

# Criterion E: Product development

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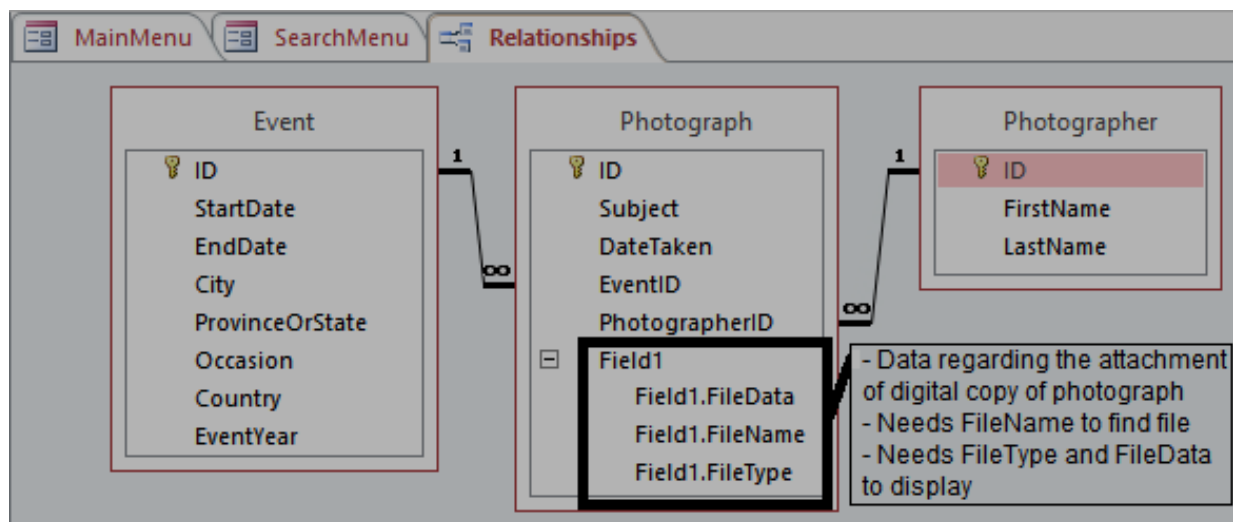
## Overall Structure

The photographs database is made up of 3 tables and queries, forms and reports used to help the user find records in these tables easily.

## Relationships

Event: Photograph = 1: Many – Many photographs can be taken at an event, but one photograph cannot be taken at many events; there is an EventID field in the Photograph table.

Photograph: Photographer = Many: 1 – Many photographs can be taken by one photographer, but many photographers cannot take one photo; there is a PhotographerID field in the Photograph table as well.



## Event Table

Event table is required to put in details about where the picture was taken. Also used to group pictures together when looking for pictures from one event.

Event								
ID	Occasion	EventYear	StartDate	EndDate	City	ProvinceOrStat	Country	
1	India Visit (Ahmedabad)	2007	2007-11-09	2007-12-01	Ahmedabad	Gujarat	India	
2	India Visit (Vadodara)	2007	2007-11-11	2007-11-14	Vadodara	Gujarat	India	
3	Black Creek Pioneer Village Visit	2008	2008-06-08	2008-06-08	Toronto	Ontario	Canada	
4	DisneyWorld Visit	2009	2009-07-08	2009-07-19	Orlando	Florida	United States of America	
5	DisneyWorld Visit	2012	2012-03-15	2012-03-15	Orlando	Florida	United States of America	
6	Kennedy Space Center Visit	2012	2012-03-14	2012-03-14	Merritt Island	Florida	United States of America	
7	Universal Studios Visit	2012	2012-03-13	2012-03-13	Orlando	Florida	United States of America	
8	Miami Visit	2012	2012-03-16	2012-03-16	Miami	Florida	United States of America	
9	Sea World Visit	2012	2012-03-12	2012-03-12	Orlando	Florida	United States of America	
10	Hiking in Barrie	2011	2011-10-09	2011-10-25	Barrie	Ontario	Canada	
11	Ruju's 9th Birthday	2007	2007-07-08	2007-07-08	Toronto	Ontario	Canada	
12	Ruju's 10th Birthday Party	2008	2008-07-01	2008-07-01	Toronto	Ontario	Canada	
*(New)		0						

## Photographer Table

Photographer table is used to put in details about who took the picture, including name and an ID number as the keyfield because people sometimes have the same name and so that it's easy to reuse photographers in the photograph records. Used to give ownership of the picture to people.

Photographer			
	ID	FirstName	LastName
+	1	Ruju	Jambusaria
+	2	Amula	Jambusaria
+	3	Dharmesh	Jambusaria
+	4	Komal	Jambusaria
*	(New)		

## Photograph Table

Photograph table is required as it's the main table that will be used to organize the pictures. It holds details about each picture including the ID number as a keyfield, the picture itself, the subject of the picture, when it was taken, and the event and photographer IDs which are foreign keys.

