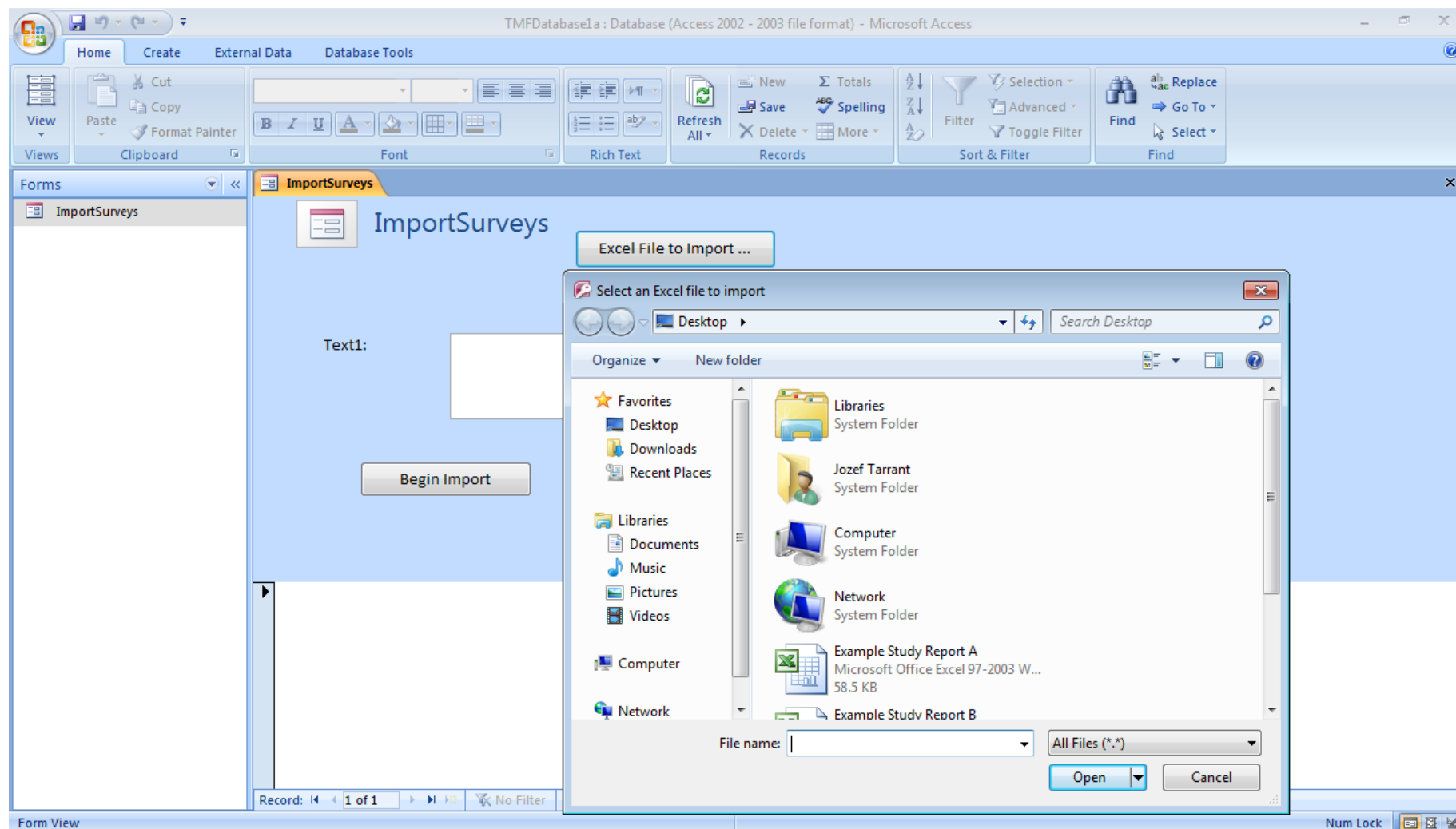


Creating forms and associating actions

The screenshot displays the Microsoft Access 2003 interface for creating a form. The title bar indicates the database is 'TMFDatabase1a : Database (Access 2002 - 2003 file format) - Microsoft Access'. The 'Form Design Tools' ribbon is active, showing tabs for 'Design' and 'Arrange'. The 'Design' tab includes groups for 'Font' (Calibri, size 11), 'Gridlines' (Width, Style, Color), 'Controls' (Title, Page Numbers, Date and Time, Logo, Text Box, Label, Button), and 'Tools' (Add Existing Fields, Property Sheet). The 'Form Header' section of the form is visible, containing a text box labeled 'Text1: Unbound' and two buttons labeled 'Begin Import' and 'Exit'. A new button labeled 'Excel File to Import ...' is being added to the form. The 'Property Sheet' on the right is open, showing the 'Event' tab for the 'BrowseButton' control. The 'Event' tab lists various events such as 'On Click', 'On Got Focus', 'On Lost Focus', 'On Dbl Click', 'On Mouse Down', 'On Mouse Up', 'On Mouse Move', 'On Key Down', 'On Key Up', 'On Key Press', 'On Enter', and 'On Exit'. The 'On Click' event is currently selected, and the 'Event Procedure' is set to '[Event Proc...]'.



Dialogue boxes in action





Target table is updated

Table Tools TMFDatabase1a : Database (Access 2002 - 2003 file format) - Microsoft Access

Home Create External Data Database Tools Datasheet

View Paste Copy Format Painter Views Clipboard

Calibri 11 Font Rich Text

Refresh All New Save Delete Records

Totals Spelling More

Filter Selection Advanced Find Replace Go To Select Sort & Filter

Tables TMFMaster

ID	Country Nar	Full Site Nar	Site Numbe	City Code	Document N	Document N	Included in	Item Status	Additional E	Keep or Disc
1	United Kingdo	1001 LON	1001	LON	101	101	Yes	Present	Nothing Select	Keep
2	United Kingdo	1001 LON	1001	LON	101	101	Yes	Missing - Lost	Fire Damage	Discard
3	United Kingdo	1001 LON	1001	LON	101	101	Yes	Present	Nothing Select	Keep
4	United Kingdo	1001 LON	1001	LON	103	103	Yes	Missing - Stole	Nothing Select	Discard
5	United Kingdo	1001 LON	1001	LON	103	103	Yes	Present	Nothing Select	Keep
6	United Kingdo	1001 LON	1001	LON	103	103	Yes	Present	Nothing Select	Keep
7	United Kingdo	1001 LON	1001	LON	104	104	Yes	Incorrectly Lab	Nothing Select	Discard
