

**A story (maximum 1,000 words).** Written in English, that tells the story of your visualization and walks users through “how to use” your visualization. The document must describe how your visualization provides meaningful insight, including potential actions and/or discoveries.

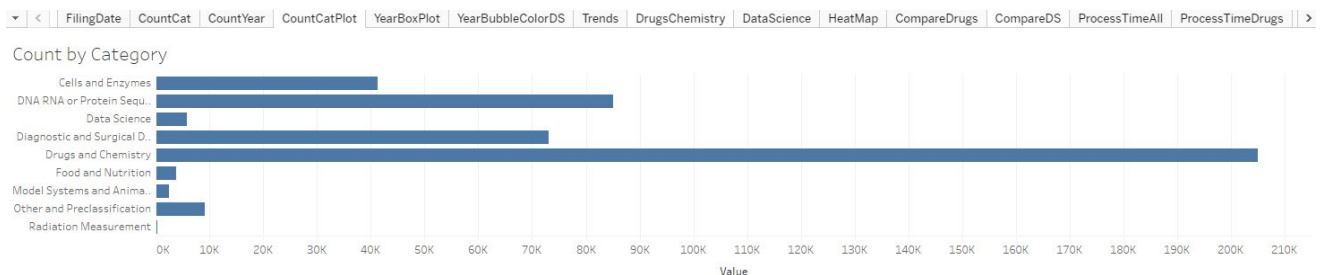
A Tableau Public visualization solution “Patents Statanalyzer” is being presented to get a better understanding of the trends/patterns in the PTO Cancer Moonshot dataset released as part of the challenge.gov challenge. More advanced solutions can be built using these plots as starting point and develop dashboards for more exhaustive what-if analysis.

**The total number of patent filings has been varying across the years.** The ratio of patent filings in the different categories have been fairly consistent across the years as can be seen in the screenshot below. The Tableau viz can be modified based on the selected years and patent filing categories - update the filter parameters for different types of views. Hovering over the different sections will show the associated count.

**In increasing order of number of patents filer per category:**

1. Drugs and Chemistry
2. DNA RNA or Protein Sequence
3. Diagnostic and Surgical Devices
4. Cells and Enzymes
5. Other and Reclassification
6. Data Science
7. Food and Nutrition
8. Radiation and Measurement

**Something to check in the data generation process** - One odd finding from this viz is that number of patents filed reduced in 2014 and 2015. Is data missing for these years that should have been included in the dataset?

