



Data Visualization: The Modus Operandi of Workplace Communication

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Abstract:

The goal of the current organizations is to turn data into information, and information into insight for the efficient workplace. The most effective way of communicating is Data Visualization in the present scenario. It has far reaching effects when the data is big and complicated. This paper offers an overview of the research issues and achievements in the field of Data visualization techniques and tools. It explores trendy visualization techniques and elucidates the possibilities of better decisions leading to workplace efficiency by providing a Model on DVP (Data Visualization Process). The Model is based on the views obtained from emails sent to the software professionals. In this point of view, this study examines the process, people and technology required to communicate data through visualization for the sophisticated workplace. Furthermore, the impacts of new technologies, such as virtual displays and on the Big Data visualization as well as the main challenges of integrating the technology are also presented with appropriate solutions.

Key Words: Data Visualization Techniques, Big data, Work Place Efficiency & Work Place Model.

I. INTRODUCTION

The use of data visualization has become continually more popular, partly because the tools to create data graphics are exhilarating and there is an urgency to communicate information in a trendy setting, thereby it is a modus operandi of communication in the current big data era. This paper offers an overview of the research issues and achievements in the field of Data visualization techniques and tools. It explores trendy visualization techniques and elucidates the possibilities of better decisions leading to workplace efficiency by providing a model on DVP (Data Visualization Process). The model is based on the views obtained from emails sent to the software professionals. In this point of view, this study examines the process, people and technology required to communicate data through visualization for the sophisticated workplace. Furthermore, the impacts of new technologies, such as virtual displays and on the Big Data visualization as well as the main challenges of integrating the technology are also presented with appropriate solutions.

Why Visualization?

Data visualizations bring themes and ideas to the surface, where they can be easily discerned. Visualizations enable us to process enormous amounts of information quickly because it is all represented in a single image or animation. Moreover, virtually any kind of data from a broad range of academic disciplines can be represented visually, making data visualization a potentially valuable approach to learning for a large number of students and researchers. Ben Fry puts it rightly, “This deluge of data necessitates new software-based tools, and its complexity requires extra consideration. Whenever we analyze data, our goal is to highlight its features in order of their importance, reveal patterns, and simultaneously show features that exist across multiple dimensions” (Ben Fry, 2007, p.5). To put it simple, Data visualization is a quick, easy way to convey

concepts in a universal manner – and different scenarios can be experimented by making slight adjustments. It has proven critical for:

- ✓ *Improving operational efficiency*
- ✓ *Detecting and responding to business change*
- ✓ *Identifying business opportunities*
- ✓ *Measuring and monitoring productivity*
- ✓ *Increasing internal and external regulation compliance*
- ✓ *Clarify which factors influence customer behavior.*
- ✓ *Predict sales volumes.*

While the research primarily focused on this issue from a big data perspective, this has been a recurring challenge for all forms of analytics—big data or small data. What is the difference then? The effective Data visualization provides strong and suitable insights while a weak or wrong visualization can bury a good insight. This is the great advantage of visualization. The era of Big Data has been rapidly promoting the data visualization market. According to Mordor Intelligence (2014) the visualization market will increase at a Compound Annual Growth Rate (CAGR) of 9.21 % from \$4.12 billion in 2014 to \$6.40 billion by the end of 2019. SAS Institute provides results of an International Data Group (IDG) research study in the white paper (2013). The research is focused on how companies are performing Big Data analysis. It shows that 98 % of the most effective companies working with Big Data are presenting results of the analysis via visualization.

Data Visualization Techniques:

From an analytics perspective, data visualization needs to be able to offer accurate abstraction and interpretation and a simplified view that can be used for understanding and explanation. Data visualization can be best explained by quoting Edward Tufte: “*Data graphics visually display measured quantities by means of the combined use of points, lines, a coordinate system, numbers, symbols, words, shading, and color.*”

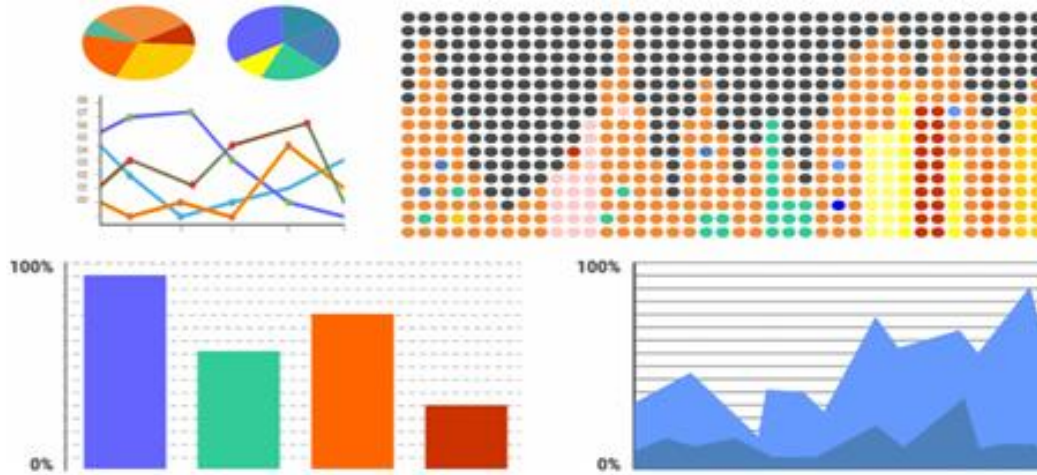


Figure .1. An example of the dashboard. This picture illustrates pie chart, visualization of data in pixels, line graph and bar chart

