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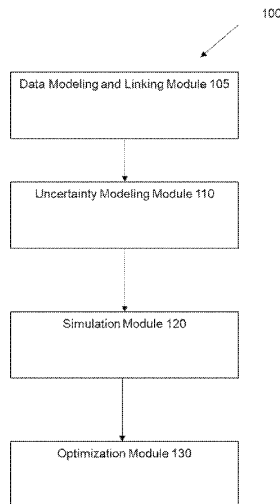


FIG. 1

(57) Abstract: The present disclosure provides systems and methods that may advantageously apply machine learning to accurately manage and predict inventory variables with future uncertainty. In an aspect, the present disclosure provides a system that can receive an inventory dataset comprising a plurality of inventory variables that indicate at least historical (i) inventory levels, (ii) inventory holding costs, (iii) supplier orders, or (iv) lead times over time. The plurality of inventory variables can be characterized by having one or more future uncertainty levels. The system can process the inventory dataset using a trained machine learning model to generate a prediction of the plurality inventory variables. The system can provide the processed inventory dataset to an optimization algorithm. The optimization algorithm can predict one or more inventory management parameters that result in a particular probability of achieving a target service level while minimizing a cost. The optimization algorithm can comprise constraint conditions.

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