Is Wi-Fi the Answer to NFL’s Empty Seats?

Research-in-Progress

Carolina Salge
University of Georgia
csalge@uga.edu

Abstract

Although past research has investigated the impact of technology acceptance on user behavior, there is limited research on these effects in professional sports. This study examines how the implementation of Wi-Fi in sport stadiums influences perceptions of game-day experience and, consequently, stadium attendance intention. Specifically, the study focuses on three aspects of Wi-Fi —perceived usefulness, perceived enjoyment, and perceived diversion. A research model is theorized and will be tested using data from NFL fans in the Southeast part of the United States.

Keywords

TAM, Wi-Fi Perceptions, and Stadium Attendance.

Introduction

Stadium attendance intention (SAI) is partially dependent on fans’ on-site experience, which is defined as the satisfaction with the experience that results from attending a NFL game. This includes, inter alia, connecting with teams and other fans, tailgating prior games, stadium attendance, traffic conditions, parking convenience, stadium pricing on food and beverages, merchandise pricing, and safety. The relationship between on-site experience and SAI is used to develop innovative products/services as a way to leverage the capability for sport teams and leagues to increase actual stadium attendance (SA). Increasing SA is a major goal for all sport organizations. Besides bringing revenues for teams and leagues SA positively impacts the economies of cities and regions (Hall, O’Mahony, & Vieceli, 2010; Kim, Trail, & Ko, 2011). Even though SA is the sole way that sport fans can truly experience in game-day atmosphere, sport spectatorship in the past 20 years, as a percentage of total recreation expenditures, is decreasing (Mullin, Hardy, & Sutton, 2000; Ross, 2006). More specifically, the most profitable sport league in the world (NFL) is being challenged with a steady attendance decline of more than 4.5 percent per year since 2007 (Florio, 2012).

The overall decrease in NFL’s attendance in past years supports the claim that football fans are less excited about the on-site, game-day experience and are, perhaps, more excited about the home experience (Mullin et al., 2000; Ross, 2006). According to practitioners, even die-hard football fans are not likely to attend football games anymore; the costs associated with stadium attendance are outweighed by the benefits of watching games at home (“NFL Fans Increasingly Prefer The At-Home Experience Over Attending Games,” 2012). High-definition television, comfortable couches, homemade food, and access to instant replay, and fantasy football are just several benefits that fans can enjoy from home. Why would an average football fan be motivated to sit in traffic, pay high parking prices, eat an over-priced hot dog, and consume a frosty beverage if he/she can enjoy better services at home?

It appears that the home experience has a negative effect on SA; in 2011, the NFL announced its lowest total attendance rate since 2002, when the league expanded to 32 teams with the addition of the Houston Texans. That year, 16,883,310 ticket-purchasing fans attended the league’s 256 regular-season games. This number increased over the next five years, reaching a high of 17,345,205 in 2007 (Florio, 2012). However, since 2007, attendance has seen a drop each year. The total paid attendance in 2011 was 16,562,706, which was lower than 2010’s 16,569,514 figure, even though the latter excluded the Giants-Vikings game that was moved to Ford Field after the Metrodome roof collapsed. Overall, the NFL paid-crowd averages 64,698 per game, which is the lowest average since 1998, when 64,020 tickets were sold
for a total of 240 regular season games (Florio, 2012). The consistent decrease in attendance over the past five years highlights the challenge faced by the NFL.

Given technological advances, there is an increasing trend of providing Wi-Fi services in stadiums as a means of ameliorating declining attendance.

“We believe that it is important to get technology into our stadiums. We have made the point repeatedly that the experience at home is outstanding, and we have to create the same kind of environment in our stadiums and create the same kind of technology,”

said NFL Commissioner Roger Goodell, as the league recently announced its plan to have high speed Wi-Fi in every stadium (Wallace, 2012). From such statements and actions, it appears that the NFL believes stadium Wi-Fi is the solution for their empty seats, anticipating fan adoption. Practitioners agree with it. In their view, stadium Wi-Fi services will positively influence game-day experience because fans will be able to watch instant replays, and check fantasy football player status along with scores for other games. Yet, the effect of providing such services on SA is not known. A useful theoretical framework to examine how fans will perceive Wi-Fi services and how this will influence SAI can be provided through an extended version of the technology acceptance model (TAM) that has been widely used to examine perceptions of, and adoption of, technology.

