

Going All in on AI: Examining the Value Proposition of and Integration Challenges With One Branch of Artificial Intelligence in Sport Management

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The sport industry has become increasingly more complex with the expanse of digital technology such as fiber optic internet access, 5G wireless communication, and blockchain, just to name a few. These advancements have shifted the amount and variety of data produced and available for analysis by sport organizations. Yet, sport organization front offices remain well behind other industry segments (e.g., retail, communications) in regard to handling, processing, and analyzing the volume and variety of data to advance business objectives. In this brief, we introduce the notion of artificial intelligence (AI) to sport management. While AI, as a concept, has been discussed for more than 50 years, this article provides a definition and overview of its historical trajectory for sport managers. Concurrently, the article also identifies the value proposition for AI capability, notably the natural language processing across four customer-centered domains: 1) listening to the public narrative, 2) automating the sales process, 3) computerized consumer content, and 4) self-operating service. Integration challenges are also addressed for sport organizations as they seek to increase their digital competence, achieve competitive advantage through technical innovations, and ultimately become more efficient in a data-driven world.

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Introduction

There have been important revolutions in human kind, such as the agricultural and industrial waves, but the newest revolution, the data revolution, is poised to

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be the most significant (Kitchin, 2014). At no point in history has there been the volume, variety, and, consequently, the value of data being produced with velocity by organizations, customers, and other stakeholders (cf. Yan, Watanabe, Shapiro, Naraine, & Hull, 2019). Whether through simple transactions like purchases and sales, or more complex activities such as resource allocation and clickthrough rates, the modern enterprise has a wealth of data to parse, analyze, and reintegrate to advance and enhance the core business. With the simultaneous rise of the machine capability to evaluate this data, organizations are poised to gain tremendous value. What makes this particular revolution so unique and yet challenging is that much of the production, organization, and analysis of these data are often hidden from the purview of many internal managers, and exist in the organization's backend or "back of house." To add, many organizations lack the structure and appropriate communication channels to fully maximize data-driven insights (McKinsey, 2016). As such, this can result in a significant amount of tacit knowledge that is unlearned and unshared across organizations and industries.

Enter sport management. One of the younger, but nascent industries in business, sport has been one segment that has been reticent to change (Slack & Parent, 2006), specifically from a technological and digital standpoint. Indeed, despite the push for analytics and technological advancement for on-field activities, the business side of the field has tended to remain cautious, skeptical, and outright dismissive of new technologies until they have been proven elsewhere or whose benefits and return on investment (ROI) are glaringly obvious (e.g., Naraine & Parent, 2017). Much of the reason for this shrewd pessimism is the lack of resources available in sport organizations, notably those which are financial and human (e.g., Abeza, O'Reilly, & Seguin, 2019). However, this does not mean sport is not absolved from external environmental forces pushing technological innovation (Parent, Naraine, & Hoye, 2018). Specifically, highly constrained offices like sport organizations are poised to benefit greatly from these advancements. To that end, highlighting the positive outcomes of such digital activity such as utilizing social media conventions to enhance reach and relevance (e.g., Yan et al., 2019) or the use of apps to build fan loyalty (e.g., Kang, 2017), the sport industry will adopt new technology when the case is made in its favor. Recently, Naraine (2019b) presented a similar argument in his presentation of blockchain and its value proposition to the sport industry. In that work, blockchain technology was not only defined and explained, but was presented to showcase the benefits to the sport industry through adoption—increasing capacity, not draining it. With this precedent, it is imperative to continue to illuminate new technology and its value to sport management to reduce managerial skepticism and increase awareness about the benefits of new digital developments.

