

# Application of Business Analysis in Sports Business

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## ABSTRACT

As two emerging professions, business analysis and sports business have a more than close cooperation. Regarding as a profession that maximizes profits through the analysis of big data, business analytics has created tremendous commercial benefits for the sports business. The primary purpose of this paper is to present the different types of application of business analysis in sports business, analyze the significance of business analytics for sports business, and forecast the future trend of sports business through business analytics.

**Keywords:** *Business analytics, sports business, sports big data, future trend of sports business, commercial value*

## 1. INTRODUCTION

Sports business refers to the organic integration of sports and related economic activities as a specific industry from the perspective of production and management. In recent years, under the management of commercial corporations, the sports industry, which has the powerful capacity to appeal to audiences due to its charm of pumping people's adrenalin, has become one of the most commercially valuable entertainment activities. The sky-high worth of famous sports stars, the massive commercial benefits of a top sporting event, and the vast profits from sports derivatives reflect the unparalleled commercial value of sports business. In many developed countries, sports business has become relatively mature. For instance, the sports industry is even worth more than \$100 billion in the United States and tens of billions of euros in most developed European countries.

In fact, apart from the constant progress of the economy and sport itself, the primary reason of sports business being so successful is its application of business analytics, which utilizes big data and statistics to create value through decision optimization. In the Internet era, data is the most valuable resource. Almost all industries are adopting big data, and sports business is also closely related to it. Continued advances in data capture, storage, and analytics are positively impacting all aspects of the sports business.

In business analytics, the most crucial part is to build models and algorithms. Different models and algorithms conduct their jobs respectively to show the way forward for the business and yield the optimal benefits for producers. A primary objective of business analysis is to utilize data-driven decision making to optimize revenue generation in different aspects, such as ticket sales and corporate partnerships.

## 2. APPLICATION OF BUSINESS ANALYTICS TO SPORTS BUSINESS

### 2.1. Application of Business Analytics to Market Development

One area of sports business research remains at the elusive center of how exactly to quantify respectable return on investment (ROI), including corporate sponsorship. Industry studies show that "about a third to a half of U.S. companies" do not have a system to comprehensively measure ROI. Many companies are still unable to quantify the impact of these expenditures effectively. Although sports sponsorship often involves substantial financial investments, sponsors often fail to come up with a viable way to measure the ROI of these investments [1]. It is also costly in another way. In fact, executives who can use analytical models to implement a comprehensive approach to measuring the impact of their sponsorship can increase their returns by up to 30%. To effectively manage sponsorship spending, advertisers must first identify a clear sponsorship strategy, including the overall goal of their portfolio, the target audience, and which stage of the consumer's decision-making journey the sponsorship can support [2]. Under the existing descriptive model, the predictive model can use the data to predict the attendance and revenue of future games, the potential return of sponsors, and even the effect of the team's marketing strategy. Specific analytical techniques include:

(1) Regression Analysis, which studies the dependency between dependent variables and independent variables and is a benchmark for predictive analysis.

(2) Artificial Neural Networks (ANN) is a nonlinear statistical data modeling adaptive system built by simulating the structure and function of biological neural networks. Under the prescribed learning rules, the team can complete the recognition pattern, make predictions, and learn independently. The specific application is to help

the team complete the visual recognition and speech recognition of fans.

(3) Decision Trees consist of a decision diagram and possible outcomes, including resources, costs, and risks, to create a plan for reaching the target—specific applications such as competition risk management and sponsorship income assessment.

(4) Support vector machine (SVM) is a supervised learning method that can be widely used in statistical classification and regression analysis.

In early 2000, the NBA has set up a new coalition TMBO independent consulting department (Team Marketing & Business Operation), designed to help alliance and team development market, optimizing operation, while the department does not directly make business decisions. However, the league and team business decision-making process play a vital role similar to the “think tank”. In recent years, TMBO has used data analytics to play a critical role in league and team decisions on ticket pricing, sponsor negotiations, and even venue food and drink pricing.

