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In this paper, the determined economic impact of the Medicine industry of the Coronavirus pandemic for aggravating items with a ramp-type demand with inflation effects in two-warehouse storage devices and wastewater treatment cost using PSO is developed. The owned warehouse has a fixed capacity of W units; rented warehouse has unlimited capacity. Here, we hypothesized that the Block chain Economic Impact of the Coronavirus Pandemic Medicine Industry in Inventory Cost of Inventory in RW is greater than that in OW using PSO. The shortcomings of the economic impact of the Coronavirus pandemic Medicine industry are allowed and partially lagged behind, and it is assumed that Block chain’s economic impact of the Coronavirus medicine pandemic industry decreases over time with a variable deterioration rate and wastewater treatment cost using PSO. The effect of inflation was also considered due to the different costs associated with Blockchain applying the Economic Impact of the Coronavirus Medicine Industry Inventory System and wastewater treatment cost using PSO. The numerical sample is also used to study the behavior of the model using particle size optimization. The cost minimization technique is used to obtain expressions for total costs and other parameters.

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1. Introduction

Many researchers have expanded the EOQ model to changing demand patterns. Some researchers have discussed the economic impact of inventory models in the Coronavirus industry pandemic with a linear trend in demand. A major constraint on the timing of the smooth time in demand is that it means uniform changes in the level of demand per hour. This rarely happens with any product on the market. In recent years, many models have been developed with a level of demand that changes dramatically over time. For seasonal products such as clothing, climatic conditions, etc. At the end of the season, it is noted that the demand for these items decreases exponentially for a certain initial period. Subsequently, the demand for products becomes stable, without decreasing exponentially. This type of statement is considered quite realistic. Such a scenario can be illustrated by the rate of ramp-type complaints.

An important question about the economic impact of the package industry inventory theory of the coronavirus industry is how to address unmet needs that arise during shortages or stocks. In most development models, the researchers supposed that the deficiencies were whichever completely delayed or completely lost. The first case, known as an order or default case, is a case in which an incomplete request is ordered entirely. In the second case, also known as the lost sales case, we assume that the unrealized demand is completely lost.

Also, in the event of a shortage, some buyers are willing to wait for an order while others will buy from other sellers. Often, customers experience delivery delays and may be willing to wait a short time to get their first option. For example, with modern, high-quality products and short product life cycles, the client's
willingness to wait decreases with waiting time. Therefore, the length of time to wait for subsequent payment will determine whether the arrears will be accepted or not. In most cases in life, during a short period of time, the waiting period is longer, reducing the lag. Therefore, for real business cases, the delay rate should be different and depends on the waiting time for the next recovery. Many researchers have altered the impact of the policy on the ferry industry's calculation for the corona virus based on the partial delay rate. Gupta and Singh [1] Local mean decomposition and artificial neural network approach to mitigate tool chatter and improve material removal rate in turning operation. Gupta and Singh [2] Ensembled local mean decomposition and genetic algorithm approach to investigate tool chatter features at higher metal removal rate. Gupta and Singh [3] Analyzing chatter vibration during turning on computer numerical control lathe using ensemble local mean decomposition and probabilistic approach. Gupta and Singh [4] Exploration of tool chatter in CNC turning using a new ensemble approach. Yadav and Swami [5] A partial backlogging production-inventory lot-size model with time-varying holding cost and weibull deterioration. Yadav and Swami [6] Integrated Supply Chain Model For Deteriorating Items With Linear Stock Dependent Demand Under Imprecise And Inflationary Environment. Yadav and Swami [7] A Volume Flexible Two-Warehouse Model with Fluctuating Demand and Holding Cost under Inflation. Yadav, et al. [8] FIFO & LIFO in Green Supply Chain Inventory Model Of Hazardous Substance Components Industry With Storage Using Simulated Annealing. Yadav, et al. [9] Red Wine Industry of Supply Chain Management for Distribution Center Using Neural Networks. Yadav, et al. [10] Healthcare Systems Of Inventory Control For Blood Bank Storage With Reliability Applications Using Genetic Algorithm. Yadav, et al. [11] N. Ahlawat, N. and Swami, A. Components Industry With Distribution Centres Using Particle Swarm Optimization. Yadav, et al. [12] LIFO in Green Supply Chain Inventory Model Of Auto-Components Industry With Warehouses Using Differential Evolution. Yadav, et al. [13] Supply Chain of Chemical Industry For Warehouse Distribution Centres Using Artificial Bee Colony Algorithm. Yadav, et al. [14] An Inflationary Inventory Model for Deteriorating items under Two Storage Systems. Yadav, et al. [15] Multi Objective Optimization for Electronic Component Inventory Model & Deteriorating Items with Two-warehouse using Genetic Algorithm. Yadav, et al [16] Reliability Consideration costing method for LIFO Inventory model with chemical industry warehouse. Yadav, et al. [17] Rose Wine industry of Supply Chain Management for Storage using Genetic Algorithm. Yadav, et al. [18] Medicine Manufacturing Industries supply chain management for Blockchain application using artificial neural networks. Yadav, et al. [19] Supply Chain Inventory Model for Two Warehouses with Soft Computing Optimization. Yadav, et al. [20] National Blood Bank Centre Supply Chain Management for Blockchain Application Using Genetic Algorithm.