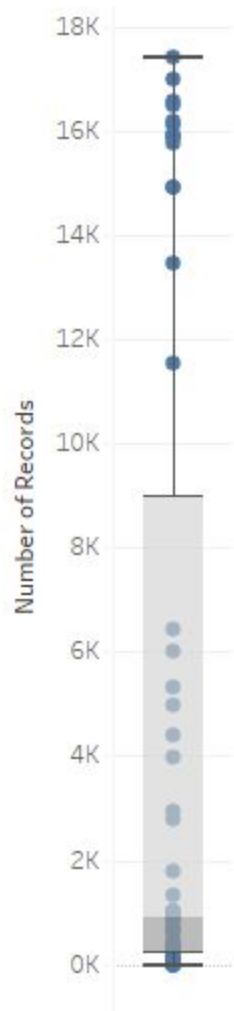


## Count by Category Table



1. 2004 (with 17,411 patents filed)
2. 2007
3. 2010
4. 2003
5. 2006

Count by  
Year of filing  
Box Plot



| ▼                             | < | FilingDate | CountCat | CountYear |
|-------------------------------|---|------------|----------|-----------|
| Count by Year of Filing Table |   |            |          |           |
| Year of F..                   |   |            |          |           |
| Null                          |   | 311        | ▲        |           |
| 1963                          |   | 1          |          |           |
| 1964                          |   | 1          |          |           |
| 1965                          |   | 3          |          |           |
| 1966                          |   | 1          |          |           |
| 1967                          |   | 6          |          |           |
| 1968                          |   | 16         |          |           |
| 1969                          |   | 33         |          |           |
| 1970                          |   | 19         |          |           |
| 1971                          |   | 31         |          |           |
| 1972                          |   | 59         |          |           |
| 1973                          |   | 105        |          |           |
| 1974                          |   | 115        |          |           |
| 1975                          |   | 152        |          |           |
| 1976                          |   | 188        |          |           |
| 1977                          |   | 238        |          |           |
| 1978                          |   | 300        |          |           |
| 1979                          |   | 299        |          |           |
| 1980                          |   | 340        |          |           |
| 1981                          |   | 375        |          |           |
| 1982                          |   | 420        |          |           |
| 1983                          |   | 451        |          |           |
| 1984                          |   | 607        |          |           |
| 1985                          |   | 717        |          |           |
| 1986                          |   | 689        |          |           |
| 1987                          |   | 888        |          |           |
