Ideologies of Effective Data Visualization

V. Manikanta
SRP in CIIL and Research Scholar
Bharathiar University, Coimbatore, India

Dr. NG. Yethiraj
Associate Professor & PG Coordinator, Department of Computer Science
Maharani's Science College for Women, Bangalore, India

OPEN ACCESS

Volume: 12

Special Issue: 1

Month: October

Year: 2024

E-ISSN: 2582-0397

P-ISSN: 2321-788X

Impact Factor: 3.025

Citation:
Manikanta, V., and NG Yethiraj. "Ideologies of Effective Data Visualization." *Shanlax International Journal of Arts, Science and Humaities*, vol. 12, no. S1, 2024, pp. 16–22

DOI:
https://doi.org/10.34293/sijash.v12iS1-Oct.8278

Abstract
The users of the world are mainly focusing on automatic way of information and easily understandable way of representation in any of the fields. The representation of data using multiple software technologies options, electronic distribution is available for effective scientific way of visualization. But, some of the scientific disciplines many concepts are incorrectly available to users like figures, present information, inference of the data, etc. So, from this all aspects how to use visualization with practical representation of the data is very crucial for any data representation. Many color combinations are showing incorrect information. So, visual practices are required in daily activities with innovative method way for users to understand the concepts. Here we explored the various best ways of ideologies to represent the visualization in any of the fields.

Keywords: Visualization, Infographics, Charts, Diagrams, Scientific Reports

Introduction

Visual learning environment is primary representation of interpreting data information and is showing the results with images, charts, graphs along with parameter of relationships. The visual learning model style recognized the comparative between text and images. Multiple technologies are providing complex visual information is neatly describing the information. Many of the publications are required graphical representation of advertisements to get the details of the products are required. In ancient years, graphical information is not provided in multiple publications through visually. The graphs representations are exists some type of error with scientific reports through visually. Multiple studies are mentioned false result statements. So, visualization technology development is required for poor information and its representation. The poor information is not easily understandable to requirement of the products. During publications, the objective of the information of graphics poor then information is misusing or not effective data. The effective representation of data is easily understanding and providing inferences of the requirements.

Applications of Data Visualization

Business Intelligence

BI tools are highly technical with user-friendly platforms to provide lightweight dashboard mechanism. Selecting the appropriate one depends on business of activities based on the prediction of data is required.

Military

Military of operation, maintenance, procurement, expenditures of various aspects of data are required in visually for understand the necessary actions.

Data Science

Discovered the data based on interpreting and obtaining results are useful information is required when we use Data Visualization subset to provide the necessary information from the data.

Finance Industries

Financial data visualization is providing accuracy of data for understanding any circumstances of loss or gain. The decision of any product market analysis is easily identified through their visualization.

Marketing

Large dataset of complex market analysis are visually represented to easiest way for strategies in statistical report, graphs, presentation, etc.

Food Delivery Apps

Visually representation of the food menu in various apps of swiggy, Zomato, Domino's, Travelkhana, Fassos, Box8, FreshMenu, Pizza Hut, etc are easily attracted with foods with effective visualizations.

Real Estate Business

Real investment and developments are mainly focus on Geospatial tools to represent the place and powerful tools are required for compelling data visualizations in various aspects.

Education

Performance analysis of students, colleges, staffs, etc is represented in visually for evaluation to growing of education.

E-Commerce

Customers interpret the values of sales strategy and customer interaction, buying product, etc are adopting visualization aspects.

Healthcare and Pharmaceutical Companies, etc

Identify the disease, recognition of many health issues in various aspects of data are required to finding new medicine or to study the healthcare care activities, etc in various visualization techniques.

Data Visualization Techniques

The visual analysis is handled with data for many patterns based on the requirement of inference. The visual analysis includes descriptive analysis, classification analysis, association analysis and prediction analysis. The descriptive analysis mainly involves the concepts of the data, class of the data, association of data, cluster analysis of data, correlation of data, regression of data, and pattern variation of data. The classification analysis is finding exact classes through conceptual description. The training data is set to find a model approach based on classification rules, machine learning techniques, neural network analysis, and classification based on tree structure, formula to evaluate many parameters. The database variables are involved in setting the value to predict, classify, visualize data, pattern identification, discovery of data, etc.

Pivot Tables

The Pivot tables are tables that represent the vast repositories of data information to convert complex problem to compress easily with effective representation. The statistical representation in single view of summarize of means, sums, or any other calculation summaries. The highlight tables are using different colors or shades to represent the value of highest or lowest in a dataset. Sometimes, more complex data are easily representing pin point forms of analysis.

Boxplots

The descriptive visualization is one type of boxplot statistics. The Boxplot is also called as box and whisker plot. It is also statistics of datasets key of visualizations and the value of maximum, minimum, means, lower quartiles of median of the lower and upper quartiles of upper halves of the value. In non-parametric of data distribution is not invoke assumptions and displaying the variation of sample of data. The main useful of the boxplots are explanatory analysis of data and exploratory analysis of data in understandable way of datasets.