In connecting the preceding thoughts, there exists an opportunity to highlight key benefits of a specific digital advancement in light of the big data revolution:

artificial intelligence (AI). AI is predicated on identifying patterns and systems from large sets of data and processes using machines (Legg & Hunter, 2007). This concept is not new per se, but its involvement in the contemporary business landscape has been swift and pervasive. Yet, much confusions surrounds the AI movement, particularly from a sport management perspective, supporting the earlier notion of technological knowledge remaining closed-off in the backend, or absent altogether. To illuminate this confusion, consider the various branches of AI (see Figure 1). There are multiple operations for which AI can be utilized, and that could lead to significant confusion for sport executives and non-technical managers without a technological savvy background.

Thus, there is a need to reveal the opportunity that AI can present to the industry, given major sport stakeholders are beginning to invest in this technology and bring it to the forefront. For instance, AI-based companies like Minute produce real-time teasers from the “vision” and “natural language processing” (NLP) branch capabilities (Lemire, 2018), and are contributing to AI revolutionizing sport journalism (Galily, 2018). In addition, Amazon has been utilizing its

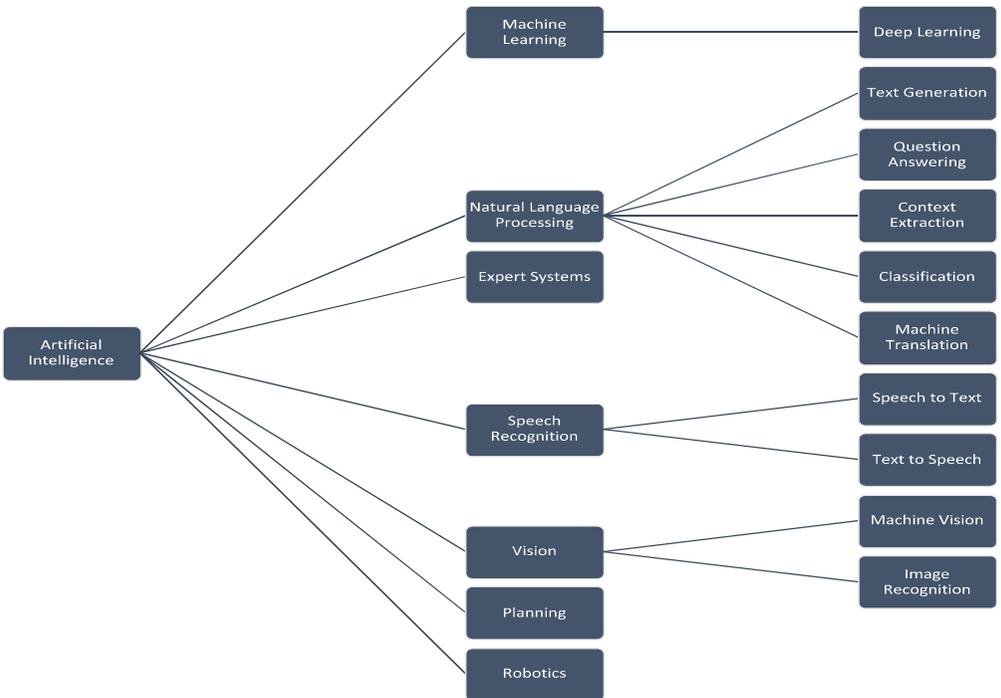


Figure 1. AI branches

(adapted from Pawar et al., 2019)

SageMaker (AI-based) service to enhance the broadcast experience with timely predictive statistics during Major League Baseball (MLB) and National Football League (NFL) games, adding value to traditional television broadcasts. But, these are just two small, albeit important, applications of AI and enhancing the business of sport. As such, in the remainder of this paper, we seek to achieve three primary functions: (1) define AI, (2) explore its value proposition to sport management, with a specific focus on one branch of AI—NLP—and its impact on the sport consumer, and (3) identify possible challenges to integrating AI into the existing sport enterprise. By achieving these functions, our goal is to provide an inspirational roadmap for sport managers to reconsider their technological strategies to incorporate AI and enjoy increased capacity it can provide.

What is AI and Why Now?

