

# Factors Affecting Leaders' Adoption of Innovation: The Case of Digital Ticketing in the High School Athletic Space

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In an environment where technologies continuously evolve, we must seek to understand how sport professionals evaluate innovation. The purpose of this study is to identify critical factors influencing sport organization leaders' decisions to adopt a technological innovation as the best strategy to gain efficiencies. We explore the factors influencing sport managers' evaluation of technological innovations—prior conditions (i.e., need identification and individual innovativeness), perceived characteristics of the technology (i.e., relative advantage, compatibility, complexity, trialability, and observability), and situational constructs (i.e., trust and cost)—and the effect they have on leaders' decisions to adopt or reject a given tool. The context of this study was high school athletic directors ( $N = 628$ ) and their decision to adopt or reject digital ticketing as the best course of action for securing revenue and serving their event attendees. From a theoretical perspective, we extend the conceptual model proposed by Rogers' (2003) diffusion of innovations theory to include situational constructs, which provide future explorations of technology adoption with the flexibility to account for specific complexities of the situation considered within a wide range of sport settings. From a managerial standpoint, the insights are valuable to companies and professionals developing and promoting innovative technologies.

Keywords: innovation, ticketing, technology adoption, diffusion of innovations theory

## Problem Framing

Innovation is a fundamental competency for any organization seeking to be more competitive and effective, and ultimately, to survive (Damanpour & Schneider,

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2006). Schwarz and Hunter (2018) highlight the importance of innovation, as it provides individuals and organizations the opportunity to transform and develop. The need for innovation is not only relevant to large sport organizations (Wolfe et al., 2006). In fact, small sport organizations have the need to develop innovative solutions to their challenges given their resource constraints (Burg et al., 2011). Digital innovation in sports refers to the application of technological advances to existing challenges faced by sport organizations (Chakraborty & Nag, 2018). Technological advances, such as digital reality, big data, live streaming, connected stadiums, artificial intelligence, and eSport, contribute to sport's reputation as the next digital innovation hub (Chakraborty & Nag, 2018). These advances present sport leaders with the questions of if and when they should adopt technological innovations.

Sport researchers have attempted to understand the adoption and implementation of innovative practices from various perspectives within sports. From an organizational viewpoint, previous research has considered the effects of organizational climate on predicting innovation in sports clubs (Escamilla-Fajardo et al., 2019), intricacies of innovation from the field of Sport for Development and Peace (Svensson & Cohen, 2020), intraorganizational conditions for social innovation (Svensson & Mahoney, 2020), and business analytics in professional sport organizations (Troilo et al., 2016). From a sport business professional's perspective, researchers have explored the individual innovativeness of sport manager candidates (Kurtipek & Gungor, 2019) and perceptions towards innovation by non-profit practitioners (Svensson et al., 2020). From a consumer's standpoint, studies have focused on sport consumption on smartphones (Chan-Olmsted, & Xiao, 2019), fan perceptions toward augmented reality in marketing (Goebert & Greenhalgh, 2020), and spectators' adoption of digital ticketing (Marquez et al., 2020). However, the bulk of the research on organizational leaders' decisions to adopt technological innovations has taken a qualitative approach; therefore, a quantitative exploration may complement the existing literature by yielding additional insight.

Innovation is an area of research mostly underexplored, as very few studies have been published in sport management journals (Girginov et al., 2015). Before examining the dispersal of technology adoption across a particular population, we must first conceptualize what is meant by innovation (Straub, 2009). An individual's or organization's perception that an idea, practice, or object is new may be termed innovation (Rogers, 2003). Emphasis is given to the perception of novelty application, not whether the idea, practice, or object is new (Straub, 2009). Technology adoption has received attention from researchers focusing on the service industry, particularly in the areas associated with tourism, such as airlines (e.g., López-Bonilla & López-Bonilla, 2015; Morosan, 2014; Smit et al.,

2018) and hotels (e.g., Ezzaouia & Bulchand-Gidumal, 2020; Lee, 2016; Ozturk & Hancer, 2014; Sun et al., 2020). However, most of these efforts have focused on the end-user, leaving a void in the literature associated with the managers' decision-making process when selecting whether to adopt technological innovations. One exception associated to sports includes the work by Winand and Anagnostopoulos (2017), who explored the disposition of staff to implement service innovation within non-profit sport organizations. They found that both volunteers and employees within these organizations showed positive attitudes toward innovation, which positively influenced the implementation of new ideas.

