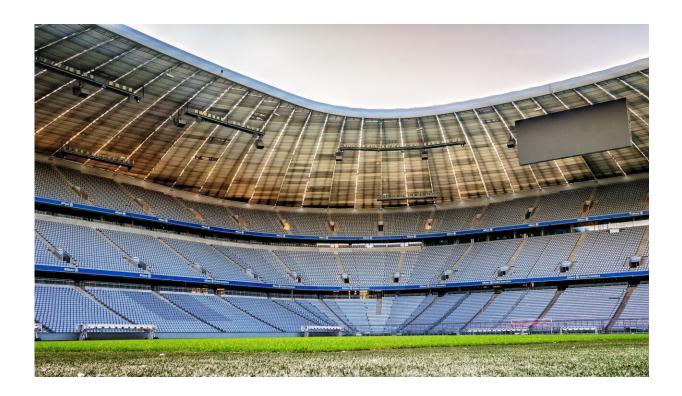# Researchers develop data-driven tool to optimize sports ticket pricing

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Credit: Pixabay/CC0 Public Domain

Anyone who has booked a flight online knows that ticket prices vary widely. From destination to timing, a long list of factors influence the price customers pay for their flight to Vegas.

Sports tickets are similar. The opponent, seat location, date of the game

and previous performance of the teams are all variables that can drive or deter ticket demand, making it difficult for management to accurately determine what a sports ticket should be worth.

To better understand what people are willing to pay for sports tickets, researchers have developed a tool that can optimize ticket prices for management and fans. This was explored in the study "Data-Driven Sports Ticket Pricing for Multiple Sales Channels with Heterogeneous Customers" published in *Manufacturing & Service Operations Management* by co-authors Robert Easley, the John W. Berry Sr. Department Chair and Professor of Information Technology, Analytics and Operations at the University of Notre Dame, and Ovunc Yilmaz, assistant professor at the University of Colorado Boulder.

To do this, the research team worked with an NCAA Division I football program and reviewed its ticket sales data. After looking at fans' purchasing behaviors and demographics, researchers examined two sales channels for purchasing tickets—season tickets and single-game tickets—and then discerned the audience segments within each channel.

Season ticket purchasers were segmented into the following audience categories: big donors, the public and employees. Single-ticket purchasers fell into three other audience categories: donors, alumni and parents.

"There are insights that arise from the data that you would not know by simply looking at a diagram of seating," said Easley. "This suggests that elements such as viewing angle and distance to the field matter to some audiences but not others. The time of year, position of the sun and thus the expected temperature can interact with the time of the game, too."

A surprising finding from the customer segment data was that as seat availability in a section fell below a certain point, fans were less likely to

choose seats in that section. This could indicate that fans do not believe those remaining seats, often on the margins of the section, are worth the price. Additionally, the research showed that some fans are not price sensitive and only want to watch the game from the best seats while other fans want to watch the game from the cheapest seat available.

This data set was then used to create a framework or pricing tool that could model the optimal prices for each seat in a stadium based on certain variables and constraints such as seat location, opponent, date and time of the game and more. Although the framework was created from the data provided by the participating football program and its set of circumstances, Easley and Yilmaz believe it is flexible enough to allow any sports team with historical purchasing data to maximize their revenues.

Easley also explained that the tool is more than just about revenue, having the potential to show what prices are necessary for fans to be willing to pay and participate. "The optimal prices suggested by our data-driven pricing tool are based on a deep understanding of the customer decision-making process; therefore these prices are able to match the customers to seats in a more effective way," said Yilmaz.

"Finding the optimal price does not necessarily mean raising it. If a team is hoping to fill a stadium, it could lead to a greater disparity in ticket prices and a good number [of tickets] needing to be a lower price than what might normally be charged," he said.

As for a future research direction, Easley and Yilmaz want to look into reviewing data from secondary ticket-purchasing platforms or resale markets for an even better perspective of the sports ticketing landscape. They believe that there are many dynamics and interplay between the primary and resale market, which would provide more in-depth data to consider and explore.

"We've really come a long way from the days of ticket scalpers on corners. The sophistication of the secondary market has grown and can provide very detailed data on seat valuation and customer preferences," said Easley.

More information: Hayri A. Arslan et al, Data-Driven Sports Ticket Pricing for Multiple Sales Channels with Heterogeneous Customers, *Manufacturing & Service Operations Management* (2021). DOI: 10.1287/msom.2021.1005

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