Branch Calls Summary Report

By Trevor Flint

Executive Summary

My wife works for Bank of Utah in the Operations Department. The bank is currently considering routing all phone calls that go to branches to a central call center located at the corporate office. In order to decide if this operational change is worth the effort, they need to track the number and type of phone calls that the branches receive in order to get a sense of how much need there truly is. The bank has created an intranet application that branch employees can log on to and enter information every time they take a phone call. The site tracks what time the call came in, who answered the call, how long the call lasted, and what the reason for the call was. This information is then compiled in a table-like summary sheet in chronological order. In order to get any valuable use out of this table, the bank needs a program that can download this file and summarize it in a way that gives them valuable insights in to the calls that the bank employees are taking on a daily basis. Based on this information they will make the decision if it makes sense to A) route all branch phone calls to a centrally located call center and B) if they do decide to route calls, how many and what types of employees will be needed to handle the volume and types of calls they receive.

My program downloads the raw data on phone calls from the bank's intranet site whenever the person overseeing the process needs updated information. By clicking a button the program downloads the data and summarizes it in an easy to read, formatted dashboard based on the specific metrics requested by the bank.

Implementation Documentation

The final workbook contains five worksheets. One worksheet where retrieved data is stored, sorted, and analyzed (DataSheet), one worksheet where the data is gathered and summarized (Summary), two formatted worksheets where the data is displayed (Call Volume & Month), and one worksheet where graphics are stored (Pictures).

Command Center

The entire workbook is controlled by what I refer to as the "Command Center." The Command Center is the sub that calls all of the other subs in the workbook. The Command Center contains the following subroutines:

```
Sub CommandCenter()

    Call RefreshData
```

Call SummaryUpdateToday
Call SummaryUpdateLast7
Call Summary UpdateLast30
Call SummaryUpdateDayofWeek
Call SummaryUpdateYesterday
Call SummaryUpdateLast25
Call CallVolume
Call Month
Call Photo

I will walk through each of these subs and summarize the function that each performs as well as the implementation of each.

RefreshData
This sub connects to the Bank of Utah Intranet and downloads the most up-to-date version of the employee call-log table in to the DataSheet worksheet (**Screenshot 1**) (**Note: this section of code is commented out in this version making the DataSheet static for testing because the data can only be updated when connected to Bank of Utah's Intranet**). The downloaded table is in chronological order and provides no useful information for the bank to make operating decisions from.

Screenshot 1:

	A	B	C	D	E	F	G
1							
2	Submit Date	Submitted By	Customer	Minutes	Customer Type	Issue	Status
3	2/24/12 17:08	Barack Obama	SANDI	5	Internal	Debit Cards	Resolved
4	2/24/12 17:00	Bill Clinton	UNKNOWN FEMALE	2	External	Account Information / Support	Resolved
5	2/24/12 16:51	Barack Obama	JUSTIN	1	External	Account Information / Support	Resolved
6	2/24/12 16:24	George H. W. Bush	HOLLY KENISON	4	External	Online Banking - ACH	Resolved
7	2/24/12 16:22	Ronald Reagan	BRADLEY SHELLEY	2	External	Debit Cards	Resolved
8	2/24/12 16:20	Jimmy Carter	Thomas Carter	3	External	Online Banking - Login Issues	Resolved
9	2/24/12 16:19	Jimmy Carter	Intermountain Hydraulics-Jim	2	External	Online Banking - Login Issues	Resolved
10	2/24/12 16:17	Gerald Ford	carol montgomery	1	External	Account Information / Support	Resolved
11	2/24/12 16:12	George H. W. Bush	Amy Mildenhall	5	Internal	Online Banking - Other	Resolved
12	2/24/12 16:08	Barack Obama	LISA	7	External	Debit Cards	Resolved
13	2/24/12 15:56	Jimmy Carter	Helgesen Waterfall-Troy	14	External	Online Banking - Login Issues	Resolved
14	2/24/12 15:53	Jimmy Carter	Helgesen Waterfall & Jones	3	External	Online Banking - Login Issues	Resolved
15	2/24/12 15:49	George H. W. Bush	BRADY ALLAN BARFUSS	2	External	Account Information / Support	Transferred
16	2/24/12 15:44	Bill Clinton	richard romano	1	External	Switchboard	Resolved
17	2/24/12 15:41	Barack Obama	BEN	1	External	Switchboard	Resolved
18	2/24/12 15:39	Ronald Reagan	UNKNOWN	1	External	Account Information / Support	Resolved
19	2/24/12 15:33	Barack Obama	SHIRLEY	2	External	Account Information / Support	Resolved
20	2/24/12 15:32	Gerald Ford	FOR LN SERVICING	1	External	Switchboard	Resolved

