


# The Effect of Individual Analytical Orientation and Capabilities on Decision Quality and Regret

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## ABSTRACT

Decision makers are exposed to an increasing amount of information. Algorithms can help people make better data-driven decisions. Previous research has focused on both companies' orientation towards analytics use and the required skills of individual decision makers. However, each individual can make either analytically based or intuitive decisions. The authors investigated the characteristics that influence the likelihood of making analytical decisions, focusing on both analytical orientation and capabilities of individuals. They conducted a survey using 462 business students as proxies for decision makers and used partial least squares path modeling to show that analytical capabilities and analytical orientation influence each other and affect analytical decision-making, thereby impacting decision quality and decision regret. The findings suggest that when implementing business analytics solutions, companies should focus on the development not only of technological capabilities and individuals' skills but also of individuals' analytical orientation.

## KEYWORDS

Analytical Orientation, Business Analytics, Decision-Making, Structural Equation Modeling, Tools and Technique Capabilities

## INTRODUCTION

Effective analysis and utilization of big data is a key factor for success in many business and service domains (Shukla & Mathur, 2020). In a context of scarce resources and profound change in customer needs, companies and individuals are faced with an abundance of decision possibilities (Kreuzer, Röglinger, & Rupprecht, 2020). Recommendation engines, filtering systems, prioritization and personalization algorithms have been tried to help individuals make better decisions and reduce their indecisiveness. Business analytics (BA) are increasingly being adopted in practice and emerging as an urgent challenge to improve personal and company performance, as evidence-based decision-making seems both desirable and rational (Beer, 2017; Holsapple, Lee-Post, & Pakath, 2014; Power, Cyphert, & Roth, 2019). Companies want to become more data-driven, specifically by taking advantage of real-time BA (Ain, Vaia, DeLone, & Waheed, 2019; Beer, 2017). BA provide a framework to exploit

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the synergies among fields such as data mining, quantitative methods, operations research, decision support system in a more practical format (Acharjya, Mitra, & Roy, 2019).

The interest of both academics and executives in investigating decision-making processes is longstanding (Ireland & Miller, 2004). The decision-making process needs to be better understood for organizations to create value from the use of BA (Sharma, Mithas, & Kankanhalli, 2014). The skillful use of BA by individual employees along with a culture of data-driven decision-making has the potential to radically improve companies' performance (Frisk & Bannister, 2017). The rise of smart manufacturing, the core idea behind the fourth industrial revolution (Industry 4.0), is generating more and more data that requires analysis. Recent advancements of several information technologies and manufacturing technologies, such as Internet of Things (IoT), big data, artificial intelligent (AI), cloud computing, cyber-physical systems, digital twins, among others, have leveraged the development and use of business analytics capabilities and an orientation to make decisions based on such data by individuals and organizations (Dhamija, Bedi, & Gupta, 2020; Jagatheesaperumal, Rahouti, Ahmad, Al-Fuqaha, & Guizani, 2021; My, 2021; Rowlands & Milligan, 2021; Sahu, Sahu, & Sahu, 2020).

Information is recognized to play a key role by enhancing and providing insights to improve decision-makers' performance (Tang & Liao, 2021). There are two main ways for an individual to process information, one being considered intuitive, natural, automatic and experiential and the other logical-conceptual, analytical-rational, explicit, systematic and intentional. Analytical orientation is characterized by an individual's thinking that is oriented by data, reason and logical connections. The experiential or intuitive orientation, in turn, can be characterized as more holistic, experiential, dissociative, oriented to immediate actions and emotional (Epstein, Pacini, Denes-Raj, & Heier, 1996; Tversky & Kahneman, 1983). Some of the past research argued that much of cognition occurs automatically outside of consciousness and in the realm of intuition (Agor, 1986; Sadler-Smith & Shefy, 2004).

Rational behavior has a central place in decision-making theory and practice (Papadakis & Barwise, 1997). Despite the existence of several seminal studies on rationality in decision-making processes (Dean & Sharfman, 1993; Eisenhardt & Zbaracki, 1992; Simon, 1979), the relationship between rationality and decision performance needs more clarification (Božič & Dimovski, 2019). Further, analysis in Ain et al. (2019) showed that human factors have largely been ignored in BA studies, which are mainly limited to either organizational or information systems-related factors. The research has not sufficiently covered all relevant levels of analysis, as there is a dearth of research on effective BA use (Trieu, 2017). Moreover, no studies have directly addressed the effects of analytical orientation and analytical capabilities on both decision quality and regret about a decision. In summary, there is no consolidated knowledge yet about the BA value creation process (Božič & Dimovski, 2019).

The aim of this paper is to empirically investigate analytical capabilities and analytical orientation as components of analytical decision-making (using an analytical approach) by individuals. We also investigate whether such decision-making has positive effects on the quality of decisions made by individuals as well as on the reduction of decision regret. We use a sample of 462 business administration students to test our proposed model.

The paper is divided into six sections, including this introduction. The second section presents the theoretical framework, which exposes the associations between analytical capabilities, analytical orientation, decision regret and decision quality. The hypotheses are presented in the third section of the manuscript, and the research method follows in the fourth section. The fifth section presents the results, followed by the research limitations and further research topics.

## **THEORETICAL FRAMEWORK**

BA is defined as the use of data to make sounder, more evidence-based business decisions enabled by IT-based tools (e.g., data warehouses, online analytical processing [OLAP] and statistical, visualization and data mining tools) (Seddon, Constantinidis, Tamm, & Dod, 2017). BA is a holistic approach

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