

Business Intelligence Dashboard Solutions for Improving Decision Making Process: A Focus on Prostate Cancer

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Abstract : Background: Decision-making processes are nowadays driven by data, data analytics and Business Intelligence (BI). BI as a software platform can provide a wide variety of capabilities such as organization memory, information integration, insight creation and presentation capabilities. Visualizing data through dashboards is one of the BI solutions (for a variety of areas) which helps managers in the decision making processes to expose the most informative information at a glance. In the healthcare domain to date, dashboard presentations are more frequently used to track performance related metrics and less frequently used to monitor those quality parameters which relate directly to patient outcomes. Providing effective and timely care for patients and improving the health outcome are highly dependent on presenting and visualizing data and information. Objective: In this research, the focus is on the presentation capabilities of BI to design a dashboard for prostate cancer (PC) data that allows better decision making for the patients, the hospital and the healthcare system related to a cancer dataset. The aim of this research is to customize a retrospective PC dataset in a dashboard interface to give a better understanding of data in the categories (risk factors, treatment approaches, disease control and side effects) which matter most to patients as well as other stakeholders. By presenting the outcome in the dashboard we address one of the major targets of a value-based health care (VBHC) delivery model which is measuring the value and presenting the outcome to different actors in HC industry (such as patients and doctors) for a better decision making. Method: For visualizing the stored data to users, three interactive dashboards based on the PC dataset have been developed (using the Tableau Software) to provide better views to the risk factors, treatment approaches, and side effects. Results: Many benefits derived from interactive graphs and tables in dashboards which helped to easily visualize and see the patients at risk, better understanding the relationship between patient's status after treatment and their initial status before treatment, or to choose better decision about treatments with fewer side effects regarding patient status and etc. Conclusions: Building a well-designed and informative dashboard is related to three important factors including; the users, goals and the data types. Dashboard's hierarchies, drilling, and graphical features can guide doctors to better navigate through information. The features of the interactive PC dashboard not only let doctors ask specific questions and filter the results based on the key performance indicators (KPI) such as: Gleason Grade, Patient's Age and Status, but may also help patients to better understand different treatment outcomes, such as side effects during the time, and have an active role in their treatment decisions. Currently, we are extending the results to the real-time interactive dashboard that users (either patients and doctors) can easily explore the data by choosing preferred attribute and data to make better near real-time decisions.

Keywords : business intelligence, dashboard, decision making, healthcare, prostate cancer, value-based healthcare

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