Once the table has been downloaded, the next thing that the macro does is to determine the hour of the day each call happened during, the number of days ago that the call happened, and the day of the week the call took place on (Screenshot 2).

These calculations will allow the reports to be summarized by time, day, and week. This information was specifically requested by the bank and will allow the bank to track the volume of calls throughout the day and over the course of a week, which will give the bank a better understanding of its personnel needs.

Screenshot 2:

Hour	Days Back	Hour	Weekday
17:03	1.00	17	5
16:58	1.00	16	5
16:50	1.00	16	5
16:20	1.00	16	5
16:20	1.00	16	5
16:17	1.00	16	5
16:17	1.00	16	5
16:16	1.00	16	5
16:07	1.00	16	5
16:01	1.00	16	5

SummaryUpdateToday
This sub summarizes the newly downloaded data in the DataSheet. The sub counts up the total number of calls, along with the number of minutes associated with those calls, for each hour of the current day and puts it in the Summary worksheet (**Screenshot 3**). This data is used in the summary charts and tables on the Call Volume worksheet.

SummaryUpdateLast7
This sub also summarizes the downloaded data in the DataSheet. The sub counts up the average number of calls, along with the average number of minutes associated with those calls, for each hour over the last seven days and puts it in the Summary worksheet (**Screenshot 3**). This data is used in the summary charts on the Call Volume worksheet.

Summary UpdateLast30
This sub also summarizes the downloaded data in the DataSheet. The sub counts up the average number of calls, along with the average number of minutes associated with those calls, for each hour over the last 30 days and puts it in the Summary worksheet (**Screenshot 3**). This data is used in the summary charts on the Call Volume worksheet.

SummaryUpdateDayofWeek
This sub also summarizes the downloaded data in the DataSheet. The sub counts up the average number of calls, along with the average number of minutes associated with those calls, for each hour of the day for whatever day of the week it currently is and puts it in the Summary worksheet (**Screenshot 3**). For example, if the current day is Friday, the data is aggregated and summarized for the average results of all Fridays that are in the downloaded data. This data is used in the summary charts on the Call Volume worksheet.

SummaryUpdateYesterday
This sub also summarizes the downloaded data in the DataSheet. The sub counts up the total number of calls, along with the number of minutes associated with those calls, for each hour of the previous day and puts it in the Summary worksheet (**Screenshot 3**). This data is used in the summary charts on the Call Volume worksheet.

Screenshot 3:

	A	B	C	D	E	F	G	H	I	J	K	L
1	3/23/12	Before 8:00	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	After 5:00
2	2/24/12	8	8	9	10	11	12	13	14	15	16	17
3	**Today**											
4	minutes	0:00	0:04	0:21	0:37	0:50	0:39	1:03	0:59	0:39	0:27	0:05
5	calls	0	2	10	19	15	9	26	15	13	9	1
6	**Last 7 days**											
7	minutes	0:00	0:24	0:49	1:17	0:35	1:04	0:47	0:55	0:49	0:50	0:00
8	calls	0	4.8	14.6	22.2	12.6	13.2	12.8	10.8	12.8	11.2	0.2
9	**Last 30 days**											
10	minutes	0:00	0:30	1:07	1:17	0:55	1:05	0:59	1:04	1:12	0:54	0:00
11	calls	0.1	5.9	17.7	21.0	16.6	17.0	16.9	16.4	16.5	13.2	0.4
12	**Fridays**	5										
13	minutes	0:00	0:19	0:50	0:58	0:50	0:56	0:39	1:04	0:58	0:37	0:02
14	calls	-	5.0	13.0	17.5	12.6	17.4	13.5	14.4	16.0	10.0	0.4
15	**Yesterday**											
16	minutes	0:00	0:49	0:57	1:37	0:23	1:53	1:22	1:30	0:43	0:40	0:00
17	calls	0	5	18	28	10	12	22	15	12	7	0

SummaryUpdateLast25

This sub also summarizes the downloaded data in the DataSheet. The sub counts up the total number of calls, along with the number of minutes associated with those calls, for each day for the prior five weeks and puts it in the Summary worksheet (**Screenshot 4**). This data is used in the summary charts and tables on the Month worksheet.

