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IS520/MBA614
April 12, 2015
Final Project Write up

Executive Summary

The purpose of this project is to have a user friendly Library or Item Inventory system that can have stored Patron information, check in and check out items, and send reminders through text and/or email. This system has the potential for both personal and professional applications.

My Mother owns a small essential oil wholesale business and has a library of professional and personal development books that she regularly lends out to people on her teams. This system can be used to track and manage this process. I also could use it to manage my own small, personal library to lend to friends and family.

System Summary

The Owner of the Library enters his/her own information in the block provided and sets the number of days late required for which items will be marked as "Lost?". Patrons are added to the system using a user form to collect their contact information. Items are tracked on the main library page and checked out and in using 2 other user forms that validate the inputs and controls. Reminders can be sent out to the Patrons with items currently checked out using a form message to either text or email based on their previously entered "Preferred Method of Contact." This messages will remind the Patrons of the item(s) they have currently checked out and the status of those item(s). Items being considered "Late" or "Lost?" is based on a date calculation using the preset number of days in the Library Owner block mentioned previously. The reminder system uses the default gateways for carriers listed in the carrier page and a valid gmail account for sending the reminders.

General Programming Notes

Most of the error handling and data validation is done through simple If statements, logical tests and showing an error message. There are a significant number of these so a model is given below from the check out task. User forms in the system contain many of these error "traps" and exit the subroutine to give the user an opportunity to correct the error and try entering the data again.

```
'Check to see if Item is available
If Not s.Cells(r, 8).Value = "IN" Then
  MsgBox ("Sorry, that Item is not available at this time. Please check the item # or try a different item.")
  Exit Sub
End If

'Validate Patron exists
If Lookup(patron, patrons, 1, 0) = "" Then
  MsgBox ("Unable to find Patron named " & patron & ". Check spelling and try again. Add new Patron if necessary.")
  Exit Sub
End If
```

Potential Improvements and Future Use

Another use for this system could be as an Item inventory and not simply for books. The items are currently tracked by simple ID integers, but more functionality could be added to use an existing ID system (such as the ISBN validator written previously this semester). Any physical item could be tagged with an ID and then a scanner could also be used to scan in and out the items.

System Design and Layout

Library Page

The Library sheet is the main page where the tracking and management of items occurs. The functionality built into the Library Ribbon primarily affects what is on this sheet.

The Items need to be manually entered in the far left 4 columns (A-D). To expand the listings, the far right 5 columns (H-L) simply need the formulas copied down. The middle 3 columns (E-G) are written and erased using the user forms to check in and check out the items. The columns on the far right will be addressed later.

Adding Patrons

Before an item can be checked out to an individual, they need to be added as a patron into the system. This is done by clicking on the Library Ribbon and clicking the "Add a Patron" button.

The New Patron user form will then appear to gather their information

Add A New Patron ×

Please enter your information and click save to add
a new patron. Click cancel to exit.

Required:

Name (First Last) | Your Namehere |
Email (example@gmail.com) | youremail@example.net |

Optional:

Phone Number | 555-555-5432 |
Preferred Contact Method | text ▼ |
Phone Carrier | Sprint ▼ |

| Save | | Cancel |

Microsoft Excel ×

Cannot Save New Patron information without a Name

| OK |

A name and email are required, and the validation on the form will ensure that this information is gathered by showing an error message. If the new patron chooses to only provide an email address, the Preferred Contact Method will automatically set itself to be "email" because the phone info is not given. If the user attempts to add a phone number or a carrier without providing the other, a similar error message will be shown.

The Preferred Contact Method and Phone Carrier combo boxes are both filled from the Carriers page which can be appended and/or edited by the Owner (See below).

	A	B
1	**Provider**	**Gateway**
2	AllTel	text.wireless.alltel.com
3	AT&T	txt.att.net
4	Boost Mobile	myboostmobile.com
5	Cricket	sms.mycricket.com
6	Sprint	messaging.sprintpcs.com
7	T-Mobile	tmomail.net
8	US Cellular	email.uscc.net
9	Verizon	vtext.com
10	Virgin Mobile	vmobl.com
11		
12		
13		
14	**Preferred Contact Methods**	
15	voice	
16	email	
17	text	

When the new Patron information is finished being gathered, the information is saved and appended onto the Patron list on the Patron sheet.