Photograph						
	ID	Subject	DateTaken	EventID	PhotographerID	
	1	Close Up	2008-03-07	2	3	
	2	Kite Flying	2007-11-11	1	2	
	3	Kite Flying	2007-11-11	1	2	
	4	Kite Flying	2007-11-11	1	2	
	5	Group Photo	2007-11-13	2	2	
	6	Riding a motorcycle	2007-11-13	2	2	
	7	Sleeping Dogs	2007-11-16	1	1	
	8	Carousel Ride	2007-11-16	1	2	
	9	Group Photo	2007-11-16	1	2	
	10	Ferris Wheel	2007-11-16	1	2	
	11	Playing Cricket	2007-11-18	1	2	
	12	Playing Cricket	2007-11-18	1	2	
	13	Playing Cricket	2007-11-18	1	2	
	14	Group photo	2007-11-20	1	2	
	16	Close Up	2007-11-20	1	2	
	17	Close Up	2007-11-20	1	2	
	18	Lunch at a Restaurant	2007-11-20	1	2	
	19	Donkeys	2007-11-21	1	2	
	20	Group Photo	2007-11-21	1	2	
	21	Group Photo	2007-11-21	1	1	
	22	Landscape	2007-11-21	1	1	
	23	Landscape	2007-11-21	1	1	
	24	Group Photo	2007-11-22	2	2	

## Complex Features

### Splash Screen

Welcomes the user in a visually-appealing way. Pictures of nature de-stress Amula, so a close up of a butterfly is used. Automatically leads to the main menu after 2 seconds for convenience.<sup>1</sup>



### Complex Queries + SQL to Develop a Back-End Database

The screenshots below show the SQL code for all queries for which users input information about what they would like to see. When these queries are run, a dialog box asking for user input appears. It's convenient for users to be able to search for what they want to save time. Amula wants all of these queries so that she can search using whatever parameters she wants or has available. When the user uses these queries, the result that shows up will be a report of a datasheet in order to 1) show the picture associated with each record, 2) have a way to navigate back to different menus, and 3) be able to export the report into a PDF file. Below are the SQL codes, and dialog boxes for each query. Some include export windows or error messages.

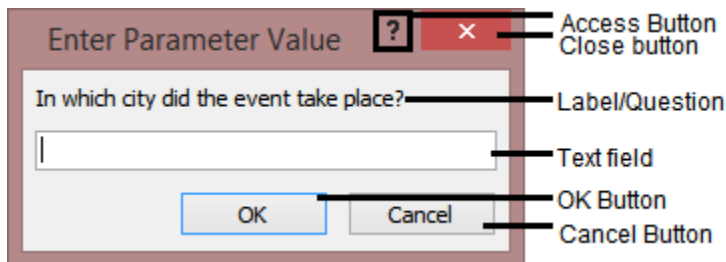
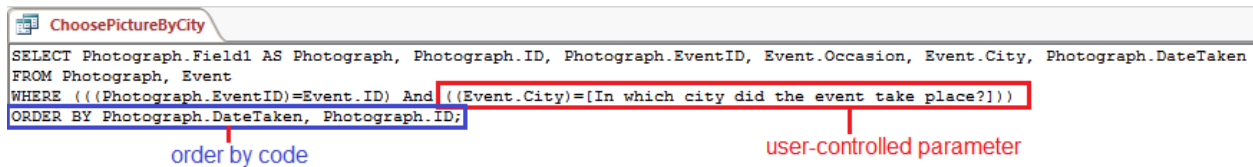
The labels/questions ask for the user to input specific information which can be any type of data unless it's a date or ID number which is accompanied with a clarification that provides further instructions on what is needed. Sometimes, the clarification is "OK if unknown" which informs the user that they can leave the box blank if they don't know the information and proceed. The text fields allow the user to enter information which will become the parameters in queries. The OK button puts the user's parameters into the query and runs it. It then shows the datasheet or the report based on the datasheet, depending on what is run. However, only the customized reports will be shown to the user because they cannot access the queries alone through the buttons in the database. The cancel and close buttons close the dialog box without running the query while the Access button opens Access 2013's own help window.

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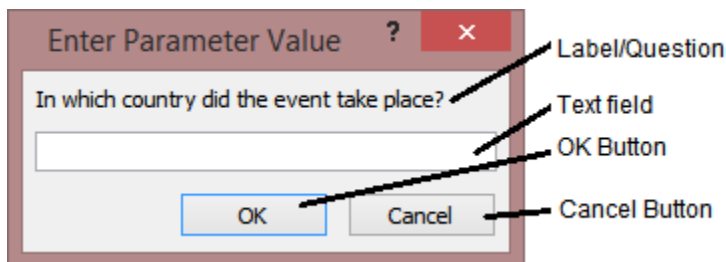
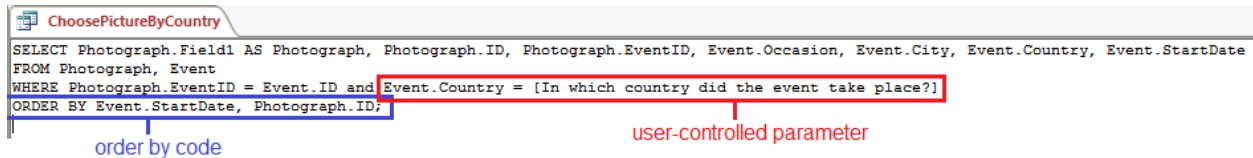
<sup>1</sup> Dev. "Creating a Microsoft Access Splash Screen:." Creating a Splash Screen. N.p., n.d. Web. 2 Jan. 2015.

