A Comparative examination of predictive and prescriptive statistics

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Abstract

In order to generate commercial value, business analytics attempts to empower organisations to make decisions more quickly, better, and intelligently. Descriptive and predictive analytics are currently the main areas of study in both the academic and industrial worlds. However, prescriptive analytics, which looks for the optimum future course of action, has been gaining more and more attention from researchers. Prescriptive analytics is frequently viewed as the next stage in developing data analytics maturity and enabling better decision-making in advance for enhancing business performance. It clarifies the prescriptive analytics study area, synthesises the literature review to identify the current research problems, and suggests areas for future research. This paper explores the existing literature relating to prescriptive analytics and popular methods for its application.

Keywords: Analytics, Prescriptive analytics, Predictive, Business Improvement, Big Data

Introduction

Big Data basically refers to extremely large amounts of data that can't be processed effectively with traditional database management methods. Big Data is the term used to describe the volume of data that is too large for current technologies to effectively store, manage, or process. Only thorough assessments of the data, clear

processing requirements, and the capabilities of the tools used to analyse it can reveal the constraints. The analytical choice is seen as crucial in an increasingly data-driven business environment because of the amount of the data. Executives with little analytical experience make a poor decision, which paves the path for automated analytics and superior judgment. Each time a new type of storage medium is created, the amount of data available increases. Since a large amount of data is unstructured text or image, The majority of previous research has focused on organizing unstructured data. The idea behind big data analytics is to increase the productivity, efficiency, and profitability of established businesses. Prescriptive analytics forces users to suggest potential outcomes in order to find a better solution or give better advice. Before making any decisions, this makes an effort to list the potential decisions. This analytics not only makes predictions about what will happen, but also explains why and how the problem exists. It then offers potential recommendations based on the actions and makes better predictions. Multiple future projections are made using this analytics, which forces the business to plan for the worst-case scenario. Algorithms, business rules, computational modeling, and machine learning approaches are all included in prescriptive analytics, which integrates both the tools and the techniques. These methods are used on a variety of datasets, including big data and real-time data as well as historical and real-time transactional data. Despite the fact that it might have many benefits, it is quite difficult to administrate, hence businesses often avoid it. But applying it to business results in smarter choices that benefit the company's bottom line. Prescriptive analytics is utilized in major businesses to successfully optimize production, inventories, and scheduling, and it produces superior products for improving the customer experience. The greatest level of analytics today is prescriptive analytics, which makes decisions about how to improve businesses through predictive and descriptive analytics. Prescriptive analytics helps consumers choose the best option out of several options and provides the best solution to the problem. Prescriptive analytics offers the best solution to the issue, in contrast to descriptive and predictive approaches. The operational research paradigm is the foundation of prescriptive analytics in this case and may be used across a wide range of businesses to achieve the best results. The analytical choice has been a difficult effort and is divided into three categories. It is no longer considered to be a superior option to the other analytics because the three analytical options are seen as complementary to one another. The robust analytics encompass descriptive analytics, predictive analytics, and prescriptive analytics in order to offer a comprehensive perspective of the business market and to compete with the business market. In this case, the description uses data mining and aggregation tasks to produce findings based on historical values. The responses are forecasted using statistics and based on future values in the predictive model. Prescriptive analytics employs optimization algorithms to determine what actions need to be

taken in order to provide better results in the future. Better guidance is given by prescriptive analytics on the prospects for better results.

Prescriptive analytics

A mathematical method known as prescriptive analytics is one that computes a set of highly valuable actions or judgments. The various objectives, restrictions, and requirements that enhance the performance of a specific sector are used to inform the judgments. Prescriptive analytics use mathematical models that combine hybrid data and rule with the use of models, rules, and data. Big Data, operational research, decision support systems, and optimization are just a few of the many sectors for which it provides solutions.

Requirement Prescriptive analytics views advice as being applied as a model or set of rules over a design, and they are independent of programming design because the idea is applied over the model, which is simpler to implement than a programming language. When the reflective information attribute is altered, the design of the system is also altered, allowing for the addition or deletion of system components as well as interaction between the necessary components. The English language is important, although the language itself is not important, see.

The importance of prescriptive elements

Prescriptive analytics can be demonstrated in many different ways, such as: 1. to start, the analytics are created by a developer in a way that they may be used over non-functional upgrades, which makes the design process simpler. 2. Prescriptive analytics is regarded as general guidance that aids in changing the design from a global standpoint. According to the necessary application, this forces the developer to match with the right libraries. 3. Grouping the objectives that support prescriptive analytics as a general idea is done as part of the implementation. 4. Prescriptive analytics' characteristics that support global adjustments and that adopt design changes based on new designs and can be applied over them round out the list. By doing this, bugs are reduced and modifications are made where they are needed. Similar to this, it is possible to apply various pieces of advice repeatedly while checking the program's dependability and schedule ability. This facilitates the realization of various design options and alterations to the design.

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One method for structuring the Big Data elements is prescriptive analytics. Utilizing optimization, prescriptive analytics finds the alternatives needed to maximize or decrease the goal function. The main areas where

analytics are applied are in operations, business, finance, and marking. The greatest pricing and marketing strategies are applied in each strategy to boost income, which includes keeping the most cash in ATMs and controlling risk with the best retirement investment plans. Review of viewpoint analytics applications.

Provisioning of data in streaming networks

Nechifor et al. presented an ongoing study in the CityPulse project that takes a fresh look at how autonomous networking and stream-based prescriptive analytics are combined to address difficulties specific to dynamic city concerns. His study offered an aim of obtaining the likely function of prescriptive analytics within the autonomous loop with a distinct emphasis on analytical processes. The selection of the appropriate stream provisions to be employed on various city services was found to provide problems.

Investigation and creation

A prescriptive analytics model called InSciTe advising was developed by Song et al. to advise researchers on their future research plans and directions. The model examines thousands of various types of information sources, including books, reports, news, periodicals, data from collective intelligence, and more. It includes two key elements from both descriptive and prescriptive analysis. If a research scholar is given, descriptive analysis offers solutions based on the research and past history of the specified research scholar's activities. Prescriptive analysis presents a group of role model researchers along with strategies for becoming these researchers. The analytical results and their description of the specific research researcher are automatically prepared and saved as a report.

Conclusion

Researchers and practitioners alike are interested in the developing field of business analytics. Numerous research projects attempt to contribute to the field of business analytics as a result of the increased availability of vast volumes of data within enterprises, allowing organizations to get insightful knowledge about their performance. In this work, we reviewed the prescriptive analytics literature, assessed the findings, pinpointed the knowledge gaps, and provided research proposals for future studies. Prescriptive analytics is an essential development in analytics, according to our review. By assisting analysts in getting closer to connecting results to specific scenarios, it can enhance decision-making and process effectiveness. Prescriptive analytics now seems to have gained popularity in a relatively small number of application domains.

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