e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

EVALUATING THE BEST E-COMMERCE FASHION WEBSITE USING ANALYTIC HIERARCHY PROCESS

Devansh Shah[*1], Chirag Choudhary[*2], Avani Seelam[*3], Ayush Toshniwal[*4], Ashmita Kapur[*5]

[*1,2,3,4,5]Anil Surendra Modi School Of Commerce, SVKM's NMIMS, Mumbai, India.

DOI : https://www.doi.org/10.56726/IRJMETS35401

ABSTRACT

Online shopping has significantly changed customers' shopping habits over the past few years and has become a common aspect of their overall shopping experiences. Therefore, it is crucial for retailers to improve their customers' shopping experiences through well-organized transactions and appealing websites. Customer loyalty is ensured when e-commerce websites inculcate the utmost level of perfection in their website. We have identified 5 criteria for ensuring the utmost level of customer satisfaction- User Interface, prices and offers, return policy, customer service and categories/product variety. Since e-commerce websites have a complicated structure that includes both qualitative and quantitative factors, evaluating their quality can be thought of as a multi-criteria decision-making problem. This study's objectives are to identify the critical elements that influence the success of online retail businesses and to assess e-commerce websites using web-related metrics. A collection of criteria and factors that are thought to be pertinent for evaluating e-commerce are offered in this empirical study. A ranking system based on the AHP technique is suggested to assess the efficiency of e-commerce websites. The proposed methodology is used to evaluate the effectiveness of certain well-known Indian e-commerce websites, including Myntra, Urbanic, Ajio, and Nykaa.

I. INTRODUCTION

The fashion industry has evolved over the years. Now, the most popular form of shopping for any kind of fashion related items like clothes, shoes, bags, accessories, makeup etc. is through e-commerce. Since Covid-19, when consumers were unable to purchase non-essential things in stores owing to worldwide lockdowns, online sales have increased rapidly. As a result, the importance of fashion websites also has increased. Even though dependence on online sales has decreased due to businesses reopening, consumers have gotten used to shopping online and are finding it more convenient because it has a lot of variety and is time-efficient. This demonstrates the value of investing in e-commerce and the necessity of having well-designed websites for fashion merchants.

Some of the most popular e-commerce fashion retailers in India are - Myntra, Nykaa, Ajio, Urbanic, Souled Store, Tata Cliq, Bewakoof, Koovs etc. Every brand's e-commerce platform is different in many ways and customers have different experiences with each of these. This paper's objective is to assess a few fashion websites using Analytical Hierarchical Process (AHP) based on certain criteria. AHP is a tool for organising and analysing complex decisions that uses math. It was created in 1990 by Thomas L. Saaty and is one of the most popular and often used multicriteria approaches. AHP assists decision-makers in making the choice that best aligns with their beliefs and perception of the issue, as opposed to dictating the "right" course of action. This method integrates the procedures of assessing alternatives and aggregating them to locate the most pertinent ones. By comparing each criteria with one another, it quantifies all the criteria used to make the final decision. When comparing two criteria, the stakeholders are asked to mention which criteria is more important for them and on a given scale, by how much is it more important than the other one.

AHP simplifies the decision making process by representing them in a hierarchical way. When compared to other mathematical methods, it is easy to use. Since it can use multiple criteria, it is a flexible tool. It also makes sure that the results in the survey are consistent enough. This ensures effective decision making. However, pairwise comparison of all the criteria is not very effective because not at all criteria match with each other. Also, when there are a lot of criteria, it is difficult to determine the weight.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