2. Background

2.1. Block-chain

Blockchain is a network technology, endowed with its ability to publicly verify, record and distribute transactions at an unaltered and encrypted rate. The technology is designed to maintain transactions in bitcoin, a digital currency that operate independently of a central bank. In short, Blockchain technology provide a platform for all bitcoin transactions - that is, creating or distributing records for millions, if not millions, of computers connected to networks around the world. As an activity with cryptocurrency manufacturers, Blockchain Technology offers greater security than the banking model and is the current online shipping process to open a bank for two to three days and transfer money from one account to another. Eliminate management costs. The term “Blockchain” comes from the “constraint” of legal and immovable transactions and how they are linked to a chain (disclosure) sequence. Hence the word “blockchain”.

2.2. Medicine industry wastewater treatment

The wastewater treatment industry varies widely in flow and structure, depending on factors such as production rate, special preparation, wastewater operations, and so on. All of these parameters mean that the final sewage contamination can be very different and vary over time. In general, these wastewater consists of the following: Large amounts of organic matter, many of which can decompose (alcohol, acetone, etc.) Slowly decomposing organic compounds and reject substances (aromatic compounds, chlorinated hydrocarbons, n.k.). Soaps and soaps and enhancements. Most wastewater is made with washing equipment at the end of the production process. It contains a small amount of other pollutants caused by water purification (reverse osmosis rejection and regeneration of ion resins), plant cleaning, laboratory sewage and so on. The best wastewater treatment methods produced by this type of industry will depend on each individual case, taking into account their major differences and the range of possible compounds.

2.3. Particle swarm optimization

Particle improvement is initiated by a number of random solutions, and every one possible solution is given a random rate. A solution that can be called a particle has poured into the problem space. Every one particle follows its coordinates in the problem area of the best solution or prosperity achieve so far, the value of equilibrium is also preserved. This value is called pbest. Another outstanding worth set by the global version of the PSO is the best worth and its place is found so far by every particle in the population. This worth is called gbest. So, in each phase, the constituent part changes its speed to a more pleasant and beautiful one, this is the universal version of the PSO in which all particles, except the best, follow a solution known as nbest or gbest. The best extract from local particle topology is a process called the internal version of the PSO.

2.3.1. Notations

In addition, the subsequent notations are used all through this paper:

\[ D(t) : \text{Demand rate} \]

\[ H(t) : \text{Heaviside's function defined as } H(t) = \begin{cases} 0, & t < T_1 \\ 1, & t \geq T_1 \end{cases} \]

\[ (\phi + 1) / \phi(t) : \text{"Backlogging rate"} \]

\[ I_{\text{OE}}(t) : \text{The Economic impact of Coronavirus pandemic Medicine industry inventory level in OW at any time } t \]

\[ W : \text{"The capacity of the own warehouse"} \]

\[ Q : \text{"The ordering quantity per cycle"} \]
3. Inventory formulation and clarification of the model

