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**“LOGISTIC DISTRIBUTION MODEL”: A STRATEGIC  
PERSPECTIVE OF SELLERS AT E- COMMERCE PLATFORM: IN  
THE REFERENCE OF AMAZON COMPANY- A CASE STUDY**

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**Article Received: 29 January 2026**

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**Article Revised: 18 February 2026**

Department of Applied Business Economics aculty of Commerce Dayalbagh

**Published on: 10 March 2026**

Educational Institute Agra-282005.

DOI: <https://doi-doi.org/101555/ijrpa.7349>

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## **ABSTRACT**

This paper demonstrates the state-of-the-art Amazon e-commerce logistic in supply chain management from a practical standpoint. This study compares and investigates the various logistic distribution modalities that Amazon Sellers must deal with in order to determine the of challenges and benefits associated with different logistic management practices. Different types of neo Logistic practices exist: (1) Fulfillment by Amazon, (2) Third-Party Logistic Distribution, (3) Self-Established Logistic Distribution (4) Amazon Prime Fulfillment (5) Easy Ship (6) Seller Flex. Nowadays, Amazon sellers are facing the problem for making their product cost effective, how to increase their product visibility, Inventory management, provide the product to customer in least time with concern of Distribution quality, for this they need best supply management practice. To explore the best logistic mode, this study has been carried out. Analytic Hierarchy Process and Technique for order performance by similarity to Ideal Solution have been used to making decision among various logistic practices. It's a concerted endeavor to discover the finest logistical methods for an ever-changing world while simultaneously enhancing efficiency. Consumers now rely on online retail enterprises and prefer to purchase for items and services online, according to changing trends. By analyzing the data it has been concluded that Fulfilled by Amazon Prime is best logistic model.

## INTRODUCTION

Hundreds of millions of items are listed on Amazon, making it one of the largest shopping platforms. About half of them are sold by third-party vendors. Amazon is an American international technology corporation created by Jeff Bezos on July 5, 1994, in his garage in Bellevue, Washington. It began as an online marketplace for books, but has since evolved to include a wide range of products. Amazon has a total of 75.1 million things for sale. Logistic plays a significant influence in the success of internet commerce firms. A good logistic system not only saves money on processing, storage, and transportation, but it also provides value to the transaction and increases consumer preference for buying items from online retailers.

According to Amazon seller data, there are 9.6 million merchants on the platform, with around 2.4 million of them having products for sale. Annual sales of \$100,000 are possible for active sellers.

Data is also important in making decisions about corporate supply chains and logistic operations that are adaptable to changing world conditions. Relevant work support procedures, such as traffic management, warehouse management, inventory management, packing, and order monitoring, are ensured by logistic management. The efficiency with which e-commerce enterprises use logistics methods today determines their success. In this digital age, Amazon is implementing a technology-driven logistics strategy that worked so successfully during the COVID-19 pandemic.

Amazon saves a lot of money on storage by combining inventory in Distribution Centers and partner warehouses. Then, unlike physical retail establishments, Amazon does not need to maintain a large inventory. To accommodate online operations, e-commerce shipments necessitate a completely new distribution infrastructure.

All assets, abilities, organizational procedures, and business attributes are included in logistic capability. Logistic capability is positively connected with a company's success route.

## Review of Literature

S.No.	AUTHOR	YEAR	TOPIC	OBJECTIVE	FINDINGS
1	Chen Xianglian, Lin Hua	2013	Research on e-commerce logistic system informationization into Chain.	To identify the self-grasp on trending logistics mode on set up e-commerce	It concluded that the enlarge in the logistic sector with artificial

				distribution system.	intelligency.
2	Jay Joong Kun Cho, John Ozment, Harry Sink.	2008	Logistic capability, logistic outsourcing and firm performance in an e-commerce market.	Effect of logistic competence and logistic source on company performance in an e-commerce market.	This study revealed that the capability of logistic is positively related with company performance in an e-commerce market.
3	Slobodan Acimovic, Veljko Mijuskovic, Nikola Milosevic.	2007	Logistic Aspect of goods home delivery: The case of Amazon Company.	Adequate effectiveness of logistics scenario for all business activity.	Finding of the study is that the modern delivery with e-commerce played a major role in entrepreneurship innovation .
4	Guoming Lai, Huihui Liu, Wenqiang Xiao.	2018	“Fulfillment by Amazon” : perspective competition at the E-commerce Platform.	To examine the economic impact of the FBA services to 3 <sup>rd</sup> party seller on retailers stage.	FBA is more effective and beneficial platform to third party and Amazon.
5	Irina V. Onyusheva , Tanathon Seenalatasatapom	2018	Strategic analytic of global e-commerce and diversification technology: The case of Amazon .company..	To identify the strategically problems of the Amazon in internal and external business scenario.	Company need to broaden development strategy in every area to maintain its competitive advantage.