The purpose of this study is to identify critical factors influencing sport organization leaders' decisions to adopt a technological innovation as the best strategy to gain efficiencies. We seek to understand the process through which sport managers evaluate an innovation as the best course of action. The independent variables considered include (a) leaders' prior conditions (i.e., need identification and individual innovativeness), (b) perceived characteristics of the innovation (i.e., relative advantage, compatibility, complexity, trialability, and observability), and (c) situational constructs (i.e., trust and cost). Meanwhile, the dependent variable is the leaders' decisions to adopt or reject the technology.

As Kellison and Hong (2015) point out, "adoption represents just one element of the larger diffusion process" (p. 250). Diffusion refers to multiple adoptions of a specific innovation taking place (Straub, 2009). The present study is grounded in the diffusion of innovations theory (Rogers, 2003), which considers four distinct elements as part of the diffusion process—the innovation, communication channels, time, and social systems. Despite the use of the diffusion of innovations theory to examine cutting-edge practices across disciplines such as economics, sociology, technology management (Gopalakrishnan & Damanpour, 1997), interorganizational systems (Premkumar & Ramamurthy, 1995), engineering (Tornatzky & Klein, 1982), and sport management (Caza, 2000; Kellison & Hong, 2015; Loy, 1968; Newell & Swan, 1995; O'Brien & Slack, 2003, 2004), it has yet to be explored using quantitative methods within a sport context.

From a theoretical standpoint, we seek to extend previous literature by taking a quantitative approach, and modify the diffusion of innovations model presented by Rogers (2003) to include situational constructs. Given the particular scenario under which a given innovation adoption is being deliberated, the elements included can vary to account for the potential influencers of the managers' decisions to adopt technological innovations. Giving simultaneous consideration to leaders' prior conditions, perceived characteristics of the innovation, and situational constructs is also a novel method for this research line. In an environment where technologies are evolving by the minute, managerial insights may allow companies to develop new tools that target sporting organizations with

the essential features that such innovations must possess. Similarly, marketing companies looking to attract new adopters to a particular technology may gain valuable understanding to devise adequate marketing and sales strategies that address decision-making sport managers' primary concerns.

The setting chosen to undertake this investigation was the case of high school athletic directors and their decision to adopt or reject digital ticketing as the best course of action for securing revenue and serving their event attendees. Within the context of high school digital ticketing (i.e., the innovation), an athletic director's decision to offer this option to event attendees represents innovation adoption, while the embracing of such technology across high schools nationwide represents diffusion. Digital ticketing is an increasingly common feature at professional and collegiate sporting events; however, the adoption of this technology is less common within interscholastic sports (Marquez et al., 2020). Marquez et al. explored factors affecting spectators' digital ticketing usage when attending high school athletic events, but the reality is that if athletic directors do not choose to adopt the technology in the first place, this decision will not reach the attendees. It is worth noting that more than 1,000 high schools nationwide provided spectators with the option to purchase tickets digitally during the 2017–18 school year (Karkaria, 2017). The study conducted by Marquez and colleagues (2020) gave insight to athletic directors who were considering the adoption of such technology, highlighting that close to 90% of the study participants used digital ticketing when attending other sporting events (e.g., collegiate and professional), and the majority would be inclined to use the technology when attending high school athletic events, if given the chance. The current work explores the decision-making process of leaders within sport organizations tasked with adopting or discarding the use of new technologies, and consequently will provide valuable insights to those stakeholders developing, marketing, and selling such technologies.

## Theoretical Framework

Notwithstanding the potential advantages gained from innovation, many sport organizations remain reluctant to adopt new technologies (Smith & Stewart, 2010; Trabal, 2008). The sport industry in general has been characterized as lagging behind other industries regarding the quality of its technology products and its rate of adopting innovations (Blue, 2015). Previous research has found that beyond team performance (i.e., spectator sports' core product), the quality of services offered to fans impacts their overall satisfaction with any given event (Levallet, 2019). When determining the level of service quality, consumers assess personal goal realization, service delivery systems, and overall consumption experience (Ko & Pastore, 2004). Multiple studies have confirmed that high-

quality services can aid customer retainment while strengthening customer loyalty (e.g., Ko et al., 2008).

In an attempt to measure service quality, researchers have devised numerous scales. For example, Parasuraman et al. (1988) developed the SERVQUAL scale to measure the disparity between the consumer's expectations and actual performance from the service experienced. The five variables considered were tangibles, reliability, responsiveness, customer assurance, and empathy. Researchers have employed the SERVQUAL scale to measure industry-specific service quality. For example, Crompton et al. (1991) adapted the SERVQUAL scale to recreational sport settings and named the resulting instrument RECQUAL. Wright et al. (1992) did the same with SERVQUAL and RECQUAL to apply to student recreation centers. Howat et al. (1996) also adapted the SERVQUAL and RECQUAL scales to develop the Center for Environmental and Recreation Management-Customer Service Questionnaire (CERM-CSQ), identifying four dimensions of service quality: core services, staff quality, facilities, and secondary services. McDonald et al. (1995) adapted SERVQUAL to professional sporting events settings and developed TEAMQUAL.