The modern methods and tools follow fundamental cognitive psychology principles and use the essential criteria of data successful representation (Julie Steele NI, 2010) such as manipulation of size, color and connections between visual objects (see Fig. . In terms of human cognition, the Gestalt Principles (Guberman S., 2015) are relevant. The basis of Gestalt

psychology is a study of visual perception. It suggests that people tend to perceive the world in a form of holistic ordered configuration rather than constituent fragments (e.g. at first, person perceives forest and after that can identify single trees as part of the whole).

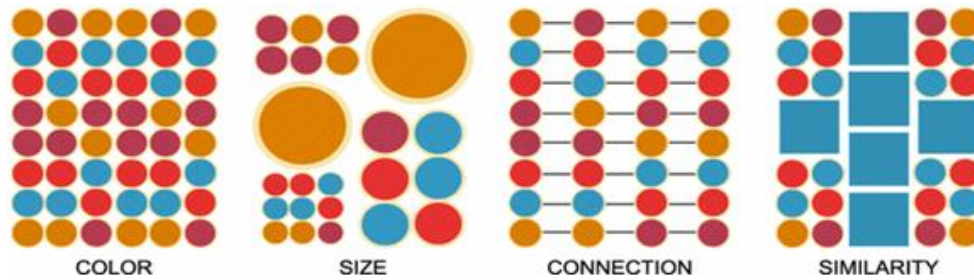


Figure 2. Essential criteria of data successful representation

Ordinary zooming works well for most high-density information graphics, but it takes away context: a fully zoomed view no longer shows an overview of the whole data set. Local Zooming

focuses on local detail while retaining context. The user remains in the same conceptual space. (Tidwell, 319)

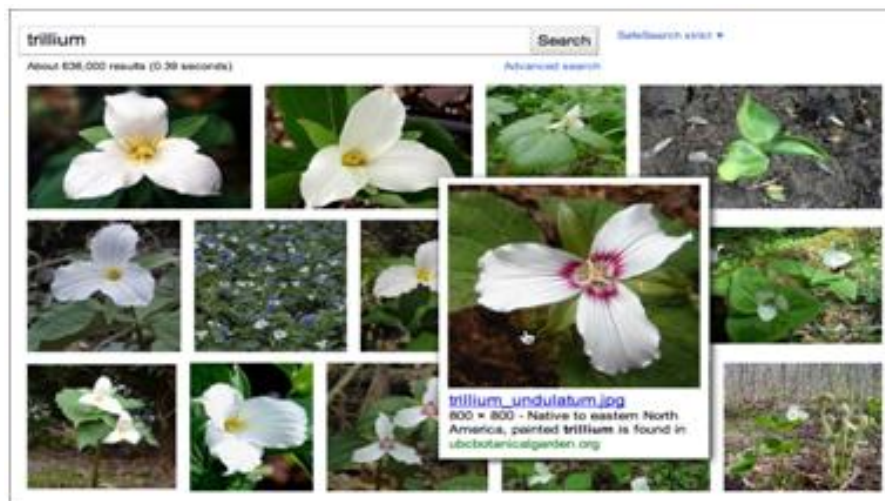


Figure 3. Local Zooming Effect

However, contemporary methods, techniques and tools for data analysis are still not flexible enough to discover valuable

information in the most efficient way. Meanwhile, visualization-based tools should fulfill three requirements: expressiveness

(demonstrate exactly the information contained in the data), effectiveness (related to cognitive capabilities of human visual system) and appropriateness (cost-value ratio for visualization benefit assessment) (Miksch S, Aigner W, 2015 & Müller W, Schumann H, 2003). These novel techniques can be implemented to achieve more beneficial goals in Big Data perception and representation.

Data Visualization: A Modus Operandi at Beaming Workplace: The demands of data visualization are one of the critical components in a modern workplace. One of the most

interesting aspects of the data visualization capabilities that are part of **IBM Cognos Business Intelligence** is the ability to expand, which enables more powerful exploratory visualizations. Analysts can visually explore and perform analysis of large data sets. (www.technologyevaluation.com). Here is a model of data visualization process at workplace that ultimately leads to branding. The model is based on the emails obtained from software professionals working in WIPRO, SAMSUNG companies in India. They have shared the visualization is an essential tool for business decisions and especially for quick and efficient assessments.