### Objective of the study

- To know the essential factors for best Logistic management system in India.
- To find out the best logistic model among the existing model of Amazon for Sellers.

### Methodology of the study

This part consists of research methodologies employed by this study. For research perspective, Amazon Company has been selected. It is the attempt to explore in depth of different existing Logistic modes, to determine the best logistic practices. Analytic Hierarchy Process method has been used to study all factors of logistic practices that are affecting supply chain management.

This study is both statistical and analytical in nature and discusses the key elements that improve value chain of e-commerce Company.

### **Analytic Hierarchy Process**

This strategy is used to make decisions and select the best option from a list of options. We begin by defining options, and then we specify the criteria. Prepare a model based on both options and criteria and then use a Pairwise comparison matrix to determine precedence among criteria. Finally, perform a consistency check to determine relative weightage.

### **TOPSIS**

It is a method for comparing a set of options by determining weights for each criterion, calculating vector normalized scores for each criterion, and computing Euclidean distance. Select the suitable choice based on the distance between each alternative and the ideal alternative.

### **Source of the Data**

The study uses secondary data for analyzing the neo logistic practices of Amazon Company.

### **Data Analysis**

In the case study of Amazon Company, we detail our analysis of the e-commerce distribution mode in this section.

Internal assets and employees are used to measure self-established logistic capabilities, as well as how they handle supply chain management with professional expertise.

Third-party logistic providers, like logistic outsourcing, handle items from supplier to end customer and handle various parts of a company's supply chain, such as inventory management and warehouse management, as well as order processing. Amazon provides some logistic management models to Amazon sellers in order for them to minimize costs, increase order rates, and get things to their customers faster than ever before.

Our Research detailed analyzes the essential factors that works as benchmark to compare all sorts of logistic practices in perspective of Sellers-

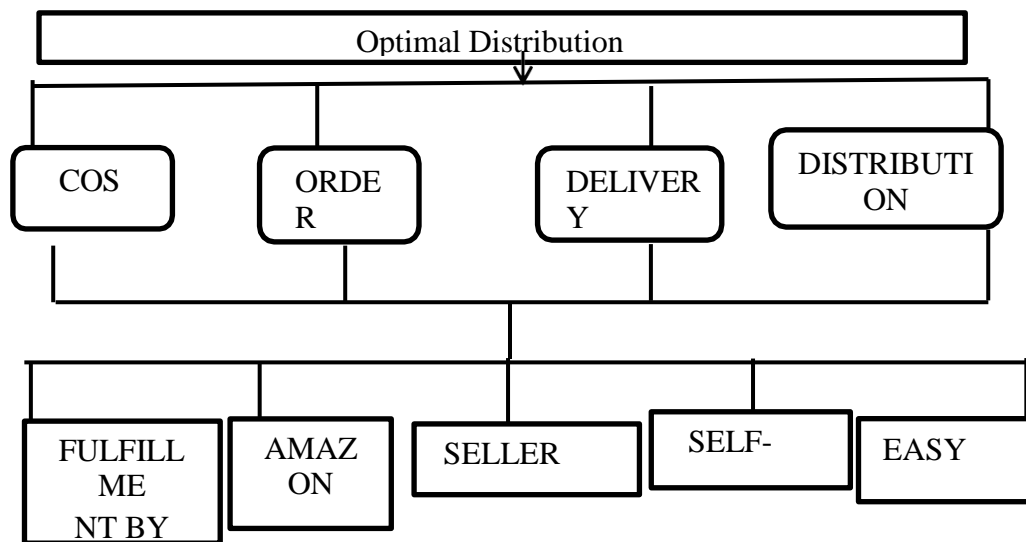
- Cost
- Order Rate
- Delivery Lead time
- Distribution Quality

### **Analytic Hierarchy process Method-**

Here, Analytic Hierarchy Process has been used for decision making in multi criteria regarding to know the best logistic practices for Amazon sellers:-

**Table.1.Selection of Best Logistic Practices.**

Alternatives	Logistic Practices	1 Cost (10000)	2 Order (1000)	3 rate Delivery Lead Time(10)	4 Distribution Quality (100)
1	FBA	7000	800	8	60
2	Amazon Prime	5000	900	2	90
3	Seller Flex	9000	600	5	50
4	Self-Ship	4000	300	9	20
5	Easy Ship	6000	500	6	70



**Fig.1.Optimum Distribution Model.**

**Table.2.Pair Wise Comparison mix.**

Criterion layer judgement matrix about the target layer.

