

Influencing users for Paper Recycling using an E-commerce Website

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Abstract— Currently, the most used promotional strategy for paper recycling includes Mail, Ads, Posters, Articles, etc. We are taking an E-commerce website that will be built upon the ideology of recycling as a candidate for being the best tool for the promotion of paper recycling among this generation among its potential impact on carbon footprint reduction. In this paper we will be comparing various statistics regarding the trends of searches and the current state of recycling in different regions of our country. We will also conduct a survey among colleagues for their habits and their current contributions. We will also be comparing different literature related to our topic. We have found that there is significant potential for a website and it has many supportive statistics with it. An E-commerce website with modern retention techniques can also bring awareness to the young masses in this cause. Big tech companies are currently competing with each other using computer science for the attention of the masses. Bringing this attention to the current most important scenarios can be so much impactful.

Keywords—E-commerce, Carbon footprint, User retention, Municipal Solid Waste, Likert Scale, Artificial Intelligence, Da

I. INTRODUCTION

Paper recycling is among the greatest task to be done in the global battle against global warming. In the modern era E-commerce website has become standard of the shopping and is already became the primary source for the current generation. In this paper we want to statistically check the potential of the E-commerce to be used in the battle. We will be going through the statistics and finding out the most impactful generation and the places those generation is spending most of their attention to and how to effectively influence them with accurate statistics and the urgency regarding the matter and how Paper recycling can help in global warming. We will show the available technologies when integrated within an E-commerce website to make it a tool to be used to promote paper recycling.

II. LITERATURE RIVEW

Zhang et al, [1] In this paper the authors have proposed an approach for gaining user profile attributes using big data. One unified model has been implemented to avoid error propagation. The authors have also proposed MagicFG model.

Najmi et al, [2] Via this paper the author found the influencing factors toward the recycling of the plastic waste. The recycling behavior of consumer was explored via

statistics.

Parmar et al, [3] In this the paper the authors have shown the detailed demographic of respondents via different attributes including Gender, Age, Income, Education, Marital Status, etc.

M et al, [4] This study calculates the contribution of recycling MSW to the improvement of the environment and the expansion of the economy in the United States. The association between MSW recycling is investigated in this study using bootstrapping autoregressive lag modeling.

Huda et al, [5] In this study the young consumers, mostly university students are been looked into for their awareness, perception, ideology, contribution and disposal pattern for waste. In this paper it was also shown that the reason for disposal and frequency of new purchases were positively influenced with the house hold income.

Daud et al [6] This study was done to identify the student's behavior and the factors that were affecting the behavior. More than 100+ respondents had participated in the study of which 70+ respondents are female and 40+ description analysis. It was shown that students have high awareness and positive attitude toward recycling.

Tilikidou et al, [7] In this paper the author has concluded that the direct relationship between environmental concern and the recycled paper product's purchases increases in the group of woke consumers.

Khan, [8] According to this analysis, the three main online payment methods were most frequently utilized to make purchases during the pandemic's outbreak. Additionally, it demonstrated how Covid had an impact on consumer spending and had helped to increase online shopping.

Roncero et al, [9] Different abstracts was searched orderly to find the materials dealing with the e-commerce packaging's sustainability to have a good understanding in materials, sustainability and logistics.

Kyaw et al, [10] This study uses online question survey method with forms to gain data. The data is then analyzed and it then reflects the different factors like security, payment, administrative psychological, timesaving, price, product.