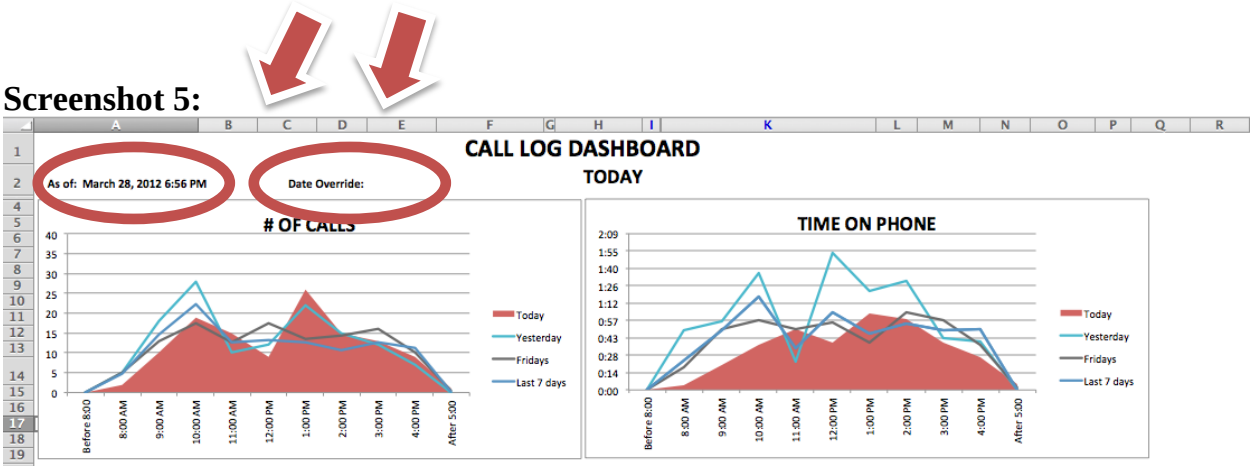
Screenshot 4:

19		1	2	3	4	5	1	2	3	4	5	1
20		33	32	31	30	29	26	25	24	23	22	19
21	Last Five Weeks	M 1/23/12	T 1/24/12	W 1/25/12	TH 1/26/12	F 1/27/12	M 1/30/12	T 1/31/12	W 2/1/12	TH 2/2/12	F 2/3/12	M 2/6/12
22	minutes	10:15	6:08	8:19	7:16	6:47	10:29	11:59	9:44	10:21	8:29	9:29
23	calls	149	105	134	124	112	165	148	152	166	136	164

CallVolume

Once the downloaded data from the DataSheet worksheet has been summarized by day and time on the Summary worksheet, the CallVolume sub pulls the data in to the Call Volume worksheet in a highly formatted way that utilizes the powerful informational summary abilities of charts and tables. The bank wanted easy to understand graphical summaries. The Call Volume worksheet is one of only two worksheets that the user actually sees (Month worksheet is the other). The other three worksheets (DataSheet, Summary, and Pictures) are strictly used for holding and summarizing data and are hidden from the user of the reporting tool. The charts on the Call Volume worksheet pull data from the Summary worksheet and give the user a graphical representation of the number of calls and time spent on the phone by hour. This allows the bank to get a clear sense of the times of the day that the most calls come in, and hence when the greatest number of employees are needed. The charts show calls for the current day, the previous day, the average for the day of the week (Fridays in this example), and the average of the last seven days (**Screenshot 5**).

Screenshot 5:



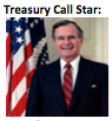
Another piece of data that the bank requested was a summary by employee that would allow the bank to determine how productive each individual employee was on a daily basis. The Call Volume sub summarizes the number of calls, the amount of time spent on the phone, and the average call time for each employee (**Screenshot 6**). The success rate is determined by if the employee was able to resolve the customer's problem. The sub is also set up to determine which employee was the "Star" for the day by looking at which employee took the greatest number of calls in each department. The picture in the center is updated through VBA code in the sub by copying the picture from the Pictures worksheet where a picture of each employee is stored. If there is a tie between employees for the greatest number of calls, the picture will update declaring a tie (**Screenshot 7**).