Joins link tables with each other so that the datasheet and reports are generated correctly and ensure data from both tables relate to the correct records. In Order By, records that share the same data are then sorted by the next field specified. With User-Entered Parameters, the query opens a dialog box and runs user's input. When match is found in database, the condition is run and creates a datasheet. The dialog box specifies what should be entered and contains clarification sometimes. For Year and EventID, a numerical value is needed and for date, value in proper format is needed. Otherwise an error message is shown. FieldName AS DisplayName results in more professional and intuitive names and it is easier to find the field.

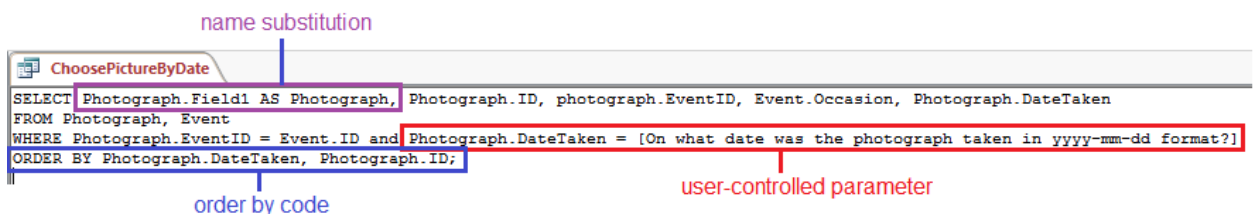
## Choose by City



## Choose by Country



## Choose by DateTaken



Enter Parameter Value ? x

On what date was the photograph taken in yyyy-mm-dd format?

Text field

OK Button

Cancel Button

## Choose By Event

```

name substitution
ChoosePictureByEvent
SELECT Photograph.Field1 AS Photograph, Photograph.EventID, Event.Occasion, Event.StartDate, Event.EndDate
FROM Photograph, Event
WHERE ((Photograph.EventID=Event.ID And (Photograph.EventID={What is the event ID? (OK if unknown)})) Or (((Event.Occasion={What was the occasion of the picture? (OK if unknown)})));

```

table join

user-controlled parameters

- allows user to enter 1 or more piece of data to search by  
- all records that have been matched to user's input will appear in datasheet

Enter Parameter Value ? x

What is the event ID? (OK if unknown)

Text field

OK button

Cancel button

Enter Parameter Value ? x

What was the occasion of the picture? (OK if unknown)

Text field

OK button

Cancel button

## Choose by Province/State

```

ChoosePictureByProvinceOrState
SELECT photograph.field1 AS Photograph, photograph.ID, photograph.EventID, event.Occasion, event.StartDate, event.ProvinceOrState
FROM photograph, event
WHERE ((photograph.EventID=event.id) And ((event.ProvinceOrState)={What province/state was the picture taken in?}))
ORDER BY event.StartDate, photograph.id;

```

ordered by code

- SQL is not case sensitive

user-controlled parameters

Enter Parameter Value ? x

What province/state was the picture taken in?

Text field

OK Button

Close button

Label/Question

## Choose by Subject

name substitution

```
ChoosePictureBySubject

SELECT Field1 AS Photograph, Photograph.ID, Subject, DateTaken, Occasion
FROM photograph, event
WHERE photograph.eventid = event.id
and subject = [Enter the subject of the photograph below (not case sensitive)];
```

join

user-controlled parameter

clarification

Enter Parameter Value ? x

Enter the subject of the photograph below (not case sensitive):

OK Cancel

Clarification

Text field

OK Button

Cancel Button

## Choose by Year

```
ChoosePictureByYear

SELECT Field1 AS Photograph, Photograph.ID, Photograph.EventID, Event.Occasion, Event.City, Event.EventYear, Event.StartDate
FROM Photograph, Event
WHERE Photograph.EventID = Event.ID and Event.EventYear = [In which year did the event take place?]
ORDER BY Event.EventYear, Event.StartDate, Photograph.ID;
```

order by code

user-controlled parameters

Enter Parameter Value ? x

Access Button

In which year did the event take place?

Label/Question

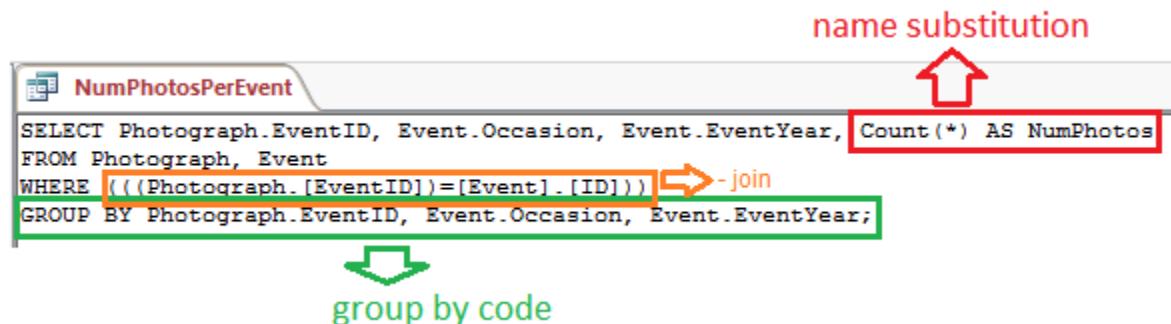
Text field

OK Cancel

OK Button

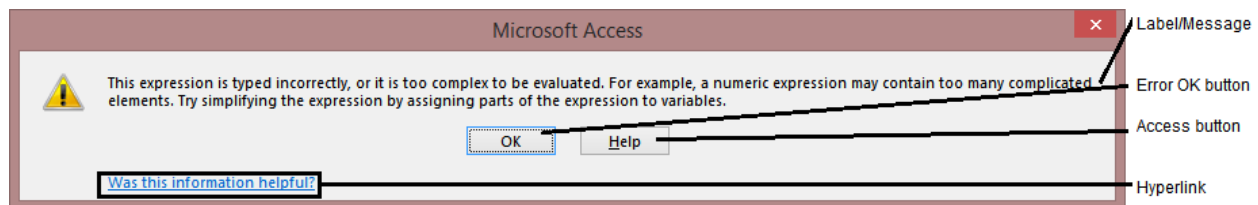
## Group By

The group by code must include all fields that will be shown in order for the query to run because otherwise, the query doesn't know which records belong to which group.