II. LITERATURE REVIEW

The Internet has become a boon for e-commerce platforms. Any type of business transaction in which the parties communicate electronically rather than through exchanges of goods or services or other direct physical contact is referred to as e-commerce. It describes commercial activity involving customers, suppliers, intermediaries, and service providers that utilise computer networks like the Internet. Now online shopping has become an integral part of our regular life. There are a number of websites providing any number of goods and services. The e-commerce portals offer products and services in a range of categories, including clothing and accessories for both men and women, health and beauty items, books and magazines, computers and peripherals, cars, software, consumer electronics, home appliances, jewellery, goods, gift items, real estate, and services. In order to ensure customer loyalty, online shopping websites need to make sure that they are immaculate in all aspects. Consumers are extremely picky when it comes to buying products and even a single disadvantage with respect to an online platform could result in the loss of a loyal customer. E-commerce websites need to make sure that their user interface, customer experience, return policy, customer service, prices, etc match the consumers' expectations. In the past, e-commerce platforms had been successful in persuading consumers. Now, however, customers have become increasingly selective since they have gained knowledge. In order to develop a successful shop, understanding customers' needs becomes essential. India is showing tremendous growth in e-commerce. Undoubtedly, with the middle class of 288 million people, online shopping shows unlimited potential in India. India's E-commerce market was worth about $3.8 billion in 2009, it went up to $17 billion in 2014 and to $23 billion in 2015. (Assocham, 2016)

The main steps involved in AHP are as follows –

1. List out all the criteria that affects your decision
2. Pair each criteria with another and compare them to create a matrix
3. Check for ideal consistency - CR (Consistency Ratio) < 10%
4. Repeat the above process to get responses from the given sample size
5. Using geometric mean, combine all the matrices that you get from each response to form a final matrix that will be used for calculation.
6. Analyse consistency

In this paper, we are comparing the websites of 4 fashion retailers –

- Myntra – Myntra is one of the largest e-commerce fashion retailers in India. It offers a wide range of fashion products for men, women and kids. It sells high-quality clothes, footwear, bags, beauty products, home accessories and many more.
- Urbanic – Urbanic is a new-age fashion brand which focuses on selling affordable fashion products to the Gen-Z women. It was founded in London which has now established itself in India too.
- Nykaa – Nykaa is a cosmetic retailer that specialises in offering multi-beauty and personal care products. It has an extensive collection of cosmetics, skincare, haircare, fragrances, bath and body and other wellness products for both men and women.
- Ajio – Ajio is a Reliance Retail's digital commerce initiative. It accounts for around 25% of Reliance's fashion sales. It sells clothes, shoes, bags etc and focuses on integrating online and offline models of reliance retail.

The criteria that are used to evaluate the above websites are –

No.	CRITERIA	HOW IT IS MEASURED
1	User Interface (UI) rating	By circulating a google form
2	Customer service	By circulating a google form
3	Discount given	Discount on top 15 bestsellers products

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

4	Product variety	No. of categories in each section
5	Return policy	Checking from the website

III. BACKGROUND

3.1 Overview Analytic Hierarchy Process

AHP is a mathematical decision-making tool for organising and analysing complex decisions. By comparing each criterion with one another, it quantifies all the criteria used to make the final decision. When comparing two criteria, the stakeholders are asked to mention which criteria is more important for them and on a given scale, by how much is it more important than the other one. Considering that a decision-maker based decisions on information and experience. The AHP technique aligns well with how a decision-maker behaves when making decisions. The advantage of this strategy is that it provides a structured yet a simple answer to the issues with decision-making by organising tangible and intangible aspects in a systematic manner.

3.2 Steps involved in AHP

1. State the problem.

In this particular research paper, the problem is to determine the best online retailer available.

2. Identify the criteria that influence the behaviour.

It is the identifying the characteristics or benefits of the product that makes the consumer choose that specific product over others. In this case the criteria are the UI quality, Return policy, Discounts, customer service and number of categories offered by the retailer.

3. Compare each element

This pair-by-pair comparison is done at every level of the hierarchy. We may always concentrate on just two of the criteria at once thanks to comparison. By doing this, we can determine for each combination which criteria are more significant than others and how important they differ from one another.

4. Calculating weights of each criterion

We assign weights to the criterion by calculating the geometric mean of all the responses for the criterion. The higher the weight assigned indicates that the specific criterion has a bigger influence on the buying decision.

5. Total utility

The total utility is the value which decides which is the best website. More the utility, the better the website.

This is calculated by dividing the rating of a website in a criterion with the highest rating in the criterion and then multiplying it with the weights given to the criterion. Then we add the scores for each website and rank them higher to lower.