TABLE I. LITERATURE REVIEW ANALYSIS OF VARIOUS PAPERS

Author	Methodology	Conclusion	Scope
Zhang et al,	There were a simple and effective ways of extracting user traffic, the approach processes all the extraction tasks in one united model. Markov logic factor graph model.	For a given task a meaningful query to retrieve relevant information. The authors present a Markov logic FG to directly model the user profile.	The MagicFG model presents human knowledge as first-order logistics and then combine these data into extraction models.
Najmi et al,	In this study survey research design was used. A set of detailed questionnaire were produced and options were presented before it from strongly agree to strongly disagree. The data was then used to carefully construct conclusive tables.	The constructs that were significantly influencing the intentions were subjective norms, awareness consequences and convenience. Among them the convenience was the most important factor for predicting.	Establishment like government can use it to strengthen their waste management system. The impact of the recycling should be told to student and people who were found to be less informed.
Parmar et al,	250 respondents were selected from Kanpur city and a structured questionnaire were made. The arithmetic mean, deviation, reliability test based Cronbach's Alpha value were some tools used for data analysis.	In this study the author presented that there were seven factors that affect consumer's online buying behaviour. Factors like customer satisfaction, availability of products, perceived usefulness, economic, website quality, perceived risk.	It would speed up some processes and increase the efficiency of performance. The purpose of this study is to know the employee's perception toward this sector of Madhya Pradesh.
M et al,	In order to investigate the relationship between MSW recycling, economic growth, energy efficiency, and carbon footprinting, this study employs bootstrapping distributed lag modeling..	This study presented use with statistics of how the proper MSW waste management not only helps in the economy but also the environment by countering the carbon emissions and helping in reducing the carbon footprinting.	These outcomes would signify that significant changes are formed when such policies are intervened. These findings help the policy makers in their work of making such efficient policies to counteract the carbon footprinting through recyclable waste management.
Huda et al,	In this study a statistical analysis was done to figure out the recycling and consumption behaviours, which was formulated to find evidence of relation of factors like age, income, and family members, etc.	It was found that that household with higher household income results a higher number of devices and were using them for longer than the household with lower household income. Both of them however had limited knowledge of e-waste management and the recycling location.	This survey offers insightful data on young customers' recycling habits and consumption.
Daud et al,	This study was done using quantitative method where structured questions provided was distributed to the students and then their responses were then reviewed.	It was concluded that majority of high school student have knowledge of recycling concepts. But, the percentage of students that actively practice recycling is low.	It was anticipated that these findings would serve as a useful reference for educational institutions, the government, and other related organizations as they develop effective strategies aimed at improving environmental education for students in accordance with their preferred methods.
Tiikidou et al,	A survey among 220+ consumers was conducted with structured questionnaire and the responses were then analyzed.	The results of multiple regression showed that the predictor of RPPPB is simply environmental knowledge and not merely the right scale of eco-literature. A sample of informed consumers' purchases of recycled paper products was found to be negatively correlated with their level of environmental concern.	These stats provide us with a clear knowledge of how knowledgeable consumer is willing to partake in the consumption of recycled products.
Khan et al,	The primary source was the structured questionnaire that was designed and distributed to more than 140 respondents. To examine the change in the buying behaviour the data was analysed using Likert scale.	This paper showed that behaviour was changed due to lockdown. The online retailer was the same persistent. The new focused products were groceries, online learning, e transactions and online content.	This research will help the policy makers to produce policies for better adapting in the outbreak.
Roncero et al,	A systematic search of abstracts was performed to have better understanding of the changes done in the materials and formats.	It was found that the packaging industry has almost never brought changes in the structure of folding boxes since the 19th century. It also hopes that the sudden exponential growth in the current technology, especially the 3d printing might bring the solution to the very problem and bring all the various pros the changes might bring.	New production processes might help optimize the packaging department in the volume and shape, using 3d printing. It would help in various factors like carbon emissions.
Kyaw et al,	This research paper uses mail questionnaire method to collect data from more than 105 respondent. Likert scale was used within these questionnaires.	The retail stores have faced major affects due to the guidelines of the lockdown, whereas the online retail has almost doubled and boomed during this period.	In this research, the scope of the study focuses on the Co-operative Universities.

Soni et al,	This study aids in understanding how Artificial Intelligence functions in e-commerce. The use of artificial intelligence in e-commerce is the main topic of this study.	Artificial Intelligence when integrated can help in user attraction as well build up an efficient system to maximize the sales. The efficiency is thought to rise and help in excelling of the sales.	This paper help in users to be motivated to adapt with the current technology of AI. This paper also helps in presenting the details regarding the aspects of the topics.
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III. METHODOLOGY

This research is designed to review both primary and secondary data sample and then try to find the most accurate information about the potential an e-commerce website possesses.

The methods used are below:

- Data Analysis

Various data from other research papers have been

analyzed to figure out the components required to answer the above point.

Also, the data has been used to show clear

- Data Gathering

We are using questionnaires via Google form to gather data using Likert Scale ranging from (Strongly Disagree, Disagree, Average, Agree, Strongly Agree).

