Universiti Teknologi MARA

Budget Visualizer Using Circle Packing Technique

Nursyahira Binti Zulkeply

Thesis submitted in fulfilment of the requirements
for Bachelor of Computer Science (Hons.)
Faculty of Computer and Mathematical Sciences

January 2019

ACKNOWLEDGEMENT

Alhamdulillah, praise and thank to Allah because of His Almighty and His utmost blessings, I was able to finish this research within the time duration given. Firstly, my special thanks go to my supervisor, Assoc Prof Ts. Dr Nur Atiqah Sia Binti Abdullah. Her wide knowledge and constructive advice have been a great value for me. Her understanding, encouraging and personal guidance have provided a good basis for the present thesis.

Special appreciation also goes to my beloved parents who have been my supporter throughout completing this project. Without their encouragement and their prayers for me, it would have been impossible for me to finish this project.

Last but not least, I would like to give my gratitude to all of my dearest friends that have always been there and giving their opinion and support in time of need. I offer my regards and blessings to all of those who supported me in any aspects during the completion of the project.

Once again, I would like to thanks to all people who have been involved directly or indirectly with the completion of this final year project.

Thank you.

ABSTRACT

Data visualization is used to analyse the patterns and trends of data, including budget distributions, business analytics and so forth in a form of diagrams, charts and so on. In Malaysia, the budget is still in the form of a speech text and info graphics. In previous study, treemap visualization technique is used to visualize the Malaysia budget, but it has resulted to data congestion as there are too many ministries and its programs in Malaysia. Besides, the visualization failed to compare previous and current budgets. Therefore, this study uses circle packing technique to visualize the Malaysia's budget where it provides a more presentable and interactive way to explore the budget that can compare the current and previous budget on a single website. In order to construct this data visualization, the circle packing algorithm is used to visualize these budgets. Json file is used to reorganise the budgets data and imported as input file. Circle packing algorithm includes creating a new pack layout, then packing the root node by assigning coordinate x, y and radius. Besides, it needs to pack the radius, then setting the size using two elements of array. It follows by setting the padding and packing the array of siblings circles. Lastly, it encloses the circles to the packing. This algorithm is then integrated with Json file and HTML to visualize it interactively on the web. This dynamic budget visualization webpage is a better option of exploration and it is beneficial to Malaysians as it helps the citizen in seeing a clearer picture of the distributions of their money. Furthermore, it is handy to understand the government future financial planning for Malaysia in an interactive way. This algorithm can be reusable to visualize any other financial data in hierarchy structure.

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CHAPTER 1

INTRODUCTION

This chapter provides the background and rationale for the study. It highlights the issues and problems that led to objectives of this study. Besides, this chapter also gives details of the significance of data visualization, before ends with a summary.

1.1 Background of Study

Data visualization, in general, is a graphical representation of data in the form of a diagram, chart and so on. The main advantage of data visualization is not that it makes data increasingly beautiful, yet it gives insight into complex data to users by the use of information graphics with a specific end goal to help them effortlessly comprehend and break down information, which generally may be difficult to grasp (Friendly, 2009). This is critical since conveying complex data in a simple and viable way is important to visualized data.

It is always hard for experts to interpret a large amount of abstract and difficult to understand data. Billions of data are often being generated and collected each minute. Without an approach to compose and present the needed and important data, these data would totally be useless. In order to convey data live to people with the aim so that they can explore it and utilize it, it has to be pictured well so that it can be understood better (Saltin, 2012) and literally enable them to take smarter actions and make better a decision.

Visualization is exceptionally useful when trying to extract and represent vital information from a major amount of data. It is compelling to use graphics instead of text to easily discover unknown facts and trends from a huge amount of data. Another major reason to use data visualization is in some cases, there is excessively information to work with and visualizing that