There is one research gap related to Wi-Fi, game-day experience, and SAI. Researchers investigating changes in SAI have not yet explained how topics related to information technology (e.g., Wi-Fi services) affect on-site game-day experience. Thus, there is little understanding of how the implementation of Wi-Fi services will influence on-site game-day experience. For example, does Wi-Fi influence on-site game-day experience both positively and negatively (e.g., by focusing on checking Facebook or other social networking sites or by texting etc and not experiencing the game)? If so, how?

The focus of this study is to address the gap identified above. Among the multiple aspects of Wi-Fi implementation, the current study shall focus on perceived usefulness, enjoyment, and diversion. The purpose of this paper is to answer the following research question: “Is Wi-Fi the answer to NFL’s empty seats?”

The continued growth of technology use in the sport industry along with declines in sport attendance, and the lack of theory explaining the impact of Wi-Fi on attendance intention should concern both practitioners and researchers. If these gaps are not filled, there is a high likelihood that lower margin, spectator sport organizations (e.g., Major League Soccer) will not be able to sustain themselves in this competitive market. The current study contributes to the literature by being the first to examine the influence of Wi-Fi on on-site game-day experience, and consequently SAI. Wi-Fi, if successful, could be utilized by practitioners to strengthen the benefits of on-site experience. For example, managers could monitor data usage patterns as a means to gain a better understanding of how to best interact with the fans during the game. Practitioners could also develop an app allowing teams to interact with fans. The rest of the paper is organized as follows. Part 2 provides a brief literature review on TAM. Part 3 presents the research model with hypotheses rationale. Part 4 discusses the methodology. Part 5 concludes the paper.

Literature Review

The Technology Acceptance Model (TAM)

TAM (Davis, 1986) is a model developed within information systems that explains the determinants of technology acceptance in a general form, while being both parsimonious and theory based. The model is an adaptation of the Theory of Reasoned Action (TRA), which is a widely studied model in the field of social psychology. It is concerned with determinants of intentional behaviors (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). The TRA states that a person’s performance of a certain behavior depends on his/her behavioral intention (BI) to perform the behavior in question. A person’s BI is subsequently determined by a person’s attitude (A) and subjective norms (SN) concerning the behavior in question (e.g., stadium attendance). BI measures the strength of a consumer’s intention to perform a certain behavior. A is defined as the consumer’s feelings concerning the behavior (it can be either positive or negative). Subjective norms represent the consumer’s perception regarding what valued others might
think he/she should do as it pertains to a particular behavior (i.e., should or should not attend games). According to TRA, a consumer’s attitude toward the behavior will depend on his or her beliefs and evaluations. SN will be based on the consumer’s perceived expectations of certain individuals or groups, and his or her motivation to comply with those expectations.

