SPS-9479-Indian Insurance Business

A Project Work

under

Data Visualization & Storytelling Challenge
of
SmartInternz-Tableau DataViz Challenge - 2021

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1. INTRODUCTION

1.1 OVERVIEW

As the name suggests, data visualisation is the practice of presenting data in a pictorial or graphical format, such as an infographic or graph. It enables concepts to be more easily understood and makes patterns quicker and easier to spot.

Although it's easy to believe that data visualisation is a modern concept, the first documented example is an illustration of geological resource distribution from 1160BC!

In modern times, digital dashboards have provided great leaps forward in making data more accessible. With the advent of big data – extremely large data sets – we expect a rise in demand for visual data representation. With the advent of tools such as Tableau, Power BI, this is becoming a reality.

1.2 PURPOSE

For organisations managing high volumes of data, visual representation brings insights to life across the organisation. This allows brokers and underwriters to make fast, informed decisions from their preferred location or device, speeding up decision making overall.

Organisations across the insurance industry can use data visualisation to aid areas of their business such as:

- Claims analysis
- Fraud detection
- Premium forecasting
- Revenue comparison

For example, data visualisation tools can not only help a business communicate risks to customers, but improve their effectiveness at providing support to them in the aftermath of a major incident. It can also be used to analyse claims to check for anomalies that could indicate fraud.

Therefore, the design and development of better datavisualization schemes are the need of the hour. The next section reviews the literature.

2. LITERATURE SURVEY

2.1 EXISTING PROBLEM

With the advent of more powerful data modelling tools we're now able to quickly overlay and incorporate data from a variety of internal and external sources to create an overall, and more accurate, picture of risk, removing the need for additional costs in many cases. Therefore, creating a "Data Visualization" that is capable of browsing information required, presenting the different options, authenticating users, and providing the opportunities to insurers as well as insured is the problem to be explored in this project. The proposed solution is discussed in the next subsection.

2.2 PROPOSED SOLUTION

A solution to build a "Data Visualization" in the chosen "Insurance Domain" with basic complexity using software package called "Tableau" and "Data Set" provided at "data.gov.in" is proposed in this project as part of SmartInternz-Tableau DataViz Challenge 2021 with the following capabilities:

A. To envisage a story on the data set provided.

B. To present a dashboard by building it on tableau.

C. To make it public on the Tableau public.

D. To make available the data visualization for public usage.

Theoretical analysis to provide the above proposed solution is described in the next section.

3. THEORITICAL ANALYSIS

3.1 OVERVIEW

The term “data visualization” has a long history dated back the 2nd century AD. At the ancient society, drawings and other visual representations were used to investigate the world and also to record the historical events. Data visualization has significantly contributed to invention and discovery throughout human history (Crapo, Waisel, Wallace, & Willemain, 2000). The invention of computer technology makes the huge change on the way of visual representation of data. Data visualization has become an important part of research in many fields including algorithms, human perception, animation, computer vision and so on. Data visualization is usually associated with the field of computer science in the contemporary society. As an emerging field, it is considered a sub-classification of visualization. The technology of data visualization has evolved from using hand drawing in the earliest stages, to “photo-etching”, to using computer technology, such as computing graphics and software (Friendly, 2009). In particular, the development of computer software has advanced the application of data visualization, allowing users to manipulate a substantial amount of data for exploration and analysis in an easier and more affordable way.

Data visualization often results in graphical images of data or concepts, which assists making decisions (Ware, 2012). The development of computing technology facilitates data visualization, identifying useful information or deriving insights from the graphical images.

The next subsection defines the data visualization.

3.2 Definition of data visualization

The term “data visualization” can be defined in several ways. Most definitions focus on the connection between data and computer technology in order to

transform data into a visual or sonic form. However, Bikakis (2018) defines data visualization as the following:

"Data visualization is the presentation of data in a pictorial or graphical format, and a data visualization tool is the software that generates this presentation. Data visualization provides users with intuitive means to interactively explore and analyze data, enabling them to effectively identify interesting patterns, infer correlations and causalities, and supports sense-making activities".

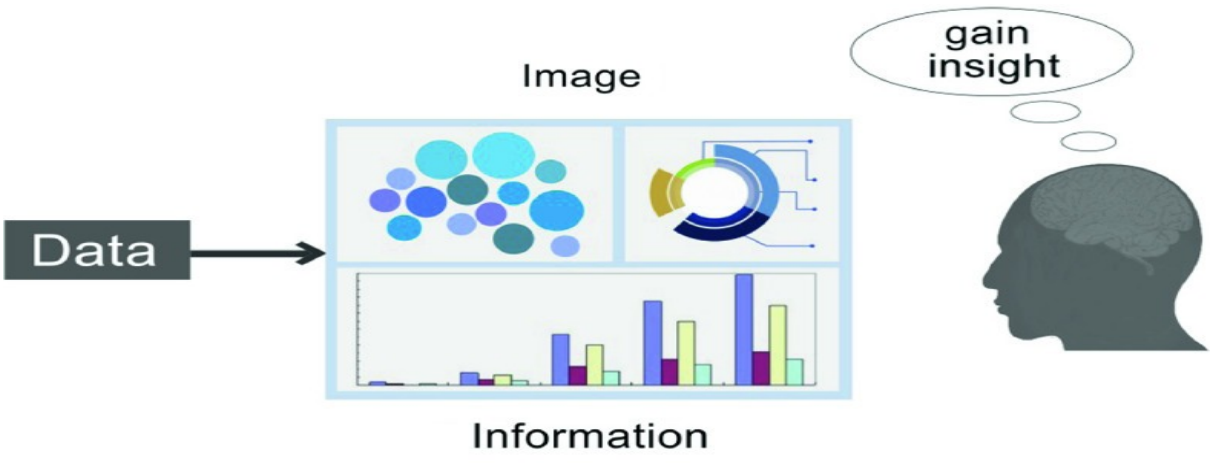
The next subsection states the importance of data visualization.

3.3 The importance of data visualization

The success of data visualization is due to the soundness of the basic idea behind it: the use of computer-generated images to gain insight and knowledge from data and its inherent patterns and relationships. A second premise is the utilization of the broad bandwidth processes, and simulations involving data sets from diverse scientific disciplines and large collections of abstract data from many sources.

3.4 Categories of Data visualization:

The information visualization and scientific visualization are two broad categories of data visualization. Information visualization is used to visually represent abstract data, such as business data. Sientific visualization represents scientific data, which are usually physically based (e.g. the human body, the environment or the atmosphere). Both information and scientific visualization focus on how to transform data into a visual form, to become understandable information for gaining insight and knowledge.



