A mathematical model for the optimization of e-commerce logistics operations in the face of the spread of COVID-19

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Abstract:
In this work, it was carry out a new model of attention to product orders in e-commerce operations in a pandemic situation. The model was evaluated in situations that require capacity and flexibility for companies when the forecast presents a high level of uncertainty. A two-echelon multi-period MIP model was used. It was shown from a case example the model's behavior in stressful situations, which represent a pandemic moment or high demand, and a case in which companies can use the model for decision-making when demand is lower or stable. It is proposed to use a productivity factor and extra hours to decide to hire permanent or temporary employees to take the best strategies in its logistics operations. The results show the usability of the model for decisions and the flexibility obtained for better productivity in e-commerce operations

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I. Introduction
In the face of the spread of COVID-19 the consumer experience changed. Due to the growth of e-commerce about 50% of global