



# CONSULTANT TOOLS

VBA Final Project

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## Executive Summary

Partners In Leadership, Inc. is a widely respected international leadership training and management consulting company. Founded in 1989, the company is now the world's premier provider of Accountability Training Services. All training services are based on books (most notably *The Oz Principle*) written by the company's founders, which focus on creating greater accountability.

- The *Self Track Training* helps people embrace their own accountability for achieving organizational results.
- The *Culture Track Training* accelerates the change within organizational culture to produce the results the organization needs now.
- The *Others Track Training* teaches people to effectively hold others accountable for results in a positive, principled way so that they successfully deliver on expectations.

The Excel Consultant Tools file I created will allow Partners In Leadership Consultants to assess how a company's employees view accountability within the three tracks. Before doing a workshop or training session, consultants will send a Google Form link to the employees. The form will ask a series of 46 questions (on a scale of 1 to 10) that are related to the three accountability tracks. The Consultant Tools file will then scrape the data collected by the form online and put it in an Excel spreadsheet. With this data, pivot tables and charts will be automated so that the consultant can evaluate where the company is struggling with accountability. The objective is to give the consultant some direction in training preparation.

# Implementation Documentation

## 1. Google Form

- The first step was to create the Google Form. I won't spend much time on this step but here is a sample of the form:  
(<https://docs.google.com/forms/d/109UZVZYsFlNsdzUl88eKzqMWomspkLsvMZmjI4Lck-c/viewform>)

**Accountability Assessment**

**Welcome!**

Before your organizations's first workshop on accountability, please fill out this form. You will be asked to rank on a scale from 1 to 10 how much you agree or disagree with a statement - with 1 being "I disagree" and 10 being "I agree." This form has three sections about three different levels of accountability:

- 1.) Self
- 2.) Culture
- 3.) Others

It should take no longer than 15 minutes to fill out. We appreciate your responses as this will enhance the quality of the workshops.

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**Accountability Assessment**

**Self**

The next 16 questions evaluate how you are doing with accountability on a personal level.

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## Accountability Assessment

**\* Required**

**01. I obtain the perspectives of others. \***

1 2 3 4 5 6 7 8 9 10

Disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Agree

**02. I communicate openly and candidly. \***

1 2 3 4 5 6 7 8 9 10

Disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Agree

**03. I ask for and offer feedback. \***

1 2 3 4 5 6 7 8 9 10

Disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Agree

**04. I hear the hard things to see reality. \***

1 2 3 4 5 6 7 8 9 10

Disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Agree


**05. I am personally invested. \***

1 2 3 4 5 6 7 8 9 10

Disagree ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Agree

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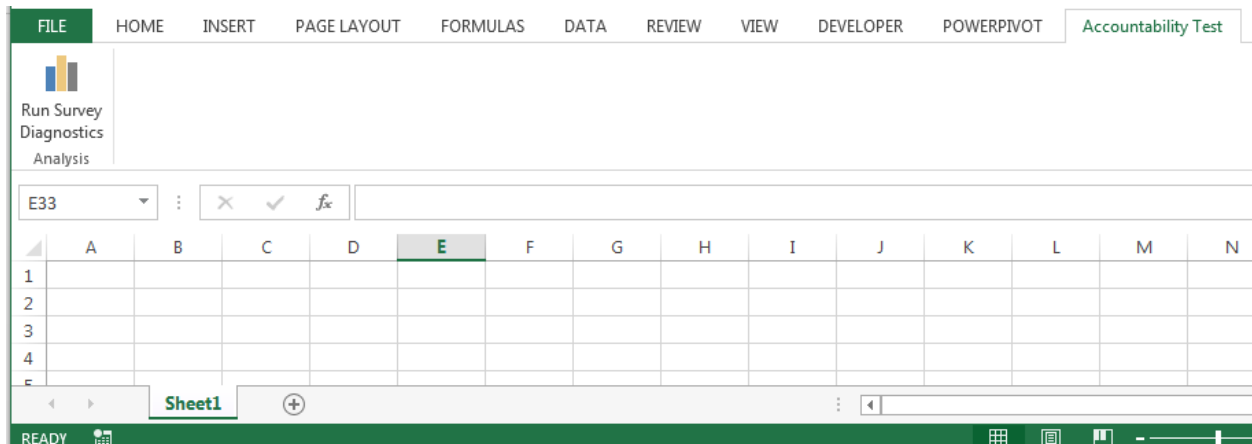
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- The form is set up so that each employee must respond (they cannot leave a question blank).
- Note: these are questions that Partners In Leadership has on their website for self-evaluation quizzes. I received permission from my Dad, who works for this company, to use these same questions.