Defining AI is a challenge. Notable computer science scholar John McCarthy simply defined AI as “the science and engineering of making intelligent machines” (McCarthy, 2007, p. 1). However, this simplicity has led to myths and misnomers about the value of AI, particularly to industry (Winfield, 2020). One of the common myths about AI is that the technology eventually leads to a post-apocalyptic society where robots and cyborgs wreak havoc, similar to the Skynet system in the popular Hollywood franchise *Terminator* (Mach, 2019). The panic reflects the age-old pattern humans fall into regarding the projection of new technology capabilities: new technologies are associated with the potential to be magical, overestimated in the short term, and underestimated in the long run (Brooks, 2017). The internet serves as a prime example; at its inception, individuals were convinced that librarians would become extinct while not anticipating the internet would ever reside in a handheld device. As this has not been the case, it lends credence to the notion that AI may not also lead to a dystopian future. At its core, AI can be defined as a learning mechanism—machines identifying patterns and systems born from large data sets and ongoing processes. Learning the “best practice,” patterned behaviors allows the machine to predict or develop a roadmap, a guide to be followed repeatedly and with no need for human resources to try and ascertain said path or result (Legg & Hutter, 2007). In other words, AI is a problem-solving tool that finds solutions in dynamic, complex, and uncertain environments (Rosa & Feyereisl, 2016). While these two elements are critical benefits to the AI process, they simultaneously highlight the ability for AI to not necessarily be in a super, “robots take over the world” state. In other words, sport business professionals should not be reticent regarding AI because, in its current state, there is an opportunity to increase capacity by enabling human resources to focus their attention elsewhere.

But, why now? As Haenlein and Kaplan (2019) discussed, AI is not a new discovery. Its roots can be traced back to Alan Turing and the Second World War, with significant academic works penned in the 1950s. In fact, it was Turing (1950) who opined that by the end of the 20th century, computer machines would be able to find the answers to complex questions without human support. Since that timeframe, there have been important AI milestones that would confirm Turing's suspicions. For instance, famed computer giant IBM developed the "Deep Blue" system to defeat the reigning chess world champion, Garry Kasparov, and would provide the framework for "Watson," who competed and beat former *Jeopardy* standouts (Tredinnick, 2017). But, while these novel exercises in computing have been occurring, practical applications of weak AI have been undertaken to advance certain business objectives. For instance, financial services companies are able to use AI to forecast low on-site reserves for ATM machines, maximizing the deployment of staff to replenish machines and improving customer satisfaction vis-à-vis limiting out-of-order units, while also detecting fraudulent transactions in the online space (Islam, 2019). There has also been an increase in the use of AI to message and converse with publics; Pepsi Thailand has been using an AI chatbot through the Messenger online application to activate its summer music campaigns (Facebook, 2020). Indeed, the total number of firms deploying AI, among other digital tools, to solve business problems and become more efficient and profitable continues to grow (Kaplan & Haenlein, 2019a). As this trend creates a "best practice" of sorts in the business world, sport operations are inclined to follow suit. For instance, many sport properties did not heavily invest initially into the social space, but eventually conceded when the practice became normative throughout the industry (Naraine & Parent, 2017). Despite that, social outreach has become an important digital opportunity for business (Kaplan & Haenlein, 2010). This has also been the case in sport, where fans now engage with brands throughout their daily routines, indicative of the need for sport organizations to adopt and adjust their social operations in kind (Naraine, Wear, & Whitburn, 2019). Thus, there exists a precedent for the sport industry moving toward integrating digital tools when they have become *too* important not to integrate into the core business. Concomitantly, the breadth of AI has become clearer, and the key functions or branches of the technology have been illuminated (see Pawar et al., 2019, for more on AI branches). With this breadth of AI capabilities vis-à-vis its branches, and the growing positive shifts towards AI usage, the time is now for sport properties to adopt and adjust their business practices accordingly.

