

Predictive Analytics in Use

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Abstract:

In the real world integrating predictive analytics with information systems can generate good results. Predictive analytics include empirical methods (statistical and other) that generate data predictions as well as methods for assessing predictive power. Predictive analytics not only assist in creating practically useful models, they also play an important role alongside explanatory modeling in theory building and theory testing.

Keywords: Data Analytics, Predictive analytics, Business Intelligence.

I. INTRODUCTION

Predictive Analytics is a term that describes using the past data to develop informed guesses about future outcomes. Many marketing companies have used their predictive analytical skills to predict the demand for their products or services, personalize their content and increase conversion[1].

More and more organizations are turning to predictive analytics to increase their bottom line and competitive advantage. The main reason is

- Growing volumes and types of data, and more interest in using data to produce valuable insights.
- Faster, cheaper computers.
- Easier-to-use software.
- Tougher economic conditions and a need for competitive differentiation.

As the interactive and easy-to-use software are becoming more prevalent, predictive analytics is no longer just the domain of mathematicians and statisticians. Business analysts and line-of-business experts are using these technologies as well.

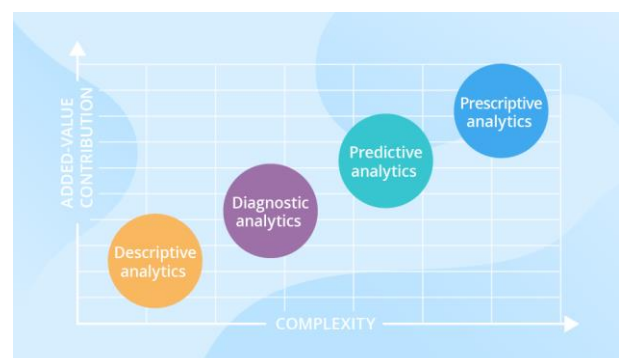
II.INTRODUCTION TO ANALYTICS TYPES

Analytics is the scientific process of discovering and communicating the meaningful patterns which can be found in data.

It is concerned with turning raw data into insight for making better decisions. Analytics relies on the application of statistics, computer programming, and operations research in order to quantify and gain insight to the meanings of data. It is especially useful in areas which record a lot of data or information.

Types of data analytics

There are 4 different types of analytics[7]



i. Descriptive analytics

Descriptive analytics answers the question of what happened. Let us bring an example from Science Soft's practice: having analyzed monthly revenue and income per product group, and the total quantity of metal parts produced per month, a manufacturer was able to answer a series of 'what happened' questions and decide on focus product categories.

Descriptive analytics juggles raw data from multiple data sources to give valuable insights into the past. However, these findings simply signal that something is wrong or right, without explaining why.

ii. Diagnostic analytics

At this stage, historical data can be measured against other data to answer the question of *why something happened*. For example, you can check Science Soft's BI demo to see how a retailer can drill the sales and gross profit down to categories to find out why they missed their net profit target.

Diagnostic analytics gives in-depth insights into a particular problem. At the same time, a company should have detailed information at their disposal, otherwise, data collection may turn out to be individual for every issue and time-co

iii. Predictive analytics

Predictive analytics tells what is likely to happen. It uses the findings of descriptive and diagnostic analytics to detect clusters and exceptions, and to predict future trends, which makes it a valuable tool for forecasting.

iv. Prescriptive analytics

The purpose of prescriptive analytics is to literally prescribe what action to take to eliminate a future problem or take full advantage of a promising trend.

Prescriptive analytics uses advanced tools and technologies, like machine learning, business rules and algorithms, which makes it sophisticated to

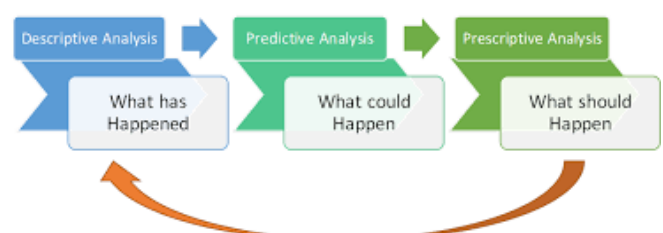
implement and manage. Besides, this state-of-the-art type of data analytics requires not only historical internal data but also external information due to the nature of algorithms it's based on.