Scatterplots

The scatterplots are displayed in 2D and 3D plots also and mainly displays the relationship gap between any of the two variables based on coordinates of X and Y axis with labeled description. The single point representation of each data items to represent the chart visually effects of scattered.

If 3D also exists while executing with three parameters displayed as scatter also. The large dataset of values is good compare to the time measurements for identifying the weight against height for correlation between relationships of variables. The difference between scatterplot and bubble chart is displaying the circles of different sizes.

Line graphs

The line graphs are visually same as scatterplot and data points distinguished by time intervals of segments joined by a line. Line graphs are simple and quick observations of line goes up, line goes down, line moves up and down. Simple line graph represents single dataset, more complex line graphs are interrelating with line while overlay several lines in different data. The line graphs are useful for deviations or correlations.

Area Charts

The area chart is same as line charts but the visibility of space between the lines are shaded or colored along with x-axis and it also tracking data. The highlights are showing the comparison between multiple variables. The stream graph is to represent the stacked area of shaded area and plotted like wobble around a central axis.

Bar Charts

The most common visualization is used in each and every application from school like bar chart. It is show like simple and provides effective structure way of discrete values for categorical data. The heights (or widths) of the bars are in direct proportion to the values they represent. This type of bar charts is easily comparing the discrete variables representation in efficient manner.

Some bar charts are comparing multiple variables for multiple points at a time using cluster bars mechanism. Other type of bar chart variation is stacked chart and divides the bar into separate sub-bars with stacked.

Histograms

Histogram is same as bar charts and one difference is charts are measuring the values in categorical data while histograms are measuring frequency of discrete numerical data point presents in a dataset. The ranges of values are displayed as data point falls on each bar. For calculation different age groups, histogram is summarizing the large set of continuous data are displayed without requirement of every single value.

Pie Charts

Other visualizations of pie charts are same as bar chats and common difference of the representing the data in numerous categories from bar chart while the pie charts are using a single variable to represent the information like percentages. Each slice is represented in quantity information easily like pie with entire circle. The pie charts are best visualization for splits the data to about six categories and data splits more categories is too complex to view.

Network Graphs

Now the data are more interconnected and very complex to distinguish the structure. The visualization of network graphs is showing the interrelated graphs one another with each element are network graphs to interrelate the features. The nodes are consisting of interconnected to lines with nodes. The visualization of these kind very useful clusters within many patterns is easily identified. The diagram with more elements is connects to find the large hidden cluster of the data.

Geographical Maps

The geographical map visualization is to provide the different range of multiple locations of specific data in most of the versatile application like distribution of voting between locations on specific comparative of high or low range of value to find the status of vote. The color variation of the visual clues is described about data distribution and example like Snapchat social media. In Snapchat, heat maps to view the shares snaps of highest density of values. Some of the maps are represented in maps like scattergram with a map of dot distribution and cartograms.

Radar Charts

The data incorporate with more than one variable in 2D are representing the spider format charts are called Radar Charts. The main features of comparison between multiple observations and identifying the outliers between observations.

Treemaps

The treemaps are data visualization to represent magnificent for displaying the hierarchical data likely in the form of rectangles with one and other. The treemaps split each division into many smaller rectangles of subdivisions.

Many of the divisions are displaying the distribution of the location from the disk space. The efficient uses of highly complex data visualizations with many divisions for analysis are useful in limited time to display the results.

Venn Diagrams

The classic Venn diagrams are used overlapping shapes in a series of circles but sometimes ellipses or other formats also to highlight the relation between groups of items. The shared features of groups are easily represented in the Venn diagram with overlapping of the shapes. Each Venn diagram is representing the features of the groups based on classification and quickly visualizing the different groups of relations and easily to represent the descriptive purposes. The Venn diagram adding more data and it will appear cumbersome.

The Ideologies of Visualization

Diagram Representation

The ideology of diagrams is like least technology. But it is very important factor to find the multiple visualizations. The information of diagram is required to share the contents based on the design, development through software. So, the actual information of the diagram preference is first then looks for other geometrical features of points and lines. But only viewing the points and lines and not providing a specific structure of the program is not good. So, main contents of the image with data quality, understanding and right diagram designed through various software is main objective for any type of diagrams. For scientific report image and text information is main factor to detect the disease or treatment.

Right Software

Effective visualization is required quality of the software to interpret the results with users requirement of information. But multiple type of software has some advantages and disadvantages at any one or more criteria. So, software program development for any type of image or text is very important to give effective visualization. The software provides users through effective decision and decision making, classification of multiple types of data to represent the effective data visualization. The software enhancement increasing like free version, licensed version is available through their respective information visually.