IV. TABLES AND FIGURES

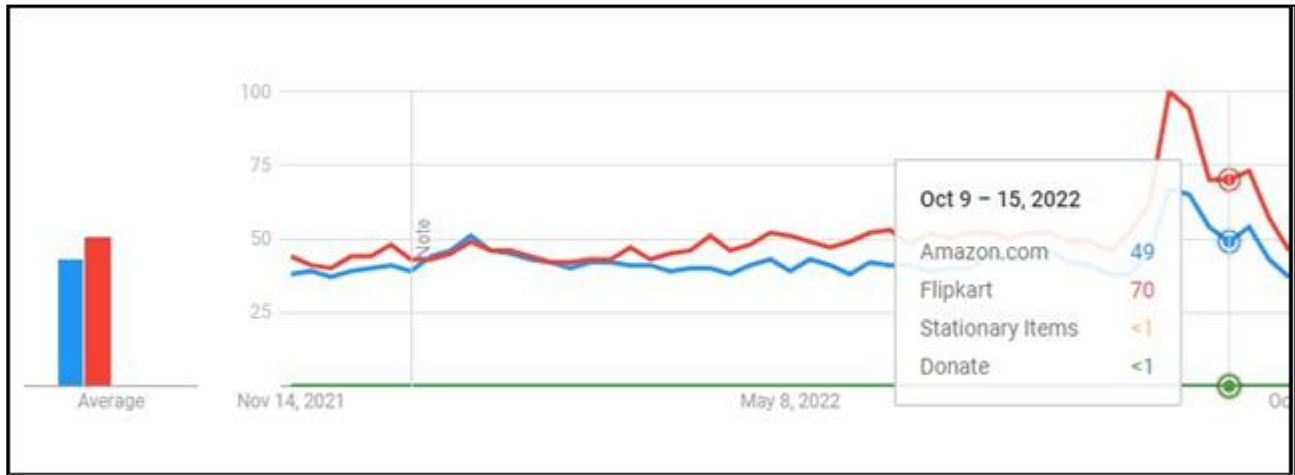


Fig. 1. Trends of current web searches

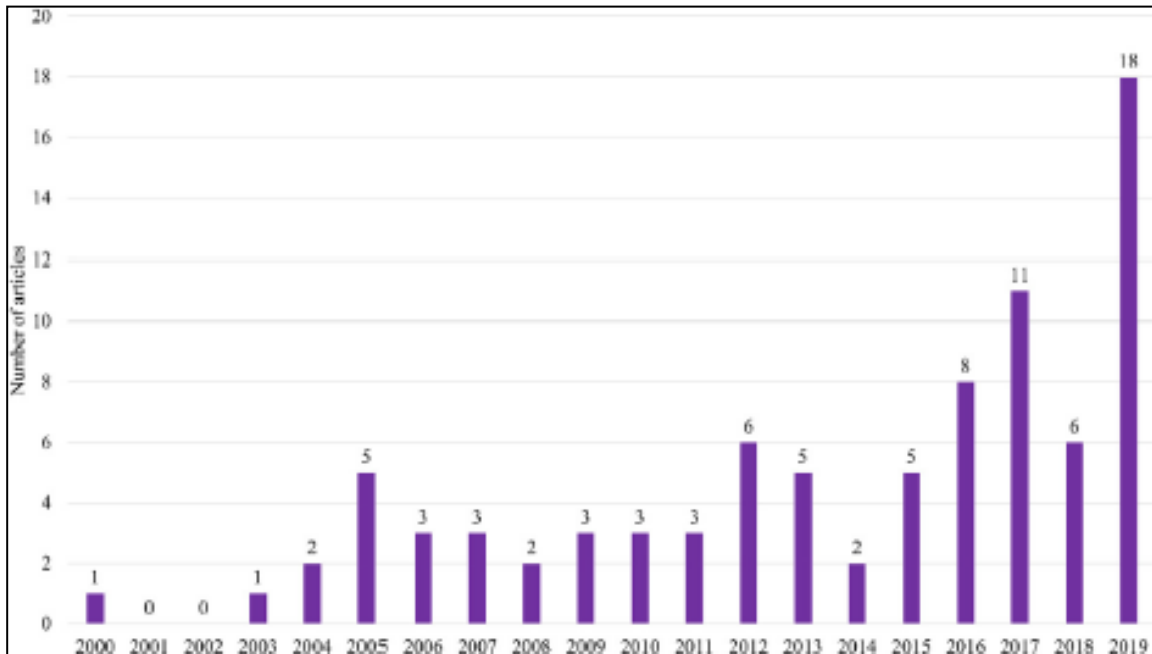


Fig. 2. Trend of E waste related consumer behavior, [5]