Screenshot 6:

TREASURY MANAGEMENT	CALLS	TIME	AVG	INTERNAL	Success Rate
Jimmy Carter	19	1:22	0:04	4	100%
Richard Nixon	0	0:00	0:00	0	0%
George H. W. Bush	22	1:26	0:03	5	95%
Dwight D. Eisenhower	0	0:00	0:00	0	0%
Total	**41**	**2:48**	**0:04**	**9**	**98%**
Average	**10**	**0:42**		**2**	

CUSTOMER SERVICE LINE	CALLS	TIME	AVG	INTERNAL	Success Rate
Harry S. Truman	0	0:00	0:00	0	0%
Gerald Ford	21	0:33	0:01	0	100%
Bill Clinton	10	0:29	0:02	0	100%
Barack Obama	32	1:04	0:02	4	100%
Franklin D. Roosevelt	0	0:00	0:00	0	0%
Ronald Reagan	15	0:50	0:03	0	100%
Total	**78**	**2:56**	**0:02**	**4**	**100%**
Average	**13**	**0:29**		**1**	

Treasury Call Star:



George

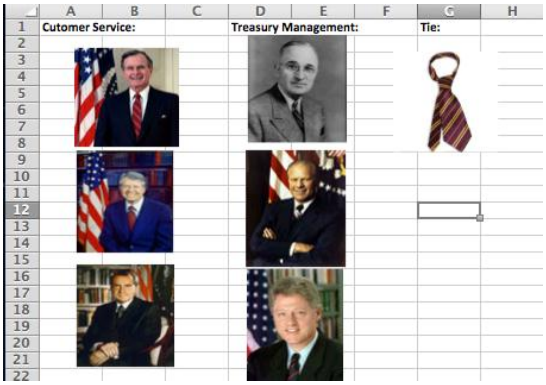
Customer Service Call Star:

Barack

TOP ISSUES	CALLS	TIME	AVG	Success Rate	
Online Banking - Login Issues	28	2:00	0:04	100%	24%
Online Banking - ACH	1	0:04	0:04	100%	1%
Online Banking - Wires	2	0:05	0:02	100%	2%
Online Banking - Remote Deposit	0	0:00	N/A	N/A	
Online Banking - Bill Pay	4	0:15	0:03	100%	3%
Online Banking - Positive Pay	0	0:00	N/A	N/A	
Online Banking - Other	7	0:40	0:05	100%	6%
Account Information / Support	34	1:18	0:02	97%	29%
Switchboard	29	0:35	0:01	100%	24%
Token Customer Orientation	0	0:00	N/A	N/A	
Wires - Not Online	2	0:06	0:03	100%	2%
Corporate Credit Cards	0	0:00	N/A	N/A	
Total	**119**	**5:44**	**0:02**	**89%**	

Finally, the bank also wanted a summary of the top issues that customers were calling in for (**Screenshot 6**). This was important to the bank because they wanted to know the types of issues that employees were handling in their calls and how long it was taking them to resolve these issues. The top issues data is summarized by the sub pulling data from the DataSheet download and aggregating it accordingly.

Screenshot 7:

