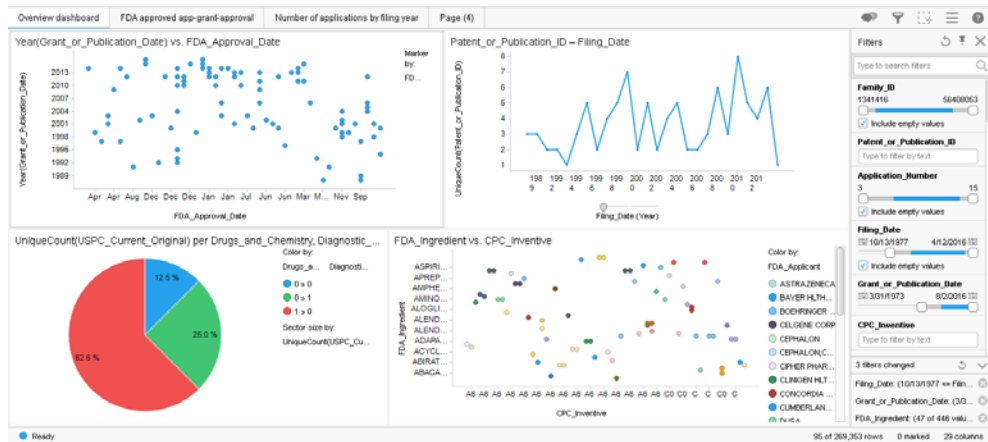**USER GUIDE:**

The proposed solution is based on Spotfire® - a web-based cloud software that allows analyzing and visualizing large data sets.

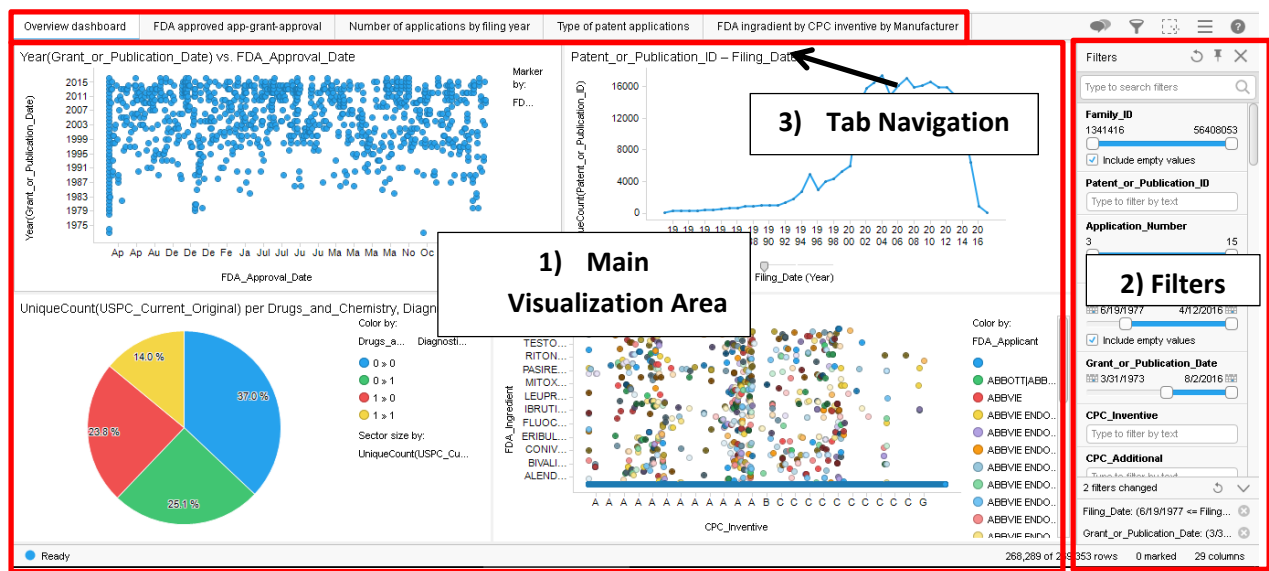How to access the dataset?