Value Proposition of AI in Sport Business: A Focus on Natural Language Processing

In the sport industry, there are multiple applications of AI, but we choose to focus our gaze on the key stakeholder for sport organizations, the customer, and one branch of AI, NLP. When computers can be trained to interpret and produce human language the “floodgates” open for a new kind of customer interaction and performance (Hirschberg & Manning, 2015). The rationale for this focus will not come as a surprise to many readers of this article. For one, more attention has been given to the idea of the sport user experience, and refining business practices through feedback to meet the needs of the consumer (Funk, 2017). However, sport brands are still decidedly concerned with developing unique and meaningful promotional campaigns and customer relationships given the competitive nature of sport and entertainment (Shilbury, Westerbeek, Quick, Funk, & Karg, 2014). Related, having increased knowledge about churn and purchase probability can impact organizational strategy and generate resource efficiencies (McDonald, Karg, & Leckie, 2014). Thus, while AI could be used in multiple facets of the sport business, deploying AI into these areas demonstrates the power and breadth of the technology. Here, we focus our attention on the NLP branch of AI, as it arguably is the most pertinent engagement piece connecting brands with consumers. NLP can be defined as computer-trained algorithms to recognize, interpret, and produce the human language (Manning & Schütze, 1999). To wit, NLP has four potential opportunities insofar as engaging consumers (see Table 1).

Table 1. NLP Capabilities to Support the Sport Consumer

Capability	Definition
Listening to the Public Narrative	Monitoring and qualifying consumer activity in the public narrative
Automating the Sales Process	Automated conversation to support the sales process from lead qualifying and targeting to reinitiating lapsed accounts
Computerized Customer Content	Computer-generated journalism and personalized consumer content
Self-Operating Service	Automated responses to customer issues in an array of outlets from social media to inbound requests

Listening to the Public Narrative

NLP opens the organization to a wide-reaching audience. With computers trained to recognize an organization’s name or product, for example, any mention of that name and the sentiment surrounding the mention can be identified and

recognized (Berger, Humphreys, Ludwig, Moe, Netzer, & Schweidel, 2020; Café, 2017). This allows sport organizations to cue in on customer voices in a way not possibly human-generated. Alan Ball, former NFL defensive back, saw a need to coach the financial well-being of college football players emerging on the professional sport scene (Lemire, 2019). When he partnered with DDIQ, a company that as one of its functions harnesses natural language processing to monitor web, social media, and public narrative mentions of financial advising companies in order to mitigate risk, budding professional athletes seeking financial advice benefited. Consequently, if any red flags existed about a financial advisor, DDIQ's comprehensive web monitoring would find it, and warn players of the dangers associated with the company. In one instance, DDIQ found a mention of dishonest practices on an investigative journalist's blog. The athlete considering this financial advisor moved to a different and more reputable company. What this example highlights are the listening capabilities associated with NLP, enabling companies to listen into the broad, public conversation, and assess consumer perceptions of new products, event experiences, and branding.

Automating the Sales Process

Automation throughout the sales process, from qualifying and targeting leads to reactivating dormant accounts, allows for an unprecedented efficiency for highly constrained sport organization sales offices. Initiating contact with potential leads in a traditional paradigm results in a time-consuming personalized email or an impersonal one-fits-all email from an entry-level salesperson. Computers trained to tailor content to the user can open the conversation with personalization and without the time-consuming nature of human effort required. For the Sacramento Kings, outsourcing part of their sales process to AI-driven company Conversica translated into increased engagement among consumers and increased efficiency for sales representatives (Conversica, 2020). The Sacramento Kings previously harnessed their analytics teams to identify the best leads so that the sales team could make contact. When the Kings employed Conversica, a chatbot initiated contact with all potential leads, parsed the best leads from the database, and suggested next steps for sales representatives to call, email, or text recently engaged customers.