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In the above figure a fundamental process of data visualization is presented. It shows that data in any form can be transformed into graphical images. When a user reads or looks at a graphical image, the image is interpreted through the human cognitive system for the acquisition of insight or the apprehension of useful

information.

Central to the process of data visualization is the transformation of data into information. Understanding the differences between the concepts of data and information, as well as their relationship is crucial to understanding the process of data visualization.

3.5 Forms of Data Visualization

The forms of data visualization are listed hereunder at Table I .

S.No	Data Visualization	Common Forms
1	Information Visualization	Tables; Charts;Trees; Maps;Scatter-plots; Diagrams;Graphs
2	Scientific Visualization	Simulations; Waveforms; Volume

As represented within the table, the common forms of data visualization refer to trees, scatter plots, charts, tables, diagrams, and graphs. Selecting forms for data visualization is dependent on the type of data.

Information visualization aims to design the efficient communication of information. It requires the content needs accurate and unbiased in the visual presentation. It attempts to present all the objective data required to enable the users to make some kind of decision.

In scientific visualization, as indicated in the table, the forms of data visualization often refers to simulations, waveforms or volume, in which data is explored, transformed and represented as an image or simulation in order to obtain insight into the phenomena. In fact, there are many different types of forms for scientific visualization.

There are more specific forms of data visualization, such as area chart, bar chart, bullet graph, Box-and-whisker Plots, Bubble Cloud, Cartogram, Circle View, Dot Distribution Map, Gantt Chart, Heat Map, Highlight Table, Histogram, Matrix, Network, Polar Area, Radial Tree, Streamgraph, Text Tables, Treemap, Wedge Stack Graph and Word Cloud.

The next subsection describes the process of data visualization in tableau.

3.6 Data Visualization Process in Tableau

Tableau is the most popular data visualization software. It is an Integrated Platform that helps you succeed in an ever-changing world. It comes with the following features:

- Fast User Adoption: You can do amazing things and make better and more confident decisions with Tableau. Whether you're building dashboards or, asking a series of questions, Tableau makes everything faster, easier and more intuitive.
- Self- Service BI: Create and share compelling reports & interactive dashboards on your own in a matter of minutes. Find, explore and share actionable data insights in a secure environment.
- Data Visualization: Create attractive & insightful reports and dashboards with a simple drag-and-drop interface. Use powerful visualization tool to uncover business insights and drill down to specifics.
- Drag and Drop UI: Create an informative and aesthetically beautiful dashboard with simple clicks using the drag-and-drop user functionality.
- Highly secure: Manage users, groups, permissions and keep your data safe and secure all the time.
- Instant Set-up:Get up and running in no time! Tableau is a fully hosted cloud solution which allows almost instant setup and easy scalability option for businesses of all sizes.
- 67 Native data connectors:Confidently connect & import data with 67 native data connectors.
- Auto- updates:Tableau brings cutting-edge innovation to meet the ever-rising needs of customers. Get access to fresh data using a live connection to your database or schedule automatic updates.

Using the features of above mentioned tabelau software the data visualizations can be created using **8-step process** listed as below:

1. Step 1: Connect to your data. ...
2. Step 2: Drag and drop to take a first look. ...
3. Step 3: Focus your results. ...
4. Step 4: Explore your data geographically. ...
5. Step 5: Drill down into the details. ...
6. Step 6: Build a dashboard to show your insights. ...
7. Step 7: Build a story to present. ...
8. Step 8: Share your findings.

4. EXPERIMENTAL INVESTIGATIONS

The experimental investigations begin with downloading the software from tableau first and activating it with the license provided by Tableau. Then, a dataset named **"New Life Insurance Business By Indian Insurers And Total Life Insurance**

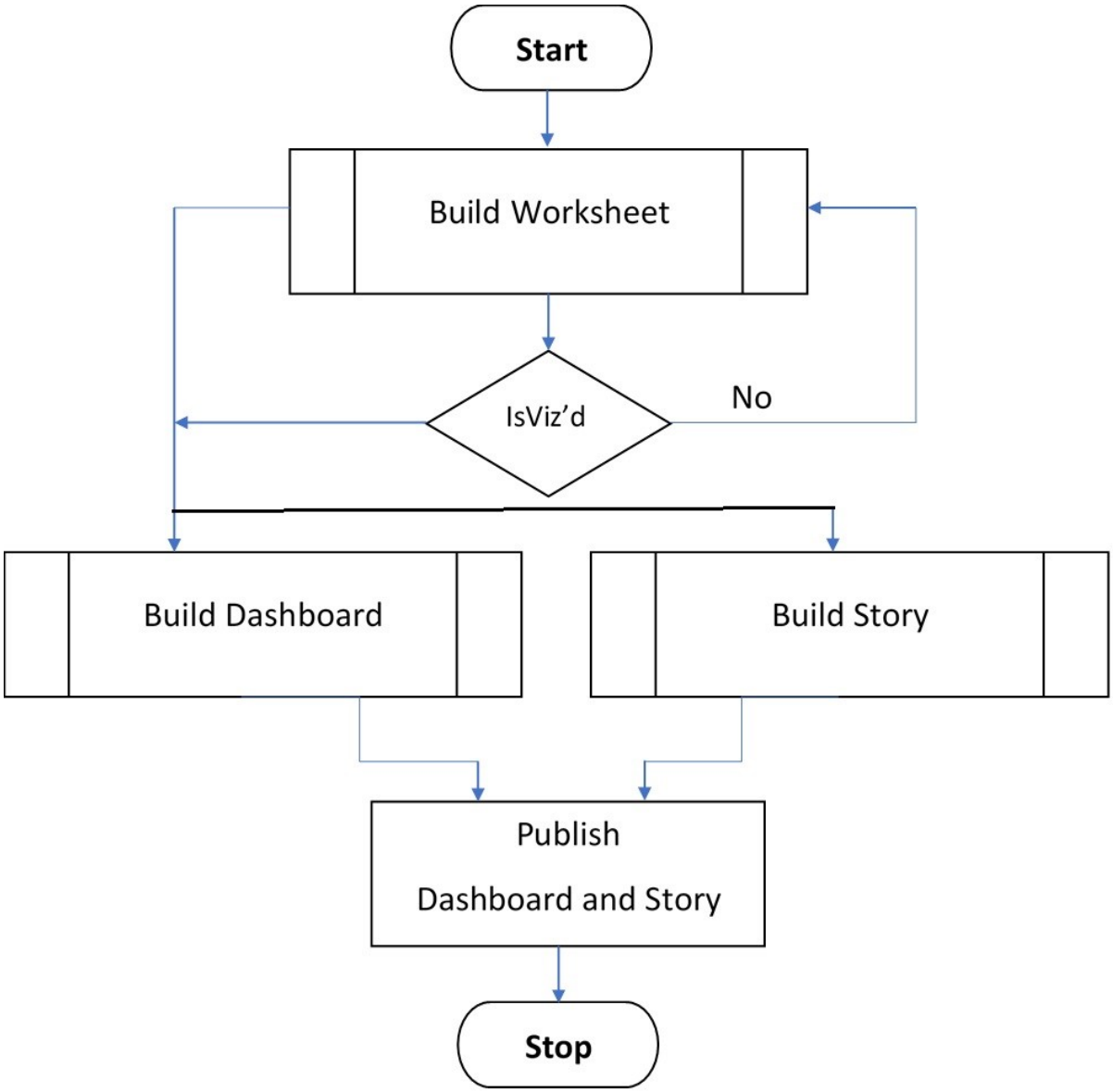
Business In Force" is also downloaded for carrying out the experiments. For creating the data visulaizations in this project tableau software is invoked and the above mentioned dataset is connected. The steps required to carry out the experimentation of creating the data visualizations are explained as below:

1. To create an account at Tableau, Tableau Public, Tableau eLearning websites to download, install and complete the eLearning course respectively. Further, to participate in Data Visualization and Storytelling Challenge at DataViz Challenge 2021 of SmartBridge-Tableau.
2. Login into Tableau Software: Using credentials registered with Tableau signed into Tableau Desktop for creating data visualizations.
3. Connect to dataset in the connect pane: The downloaded dataset mentioned above is considered to connect. In the data pane, the connection is made once, the connection is made.
4. Create Relevant Worksheets: Existing Sum Assured & Bonus, Existing Annuity Business, Existing Non-annuity Business, Growth in Sum Assured Policies, Growth in Annuity Policies, Growth in Non Annuity Policies, Year Wise New Business Size, Year Wise Market Size, Year Over Year Business Growth, Insurance Business CAGR are the worksheets created for the purpose of visualization.
5. Create Dashboard: A dashboard named "Insurance Business Dashboard" is created to project growth and business turned out during the years of data available in the dataset.
6. Create Story: Having captured insights of the data a story named "Indian Insurance Business Story" is being created based on the available dataset.
7. Publish to Tableau Public: The story created together with dashboard it is being uploaded into Tableau Public to publish the dashboard and story.
   The next section presents a flow-chart to explain the flow of experimentation.

5. FLOWCHART

A flowchart explaining flow of the experimentation is presented in this section as seen below at Fig 5.1. The experimentation begins with downloading and installing tableau software from tableau site and dataset from data.gov.in site. Further, one has to sign up for an account and create a url to login onto tableau website. Initially, the domain in which the project is to be developed is to be identified. Next, to design data visualizations in a selected dataset connect it to tableau software. Build the worksheets adequate to present the data held on the computer. Build a dashboard as well as a story to reflect the visualizations as deemed to be fit to explain all options. Extract the data onto the local machine before uploading it to Tableau public. Upload the story together with dashboard to visualize the data and make faster decisions. Make visulaization go live onto the internet. Verify the visualizations through website and edit, if necessary.

Fig. 5.1 Data Visualization Flow Chart



The details of data visualizations build using Tableau are presented in the next section.

6. RESULT

The Data Visualizations developed in the project are hosted in the webspace offered by tableau public and such visualizations are displayed as hereunder:

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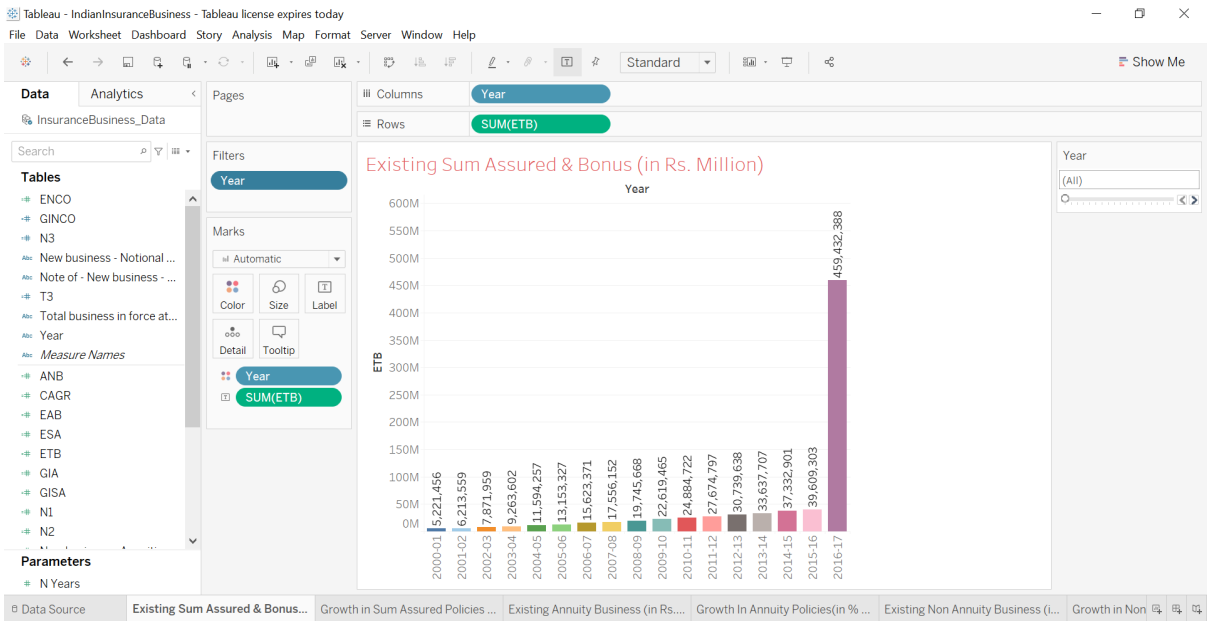