3.3 Evaluation of AHP

AHP simplifies the decision making process by representing them in a hierarchical way. When compared to other mathematical methods, it is easy to use. Since it can use multiple criteria, it is a flexible tool. It also makes sure that the results in the survey are consistent enough. This ensures effective decision making. However, pairwise comparison of all the criteria is not very effective because not at all criteria match with each other. Also, when there are a lot of criteria, it is difficult to determine the weight

IV. RESEARCH METHODOLOGY

To determine the relative significance of the specified criteria on e-commerce platforms with regard to choosing the most favoured alternative, a questionnaire-based field survey was carried out. The initial development of the criteria and their measurement components was based on the literature review.

The age demographic for the same was 18-25 years. And image below is a sample questionnaire.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

Pairwise Comparison

10 pairwise comparison(s). Please do the pairwise comparison of all criteria. When completed, click *Check Consistency* to get the priorities.

With respect to *AHP priorities*, which criterion is more important, and how much more on a scale 1 to 9?

	A - wrt AHP priorities - or B?		Equal	How much more?
1	◉ UI	○ Prices and discounts	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
2	◉ UI	○ Customer service	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
3	◉ UI	○ Product variety	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
4	◉ UI	○ Return policy	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
5	◉ Prices and discounts	○ Customer service	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
6	◉ Prices and discounts	○ Product variety	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
7	◉ Prices and discounts	○ Return policy	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
8	◉ Customer service	○ Product variety	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
9	◉ Customer service	○ Return policy	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9
10	◉ Product variety	○ Return policy	◉ 1	○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9

CR = 0% Please start pairwise comparison

Calculate

AHP Scale: 1- Equal Importance, 3- Moderate importance, 5- Strong importance, 7- Very strong importance, 9- Extreme importance (2,4,6,8 values in-between).

V. MODELLING AND ANALYSIS

1. Creating a cumulative pairwise matrix

The geometric mean of all the cells of the 50 matrix was taken and one final cumulative matrix is formed

Table 1: Mean of all 50 responses

Mean of 50 questionaires					
Comparisions	**UI**	**Prices and discounts**	**Customer service**	**Product variety**	**Return policy**
UI	1	0.7974251	1.024948834	0.922799792	0.676640233
Prices and discounts	1.254036147	1	1.552203148	1.672267031	1.106391605
Customer service	0.975658264	0.64424544	1	0.998621094	0.632386675
Product variety	1.083658762	0.597990537	1.00138063	1	0.602913272
Return policy	1.477890304	0.903838962	1.581310992	1.658613281	1
	5.791243477	3.943500039	6.159843604	6.252301198	4.018331786

2. Finding the normalised pairwise matrix

In the next step, we calculate the normalised matrix by taking each value in the previous table as a percentage of the total sum at the bottom. All elements of the column are divided by the sum of the column.

Table 2: Weight of each criterion

Normalized matrix	UI	Prices and discounts	Customer service	Product variety	Return policy	Weight	weight
UI	0.172674488	0.202212525	0.166392022	0.147593624	0.168388344	0.171452	17.15%
Prices and discounts	0.216540049	0.253581841	0.251987428	0.267464247	0.275336051	0.252982	25.30%
Customer service	0.168471291	0.163368945	0.162341784	0.159720567	0.157375426	0.162256	16.23%
Product variety	0.187120222	0.151639541	0.162565918	0.159941111	0.15004069	0.162261	16.23%
Return policy	0.255193951	0.229197148	0.256712847	0.265280451	0.24885949	0.251049	25.10%
Total	1	1	1	1	1	1	

After the completion of the normalised pairwise matrix, we now have the criteria importance according to AHP. (Table 2)

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

3. Calculation of consistency

Table 3: Consistency calculation

Weights	0.1714522	0.252981923	0.162255602	0.162261496	0.251048778			
	UI	Prices and discounts	Customer service	Product variety	Return policy	weighted sum	criteria weight	weighted sum/ weighted
UI	0.1714522	0.201734135	0.166303691	0.149734875	0.169869703	0.859094605	0.1714522	5.010694541
Prices and discounts	0.215007257	0.252981923	0.251853657	0.271344551	0.27775826	1.268945648	0.252981923	5.015953833
Customer service	0.167278756	0.16298245	0.162255602	0.162037753	0.158759902	0.813314464	0.162255602	5.012550884
Product variety	0.185795679	0.151280796	0.162479617	0.162261496	0.15136064	0.813178229	0.162261496	5.011529215
Return policy	0.253387545	0.228654919	0.256576568	0.269129073	0.251048778	1.258796881	0.251048778	5.014152603

For the calculation of consistency, the weighted sum of each criteria is found. Then this sum is divided by the criteria weights. These figures are then used to calculate the lambda max which is the average of the weighted sum \ weighted criteria.