Despite the investigation of service quality in various sport industry segments, these studies have primarily focused on identifying dimensions based on the end-users' evaluations and perceptions of event-related services. One such service element that is likely to affect spectators' experience when attending live sporting events is ticketing. In interscholastic sports, where traditional ticketing practices can result in long lines and reduce attendees' overall experience, athletic directors must give special consideration to technological innovations such as digital ticketing.

## Diffusion of Innovation

When considering the adoption of technology like digital ticketing, an individual's adoption of innovation has been considered a multi-step process. According to the diffusion of innovations theory (Rogers, 2003), the innovation-decision process refers to the stages through which an individual or decision-making team crosses from first learning about the innovation, to then forming an attitude toward it, to determining whether to adopt or reject, to implementing it, and finally confirming their decision. Rogers (2003) further explains that the decision to adopt an innovation is not an instantaneous act, but rather a series of actions and decisions that take place across time. To reduce uncertainty about the potential advantages and disadvantages of the innovation, these actions and decisions occur through the following stages: (a) knowledge (the initial exposure to the existence of the innovation, while gaining cognitive understanding over the functions of

the innovation); (b) persuasion (forming of a favorable or unfavorable affective attitude toward the new idea, as a result of an initial interest that escalates to actively searching for more details about the innovation); (c) decision (weighing the advantages and disadvantages and deciding between adoption and rejection of the innovation); (d) implementation (putting the innovation to use); and (e) confirmation (reinforcement or reversing of a previous decision to adopt or reject an innovation, depending on the messaging received).

### *Prior Conditions*

The initial stage of innovation-adoption consideration is defined by Rogers as prior conditions, which describe individual characteristics that may be determinant factors influencing decision makers' navigation through the aforementioned process. Among these prior conditions are the individuals' identification of a need or problem and their level of innovativeness.

**Need Identification.** Need identification refers to an individual's state of dissatisfaction or frustration as a result of desires outweighing actualities (Rogers, 2003). Rogers further explains that an individual may develop a need after learning that an innovation exists, which means that an innovation can lead to needs, or vice versa. In the case of interscholastic athletic directors, the perceptions that athletic departments' ticketing processes must improve may lead to the identification of a need for an innovative solution. In light of this possibility, we propose the following hypothesis:

H1: Identification of a need to improve the ticketing process will positively influence athletic directors' decisions to adopt digital ticketing.

**Innovativeness.** An individual's innovativeness, which constitutes part of the prior conditions (i.e., perceptions towards technology based on past experiences prior to interacting with the innovation under consideration), may influence the individual's evaluation of the specific characteristics of the innovation and, ultimately, its adoption (Vannatta & Banister, 2009). Therefore, it was included in our investigation. Considering the context of adoption of digital ticketing by high school athletic directors, we propose:

H2: The level of innovativeness of the athletic director will positively influence their decision to adopt digital ticketing.

### *Characteristics of the Innovation*

The diffusion of innovations theory emphasizes that the perceived characteristics of the innovation (i.e., relative advantage, compatibility, complexity, trialability, and observability) found in the persuasion stage are considered essential predictors of innovation adoption (Rogers, 2003; Waheed et al., 2015). Although

these stages are, theoretically speaking, presented sequentially, Rogers (2003) does clarify that influence among the different factors may be, practically speaking, multidirectional.

**Relative Advantage.** Relative advantage refers to the degree to which an individual perceives the innovation as an improvement from the status quo (Rogers, 2003; Waheed et al., 2015). The more an individual perceives the innovation as advantageous—superseding its predecessor—the higher the likelihood and rate of adoption (Ooi et al., 2011; Rogers, 2003). Associated with the adoption of mobile technologies, relative advantage of mobile commerce and mobile payment has been found to influence consumers' intentions to adopt (Chung, 2014; Duane et al., 2014). Therefore, high school athletic directors' perceptions that digital ticketing would represent an improvement over the use of traditional paper ticketing is likely to influence their decision to adopt the technology:

H3: Perceptions of relative advantage of digital ticketing over the alternative (i.e., paper ticketing) will positively influence athletic directors' decisions to adopt the technology.

**Compatibility.** Compatibility refers to the extent to which the innovation is perceived to be consistent with existing values, past experiences, and needs of potential adopters (Rogers, 2003). If an innovation is compatible with the needs and values of the individual or organization, the more likely that it will be adopted (Antón et al., 2013). An incompatible idea will not be adopted as rapidly as a compatible one (Chung, 2014). In this study, compatibility refers to the perception that the new technology is well-suited to satisfy the current needs of high school athletic directors, their staff, and spectators, as hypothesized in H4:

H4: Perceptions of compatibility between digital ticketing and the current needs of high school athletic departments will positively influence athletic directors' decisions to adopt the technology.