| 1988                          |   | 872        | ▼        |           |

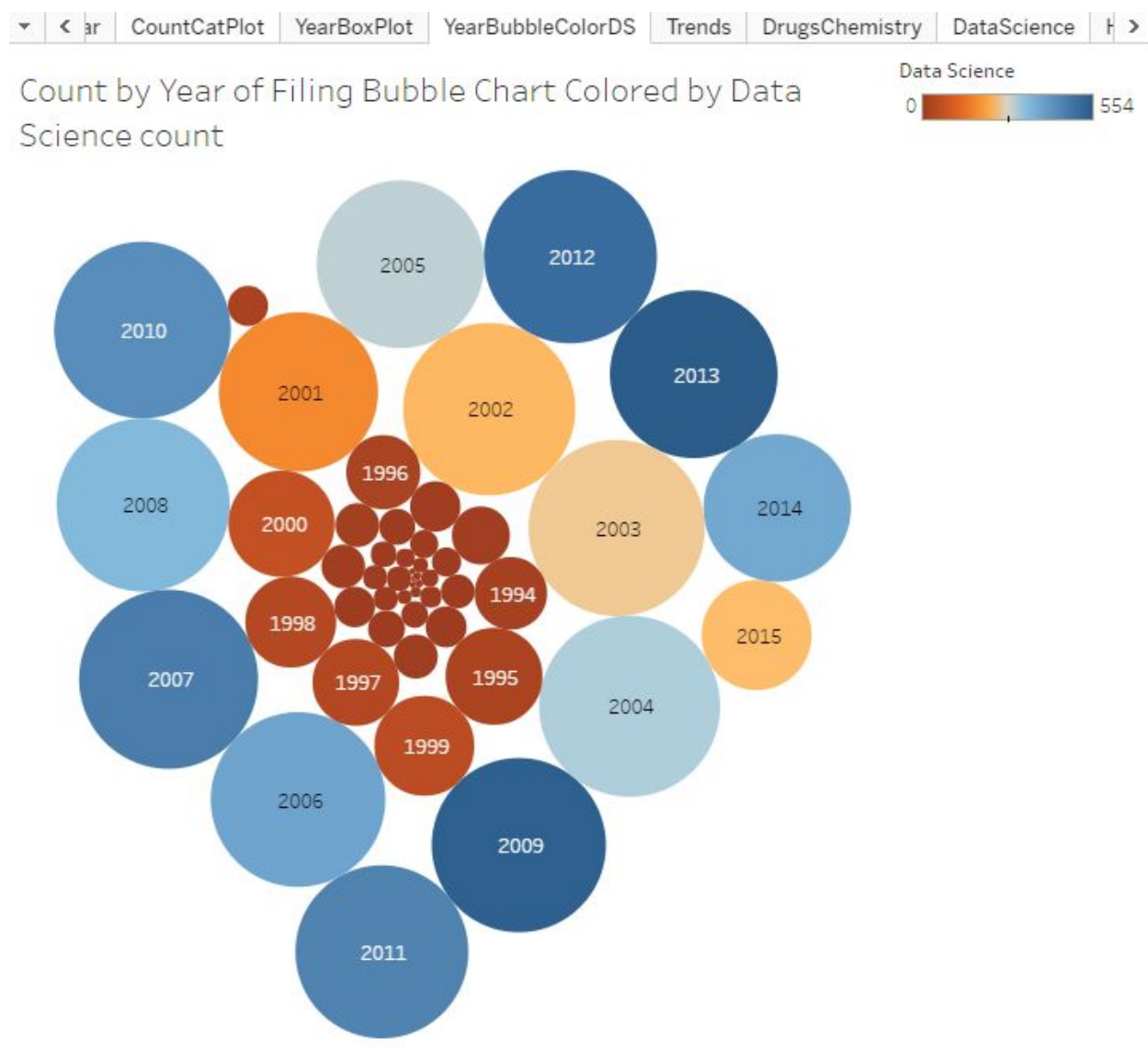
| ▼                             | < | FilingDate | CountCat | CountYear |
|-------------------------------|---|------------|----------|-----------|
| Count by Year of Filing Table |   |            |          |           |
| Year of F..                   |   |            |          |           |
| 1989                          |   | 1,010      | ▲        |           |
| 1990                          |   | 1,015      |          |           |
| 1991                          |   | 1,025      |          |           |
| 1992                          |   | 1,342      |          |           |
| 1993                          |   | 1,783      |          |           |
| 1994                          |   | 2,791      |          |           |
| 1995                          |   | 4,982      |          |           |
| 1996                          |   | 2,926      |          |           |
| 1997                          |   | 3,988      |          |           |
| 1998                          |   | 4,395      |          |           |
| 1999                          |   | 5,312      |          |           |
| 2000                          |   | 6,011      |          |           |
| 2001                          |   | 13,478     |          |           |
| 2002                          |   | 15,777     |          |           |
| 2003                          |   | 16,507     |          |           |
| 2004                          |   | 17,411     |          |           |
| 2005                          |   | 14,918     |          |           |
| 2006                          |   | 16,192     |          |           |
| 2007                          |   | 17,009     |          |           |
| 2008                          |   | 15,942     |          |           |
| 2009                          |   | 16,137     |          |           |
| 2010                          |   | 16,571     |          |           |
| 2011                          |   | 15,905     |          |           |
| 2012                          |   | 15,912     |          |           |
| 2013                          |   | 14,937     |          |           |
| 2014                          |   | 11,544     |          |           |
| 2015                          |   | 6,439      | ▼        |           |