Economic impact of Coronavirus pandemic Medicine industry inventory level at OW is administered by the following differential equations:

\[
\frac{dlw(t)}{dt} = [-(\frac{\alpha}{\theta_0}) (t)I(t)]\quad 0 \leq t < T_1
\]  

\[
\frac{dlw(t)}{dt} + \left(\frac{\alpha}{\theta_0}\right) (t)I(t) = \left[-\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right]_{T_1} \leq t \leq T_2
\]

And

\[
\frac{dlw(t)}{dt} = \left[-\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right]_{T_2} \leq t \leq T_0
\]

\[l_{ow}(0) = W \text{ and } l(T_2) = 0 \quad (4)
\]

“The solutions of equations (1), (2) and (3) are given by”

\[l_{ow}(t) = We^{\left(-\frac{\omega}{\theta_0}t\right)^{1/2}}, \quad 0 \leq t < T_1
\]

\[l_{ow}(t) = \left[\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right]_{T_1} \leq t < T_2
\]

And

\[l_{ow}(t) = \left[\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right]_{T_2} \leq t < T_0
\]

respectively.

The Economic impact of Coronavirus pandemic Medicine industry inventory level at RW is administered by the resulting differential equations:

\[
\frac{dlw(t)}{dt} + \left(\frac{\alpha}{\theta_0}\right) (t)I(t) = \left[-\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right]_{0 \leq t < T_1}
\]

\[l_{ow}(0) = 0
\]

\[l_{ow}(t) = \left[\left(\frac{\alpha}{\theta_0}\right) \left(\frac{\omega}{\theta_0}\right)^{1/2} \right]_{T_1} \leq t < T_2
\]

“Due to continuity of \(l_{ow}(t)\) at point \(t = T_1\) it follows from equations (5) and (6), one has”

\[W e^{\left(-\frac{\omega}{\theta_0}t\right)^{1/2}} = \left[\left(\frac{\alpha}{\theta_0}\right) e\left(-\frac{\omega}{\theta_0}t\right)\right] \quad (7)
\]

“The total average cost consists of following elements”:

Ordering cost \(Z_{o0}\)

\[Z_{o0} = \left(\frac{\alpha}{\theta_0}\right)
\]

(ii) Holding cost \(Z_{h0}\) in OW

\[Z_{h0} = \zeta_1 \int_0^{T_1} l_1(t)e^{\left(-\frac{\omega}{\theta_0}\right)t_1} \, dt + \int_{T_1}^{T_2} l_1(t)e^{\left(-\frac{\omega}{\theta_0}\right)t_1} \, dt
\]

\[Z_{h0} = \zeta_1 \left\{\begin{array}{l}
T_1 e^{\left(-\frac{\omega}{\theta_0}\right)t_1} + \left(\frac{\omega}{\theta_0}\right) t_2 - \left(\frac{\omega}{\theta_0}\right) t_1
\end{array}
\]

\[T_2 - \left(\frac{\omega}{\theta_0}\right) t_2 + \left(\frac{\omega}{\theta_0}\right) t_1
\]

\[T_2 - \left(\frac{\omega}{\theta_0}\right) t_2 + \left(\frac{\omega}{\theta_0}\right) t_1
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\[T_2 - \left(\frac{\omega}{\theta_0}\right) t_2 + \left(\frac{\omega}{\theta_0}\right) t_1
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\]

\[T_2 - \left(\frac{\omega}{\theta_0}\right) t_2 + \left(\frac{\omega}{\theta_0}\right) t_1
\]
(iii) Holding cost ($Z_{HR}$) in RW

\[
Z_{HR} = \frac{a}{a_0} \int_0^{T_1} I_r(t) e^{-\left(\frac{T_r}{T_1}\right)} dt
\]

(iv) Cost of deteriorated units per cycle ($Z_{DC}$)

\[
Z_{DC} = Z_5 \left[ \frac{f_1^1 \left( \frac{R_1}{R_0} \right) t_0(t) e^{-\left(\frac{T_r}{T_1}\right)} dt}{\left(\frac{T_r}{T_1}\right)} \right]
\]