**Complexity.** Complexity denotes the degree to which an individual sees an innovation as comparatively easy or difficult to understand or use, with those innovations perceived to be on the stress-free side of the spectrum being adopted more rapidly than those that require adopters to develop new skills and understandings (Rogers, 2003; Waheed et al., 2015). The technological innovations that feature user-friendly features are likely to be perceived in a more positive light, increasing the likelihood of their adoption (Chung 2014). Complexity is a measure of an individual's perception of difficulty associated with operating, understanding, and learning about digital ticketing. Thus, we propose:

H5: Perceptions of complexity of digital ticketing will negatively influence athletic directors' adoption of the technology.

**Trialability.** Trialability refers to the degree to which an innovation may be tested (1) to remove uncertainty from those that learn by doing and (2) on a

limited basis prior to any commitment (Rogers, 2003; Waheed et al., 2015). Innovations that allow for trial periods attract more users and positively influence their adoption (Chung, 2014). Trialability refers to the athletic directors' beliefs that there is a possibility to test the technology before the adoption. In the context of digital ticketing, we expect the following:

H6: The trialability of digital ticketing will positively influence athletic directors' adoption of the technology.

**Observability.** Rogers (2003) describes observability as the degree to which the use and benefits of the innovation are visible to others, acting as a further stimulus to be adopted by others. The visibility of an innovation prompts individuals to both discuss it and build positive attitudes toward its use (Duan et al., 2010). Knowledge of the existence of an innovation may also generate stimulus for adoption (Rogers, 2003). Observability points to the degree to which the results of digital ticketing are observable by athletic directors (e.g., seeing the technology used at state championship events). Therefore, we anticipate:

H7: The observability of digital ticketing will positively influence athletic director' adoption of the technology.

### *Situational Constructs*

Understanding that the adoption of any given innovation will be influenced by the particular scenario under which it is being considered, we deemed it necessary to extend Rogers' diffusion of innovations model to include situational constructs. Given the scenario investigated, we included trust of digital ticketing and the cost associated with the adoption of the technology.

**Trust.** Digital ticketing is a financial and technological innovation. Thus, leaders must display trust toward the digital ticketing process, where a third party will manage not only the sensitive financial information from purchasers, but also the funds from purchases, which will then be transferred to the organization. Perceived trustworthiness has been included in past research measuring consumers' trust toward information presented by sport channels, websites, and apps (Carlson & O'Cass, 2012; Hur et al., 2012; Kim et al., 2017). The construct of trust is common in e-commerce research and includes aspects such as the trustworthiness of social media sites and privacy issues (e.g., Cheng et al., 2006; İkrām & Cem, 2016). In the context of sport ticketing, Marquez et al. (2020) measured the level of trust displayed by consumers when choosing whether to adopt the technology while attending interscholastic sporting events. This construct is now adapted to explore its effect on high school athletic directors deciding to implement digital ticketing, as expressed in the following hypothesis:

H8: Perceived trust toward digital ticketing will positively influence the decision to adopt.

**Cost.** The addition of an innovation may incur expenses (Kim & Ammeter, 2014). Early research considering the adoption of innovation considered the monetary cost (e.g., Tornatzky & Klein, 1982), while later studies considered cognitive efforts (e.g., Moore & Benbasat, 1991). Kim and Ammeter (2014) considered both dimensions of the construct, accounting for participants’ evaluation of the monetary expenses and cognitive efforts associated with the adoption of innovation systems, while extending the diffusion of innovation model. Previous research has considered the relationship between the costs associated with an innovation and its diffusion (e.g., Hong & Zhu, 2006). Therefore, the cost of an innovation—whether monetary or cognitive—is presumed to negatively affect the innovation’s adoption and implementation.

H9: Perceived costs associated with digital ticketing will negatively influence the decision to adopt the technology.