Computerized Customer Content

When computers are trained to produce language, automated journalism, advertising, and promotions remove tedious tasks from the workday and frees personnel for other revenue-generating tasks. Sport enterprises constantly devise unique promotions to engage consumers, including hosting military appreciation, Star Wars, and bring-your-dog themed nights at professional sporting events. But,

once those promotional campaigns are initiated, they are often left uncontrolled and without ongoing virtual touchpoints to maximize engagement (Shilbury et al., 2014). The aforementioned summer music campaign by Pepsi is one such example of how AI can be used to engage with sport consumers in a promotional setting. In the case of Pepsi, the brand advocated both online and on-location that concert attendees follow them on their social media platforms, particularly Facebook, and initiate a conversation via the Messenger feature (Facebook, 2020). Once initiated, the brand's AI bot would send out questions to solicit demographic information about the user, but also provide information that the user could use to enter a contest for exclusive access and content. In essence, this AI bot served as a virtual game-show host, but with a friendly, one-on-one vibe. If the user did not engage with the chatbot after a certain period of time, the AI bot could also initiate a reminder to the user, stimulating feedback and engagement.

Here, while AI is powering another bot, its function and purpose slightly differs but affords another unique proposition to a sport organization looking to develop a new, engaging partnership with another brand, or simply looking to maximize its own campaigns. For instance, a sports team could deploy a bot to engage with consumers and task those consumers with answering certain questions related to the game in which the team was playing. In this sense, the brand does not need to constantly engage with the consumer, because the chatbot can do so in an automated fashion. Another example of computerized customer content is what the Associated Press has been producing with MLB. In 2016, the two entities worked together to develop automated game recaps for MLB games, reducing the need for dedicated sports journalists to attend games (Galily, 2018). In this capacity, the human workforce that would traditionally be required to produce content can be deployed elsewhere (e.g., more human-interest stories), while machines work to simplify the task of presenting recaps for fans.

Self-Operating Service

Automated customer service serves as a platform to respond faster to customer issues that consumers raise to the organization, but also that arise throughout the public narrative. Communicating with dissenting customers can be a challenge for businesses, in sport or otherwise. When a consumer is dissatisfied with a product, or receives inadequate service quality, taking steps to quell the dissent often requires significant time and human resources (Shilbury et al., 2014). Customer complaints often occur after the fact because the consumer still wants to receive some of the experience (especially in sport), or because the consumer needs time to reflect and gather his or her thoughts in a non-enraged state (or at least try). This could be anything from a lack of knowledgeable staff on duty, technological inconveniences, seat issues (e.g., duplicate tickets), or even

physical violence in the stands, among others (Lee & Hur, 2019). The traditional mechanism to rectify customer service issues has been predominantly face-to-face (by visiting a customer service kiosk in-stadium or a similar concierge setup), by phone, or even by e-mail (Shilbury et al., 2014). In fact, many sport brands now offer “contact us” forms on their webpages to consolidate feedback and customer service queries. However, this model still requires a human response to collate the messages and spend considerable time to read or listen to the complaint (which, for anyone who has complained before, knows consists of rambling and incoherence). One strategy that other businesses have begun to implement is using AI to develop “virtual” customer service resources to handle certain issues and get to the core of the dissent or dissatisfaction. One example of this is Rogers Communications in Canada. The telecommunications giant, which owns the Toronto Blue Jays and co-owns Maple Leaf Sports and Entertainment (MLSE), has been using AI to power its “chatbot,” an online customer service interface. The use of the chatbot, accessible by visiting the Rogers website, has resulted in a reduction in customer complaints by more than 50% (Islam, 2019). Part of the reason for this reduction is customers have the ability to ask questions and be directed to certain services or information repositories to answer their questions, without feeling dissatisfied and having to issue a complaint. While Rogers has not yet been using the chatbot for the Blue Jays or teams under the auspices of MLSE (i.e., Raptors, Maple Leafs, Toronto FC, and Argonauts), introducing AI-powered chatbots for sports brands is a proposition that can lead to greater consumer satisfaction. Even in situations where sport consumers complain about team transactions or win-loss performance, AI-powered chatbots can steer the conversation towards business operations issues and help re-focus the consumer’s concerns. Moreover, it is highly likely that a chatbot in sport contexts be implemented online, similar to Rogers. Given the limited use of in-venue technology by fans (Naraine, O’Reilly, Levallet, & Wanless, 2020), providing an online bot that fans can easily access using their smartphone, regardless of location, is likely to be most effective in sport.