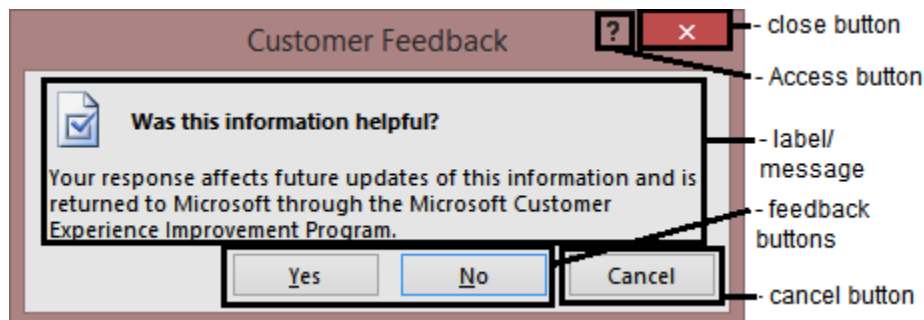


## Error Message

The label or message is standard for any error message and tells the user what they did wrong (i.e. typed an invalid expression). The hyperlink in the bottom left corner opens the customer feedback form.



The customer feedback form sends a report to Microsoft if the user clicks the feedback buttons.



## Use of Macros

Macros were mainly used in reports to navigate to another page or perform a function such as export. Below are screenshots of the scripting environment which was used to create the macros.



**OpenForm**

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

1st action

**CloseWindow**

Object Type Report

Object Name ChoosePictureByCity

Save Prompt

2nd action

+ Add New Action

**OpenForm**

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

**CloseWindow**

Object Type Report

Object Name ChoosePictureByCountry

Save Prompt

+ Add New Action

### OpenForm

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

### CloseWindow

Object Type Report

Object Name ChoosePictureByDate

Save Prompt

+ Add New Action

### OpenForm

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

### CloseWindow

Object Type Form

Object Name ChoosePictureByEvent

Save Prompt

+ Add New Action

MainMenu

SearchMenu

ChoosePictureByEvent

ChoosePictureByProvinceOrState

ChoosePictureByProvinceOrState : Command31 : On Click

OpenForm

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

CloseWindow

Object Type Report

Object Name ChoosePictureByProvinceOrState

Save Prompt

+ Add New Action

MainMenu

SearchMenu

ChoosePictureByYear

ChoosePictureByYear : Command31 : On Click

OpenForm

Form Name SearchMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

CloseWindow

Object Type Report

Object Name ChoosePictureByYear

Save Prompt

+ Add New Action

EventsReport

EventsReport : Command45 : On Click

OpenForm

Form Name EventEntryForm

View Form

Filter Name


Where Condition

Data Mode

Window Mode Normal

+ Add New Action

 EventsReport

 **EventsReport : Command39 : On Click**

**OpenForm**

Form Name MainMenu

View Form

Filter Name


Where Condition

Data Mode

Window Mode Normal

 Add New Action



 NumPhotosPerEvent

 **NumPhotosPerEvent : Command23 : On Click**

**OpenForm**

Form Name MainMenu

View Form

Filter Name


Where Condition


Data Mode

Window Mode Normal

 Add New Action



 OrderedByDate

 **OrderedByDate : Command23 : On Click**

**OpenForm**

Form Name MainMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

 Add New Action



PhotographerReport

PhotographerReport : Command19 : On Click

OpenForm

Form Name MainMenu

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

+ Add New Action

PhotographerReport

PhotographerReport : Command20 : On Click

OpenForm

Form Name PhotographerEntryForm

View Form

Filter Name

Where Condition

Data Mode

Window Mode Normal

+ Add New Action

Photograph Report

Photograph Report : Command31 : On Click

OpenForm

Form Name MainMenu

View Form


Filter Name


Where Condition

Data Mode

Window Mode Normal

+ Add New Action


 Photograph Report


 Photograph Report : Command32 : On Click

**OpenForm**

Form Name   PhotographEntryForm

View   Form

Filter Name

Where Condition

Data Mode
























Window Mode   Normal

+ Add New Action

## Use of Graphics Fields

Since this is a photographs database, it requires the user of a graphics field in order for the photographs to be seen.

Graphics in table (attachment):

Photograph		
ID		
1		CI
2		Ki
3		Ki
4		Ki
5		Gr
6		Ri
7		SI
8		Ca
9		Gr
10		Fe
11		PI
12		PI
13		PI
14		Gr
16		CI
17		CI
18		Lu
19		De
20		Gr
21		Gr
22		La
23		La
24		Gr

Graphics in reports:

Photograph	
	
	
	

Entry field to add photographs to a record:

Photograph	
	

## Proficient Design of Reports and Forms

All reports, as shown below, are formatted so that no space is wasted. Buttons are located in the headers section. Photographs are given enough space so that the user can see them easily.