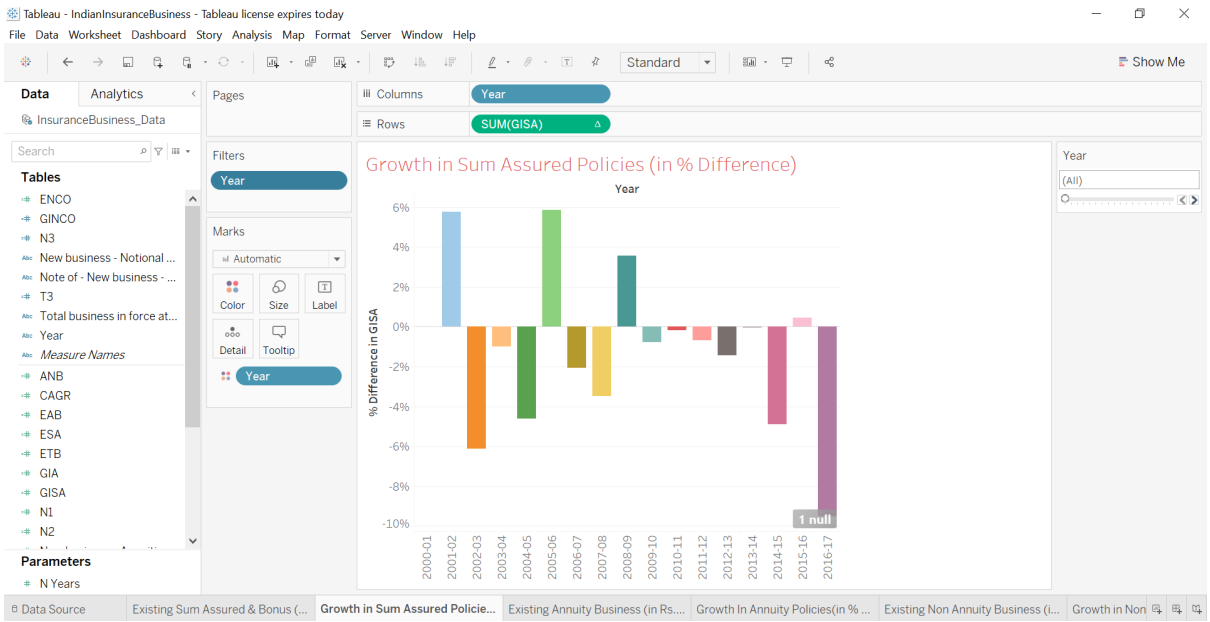

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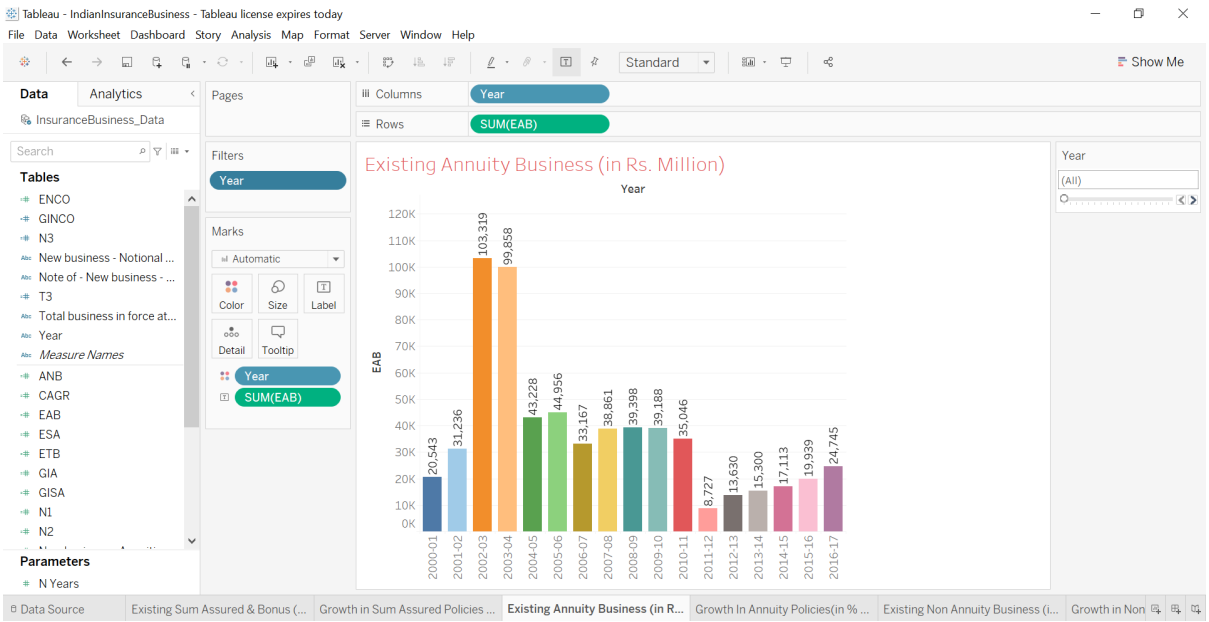