The view above can be further viewed on quarter basis - click the + sign against the Year of Filing.

## Count by Year of Filing Table

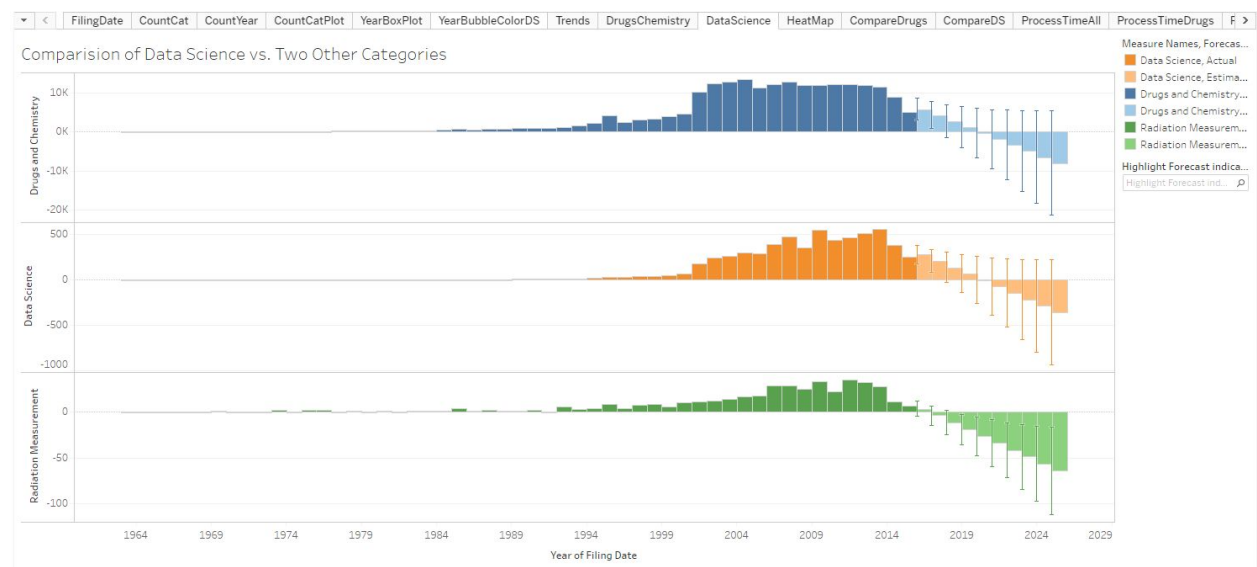
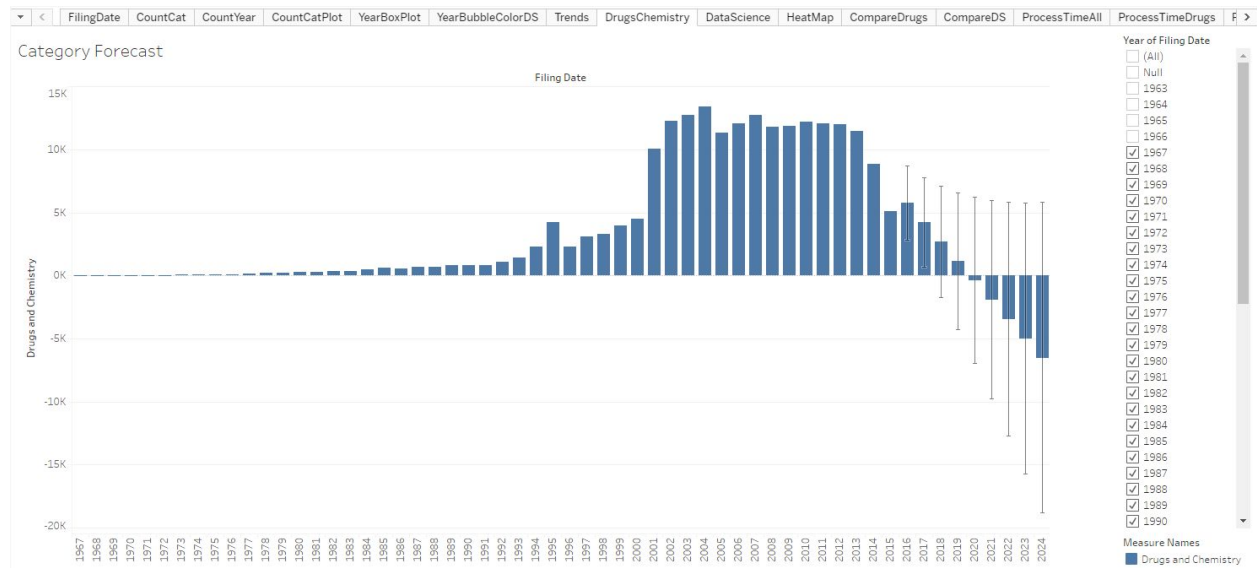
| Year of Filing | Quarter of Filing | Count |
|----------------|-------------------|-------|
| 2016           | Q1                | 811   |
|                | Q2                | 46    |
| 2015           | Q1                | 1,716 |
|                | Q2                | 1,666 |
|                | Q3                | 1,716 |
|                | Q4                | 1,341 |
| 2014           | Q1                | 3,916 |
|                | Q2                | 3,051 |
|                | Q3                | 2,546 |
|                | Q4                | 2,031 |
| 2013           | Q1                | 4,448 |
|                | Q2                | 3,352 |
|                | Q3                | 3,493 |
|                | Q4                | 3,644 |
| 2012           | Q1                | 3,894 |
|                | Q2                | 4,167 |
|                | Q3                | 4,016 |
|                | Q4                | 3,835 |
| 2011           | Q1                | 3,825 |
|                | Q2                | 4,145 |
|                | Q3                | 3,875 |
|                | Q4                | 4,060 |
| 2010           | Q1                | 3,987 |
|                | Q2                | 4,354 |
|                | Q3                | 4,036 |
|                | Q4                | 4,194 |

In order to analyze the specific categories and the years they have been most active based on the number of patent filings, the provided bubble chart in "" tab is useful. The screenshot below shows for "Data Science" category. Any of the other categories can be visualized by replacing the category - it can be done using the Tableau 10 desktop (cannot be done in the Tableau Public view). Largest number of Data Science filings were in 2012 and 2013 with associated count of 15912 and 14937 respectively.