- Go to the following link
  https://spotfire.cloud.tibco.com/spotfire/wp/OpenAnalysis?file=1ebb4f36-a544-49bb-9fa1-57aa93348ce9


Main Dashboard:

- Upon entering the dashboard, you will land on this following page which includes 1) main visualization area separated into 4 sections, 2) filters, 3) navigation to the different tabs.
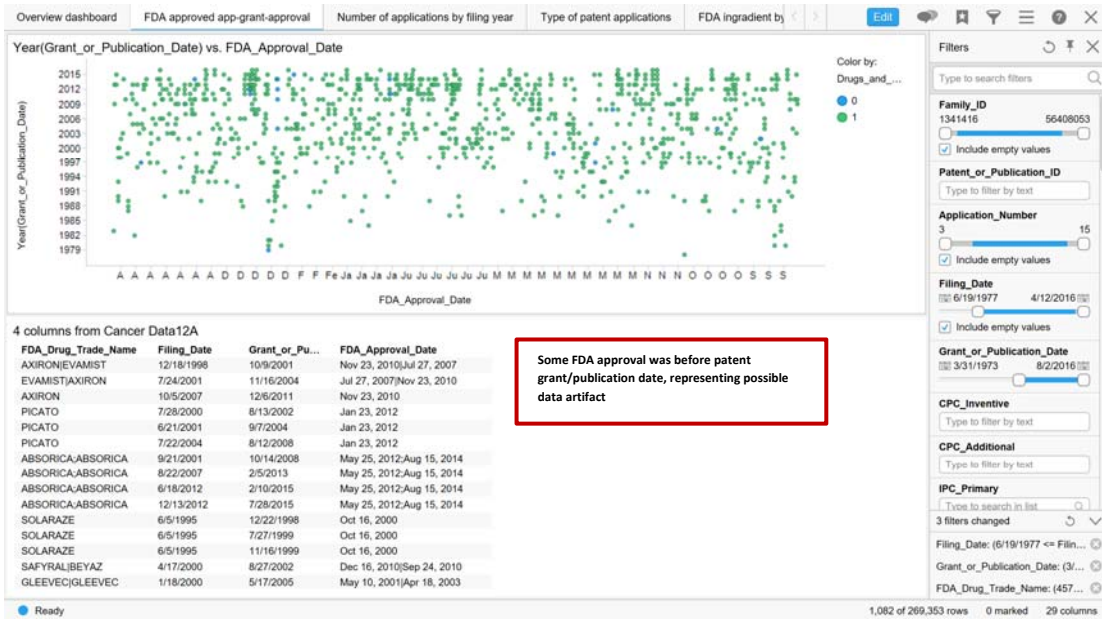
Sub-Screens:

- To move to another screen, press the desired tab on the top of the page.
  - o You will be directed to the relevant tab.
- Adjusting the filters on that tab will create an updated visualization on that tab.
- To reset filters, press on the "reset" button on the top right hand of the filter pane

