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### The role of data in decision making: Why quality data matters

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#### Abstract

The purpose of this research paper was to discuss the role of data in decision-making and why it matters. A systematic literature review of the role of data in decision-making was adopted. The authors searched peer-reviewed journal articles and professional journals published from 2003 to 2021. The

study focused on the quality dimension, verifying the quality, and misleading data. The results from this study point to data attributes or factors to consider for quality decision-making. The study can guide analysts, leaders, and managers on what data to use for quality decision-making.

**Keywords:** Role of Data, Decision Making, Quality, Data Matters, Quality Dimension, Verify the Quality, Misleading Data

#### Introduction

The capability to make effective decisions is essential to an organization's existence in today's tumultuous business arena. The word data has been misconstrued in many circles. Some people even use it interchangeably with information. Data may be viewed as an observation that is captured, recorded, stored, retrieved, and represented in a defined way. It is a basic fact or input. In some populations, the mention of data brings into mind mobile data, which is the currency that enables communication or part of the smartphone system that allows connectivity with other nodes through the internet. However, there should be no ambiguity associated with the term data. A collection of data forms information that brings meaning to an observed phenomenon. When the pieces of data are put together, we have information that carries some meaning. For example, first name = Mark, last name = Sage, age = 25 years could be put together as Mark Sage is 25 years old, which makes it more meaningful than just age = 25 years. However, in the event that we fail to capture, for example, the age or name correctly or deliberately alter it, we are bound to have issues with the credibility of the information at hand. The question then becomes, does the data accurately represent the object/phenomenon, and for that matter, can any valid/useful decision be made about the object?

Conceptual Theory of Data-driven Decision-Making

#### Literature review and search strategy

The purpose of conducting this systematic review was to discuss the role of data in decision-making; why quality data matters. We reviewed literature on quality data, quality dimension, verifying the quality, and misleading data. Additionally, to achieve this end, we used major databases: Social Science Research Network, Google Scholar, Business Complete, EBSCOhost, ProQuest, and Emerald. We also sourced the Interdisciplinary Journal of Contemporary Research in Business, Journal of Organizational Behavior, International Journal of Management, International Business Management Journal, Academy of Management Journal, and Journal of Management Development. For search terms, we used quality data, quality dimension, verify the quality, misleading data and limited the search to peer-reviewed journal articles and professional journals published from 2003 to 2021.

According to Olson (2003) <sup>[5]</sup>, there has not been much done about data quality. In the past, data had been collected in both formal and informal ways; however, in modern times and with the advancement in computing and technology, the quantity of data collected on a daily basis greatly supersedes that of the past. It is unbelievable how much data is collected over the web every split second. However, there is not much said about data quality in the literature. The issue of quality dimensions is reviewed in this paper.

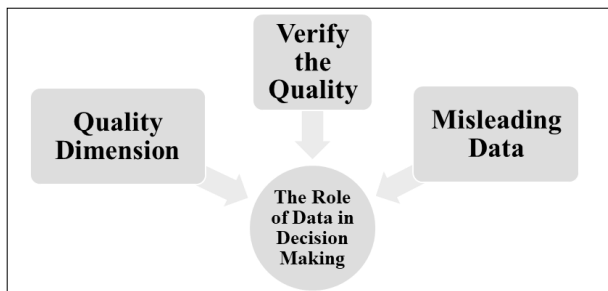


Fig 1

### Quality Dimension

Makela and Hoff (2019) <sup>[4]</sup> wrote that there should be enough evidence to demonstrate that data collected from the Internet has been systematic, well documented, and reasonably represents the target population. It must accurately capture/represent the demographics. Mahanti (2019) <sup>[3]</sup> opines that accuracy alone does not give a holistic view of the quality of data. However, even though it may not all be required, other data dimensions related to the context, situation, and mission must be taken into consideration as they present attributes which when analyzed, would present a thorough picture.

Among the quality, dimensions are completeness, timeliness, readability, consistency, integrity, uniqueness, precision, accessibility, relevance, reliability, and security (Mahanti, 2019; Williams & Herman, 2020) <sup>[3, 8]</sup>. Completeness refers to the entirety of data, meaning the ratio of the collection to what ought to be collected. Timelines, on the other hand, refer to the period of data and the degree to which it is current and relevant. Readability refers to the ease with which data can be appreciated and trusted. Consistency is the extent to which data remains unaltered even in multiple tables. Integrity is the extent to which data can be authenticated against an accepted standard/model.

Uniqueness is the degree to which data is captured only once without any form of recurrence. Precision is the degree to which the attributes are closer to the granularity of the data or to each other. Accessibility refers to the ease with which data can be acquired/retrieved. Relevance is the degree to which the attribute of the data adequately relates to the purpose/circumstance. Reliability is the degree to which data can be depended on to generate the right information. While security may be viewed as the degree to, which only authorized users can have access to data.

