Volume 3, Issue , 2024
PP 247-257

International Journal of Futuristic Innovation in Arts, Humanities and Management (IJFIAHM)

INFORMATION VISUALIZATION METHODS, ANDINTERACTIVEMECHANISMS

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ABSTRACT

With vacuity of enough visualization ways, it can be veritably confusing to know what and when should be applicable fashion to use in order to convey maximum possible understanding. The introductory purpose of visual representation is to efficiently interpret what's sapience, as easy as possible. Different available visualization ways are used for different situation which convey different position of understanding. This document is companion for the youthful experimenters who wants to start work in visualization. The purpose of this piece of document is to collect all visualization ways with their brief preface. This paper deals with numerous delineations and aspects of visualization, how visualization take place i.e. different way of visualization process, problems that are defy in visualization, categorization of visualization ways on the bases of distinct perspective, generally known common data and information visualization ways, introductory interactive styles for visualization their advantages and disadvantages, interactivity process, and the compass of visualization up to some extent in different field of exploration.

Keywords: Information Visualization, Data Visualization, Interactive Mechanisms.

1.INTRODUCTION:

The information is now the essential part of mortal life, which encourage new ways to suppose and evolve new advancement. Huge quantum of information or data are generated from different sources, this informationis of different types and stored in colorful format. For illustration, the existent goes through particular information i.e., dispatch, converse,

schedules, news etc., scholars access innumerous digital libraries for educational purposes (1). Indeed,from all discipline of life a lot of data being generated, access, and use for individual, collaborative benefits. Because of similar versatility of information heave significant issues that how to represent this information in further useful manner that the stoner can use it efficiently. The main issue is how represent these massive data in order to understand and prize knowledge from stored data or information, which is a ubiquitous task. In simple words, the collection of information is no longer a problem but rooting of precious knowledge from the collected or available information is a big problem. Visualization styles are considered to be veritably important for the druggies' because it provides internal models of the information (1). Visualization ways make huge and complex information comprehensible. Information visualization is a visual stoner interface that provides sapience of information to the stoner (3). The introductory purpose of visualization is to produce interactive visual representations of the information that exploit human's perceptual and cognitive capabilities of problem solving (2). The thing of visualization is that the stoner can fluently understand and interpret huge and complex set of information. There are a lot of issues in visualization, to attack these issues numerous fields should be considered. Human Computer Interaction is one of the major fields, which make effects easy to use and easy to understand and interpret. All usability issues are important to suppose about in order to completely achieving the visual representation objects. The main ideal of this document is to give the introductory knowledge about visualization for youthful minds want to work in visualization. First part of this document describes introductory delineations of visualization and six step process of visualization, alternate part describes the challenges or problems defy by visualization and orders set up in literature. also, in third part of the document compactly describe Data and Information visualization styles with exemplifications. Second last part gives the Interactivity ways that are used for visualization and the major way that are involve in visualization interactivity. Last section describes compass of visualization in many fields and field of exploration that requires critical step of action.

2.METHODOLOGY:

Differing with the large number of reports on usability of stoner interfaces, there are many authors addressing evaluation issues for information visualization ways. proposes quantitative

criteria to estimate the effectiveness of 3D static representations, principally plots, but don't address commerce mechanisms. For each display, he measured the number of data points (for data viscosity), number of confines (for cognitive complexity), occlusion rate, and the number of identifiable data points. describe the evaluation of three visualization ways (Cam Trees, Information cell and Information Landscape) grounded on the tasks (as defined by Shneiderman) they support. The authors enforced these three mentioned ways and anatomized them in terms of which tasks they support. Usability trials were carried out to corroborate completion of tasks and difficulties in commerce using named visual representations for a query result handed by NIRVE (the NIST Information Retrieval Visualization Machine). The thing was to specifically test design features espoused in NIRVE's indispensable visual representations in relation to the cognitive cargo. Although not directly related to information visualization, the effect of the reduction of quality on 3D images and the quality of information handed were tested by Watson etal. using the picking time system, a special kind of usability evaluation system grounded on stoner testing. That study has demonstrated the use of some cognitive aspects of visual representation quality and stoner performance related to the time spent for achieving some pretensions relating objects and understanding information).