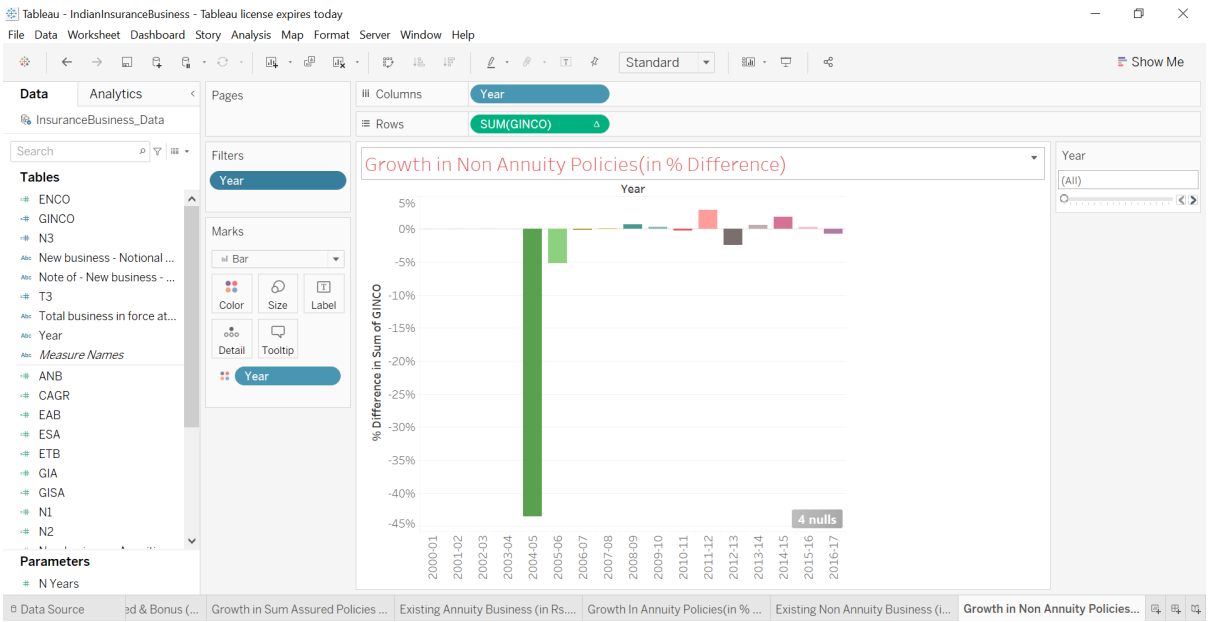

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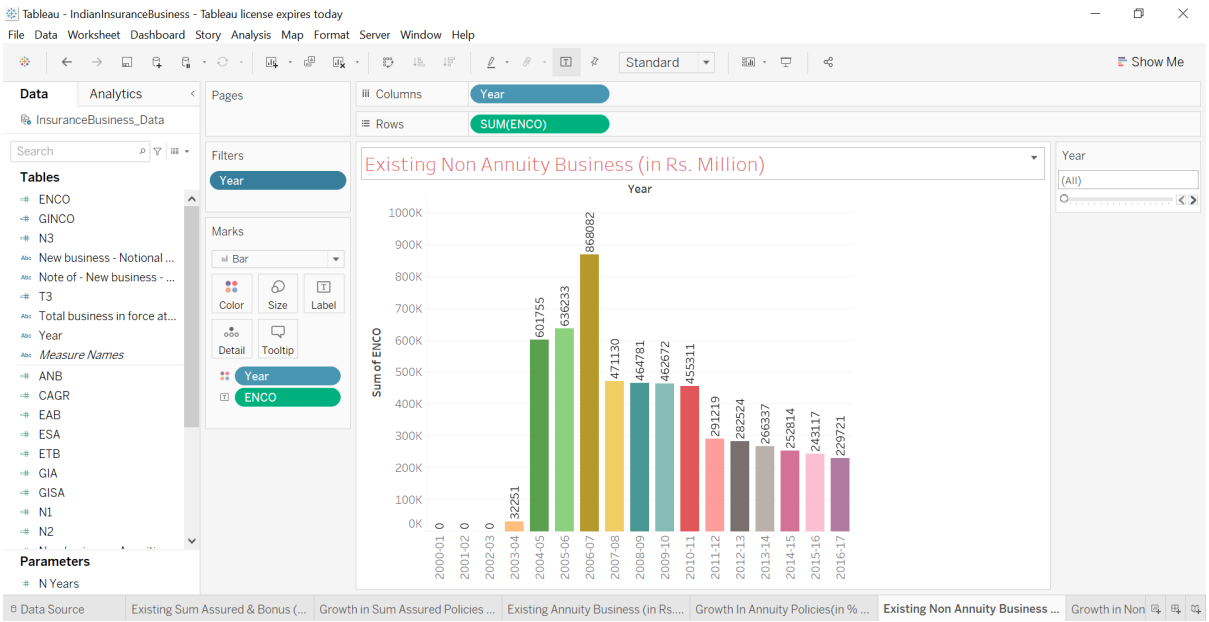