Following the grounds of TRA, but tailored for explaining user acceptance of information systems, TAM claims that behavioral intention to use information (e.g., Wi-Fi) is a precedent of consumer’s attitude, which in turn is caused by (a) perceived usefulness and (b) perceived ease of use. The main difference between TRA and TAM is that TRA requires beliefs to be elicited for every new contest, where TAM assumes that the two most salient beliefs for technology acceptance are always perceived usefulness and ease of use. Several researchers have supported and used TAM across diverse contexts (Chau, 1996; Kwak & McDaniel, 2011; Moon & Kim, 2001; Van der Heijden, 2004; Zhang & Mao, 2008). Although TAM has been widely adopted by researchers inside and outside the IS field, a concern has been raised regarding the task context in which TAM is applied. Hirschman and Holbrook (1982) argued that it is important to take into account the context of consumption/use when applying theories. For instance, most studies using TAM as a theoretical background involve utilitarian-oriented tasks, which evaluate how well the technology serves its intended purpose or performs its proper function (e.g., health care system use). Conversely, just a few studies apply TAM to hedonic-oriented tasks (Kwak & McDaniel, 2011; Van der Heijden, 2004). Hedonic-oriented tasks aim to provide enjoyment and pleasure for consumers, where criteria for successful consumption are not based on the product’s performance but rather on the appreciation of the product for its own sake (Hirschman & Holbrook, 1982; Holbrook & Hirschman, 1982; Holt, 1995). Therefore, researchers reinforce the need for TAM to include other beliefs such as perceived enjoyment (Van der Heijden, 2004) as well as psychological and demographic variables (e.g. gender and age) to improve its generalizability toward contexts involving hedonic-oriented tasks (Imsook, Youngseog, & Munke, 2007; Moon & Kim, 2001; Van der Heijden, 2004).

**Research Model and Hypotheses**

Figure 1 shows the theoretical model that relates the antecedents and consequences of fan on-site experience and at-home experience for football fans. Following Davis (1986) and Van der Heijden (2004) approaches, Wi-Fi is perceived along three salient beliefs: (1) Perceived Wi-Fi usefulness, (2) perceived Wi-Fi enjoyment, and (3) perceived Wi-Fi diversion. Perceived Wi-Fi usefulness is conceptualized as fans’ perceptions that the access to Wi-Fi in sport stadiums is useful/beneficial. Perceived Wi-Fi enjoyment is defined as “the extent to which the activity of using Wi-Fi is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated” (Bagozzi, Davis, & Warshaw, 1992). Perceived Wi-Fi distortion is defined as fans’ perceptions that free stadium Wi-Fi draws their attention away from the NFL game.
Stadium Attendance Intention (SAI)

SAI is part of the subcategory of the overall concept revolving around sport consumption, which has been vastly explored for several years. SAI is the degree to which fans formulate conscious plans to watch NFL games at the stadium. The construct has both theoretical and managerial importance because it is normally associated with customer loyalty and retention (Alexandris, Dimitriadis, & Markata, 2002). For instance, Zeithaml, Berry, and Parasuraman (1996) argue that intention is a more adequate factor to measure SA when compared to service quality or consumer satisfaction because SAI is more closely related to actual behavior.

Wi-Fi and Fan On-Site Experience

It is theorized that Wi-Fi influences on-site game experience for NFL fans. I believe this influence is predominantly positive, but a negative effect would not necessarily be a surprising result. To elaborate, I expect fans to find Wi-Fi useful for accessing fantasy football, viewing instant replays, checking e-mail, and keeping updated with other game scores. This does not imply that I expect fans to go to the stadium just to use Wi-Fi—I do not expect that. Nowadays, however, people do not leave their homes without their cell phones. Being connected 24/7 is simply a part of our everyday lives, including leisure time. A TIME magazine study has found that people are addicted to their cellphones (Duerson, 2012). Eighty-four percent worldwide admit they could not go a single day without their mobile device, suggesting that people need- and want- to be connected to others at all times. This further suggest that people do not like to go to places where there is no connectivity at all—especially if they plan to spend several hours there and mainly if they are paying lots of money to go there. NFL games have numerous stoppage times within a game (e.g., timeouts). So what do people do during these dead periods? For many of them, no matter where they are—sparse time is an opportunity to connect with the world. Stadium Wi-Fi will therefore be useful because it will enable fans to connect with the world whenever they choose to. I do not assert that the majority of fans who attend NFL games will spend the whole time there immersed in the Internet. Yet, I do assert that almost every fan, at some point during a game, is going to want to connect to others in some fashion, even if it’s just to let someone know where they are seated or when they will leave the game. And stadium Wi-Fi is going to be useful because it is the answer as to how such connectivity happens. Therefore:

Hypothesis 1a. All else equal, Wi-Fi perceived usefulness is likely to positively influence fan on-site experience.