III. PREDICTIVE ANALYTICS AND ITS ADVANTAGES

Predictive analytics belongs to advanced analytics types and brings many advantages like sophisticated analysis based on machine or deep learning and proactive approach that predictions enable. However, our data consultants state it clearly: forecasting is just an estimate, the accuracy of which highly depends on data quality and stability of the situation, so it requires careful treatment and continuous optimization[3].

Predictive analytics is a category of data analytics aimed at making predictions about future outcomes based on historical data and analytics techniques such as statistical modeling and machine learning. The science of predictive analytics can generate future insights with a significant degree of precision. With the help of sophisticated predictive analytics tools and models, any organization can now use past and current data to reliably forecast trends and behaviors milliseconds, days, or years into the future.



Predictive analytics draws its power from a wide range of methods and technologies, including big data, data mining, statistical modeling, machine learning and assorted mathematical processes. Organizations use predictive analytics to sift through current and historical data to detect trends and forecast events and conditions that should occur at a specific time, based on supplied parameters.

Predictive Analytics offers a unique opportunity to identify future trends and allows organizations to act upon them. As organizations are increasingly turning to predictive analytics to improve decision making, it's important to ensure that real impact is

achieved.

IV. USES OF PREDICTIVE ANALYTICS

Top use cases for predictive analytics across different industry verticals[4].

- **Energy & Utilities:** The importance of predictive analytics in the energy sector is hardly a secret. It is used to predict the demand and supply of electrical energy through the power grids. By using complex models to study the plant availability, impact of changing weather pattern and other such factors, the energy industry can save valuable resources.
- **Banking and Financial Services:** Banks and other financial institutions are deploying predictive analytics to ensure that their clients can enjoy a superlative experience that is secure and user-friendly. Such models can customize products and services based on the clients' profile, identify opportunities for cross-selling and detect frauds among other benefits.
- **Manufacturing:** By combining the benefits of business analytics with predictive analytics techniques, the manufacturing industry can streamline all their multiple processes right from the supply chain management to the distribution and improve their quality of service[6].



Predictive analytics is increasingly being used in many industries and how important it is as follows[8]:

- **Optimize Marketing Productivity:** Using their predictive analytical skills, marketers can foresee the trends and outliers to take better decisions. They are empowered to identify prospective customers who are likely to buy or have the highest propensity to buy their products or services. This can further provide the marketers with an advantage of optimizing their campaigns and generating better returns on investments.
- **Gain a Competitive Advantage:** Companies can make their way to the top by using predictive analytical skills to develop intent-based personalization. By creating effective predictive models based on the company's strengths and competitor's weaknesses, you can innovate and outshine your competitors.
- **Understand Your Customers Better:** With a reliable predictive analytics model in place, your company would be able to analyze all the structured as well as the unstructured data and predict customer expectations. Be it the geographic and demographic data or the specific inputs of the prospective customers from their social media, it would be possible for you to identify customers who can convert and get more business for you[10].
- **Identify Areas of Attrition:** Using your predictive analytical skills, you can forecast the next

probable action of your customers and win back the lost customers. You can identify the reasons why your earlier customers switched to your competitors and model out others who are planning to exit. Since you know this at a very initial stage, you can invest your time in planning strategies aimed at these customers to retain them and build long-term relationships.

- **Identify New Revenue Opportunities:** Predictive models can obtain rare insights related to the customers. Companies can analyze the buying patterns of their customers and link them with promotional offers and discounts to create new revenue sources. Using an identity management system, you can collect valuable data on your customers like their location, IP address, number of logins and the timestamp of their logins, all of which will help you to figure out user behavior and boost your revenue.

V. COMMON MISCONCEPTIONS OF PREDICTIVE ANALYTICS

A common misconception is that predictive analytics and machine learning are the same things. At its core, predictive analytics includes a series of statistical techniques (including machine learning, predictive modelling, and data mining) and uses statistics (both historical and current) to estimate, or predict, future outcomes[2]. Predictive analytics help us to understand possible future occurrences by analyzing the past. Whereas machine learning, on the other hand, is a subfield of computer science that, as per the 1959 definition by Arthur Samuel—an American pioneer in the field of computer gaming and artificial intelligence which gives "computers the ability to learn without being explicitly programmed."

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