	Cost	Order Rate	Delivery Lead Time	Distribution Quality
Cost	1	1/7	1/5	1/3
Order Rate	7	1	2	3
Delivery Lead Time	5	1/2	1	3
Distribution Quality	3	1/3	1/3	1

Then, the judgement matrix is simplified-

**Table.3. Simplification of Judgement Matrix.**

	Cost	Order Rate	Delivery Lead Time	Distribution Quality
Cost	1	0.14	0.2	0.33
Order Rate	7	1	2	3
Delivery Lead Time	5	0.5	1	3
Distribution Quality	3	0.33	0.33	1
Sum	16	1.97	3.53	7.33

Then the Normalized Decision Matrix has been made (after dividing the Decision preferences by Total Value-

**Table.4. Normalized Decision Matrix.**

	Cost	Order Rate	Delivery Lead Time	Distribution Quality
Cost	0.06	0.07	0.06	0.05
Order Rate	0.44	0.51	0.57	0.41
Delivery Lead Time	0.31	0.25	0.28	0.41
Distribution Quality	0.19	0.17	0.09	0,14

After Normalized Decision Matrix, Criteria Weight has been calculated on basis of given data:-

**Table.5. Calculation of Criteria Weight.**

	Cost	Order Rate	Delivery Lead Time	Distribution Quality	Criteria Weight
Cost	0.06	0.07	0.06	0.05	0.06
Order Rate	0.44	0.51	0.57	0.41	0.48
Delivery Lead Time	0.31	0.25	0.28	0.41	0.31
Distribution Quality	0.19	0.17	0.09	0,14	0.15

After Calculation of Criteria Weight, Weighted Sum Value has been calculated by dividing the judgement matrix by Criteria weight, then the ratio is to be calculated between Weighted Sum value and Criteria Weight:-

**Table.6. Calculation of Weighted Sum Value**

	Cost	Order Rate	Delivery Lead Time	Distribution Quality	Weighted Sum Value	Criteria Weight	Ratio
Cost	0.06	0.07	0.06	0.05	0.24	0.06	4.0587
Order Rate	0.42	0.48	0.62	0.45	1.97	0.48	4.1021
Delivery Lead Time	0.30	0.24	0.31	0.45	1.30	0.31	4.1309
Distribution Quality	0.18	0.16	0.10	0.15	0.59	0.15	4.0395

Now, Calculate the Consistency Index:-

$$\text{Consistency Index} = (\lambda_{\max} - N) / (N - 1)$$

$$\lambda_{\max} = 4.0587 + 4.1021 + 4.1309 + 4.0395 / 4 = 4.0827$$

$$\text{Consistency index} = 4.0827 - 4 / (4 - 1) = 0.0275$$

After Calculation of Consistency Index, Consistency ratio has been found out to know the consistency level-

Consistency Ratio= Consistency Index/ Random Index Random Index for 4 Matrix Size is **0.9**

Consistency Ratio=  $0.0275/0.9=0.030$

**The Consistency ratio is  $\leq 0.1$  (Standard Consistency ratio)  $0.030 \leq 0.1$**

**If, Consistency Ratio is less than 0.1, then matrix is reasonably constant.**

Now, Local Priorities of the alternatives with respect to each criterion. Assign the Priorities to each criterion to be clear about the preferences of Logistic Model-

**Table.7. Assignment of Priorities to Criteria.**

	1	2	3	4
Logistic Practices	Cost (10000)	Order rate (1000)	Delivery Time(10)	Lead Distribution Quality (100)
FBA	$4000/7000=0.5714$	$800/900=0.889$	$2/8=0.25$	$60/90=0.66$
Amazon Prime	$4000/5000=0.8$	$900/900=1$	$2/2=1$	$90/90=1$
Seller Flex	$4000/9000=0.444$	$600/900=0.667$	$2/5=0.4$	$50/90=0.55$
Self-Ship	$4000/4000=1$	$300/900=0.333$	$2/9=0.22$	$20/90=0.22$
Easy Ship	$4000/6000=0.667$	$500/900=0.555$	$2/6=0.33$	$70/90=0.78$

