Using Video Analytics to Improve Customer Assistance and Saleforce Allocation in Retail Stores.

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Store staffing decisions typically account for a large portion of a retailer's operational costs. The effectiveness of these decisions has often been analyzed by relating staffing levels to revenues. However, that approach does not explicitly consider the mechanisms by which the store’s staff can contribute to generate revenues. In this work, we seek to uncover one such mechanism: the role employee’s assistance to customers and its contribution to store revenues. Using data collected through video analytics, we first show how to construct metrics that effectively capture the level of customer assistance and can be linked with point of sales data. However, measuring the causal effect of assistance on revenues is challenging because assistance is endogenous: there are unobservable customer characteristics that are both related to the likelihood of receiving assistance and the customer’s purchase incidence. We present an identification strategy that uses variation in the level of congestion in the store (the ratio between demand and capacity to provide assistance) as an instrumental variable. Using this methodology, we studied the impact of customer assistance in two different studies: (1) a women’s apparel store; (2) and a large home improvement store, where sales employees can be allocated across different store departments. These studies show that the impact of customer assistance is substantial and can explain a significant portion of the variation in store sales. Moreover, the proposed metrics of assistance that we developed can be tracked in real time and used to dynamically allocate labor across different areas of the store in order to maximize the effectiveness of assistance. Altogether, this analysis shows that combining a flexible salesforce with real time in-store operational data can increase sales of a store in the order of 3 to 6%.