(v) Wastewater treatment cost per cycle ($Z_{SC}$)

\[
Z_{SC} = Z_3 \left[ \int_{T_2}^{T_3} -l_1(t) e^{-\left(\frac{T_r}{T_1}\right)} dt \right]
\]

(vi) Opportunity cost ($Z_{OC}$)

\[
Z_{OC} = Z_4 \left[ \frac{a - 1}{a_0} \int_0^{T_1} \left[ 1 - e^{-\left(\frac{T_r}{T_1}\right)} \right] e^{-\left(\frac{T_r}{T_1}\right)} \right] dt
\]

(vii) The Efficient recall Maintenance cost

\[
RM_e = A_0 Z_7
\]

\[
\begin{align*}
\text{(viii) Chemical cost in use wastewater treatment.} \\
C_e = A_3 Z_9 + A_2 Z_8 + \left(\frac{a - 1}{a_0}\right) e^{-\left(\frac{T_r}{T_1}\right)} \left[t - (t - T_1)_{1/2} \right]
\end{align*}
\]

4. Particle swarm optimization

Particle improvement is initiated by a number of random solutions, and every one possible solution is given a random rate. A solution that can be called a particle has poured into the problem space. Every one particle follows its coordinates in the problem area of the best solution or prosperity achieve so far, the value of equilibrium is also preserved. This value is called best. Another outstanding growth set by the global version of the PSO is the best worth and its place is found so far by every particle in the population. This worth is called gbest. So, in each phase, the constituent part changes its speed to a more pleasant and beautiful one, this is the universal version of the PSO in which all particles, except the best, follow a solution known as nbest or gbest. The best extract from local particle toplology is a process called the internal version of the PSO.

Step 1: “Divide the region where the solution is best”.

Step 2: “Start each pheromone trace with the same amount of pheromone and create a doable solution at random”.

\[
\text{SQC} = A_1 Z_6
\]

\[
\text{RM_e} = A_0 Z_7
\]

\[
\text{WWT_e} = A_2 Z_8 + \left(\frac{a - 1}{a_0}\right) e^{-\left(\frac{T_r}{T_1}\right)} \left[t - (t - T_1)_{1/2} \right]
\]

\[
\text{Recycle cost.} \\
R_e = A_4 Z_{10} + A_3 Z_9 + A_2 Z_8 + \left(\frac{a - 1}{a_0}\right) e^{-\left(\frac{T_r}{T_1}\right)} \left[t - (t - T_1)_{1/2} \right]
\]

Therefore, the total average cost per unit time of our model is obtained as follows

\[
T_r \left( T_1, T_2, T_3 \right) - \sum_{\text{Ordering cost} + \text{Holding cost} + \text{Wastewater cost} + \text{Opportunity cost} + \text{Scanning cost} + \text{Efficient recall Maintenance cost} + \text{Recycle cost}}
\]

\[
\text{Chemical cost in use wastewater treatment.}
\]

\[
\text{Recycle cost.}
\]
Step 3: “Move the ants according to the pheromone paths to produce a viable solution”.
Step 4: “Repeat the third step for a number of ants”.
Step 5: “Update the pheromone based on the best possible solution in iterating the current algorithm”.
Step 6: “Repeat the third and fifth steps for a certain number of loops or termination criteria”.
Step 7: “Report the best solution”.

5. Blockchain in medicines inventory model

(i) **Manufacturer of medicines and adds a QR code**: The manufacturer makes medicines and adds a QR code that contains basic information such as timestamp, name of the item, area and composition and expiration date. The data contained by the manufacturer is placed on a blockchain, making it easier for other partners to track the drug supply chain. When data is added to the blockchain, a hash ID is provided which can be used to track the exchange.

(ii) **Distributors send medicines to hospitals**: When logistics providers deliver medicines to distributors, they can check the origin of the prescription using a hash ID stored on the blockchain. Distributors approve the medications received and carefully sign the exchange which is then added to the blockchain.

(iii) **Pharmacists receive drugs and check its source**: Drug specialists are given drugs that they can track to understand their origin using a hash ID stored on the blockchain. With the exception of the possibility that an illegal trader attempts to sell counterfeit medicines with a forged identity card to specialists or patients, the exchange is considered invalid due to false information on the medicines.

