

Location-based data can provide insights for business decisions

July 1 2019, by Michelle Klampe



Credit: Karen Arnold/public domain

Data from social commerce websites can provide essential information to business owners before they make decisions that could determine whether a new venture succeeds or fails, a study from Oregon State University shows.

Social commerce sites such as the review and recommendation site Yelp collect large amounts of data from a variety of users, including customer opinions, geographical distribution of businesses in a given area, and customer "check-ins" that provide a sense of the foot traffic.

That information can provide business owners valuable information about the [competitive environment](#) in which they operate or are considering operating in, said the study's lead author, Xiaohui Chang, an assistant professor in OSU's College of Business.

Chang and co-author Jiexun Li of Western Washington University developed a tool that uses data collected through a social commerce site, including details such as types of businesses in a neighborhood, their hours, parking availability and other consumer features, to help determine whether one location is more likely to be successful than another.

"Small [business owners](#), in particular, have a lot of choices when opening a new business, including where to locate," Chang said. "With this model, we use existing social commerce data to help you determine which location is going to perform the best."

The findings are published in the July issue of the journal *Expert Systems With Applications*.

The study was conceived as a way to address the age-old question of why some businesses succeed and others do not, Chang said. The work is particularly applicable to small businesses. While large companies can

devote resources to collecting and analyzing financial data, small businesses may not have all of those tools available when researching where to open or what operating hours to keep.

The researchers focused on restaurants because the majority of new small businesses are restaurants, and many fail within the first year of opening.

For the study, the researchers looked at the accuracy of four different business performance prediction models. The attribute affinity model is a basic model that looks at businesses' intrinsic attributes without taking into account location or competition.

The geographic model, which has been used and tested by other researchers, suggests that businesses that are close to each other and share similar attributes are likely to do equally well. The contextual model, which is a new model, looks at the attributes of the business and the environment that might contribute to the success of a business; two businesses hundreds of miles apart with similar attributes and surrounding neighborhoods could achieve similar performance. The hybrid model uses both contextual and geographic models, which each also include aspects of the affinity model.

The researchers used Phoenix-area restaurant data from Yelp, a social commerce site that helps consumers find businesses using location-based services, to test each model. Yelp has made some of its data available to researchers and this study used data from 2013.

They found that the hybrid model did the best job of predicting whether a restaurant would be successful. Both business attributes and surrounding environments play important roles, Chang said.

Additional research is needed to fully test how the model might be used

to help a new business make decisions, and to determine if it also works for other types of businesses, Chang said. In addition, social commerce companies such as Yelp, Trip Advisor or Foursquare, which collect a trove of location-based data, could use the model to help companies improve their businesses.

"You could regularly get new performance predictions and the data could be used to help businesses solve problems or keep themselves vibrant," Chang said. "If a similar [business](#) is more successful and you can use location-based data to pinpoint that the success is due in part to parking availability, hours or price point, you can make decisions based on that information."

More information: Xiaohui Chang et al, Business performance prediction in location-based social commerce, *Expert Systems with Applications* (2019). [DOI: 10.1016/j.eswa.2019.01.086](https://doi.org/10.1016/j.eswa.2019.01.086)

Provided by Oregon State University

Citation: Location-based data can provide insights for business decisions (2019, July 1) retrieved 23 April 2024 from <https://phys.org/news/2019-07-location-based-insights-business-decisions.html>

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