

A quick fix for queues

June 1 2010

Queuing, standing in line... it's what we do well, but complain about the most. Thankfully, science is coming to the rescue as researchers in Taiwan have devised a formula that could revolutionize restaurants, post offices, customer service desks, and theater ticket sales everywhere.

Business management professor Pen-Yuan Liao of the National United University in Miaoli, Taiwan, that queuing as one of life's inevitabilities when seeking fast food, restaurant services, banking and postal services, and shopping and buying tickets for events and activities, or waiting for your turn on a theme park ride. No one enjoys queuing, so even small reductions in waiting time will result in better quality of service and lead to enhancing customer loyalty and so increased sales, Liao says.

"The profit loss from business resulting from inefficient queuing systems is quite difficult to estimate," Liao explains, "but there is a creative and effective way to formulate the costs of waiting and so improve <u>customer satisfaction</u> and sales."

Liao has devised a scientific formula he refers to as the "balking index", which is referred to by the Greek letter theta. Ironically, this symbol is used elsewhere in science as shorthand for temperature, a parameter that often rises among people standing in ineffective queues. Liao has encapsulated theta as relating the expected queue length and the mean arrival rate in a given time period. Multiplying the balking index, the queue length, and the mean arrival rate gives you the number of frustrated customers who will leave their position in the queue in that time period.



"Estimating balking loss enables a store manager or other person in charge of staffing levels to determine the optimal number of servers by minimizing total cost, including service cost and balking loss," says Liao. He has successfully tested the formula in advising a fast food manager on how many staff to have serving at any given time depending on the balking index.

"By using this formula, approach, restaurants and other services that have queues can cut costs and improve customer loyalty," he says, "Customers benefit from much reduced queuing times."

More information: "Optimal staffing policy for queuing systems with cyclic demands" in Int. J. Services and Operations Management, 2010, 7, 317-332

Provided by Inderscience Publishers

Citation: A quick fix for queues (2010, June 1) retrieved 26 April 2024 from <u>https://phys.org/news/2010-06-quick.html</u>

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