(iv) **Patients buy medicines and scan the QR code to find its source**: Patients can be assured whether the medicine they are purchasing is safe or not. By checking the QR code that is added to the medicine package with the portable application, they can learn more about its source even if it meets the quality guidelines. A hash ID associated with a QR code would bring data from the blockchain and patients can access basic details.

6. Blockchain advantages

(i) **Full traceability of health products**: The use of pharmaceutical block agreements will facilitate the visibility of the development and partners through which medicines or prescriptions travel in the store network. Better visibility encourages streamlined product flow and an efficient inventory management framework.

(ii) **Reduced counterfeiting losses**: The use of blockchain can improve the clear visualization of the journeys of healthcare products through the supply chain. In the event that a problem arises during a drug or drug supply, the blockchain may be able to identify the last partner the item passed through.

(iii) **Transparency to improve accountability**: The procurement and transport of healthcare products through the supply chain can be closely monitored. Furthermore, it is possible to keep track of the stakeholders or partners involved in the supply chain. In the event that a problem arises during a drug or drug supply, the blockchain may be able to identify the last partner the item passed through.

(iv) **Effective recall management**: The use of blockchain in a pharmaceutical store network can enable the identification of specific drug locations. Cluster updates can be transmitted or completed productively and quickly while maintaining patient health safety. A private blockchain can be a compelling case for using the pharmaceutical economic impact of the Coronavirus pandemic medicine industry inventory network, but the rights granted to each partner may differ depending on their business.

7. Numerical design

To point up the model numerically the following parameter values are well thought-out.

\[ \frac{Z_1}{T_1} = 350 \text{ units}, \quad \frac{Z_2}{T_1} = 33.0 \text{ each item and year}, \quad \frac{Z_3}{T_1} = 0.035 \text{ each item,} \]
\[ Z_4 = Rs. 330.0 \text{ each item and year}, \quad Z_5 = Rs. 300.0 \text{ each item,} \]
\[ Z_6 = Rs. 332.0 \text{ each item and year,} \quad Z_7 = Rs. 232.0 \text{ each item and year}, \quad Z_8 = Rs. 3300 \text{ per order,} \]
\[ T_1 = 3.2 \text{ year}, \quad Z_9 = Rs. 34.0 \text{ each item,} \quad Z_{10} = 0.023 \text{ each item,} \]
\[ Z_{11} = Rs. 332.0 \text{ each item and year,} \quad Z_{12} = Rs. 332.0 \text{ each item and year,} \quad Z_{13} = Rs. 132.0 \text{ each item and year,} \quad T_2 = 2 \text{ year,} \]
\[ T_3 = 0.799224 \text{ year,} \quad S = 38.597235 \text{ units and} \quad T^c = Rs.358.335354 \text{ per year.} \]

Actual values must be condensed with the particular PSO through experience and trial and error. However, some standard arrangements are described in the literature.

Population size = 190, Number of generations = 3100, Crossover type = colon, Crossing rate = 1.8
Mutation types = flip bit, mutation rate = 0.013 per bit
If a single point crossing is used instead of a two point crossing, the crossing speed can be reduced to a maximum of 1.70

8. Sensitivity analysis

Fig. 1.Fig. 2.Fig. 3.Table 1.Table 2.Table 3.Table 4.Table 5.Table 6.
Table 7.Table 8.Table 9.Table 10.Table 11.Table 12.Table 13.

9. Conclusion

A single item is considered in this model which deteriorates with variable rate of deterioration. Let Q be the total amount of initial Economic impact of Coronavirus pandemic Medicine industry inventory at the commencement of each cycle after fulfilling backorders. Out of Q units, W units are reserved in the own warehouse and the remaining units in the rented warehouse. To institute the total cost relevant function, we consider the following time intervals independently: \( T_{11}, \ T_{12}, \ T_{21}, \ T_{22}, \ T_{23} \). Between the interval \( T_{11} \), the Blockchain application Based Economic impact of Coronavirus pandemic Medicine industry inventory levels are positive at RW and OW using Particle swarm optimization. At RW, the Blockchain application Based Economic impact of Coronavirus pandemic Medicine industry inventory is depleted due to the combined effect of demand and deterioration and wastewater treatment cost using Particle swarm optimization. At OW, the Blockchain application Based Economic impact of Coronavirus pandemic Medicine industry inventory is only depleted only by the
Fig. 1. Graphical representation of Pollution load of parameters analyzed in Medicine industry wastewater.