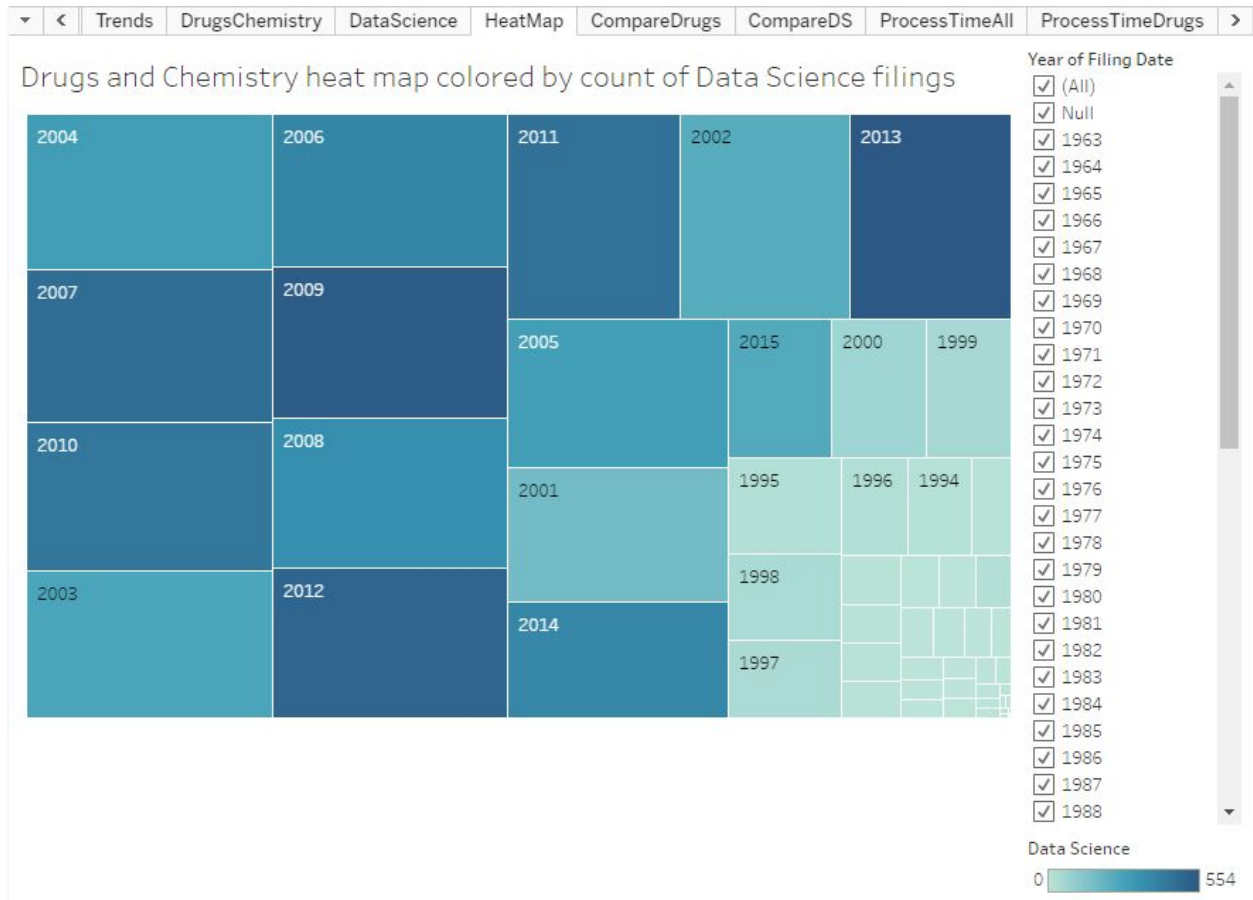


**Forecasting future trends in patent filing on a given category of filing** - example below shows for “Drug and Chemistry” - based on the trend from the past few years (for example, 2010 through 2016 data), it appears by 2020, there will not be anymore filings.