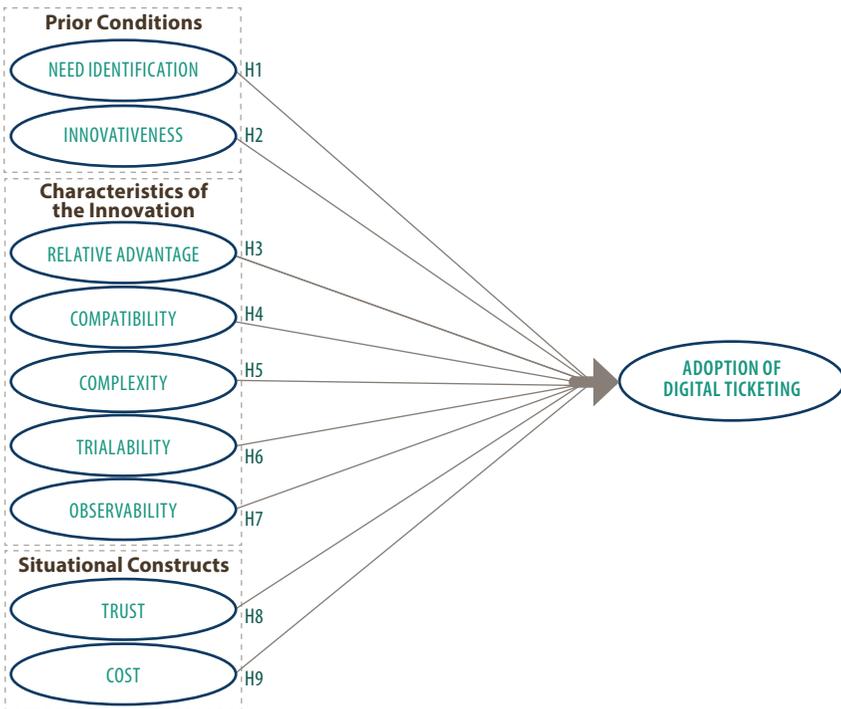


Figure 1. Factors influencing the adoption of innovation – digital ticketing.

## Method

To test our hypotheses, an original 35-item survey was electronically distributed using Qualtrics to 17,039 high school athletic directors across the US. This survey was designed to measure the influence of prior conditions, characteristics of the innovation, and situational constructs on their adoption of the innovation (i.e., digital ticketing). The participants ( $N = 628$ ; 3.7% response rate) represented athletic directors who reported charging spectators for admission and having been offered the opportunity to adopt digital ticketing to manage their athletic events.

The survey instrument was adapted from previously validated items. To assess prior conditions, need identification was measured using three items from Rogers (2003), and individuals' innovativeness was measured using three items from Vannatta and Banister (2009). Four characteristics of the innovation—relative advantage, compatibility, complexity, and trialability—were each measured using three items from Rogers (2003) and Waheed et al. (2015), while observability was measured using a binary variable. One situational construct, trust of digital ticketing, was measured using three items from Chung (2014) and İkrām and Cem (2016). The second situational construct, cost associated with the technology adoption, was measured using three items from Kim and Ammeter (2014). All items used a 7-point Likert scale, except for the binary variable used to measure observability. The dependent variable (i.e., adoption of digital ticketing) was assessed using a binary variable. Demographics included gender, age, and education level. Participants also reported their number of years of experience as a high school athletic director, smartphone usage, social media presence, and personal experience using digital ticketing when attending professional and/or collegiate sporting events.

SPSS Statistics 25 was used to run the analyses. We examined the survey, testing for discriminant validity; evaluating evidence of convergent validity; and calculating standardized path loadings, composite reliability (CR), Cronbach's alpha ( $\alpha$ ), and average variance extracted (AVE). Correlations between all constructs were also assessed. We also calculated descriptive statistics for demographic variables. To test the influence of prior conditions, characteristics of the innovation, and situational constructs on digital ticketing adoption by athletic directors during the 2019–20 school year, we used binary logistic regression (see Figure 1). The simultaneous consideration of these three stages of the innovation adoption process represents a novel approach to this research line.

## Results

On average, the athletic directors were 49.65 years old, men (80.1%), and possessed over 10 years of experience. About 71% reported personally using digital ticketing

when attending professional and/or collegiate sporting events. More than 72% of respondents reported they had been presented with the opportunity to use digital ticketing at their high school athletic events; however, only 17.2% (108=yes, 520=no) reported offering digital ticketing during the 2019–20 school year. As reported in Table 1, correlations between the independent variables were within recommended levels (i.e., < 0.85; Kline, 2005). The acceptable AVE value of 0.50 was also met for all constructs, ranging from 0.53 to 0.81. To test for multicollinearity issues, we used the AVE test for discriminant validity (Fornell & Larcker, 1981). Evidence of the measurement model's discriminant validity was found to be satisfactory, with the independent variables are distinctive from each other.