Business analytics can also correctly manage customer relationships and fan engagement. A good example is the customer relationship management (CRM) system developed by sports organizations to create fan profiles and build ticket sales strategies. The CRM data warehouse functions as a centralized, integrated database that provides information related to customer demographics in addition to customer ticket, merchandise, food, and beverage purchase patterns. The organization can then analyze this data and develop customized messages for specific ticket holders. For example, a sports club could mine CRM data to determine that a particular season ticket holder would typically buy crisps and cola at the same kiosk at the end of the first quarter of each family football game. The analysis team also has access to customer background information, such as the date of birth of each season-ticket holder. Armed with this data, they can wait for a team representative at the concession stand at the end of the first quarter at a football game, which is closest to the ticket holder’s birthday to provide a personalized thank them for their free snack for the entire family [3].

## ***2.2. Application of Business Analytics to Consumer Evaluation***

By mining and analyzing the patterns and correlations of the data, the team can be helped to identify and classify different consumer groups and understand their group characteristics and consumption habits. Specific analytical techniques used include:

(1) Clustering Analysis aggregates similar objects to summarize their differences and similarities. In this case, it needs to be distinguished from Discrimination Analysis. Clustering is a process of combining each category of similar consumers into a clustering process. Discrimination is to analyze the group to obtain classification rules when a series of quantitative variable values reflecting the group

characteristics of consumers re-known.

(2) Anomaly Detection searches the data set for items that do not match the expected patterns or behaviors, such as fan complaints or complaints, abnormal consumption behavior.

(3) Association Rule Learning finds the correlation between different records in the database, such as ticket price and income of fans, fanaticism, and education.

(4) Principal Component Analysis (PCA) is to analyze and simplify the data set by reducing the dimension of the data set, so as to effectively discover the connection between variables and protect the variable features that make the most considerable difference contribution in the data set.

(5) Affinity Grouping: grouping consumers according to their spending habits and other characteristics to identify groups that can use the same market strategy. For example, season ticket holders with annual revenue of more than \$100,000 maybe more concerned with the promotion of team car sponsors.

An effective data management system will enable companies to organize, standardize, centralize, integrate, and streamline collected data. In this way, organizations can quickly mine data and create analytical models that transform raw data into real, actionable insights. For example, a sports team can use statistical software such as SAS to identify all first-year season ticket holders who bought the cheapest tickets, lived 40 miles away from the track, and spent no more than two months watching the games individually. Teams may mark these season-ticket holder accounts as “most likely not to renew”, which will directly impact the renewal priority strategy of the team sales and service representative responsible for renewing the season-ticket account. The move will significantly boost the teams’ ability to make the most money from ticket sales.

## ***2.3. Application of Business Analytics to Decisions Making***

The use of the decision model is based on the first two models. The descriptive model based on historical data enables team managers to find anomalies, patterns, and correlations. The predictive model helps the strategist to predict possible outcomes. By contrast, the decision model in order to give actions and strategic recommendations based on the prediction and the results associated with each decision may be involved.

To simplify the expression with an example, through the analysis of historical data, the team found that several different consumer groups had resistance to the pricing of hot dogs in the stadium (the price was too high, or the product quality was not ideal), which affected the sales volume. By introducing a regression analysis of various variables related to hot dogs, the decision tree predicts consumers’ expectations of hot dogs and the profit margins of products. Nevertheless, these conclusions are not enough, and the team also needs a decision-making model to effectively identify the different impacts of different hot

dog pricing and product improvement strategies and find the best solution. Meanwhile, the decision-making model also broadens the space of the database to a certain extent, including integrating the unstructured data (fans' comments, voice, pictures, videos) into the analysis, filtering, and converting them into sufficient data for reference. Specific analytical techniques of decision-making model include:

(1) Predictive Analysis (PA) is the most valuable Predictive data Analysis method, which can predict consumers' future behavior and thus identify risks and opportunities.

(2) Optimization Analysis is the algorithmic process of optimizing product/market strategies to meet expectations such as ROI, attendance, and spectator experience.

