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LITERATURE SURVEY ON RETAIL STORE STOCK INVENTORY ANALYSIS

Introduction:

Retail inventory management is the process of ensuring you carry merchandise that shoppers want, with neither too little nor too much on hand. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply. In practice, effective retail inventory management results in lower costs and a better understanding of sales patterns. Retail inventory management tools and methods give retailers more information with which to run their businesses, including:

- Product locations
- Quantities of each product type
- Which stock sells well and which doesn't, by location and sales channel.
- Profit margin by style, model, product line or item
- Ideal amount of inventory to have in back stock and storage
- How many products to reorder and how often
- When to discontinue a product
- How changing seasons affect sales

The manual inventory gives an uphill task to the inventory manager, who has to reconcile every receipt and the physical stock. A computerized point of a sale information system that updates the inventory once there is a sale simplifies the inventory management. This may involve installing bar code scanners at the point of sale scanners to mark up every item sold. The inventory should also evaluate how each product is

faring in terms of sales. Besides, the systems should provide analysis of the comparison between different products as well as other competitor retails. The inventory systems should also have security measures to keep the inventory away from unauthorized persons.

Problem Statement:

Basic Questions of every retailer : How much inventory should I carry? Too much inventory means working capital costs, operational costs and a complex operation, lack of inventory leads to lost sales, unhappy customers and a damaged brand.

This is why short-term forecasting is so important in the retail and consumer goods industry.

Existing Solutions:

1. **Analysis of Different Inventory Control Techniques: A Case Study in a Retail Shop** by S. K. Biswas, C. L. Karmaker, Ariful Islam, Nazmul Hossain, Shamim Ahmed

Through proper inventory control techniques, probability of stock-out as well as overstock situations in the retail shops can be minimised. The sole purpose of the study is to provide a guideline for inventory managers that will help them to ensure product availability at right quantity as and when required.

2. **Relationships between inventory, sales and service in a retail chain store operation** by
Chris Dubelaar, Garland Chow, Paul D. Larson

Effective inventory management is critical to retailing success. Surprisingly, there is little published empirical research examining relationships between retail inventory, sales and customer service. Based on a survey of 101 chain store units, this paper develops and tests a series of hypotheses about retail inventory.

3. **Towards Intelligent Retail: Automated on-Shelf Availability Estimation Using a Depth Camera** by Annalisa Milella, Antonio Petitti, Roberto Marani, Grazia Cicirelli, Tiziana D'orazio

The proposed solution exploits 3D point cloud reconstruction and modelling techniques, including surface fitting and occupancy grids, to estimate product availability, based on the comparison between a reference model of the shelf and its current status. No a priori knowledge about the product type is required, while the shelf reference model is automatically learn based on an initial training stage. The output of the system can be used to generate alerts for store managers, as well as to continuously update product availability estimates for automated stock ordering and replenishment and for e-commerce apps.

4. **Stock Management Problem: Adaptive Fixed-Time Convergent Continuous Controller Design** by Michael V. Basin, Fernando Guerra-Avellaneda, Yuri B. Shtessel

This idea presents an adaptive fixed-time convergent continuous controller designed to solve a stock management problem with the objective to drive stock and supply chain levels at the reference values, subject to loss rate disturbances whose bounds are unknown. The only measurable state of the supply chain is the inventory retailer stock level, whereas the supply line inventory level should be estimated.

Reference:

1. Biswas, S. K., et al. "Analysis of different inventory control techniques: A case study in a retail shop." *Journal of Supply Chain Management Systems* 6.3 (2017): 35.

2. Dubelaar, Chris, Garland Chow, and Paul D. Larson. "Relationships between inventory, sales and service in a retail

chain store operation." *International journal of physical distribution & logistics management* (2001).

3. Milella, Annalisa, et al. "Towards intelligent retail: Automated on-shelf availability estimation using a depth camera." *IEEE Access* 8 (2020): 19353-19363.

4. Basin, Michael V., Fernando Guerra-Avellaneda, and Yuri B. Shtessel. "Stock management problem: Adaptive fixed-time convergent continuous controller design." *IEEE Transactions on Systems, Man, and Cybernetics: Systems* 50.12 (2019): 4974-4983.