## 2. General Overview

- The ribbon is modified as shown in the picture below
- The consultant only needs to press the one button and this will prompt a sub procedure called “analyze” that controls the order of the other sub procedures.
- The flow of the module is as follows:
  - Getting raw data from the internet into Excel
  - Transform data to make it useful for Pivot Tables
  - Create Summary Pivot Table with expanded/not expanded options
  - With expanded Summary Pivot Table, create five number summaries for each accountability track and question
  - Create chart from Summary Pivot Table for visual analysis
  - Create another Pivot Table for histogram chart
  - Histogram chart created from same generic sub procedure for making charts
- Pages are deleted and added if the module runs more than once so that no errors occur in “refreshing” the data.
- The most important tabs are colored in blue – this indicates that these worksheets are used for analysis.
- The module will always end on the Summary worksheet so that the consultant can start with an overview of the survey data. The Sheet1 worksheet will be deleted since it is not needed.



### 3. Getting Raw Data into Excel

- The form responses are stored in a Google Spreadsheet. I had this spreadsheet published on the internet.  
(<https://docs.google.com/spreadsheet/pub?key=0AiOCLf98mtTZdE8tLUNmcktjbm9zZ2VLV3pzSDlQV0E&single=true&gid=0&output=html>)

responses : Form Responses

Timestamp	01. I obtain the perspectives of others.	02. I communicate openly and candidly.	03. I ask for and offer feedback.	04. I hear the hard things to see reality.	05. I am personally invested.	06. I learn from others.
4/3/2014 20:25:25	9	9	8	10	9	9
4/3/2014 20:38:56	7	7	7	5	8	8
4/3/2014 23:29:41	7	4	3	1	10	10
4/7/2014 21:01:42	6	4	3	9	8	8
4/7/2014 21:03:17	8	7	9	10	9	9
4/7/2014 21:04:37	5	4	4	3	5	5
4/7/2014 21:06:03	8	7	9	8	10	10
4/7/2014 21:07:47	7	8	6	7	4	4
4/8/2014 9:32:17	2	3	4	5	3	3
4/8/2014 9:33:42	7	4	5	6	5	5
4/12/2014 12:40:03	3	2	5	4	3	3
4/16/2014 21:07:07	2	1	1	1	1	1
4/16/2014 21:10:35	4	4	4	4	4	4
4/16/2014 21:17:06	8	10	8	10	8	8

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- Then using the Class Module “agent” that we learned in class, I wrote a sub procedure called “getData” that scrapes the data from this published spreadsheet and inserts it into an Excel Spreadsheet titled “RawData.” Instead of including the timestamp column, I changed it to an ID number for keeping track of how many responses have come in.
- A special feature I added was named ranges. All the responses are named/grouped by accountability track. In addition, each question’s responses are named *Self1*, *Self2*, ..., *Culture1*, *Culture2*, ..., *Others1*, *Others2*, etc. This allowed transferring responses and referring to responses much easier in other sub procedures in VBA.

	A	B	C	D	E	F
1	ID	01. I obtain the perspectives of others.	02. I communicate openly and candidly.	03. I ask for and offer feedback.	04. I hear the hard things to see reality.	05. I am personally invested.
2	1	9	9	8	10	9
3	2	7	7	7	5	8
4	3	7	4	3	1	10
5	4	6	4	3	9	8
6	5	8	7	9	10	9
7	6	5	4	4	3	5
8	7	8	7	9	8	10
9	8	7	8	6	7	4
10	9	2	3	4	5	3
11	10	7	4	5	6	5
12	11	3	2	5	4	3
13	12	2	1	1	1	1
14	13	4	4	4	4	4
15	14	8	10	8	10	8