Different categories show different years when the filings would stop if the current trend continues - data science will also be reduced to zero by 2020 while radiation measurement will be done by 2017. More than one category can be viewed and compared in the “DataScience” tab (second screenshot below).

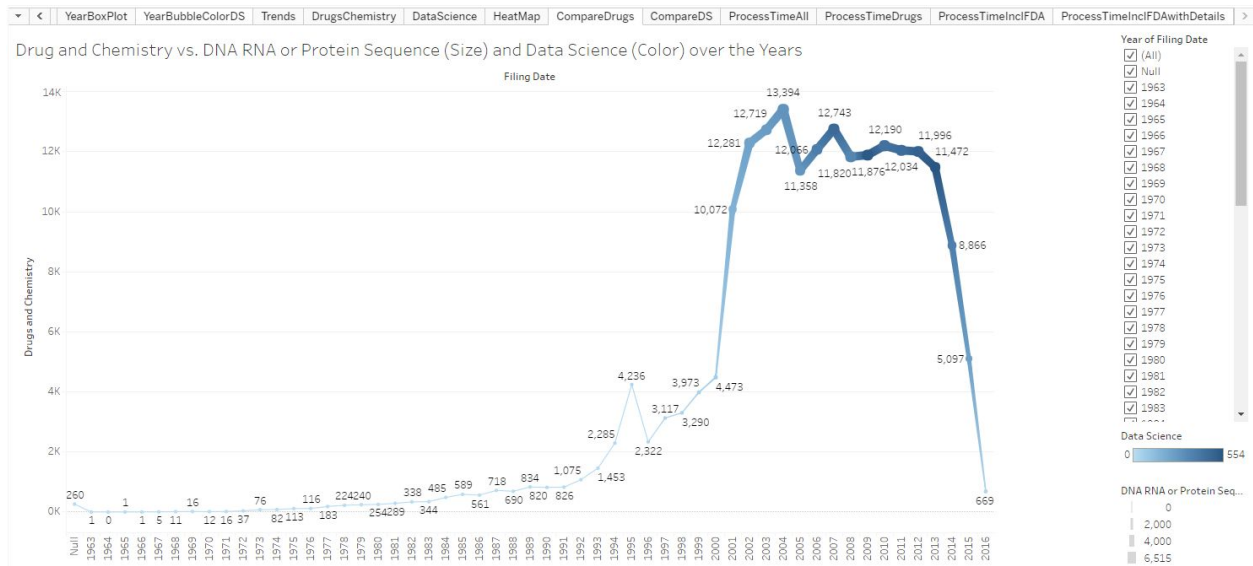


The heatmap below is another representation of how a particular category performed in the years with increased number of total patent filings. The example screenshot shows how data science performed (2013 being the darkest - color representing the count for data science category - aligns with our earlier finding that 2012 and 2013 are the years with largest number of data science filings)

