

Artificial intelligence comes to the real estate market

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While providing services to real estate agents, EnterUp Tecnologia, a startup based in São José do Rio Preto city, Brazil, identified a problematic gap between demand and supply in the online real estate market. Search tools offered by websites and apps cannot yet meet consumers' expectations with satisfactory speed, and users are often confused by the myriad of options when looking for a property.

In Brazil, according to numbers presented by Adriano Nasser, an executive from Google's local headquarters, at least 71 percent of consumers begin the search for a property by visiting the websites or apps of [real estate](#) agents.

Looking for a way to profit from that particular demand, EnterUp partner Paulo Scarpelini Neto, who holds a master's in computer science from São Paulo State University (UNESP), proposed a real estate recommendation engine that could personalize online searches by suggesting items aligned with the user's interests.

This approach is widely used by multimedia streaming services and online bookstores, which suggest movies, songs and books similar to those already bought by the user. However, so far, it is a novelty in the [real estate market](#).

According to tests performed in the project's initial steps, personalized recommendation produces a 25 percent increase in the rate at which prospects are converted into actual property sales or leases.

EnterUp used framework technology to develop the solution. In computer programming, a framework is an application or set of applications (programs) that support the development of software products and tools. The startup opted for a hybrid framework "because it combines different techniques," says Scarpelini.

He explains that EnterUp uses two techniques used by many existing recommender services—demographic filtering based on gender, age and home location, and collaborative filtering, based on the preferences of people with similar taste profiles. But the firm also used a third technique it calls spatial collaborative filtering. "People interested in nearby properties tend to have the same preferences, so we locate similar taste profiles in the same areas of interest," he says.

The advantage of spatial collaborative filtering, Scarpelini adds, is that it extends the range of offerings. A customer who is looking for specific characteristics in a particular neighborhood such as a house near a shopping mall, for example, will also see other areas with the same characteristics according to the search results obtained by users with the same profile.

The user's interaction with the search engine supplies additional data in a non-explicit manner. The system records the properties visited online, the time spent looking at each one, and whether the user viewed photographs or other kinds of information. The resulting massive amounts of data can be managed only via a computational framework including storage and processing tools.

Systems based on computational intelligence are capable of revealing useful knowledge that enhances business efficiency. "An example often cited in the literature refers to a major U.S. retail chain," Scarpelini says. "Analysis of the data showed that many people who purchased disposable diapers on Friday evening also bought beer. So they put the

diapers and beer side by side in the supermarkets and boosted sales of both products."

Working with Big Data was a technological challenge for which EnterUp's partners. During [Phase 1](#) of their PIPE project, between February and October 2016, they developed a prototype and concluded from tests that the recommendation system was, in fact, capable of enhancing and stimulating sales.

Structuring the business model was an even more daunting challenge. For this task, the researchers were aided by participation in the PIPE High-Tech Entrepreneurial Training offered in collaboration with George Washington University (GWU) in the United States in March-April 2016. After this seven-week course, as well as more than 100 interviews with proprietors of real estate and tech companies, the young entrepreneurs reviewed their plans and reached a conclusion that not only changed their business plan but sowed the seeds of a new firm.

"We had a reality shock. The business model was a long way away from what the market expected," Scarpelini says. The software was well received, but firms were not willing to pay for it. The real estate industry is conservative, technology-averse, and not prepared to take technology on board as a product.

The solution was to create a new brand name, Sua Casa Online ("Your Online Home"). "We completely revamped the business model," he recalls. "We decided to build a real estate agency supported by technology."

The real estate startup will have a substantial fixed staff of tech experts following the example set by large-scale portals in other countries. In some locations, computer science specialists account for 50 percent of the payroll. "It was one of the hardest decisions we had to make. It was

also the biggest lesson we learned throughout the process," Scarpelini says. "As researchers, we have many desires, but we realized our role as entrepreneurs was to solve a problem for the market."

Scarpelini is excited by what lies ahead. In Phase 2 of the PIPE project, he plans to make the system available online and reach out to end-users. Despite the economic recession Brazil is still experiencing, he adds, the market for low-income and social housing in the interior of São Paulo State, where he is based, is booming, especially among younger people: Sixty to 70 percent of first-time home buyers are aged between 20 and 30, and these people are digital natives, so his product could not be more timely.

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