	A	B	C	D	E
1	**Patron List**				
2	**Name**	**Email**	**Phone**	**Preferred Contact Method**	**Carrier**
3	Ben Smith	smithb@yahoo.com	425-987-6543	voice	AT&T
4	Diego Carston	czar07x@xkcd.org	206-875-9210	email	Verizon
5	Gillian Gremmert	gg@gmail.com	435-212-9876	text	Sprint
6	Jake Gremmert	jgrem@gmail.com	801-343-9999	text	Verizon
7	Seth Gremmert	sethgrem@gmail.com	425-318-9015	email	Sprint
8	Sheila Douglas	shedugie@gmail.com	585-021-0854	text	AT&T
9	Veronica Page	pageturner@gmail.com	425-318-9015	text	Sprint
10	Bilbo Baggins	BbBg@middleEarth.realr	888-222-9632	email	Cricket
11	Jill Gremmert	ganncox@gmail.com	585-521-0244	text	Sprint
12	Tom Riddle	HwMnBn@mail.azk		email	
13	Eli Gremmert	tremmergile@gmail.com	801-946-4075	email	Verizon
14	Your Namehere	youremail@example.net	555-555-5432	text	Sprint
15					

This new patron can now check out. Since their information has been added to the patron's page, their information will validate when trying to check out an item, and the lookup formulas will be able to place their information on the Library page when an item is checked out to them.

Checking Out Items

Checking out an item is done by pressing the "Check Out An Item" button on the Library Ribbon. After pressing the button, the following form will appear to gather the necessary information and check out the item to that patron.

Item Checkout   ×

Please fill out the following form and click
submit to checkout. Click cancel to exit

Patron Name   Seth Gremmert

Item ID   13

Checkout Date   2/13/2015
(MM/DD/YYYY)

Return Date   2/26/2015
(MM/DD/YYYY)

              Submit   Cancel

If the user attempts to input a return date that is smaller than the checkout date, or invalid dates in either field, they will be given plain error messages alerting them to those issues. This is accomplished by attempting to input the data into the sheet and checking if the formulas to the right throw errors. If so, the information is removed from the sheet and the user can try to enter valid dates in again. The user is also prevented from checking out any items that are already checked out to another patron.

After the information is validated, it is added to the sheet and the formulas in the far right columns are filled using lookup functions and calculating the date differences. The Item is marked as "Out" in both columns and changed to "Late" or "Lost?" depending on the period specified in the owner block.

	Item ID	Title	Author/Entity	Edition/Format	Checked out by:	Checkout Date	Return Date	Status (In,Out,Late)	Lost?	Days Out	Email	Phone
6												
7	17	Avett Brothers Li	The Avettt Brothers	CD	Gillian Gremmert	2/15/2015	5/11/2015	Out	Out	57	gg@gmail.com	435-212-9876
8	15	Frozen	Disney/Pixar	DVD				IN	IN			

The owner block contains the owner information and the period in days that a checked out late item is considered "Lost?". This block of cells is located just to the right of the main library block.

Owner Information		
Owner Name	**Owner Email**	**Owner Phone**
Seth Gremmert	sethgrem@gmail.com	425-318-9015
Days Past Due to Consider an Item Lost:		21

Sending Reminders

The owner of the library or inventory inputs their information and that information is used when sending reminders to patrons facilitated by the two text files that serve as a template for sending email or text reminders depending on each Patron's preference. A snip of the email form reminder is given below:

```
1   Checked Out Item Reminder
2   <PatronName>:
3
4   This is a friendly reminder that you have an item checked out from <OwnerName>, Here are the details:
5
6   On <CheckoutDate> you checked out item # <ItemID>, "<ItemTitle>", a <ItemEdition>.
7
8   According to our records, the original estimated return was <DueDate> and the item status is marked as: <ItemStatus>
9
10  Feel free to contact me with any questions or to ask for an extension.
```

To send reminders, the owner clicks on the "Send Reminders" button and the code and is asked to validate their gmail credentials to send the reminders. The function only works with gmail accounts because that is the example used in class. The owner is presented with this simple login form.

