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FIFO IN GREEN SUPPLY CHAIN INVENTORY MODEL OF ELECTRICAL COMPONENTS INDUSTRY WITH DISTRIBUTION CENTRES USING PARTICLE SWARM OPTIMIZATION

AJAY SINGH YADAV[1], KAPIL KUMAR BANSAL, SHIVANI, SEEMA AGARWAL, AND R. VANAJA

ABSTRACT. FIFO, which stands for first in first out, is a method of inventory valuation that assumes that the last items placed in inventory were sold for the first time during the accounting year. This paper reports on a method based on Particle Swarm Optimization to optimize FIFO in green supply chain inventory management of Electrical components industry. In particular, we focus on determining the most likely level of surplus stock and shortage required for FIFO in green supply chain stocks of Electrical components industry so that the total cost of the supply chain is minimized. We apply our three-phase FIFO methods to a green supply chain inventory model of Electrical components industry studied for optimization.

1. INTRODUCTION

The goal of each FIFO in the green supply chain inventory should be to maximize the total value obtained. For most FIFOs in the supply chain inventory, the value would be strongly related to the total profitability of FIFO in green supply chain inventories, which is calculated as the difference between customer revenue and the total cost of FIFO in green supply chain inventory. The higher the FIFO in green supply chain profitability, the more successful the FIFO in green

[1]*corresponding author*

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supply chain stocks. The success of FIFO in the green supply chain should be measured in terms of FIFO in the profitability of green supply chain stocks, and not in the form of profit at a single stage. For a sustainable FIFO in the green supply chain inventory, due attention should be paid to the customer. All other cash flows are simply exchanges of funds occurring within FIFO in the green supply chain list, given that different phases have different owners. All flows of information, products or funds create costs within FIFO in the green list of the supply chain. Therefore, proper management of these flows is the key to FIFO for the success of a green supply chain inventory. Effective FIFO in supplier green chain inventory management involves the management of FIFO asset and green supply chain inventory products to maximize the overall FIFO in green supply chain return profitability. In short, in order to do all this precisely and quickly, especially with a large number of products, a system is needed that will perform a number of tasks. This includes making forecasts, calculating the correct levels of security stocks, determining the amount of economic orders, determining the best quantities of discounts, automatically adjusting variations and providing full visibility of changes throughout FIFO in the green supply chain list to enable rapid response to changes. FIFO in green supply chain stocks is only as strong as the relationships that connect sellers, buyers and other participants together. Looking at these other companies and suppliers as partners in FIFOâĂŹs success in green supply chain inventory is important and should be a top priority in the organization.

2. Literature Review

Pandey, et. al. (2019) An Analysis Marble Industry Inventory Optimization Based on Genetic Algorithms and Particle swarm optimization. Malik, et. al. (2019) Security Mechanism implemented in Gateway Service Providers. Yadav and Swami (2019) A Volume Flexible Two-Warehouse Model with Fluctuating Demand and Holding Cost under Inflation. Yadav, et. al. (2019) Supply Chain of Chemical Industry For Warehouse With Distribution Centres Using Artificial Bee Colony Algorithm. Yadav, et. al. (2020) Electronic components supply chain management of Electronic Industrial development for warehouse and its impact on the environment using Particle Swarm Optimization Algorithm. Yadav, et. al. (2020) Reliability Consideration costing method for LIFO Inventory model

with chemical industry warehouse. Yadav, et. al. (2020) proposed National Blood Bank Centre Supply Chain Management For Blockchain Application Using Genetic Algorithm. Yadav, et. al. (2020) a give Medicine Manufacturing Industries supply chain management for Blockchain application using artificial neural networks. Yadav, et. al. (2020) proposed Red Wine Industry of Supply Chain Management for Distribution Center Using Neural Networks. Yadav, et. al. (2020) a give Rose Wine industry of Supply Chain Management for Storage using Genetic Algorithm. Ahlawat, et. al.. (2020) a give White Wine Industry of Supply Chain Management for Warehouse using Neural Networks. Chauhan and Yadav (2020) proposed An Inventory Model for Deteriorating Items with Two-Warehouse & Stock Dependent Demand using Genetic algorithm. Chauhan and Yadav (2020) a give Inventory System of Automobile for Stock Dependent Demand & Inflation with Two-Distribution Center Using Genetic Algorithm. Yadav, et. al. (2020) a give Reliability Consideration costing method for LIFO Inventory model with chemical industry warehouse.

