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Perspectives on the Sports Analytics Revolution: An Introduction to the Special Issue

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The sports industry has become increasingly reliant on data-driven decision-making. Coaches turn to on-field data metrics to optimize play calls and front offices use data analytics to prioritize player development. Contributing in large part to the popularization of the data analytics movement in sports is the book, *Moneyball*. Analytics has been around sports for decades, but *Moneyball* helped make it mainstream. The book by Michael Lewis tells a story about the use of data analytics in baseball. In the book, Lewis explains how Billy Beane, then the general manager (GM) of the Oakland A's, helped lead his team to the playoffs by adopting sabermetrics in order to construct a formula for building a winning roster with a low payroll budget. The book, *Mathletics*, written by Wayne Winston in 2009, a former professor of Decision Sciences at Indiana University, is another excellent book on sport analytics. Though it didn't result in a movie starring Brad Pitt, Winston's is a popular sports analytics textbook. His book explains how mathematical methods can be combined with a large dose of common sense to better evaluate players and game strategy in major sports.

Analytics has become commonplace in sports. Forbes (2022) projected the sports analytics market to grow from \$2.5 billion in 2021 to \$8.4 billion by 2026. The pandemic accelerated the drive of sports teams and organizations to build online solutions to efficiently store and access vast swaths of data. Thus, it is not surprising that today every major pro team has an analytics unit or staff. With the support of artificial intelligence and cloud-based technologies, teams and organizations have seamless access to data in the cloud which can provide actionable insights in real time. While we cannot accurately predict the exact future of the sports analytics market (i.e., trends and size), it seems obvious that teams and organizations will increasingly allocate a larger piece of the budgetary pie to data analytics and will also embrace various technologies in order to fully exploit the power of the data they amass. Consider the example of machine learning.

Machine learning is a method for analyzing extensive datasets. This approach to analyzing data is based on the idea that systems can learn from data, identify patterns, and make decisions with minimal

human intervention (Jordan & Mitchell, 2015). Though forecasting the sports outcomes using statistical analyses is not new, machine learning methods have recently become popular in predicting sport event outcomes (Wilkens, 2021). Machine learning is valuable to the study and advancement of sports analytics because it provides researchers with the capability to weigh and train complex nonlinear data more efficiently than traditional statistical analyses. However, though valuable, machine learning research is not without limitations. With machine learning there are still too many variables in place that can affect each outcome. Thus, machine learning algorithms are more suited for explanatory predictive modeling and classification with a large dataset and complex features as well as solving more applied problems rather than establishing the validity of the research hypotheses.

Another feature of contemporary analytics is that interdisciplinary perspectives are increasingly being used to better understand and apply analytics to various sport contexts. For instance, eSports analytics is a great example of how sports analytics research has expanded to a new emerging field. Dr. Maymin's (2021) study, 'Smart kills and worthless deaths: eSports analytics for League of Legends,' was recently published in the *Journal of Quantitative Analysis in Sports*. This study provides a useful framework for future esports research that integrates multiple analytical methods (e.g., large-scale cloud computing, machine learning, dynamic client hooks, etc.). Another notable study, one done by Baker et al. (2022), examined the phenomenon of emerging cryptographic assets on a blockchain technology called Non-Fungible Token (NFT). Baker et al. argued that NFT's recent popularity was due to a confluence of factors, including a lucrative market for cryptocurrency, popular culture trends, and repeated surges in speculative stock market movements. For example, NBA Top Shot represents a joint venture between NBA and Dapper Labs that is a blockchain-based platform that allows sports fan to trade NFTs of NBA video highlights. As of September 2021, NBA Top Shot had more than 1 million registered users, and reached a volume of nearly \$1 billion on the platform since its inception (Forbes, 2022). Top Shot's commercial success is a reflection to the enduring phenomenon of developing new ways for users/fans to interact with and use their digital collectables. Moving forward, more advanced analytics with software applications such as automated video analysis, 3D depth camera analysis to track every shot, and AI powered fan engagement data (i.e., what fans buy and when they buy) will emerge and evolve. Based on the rapid development of analytics technology and contemporary hiring trends that see pro teams creating numerous positions for analytics executives, analytics in sports is here to stay. Using analytics, sports teams and organizations will improve human resources practices and enhance their decision-making capabilities about their core product and services so that they can improve the fan experience and maximize revenue generation.

The goal of this special issue is to add to the academic literature on analytics by offering a diverse array of perspectives on the use of analytics and technology in sports. Sticking with the overall scope of the *Journal of Applied Sport Management*, the "think pieces" in this special issue are meant to be grounded in existing scholarship while allowing the invited authors a great deal of originality and flexibility to consider what may be coming next and how we, as sport professionals and scholars, can be prepared to meet the challenges and opportunities that are on the horizon.