	A	B	C	D	E	F	G	H
1	ID	01. I obtain the perspectives of others.	02. I communicate openly and candidly.	03. I ask for and offer feedback.	04. I hear the hard things to see reality.	05. I am personally invested.	06. I learn from others.	07. I align my actions with my values.
2	1	9	9	8	10	9	8	7
3	2	7	7	7	5	8	8	9
4	3	7	4	3	1	10	7	3
5	4	6	4	3	9	8	8	7
6	5	8	7	9	10	9	7	8
7	6	5	4	4	3	5	8	7
8	7	8	7	9	8	10	9	8
9	8	7	8	6	7	4	8	9
10	9	2	3	4	5	3	6	3
11	10	7	4	5	6	5	5	6
12	11	3	2	5	4	3	1	2
13	12	2	1	1	1	1	1	3
14	13	4	4	4	4	4	4	4
15	14	8	10	8	10	8	8	8

#### 4. Transform Data for Pivot Table Analysis

- The raw data itself was not useful for pivot analysis, so I wrote a sub procedure called “getPivotData” that would transform the data into something more useful. It is placed in a worksheet titled “PivotData.”

ID	Assessment	Question	Response
1	1. Self	01. I obtain the pe	9
2	1. Self	01. I obtain the pe	7
3	1. Self	01. I obtain the pe	7
4	1. Self	01. I obtain the pe	6
5	1. Self	01. I obtain the pe	8
6	1. Self	01. I obtain the pe	5
7	1. Self	01. I obtain the pe	8
8	1. Self	01. I obtain the pe	7
9	1. Self	01. I obtain the pe	2
10	1. Self	01. I obtain the pe	7
11	1. Self	01. I obtain the pe	3
12	1. Self	01. I obtain the pe	2
13	1. Self	01. I obtain the pe	4
14	1. Self	01. I obtain the pe	8
15	2. Self	02. I communicate	9
16	2. Self	02. I communicate	7
17	2. Self	02. I communicate	4
18	2. Self	02. I communicate	4
19	2. Self	02. I communicate	7
20	2. Self	02. I communicate	7

- This multiplied the lines of data by 46 (because of 46 questions per ID). I considered this potentially being a problem, but Excel offers over a million lines within a spreadsheet.
- I think it would be rare for a workshop to include more than 15,000 people – most companies have Partners In Leadership only focus on a subdivision or region within their company.

## 5. Pivot Table and Formatting

- I wrote a sub procedure called “pivotAnalysis” that would create a pivot table. This sub procedure receives two variables when called: sheetName and expanded.
- The sheetName variable is self-explanatory, and the expanded variable is Boolean to determine if the nested data should be expanded or not.
- I have this sub procedure run twice to create two new sheets: one without the expanded data and one with it. These sheets are named “Summary” and “Details”, respectively.

Row Labels	Average Scores
1. Self	6.103
2. Culture	5.390
3. Others	5.914
Grand Total	5.809

- The picture above shows the collapsed version of the Pivot Table in the Summary Worksheet.
- It shows the average responses for each of the accountability tracks
- The consultant is aware of the average numbers across the globe for each of these accountability tracks and will know where the company is falling short.