Variables	Likert Scale				
	Strongly Disagree (1)	Disagree (2)	Average (3)	Agree (4)	Strongly Agree (5)
During the lockdown, online buying behavior has changed when it comes to purchasing health equipment and medicines. (V1)	2	2	21	36	80
Customers tend to make more purchases using e-commerce during lockdown as compared to normal days due to the high demand for disinfectants. (V2)	17	22	36	30	36
During lockdown customers largely use e-commerce for learning purpose than other necessities. (V3)	24	13	22	25	57
Customers find e-commerce more convenient and secure during lockdown. (V4)	9	20	49	36	27

Fig. 3. Trend of E waste related consumer behavior, [5]

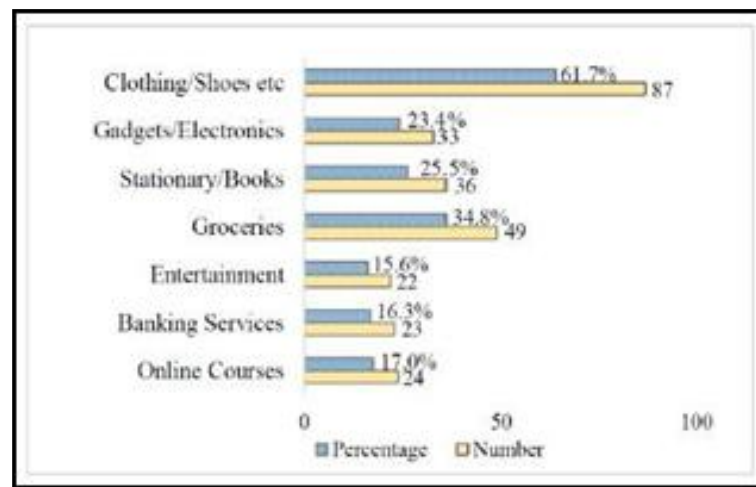


Fig. 4. Consumer's online buying behaviour before COVID, [8]

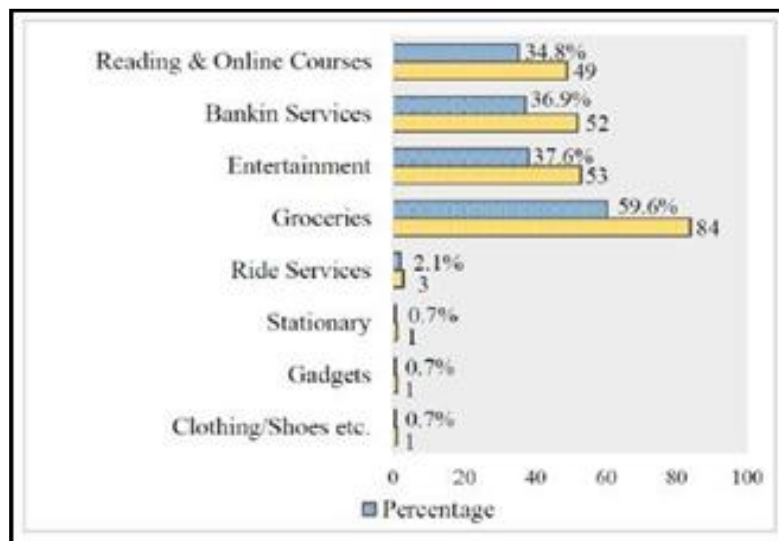


Fig. 5. Consumer's online buying behaviour during COVID, [8]