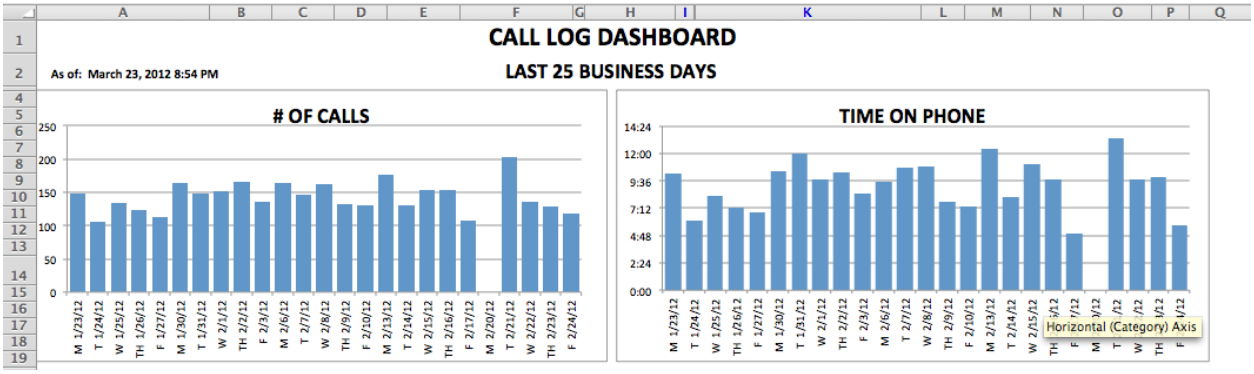


Month

The next report worksheet shows the long-term patterns that the bank is really interested in. The Month sub pulls in the data from the DataSheet worksheet and summarizes the number of calls and time on the phone by date and enters it in to charts for the last five weeks (**Screenshot 8**). This view gives the bank really good insight on the upper and lower bounds of call volume that the bank can expect on a daily basis. This data will

give the bank the best indication of what their workforce needs to be on average to handle the expected number of calls each day.

Screenshot 8:



Similar to the Call Volume worksheet, the Month worksheet summarizes the total number of calls, total times spent on the phone, and the average length of each call for each department (**Screenshot 9**). The sub also brings in the photo of the top performing employee, similar to the Call Volume worksheet. The bank requested this feature so that they would have an easy time identify the production of each employee and would have a gauge to measure performance as a basis for awards. The sub also calculates the top issues for the last five weeks, giving the bank a good long-term view of the types of issues that their customers are calling in about. This will help the bank determine the mix of employees that will be needed to handle expected customer issues in the future.

Screenshot 9:

TREASURY MANAGEMENT	CALLS	TIME	AVG	INTERNAL	Success Rate
Jimmy Carter	506	47:14	0:05	78	98%
Richard Nixon	220	20:58	0:05	48	98%
George H. W. Bush	427	34:31	0:04	83	93%
Dwight D. Eisenhower	472	34:28	0:04	15	99%
Total	1,625	137:11	0:05	224	97%
Average	406	34:17		56	

CUSTOMER SERVICE LINE	CALLS	TIME	AVG	INTERNAL	Success Rate
Harry S. Truman	254	9:39	0:02	32	92%
Gerald Ford	362	11:25	0:01	5	94%
Bill Clinton	252	11:10	0:02	4	96%
Barack Obama	321	12:25	0:02	40	98%
Franklin D. Roosevelt	42	4:36	0:06	9	74%
Ronald Reagan	185	9:22	0:03	9	95%
Total	1,416	58:37	0:02	99	95%
Average	236	9:46		17	

This Month's Call Star:

Jimmy

This Month's Service Provider Star:

Gerald

TOP ISSUES	CALLS	TIME	AVG	Success Rate	
Online Banking - Login Issues	613	46:29	0:04	100%	20%
Online Banking - ACH	82	8:35	0:06	94%	3%
Online Banking - Wires	81	6:16	0:04	96%	3%
Online Banking - Remote Deposit	90	14:01	0:09	98%	3%
Online Banking - Bill Pay	77	7:16	0:05	92%	3%
Online Banking - Positive Pay	2	0:09	0:04	100%	0%
Online Banking - Other	216	18:17	0:05	97%	7%
Account Information / Support	815	40:58	0:03	94%	27%
Switchboard	534	11:22	0:01	95%	18%
Token Customer Orientation	22	9:15	0:25	73%	1%
Wires - Not Online	131	7:21	0:03	98%	4%
Corporate Credit Cards	36	2:50	0:04	89%	1%
Total	3,048	196:15	0:03	85%	