OrderedByDate										=Date()
										=Time()
Page Header										
Photograph					DateTaken	ID	Occasion			
Detail										
Photograph					DateTaken	ID	Occasion			
Page Footer										
										= "Page " & [Page] & " of " & [Pages]
Report Footer										
=Count(*)										

NumPhotosPerEvent										=Date()
										=Time()
Go to Main Menu										Export Report
Page Header										
EventID		Occasion			EventYear		NumPhotos			
Detail										
EventID		Occasion			EventYear		NumPhotos			
Page Footer										
										= "Page " & [Page] & " of " & [Pages]
Report Footer										
=Count(*)										

Event										=Date()	
										=Time()	
Go to Main Menu										Add or Delete an Event	Export Report
Page Header											
ID	StartDate	EndDate	City	ProvinceOrState	Occasion	Country	EventYear				
Detail											
ID	StartDate	EndDate	City	ProvinceOrState	Occasion	Country	EventYear				
Page Footer											
										= "Page " & [Page] & " of " & [Pages]	
Report Footer											
=Count(*)											

ChoosePictureByYear										=Date()
										=Time()
<a href="#">Go to Search Menu</a> <a href="#">Export Report</a>										
Page Header										
Photograph		ID	EventID	Occasion		City		EventYear	StartDate	
Detail										
Photograph		ID	EventID	Occasion		City		EventYear	StartDate	
Page Footer										
										= "Page " & [Page] & " of " & [Pages]
Report Footer										
=Count(*)										

ChoosePictureBySubject										=Date()
										=Time()
<a href="#">Go to Search Menu</a> <a href="#">Export Report</a>										
Page Header										
Photograph		ID	Subject		DateTaken	Occasion				
Detail										
Photograph		ID	Subject		DateTaken	Occasion				
Page Footer										
										= "Page " & [Page] & " of " & [Pages]
Report Footer										
=Count(*)										

ChoosePictureByProvinceOrState										=Date()
										=Time()
<a href="#">Go to Search Menu</a> <a href="#">Export Report</a>										
Page Header										
Photograph		ID	EventID	Occasion		StartDate		ProvinceOrState		
Detail										
Photograph		ID	EventID	Occasion		StartDate		ProvinceOrState		
Page Footer										
										= "Page " & [Page] & " of " & [Pages]
Report Footer										
=Count(*)										

ChoosePictureByEvent										=Date()	
										=Time()	
Go to Search Menu					Export Report						
Page Header											
Photograph				EventID		Occasion		StartDate		EndDate	
Detail											
Photograph				EventID		Occasion		StartDate		EndDate	
Page Footer											
										="Page " & [Page] & " of " & [Pages]	
Report Footer											
=Count(*)											

ChoosePictureByDate										=Date()	
										=Time()	
Go to Search Menu					Export Report						
Page Header											
Photograph				ID	EventID		Occasion		DateTaken		
Detail											
Photograph				ID	EventID		Occasion		DateTaken		
Page Footer											
										="Page " & [Page] & " of " & [Pages]	
Report Footer											
=Count(*)											



## Proficient Use of Techniques to Enable Easy Navigation

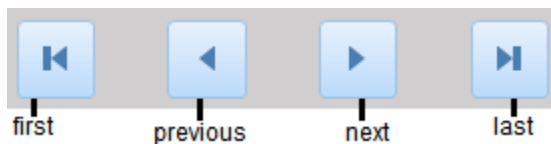
### Main Menu

Allows easy navigation of the database. Includes easy access to all reports that summarize tables and give statistical information and forms which lead to other reports. It's labelled in a user-friendly way to ensure no problems are experienced.



### First, Previous, Next, Last Function

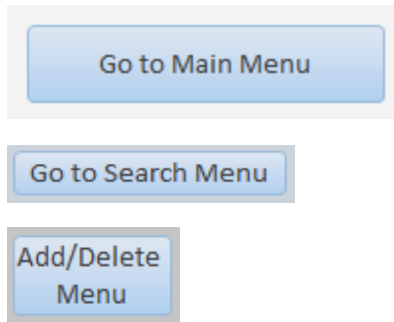
They have an intuitive design and layout. They allow navigation between records in the entry forms so that the user is able to see records for reference or delete them.



### Buttons

Buttons are used throughout the database for user convenience. The user can always navigate from a screen to another menu. This applies also for the search menu and add/delete menu. Mainly buttons are used to navigate through the whole database. The user doesn't need to use the navigation bar on the left of the database.<sup>2</sup>