Integration Challenges

The aforementioned four capabilities can certainly aid the business operations side of the sport industry, but there are challenges to integrating AI into the firm. First, while sport organizations tend to refrain from new innovations, we do know that adoption is possible (Naraine & Parent, 2017). However, that requires an idea “champion” within the organization (Hoeber & Hoeber, 2012). Champions are those enthusiasts who adamantly believe in its value to the business and do not waver in their support of the idea when there is pushback. AI champions are a significant element to the adoption of NLP products and services to aid the sport

business operation, but identifying those persons may pose a challenge for a variety of reasons (e.g., lack of understanding of the technology, fear of overstepping their role in the workplace). A second challenge beyond the organization identifying a champion is the absence of strategic direction. Sport organizations that pivot to a new technology without a structured plan are destined to experience ineffective or inefficient usage. For example, Naraine et al. (2020) opined one of the reasons for significantly low WiFi usage at professional basketball games is the absence of strong relationship marketing and gamification strategies, clarifying the added value beyond the basic service to the consumer. A similar sentiment applies here; if AI, specifically NLP, is to be adopted, practitioners need to be cognizant of the added value to the consumer and how NLP can forge an enhanced relationship with the consumer. A third challenge is sport organizations using AI to try and alleviate other deficiencies that exist within the organization. There are a host of challenges that sport organizations are currently experiencing such as their social presence (Naraine, 2019a; Naraine et al., 2019), and those digital tools may require further attention—particularly from a capacity standpoint (Abeza et al., 2019)—before new technology tools like AI are embraced.

Beyond these initial challenges, McKinsey (2016) suggests that AI adoption will mirror the timeline of analytics adopters. Specifically, training individuals in analytics and algorithms remains under-addressed, especially in sport management academic programs. For sport organizations that do not consider these integration challenges, there is the potential for AI (specifically NLP in the context of this treatise) to become an ineffective touchpoint to engage the consumer. Similar to how professional sport organizations have indicated they struggle with social media (Abeza et al., 2019), AI could become another technological adoption that is not used to its full extent and results in a net loss expenditure of resources and effort.

Conclusion

The purpose of this article was to define, explore, and discuss the challenges pertaining to AI in sport management. Those working on the business side of the sport industry should not be fearful of automating certain business functions, specifically those outlined by the NLP's capabilities for the sport consumer. As the many examples in this article highlight, AI offers a unique contribution to growing businesses and generating efficiencies. However, we have made a purposeful choice to showcase one aspect of AI for sport management, the capabilities for the sport consumer. There are other capabilities of AI that can assist business operations, including database management and recording keeping. This issue has been identified by Naraine (2019b) once before, and machine learning can certainly be useful to minimize that challenge. Moving forward, practitioners

should consider the points made in this article as well as other facets of AI that could be applicable to their firm, and scholars should consider how they can track and document AI integration in sport. Concurrently, the sport management academe must also consider the value of studying the NLP branch of AI further as it continues to impact the relationship between brands and consumers in sport. Notably, there are more teams in the NFL, MLB, and other sport leagues that are using AI technology, and that serves as an opportunity to investigate these developments, building relationships with digital consumers (e.g., Naraine, 2019a). Finally, scholars should also seek to look at other areas of AI. In this article, only the NLP was discussed, but the other components of AI have value too. Notably, scholars would do well to heed the information provided in this article and by other works (e.g., Galily, 2018; Pretorius & Parry, 2016) before engaging in further exploration to understand AI's true value to the sport industry.

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