Service Systems with Heterogeneous Strategic Customers : Effect of Heterogeneity

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We consider a transportation system with strategic customers who have heterogeneous delay costs and service rewards. Customers are strategic decision makers that weigh the reward from the transport service against the waiting cost for the vehicle at a transportation station. The intervisit times of the vehicle are random and the customers may have different information available to them before making their decisions to take the service or not. This includes no informatıon (apart from intervisit time distribution), full information where customers are provided the next passage time of the vehicle, information about the elapsed time from the previous visit of the vehicle, and information about the number of customers waiting at the station. Assuming that customers have their individual utility functions where their reward from service and delay costs are dependent, we investigate the equilibrium joining behaviour at the station under all four information structures. We then characterize the optimal pricing decision for the administrator of the system. We are interested in the effect of customer heterogeneity on expected total customer utility and the expected administrator revenue. We also wish to explore what happens if the administrator sets the revenue-maximizing fee ignoring customer heterogeneity, i.e., assuming that all customers have the average delay sensitivity.

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