### Verify the Quality

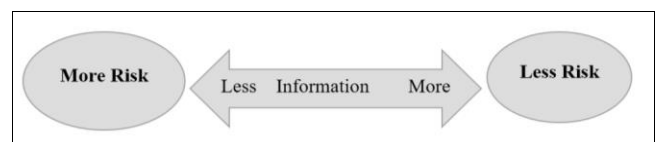
How often have you bothered about the data quality? Some researchers and industry professionals assume their data is quality without checking for the dimensions or without properly scrutinizing the data. Subsequently, poor decisions or judgments are made. Data that is inadequate, inaccurate, or does not meet the relevant dimensions can lead to a wrong decision and failure in achieving any desired goal(s). For example, in recent times, we often find many retail/grocery stores will ask for phone numbers and zip codes at the checkout. In most cases, the intent is to collect data and make a decision about what people are buying so that they will ensure that they cater to their needs.

Some businesses even give out store cards that enable the customer to get discounts any time the store has sales going on. In exchange for the card, the customer will have to fill a

form or give out some personal data such as name, cell phone, and email address. The stores use these data to track purchases and adopt strategies to lure the customer into making repeated purchases. The question is what if the cell phone number or email address provided has some missing characters or is not correct. Any personalized adverts created and targeted at or sent to the customer may never get to him or her. In that case, the targeted sales may never be met. Quality data is essential for making strategic decisions that can enhance competitive advantage.

In the United States of America 2016 Presidential election, almost all the pollsters got their predictions wrong. Hillary Clinton was projected to win both the electoral and popular votes in the 2016 presidential election. However, to the amazement of many, Donald Trump emerged as the winner of the electoral votes. He had 304 electoral votes, while Hillary had 232 electoral votes (Schmidt & Andrews, 2019). So, what went wrong? According to Barnes (2016), participants in the polls did not accurately represent the population. He further suggested that pollsters might have faced an increasing challenge in getting people to participate.

Using and analyzing data that does not accurately represent the population or does not fall in line with the appropriate data dimensions is bound to give false representation and to create errors in decision making, leading to false judgment (s) that will be misleading. It is just like collecting data from a group a population to make a decision about a product. Care must be taken to avoid any biases; however, if the population is not carefully focused, then there are bound to be issues with the data collected, which when analyzed can present a picture that is misleading. According to Pride, Hughes, and Kapoor (2014) <sup>[6]</sup> when quantity of available information is high, leaders and managers tend make superior decisions. On the other hand, when amount of information is low, there is high risk of making a poor discussion. See figure 2 below.



Sources: Pride, W. M., Hughes, R. J., & Kapoor, J. R. (2014) <sup>[6]</sup>. *Foundations of business*. Cengage Learning.

Fig 2

### Misleading Data

Misleading data will lead to a disingenuous conclusion. It will impede scientific progress or lead to erroneous actions that could eventually harm the company in so many ways, such as an increase in the cost of operation or damage the reputation of the researcher (Olson, 2003) <sup>[5]</sup>. According to Hooper (2021) <sup>[2]</sup>, Dr. Birx, who was the Trump Whitehouse Corona Virus response coordinator, revealed that the President had been issue alternative (parallel) data set by another person unknown to her on the pandemic, which created some degree of doubts and confusion in decision-making.

Decisions that were made apparently were based on analyzing alternative data set, which did not represent the true picture of the situation. According to her, the graphs used by the President did not look the same as what she had submitted. She stated that on numerous occasions, she

thought about resigning as she realized that her reputation was on the line. It is, therefore, clear how decisions made from misleading data contributed to a high Covid-19 death toll in the United States of America.

### Methodology

This study used a systematic literature review method and the research question guided this review was: What is the role of data in decision-making and why it matters? The paper focused on the quality data, quality dimension, verify the quality, misleading data. The author reviewed papers and articles concerned quality data, quality dimension, and misleading data. The authors limited the search to peer-reviewed journal articles and professional journals published from 2003 to 2021.

### Findings

All the literature reviewed during this study collectively underscored data completion, timely collection of data, readability of data, data consistency, data integrity, uniqueness of data, data precision, accessibility of data, and reliance on data as essential factors to consider when capturing and analyzing data for quality decision making. Data must be viewed holistically.

### Conclusion and practical implications

Data devoid of quality can be very misleading. It serves no purpose and has the potential to spell disaster. It, therefore, calls for ensuring that quality forms the focus in the data we collect to analyze and make decisions. Many businesses/organizations have failed many times and have been far from attaining their long and short-term goals because of decisions made with poor quality data. Some leaders, including politicians, have been disappointed because of data that tend to misinform.

In the 21st competitive landscape, the right decisions always guarantee a competitive edge. Managers can only help their businesses to be successful and lead the market when they are able to identify trends and make accurate projections. What it means is that to make good decisions we must be furnished with quality data. Extraction, transfer, and loading of data must carefully consider the relevant quality dimensions. That calls for a strict data quality assurance program that will guarantee quality data. Smart and strategic business decisions, including political decisions, are only possible with quality data.

The findings in this study point to data attributes or factors to consider for quality decision-making. The study can guide analysts and leaders/managers about what data to use for quality decision-making.

### Limitations

This research paper has several limitations. First, the study was limited by the fact that it used a systematic review of literature methodology. Second, the study covered publications published over the last 18 years from 2003 to 2021. Third, the study focused on the role of data in decision-making. The limitations mentioned might simultaneously open several opportunities that yield fruitful insights but have not been addressed or spoken by this study and have been neglected by previous studies.

### Future research

While the quality data guarantees quality decision-making, data quality encompasses more than ensuring the quality of the data. We propose future studies to focus on how people are managed and trained to handle the process, the technology, and the standards used.

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