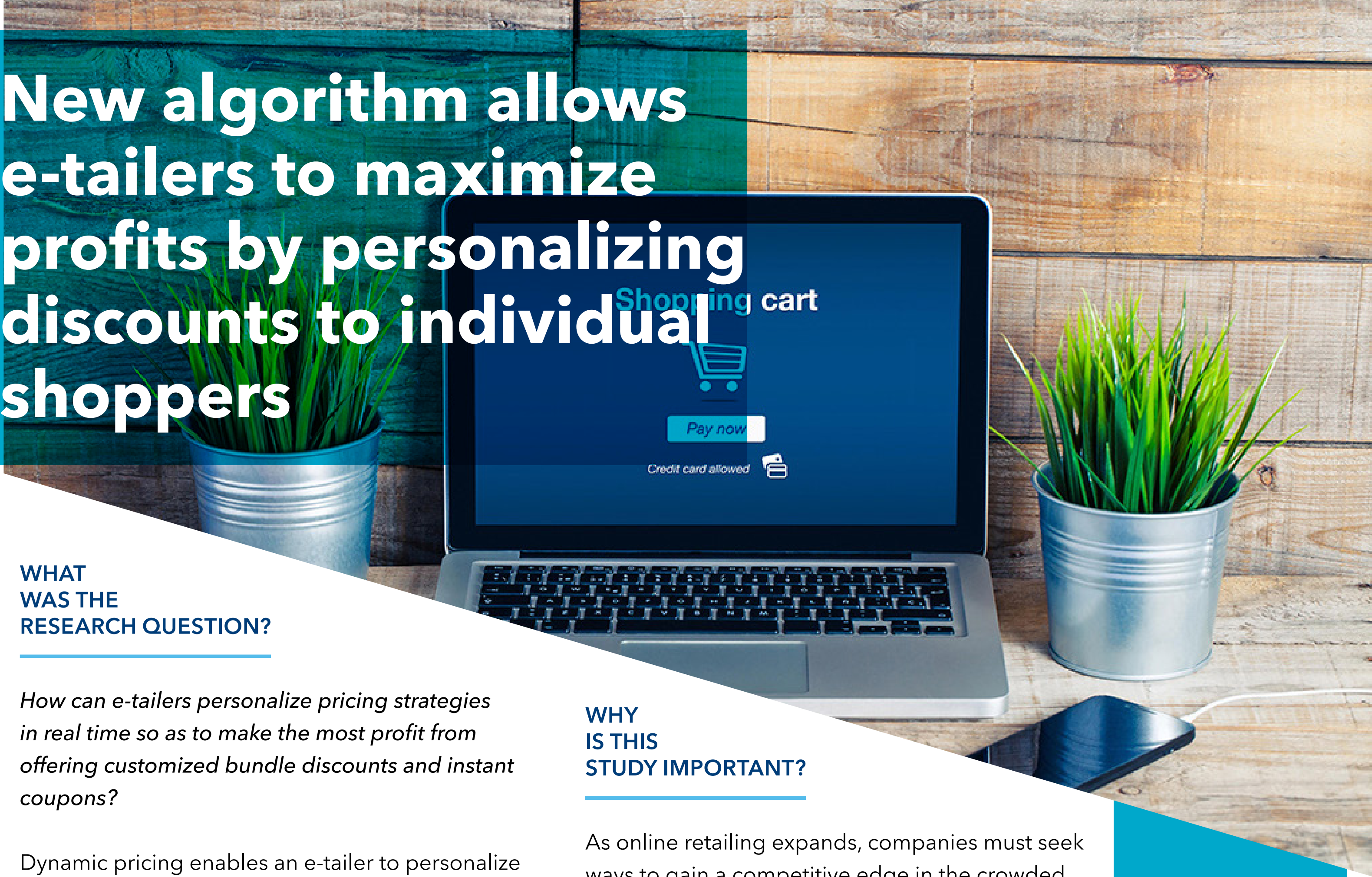
New algorithm allows e-tailers to maximize profits by personalizing discounts to individual shoppers



WHAT WAS THE RESEARCH QUESTION?