Synthesis of Model:-

FBA=  $0.57+0.89+0.25+0.66=2.37$

Amazon Prime=  $0.8+1+1+1=3.8$

Seller flex=  $0.44+0.67+0.40+0.55=2.06$

Self-Ship=  $1+0.33+0.22+0.22=1.77$

Easy ship=  $0.67+0.55+0.33+0.78=2.33$

**Table.8. Priority of Logistic Model.**

Alternatives	Overall priority
FBA	2.37
Amazon Prime	3.80
Seller Flex	2.06
Self-Ship	1.77
Easy Ship	2.33

In other words, Given the importance of each Logistic Model in reference of Amazon Company( Cost, Order rate, Delivery lead time, Distribution quality) The **Amazon Prime** is

preferable (overall Priority is 3.80) compared to remaining Logistic Model.

**TOPSIS Method**

Now, TOPSIS method is in the combination with AHP method, has been applies in logistic research. Our research utilizes TOPSIS method to verify the AHP model of selecting an appropriate e-commerce Logistics Distribution mode.

**Table.9. Application of TOPSIS.**

		1	2	3	4
Alternati ves	Logistic Practices	Cost (10000)	Order rate (1000)	Delivery Lead Time(10)	Distribution Quality (100)
1	FBA	7000	800	8	60
2	Amazon Prime	5000	900	2	90
3	Seller Flex	9000	600	5	50
4	Self-Ship	4000	300	9	20
5	Easy Ship	6000	500	6	70

Vector Normalization has been calculated, For this Denominator has calculated for all influential Factors, to square root of the squared summation gives denominator of all these values-

**Table.10. Computation of Vector Normalization.**

Logistic Practices	Cost	Order rate	Delivery Lead Time	Distribution Quality
FBA	7000	800	8	60
Amazon Prime	5000	900	2	90
Seller Flex	9000	600	5	50
Self-Ship	4000	300	9	20
Easy Ship	6000	500	6	70
<b>Denominator</b>	<b>14387.49</b>	<b>1466.29</b>	<b>14.49</b>	<b>139.64</b>

Now, each value is divided by its roots summation of squared value, it is a way of calculating the performance value of each cell-

**Table.11. Calculation of performance value for Each cell.**

Criteria	Cost	Order rate	Delivery Lead time	Lead Distribution Quality
FBA	$7000/14387.49=0.4865$	$800/1466.28=0.5455$	$8/14.49=0.5521$	$60/139.64=0.429$ 6
Amazon Prime	$5000/14387.49=0.3475$	$900/1466.28=0.6137$	$2/14.49=0.1380$	$90/139.64=0.644$ 5
Seller Flex	$9000/14387.49=0.6255$	$600/1466.28=0.4091$	$5/14.49=0.3450$	$50/139.64=0.358$ 0

Self-Ship	4000/14387.49=0.2780	300/1466.28=0.2046	9/14.49=0.6211	20/139.64=0.1432
Easy Ship	6000/14387.49=0.4170	500/1466.28=0.3409	6/14.49=0.4140	70/139.64=0.5012

Next, multiply the weights of each criteria with normalizes Performance Value of each cell, Weightage of each cell is 0.25.

Criteria	Cost	Order rate	Delivery Lead time	Distribution Quality
FBA	0.1216	0.1364	0.1380	0.1074
Amazon Prime	0.0869	0.1534	0.0345	0.1614
Seller Flex	0.1564	0.1023	0.0863	0.0895
Self-Ship	0.0695	0.0512	0.1553	0.0358
Easy Ship	0.1043	0.0852	0.1035	0.1253
V <sup>+</sup> <sub>1</sub>	0.0695	0.1534	0.0345	0.1614
V <sup>-</sup> <sub>1</sub>	0.1564	0.0512	0.1553	0.0358

V<sup>+</sup><sub>1</sub>= Indicate the Ideal Best Value V<sup>-</sup><sub>1</sub>= Indicate the Ideal Worst Value

Calculating the Euclidean Distance for all alternatives, For Calculating Positive Euclidean Distance S<sup>+</sup><sub>1</sub>, taking the difference between ideal best value and each cell value of each alternative, then square the found value, after that summation of values of each alternatives.

