

Qualtrics, R and Data Visualization: the importance of tidyverse and ggplot2 collaboration to portray meaningful results

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Working closely with the professional evaluation team of Aligned Impact of Greensboro, NC, this internship provided me the opportunity to learn report writing using R, R Markdown, tidyverse, and ggplot2. The learning emphasized data importing, formatting, visualization, and reporting.



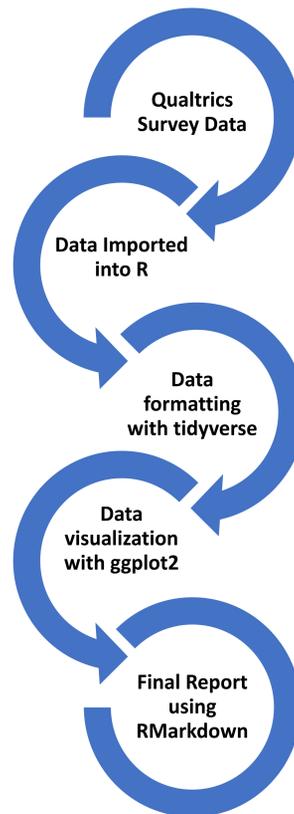
Internship takeaways

Qualtrics is a popular online surveying tool to collect qualitative and quantitative data. While it can do some basic statistical analysis and data visualization, the survey data is often exported for enhanced statistical analysis and data visualization. In my internship, we imported into R the survey data collected with the Qualtrics system.

R, and RStudio's basic desktop version, are free and open-source, and there are plenty of online high-quality learning resources available.

Since R is an open-source platform, newer statistical analysis and data visualization packages are developed and published on regular basis by the R community.

For the additional and/or newer capabilities of R, all one needs to do is install these packages.



R is a scripting language requiring you write code instead of just point and click.

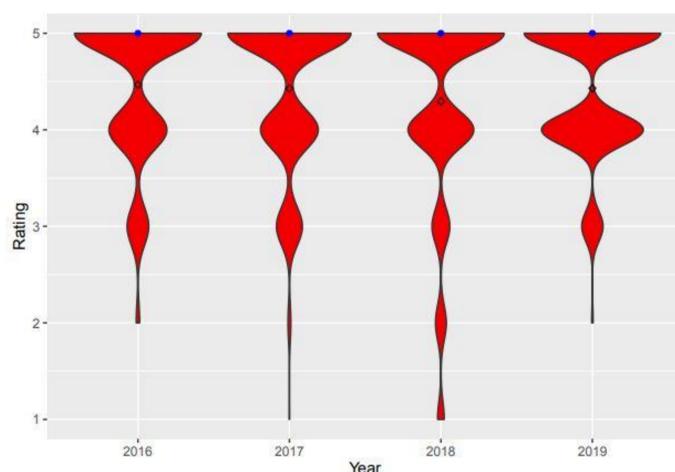
R learning curve is rather steep but knowing that similar datasets' reports can be generated by running the same R script with a few changes is very efficient in the long run.

Once you understand the scripting syntax, it becomes easy to understand how to provide inputs to the functions of the packages that you have installed as your R set of tools.

Two of the commonly used libraries for data formatting and visualization are tidyverse and ggplot2.

How I handled my R learning challenges

- Weekly meeting with my internship team's research scientist
- Studying eBooks suggested by my internship supervisor
- Following along an online R data visualization class
- Perusing online R learning resources and code examples
- Writing simple and well documented code
- Sharing R code and regular discussions with my internship team's research scientist



An example of Violin Graph for our final report.

2016	8	0	0	8	85	13
2017	0	0	0	6	94	16
2018	0	0	0	6	94	17
2019	0	0	0	10	90	21
Overall	1	0	0	7	91	67

An example of highlighting data for our final report.

My own statistical analysis and data visualization tool set

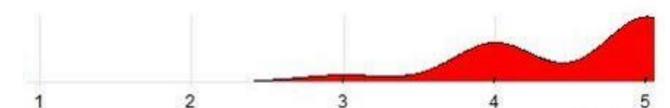
R and RStudio installation: to get my software setup right, I had to do R and RStudio installation several times. Each time, I was amazed how I could get my R and RStudio installation up and running, from scratch, in about an hour.

R Markdown is a platform which allows to create a report from within R. We used R Markdown to create a professional report (the output can be PDF, Word, or HTML) which included text, data, and graphs.

Instead of doing statistical analysis in one software package, data visualization in another, and then combining it with text in yet another software package, all of this can be done under the R umbrella using R Markdown scripting.

The internship got me so excited about the open-source movement, that I purchased a laptop with Ubuntu Linux operating system. I then installed R and RStudio on it, which was quick and flawless.

My internship led me to discovering an open-source and free solution to statistical analysis and data-visualization: a tool set that I can use now and for my professional evaluation work beyond the graduate school.



An example of Density Graph for our final report.

My Favorite Resources

The R Project for Statistical Computing: for downloading R software https://www.r-project.org/	An excellent eBook for learning data visualization with practice code Data Visualization, A Practical Introduction: https://socviz.co/
RStudio: for downloading the graphical user environment to enhance R experience https://rstudio.com/	An online class to practice ggplot2 as well as the principles of graphic design Data Visualization: https://datavizm20.classes.andrewheiss.com/
An excellent eBook for learning data importing, transforming, and analysis R for Data Science: https://r4ds.had.co.nz/	A great source to learn about selecting the appropriate graph which reflects the data accurately Fundamentals of Data Visualization: https://clauswilke.com/dataviz/