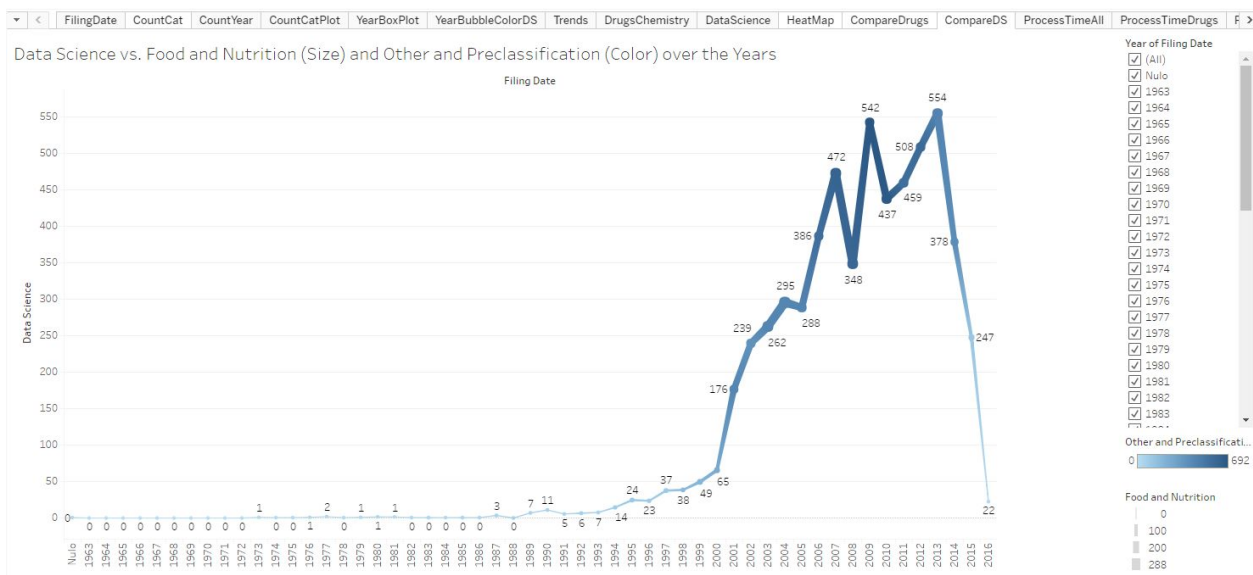


The view below gives us an idea of how three different categories of filings played out across the years. Drugs and Chemistry filings have been provided from 1963. DNA RNA or Protein Sequence picked up from 1995. Data Science from 2001.



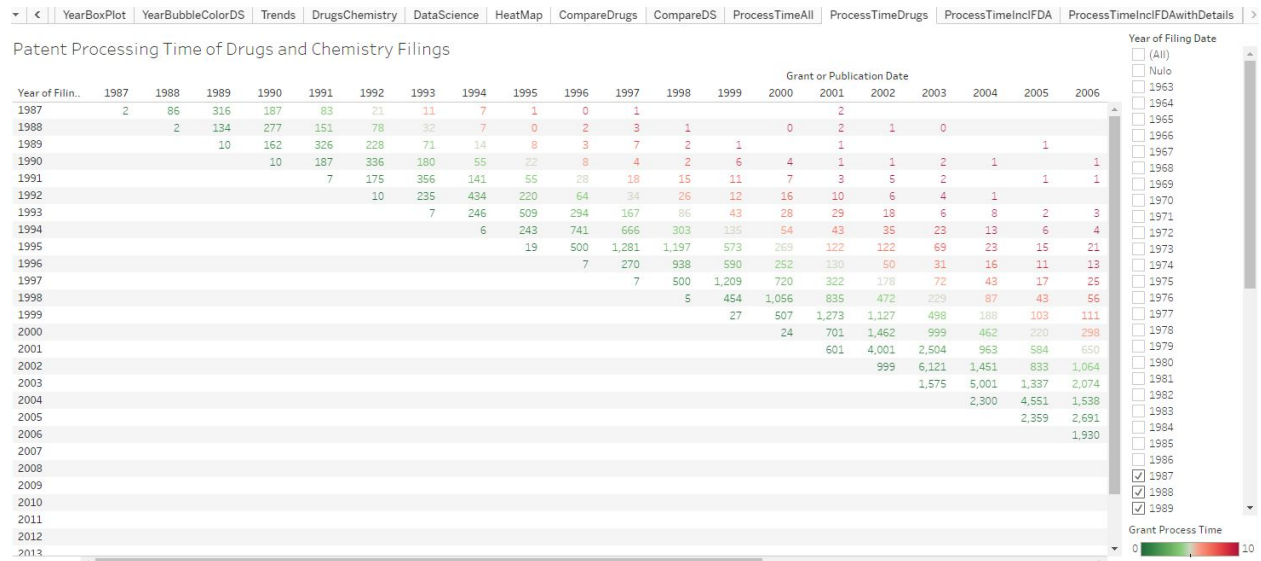


Comparing the least patented three categories shows their inter-relationship below. That is, Data Science vs. Food and Nutrition, and Other and Reclassification.