After the owner enters their credentials and clicks "Ok" the code iterates through the listings on the library page and sends out the personalized email and text reminders by pulling the information off the page and inserting each term into the form text files as appropriate. The patron's email addresses, carriers and each carriers default gateway allow all of the text and email reminders to be sent through the owners single account (with a limit of 500 emails daily for a normal personal gmail account). Below are the sent examples of the reminders:
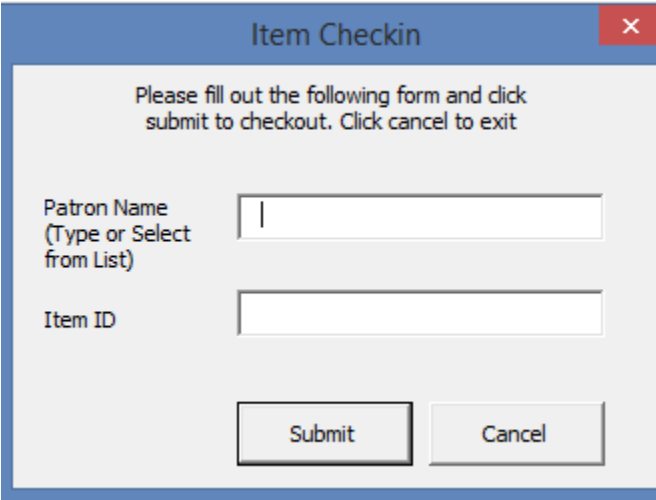
Checking In Items

When a Patron returns an item, it needs to be checked in by the owner. The owner is presented with this form:

The owner inputs the desired information and clicks "Submit." The form using many of the if statement traps mentioned in the system summary to ensure that the patron exists in the system, the spelling is correct, the item # is valid, and the patron is actually the person that has that item checked out. When all of those logical relationships are satisfied, the cells containing the patron name, checkout date, and check in date are cleared. When these fields are cleared, the formulas to the right are cleared as well and revert to being blank. The item is now checked in.

Code Help

Many of the concepts used were taken from in class examples and code snippets that were provided. However, I did personally perform all the modifications to take these different pieces of functionality and attach them to my library system. When writing the user forms, I also would look back on the Colonial Heritage Volunteer assignment to refresh my memory and implement the controls used.

Lessons Learned

I was again reminded how simple it is to create a project in my mind, but actually planning and programming the whole idea into a functional piece of software is much more work. I think this exercise was valuable because it forced me to take the concepts we had learned in class and were walked through and apply them to a separate problem domain. Doing the homework assignments and projects was helpful, but this self-directed learning was incredibly effective to help me get into the concepts and learn how to apply them to new projects.

A specific example of something new I learned is how to use the worksheet itself to implement error detection and handling. It may not be a best practice, but it was very helpful for what I was trying to accomplish. When inputting a check out for an item, the form actually writes the dates to the appropriate cells and then uses an If statement with 3 tests to ensure that all 3 date calculations are not throwing an error and thus validating the input dates. I used Worksheet Function to access the Iserror function and test if these formulas were working or not. It was really convenient to test the inputs and catch the errors that way.

I wanted to implement more pieces of functionality, but didn't have sufficient time towards the end of the semester. The system would work much better if an ISBN or UPC protocol was added to the items. We recently learned about quecat scanners in class and it would have been cool to use a scanner to check in and check out the physical items instead of simply using integers as ID numbers.

I was also going to make the item listings into a table so it could be sorted and filtered easily. I was nervous that some of the functions or VBA code would be broken, or would be much more complex if I tried to apply custom filtering or sorting into the table. It would require further testing and analysis that I also did not find time to do.