I also expect NFL fans to perceive Wi-Fi services as providing a form of enjoyment through increased experiences as more interactions will take place. In additional to physically interacting with one another, NFL fans will be able to interact with each other through social networking sites, email, video and etc. Moreover, the TIME article clearly suggests that people are usually addicted to their cell phones. If they are addicted to their cell phones then they must get some sort of enjoyment while using it. Stadium Wi-Fi will allow people to enjoy their devices even more because it will allow fans to connect to the world. This is likely to make fans’ on-site experiences more enjoyable because now they don’t only get to spend time interacting with the friends and fans around themselves but also with others that could not be there. Thus:

Hypothesis 1b. All else equal, Wi-Fi perceived enjoyment is likely to positively influence fan on-site experience.

I have thus far discussed the positive aspects of stadium Wi-Fi. Yet, I should not neglect its imaginable negative effects. For instance, is it possible for fans to be too distracted with Wi-Fi and not pay attention to the game? Should the NFL be worried that this would backfire at them? These questions are equivocal in nature and can be answered in many different ways. The truth is that the NFL does not seem to be worried about Wi-Fi diversion. They believe most of the Internet usage will take place in-between plays or during television commercial timeouts (Dyce, 2014). But, if people are addicted like the TIME article suggests, can they control their Internet usage? Even though I believe most of them can and will control their usage, it is quite possible that others will not. These fans are more likely to miss out on important plays. Yet, it is my assertion that this is not going to have a huge impact on their on-site experience because if they are that addicted to their devices and with using the Internet—they are also likely to miss out on key plays when they are watching games at home. And so missing out on key plays is probably not a main issue for these fans. Thus:
Hypothesis 1c. All else equal, Wi-Fi perceived distortion is unlikely to negatively influence fan on-site experience.

On-Site versus At-Home Experience, On-Site Relative Advantage, and SAI

The major question this paper is trying to answer is: Is Wi-Fi the answer to NFL’s empty seats? To be able to answer that, I need to compare the on-site experience with the at-home experience after the installment of Wi-Fi. I define fan at-home experience as the satisfaction with the experience that results from watching a NFL game at home. This includes, inter alia, comfort, convenience, watching games with friends, being able to (a) access replay systems, (b) watch multiple games, (c) access fantasy football/gambling, and (d) save money, and (e) not having to deal with obnoxious fans.

On-site relative advantage is a construct that will help me in answering my question. It is the degree to which watching NFL games at the stadium is perceived as being better than watching NFL games at home with the installment of free stadium Wi-Fi. I assert that on-site relative advantage will result in a negative number because the home experience is currently much superior than the on-site experience. Moreover, Wi-Fi is not the reason why fans attend games in the first place.

Blog Fan X: “Wifi is not the reason people go to the game.”

Blog Fan Y: “[Wi-Fi] would never be a factor in my decision-making process regarding attending a sporting event.”

Wi-Fi improves the on-site experience because it brings the connectivity aspect but Wi-Fi, per se, does not make other aspects of the on-site experience better. That is, fans will still (a) sit in traffic, (b) still pay lots of money for parking and tickets, and (c) still eat an over-priced hot dog. Why would they undergo all of these undesirable consequences when they have better services at home? The truth is that Wi-Fi is not enough of an incentive because most fans have Internet access at home. While Wi-Fi helps decrease the gap, it does not influence other important aspects—such as those mentioned above—that clearly influence fans’ decision to attend games. Thus:

Hypothesis 2. All else equal, an increase in fan on-site experience will be positively related to an increase in on-site relative advantage. Yet, the effect will not be high enough to get on-site relative advantage to be a positive number.

Hypothesis 3. All else equal, fan at-home experience will negatively influence on-site relative advantage.

Hypothesis 4. All else equal, an increase in on-site relative advantage will be positively related to an increase in SAI.