8	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
9	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
10	United Kingdo	1001 LON	1001	LON	105	105	Yes	Missing - Lost	Nothing Select	Discard
11	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
12	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
13	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
14	United Kingdo	1001 LON	1001	LON	106	106	Yes	Present	Nothing Select	Keep
15	United Kingdo	1001 LON	1001	LON	106	106	Yes	Present	Nothing Select	Keep
16	United Kingdo	1001 LON	1001	LON	101	101	Yes	Missing - Stole	Nothing Select	Discard
17	United Kingdo	1001 LON	1001	LON	102	102	Yes	Present	Nothing Select	Keep
18	United Kingdo	1001 LON	1001	LON	103	103	Yes	Present	Nothing Select	Keep
19	United Kingdo	1001 LON	1001	LON	103	103	Yes	Incorrectly Lab	Nothing Select	Discard
20	United Kingdo	1001 LON	1001	LON	103	103	Yes	Present	Nothing Select	Keep
21	United Kingdo	1001 LON	1001	LON	103	103	Yes	Present	Nothing Select	Keep
22	United Kingdo	1001 LON	1001	LON	105	105	Yes	Missing - Lost	Nothing Select	Discard
23	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
24	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep
25	United Kingdo	1001 LON	1001	LON	105	105	Yes	Present	Nothing Select	Keep

Record: 1 of 217 No Filter Search



VBA vs. SAS

VBA	SAS
Consolidation through importing to Excel	Consolidation through PROC IMPORT or CONNECT TO ODBC
IF statements control reading	IF and WHERE statements control reading and writing
Exporting to Access by creating temporary recordset object	Write out directly to an external database



VBA vs. SAS continued

VBA	SAS
Explicit loops	Implied loops
Variables have to be defined in type and number	Allows the user to create variables as and when needed
Requires interfaces with external objects to be explicitly programmed and embedded	SAS uses built-in, or sometimes additionally licensed, engines to interface with external objects
Custom functions	Parameterized macros



Conclusions

- Both VBA and SAS are perfectly good options to consolidate data from multiple sources
- VBA is included as part of MS Office, although no formal support is provided
- SAS is much easier to use and benefits from greater discipline across all procedures and functions



- ... Any Questions?

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