Geometrical Features

Geometrical features are mainly involved the distance, shape, angles, size and position of the figures. The visual appearances of points, lines, angle, polygon, circle, edges, faces, vertices, etc are easily solved in various fields of results. So, software features are providing multiple types of in built functionalities with mathematical structures to show the information. The bar graphs are describing through bar geometry with dataset of relations with any type of well known geometrical features. The geometrical representation is multiple forms to get using more geometry also. The data ratio is the measures the studies between any of the concepts or comparison analysis are explored with visualized observations. Suppose the data is representing the ink in ration, the data should be decisions based on comparing of overall ink, High data ink, non data ink, low data ink, etc. so, visualization of the figures provides the results of the real time applications. Many of the geometrical features are grouped into compositions, comparisons, distributions, relationships, etc based on categories. The geometry function works more than one category and provides the visualized information more than one category based on the datasets. The geometrical approach is completely providing the necessary information with robustness way of visualization.

Colors

The visualization using color combination is more powerful to give as output. Even though lot of technologies are developed still color visualizing is not complete. The color visualizations are memorable and huge type of reports with neat describing way of structure using color. The document effects in the color are easily understandable of the concepts with relational data with multiple categories. The colors are appeared like blue, green or brown while observing the water in maps. The color consists of sequential, diverging or qualitative schemes. The sequential color is range from light to dark with related hues one or more for increasing the darkness. The scheme of diverging color is range from red to blue with hues. The scheme of qualitative color is not primary importance then the process is different along with qualitative groups.

Uncertainty

Uncertainty is sometimes cannot know which one is perfect for comparing any concepts. This type of situation is called uncertainty. The inherent properties of the visual part are recognized from uncertainty. The uncertainty challenge visuals representation appearance failure to include the misinterpretation of uncertainty. The uncertainty is not integrated with diagrams or figures and it is statistical part of the message inference on the mean. Most of the software programs considered as error bars and shaded intervals like polygon. The uncertainty of common metrics like Standard deviation, standard error, credible intervals, confidence intervals, etc. is measuring in different ways.

Panel

The panel of each data represents belongs to a change in one variable through group, step, time or any other factors. The data visualization studies with more effective way representation for objective of small multiples comparisons. The small multiples are approach the diagram or figure to show the highlight difference. The techniques are represents as paneling for small multiples like axes, axes scales, etc. with design elements similar and data differences are easily explored.

Data and Models Are Different Things

The Summarized data of raw data using scatterplot, box plot, etc to get the inference of statistics or regression, summarized value are providing neatly. The model of plotted is need more detailed explanation required to reproduce the full work. Any kind of model is required the complete mechanism for visualization. The model is required figure caption along with neatly description of the groups, classification, values, etc using model.

Simple Visuals, Detailed Captions

The data representations of high data-ink ratios with detailed figure captions are very important to explain the diagram for getting the visual concepts of the solution. Most of the researches are not mentioning the fully captions only show the data or model. But, the representation of figures with captions is self explanatory part of the visualization. Some of the mathematical or statistical way of models required more captions to represents the actual things. Many of the scatterplot, box plots, etc, are representing the points of data with captions.

Consider an Infographic

A clear and visualization of data with information using an infographics method. The data elements like symbols, charts and imagery representation to display infographic for complex problems to easiest way. Many scientists improve information to incorporate the text, images and other elements of any diagrams along with highest memorability for transfer the ideas to infographic of multiple pieces of information effectively. The main elements of the infographic require story, design, style, visual appeal and information. This type of infographics improves cognition from various graphics to enhance the visual patterns and trends. The multiple infographics are timeline, process, informational, map, resume, list, data visualization, comparison, flowchart and interactive.

Get an Opinion

Many principles and methods are used for effective data visualization. But our requirement is effective visualization it connects with users while approaching to external reviews of their visual figure. The colleagues or people review the figures and provide necessary feedback information to get effective visualization and sometimes, ineffective visualization also converts effective visualization using opinion. So, recommended from various reviewers of figures is easiest way than document review. The review from feedback is easiest way of implementation to make effective visualization.

Conclusion

While seeing multiple journals are adopted many of the elements for visual representations like graphical abstracts, infographics and overview of figures. For scientific reports required more advanced software design for creating the graphics of effective images automatically. The visual picture knowledge is essential for trails with data and results of functional activities.

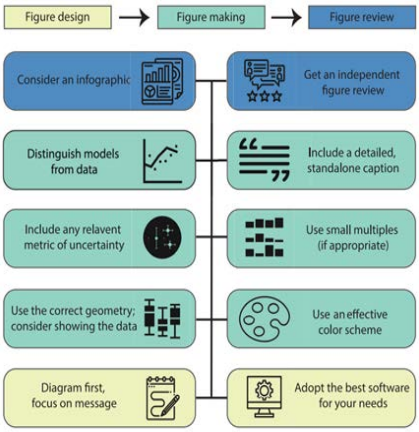

Figure 1 Ideologies of visualizations

The two ideologies in yellow colored indicate that design phase. The six ideologies in green colored indicates that decisions and considerations for creating a figure. The two ideologies in blue colored indicate that final steps of figure. The visualization demands are increasing in daily with various representations and research is required for all the principles of image. The effective visualization of data is required optimized way of techniques and algorithms to get scientific reports or any other reports.

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