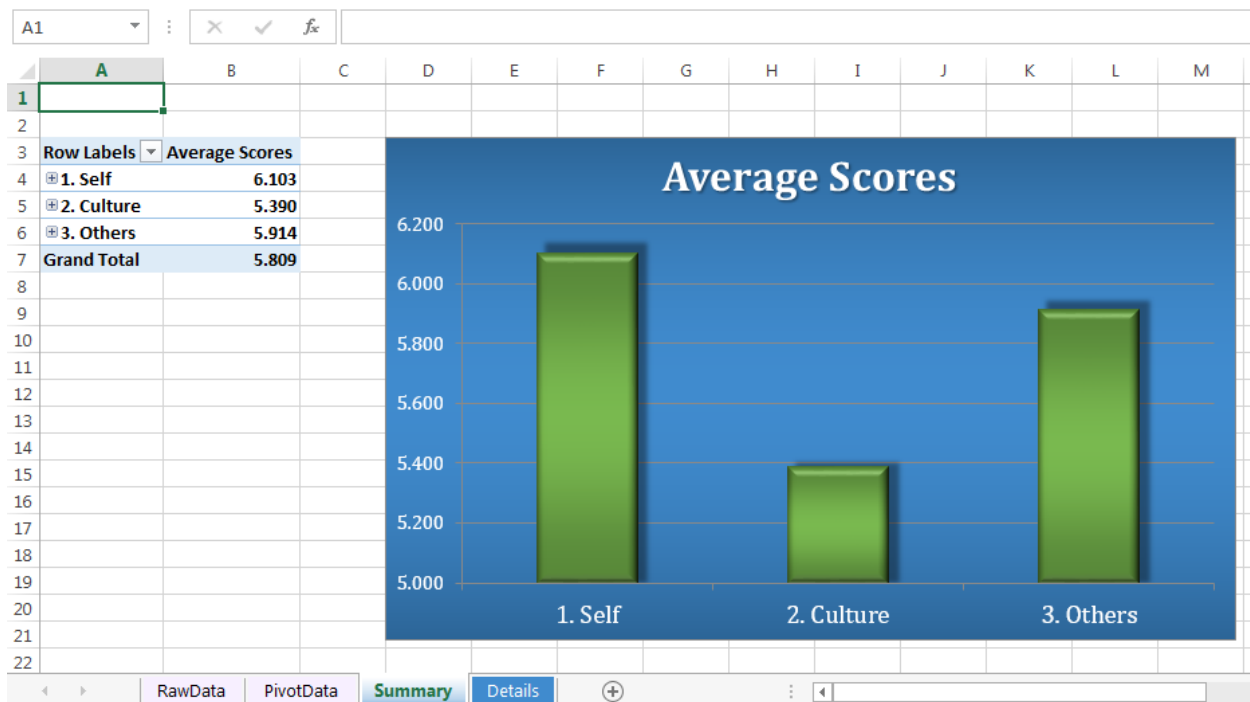
- The picture below (in the Details Worksheet) shows what happens when the expanded variable is true.
- The Details worksheet is useful to the consultant for identifying questions with high or low average responses (using data bars). It also provides a breakdown of responses with the 5 number summary.

Row Labels	Average Scores	Minimum	25th Percentile	Median	75th Percentile	Maximum
<b>1. Self</b>	<b>6.103</b>	<b>1</b>	<b>4</b>	<b>7</b>	<b>8</b>	<b>10</b>
01. I obtain the perspectives of others.	5.929	2	4.25	7	7.75	9
02. I communicate openly and candidly.	5.286	1	4	4	7	10
03. I ask for and offer feedback.	5.429	1	4	5	7.75	9
04. I hear the hard things to see reality.	5.929	1	4	5.5	8.75	10
05. I am personally invested.	6.214	1	4	6.5	8.75	10
06. I learn from both my successes and failures.	6.286	1	5.25	7.5	8	9
07. I align my work with desired company results.	6.000	2	3.25	7	8	9
08. I act on the feedback I receive.	6.071	1	4.25	6	8.75	10
09. I constantly ask, "What else can I do?"	5.500	1	4	4.5	8	9
10. I overcome cross-functional boundaries.	5.429	1	3	6	8	10
11. I creatively deal with obstacles.	7.000	1	4.25	8.5	9	10
12. I take the necessary risks.	6.571	1	4.5	8	8.75	10
13. I do the things I say I'll do.	6.714	1	4.25	7.5	9.75	10
14. I focus on the top priorities.	6.571	1	4.25	8	9	10
15. I stay Above The Line by not blaming others.	5.786	1	5	6	7.75	9
16. I work to sustain an environment of trust.	6.929	1	4.5	7.5	9	10
<b>2. Culture</b>	<b>5.390</b>	<b>1</b>	<b>3</b>	<b>5</b>	<b>8</b>	<b>10</b>
01. Our organization's culture provides a strong foundation.	6.000	1	4.25	6	8	10
02. The current culture has a positive impact on performance.	5.429	1	3.25	5	8	9
03. People have aligned around the way we work.	5.429	1	4	4.5	7.75	10
04. We enjoy a high level of trust throughout the organization.	6.000	1	4	6	9	10
05. People see managing the culture as a top priority.	4.571	1	2	4	6	10
06. People effectively and consistently ask for feedback.	4.929	2	2	4	8.75	9
07. We courageously tell the truth to one another.	4.071	1	2.25	4	5	10
08. People sufficiently grasp the vision and mission.	5.000	1	3.25	5	7.75	9
09. We have clearly defined and communicated our values.	5.071	1	3.25	5	6.75	10
10. People show a high level of personal integrity.	5.214	1	2.5	5.5	7.5	10
11. We will achieve our organizational results through collaboration.	6.643	2	4.25	8	9	10
12. We have a sense of urgency about getting things done.	5.571	1	3.25	5.5	7.75	10
13. Cross-functional teamwork is a significant part of our success.	5.643	1	3	6.5	8	10
14. People like working here and speak well of the organization.	5.643	1	3.25	7	7	10
15. The experiences created by the management team are positive.	5.643	2	3	6	7.75	10
<b>3. Others</b>	<b>5.914</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>10</b>
01. People clearly understand the expectations of their roles.	6.286	1	4	7	9	10
02. I rarely find myself asking the question "What's in it for me?"	5.286	1	4	5	7.75	10
03. I hold positive and candid accountability conversations.	6.929	1	4.25	6.5	9	10