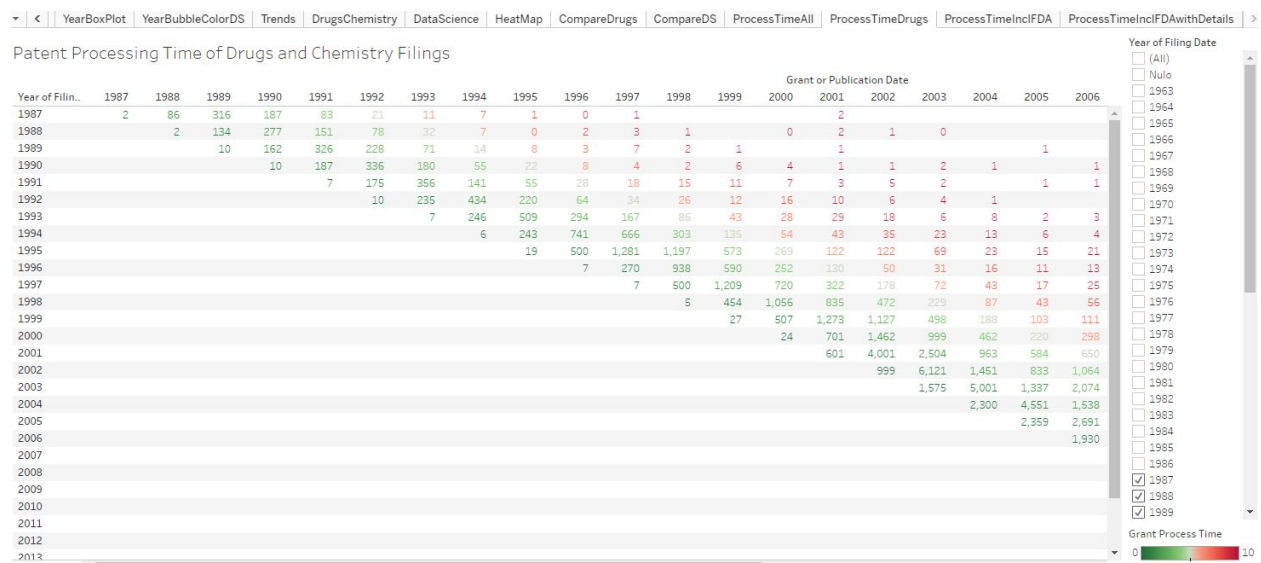


Time-lapse between Patent Filing and Grant and Publication date will give interesting insight on the time-taken for individual grants. It should enable decision makers in figuring out the characteristics that cause certain patents to take longer to be granted and if anything can be done in order to expedite similar patents in future.

The viz below shows the number of patents filed in a given year and the year of being approved. The sooner it is approved, it is green in color. The longer it takes to approve, it shown in red. The viz below shows the time lapse info for all patents.



If you want to see the above for a particular category, it is as shown below for “Drugs and Chemistry” category



Including FDA Approval date to the analysis and looking into applicant and drug details, the viz below provides some of the information.



## Summary

All the viz are interactive in nature. Filters have been provided so the parameters can be modified for the viz to focus on certain sections of the data. Hovering over the charts will give more detail than has been provided in the screenshots above. Additional fields can be added for the hover information as well as included in filters and most important, also in the charts developed. There is a tremendous amount that can be done with the existing viz - lot more can be added for insight and investigation purposes.

**Access to and testing instructions for your submission.** This can be appended to your visualization description and does not count toward the 1,000 word maximum.

Use your browser to access the link below:

[https://public.tableau.com/profile/pragyan#!/vizhome/pto\\_challenge/FilingDate](https://public.tableau.com/profile/pragyan#!/vizhome/pto_challenge/FilingDate)

Use the different tabs to access the different visualizations discussed above.

The Tableau 10 workbook can be downloaded from Tableau Public link provided by clicking on "Download Workbook" (refer screenshot below). You will need Tableau 10 desktop - trial version can be downloaded from here: <http://www.tableau.com/products/desktop>



Edit Details



Download Workbook

|           |                |                  |   |
|-----------|----------------|------------------|---|
| CompareDS | ProcessTimeAll | ProcessTimeDrugs | > |
|-----------|----------------|------------------|---|

**Link to the submission.** We will not accept any submission without a link.

Use your browser to access the link below:

[https://public.tableau.com/profile/pragyan#!/vizhome/pto\\_challenge/FilingDate](https://public.tableau.com/profile/pragyan#!/vizhome/pto_challenge/FilingDate)