

## Impact of Cognitive Biases on Managerial Decision-Making Using 2D and 3D Dashboards

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### Abstract

Business analytics environment is characterized by excessively large volumes of visually presented data and complex conditions of uncertainty. Human-computer interaction (HCI) opens up extensive possibilities for comprehensive big data analysis, modelling various scenarios and identifying possible patterns for business analytics. At the same time, HCI during the creation and analysis of visual data is accompanied by cognitive biases, due to increased cognitive load and a focus on the most attractive objects. In this study, only the anchoring effect and the framing effect were considered, since they are more likely to lead to overestimation of certain visual information in business dashboards and ignoring others. The study identified which visual and structural design elements contribute to these biases in 2D and 3D business dashboards. It has been shown that the interaction between these effects is more pronounced and difficult to correct in 3D than in 2D dashboards. We suggested the debiasing-framework for the decision-making in business analytics, that can be applied to analyzing the impact of strategies for reducing cognitive biases in analytics' perception of visualized data.

**Keywords:** cognitive biases, business dashboard, debiasing, decision-making, business analytic

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