New type of mobile tracking link shoppers' physical movements, buying choices

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Improvements in the precision of mobile technologies make it possible for advertisers to go beyond using static location and contextual information about consumers to increase the effectiveness of mobile

advertising based on customers' location. A new study used a targeting strategy that tracks where, when, and for how long consumers are in a shopping mall to determine how shoppers' physical movements affect their economic choices. The study found that targeting potential customers in this way can significantly improve advertising via mobile phones.

The study, by researchers at Carnegie Mellon University, New York University, and Pennsylvania State University, appears in the journal *Management Science*.

"Our results can help advertisers improve the design and effectiveness of their mobile marketing strategies," says Beibei Li, assistant professor of information systems and management at Carnegie Mellon University's Heinz College of Information Systems and Public Policy, who coauthored the study.

The study took place in June 2014 at an Asian shopping mall with more than 300 stores and more than 100,000 daily visitors. Consumers were asked if they wanted to enjoy free Wi-Fi, and if they did, completed a form with their age, gender, income range, and type of credit card and phone.

Researchers tracked 83,370 unique responses over 14 days. Participants were randomly assigned to one of four groups: Those who did not receive any ads via their mobile phone, those sent an ad from a randomly selected store, those send an ad based on their current location, and those sent ads based on information trajectory-based targeting. Researchers monitored the participants, obtaining detailed information on the shoppers' trajectory—where they were, when, and for how long—as well as detailed behavioral data that is recorded and updated regularly from many mobile devices.

Customers who purchased an item from a store in the mall were asked to fill out another form, which included similar questions as well as information on the amount spent and whether the purchase was related to a coupon the customer received via his or her mobile phone. A short follow-up survey was conducted via phone.

The study found that trajectory-based targeting can lead customers to use offers sent via mobile phone more frequently and more rapidly than more conventional forms of mobile targeting. In addition, trajectory-based targeting led to higher customer satisfaction among participants.

Trajectory-based mobile targeting also increased total revenues from the stores that were associated with the promotion, as well as overall revenue for the shopping mall. It was less effective in raising overall mall revenues on weekends, and less effective for shoppers who were exploring products across a range of categories instead of considering buying something from just one category.

The study also found that trajectory-based targeting is especially effective in attracting high-income and male shoppers.

"Mobile ads that are based on customers' trajectories can be designed to influence consumers' shopping patterns," explains Anindya Ghose, professor of business at New York University, who coauthored the study. "This suggests that this type of targeting can be used not only to boost the efficiency of customers' current shopping behavior but also to nudge them toward changing their shopping patterns, which will generate additional revenue for businesses."

More information: Anindya Ghose et al, Mobile Targeting Using Customer Trajectory Patterns, *Management Science* (2019). DOI: 10.1287/mnsc.2018.3188

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