**Table 1. Correlation Among Variables**

Factors	1	2	3	4	5	6	7	8	9	10
1. Need	1									
2. Innovativeness	.24**	1								
3. Advantage	.61**	.26**	1							
4. Compatibility	.56**	.29**	.73**	1						
5. Complexity	-.22**	-.30**	-.29**	-.37**	1					
6. Trialability	.51**	.23**	.51**	.45**	-.12**	1				
7. Observability	.23**	.19**	.18**	.27**	.25**	.18**	1			
8. Trust	.50**	.34**	.62**	.57**	-.31**	.59**	.25**	1		
9. Cost	.03	-.02	-.03	-.16**	.44**	.01	-.16**	-.05	1	
10. Adoption	.35**	.13**	.36**	.41**	-.39**	.25**	.32**	.33**	-.28**	1

Note. \*\* Correlation is significant at the 0.01 level (2-tailed).

The psychometric properties of the scales were found to be within acceptable values. The Cronbach's alpha ( $\alpha$ ) coefficient for the variables considered ranged from 0.77 to 0.93, above the acceptable 0.70 standard suggested by Fornell and Larcker (1981). Items were also evaluated for reliability and convergent validity. When testing internal validity, factor loading levels for the individual items from each construct were between .67 and .95, which made them acceptable (i.e., > 0.50). Measures of CR were between 0.77 and 0.93 for all items, meeting the acceptable standard of 0.70 (Fornell & Larcker, 1981; see Table 2).

After confirming the acceptable psychometric levels of the scales, we proceeded to test the influence that the independent variables had on athletic

**Table 2. Independent Variables Considered**

<b>Constructs</b>	<b>α</b>	<b>CR</b>	<b>AVE</b>	<b>M</b>	<b>SD</b>	<b>β</b>
<i>NEED</i> (Rogers, 2003)	0.90	0.90	0.75	3.99	1.62	
In the past, I have felt the need to improve our ticketing experience for the spectators.				4.04	1.80	0.90
In the past, I have felt the need to improve our ticketing processes for our event day volunteers				4.04	1.79	0.89
In the past, I have felt the need to improve our ticketing processes in order to increase the accuracy of our bookkeeping.				3.89	1.76	0.80
<i>INNOVATIVENESS</i> (Vannatta & Banister, 2009)	0.90	0.91	0.77	5.25	1.26	
I am confident in trying to learn new technologies.				5.46	1.31	0.91
I feel comfortable about my ability to work with mobile technologies.				5.55	1.27	0.94
I am confident with my ability to troubleshoot when problems arise while using technology.				4.73	1.55	0.78
<i>RELATIVE ADVANTAGE</i> (Rogers, 2003; Waheed et al., 2015)	0.85	0.85	0.64	4.73	1.14	
Digital ticketing allows us to secure revenue in an efficient manner.				4.86	1.25	0.80
Digital ticketing improves the ticket purchasing experience for spectators.				4.59	1.35	0.84
Digital ticketing makes auditing processes more efficient.				4.74	1.28	0.77
<i>COMPATIBILITY</i> (Rogers, 2003; Waheed et al., 2015)	0.83	0.83	0.62	4.42	1.66	
Digital ticketing is compatible with our game-day staff skills.				4.27	1.41	0.83
Digital ticketing is compatible with spectators' technology expertise.				4.44	1.33	0.79
Digital ticketing is compatible with our bookkeeping needs.				4.55	1.31	0.75
<i>COMPLEXITY</i> (Rogers, 2003; Waheed et al., 2015)	0.86	0.87	0.68	3.86	1.05	
Digital ticketing is complex.				3.94	1.20	0.76
Interacting with digital ticketing would be unclear.				3.85	1.12	0.85
Managing a digital ticketing system would be difficult.				3.79	1.23	0.87
<i>TRIALABILITY</i> (Rogers, 2003; Waheed et al., 2015)	0.88	0.90	0.73	4.72	1.32	
Trying out digital ticketing without long term commitments is important to me.				4.50	1.61	0.72
Trying out digital ticketing at an event would give a better sense of its benefits.				4.82	1.37	0.93
Trying out digital ticketing would allow us to evaluate if it's what we need.				4.84	1.40	0.92
<i>TRUST</i> (Chung, 2014; İkrām & Cem, 2016)	0.93	0.93	0.81	5.00	1.15	
I believe digital ticketing is a safe way to secure funds from high school athletic event sales.				5.09	1.24	0.88
I trust digital ticketing to be a secure way to process payments from high school athletic event spectators.				5.04	1.23	0.95
I trust digital ticketing companies to process payments at high school athletic events.				4.89	1.23	0.88
<i>COST</i> (Kim & Ammeter, 2014)	0.77	0.77	0.53	4.83	1.08	
Offering digital ticketing to our spectators would result in added costs to the school.				4.45	1.52	0.70
Using digital ticketing would require the school to invest in hardware (e.g., scanners).				4.88	1.52	0.82
Using digital ticketing would require the school to invest time and resources to train the staff on how to use digital ticketing.				5.34	1.24	0.67