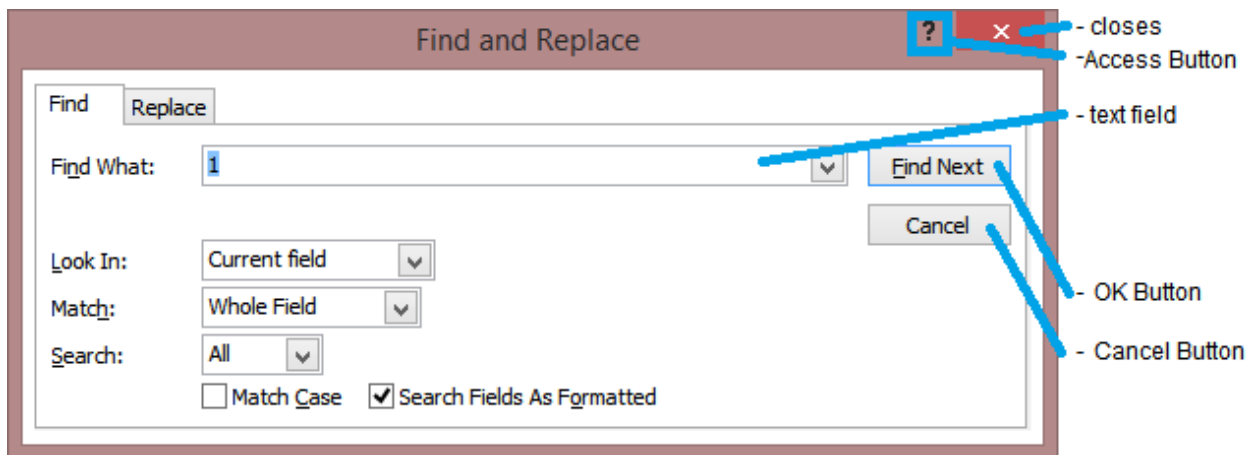
<sup>2</sup> "What's New in Microsoft Access." <https://support.office.com>. Microsoft Inc., n.d. Web. 2 Jan. 2015.



## Entry Forms

### Find Function

The text field allows the user to enter information about a record but unlike the queries, is not limited to one field. The button with “Find Next” on it acts as an OK button and runs the search while the cancel and close buttons close the dialog box.<sup>3</sup>




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<sup>3</sup> Ibid.



MainMenu Add\_Delete\_Records\_Menu EventEntryForm

Event

### Add/Delete Events



ID	<input type="text" value="1"/>
StartDate	2007-11-09
EndDate	2007-12-01
City	Ahmedabad
ProvinceOrState	Gujarat
Occasion	India Visit (Ahmedabad)
Country	India



Picture

ID

Dates

Other Information

Entry Navigation

New Button

Delete Button

Find Button


General Navigation


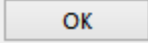
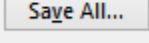
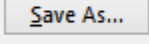
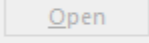
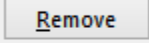
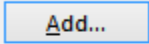
General Navigation

Instructions

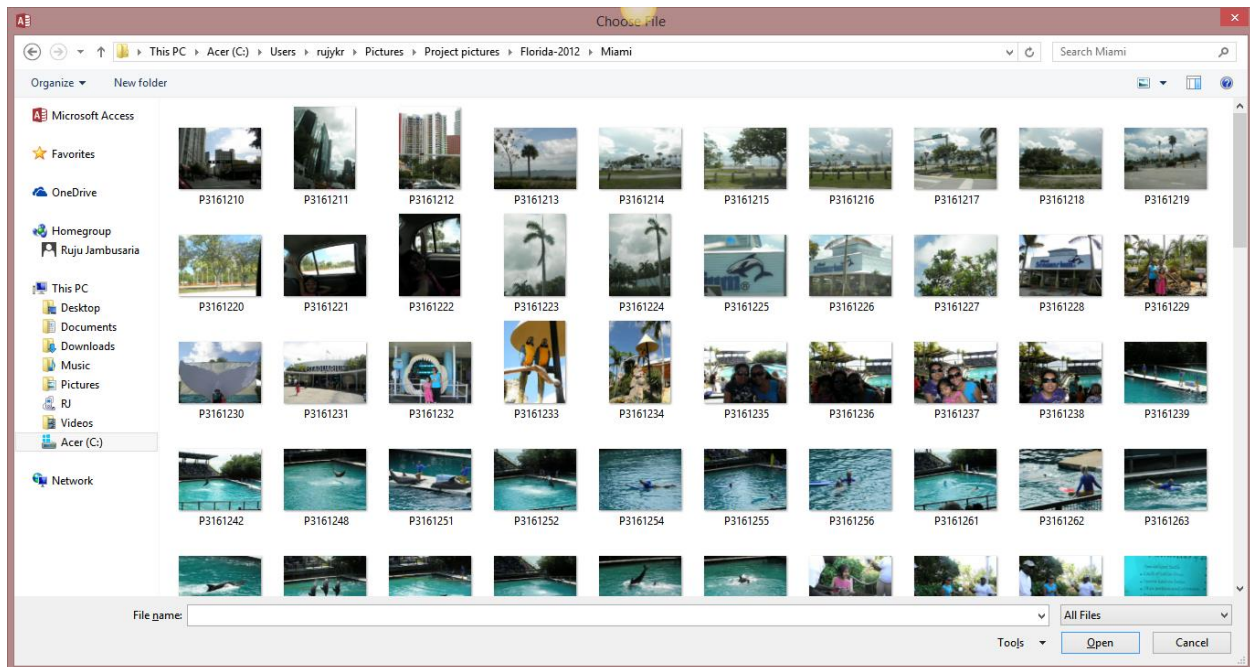
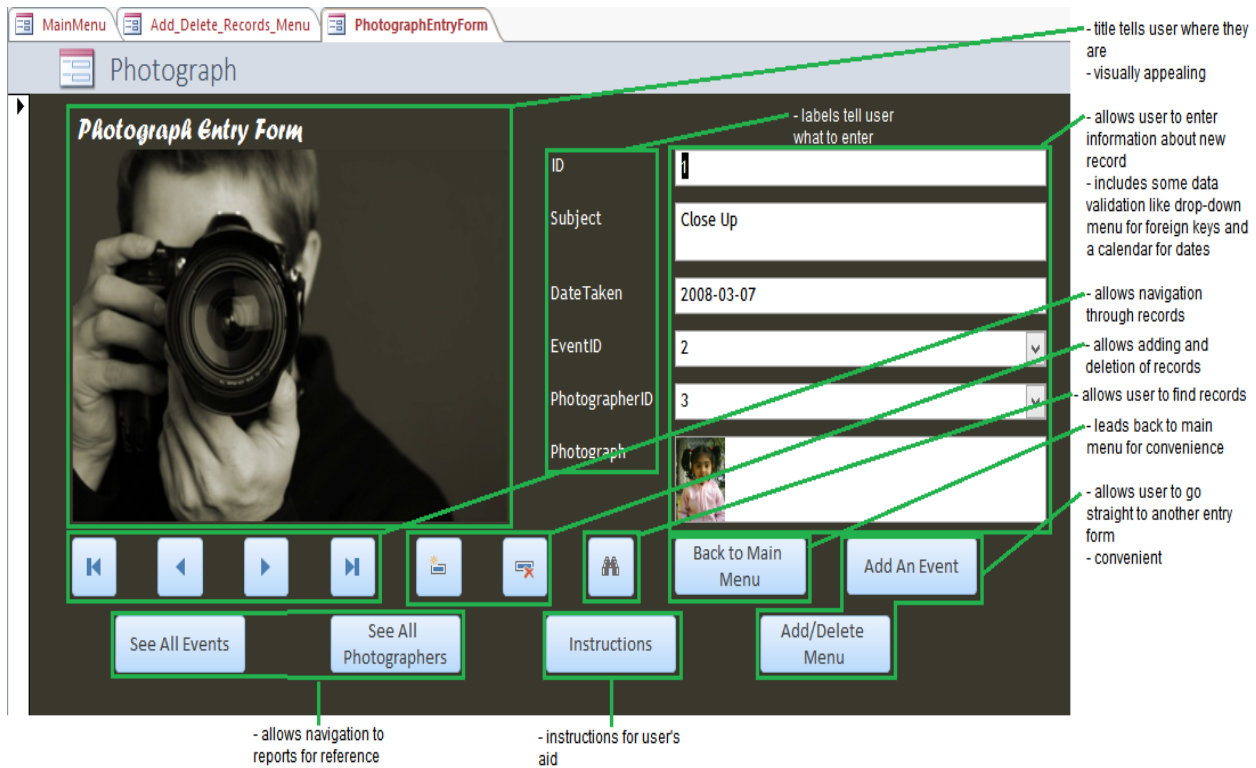
### Attachments