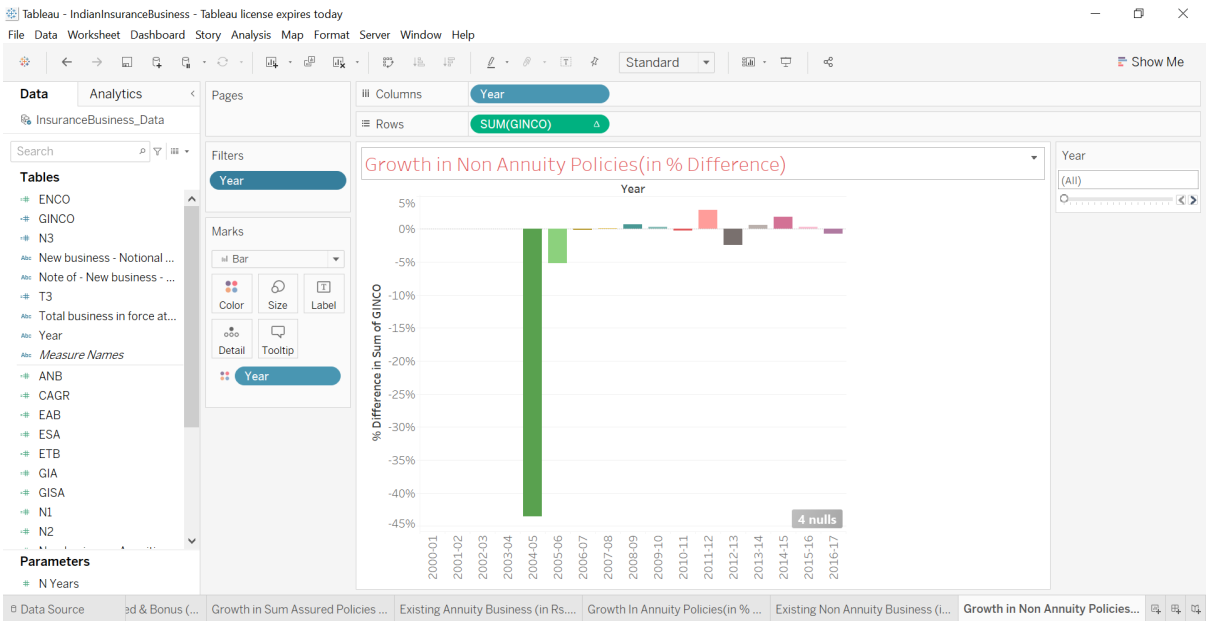

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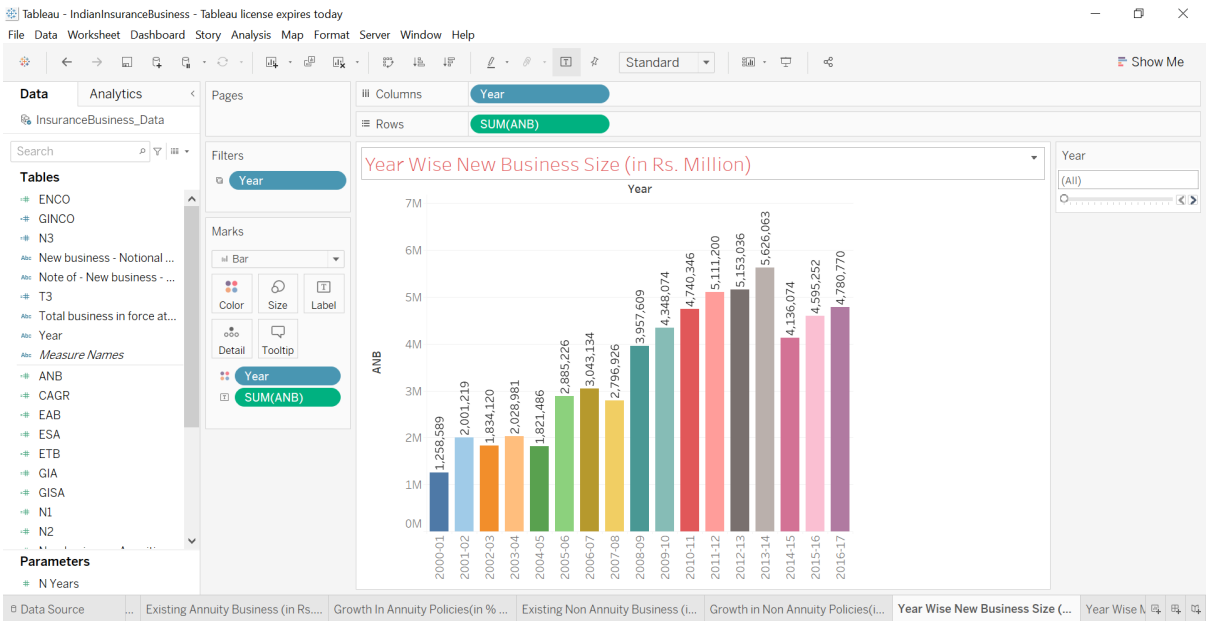

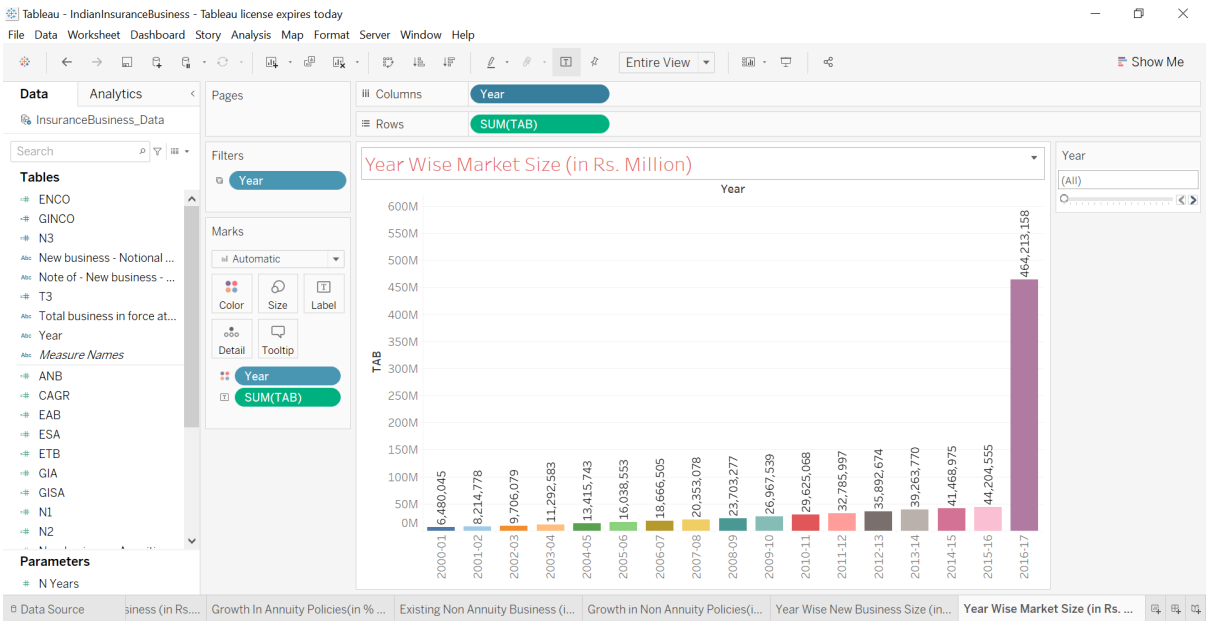

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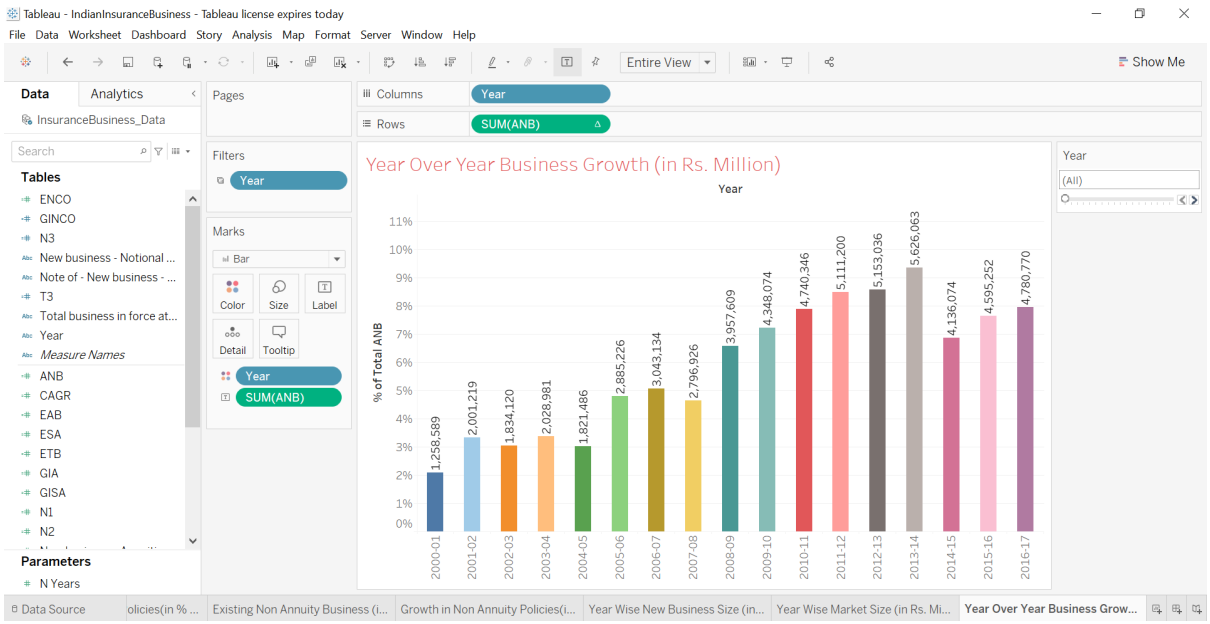

