Understanding the Dynamics Behind Pricing

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Some prices never sit still. Retailers discount clothing and technology products seasonally. Traders bid stocks up and down daily. Airline and hotel prices fluctuate by the hour. These are examples of dynamic pricing, where companies price goods based on cost, customer behavior, and competitive dynamics. Soulaymane Kachani's research in the field has taken him in some interesting directions.

"We are applying traffic flow theory used in transportation networks to blood rheology to prevent blood clots," he said. "Existing models are hard to calibrate for elderly patients because they require too much ultrasound data. Our models are simpler, and appear to better predict where clots will form. Our next step is to conduct clinical trials."

One recent project assessed lifecycle pricing for different generations of technology products. He found that to maximize long-term profits, companies should not discount old technology too deeply.

"These companies interact repeatedly with their customers," Kachani explained. "Once they set a price, it affects the reference price. So if they start driving down the price of older goods, they cannot go back and ask for a dramatically higher price for their next-generation product. In fact, long term, many tech companies are better off discontinuing old products than discounting to sell off inventory."

Real estate, on the other hand, could benefit from more dynamic pricing. "Imagine you're developing condominiums," Kachani said. "What price do you assign each unit?

"You don't want to sell out all the units with upper floors, good views, or two bedrooms first. If you do that, it means you did not put the right premium on the more desirable units. If the premiums are set correctly, all your different units should sell at roughly the same pace," Kachani explained.

To find the right premiums, Kachani looks at both unit sales and also what units visitors view. He uses their actions as input for a computer model that modifies prices based on real market input. This gives developers a realistic way to set prices to maximize returns.

His work also extends to fashion. Kachani compared retailers who emphasize innovation and design with those who focus on pricing. The innovators, with short product runs and high turnover, had higher profits than retailers with larger product runs who relied on periodic discounts to clear the shelves.

Yet Kachani urged the innovators to consider dynamic pricing. "They would do even better if they managed their pricing strategy better," he said.

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