3. VISUALIZATION:

Visualization is an internal image or a visual representation of an object or scene or person or abstraction that's analogous to visual perception (10). Visualization has numerous descriptions but the most appertained one, which is set up in literature is "the use of computer- supported, interactive, visual representations of data to amplify (6) (7). Visualization is a graphical representation that stylish conveys the complicated ideas easily, precisely, and efficiently. These graphical delineations are fluently understood and interpret effectively (8) (6). The main thing of Visualization is to find out what sapience. Visualization is the metamorphosis of Emblematic representation to geometric representation. The thing of visualization is to dissect, explore, discover, illustrate, and communicate information in well accessible form. Visualization is use to present huge quantum of information coherently, curtly, from different shoes, and provides several situations of details (65). Visualization evaluation is using in resemblant and it's use to determine how nearly the visualization thing

is achieved. In evaluation there are numerous confines to observe, involving Usability evaluation, how important visualization fashion is effective, accurate, robust, efficacity, and easy to use etc. (1). The visualization is an important tool that can be used for different cognitive processes like exploratory, logical and descriptive (9).

4. VISUALIZATION METHODS:

A number of visualization ways have been developed in last many times due to representation of huge massive information and to dissect it. These ways have numerous features like interactivity, usability, interface features etc., which make them easy to use and salutary as bandied. These styles have evaluation medium to achieve the thing of visualization as compactly bandied. In this check the focus are on conventional Data and information visualization ways.

4.1. DATA VISUALIZATION:

Data visualization is the study of representing data in some methodical form, including attributes and variables for the unit of information (21). Information visualization, scientific visualization, information plates and statistical plates are nearly affiliated to data visualization. There are numerous conventional data visualization ways which are concentrated in this document because these ways have general features and common understanding. These data donation should be beautiful, elegant, descriptive, and interpretable in order to convey communication to the anthology effectively (22). There are new advanced fascinating styles are introducing, but ultramodern approaches have its own perpetration problems and no congruity, so delicate to borrow. In the following section we going to bandy many given conventional data visualization ways and give its illustration in order to get original idea about the fashion.

4.1.1 TABLE:

Table is the simple, easy to understand, and easy to interpret data representation fashion. Table is a structured format, organized by rows and columns that convey connections, is one of the most common delineations. Row has different antonyms like record, tuple, vector etc.

Column has common antonyms like field, parameter, trait, property etc. Rows represent variables and columns represent records with the set of values. occasionally this arrangement can be altered, means columns represent variable and rows represent records. The entries may or may not be in ordered, it depends on the data and its attributes (6) (25). The part of table is essential part in exploration and in data analysis. It has significant in fields like print media, computer software, conveying generalities or ideas, and numerous other fields. The table conventions and introductory language is depending on the environment it has been used. Table has differentkinds, inflexibility, structure, memos, representation, and use (26) (27). For illustration, the following table shows collected data for a trial with three measurable units.

Paragraphs	CL Without Spaces	C/L With Spaces	CL in Inches
Paragraphs 1	77	93(±5)	5.25
Paragraphs 2	111	133(±5)	10
Paragraphs 3	116	141(±5)	9.13
Paragraphs 4	102	122(±5)	9.5
Paragraph 5	74	87(±5)	10.74
Paragraph 6	96	115(±5)	4.87
Paragraph 7	114	134(±5)	8.13
Paragraph 8	96	111(±5)	9.4

Fig 1: Shows Simple Table

Whereas the column is related as the dependent variable called with word “Variates” (29). It has multi operations and uses in nearly all fields.

4.1.2 PIE CHART:

A pie map is also called circle graph. Pie map circle is divided into number of sectors, each circle describes a proportion in a whole volume (34) Spence (2005)). The pie map control is use to determines the size of data sandwich as compare to other data wedges. In pie map a wedge represents the part of data that has common point or characteristics. There are two common variations i.e., Doughnut maps and Exploding pie maps. Doughnut maps are

analogous to standard pie maps except they've concave center. While in Exploding maps wedges or member or sector can be uprooted from the rest of the wedges. These sectors or