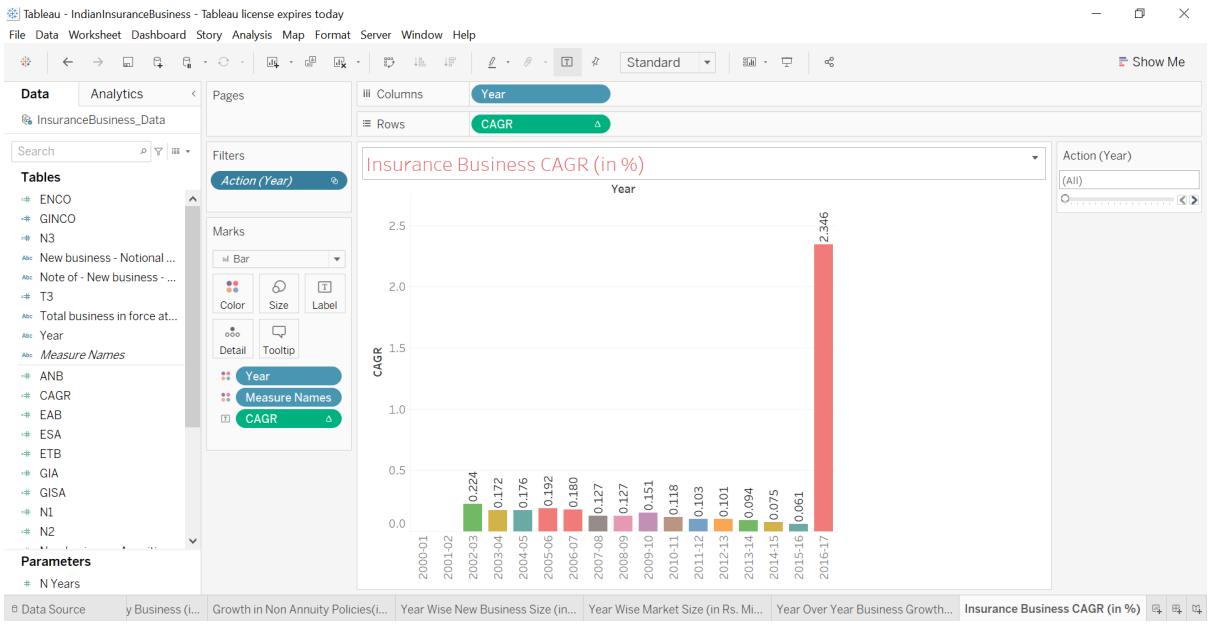

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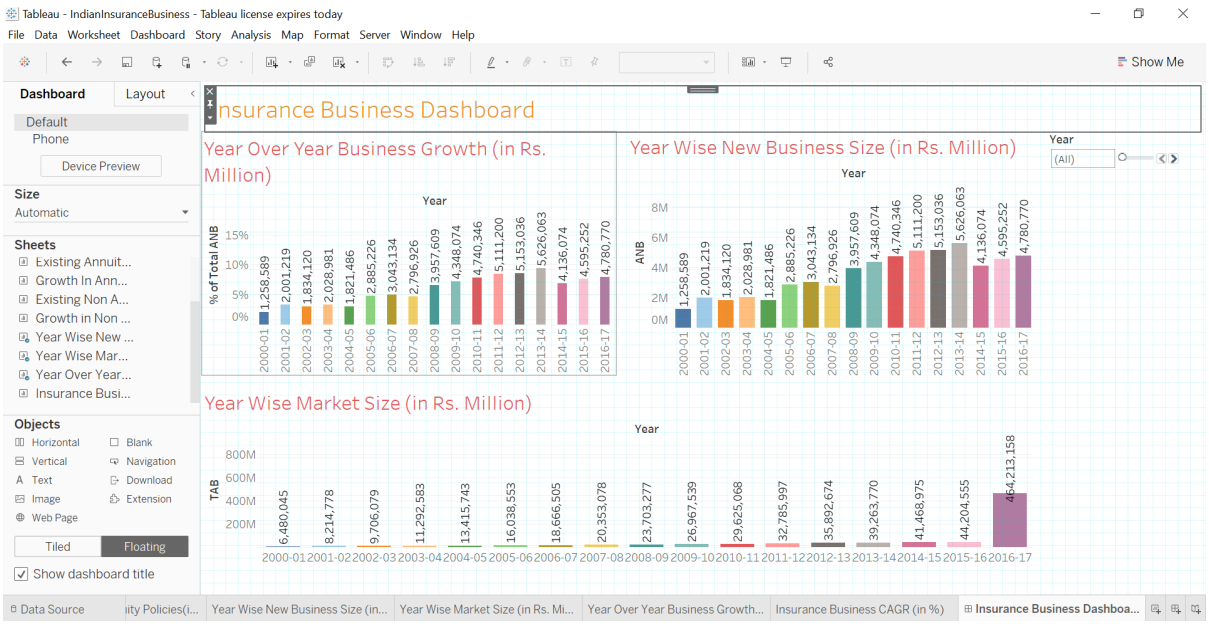