- To the right of this Pivot table are 5 number summaries for each track and question.
- When the optional expanded variable is true in "pivotAnalysis", the sub procedure calls a sub procedure named "detail" which then goes through all of the raw data and calculates the Minimum, 25<sup>th</sup> Percentile, Median, 75<sup>th</sup> Percentile, and Maximum.
- Borders and bold font are added to the accountability tracks to make it easier to identify track summaries.
- I used the worksheet function Quartile to do this in VBA.
- This is where the named ranges came in handy and made it easier to automate the process of calculating the 5 quartiles.

## 6. Pivot Chart and Formatting

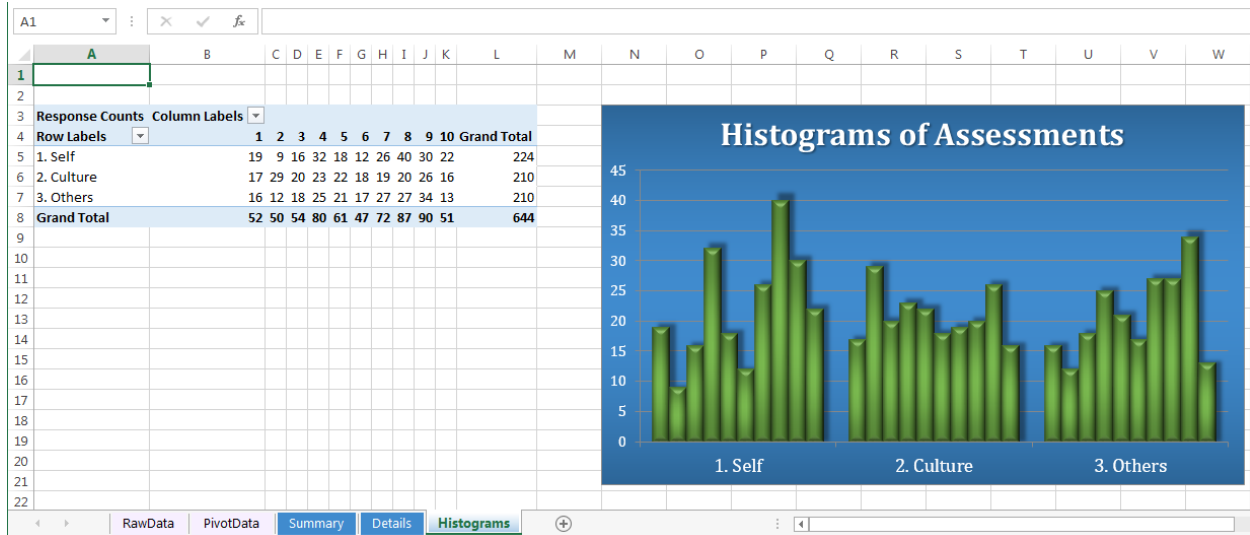
- If the optional expanded variable is false in “pivotAnalysis”, then it will call a sub procedure called “makeChart” that will create a Pivot Chart.
- This sub procedure receives two variables: sheetName and title. The sheetName variable is used to identify which sheet to put the chart on and the title variable is for the title of the chart.
- The formatting included shadowing, beveling, creating gradient background colors, and changing font color, size, and text in VBA.



- This sub procedure is very useful because it is dynamic with the number of column series and can be reused for other pivot tables with larger series.
- The consultant now has a visual of the average responses of each accountability track, which makes it nicer and quicker to analyze.