Method

My empirical study will be conducted in the context of the sport industry in the United States. Testing the model requires that game-day experience (both on-site and at home), Wi-Fi services, and SAI be relevant for the industry context. American football is the most popular sport in the United States. Specifically, thirty-five percent of Americans selected professional football as their favorite sport (“Pro Football Continues Popularity Among U.S. Sports Fans,” 2011). Both college and professional football are known for their unique on-site and at home game-day experiences and high SAI. Thus, the sport industry is an applicable context to test the research model. The unit of analysis is SAI, which involves intentions to attend future games.

Sample

Data are currently being collected using an online survey to measure all variables from the perspectives of fans. An initial e-mail was sent to participants, and followed up reminder e-mail will be sent in two weeks. Respondents will be prompted with an online consent form that will emphasize the purpose of the study. Once participants agree to participate, the form will direct them to the actual questionnaire. Written instructions are provided in all sections of the questionnaire. Nonresponse bias will be assessed by

1 http://www.cnn.com/2013/09/02/tech/innovation/nfl-wi-fi-stadiums/
comparing data from first and second waves of questionnaire responses (Armstrong & Overton, 1977). I expect analysis of variance (ANOVA) tests to reveal no differences between the two waves.

**Instrument Development**

I use existing scales to develop online questionnaires for fans. However, I created measures where existing scale items did not exist. Researchers with expertise in technology acceptance evaluated the clarity of the instructions, appropriateness of terminology and wording, response format, and scales. The survey was then refined through several preview tests with researchers and doctoral students at a major university in the Southeastern United States.

**Measures**

The measures in the questionnaire began with the following instructions: “I would like to request your voluntary participation in this brief survey, the purpose of which is to provide insights into implementations of free Wi-Fi services in NFL stadiums. So, your experiences and perceptions as a NFL fan are valuable. The information collected in this questionnaire will be confidential and solely used for research purposes. Your sincere and honest response is very much appreciated. There are no right or wrong answers. What matters are your perceptions and opinions.”

**Stadium Attendance Intentions (SAI).** I use tree items based on work by Venkatesh and Davis (2000) to measure both global SAI and Wi-Fi driven SAI. Their scale items were deemed to have acceptable reliability properties: alpha coefficient values ranged from .82 to .97 (Venkatesh & Davis, 2000). Sample items include: “I predict that I will attend more NFL games,” and “I plan to attend more NFL games in the future.”

**On-site Relative Advantage.** This was assessed with four items based on work by Polites and Karahanna (2012). Their scale items were deemed to have acceptable reliability properties: alpha coefficient value was .93. Sample items include: “Attending NFL games at the stadium, rather than watching them at home, would increase my satisfaction,” and “I would have a better game-day experience watching NFL games at the stadium, rather than watching them at home.”

**Fan On-site Experience.** I developed six items to measure fans’ perceptions of on-site game experiences. I measure these six items for both With Wi-Fi and Without Wi-Fi conditions. Sample items include: “How pleased are you with your on-site game-day experience? (Very Unpleased to Very Pleased—5-items),” “Does your typical on-site game-day experience fulfill your expectations? (Not at all to Very much—5 items),” and “Can your typical on-site game-day experience be improved? (Not at all to Very much—5 items).” For participants that may not have experienced a game with Wi-Fi I asked them to answer how they believe they would perceive it. I also asked participants how satisfied they were with their on-site game-day experience when it came to ticket prices, connecting with teams and fans, tailgating prior games, stadium atmosphere, traffic conditions, parking convenience and cost, stadium price of food and beverages, merchandise prices, safety, having to deal with obnoxious fans, safety, and being able to (a) access instant replay systems, (b) watch multiple games, and (c) access fantasy football/gambling. Finally, I asked participants how important the aforementioned components were to their on-site experience.

