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| **Task** | **Bari – R/Shiny** | **Periscope Data** | **Tableau** |
| What is it? | * R code to structure, clean and manipulate data in script that refreshes with new data. * Use the data to create visualizations & tables. * Create an interactive web platform using R-Shiny. R-Shiny is an HTML overlay that incorporates JS, CSS and R to create a BI user interface. * I am building basic user interactivity for data exploration. | BI user interface that allows gives users interactivity with data for exploration and visualization. | BI user interface that gives users interactivity with the data for exploration and visualization. |
| Data Backend | Bari wrote R code to tie together data from the PostgreSQL table and other sources (CSV of room information and availability dates). Built new tables to produce the analysis for occupancy and availability. Manipulated and restructured (joined, lengthened and spread) data to perform different analysis and visualization. (I.E. I performed the Analyst role that is needed for all three platforms to create a data set that can be used for exploration). All code is repeatable and transferable. | Initially an Analyst is required to build SQL queries to structure the data for analysis. Since many of the joins and other data manipulation tasks are easier in R and Python than in SQL, it looks like PD has added the ability for analyst to incorporate R or Python scripts. It also claims to have an interface with SQL to make writing SQL queries less cumbersome. | Tableau needs a clean and well-structured data set fed to it. It can handle data from a variety of platforms including Excel and SQL. I didn’t have as much experience connecting directly to bigger data sources but did have it connected to SQL queries.  Tableau just launched their own proprietary data cleaning tool to compete with PowerQuery and perhaps Alteryx (these are both overlays that manipulate data with minimal need to use code). |
| Data Exploration | Shiny will need to have the user interactivity programmed by someone familiar with R. Once established, then should be simple to maintain. | Seems to incorporate some of the Tableau drag and drop features to allow the user to explore the data.  I’m not sure how much coding is needed for some of the more complex calculations. Would be interesting to compare to Tableau. | It is very intuitive once you make the mental shift from Excel to Tableau and the way it handles data. For more complex analysis, the user needs to write simple formulae within the visualization, similar to Excel and sometimes SQL. |
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| Dashboard | Bari building in Shiny. Code based. I built all of the graphs, tables and visuals, the interactivity, and the layout by writing the code to do it. | Seems to have dashboard capability similar to Tableau and PowerBI. | Dashboards are easy to build by inserting the visualizations. Basic interactivity built using filters. Needs someone with high Tableau proficiency to build the dashboard interface, but not a high need for programming skill. Hybrid developer/analyst. |
| Pros | * Higher level of customization available in the graphs and visualizations. * Repeatable. Code can be copied and used elsewhere. * Integrated with powerful R analysis capabilities if there’s a move toward statistical modeling and machine learning. * Data structure scripting is robust and repeatable. | * Might be a middle ground between Tableau and base R/Python. Because it incorporates R, it may be better able to incorporate & visualize machine learning and regressions. * Visualizations seem to be JavaScript/D3, so fast interactivity. | * Not a lot of coding skill needed. If you have experience with Excel, it’s fairly simple to write the formulas needed to create some of the analysis. * Drag and drop interactivity makes exploration of data easy. |
| Cons | * Code based. If you want more hands-on data exploration, you will need to learn R or have someone build complex interactivity. * Interactivity is developed through packages that integrate JavaScript. Not as well developed as the static tools, so some of the viz’s seem more basic. | * Initially based on SQL. Not sure how well R is integrated. SQL is cumbersome for data analysis and restructuring. * Not sure how easy it is to set up for building visualizations. | * Tableau visualizations are not repeatable and transferable. In Tableau, you have to rewrite the analysis formula in each separate window. * Tableau does not have strong statistical interface or visualization capabilities. Limited for data science applications. |
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| Implementation | * Needs a web interface. You can run from your own machine, host on ShinyApps.io (~$1000/ year), or implement R-Server/Shiny-Server on AWS. * Shiny/R server is opensource, so free to implement. AWS has robust deployment infrastructure and help documents for R deployment. | * Looks like it is supposed to be embedded in web applications. * Part of the offering is data hosting; this seems to be important part of their business model. Would this duplicate your AWS ecosystem? * Another offering that is front and center on their site is consulting service to build your data models and dashboards; indication of level of difficulty. | * Tableau subscription model for Tableau Desktop (to build the visualizations), Tableau Server or Tableau Online (host the data), and user consumer subscriptions. * Difficult to embed in a web ap. My own experience is that reactivity is slow. |
| Pricing | * Domicile hosted app on AWS site (free software for deployment.) * Potential consultant time for maintenance and potentially new features. | * I can’t find prices on their site. *(This may be a sign they want to upsell the data storage and development services ??)* | $70/month – Desktop (at least one, more likely 2 subscriptions). For other consumers, minimum five, so 5 x $35.  Total $1680 + $2100 = $3780 annually.  Consultant time for setup? |
| Trial Use | * Download Shiny Server and deploy the app. | I clicked the button to start a free trial. After entering user and company information, I got a message that said I would be contacted within a week. Makes me wonder about their business case – are they really selling their data hosting and manipulation service or do they have a robust tool that you can implement without buying the other stuff? | Tableau has a free trial. I’ve already used mine, but we could set you up with a trial and a clean data set to play with. |
| Takeaways | For R-Shiny Dashboard:   * May be either a cheap, basic solution if you deploy what I’ve built using free R-Server and existing AWS), or * too limiting if you want to build new visualizations and want to do it yourself. | Periscope Data looks interesting.   * Will need analyst to clean and structure the data for consumption and power user to build the dashboards * My only hesitation is that it’s SQL based, and that’s only due to my own experience realizing that data is so much easier to handle in R. | Tableau is a good data exploration tool to consider.   * Well established and supported. * Will need to have someone clean and structure the data. * Will need a power-user to build the visualizations and dashboards. * Limitations for data science applications. |
| Immediate Recommendation | * Spend some time & resources building a stable data structure. Immediate recommendation is to add two tables to PostreSQL: 1. building lookup with all of the building information (rooms, address, Lat/Lon, neighborhood, etc.) and 2. A table with building/room start and end dates. I have built my own in csv files, but I believe the start and end dates aren’t updated. | | |