Table 1
The parameter is holding cost in RW.

| \( Z \) | \( T_1 \) | \( T_2 \) | \( T_n \) | \( T^2(T_2, T_n) \) |
|------|------|------|------|------|
| 30   | 0.3732| 3.4993| 0.0866| 3482.72 |
| 27.5 | 0.3959| 3.5002| 0.0863| 3490.43 |
| 22.5 | 0.4369| 3.5029| 0.0856| 3485.08 |
| 20   | 0.4362| 3.6668| 0.0853| 3475.85 |

Table 2
The parameter is holding cost in OW.

| \( Z \) | \( T_1 \) | \( T_2 \) | \( T_n \) | \( T^2(T_2, T_n) \) |
|------|------|------|------|------|
| 24   | 0.4535| 3.5220| 0.3370| 3896.03 |
| 22   | 0.4268| 3.5323| 0.3336| 3692.90 |
| 38   | 0.3734| 3.4894| 0.0607| 3280.54 |
| 36   | 0.3393| 3.4756| 0.0338| 3070.75 |

Table 3
The parameter is Shortage cost.

| \( Z \) | \( T_1 \) | \( T_2 \) | \( T_n \) | \( T^2(T_2, T_n) \) |
|------|------|------|------|------|
| 320  | 0.4008| 3.5002| 0.0863| 3492.90 |
| 330  | 0.4033| 3.4989| 0.0866| 3490.39 |
| 90   | 0.3998| 3.5027| 0.0857| 3485.38 |
| 80   | 0.3993| 3.5040| 0.0853| 3482.87 |

Table 4
The parameter is Opportunity cost.

| \( Z \) | \( T_1 \) | \( T_2 \) | \( T_n \) | \( T^2(T_2, T_n) \) |
|------|------|------|------|------|
| 32   | 0.2535| 3.4328| 0.0024| 838.953 |
| 33   | 0.3307| 3.4653| 0.0448| 3385.25 |
| 9    | 0.4636| 3.5402| 0.3262| 3809.15 |
| 8    | 0.5224| 3.5807| 0.3655| 2032.73 |
Table 5
The parameter is Deteriorated cost.

| $Z_5$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-------|-------|-------|-------|-----------------|
| 30    | 0.4006| 3.5009| 0.0738| 3489.38         |
| 27.5  | 0.4005| 3.5032| 0.0782| 3488.56         |
| 22.5  | 0.4002| 3.5039| 0.0954| 3487.06         |
| 20    | 0.3999| 3.5024| 0.3072| 3486.04         |

Table 6
The Scan the QR code cost.

| $Z_6$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-------|-------|-------|-------|-----------------|
| 420   | 0.4556| 4.5297| 0.4396| 4937.06         |
| 430   | 0.4289| 4.5364| 0.4329| 4703.62         |
| 40    | 0.4690| 4.4854| 0.4587| 4269.66         |
| 50    | 0.4342| 4.4649| 0.4333| 4048.43         |

Table 7
The Efficient recall Maintenance cost.

| $Z_7$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-------|-------|-------|-------|-----------------|
| 520   | 0.5556| 5.5297| 0.5396| 5937.06         |
| 530   | 0.5289| 5.5364| 0.5329| 5703.62         |
| 50    | 0.5690| 5.4854| 0.5587| 5269.66         |
| 60    | 0.5342| 5.4649| 0.5333| 5048.43         |

Table 8
The Wastewater treatment cost.

| $Z_8$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-------|-------|-------|-------|-----------------|
| 620   | 0.6556| 6.5297| 0.6396| 6937.06         |
| 630   | 0.6289| 6.5364| 0.6329| 6703.62         |
| 60    | 0.6690| 6.4854| 0.6587| 6269.66         |
| 50    | 0.6342| 6.4649| 0.6333| 6048.43         |

Table 9
Chemical cost in use wastewater treatment.

