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(57) Abstract :

Call centers are the essential and preferred method for serving their customers. The call center industry is rapidly growing in terms of economic growth and customer satisfaction. Due to the advent of automation of call centers leads to a reduction in workforce and an increase in waiting time. Due to this user may balk or abandon. The waiting time of the customer is increasing due to queuing time to reach a representative or not reached the correct skilled representative. Waiting time can be reduced by incorporating non-Markovian queuing models combined with voice processing of user requirements using machine learning algorithms. Non-Markovian model forms the queueing system using a continuous-time level-dependent quasi-birth-and-death process for which a sufficient condition for the ergodicity is derived. We obtain the numerical solution for the stationary distribution based on which performance measures, such as the waiting time distribution and the blocking probability are derived. Customer behaviours like frustration, urgency, and repetition are identified, and the needs of customers are assessed through initial voice call transcription. We used natural language processing (NLP) to extract the customer states and representative actions from call transcriptions. Our results identify and visualize the most frequent transcription sequences from fruitful conversations and estimate the expected probability of an outcome when a representative takes action given a specific customer state. Then, the calls are forwarded to the appropriately skilled representative rather than the First come and First Service model. Thus customer needs also satisfied quickly, and waiting time also reduced.

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