Calculation of average consistency (λ_{max})

$$\frac{5.010694541 + 5.015953833 + 5.012550884 + 5.011529215 + 5.014152603}{5}$$

Hence λ_{max} = 5.012976215

Consistency Index (CI) {By using (5)}

= (λ_{max} - n) / (n - 1)

= (5.012976215- 5) / (5 - 1)

= 0.003244054

Table 4: Randomly Generated Index Values

n	1	2	3	4	5	6	7	8	9	10	11	12
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.58

Source: Saaty (1980)

The randomly generated index value here will be 1.12

lamda max	5.012976215
consistency index	0.003244054
random index	1.12
consistency ratio	0.002896477
is it consistent	yes

Since consistency ratio < 0.10, we can assume that our matrix is reasonably consistent.

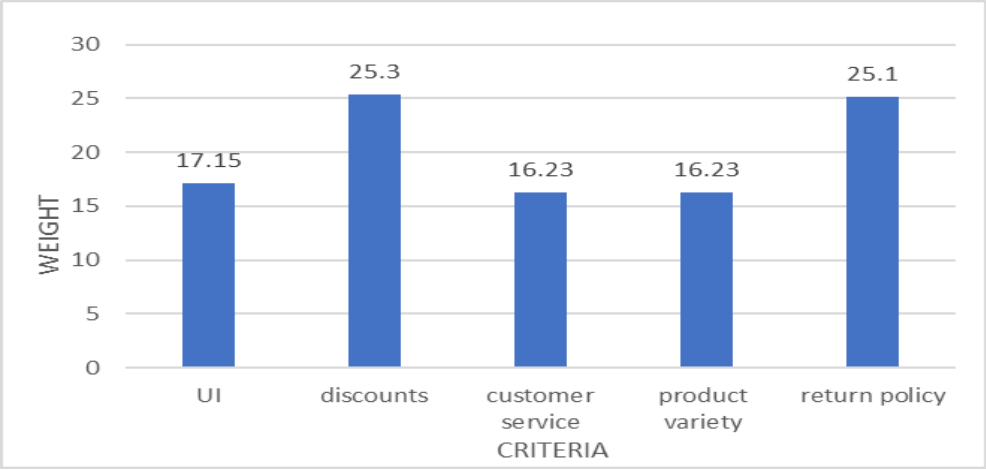

Fig 1: Criteria weights

The graph above shows the importance or weightage of each of the criteria. As seen, the most important criterion is discounts, carrying a weightage of 25.3%. Our sample for collecting data consisted of 18-25 years

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

old men and women. People of this age are usually students. Students usually prefer to buy online when huge discounts are given on their products, for example, during Myntra's Diwali sale. Hence, discounts were the most important criterion. The second most weighed criterion is return policy with a weightage of 25.1%. Return policy is important for the customers because they cannot check products physically before buying. So, having a good return policy is very essential for all the e-commerce sites. UI has a weightage of 17.15%, which is significantly less than the top 2 criteria. UI provides the customers with a seamless and pleasant shopping experience. Lastly, customer service and product variety have the least importance. Product variety is not very important because there are a lot of sites available and the customers do not need all the products on a single site. The customers can easily go through a number of sites and this is more beneficial for the customers because each site is specialised in its products and can offer a wider range for the customers.

Evaluation of alternatives

Table 5: Criteria ratings

	BENEFICIAL UI	BENEFICIAL Discounts	BENEFICIAL Return time	BENEFICIAL customer service	BENEFICIAL category
ajio	3.5	43.80	15	3.55	52
myntra	4.15	44.60	30	2.8	60
urbanic	2.95	19.67	10	2.5	15
nykaa	4	62.47	7	2.35	82

In create the final normalized matrix, each criteria's rating gets divided by the higher of all the ratings (as all the criteria are beneficial). Then that figure is multiplied by the weight of that particular category calculated with the help of Analytic hierarchy process (table 2).