| $Z_9$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-------|-------|-------|-------|-----------------|
| 720   | 0.4556| 7.5297| 0.7396| 7937.06         |
| 730   | 0.7289| 7.5364| 0.7329| 7703.62         |
| 70    | 0.7690| 7.4854| 0.7587| 7269.66         |
| 60    | 0.7342| 7.4649| 0.7333| 7048.43         |

Table 10
The Recycle cost.

| $Z_{10}$ | $T_1$ | $T_2$ | $T_n$ | $T^*(T_2, T_n)$ |
|-----------|-------|-------|-------|-----------------|
| 820       | 0.8556| 8.5297| 0.8396| 8937.06         |
| 830       | 0.8289| 8.5364| 0.8329| 8703.62         |
| 80        | 0.8690| 8.4854| 0.8587| 8269.66         |
| 70        | 0.8342| 8.4649| 0.8333| 8048.43         |

Table 11
Sensitivity analysis with PSO.

| Function | Algorithm | Best  | Worst | Mean  | Standard Deviation |
|----------|-----------|-------|-------|-------|--------------------|
| $Z_1$    | PSO       | 0.16488 | 19.4764 | 10.6807 | 013,436           |
| $Z_2$    | PSO       | 0.17477 | 10.7060 | 14.0498 | 017,604           |
| $Z_3$    | PSO       | 0.17468 | 10.6809 | 14.0600 | 017,570           |
| $Z_4$    | PSO       | 0.17605 | 13.0333 | 13.6067 | 018,080           |
| $Z_5$    | PSO       | 0.10073 | 18.6083 | 10.7003 | 010,730           |

Table 12
Data of reported Medicine industry wastewater characteristics.

| Parameter                 | Min       | Max       | Standard deviation | Mean   |
|---------------------------|-----------|-----------|--------------------|--------|
| pH                        | 12.4      | 52.4      | 32.48              |        |
| EC                        | 12.25      | 52.25     | 32.25              |        |
| Total solids              | 124.3      | 524.3     | 324.35             |        |
| Total volatile solids     | 124.5      | 524.5     | 324.54             |        |
| Suspended solids          | 126.7      | 526.7     | 326.78             |        |
| Total sugars              | 125.2      | 525.2     | 325.26             |        |
| Citric acid               | 129.0      | 529.0     | 329.04             |        |
| Tartaric acid             | 128.2      | 528.2     | 328.27             |        |
| Malic acid                | 124.2      | 524.2     | 324.28             |        |
| Lactic acid               | 127.3      | 527.3     | 327.37             |        |
| Succinic acid             | 12.2       | 52.2      | 32.22              |        |
| n-Valeric acid            | 12.8       | 52.8      | 32.82              |        |
| Hexanoic acid             | 12.3       | 52.3      | 32.37              |        |
| Ethyl butyrate            | 120.4      | 520.4     | 3204.4             |        |

Table 13
Pollution load of parameters analyzed in Medicine industry wastewater.

| Chemical parameters | Value |
|---------------------|-------|
| Ph                  | 17.1  |
| Phenolphthalen      | 1147  |
| Methyl orange       | 122   |
| Chemical oxygen demand | 11,926          |
| Biochemical oxygen demand | 112.8          |
| Phosphate           | 115.8 |

Effect of deterioration. During the interval $[T_1, T_2)$, the Blockchain application Based Economic impact of Coronavirus pandemic Medicine industry inventory in OW is depleted outstanding to the mutual consequence of demand and deterioration, becomes zero and wastewater treatment cost and wastewater treatment cost using Particle swarm optimization. Afterwards, shortages begin to develop with the concept of partial backlogging and the replenishment is made again at time $t = T_n$ to meet all the unsatisfied demand and to hold the Blockchain application Based Economic impact of Coronavirus pandemic Medicine industry inventory for the next cycle and wastewater treatment cost using PSO.
CRediT authorship contribution statement

Ajay Singh Yadav: Mathematical and Software supervision.
Garima Pandey: Waste water treatment (using chemical).
Tarun Kumar: Arora Blockchain Application.
Pavan Kumar Chaubey: Software supervision.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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