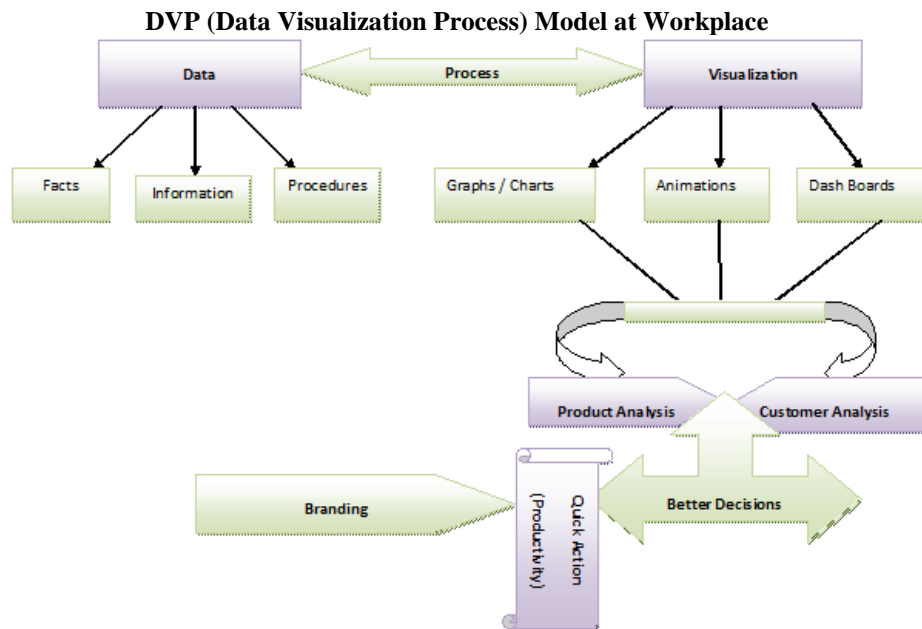


Figure. 4. DV Model

Source: Author

The diagram shows visualization development cycle which provides a richer understanding of product and customer analysis. An insightful visualization provides a path way to more holistic and better decisions lead to productivity and thereby branding. Data Visualization is implemented successfully in the government sectors also to monitor the things. At first, the data is essential for visualization process. The data is nothing but facts, information and procedures. As shown in the figure, the data consists of three important components. Many a time the data is huge and complex there by creating perplexity. In order to simplify the complexity, visualization through graphs, animations and Dashboards would help to make the governance

more efficient. This gives the workplace an updated informative set up. By this, graphical analysis, it is easy to know the anomalies or higher and lower performance at a snapshot. This gives apt product and customer analysis leading to enhanced performance by taking better decisions. The info-graphic visualizations will enable quick and prompt decisions. In any organizational set up the most essential aspects are the performance indicators. The leaders should make use of these indicators to improve productivity and they can obtain branding in no time. In real time, various examples suggest the significance of Data visualization. The current paper discusses CM Core Dash Board for better governance.



Figure.5. CM Dash Board – Andhra Pradesh

Source: core.ap.gov.in

CM Dashboard provides at a glance view of KPIs (key performance indicators) and relevant wings of Government such as Energy, Rural Development, NTR Bharosa (Health Scheme), Civil Supplies and Women welfare and so on. This facilitates ruled and ruler to get updates as well as status of the respective fields. The CM Core Dashboard of Andhra Pradesh is displayed on a web page that is linked to a database which allows the report to be constantly updated. For example, the latest updates as on 16-03-2017 are as follows - street lights in the dashboard shows 5,75,836 street lights available in the state. Coming to rainfall 630.5 (mm) is displayed. Energy status is 6133 (MW) 50.5 (HZ). In the similar manner, the status of other departments is clearly displayed with facts and figures for better understanding of the governance. These numbers are related to productivity such as number of parts manufactured, or number of failed quality inspections per hour. Thus, Digital dashboards allow managers to monitor the contribution of the various departments in their organization. To gauge exactly how well an organization is performing overall, digital dashboards report specific data points from each department within the organization, thus providing a platform for competent performance.

II. FUTURE IMPLICATIONS AND CONCLUSION

Visualized data can significantly improve the understanding of the preselected information for an average user. Images are often more easier to perceive in comparison to text. There is a need to *develop a machine learning system and to define basic intuitive gestures* that are currently in research for general purposes (Vafadar M, Behrad A., 2014). The strong and growing trend toward visualization-based data discovery tools is expected to continue in the years to come, as more businesses seek better, more cost-effective ways to derive meaning from their big data. In this paper we have obtained relevant Data Visualization methods classification and have suggested the modern tendency towards visualization-based tools. The great benefits and challenges of data visualization were described and supported by analysis of workplace efficiency by a feasible working Model on Data Visualization.

III. REFERENCES

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