3. Particle Swarm Optimization Based FIFO in Green Supply Chain Inventory Optimization Analysis

In order for FIFO to be more efficient in green supply inventory control of Electrical components industry the main primary goal is to predict where, why and how much control is needed and such prediction should be made here through a methodology. The proposed methodology can provide appropriate stock levels to be maintained in the coming periods that will minimize the FIFO in the cost of green supply chain of Electrical components industry stocks. The supply chain model is divided into three phases in which optimization will be carried out.

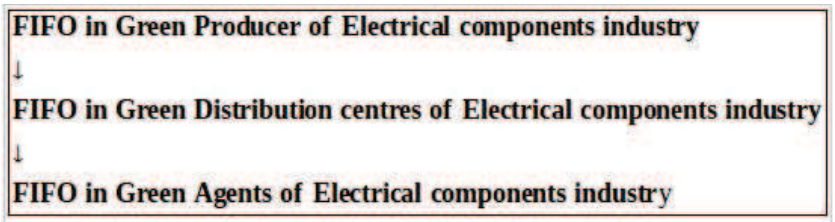

Figure 1. Three stage green supply chain (Studied Model)

In this figure 1. FIFO in the manufacturer produces of Electrical components industry different products and determines how it will be delivered to FIFO in distribution centres of Electrical components industry and how stocks will be transferred to FIFO in agents of Electrical components industry. The proposed methodology aims to determine the specific product on which to concentrate and the amount of product stocks that must be maintained by different members of FIFO in the supply chain of Electrical components industry and the methodology also analyzes the level of stocks.

4. Particle Swarm Optimization

The PSO algorithm is based on the social behavior of birds. This algorithm first creates a random population. Each individual called particle is given a speed and a small social network. For all particles, the values of the fitness or objective function are evaluated. On the basis of physical condition in relation to GA, the PSO has no cross / mutation, but the personal optimum for each individual, the overall optimum in the total population and the neighborhood optimum found by the neighbors of each individual are stored for speed and position update each. This process is repeated until the maximum generations or convergence is reached.

5. Results and Discussions

The optimization of FIFO in green supply chain inventory control in Supply Chain Management based on Particle Swarm Optimization is analyzed with the help of MATLAB. Inventory levels for three different members of FIFO in the supply chain, FIFO in the manufacturer of Electrical components industry, FIFO in the distribution centres of Electrical components industry, and FIFO in the agent of Electrical components industry are generated using the MATLAB script, and this generated data set is used to assess the effectiveness of Particle Swarm Optimization. Some examples of data sets used in implementation are listed in Table 1. Some 5 data sets are given in Table 1 and they are assumed to be records in the previous period.

TABLE 1. Some 5 Data sets are given are assumed to be records in the previous period

S.N.	FIFO in Green Producer of Electrical components industry	FIFO in Green Distribution centres of Electrical components industry	FIFO in Green Agents of Electrical components industry
1	69	15	94
2	49	87	65
3	78	20	86
4	94	59	28
5	26	37	40

CONCLUSION

FIFO, which stands for first in first out, is a method of inventory valuation that assumes that the last items placed in inventory were sold for the first time during the accounting year. FIFO in green supply chain inventory management is a significant component of supply chain management. We discussed a method based on Particle Swarm Optimization to optimize FIFO in green supply chain inventories in supply chain management, and focused on how to specifically determine the most likely surplus inventory and level of shortage required for FIFO in optimizing green chain inventory in a supply chain such that the total cost of the supply chain is kept to a minimum. We apply our methods to a three-phase supply chain optimization model. The proposed method was applied, and its performance was evaluated using MATLAB.

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DEPARTMENT OF MATHEMATICS, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, DELHI-NCR CAMPUS, GHAZIABAD, INDIA.

DEPARTMENT OF MATHEMATICS, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, DELHI-NCR CAMPUS, GHAZIABAD, INDIA.

SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, DELHI-NCR CAMPUS, GHAZIABAD, INDIA.
E-mail address: shivanideepak23@gmail.com

DEPARTMENT OF MATHEMATICS, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, DELHI-NCR CAMPUS, GHAZIABAD, INDIA.

DEPARTMENT OF MATHEMATICS, SRM INSTITUTE OF SCIENCE AND TECHNOLOGY, RAMAPURAM CAMPUS, RAMAPURAM, CHENNAI.