Attachments (Double-click to open)

 P3161223.JPG







Above, you can choose an image to add to the database.



structure is similar to other entry forms

title is visually appealing

intuitive labels

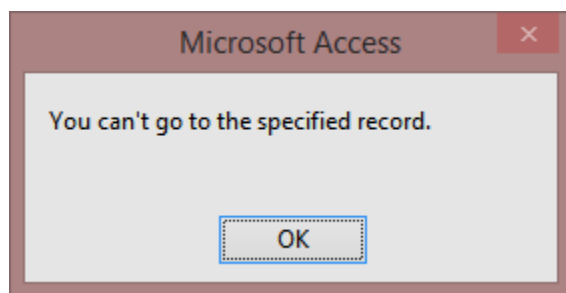
allows navigation of records

add/delete records

allows user to find record faster

leads to other forms

convenient for user



## Instructions Page

The purpose of the instructions page is to explain how to use the “add” and “delete” functions of the entry form. Both the title and subtitle are in sans-serif fonts. The title remains in the Forte font to maintain consistency. The instructions are in Times New Roman font and explain in detail how to add or delete a record. The navigation buttons allow easy navigation to the main menu and back to the entry forms.<sup>4</sup>

title

sub-title

instructions

navigation buttons

<sup>4</sup> "Create an Access Form." Create an Access Form. Microsoft, n.d. Web. 9 Dec. 2014.

## Five Data Types

All ID numbers must be auto numbers so that 1) no record ever has the same ID number as another and 2) it's a form of data validation and the data is reliable. The attachments are graphics and hold the photographs. The subject and other fields that require letters to be entered are short text to save storage space and prevent users from entering a lot of text which would become inconvenient. All dates are put into date types so that the functions associated with that data type can be used and to add a layer of data validation such as the calendar option when entering the data about the date. The foreign keys are made using lookup & relationship because it allows data validation when entering data through the use of drop-down menus. These data types are also used in the event and photographer tables. Foreign keys and the year field are also known as number data types as they simply hold numbers.

### Event Table Data Types

	Event	Photograph	Photographer
	Field Name		Data Type
🔑	ID		AutoNumber
	StartDate		Date/Time
	EndDate		Date/Time
	City		Short Text
	ProvinceOrState		Short Text
	Occasion		Short Text
	Country		Short Text
	EventYear		Number

### Photographer Table Data Types

	Event	Photograph	Photographer
	Field Name		Data Type
🔑	ID		AutoNumber
	FirstName		Short Text
	LastName		Short Text

### Photograph Table Data Types

	Event	Photograph	Photographer
	Field Name		Data Type
🔑	ID		AutoNumber
	Subject		Short Text
	DateTaken		Date/Time
	EventID		Number
	PhotographerID		Number
	Field1		Attachment

## Data Validation

### Calendar

The calendar allows the user to intuitively enter the date into the entry form while also ensuring the reliability of the data because the calendar converts the user's selection into the desired format.