-
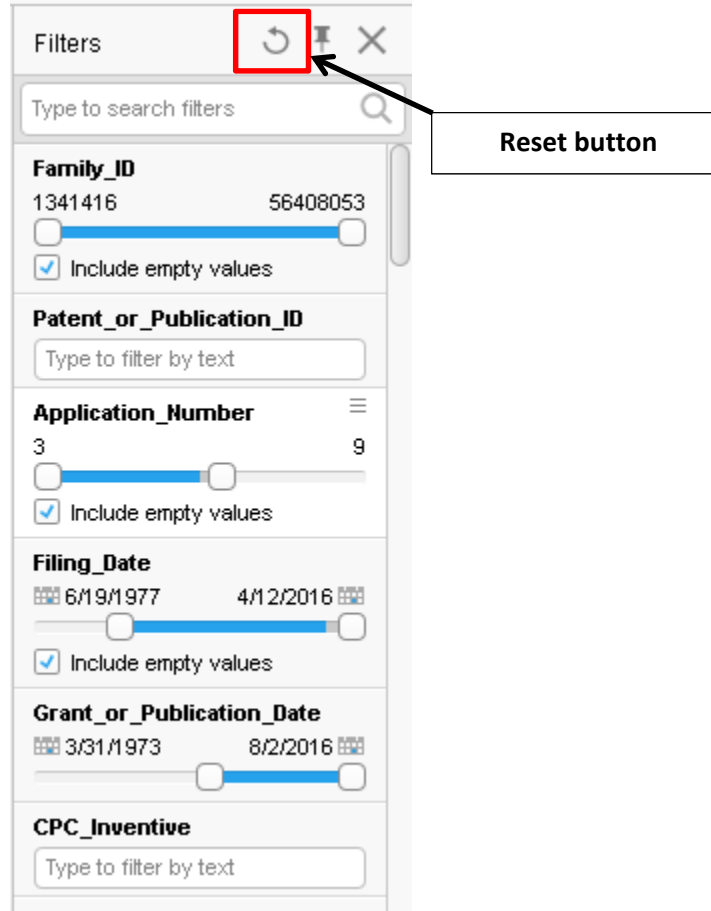
1) FDA approved app-grant-approval:

This is the tab that visualizes the timeline from patent application, patent grant, to FDA approval. Below the top figure is the raw data table with the timing information for each FDA approved trade name product. Please note FDA approval dates are not arranged by year and may need additional formatting. Some FDA approval dates were also before patent grant – we may need to drill into these data entries for an understanding whether it is real or data artifacts.

Overview dashboard | FDA approved app-grant-approval | Number of applications by filing year | Type of patent applications | FDA ingredient by | Edit

Year(Grant_or_Publication_Date) vs. FDA_Approval_Date

Color by: Drugs_and_... ● 0 ● 1

Filters

Family_ID: 1341416 — 56408053 ☑ Include empty values
Patent_or_Publication_ID: Type to filter by text
Application_Number: 3 — 15 ☑ Include empty values
Filing_Date: 6/19/1977 — 4/12/2016 ☑ Include empty values
Grant_or_Publication_Date: 3/31/1973 — 8/2/2016
CPC_Inventive: Type to filter by text
CPC_Additional: Type to filter by text
IPC_Primary: Type to search in list

3 filters changed
Filing_Date: (6/19/1977 <= Filin...
Grant_or_Publication_Date: (3/...
FDA_Drug_Trade_Name: (457...

4 columns from Cancer Data12A

FDA_Drug_Trade_Name	Filing_Date	Grant_or_Pu...	FDA_Approval_Date
AXIRON|EVAMIST	12/18/1998	10/9/2001	Nov 23, 2010|Jul 27, 2007
EVAMIST|AXIRON	7/24/2001	11/16/2004	Jul 27, 2007|Nov 23, 2010
AXIRON	10/5/2007	12/6/2011	Nov 23, 2010
PICATO	7/28/2000	8/13/2002	Jan 23, 2012
PICATO	6/21/2001	9/7/2004	Jan 23, 2012
PICATO	7/22/2004	8/12/2008	Jan 23, 2012
ABSORICA;ABSORICA	9/21/2001	10/14/2008	May 25, 2012;Aug 15, 2014
ABSORICA;ABSORICA	8/22/2007	2/5/2013	May 25, 2012;Aug 15, 2014
ABSORICA;ABSORICA	6/18/2012	2/10/2015	May 25, 2012;Aug 15, 2014
ABSORICA;ABSORICA	12/13/2012	7/28/2015	May 25, 2012;Aug 15, 2014
SOLARAZE	6/5/1995	12/22/1998	Oct 16, 2000
SOLARAZE	6/5/1995	7/27/1999	Oct 16, 2000
SOLARAZE	6/5/1995	11/16/1999	Oct 16, 2000
SAFYRAL|BEYAZ	4/17/2000	8/27/2002	Dec 16, 2010|Sep 24, 2010
GLEEVEC|GLEEVEC	1/18/2000	5/17/2005	May 10, 2001|Apr 18, 2003