Sports business organizations can use analytics to inform ticket inventory and pricing decision making processes. Most sports teams focus on a combination of "maximizing attendance" and "optimizing revenue". In addition to understanding the significance of "customer lifetime value", the team also focuses on creating customer value such as fan events. The ticket demand model combines direct feedback from customers to help sports organizations develop ticket pricing strategies and customize ticket promotions to attract more potential consumers.

Social media and digital marketing analysis measuring the value of social media marketing campaigns have become a significant concern across the industry. Sports organizations try to analyze impression-based metrics such as page views, or the number of Twitter "followers", and attention-based metrics to determine the overall effectiveness of social media marketing campaigns. Bob Bowman, a sports business leader, says corporate sponsors are "increasingly understanding that a more nuanced and sophisticated experience on social media leads to better results". For instance, the time spent watching video content and related comments on a website may be more reliable than merely "liking" a Facebook post or visiting a website. Similarly, visual analysis of photos of sports teams or corporate partners that consumers post on Twitter may provide more insight into the influence of a team or sponsor's brand than basic retweets and consumers' use of tags [4].

### 3. DISCUSSION

Based on the above article, business analytics has been applied to every aspect of the sports business. From consumer evaluation to find suitable sponsors, it has become an indispensable link in the development of sports business. At present, sports business analysis is booming, and various technologies are gradually maturing. Nevertheless, there are some personal prospects for future improvement in sports business analytics:

(1) Cost scope. Marketing executives should use data from internal sources or sponsors to estimate quarterly the cost of each contact—that is, the number of people exposed to sponsors through media such as television, radio, and print.

The calculations of reach should focus more on reaching the target population than on reaching the total

(2) The sense of independence of each reach. The study found that companies typically spend much money on sponsorship rights, but little on events: marketing campaigns that promote sponsorship. IEG's research from 2011 showed a significant difference: companies spending \$0.5 to \$1.6 on activation for every \$1 spent on sponsorship. For example, a football club spends 80% of its sponsorship budget on transfers and only 20% on activities. After analyzing their efforts, they found that increased activation led to a greater sense of independence and higher brand recall rates. With this in mind, the company shifted resources away from under-performing player transfers to increase its high-profile sponsorship campaign, increasing its independent profile by 15% [5].

(3) Long-term brand attributes. Sponsorship has the potential to go beyond short-term sales to build a brand image. Brand strength, which accounts for 60-80 percent of total sales, is critical to sustain long-term sales growth. A qualitative assessment or survey can help the company determine the brand identity of each sponsor. Analyzing these results can help marketers determine which sponsorships are best for them and can lead to long-term partnerships.

For the future of business analytics, the author firmly holds a perspective that "As analytics gains significant importance in cyber security, the requirement in the business analysis market will continue to soar". Efficient business analytics requires not only skillful workers but also the right and suitable technology and support for the organization's management. In addition, the demand for accurate data and skilled data scientist to manipulate data will considerably surge, and business will adopt tools with the capability of extracting insight from unstructured data [6].

### 4. CONCLUSION

To summarize, the digital economy is becoming the core driving force of economic development, and data elements are becoming the key factors to promote the development of the digital economy, running through every link of economic activities. Therefore, in the sports business, the proportion of data-driven business analysis should be increased to promote better economic development better. According to this paper, it can be known that the main purpose of sports business analysis is to transform raw data into information that enables sports business professionals to make strategic business decisions that promote a company's financial performance and a measurable and sustainable competitive advantage. The primary functions of business analysis are to develop markets, evaluate consumers, and make decisions by exploiting diverse models. Nevertheless, due to the fact that the theme of this paper, "sports business analysis" is a relatively brand new industry, as real-life examples and data sources are extremely scarce. Therefore, without the support of obvious statistical data, this paper will be slightly less

lively and authoritative. In this case, the author hopes that in the future, sports business can advance more promptly, and render data more transparent for all practitioners and the general public.

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