*Note.* Cronbach's alpha ( $\alpha$ ), Composite reliability (*CR*), Average variance extracted (*AVE*), Mean (*M*), Standard deviation (*SD*), and Factor loading ( $\beta$ ). Observability was measured using a binary variable.

director' decisions to adopt digital ticketing. The model was found to be statistically significant ( $p < .001$ ), with a Nagelkerke R-squared value of .503, and an overall predictability accuracy of 87.6% (see Table 3). As athletic directors identified the need to improve their ticketing processes, they were more likely to adopt the technology (Need:  $\beta = 0.458$ ,  $p < .001$ ). Therefore, H1 was confirmed. When participants viewed digital ticketing as complex, difficult, or unclear, they were less likely to adopt (Complexity:  $\beta = -.340$ ,  $p < .030$ ), also confirming H5. The findings also provide evidence that athletic directors were more likely to adopt digital ticketing when they saw it in action at high school events (Observability:  $\beta = 1.947$ ,  $p < .001$ ), confirming H7. Also, as expected, perceptions of added expenses were negatively associated with adoption (Cost:  $\beta = -.660$ ,  $p < .001$ ), confirming H9. All other constructs (i.e., innovativeness, relative advantage, compatibility, trialability, and trust) were non-significant, leading us to reject hypotheses 2, 3, 4, 6, and 8.

**Table 3. Logistic Regression Results**

Constructs	<i>B</i>	<i>S.E.</i>	$\chi^2$	<i>df</i>	<i>p</i>	<i>Exp(B)</i>
<i>NEED</i> (H1 - Accepted)	.458	.128	12.854	1	.000	1.581
<i>INNOVATIVENESS</i> (H2 - Rejected)	-.205	.144	2.023	1	.155	.815
<i>RELATIVE ADVANTAGE</i> (H3 - Rejected)	.277	.228	1.475	1	.225	1.319
<i>COMPATIBILITY</i> (H4 - Rejected)	.401	.214	3.496	1	.062	1.493
<i>COMPLEXITY</i> (H5 - Accepted)	-.340	.157	4.692	1	.030	.712
<i>TRIALABILITY</i> (H6 - Rejected)	.181	.144	1.578	1	.209	1.198
<i>OBSERVABILITY</i> (H7 - Accepted)	1.947	.433	20.182	1	.000	7.009
<i>TRUST</i> (H8 - Rejected)	.017	.198	.008	1	.931	1.017
<i>COST</i> (H9 - Accepted)	-.660	.155	18.252	1	.000	.517
Constant	-4.135	1.324	9.754	1	.002	.016

*Note.* *B* = Standardized Beta Coefficients, *S.E.* = Standard Error,  $\chi^2$  = Wald Log-Linear Chi-Square Test, *df* = Degrees of Freedom, *p* = Significance, *Exp(B)* = Exponentiation of *B* Coefficient. Dependent Variable is Adoption, Model  $p < .001$ , Nagelkerke  $R^2 = .503$ , and Predictability Accuracy = 87.6%.

## Discussion

Previous researchers found that leaders, through visionary behaviors, can effectively influence innovative interactions of employees in the sport industry (Eskiler et al., 2016). Leaders are in a position not only to decide what technologies are adopted but also to foster innovative environments. The present

work, grounded in the diffusion of innovations theory, sought to quantitatively test the model presented by Rogers (2003) while extending it to account for situational constructs. Through an innovative quantitative approach, the research takes simultaneous consideration of decision-makers' prior conditions (i.e., need identification and individual innovativeness), perceived characteristics of the innovation (i.e., relative advantage, compatibility, complexity, trialability, and observability), and situational constructs (i.e., trust and cost).

More specifically, this study provides insight into some of the factors affecting leaders' decisions to adopt an innovation—digital ticketing. Concerning the prior conditions, athletic directors' identification of the need to improve their ticketing processes positively influenced the likelihood that digital ticketing was adopted once it is made available to them. In other words, if athletic directors were unhappy with the performance of traditional processes (i.e., physical ticketing), they would be more likely to consider making the change to digital. However, the individuals' self-rated innovativeness did not have a direct influence on the outcome.

Regarding the characteristics of the innovation, athletic directors' perceptions of complexity toward digital ticketing harmed the decision to adopt the technology. Therefore, those leaders that felt that the transition would be too complicated for them and their staff were more likely to avoid the adoption of digital ticketing. Observability (i.e., the degree to which the technology was seen in action) positively influenced the adoption of digital ticketing. Those athletic directors that had the opportunity to see digital ticketing used at other high school athletic events, such as state championships or theater productions, were more open to adopting the technology. However, perceptions of relative advantage, compatibility, and trialability were non-significant factors in the athletic directors' decisions to implement digital ticketing. Finally, related to the situational constructs, perceptions that digital ticketing would result in added costs hurt its adoption. The trust of the technology to secure the funds from ticket sales did not significantly influence the decision.