DateTaken



DateTaken

EventID

PhotographerID

Photograph 

Back to Main

March, 2008

Su	Mo	Tu	We	Th	Fr	Sa
24	25	26	27	28	29	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5


Today



DateTaken

EventID

PhotographerID

Photograph 

Back to Main

December, 2007

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Today



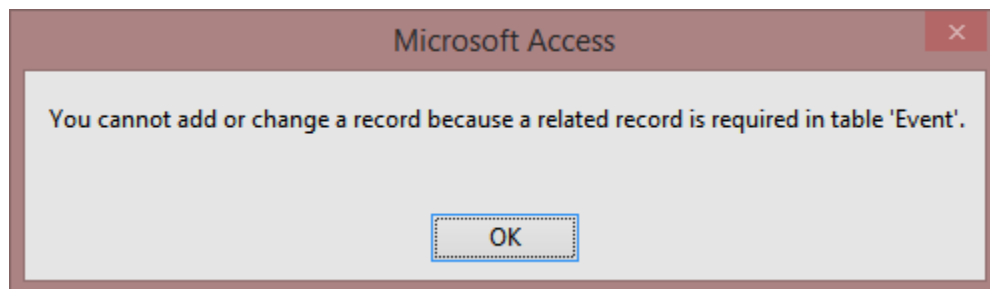
DateTaken

### Drop Down Menu

It appears when the button is clicked. The drop down menu allows the user to choose an option from the ones shown. The options shown are the only options that are valid, thus preventing the user from entering invalid data.

The top screenshot shows a form with three main fields: EventID, PhotographerID, and Photograph. A vertical list of numbers 1 through 12 is shown next to the PhotographerID field. A dropdown arrow is at the top right of the list. Labels 'label', 'button', and 'options' point to the dropdown arrow, a small button, and the list of numbers respectively. The bottom screenshot shows the same form with the PhotographerID field set to 1 and the Photograph field set to 1.

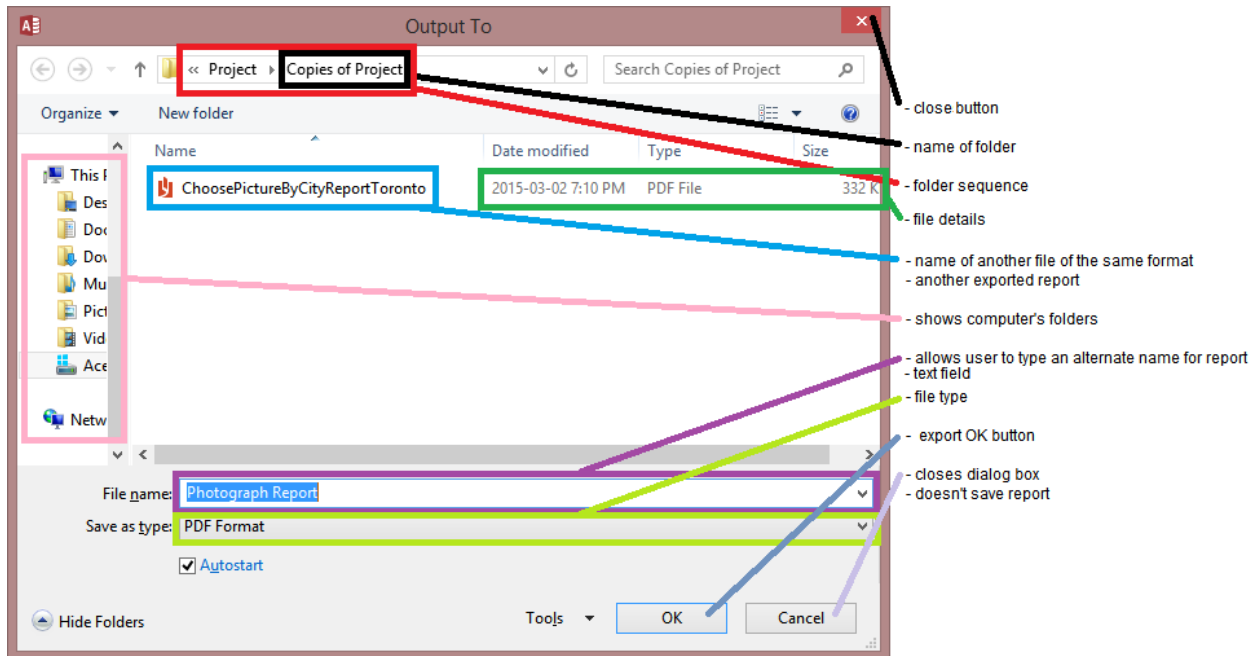
If a user enters an invalid ID (one that is not from the drop down menu) by typing it, they will receive the following message as soon as they try to navigate away from the page:



Therefore, the user is unable to input invalid data into the date and ID fields.

## Exporting

After the export button at the top of a report is clicked, the following window appears:



It is the same window that appears for any file management, so it should be familiar to the user and therefore, easy to use. The user can save their file anywhere they like with any name, but the default name is the report name.

Number of Words: 1311