The first and second papers in the special issue provides a critical perspective on the misuse of sports analytics and suggests how to properly adopt analytics in both academia and the industry side of sport management. In the first paper, Watanabe and Rewliak do not deny that analytics can yield important

contributions to the study and practice of sport. However, they also point out that if researchers undertake big data or complex analytics projects without knowing the principles of algorithms utilized, they will be unable to accurately reflect the results. With that in mind, the authors provide an excellent example of improper analytics applications from the Premier League. The relationships between progressive passes and assists had a statistically positive correlation, which implies that teams should hire defenders who pass progressively to increase the number of assists. Watanabe and Rewliak note that this is a bad recommendation because the decision is far more complex. This example supports their idea that establishing the desirable characteristics of an interest in sports should be the first step in building holistic analytical insight rather than prioritizing software and coding experiences.

The second paper by Morgan and Magnusen sparks discussion about the fallacies of the use of analytics in sports. The authors point out that the underlying functions served by analytics are not new and that analytics does not remove human input. With sports, teams have long used some sort of analytics to create a competitive advantage. Sport is not sacred ground that has never been touched by analysis. Thus, the novelty of analytics is simply the application of tools used in other quantitatively oriented disciplines. Further, sport analytics does not remove the human factor in decision-making. The data selected is not truly objective and the results of analysis are interpreted by humans. So, in closing, Morgan and Magnusen conclude that if the use of advanced analytics in sports offers desirable outcomes, such as preserving the health of athletes and increasing the enjoyment of sport consumption for consumers, the incorporation of analytics into sports should be encouraged rather than opposed.

The third paper from Troilo and Bouchet focuses on business analytics in professional sports organizations. Among their many points, the authors touch on four propositions to guide the current development of business analytics with professional sports teams. One area they address is monopoly power and debt financing. They explain how the high valuations of pro teams stimulate potential and current owners to increase their debt holdings, both to acquire and to operate teams. This encourages the owners to seek new revenue streams, which in turn leads to new offerings to fans and stakeholders after partnering with other firms. They also note that pro sports teams were early adopters of analytics for on-the-field usage so they should be willing to use analytics to drive revenue on the business side.

In the fourth paper, Naraine and Bradish explore iGaming and placing bets with mobile apps. With new legislation in the United States and Canada opening up iGaming for legal operation, the authors see opportunity for increased consumer activity on this front. This conceptual perspective provides an initial glimpse into the iGaming model, unpacking various stages of promotion and betting behaviors. The piece also explores areas where big data analytics could be examined in the context of iGaming, specifically customer acquisition costs, customer retention, and customer lifetime value.

The fifth paper by Kim addresses methodological challenges in recent virtual reality studies. Because VR is a relatively new instrument and valid implementation of VR can be challenging, Kim notes that researchers need to exercise caution when manipulating stimuli and measuring experimental conditions. Accordingly, Kim provides theoretical perspectives of affordance, immersion, and spatial presence that guide the manipulation of sport-related VR research.

Next, in the sixth paper, Baker explores economic impact in virtual stadiums. The rise of the Metaverse has resulted in the launching of a spate of virtual reality sports stadium initiatives. Virtual

stadiums offer a contrast to the ever-escalating costs of their physical counterparts and growing resistance to public subsidization for construction. Baker points out that long-established approaches estimating the economic and non-economic impact of physical stadiums require reconceptualization for stadiums built in virtual reality. Moving to digital-first sport also entails addressing a host of novel challenges including: how best to support social interactions between fans, design of truly immersive environments, personalizing spectator experiences, technology infrastructure and equitable access, licensing rights, integrity of the game, and cybersecurity. This paper seeks to spark continued interest in the expanding field of the Metaverse and how sport will function within this virtual realm.

The seventh paper from Wanless considers the impact of progressive analytic diffusions in both sport management research and education. She argues that sport management researchers and graduate sport management programs should focus more heavily on data-driven culture, data integration strategies, and analytics project management that are currently underexplored and underestimated areas within the sport management discipline. Wanless believes that dual degrees, such as a master's in business analytics combined with a master's in sports administration, will offer a competitive edge for sport management students.

Lastly, in the eighth paper, Ozkul and Duman discuss how sport analytics can relate to service quality from the lens of co-creation of value in spectator sports. Sport analytics are closely related to service quality because multi-perspective objectives and subjective data need to be collected and analyzed on a regular basis to maximize customer satisfaction. The authors discuss different data analytical approaches, including predictive analytics and cluster analysis. They conclude that monitoring sport service quality from different perspectives can provide valuable business intelligence and help sports administrators better adjust their decision-making to optimize overall game experience.

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