How can e-tailers personalize pricing strategies in real time so as to make the most profit from offering customized bundle discounts and instant coupons?

Dynamic pricing enables an e-tailer to personalize pricing for the individual customer in real time, in response to the customer's behaviour on their website.

Two common forms of dynamic pricing are bundle discounts and digital coupons:

- **Bundle discounts** apply when a customer purchases more than one item. For instance, if you buy the first book in a series on Amazon, you're offered the sequel at a percentage off the regular price.
- **Instant coupons** are digital coupons that apply once a customer reaches a certain sales threshold. For instance, you might get $20 off once you've spent $80.

What's the best way to combine the bundle discounts and instant coupons so as to maximize profits in real time?

WHY IS THIS STUDY IMPORTANT?

As online retailing expands, companies must seek ways to gain a competitive edge in the crowded marketplace. One way to do that is to offer real-time discounts, tailored to individual customer preferences.

So far, no one has developed a dynamic pricing model that would enable e-tailers to integrate bundle discounts and instant coupons so as to maximize revenue in real time.

HOW DID THE RESEARCHERS CONDUCT THE STUDY?

First, the researchers developed a programming model for offering customized bundle and coupon discounts together, at the same time. This model enabled them to simulate different kinds of customer behaviour.

The researchers then tested their model, using various customer scenarios. They compared their outcomes to results an e-tailer would get from the traditional strategy of offering either bundle discounts or instant coupons (not the two discounts together).

Yuanchun Jiang, Yezheng Liu, Hai Wang, Jennifer Shang, & Shui Ding. "Online pricing with bundling and coupon discounts," *International Journal of Production Research* 56, no. 5 (March 2018): 1773-1788.

Hai Wang is a professor of Finance, Information Systems & Management Science at SMU. He is also an adjunct professor in Dalhousie University's Faculty of Computer Science.

New algorithm allows e-tailers to maximize profits by personalizing discounts to individual shoppers

WHAT WERE THE MAIN FINDINGS?

1. The study showed that e-tailers can maximize profits by using dynamic pricing to offer customized bundle discounts and instant coupons at the same time. This combined approach can generate more profits than offering either bundle discounts or coupons on their own.

   The following table shows profit gains in the triple digits:

E-TAILER'S PROFITS				
# Products	Traditional profit (amount)	Profit in model (amount)	Profit improvement (amount)	Improvement percentage (%)
2	1984.41	5711.87	3727.46	188
3	2759.94	9279.65	6519.71	236
4	3436.77	13094.33	9657.56	281
5	4015.07	17112.40	13097.33	326
6	4586.64	21440.62	16853.99	367

2. The approach of offering bundle discounts and coupons at the same time works for all types of customers, whether or not they prefer coupons and whether or not they prefer bundle discounts. Even for customers who don't prefer coupons, the model combining coupons with bundle discounts proved just as profitable as the traditional approach of offering only bundle discounts.

"The profit improvements with bundle discount are always larger than that without bundle discount. This is because coupons require a sales threshold. Without a dynamic bundle discount, the pricing strategy cannot motivate enough customers to purchase, as many customers cannot reach the coupon threshold to realise the savings they desire."

HOW CAN YOU APPLY THE FINDINGS IN YOUR BUSINESS?

- To maximize your online profits, use dynamic pricing to offer bundle discounts and instant coupons at the same time. This combined approach will generate more profit than the traditional approach of offering one kind of price incentive at a time.
- Before you implement dynamic pricing, you may need to analyze your different customer segments and estimate each segment's reservation price (the maximum amount a customer is willing to pay for an item).
- As you implement dynamic pricing, be sensitive to privacy concerns. How can you show customers that the benefits to them outweigh the perceived risks? If you use dynamic pricing, you may want to disclose that in your website's privacy policy.