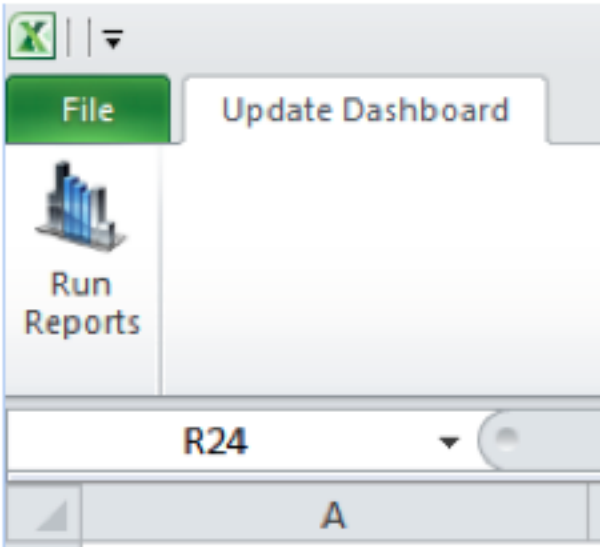
Photo

This sub is used strictly to bring the photos of the "Star" performers for the day and month over from their storage location on the Pictures worksheet. I accomplished this using a Max function to look at the number of calls that each employee took and then used a delete and copy method for the shape with the appropriate name so that the pictures in both reports were replaced with that of the "Star" performer.

Running the Reports

I created a custom ribbon button for the user to run the CommandCenter macro from to update the workbook (**Screenshot 10**). This functionality allows the user to run the report from anywhere in the workbook, regardless of what report tab they are currently looking at (Call Volume or Month). The button runs the macro for the current date, unless the user types an override date in the highlighted space on the Call Volume worksheet (**Screenshot 5**). If an override date (a date in the past) is typed in to the workbook, the CommandCenter macro is run for that date.

Screenshot 10:



Learning and Conceptual Difficulties

While this project was extremely painful at times, it also proved to be a very valuable learning experience. I was amazed at the vast amount of time it took me to create what I thought was going to be a very straightforward project. I was constantly running in to problems with my code not giving me the results that I wanted. I would have to spend hours reviewing the code and making adjustments until it would finally work and I could move on to the next section. This was an ongoing theme of this project.

I also wanted to keep the report very easy to use for the user, because I was told that the bank employee who was monitoring this process would be running the report several times a day to track call volume throughout the day. Because of that I wanted the report to be as simple to use as clicking one button to run all the code and update the reports. I have given a preview of the tool to the manager of the process at the bank and she is very pleased with the functionality and results.

Some of the main difficulties that I encountered and key learning points that I achieved during the course of this project are:

1. **Difficulty-** Updating the "Star" pictures on the reports turned out to be an extremely hard process for me to work through. Once I was able to get the pictures to delete, copy, and format correctly I was faced with the challenge of the macro identifying which picture was the correct one to bring in based on the results of the data. I was finally able to get it working with some creative use of a couple of variables, the Max function, and liberal use of If Statements.
2. **Difficulty-** I had a rough time getting the RefreshData sub to connect with the Bank's Intranet to download the raw data I would be using to create the reports. I ended up recording myself manually downloading the data and then I had to make several "tweaks" to the code in order to get it to work correctly.
3. **Learning Point-** The first major skill that I developed during the course of this project was improved error handling. I ran in to so many problems during the project, from my code erring out to my code not bringing back the correct values. I got ample practice using break points and stepping through my code one line at a time until I was able to determine where the code was incorrect. I am now very confident in my ability to track down errors in VBA code and I have developed a systematic approach that allows me to more easily hone in on problem areas.
4. **Learning Point-** The next major skill that I feel I mastered during this project is the use of loops. Because I was going through thousands of lines of code and performing very similar calculations, I was able to take significant advantage of loops in my coding. Some of this loops were in very complex With and If statements, but after a lot of trial and error I was able to get the loops functioning properly, which made doing the same calculations for several rows of summarized data much easier. I now feel that I have mastered the use of loops in VBA coding.
5. **Learning Point-** I also learned how valuable it is to properly indent your coding and to liberally use comments to document everything you are doing. As my code got to be thousands of lines long I had an extremely difficult time going through my code to find sections that I wanted to make changes and fixes in. If I had been indenting consistently from the beginning, and had document what each section did, I would have had a much easier time identifying the section I was looking for. This is a HUGE lesson that I will take away from this project and will make sure that I implement on the next project I undertake.

Assistance

Other than a few questions and roadblocks I discussed with the Professor during this project, I did not receive any outside assistance and I had no prior VBA knowledge or experience prior to taking this class.