## Theoretical Implications

While considering the context of digital ticketing adoption by high school athletic directors to serve their sporting event attendees, the present study extends innovation diffusion literature. From a theoretical perspective, we were able to test and further develop the conceptual model proposed by Rogers (2003). The constructs associated with the characteristics of the innovation, proposed by Rogers, were explored quantitatively by Waheed and colleagues (2015) while studying the adoption of ebooks by consumers. However, the application of a quantitative approach to evaluate the factors influencing sport leaders' decisions to adopt an innovation is a novel contribution to the sport management literature.

We deemed it necessary to extend the model proposed by Rogers to include situational constructs—in our case, trust and cost—which accounted for specific complexities of the situation considered. Future research grounded in the diffusion of innovations theory would benefit from including situational constructs in their explorations of technology adoption within a wide range of sport settings. Another contribution from our work involves the simultaneous consideration of prior conditions, characteristics of the innovation, and situational constructs, which had not been undertaken by previous research examining the adoption of technological innovations. This approach has allowed us to identify what elements are most relevant while accounting for all constructs in the model concurrently, strengthening our findings' value.

### **Managerial Implications**

From a managerial standpoint, the insights surrounding the decision-making process of sport managers tasked with deciding which technological advances to adopt or not will most likely be of value to companies and professionals developing and promoting such innovations. Understanding the most critical factors influencing managers' decisions surrounding technology adoption (i.e., complexity, need identification, observability, and cost) allows these stakeholders to narrow their efforts to incentivize adoption and diffusion of innovations.

Simplicity should be the top concern for those companies building new technologies or adapting existing ones to sports settings. Like many non-profit sport organization professionals, high school athletic directors have plenty to do with limited resources. The last thing managers want to do is invest enormous amounts of time learning and training their staff—many of whom are volunteers—on how to implement a new process. Therefore, these technological innovations must be intuitive to use and provide the least resistance from the user experience standpoint.

Given the magnitude of the undertaking, attempting to transition more than 10,000 high schools nationwide from traditional (i.e., paper) to digital ticketing, marketing and sales companies must narrow their efforts to maximize their impact. For example, companies could use this information to identify those high school athletic directors who consider their traditional ticketing processes to be in need of improvement (and thus, would be more likely to consider the adoption of digital ticketing).

Also, the knowledge that the ability to see the technological innovation in action positively affects adoption should encourage sellers to highlight such opportunities. Connecting athletic directors to colleagues at nearby high schools who have already adopted digital ticketing would allow for the coordination of

seeing the technology in action firsthand. Wemmer et al. (2016) found that those sport managers willing to seek outside knowledge and collaborate with “competitors” increased organizational performance and innovation implementation.

Lastly, identifying cost as an obstacle that inhibits adoption is a factor that warrants further discussion. Various companies operating in the non-profit space often have a free version of their technology while offering a paid subscription for access to more advanced features. The opportunity to adopt digital ticketing at no cost is available through various companies, which present high school athletic directors with a free option to adopt this technology. Therefore, sellers must make it clear that there is a free version for schools to adopt. Getting schools on board and allowing them to experience, grow accustomed to, and eventually become dependent on tools that make their job easier, such as managing events and serving patrons, should be the first goal toward building a long-lasting relationship. It is also worth noting that with digital technologies, the end goal is to get as many end-users on board to maximize the ability to sell sponsorships through the platform.

## Limitations and Future Research

Although it was grounded in sound theoretical foundations from previous research on the adoption of innovations, the present study was exploratory within the sport management field. Limitations included the consideration of technology adoption at one specific moment in time. Given the numerous factors influencing athletic directors’ decisions to adopt digital ticketing, it would be of great value to explore their decision-making process through a longitudinal study that accounted for dynamics between all stakeholders that may influence the ultimate decision of adoption.

Future work may explore the relationship between the independent variables considered in this study. For example, although innovativeness did not have a statistically significant direct effect on the decision to adopt digital ticketing, perhaps it influences athletic directors’ perceptions toward some of the characteristics of digital ticketing.

Looking ahead, it will be interesting to see how the COVID-19 pandemic will affect the adoption of digital ticketing in the high school space. The need for non-contact transactions and ticket redemption may increase the relative advantage of technology adoption by both schools and spectators. Additionally, recognizing that athletic directors may not be the sole decision-makers regarding the adoption of digital ticketing at any given high school, it would be valuable to survey other vital stakeholders, such as school principals, to gauge if the perceptions differ.

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