In case of Beneficial elements, we use this formula –

$$\text{Beneficial} - \frac{Xij}{Max(Xij)}$$

In case of Non-Beneficial elements, we use this formula –

$$\text{Non-Beneficial} - \frac{Min(Xij)}{Xij}$$

Table 6: Normalised decision matrix

Weights	0.1714522	0.252981923	0.162255602	0.162261496	0.251048778	TOTAL	RANKS
ajio	0.1446	0.1774	0.0811	0.1623	0.1592	**0.7246**	**3**
myntra	0.1715	0.1806	0.1623	0.1280	0.1837	**0.8260**	**1**
urbanic	0.1219	0.0796	0.0541	0.1143	0.0459	**0.4158**	**4**
nykaa	0.1653	0.2530	0.0379	0.1074	0.2510	**0.8146**	**2**

After multiplying all the cell, the weighted sum for each company is found which gives us the weighted rating which gives us the best alternative i.e. Myntra got a total of 0.8260. Nykaa takes the 2nd rank with 0.8146, 3rd best alternative will be Ajio (0.7246) and Urbanic is the worst option.

VI. CONCLUSION

From the above analysis it can be concluded that the most influencing factor when deciding which online retailer to shop from is discounts followed by return policy. Using this analysis online retailers can modify their business strategies and focus on giving more discounts and having a liberal return policy to attract consumers from their competition and increase their market share.

From the above analysis it can also be concluded that out of the four Myntra is the best alternative followed by Nykaa, Ajio and lastly Urbanic. Myntra has performed well in all the criteria and are the best in terms of UI user friendliness and return policy. Nykaa is close second due to a very low return period. It can easily rise in the rankings just by increasing its return period from 7 days to 30 days. Urbanic has ranked 4 and is the worst among the options. It has bad scores across all 5 categories and needs to improve in all categories to increase its ranking. The ranking order of all the various websites is given above. According to the analysis, anyone who is trying to buy clothes online should go for Myntra.

e-ISSN: 2582-5208
International Research Journal of Modernization in Engineering Technology and Science
(Peer-Reviewed, Open Access, Fully Refereed International Journal)
Volume:05/Issue:04/April-2023 Impact Factor- 7.868 www.irjmets.com

VII. REFERENCES

[1] Ajio. (n.d.). Online Shopping for Women, Men, Kids – Clothing, Footwear | AJIO. https://www.ajio.com/?gclid=Cj0KCQjw8qmhBhClARIsANAtbofkIQomKMboSsOR_dWIDLLJJcKsWyG-OMGerMIj5Kf7Ep_vDFzi3a4aAjCMEALw_wcB

[2] Aziz, U. A., Wibisono, A., & Nisafani, A. S. (2019a). Measuring the quality of e-commerce websites using analytical hierarchy process. TELKOMNIKA Telecommunication Computing Electronics and Control, 17(3), 1202. https://doi.org/10.12928/telkomnika.v17i3.12228

[3] Aziz, U. A., Wibisono, A., & Nisafani, A. S. (2019b). Measuring the quality of e-commerce websites using analytical hierarchy process. TELKOMNIKA Telecommunication Computing Electronics and Control, 17(3), 1202. https://doi.org/10.12928/telkomnika.v17i3.12228

[4] Lee, Y., & Kozar, K. A. (2006). Investigating the effect of website quality on e-business success: An analytic hierarchy process (AHP) approach. Decision Support Systems, 42(3), 1383–1401. https://doi.org/10.1016/j.dss.2005.11.005

[5] Myntra: Online Shopping for Women, Men, Kids Fashion. (n.d.). Myntra. https://www.myntra.com/

[6] N. (n.d.). Buy Cosmetics Products & Beauty Products Online in India at Best Price | Nykaa. Nykaa. https://www.nykaa.com/

[7] Taherdoost, H. (2017). Decision Making Using the Analytic Hierarchy Process (AHP); A Step by Step Approach. HAL (Le Centre Pour La Communication Scientifique Directe).

[8] Urbanic.com | Fashion and Lifestyle | Shop Online. (n.d.). urbanic.com. https://in.urbanic.com/