Some FDA approval was before patent grant/publication date, representing possible data artifact

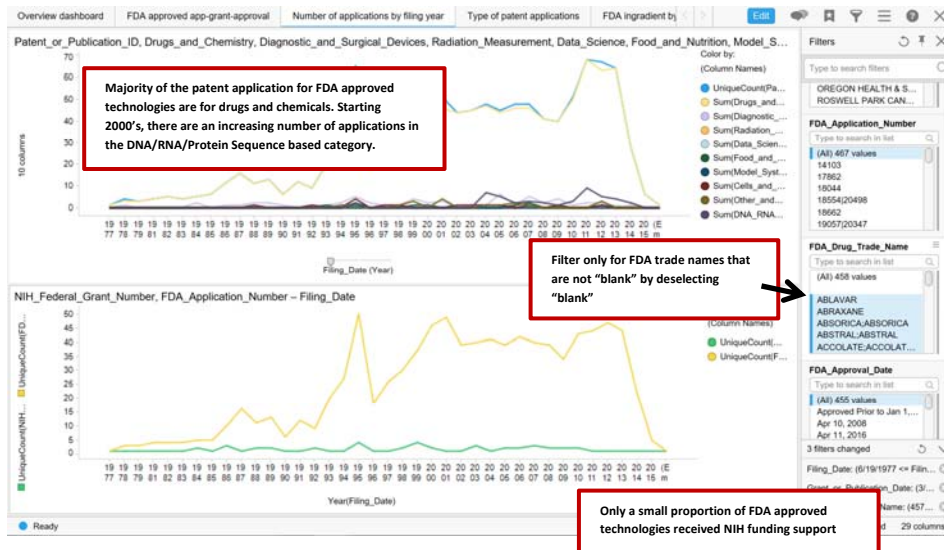● Ready — 1,082 of 269,353 rows — 0 marked — 29 columns

2) Number of applications by filing year: This tab shows the trend of patent filing with time, also drilling into trends of CPC-based technology category or DNA, RNA or Protein Sequence technologies.

Without filtering by FDA approval status:

An increasing number of patent applications since 2000, with a dip around 2005 and significant drop starting 2014

For patents that received NIH funding support, a small but increasing proportion applied for FDA application.
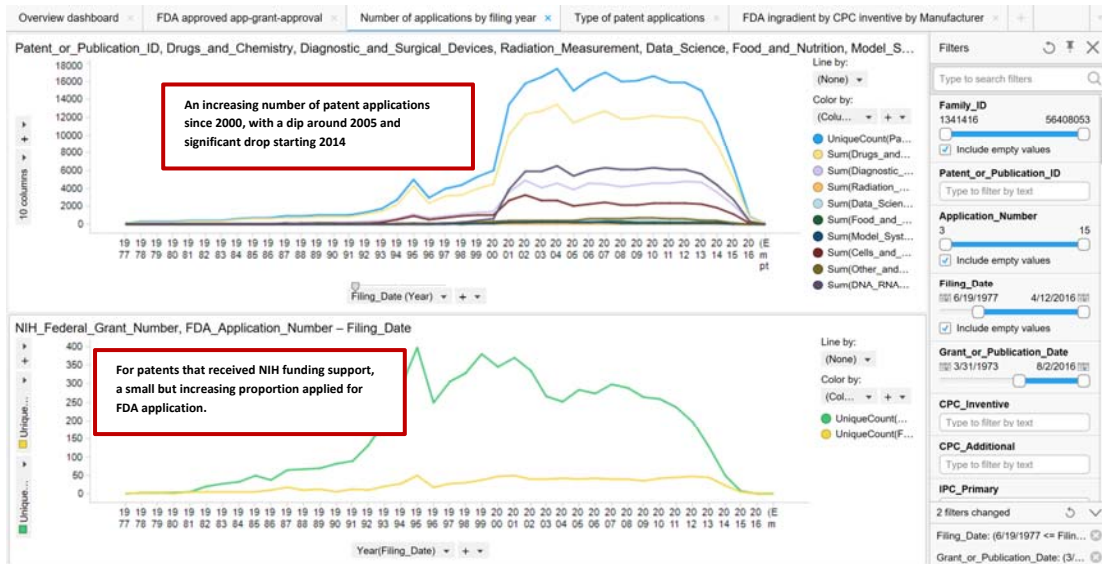
After filtering on the right for only FDA approved technologies:

3) Type of patent applications: this tab summarizes that proportion of patent applications represented by "drugs and chemical" and "diagnostics and devices", versus the other categories, throughout history of the data. By selecting different "filing date" range to the right, one can observe the dynamics in changing proportion of categories.

4) FDA ingredient by CPC inventive by Manufacturer: this tab visualizes the FDA approved "ingredients" vs CPC inventive codes. Only patents with FDA approval were selected. Color was also added to allow drill down into manufacturers.
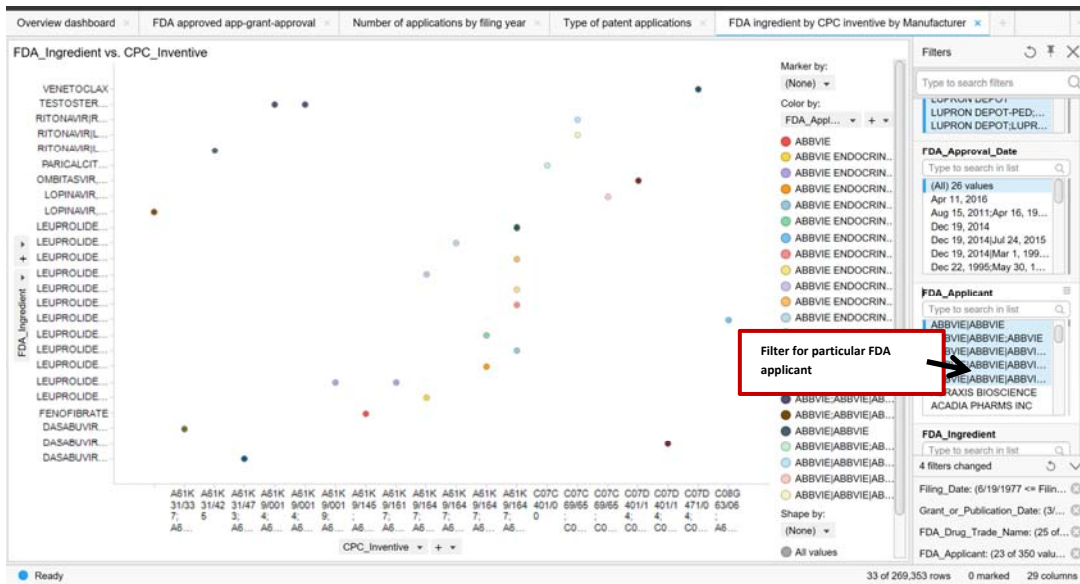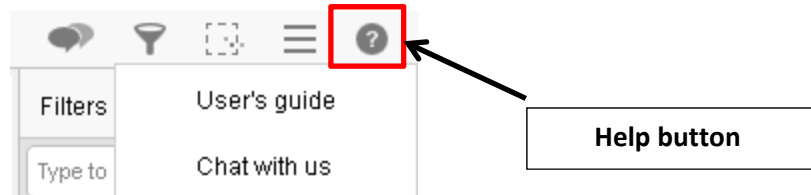
Downloading and sharing your dashboard / analysis:

- In order to share your dashboard with others, go to Menu > Share.
- In order to download your report, go to Menu > Download as…

In case you would like to know more about this report:

- About Spotfire® – go to Help > Users Guide

- For general dashboard questions, please reach out to
  o Jane Zhang – janeyqz@gmail.com
  o Yair Markovits – yair.markovits@gmail.com

* Spotfire® is a registered trademark of TIBCO Software Inc. The authors of this proposal are not affiliated with Spotfire® or TIBCO Software Inc.