Abstract

This paper proposes improving Hajj and Umrah services by benefiting from the development of the exploratory data visualization technology. We will describe the updated idea of data visualization, its difference from the normal explanatory figures and how it is needed as a current effective exploration decision making solution using the huge amount of data (big data) gathered from all agencies serving Hajj and Umrah. The data visualization approach proves the concept by presenting some real exploratory global practical examples. We apply the technique to visualize some real data from 2015 Hajj season representing the numbers of people and services as well as accommodation of pilgrims in Makkah during the peak Hajj days. We also give a simplified theoretical example to illustrate the concept linking between pilgrims of different nationalities and their residence in Makkah beside the grand mosque (Al-Masjid Al-Haram). We show another exploratory data visualization example relating a virtual map of Mina (a 4-days Hajj living area) to improve civil defense system services providing the various civil defense stations with its specialized most probable needed equipments and number of employees.

Full text is available in Arabic section under title الاستفادة من التمثيل المرئي للبيانات لتحسين خدمات الحج والعمرة