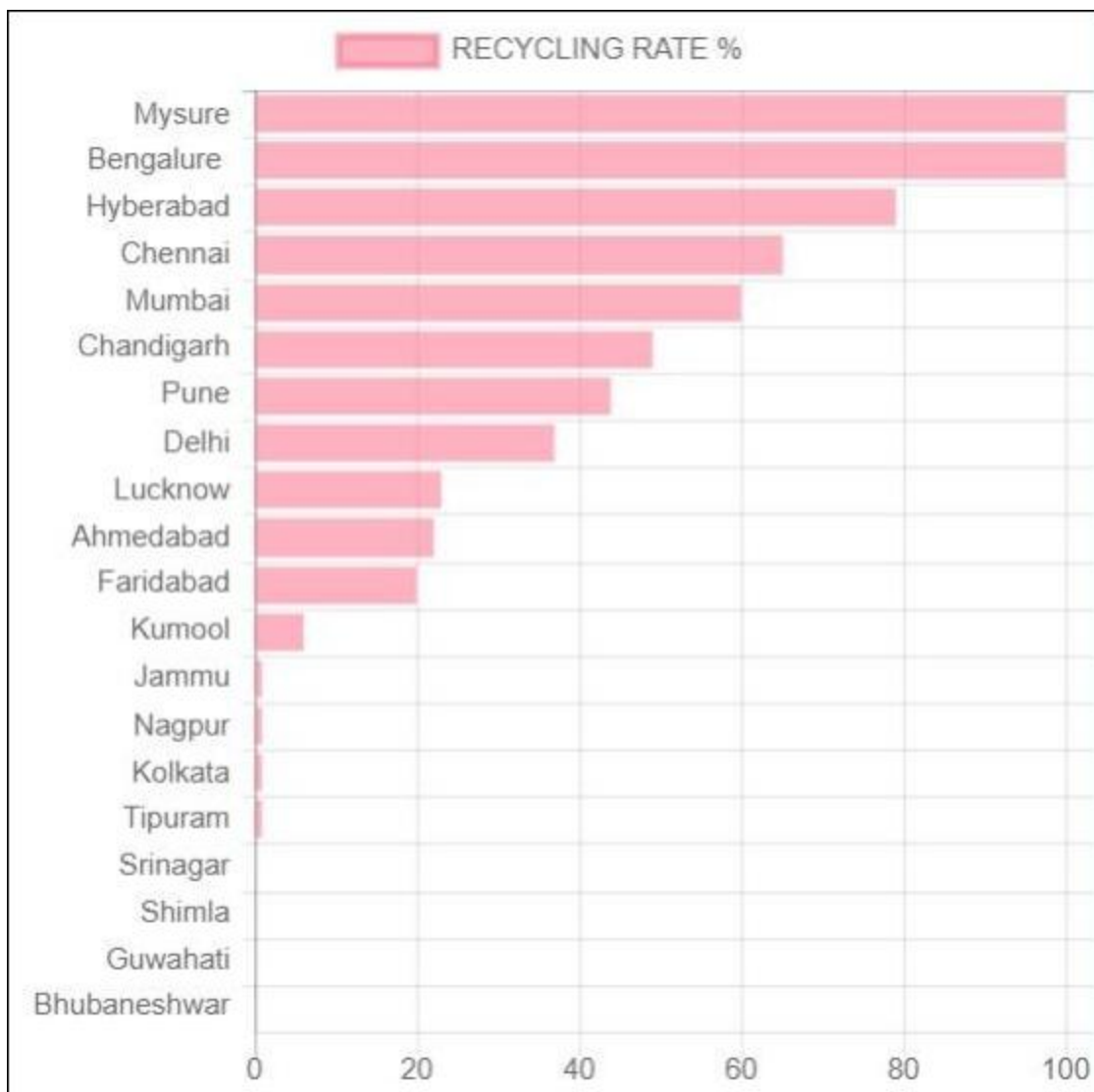


Fig. 6. Recycling rate of various cities in India

TABLE II. ANALYSIS OF BEHAVIOR TOWARD RECYCLING AMONG USERS

Elements	Likert Scale(%)				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I like to recycle wastepaper at home, school or office	2.2%	6.7%	24.4%	46.7%	20%
I like to make an effort to recycle as much as I can	0%	4.4%	20%	42.2%	33.3%
It will make me feel happy and satisfied if I recycle my waste	0%	4.4%	28.9%	26.7%	40%
I will recycle my books, shoes, clothes and other recyclable materials	0%	6.7%	11.1%	40%	42.2%
I like to recycle but I don't have much time to recycle my waste	4.5%	31.8%	27.3%	18.2%	18.2%
I think recycling is very inconvenient	8.9%	20%	33.3%	26.7%	11.1%
I think recycling is too complicated	22.2%	15.6%	22.2%	22.2%	17.8%
I think recycling is too much trouble	13.3%	22.2%	42.2%	11.1%	11.1%
I think recycling takes too much space at home	24.4%	24.4%	24.4%	24.4%	6.7%

V. RESULTS AND FINDINGS

- The E-commerce website

Before attracting the majority audience, we need the proper website that will be the candidate of our motive.

The website should have all the tools required for User redundancy as well as able to be focused on the customer's unique profile.

Much research has shown that there are many technologies already available to arm up a website for the need.

Artificial Intelligence could be implemented, which has been shown to be useful in rising and excelling sales, [11].

User's data can also be used to model the algorithm fit for that user, [1].

- Trends in Searches

Fig. 1 Shows that among the young generations there is a lack of curiosity for the topic of recycling and active searches online are almost non-existent.