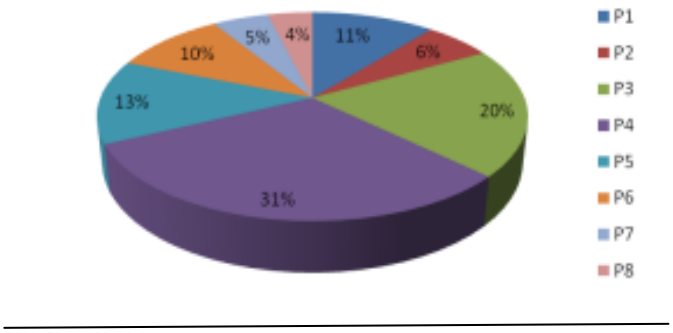

Fig 2: Standard Pie Chart

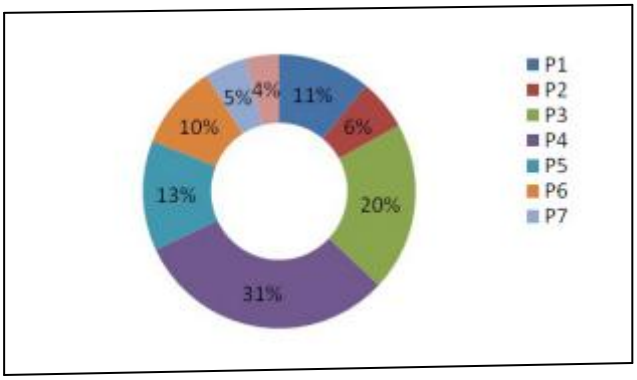

Fig 3: Doughnut Pie Chart

Multi-level Pie, Radial tree, or Ring map is another variation of pie map. This kind of map is utmost of the time use for hierarchical data, illustrate by concentric circles. The center circle represents the root or parent member of the scale and the upper or external circles represent the child or down side data of the scale (31) (32).

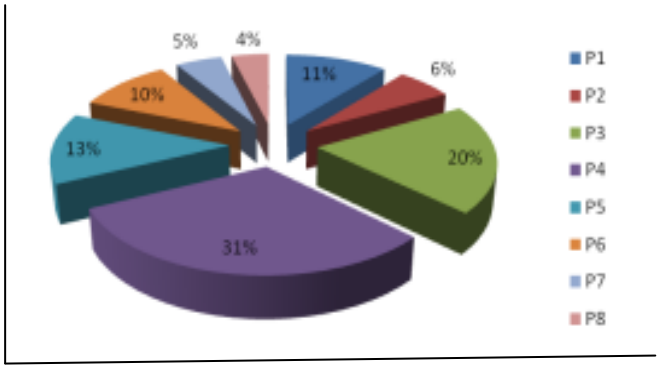

Fig 4: Exploding Pie Chart

Pie map visualization is effective in some cases. comparing a member of pie map to the rest of the parts of the pie map, but it's delicate to compare different pie maps and different section of different pie maps among each other (32). Color usability make it easier to understand and interpret, different color should use for different slice or member. The figure shows two position breakdowns, first position illustrates passengers and crew of the plan and the alternate position explain the gender in each portion of the first position. Multi position map can be extend up to reasonable number of situations.

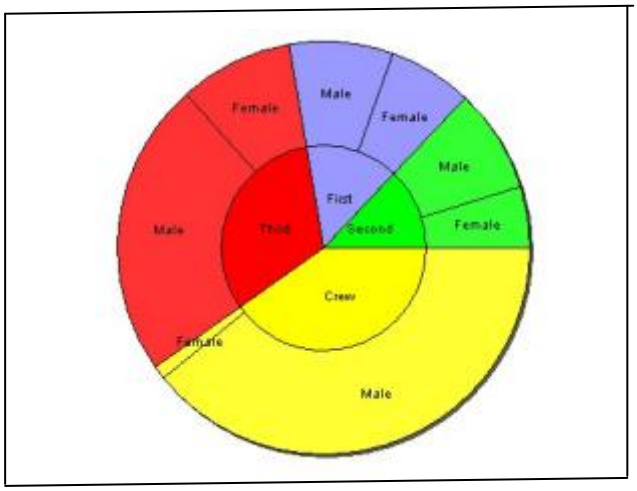

Fig 5: Multi-Level Pie Chart

5. CONCLUSION:

The main idea behind this document is to initiate the introductory of visualization for unborn generation, keeping in mind the significance of visualization. The business sector still substantially ignores, mis knew, used in inefficiently data and information visualization, which leads to the overall lower product. So, the experimenter needs to concentrate on visualization ways in order to get maximum benefits offer by visualization. Another important aspect is to easily specify what data type needs to represent which visualization system, that interpret maximum understandings. As Data mining is one of the arising fields of computer wisdom, largely use in the business sector produce results in the form of visual data mining, which needed critical amenities to produce interactive visualization that fluently describe what sapience. Because interactive and animative visualization is more salutary to convey the conclusion of huge or veritably huge data set that's not readily to understand under traditional approaches. Another focus area is mobile bias visualization or visualization of mobile bias, where it's more important to identify visualization styles for it with upkeep in mind the limitations of mobile bias. Data booby-trapping ways, mining results visualization and interactive mechanisms on mobile bias is also a significant field of exploration which is docket of my present and unborn exploration work. The moment world demands the standardization of data and information visualization ways with respect to data to be present, interactive mechanisms with respect to visualization styles, mobile visualization with respect to different aspects of data and information visualization.

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