## 7. Histograms for Accountability Tracks

- One last analysis worksheet is the Histograms worksheet.
- A sub procedure called “pivotHistogram” creates another Pivot Table that takes the count of each response value for each of the three accountability tracks.
- This sub procedure then calls the “makeChart” sub procedure to make a chart. This is where the dynamic column series is useful.



- The bins of the histograms are the values of the response variables (1 through 10).
- The consultant now has a visual of the distribution of responses for each of the three accountability tracks making it easier to analyze.

## Discussion of Learning and Conceptual Difficulties

### 1. *Scraping Data from Internet into Excel*

- This was a challenge. I thought I understood the process from class, but I had trouble implementing it with my project.
- I had to analyze the Class Module “agent” so that I could follow how it would pull data from the internet.
- I learned a lot about how to be “smart” with finding data within a webpage’s source code. This actually ended up being very rewarding when I got it to work.
- Adding named ranges was hard to learn. Because of the three accountability tracks, I had to figure out a loop that would go through all of the questions but name the range of the question responses by track and question number.
- I learned how to manipulate the named ranges with conditional statements.

### 2. *Getting Data to be Useful for Pivot Analysis*

- After getting the data successfully from the internet, I realized that the format of the data was not ideal for creating Pivot Tables.
- I had to figure out a way to transform the data so that the Pivot Table would be able to function for analysis.
- I used nested loops to transform the data.

### 3. *Making the Pivot Table in VBA with Formatting*

- I struggled with referring to objects in VBA so this part was a great review for me.
- I learned how to successfully refer to an object in VBA and create a Pivot Table.
- I really wanted to include conditional formatting because it looks cool and it is very useful for quick analysis.
- The data bars with different colors took me some time to learn. It required using the macro recorder and researching how to do this. In particular, I learned better how to refer to a range, change its properties, and use its methods appropriately.

### 4. *Making the 5 Number Summary*

- The 5 number summary was the main reason I had named ranges in the raw data.
- I learned how to create nested loops that would go through each of the named ranges and output the 5 number summary.
- I also learned how to add borders to the three tracks.
- Something I would have liked to add were box plots for each of the 5 number summaries – particularly for the three accountability tracks
- I know how to make a box plot in Excel, but after spending several hours on the first chart (as described below), I decided that histograms would suffice.

## 5. *Creating Pivot Charts through VBA*

- For me this was the most frustrating and time-consuming part of my project.
- This sub procedure was one of the more difficult ones for me to create because I wanted to make the chart look professional with very specific formatting.
- It turns out the macro recorder is practically useless when doing special formats to charts. I had to research extensively to find out how to change these chart elements.
- However, it was very rewarding when I got it to work, and I believe it adds to the professionalism of the project.

## 6. *Creating Histogram Pivot Chart*

- When I decided I wanted to create histograms, I decided to use the same code as I did for the first chart.
- A major problem I ran into was that the Histograms Chart had several series (10 total – one for each response value). The first chart had only one series.
- I had to figure out how to format all of the series within a loop as shown below and make sure it would still work for the first chart (and it successfully worked!).
- I was excited about this loop because it allowed me to reuse the sub procedure and keep the same style throughout the project.

```
'Formats Series
For x = 1 To theChart.FullSeriesCollection.Count
    With theChart.FullSeriesCollection(x)
        .Interior.Color = RGB(112, 173, 71)
        .Fill.OneColorGradient Style:=msoGradientHorizontal, variant:=4, Degree:=0.25

        'Sets the Bevel Format
        With .Format.ThreeD
            .BevelTopType = msoBevelCircle
            .BevelTopInset = 6
            .BevelTopDepth = 6
        End With

        'Sets the Shadow Format
        With .Format.Shadow
            .Type = msoShadow27
            .Style = msoShadowStyleOuterShadow
            .Blur = 4
            .OffsetX = 4
            .OffsetY = -0.06
            .Size = 103
        End With
    End With
Next
```

## 7. *Additional Elements that would be Nice*

- I haven't tried the program on previous versions of Excel or on Excel for Mac, but I'm guessing problems might occur with formatting the charts and data bars.
- Ideally, I would want to make sure this workbook functions properly for consultants with different versions of Excel.

## Assistance

- I received help from Dr. Allen with regard to the idea and scope of the project. He helped me think of the Google Form and then importing the data into Excel for running different analysis procedures.
- Other than that, I did not receive substantial assistance. I taught myself any code I was not sure how to write.