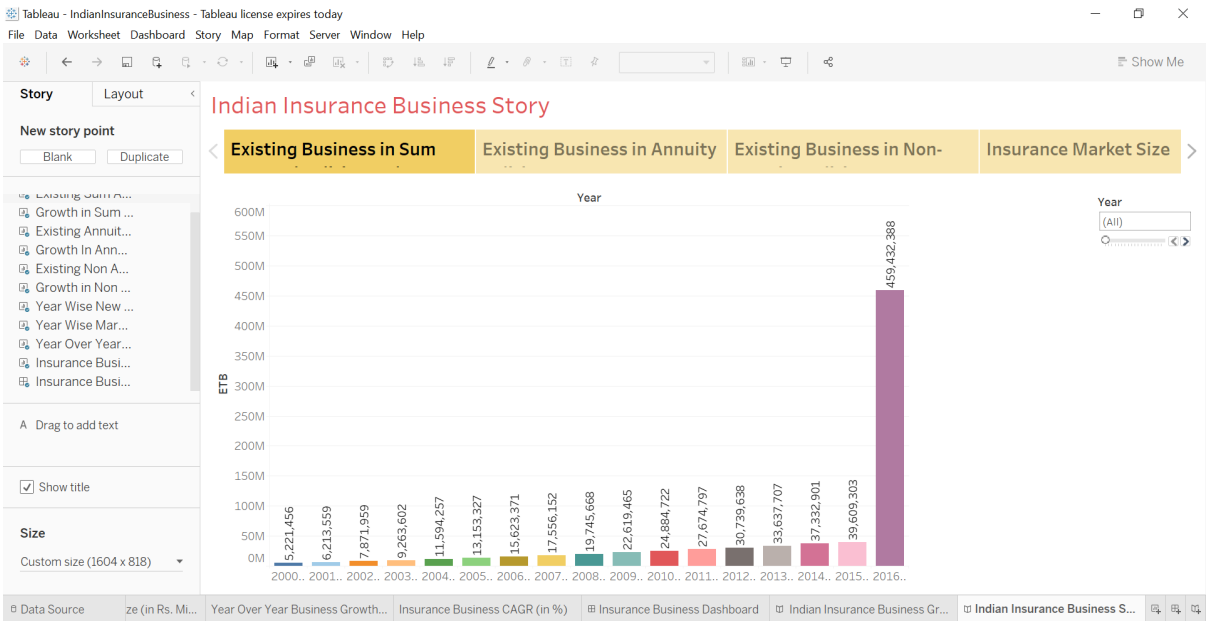

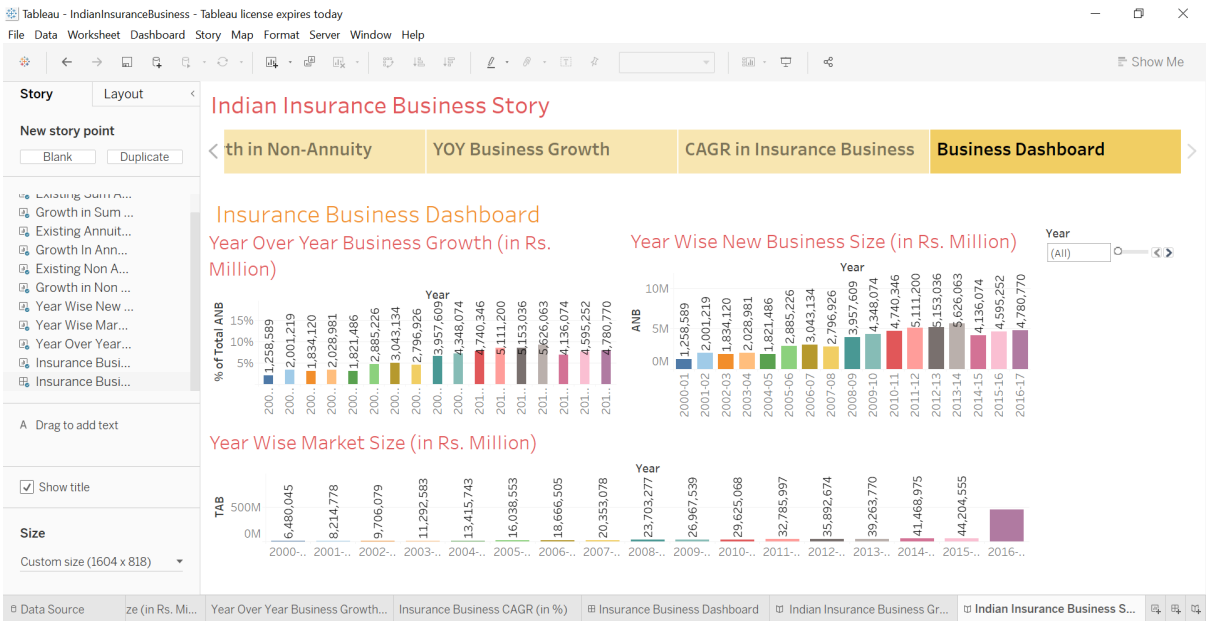

The advantages and disadvantages are listed in the next section.

7. ADVANTAGES AND DISADVANTAGES

The Data Visualization built under the auspices of SmartInternz-Tableau is most successful one and became live after hosting in Tableau public server. The advantages and disadvantages are listed as below:

7.1 ADVANTAGES:

a. It works on any devices such as mobiles, tablets, desktops etc.
b. It is platform independent and thus it is portable.
c. It saves time, effort and energy of the consumer/organization.
d. Websites are easily built as less coding is employed.

7.2 DISADVANTAGES:

a. One must be aware of softwares/technologies to develop websites.
b. There may be a chance of losing opportunity to browse information in absence of a website.

The possible applications of the data visualizations are presented at the next section.

8. APPLICATIONS

Recent days due to technological evolution, people are in continuous usage of modern gadgets such as mobiles, notebooks, tablets, laptops and other devices in their busy life. In such engagements people find it to complete their important tasks such as shopping, paying bills, completing financial transactions which require to browse their websites. The current visualization techniques available are very poor

and many a time they mislead and prone to lot of mistakes. To accurately respond and understand the web managers need lot of new technologies. As part of it lot of scope to apply this developed visualization techniques, particularly in the insurance domain to derive and look into visualization. So as to enable the domain excel in their business. This project of developing a Data Visualization in the Insurance domain is concluded in the next section.

9. CONCLUSION

A Data Visualization of basic complexity data meant for Insurance Domain is explored in this Data Visualization and Story telling Challenge of Tableau DataViz Challenge-2021 project by using the Tableau software. In this process, an Indian Insurance Dashboard and Indian Insurance Business Story is being successfully built as per the project specification and hosted it on the Tableau Public Server provided hosting space. The results of experiments are verified and found that that the Dashboard Visualization and Story telling is live on the internet. The next section expores the possible future scope of work.

10. FUTURE SCOPE

The Data Visualizations built on Tableau software in this Data Visualization and Story telling Challenge of Tableau DataViz Challenge-2021 is with some basic features. These features can be expanded to make more comprehensive predictions of insurance business and can help to explore new ways of tapping insurance business. Such a system can assist of the stakeholders of the insurance industry to clearly achieve their target.The bibliography is followed.

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