It shows e-commerce websites like Amazon.com and Flipkart.com searches are 7000% more than an active search of any recycled product or even trying to donate to the causes.

- Finding Majority Audience

The most age group that partake in online shopping are aged 20-25, have income less than 25000, are students and doing bachelor's, are Unmarried, and shop monthly, [3].

It concludes the majority of the Audience is youth.

- The habits of that Audience

The most searched products include Fashions – 77.3%, Food – 54.5%, Books – 30.9%, Home Appliances, Medicine, etc, [10].

- The growth of E-commerce

From Fig. 4. and Fig. 5. The Covid brought many new online retailers, almost 100% increase, along with many users which shifted to the online Commerce, [8]. Technologies like AI implemented within modern websites are helping people excel in their high sales and customer relationships, [11].

- Lack of recycling

Fig. 6, shows that only 5 cities in India are recycling more than 50% of the waste packaging of beverages only 2 among them are recycling 100%.

- Awareness Status

Fig. 2 shows that consumer behavior regarding the waste management of E-waste has steadily but surely increased in the past 2 decades, [5].

- Reasons for not Recycling

It was also shown that the reasons behind not recycling are, they don't have time to recycle waste, is Inconvenient, and complicated, too much space at home, [6].

- Willing Audience

From our personal survey via questionnaire, we have seen the clear interest and willingness of youngsters for the cause.

VI. CONCLUSION AND SCOPE

Through this paper, we can conclude that E-commerce websites have seen a rise in these coming years and this pandemic has shifted the user's attention to online websites. Majority of the internet users are youngsters, mostly students, and among them, the ones with high household incomes are more aware of recycling than one with low household incomes. But both don't participate in recycling or find it troublesome. These youngsters are willing to recycle. Modern e-commerce websites can become tools that they can use if made with the situations in mind. The users are very willing to use it and contribute to recycling. E-commerce websites would be needed to be equipped with technologies like Artificial Intelligence and have user retention. This paper shows that just like a website the technology can be equipped with the user's habits in mind to make that tool more effective.

REFERENCES

- [1] Gu, X., Yang, H., Tang, J., & Zhang, J. (2016, August). Web user profiling using data redundancy. In *2016 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM)* (pp. 358-365). IEEE.
- [2] Khan, F., Ahmed, W., & Najmi, A. (2019). Understanding consumers' behavior intentions towards dealing with the plastic waste: Perspective of a developing country. *Resources, Conservation and Recycling*, 142, 49-58.
- [3] Pandey, A., & Parmar, J. (2019). Factors affecting consumer's online shopping buying behavior. In *Proceedings of 10th international conference on digital strategies for organizational success*.
- [4] Razzaq, A., Sharif, A., Najmi, A., Tseng, M. L., & Lim, M. K. (2021). Dynamic and causality interrelationships from municipal solid waste recycling to economic growth, carbon emissions and energy efficiency using a novel bootstrapping autoregressive distributed lag. *Resources, Conservation and Recycling*, 166, 105372.
- [5] Islam, M. T., Dias, P., & Huda, N. (2021). Young consumers'-waste awareness, consumption, disposal, and recycling behavior: A case study of university students in Sydney, Australia. *Journal of Cleaner Production*, 282, 124490.
- [6] Asri, A. M., & Daud, Z. (2022). A Study of High School Students Awareness towards Recycling Activity and Its Relationship with their Attitude and Behaviors related to Recycling Practices. *Recent Trends in Civil Engineering and Built Environment*, 3(1), 748-759.
- [7] Delistavrou, A., & Tilikidou, I. (2022). Environmental Unconcern and Recycled Paper Products Purchase: The Moderating Role of Environmental Knowledge. *International Journal of Innovation and Technology Management*, 2241002.
- [8] Khan, H. (2021). Examining the buying behavior of online consumers in India during the pandemic COVID-19. *Journal of Management and Training for Industries*, 8(2), 1-23.
- [9] Escursell, S., Llorach-Massana, P., & Roncero, M. B. (2021). Sustainability in e-commerce packaging: A review. *Journal of cleaner production*, 280, 124314.
- [10] Kyaw, A. T. T. Factors Affecting Consumers' Online Buying Behavior during the COVID19 Pandemic: Empirical Study in Co-operative University, Thanlyin (Doctoral dissertation, MERAL Portal).
- [11] Soni, V. D. (2020). Emerging roles of artificial intelligence in ecommerce. *International Journal of trend in scientific research and development*, 4(5), 223-225.