For Calculating Negative Euclidean Distance S<sup>-</sup><sub>1</sub>, taking the difference between ideal Worst value and each cell value of each alternative, then square the found value, after that summation of values of each alternative.

Criteria	Cost	Order rate	Delivery Lead time	Distribution Quality	S <sup>+</sup> <sub>1</sub>	S <sup>-</sup> <sub>1</sub>
FBA	0.1216	0.1364	0.1380	0.1074	0.0167	0.0139
Amazon Prime	0.0869	0.1534	0.0345	0.1614	0.0003	0.0456
Seller Flex	0.1564	0.1023	0.0863	0.0895	0.0180	0.0102
Self-Ship	0.0695	0.0512	0.1553	0.0358	0.0408	0.0075
Easy Ship	0.1043	0.0852	0.1035	0.1253	0.0119	0.0146

Table.13. Calculation of Performance Score.

Criteria	S <sup>+</sup> <sub>1</sub>	S <sup>-</sup> <sub>1</sub>	S <sup>+</sup> <sub>1</sub> +S <sup>-</sup> <sub>1</sub>	P <sub>1</sub>
FBA	0.0167	0.0139	0.0305	0.4557
Amazon Prime	0.0003	0.0456	0.0459	0.9934
Seller Flex	0.0180	0.0102	0.0282	0.3617
Self-Ship	0.0408	0.0075	0.0483	0.1552
Easy Ship	0.0119	0.0146	0.0265	0.5509

$$P_1 = S^-_1 / S^+_1 + S^-_1$$

Therefore, rank the criteria on basis of its Performance score-

**Table.14. Ranking the Criteria**

Criteria	P <sub>1</sub>	Rank
FBA	0.45573	3
Amazon Prime	0.99341	1
Seller Flex	0.36174	4
Self-Ship	0.15525	5
Easy ship	0.55092	2

By providing the rank as per performance score, Amazon Prime is best logistic practice for Amazon sellers. So, here the result of AHP has been verified by TOPSIS Method. Both methods give same results.

### Data Interpretation

After analyzing the data, it becomes evident about Amazon's existing logistic model for sellers, and the criteria have been chosen on that premise, we may choose the best choices of the available Logistic Model. Cost, Delivery Lead Time, Distribution Quality, and Order Rate are the criteria. Consistency was checked using the Analytic Hierarchy Process Method, given the subjective weightage for each criterion, and the Consistency Ratio was found to be constant, the reason being that the Consistency Ratio is less than 0.1. After checking for consistency, assign Priorities to each criterion to be explicit about the Logistic Model's preferences. As a result, Amazon Prime is cost-effective, has a short delivery time, a high order rate, and good distribution quality.

TOPSIS Method has been utilized to verify the results by providing objective weightage for each criterion in order to select the best Logistic Model. Vector Normalization has been calculated, and the Euclidean Distance for all alternatives has been computed. For the Positive Euclidean Distance  $S^{+1}$ , the difference between the ideal best value and each cell value of each alternative has been calculated, and the performance score for each alternative has been identified and ranked. Because the result of this method is that Amazon Prime is the best, the **Amazon Prime Logistic Model** can be stated to be the best for Amazon Sellers.

### CONCLUSION

Analysis of the various logistic models available to Amazon sellers clearly shows that Fulfilled by Amazon Prime is the best option for supply chain management because in this

model, product visibility is always high so that customers can easily explore the product due to Prime Batch, and there are no charges for shipping the product to customers. Additionally, it provides various perks such as access to exclusive deals on Prime Day. Amazon's most frequent consumers are Prime Members and members of the younger generation, hence the order rate is higher than average.

72.8 million Amazon Prime subscribers account for almost 65 percent of all Amazon customers and 93 percent of Amazon Prime members renew their membership after a year.

- 48% of Amazon Prime Subscribers purchase product online once a week.
- 74% of Amazon Prime Subscribers purchase product online at least every few weeks.
- 37% of Nonprime members purchase online just few times a year.

As per this data, it can be concluded that Amazon sellers get larger customer base from Amazon Prime Subscribers.

In most of the cases, by using this Logistic model, Delivery takes only one or two days, so the customer is highly delighted with this service of prime.

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