**Fan At-home Experience.** I developed six items to measure fans’ perceptions of home game experiences. Sample items include: “How pleased are you with your home game-day experience? (Very Unpleased to Very Pleased—5-items),” and “Does your typical home game-day experience fulfill your expectations? (Not at all to Very much—5 items).” I also asked participants how satisfied they were with their home game-day experience when it came to comfort, convenience, watching games with friends, pregaming with friends, not having to deal with obnoxious fans, home atmosphere, and being able to (a) access instant replay systems, (b) watch multiple games, (c) access fantasy football/gambling, and (d) save money. Finally, I asked participants how important the aforementioned components were to their on-site experience.

**Wi-Fi Perceived Usefulness (Global).** This was assessed with three items based on work by Venkatesh and Davis (2000). Their scale items were deemed to have acceptable reliability properties: alpha coefficient values ranged from .87 to .98 (Venkatesh & Davis, 2000). Sample items include: “I would find useful to have free Wi-Fi at NFL stadiums,” and “It would be beneficial to have free Wi-Fi in NFL stadiums.”
Wi-Fi Perceived Usefulness (Wi-Fi). I developed six items to measure the usefulness of Wi-Fi. Sample items include: “It would be handy for me to check fantasy player status with free stadium Wi-Fi,” and “I would find it useful to have Wi-Fi at NFL stadiums to text my friends.”

Wi-Fi Perceived Enjoyment. I assessed Wi-Fi perceived enjoyment using four items adapted from Van der Heijder (2004). His scale items were deemed to have acceptable reliability properties: alpha coefficient value was .86. Sample items include: “My game-day experience would be more enjoyable if I had access to free Wi-Fi at NFL stadiums,” and “It would be more fun to have free Wi-Fi at NFL stadiums.”

Wi-Fi Perceived Diversion. I developed four items to measure the extent to which Wi-Fi would divert fans’ attention from the NFL game. Sample items include: “Having free stadium Wi-Fi would divert my attention from the game,” and “I would not pay much attention to the game if I had access to free Wi-Fi at NFL stadiums.”

Control Variables

I included conceptually relevant control variables known to affect SAI. For example, I control for ticket price. Some fans might not attend games simply because they are not financially able to. Game quality is also a control—it is possible that fans only plan to attend “good games.” I also control for prior experience, Wi-Fi perceived ease of use, fan engagement with (a) the league, (b) their favorite team, and (c) fantasy football, age and gender. I believe younger fans might perceive Wi-Fi services more positively and easier to use. A gender effect is not anticipated. However, past research finds mixed results; therefore, I control it. Finally, I control for whether fans own a smartphone or not, and if they do, which type of data plan they have. I expect those who own smartphones to perceive Wi-Fi more positively.

Conclusion and Future Research

Is Wi-Fi the answer to NFL’s empty seats? Maybe. Yet, I do not think it is. Wi-Fi helps increase on-site experience but this increase is not enough to make it better than the home experience. Comfort and convenience are just some of the benefits associated with the home experience that truly outweigh the benefits of on-site experience. The NFL must provide services that aren’t available to fans at home to get more of them to attend games at the stadium. Perhaps the NFL can use Wi-Fi to just do that. For example, the league may develop an app to allow fans in the stadium to interact with their favorite team during halftime. The app may even allow fans to order food and beverages from their own seats. In fact, an interesting area for future research would be to investigate alternative ways in which the NFL could utilize information systems to get the on-site experience to become better than the home experience. Such studies would not only be important, but would also contribute to the IS body of literature.

REFERENCES

Casey, M. 2013. “NFL lagging on stadium Wi-Fi,” Tech,.
Davis, F. D. 2005. “A technology acceptance model for empirically testing new end-user information systems:: theory and results.”
Duerson, M. 2012. “We’re addicted to our phones: 84% worldwide say they couldn't go a single day without their mobile device in their hand.”
Dyce, M. 2014. “Extreme Networks and NFL announce WiFi analytics partnership,” Fansided,.
Santschi, R. 2013. “Chiefs Launch Mobile App & Arrowhead Wi-Fi,”.
Wallace, K. 2012. “Touchdown! NFL brings Wi-Fi to stadiums,” HLN.