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FORECASTING THE IMPACT OF SOCIAL MEDIA ADVERTISING AMONG COLLEGE STUDENTS USING HIGHER ORDER STATISTICAL FUNCTIONS

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Abstract. Nowadays, social media has emerged as one of the activities among the users in their day-to-day life activity. This research work plans to develop a statistical review that concerns on social media advertising among college students from diverse universities. The review analysis on social media advertising is given under six sections such as (i) Personal Profile; (ii) Usage; (iii) Assessment; (iv) Higher Order statistics like Community, Connectedness, Openness, Dependence , and Participation; (v) Trustworthiness such as Trust, Perceived value and Perceived risk; and (vi) Towards advertisement which involves attitude towards advertisement, response towards advertisement and purchase intension. The initial stage is on questionnaire preparation based on social media networking. The records stated in the questionnaire are intimately taken about the usage of social media sites and the advertisement on networking. In the second stage, the planned questionnaire is distributed over college students from diverse universities. The entire questions are made mandatory in this questionnaire and after this, the students from various universities are demanded to fill up their responses to this questionnaire. These responses from the students are then taken for analysis purposes. In this research work, the analysis is performed based on higher-order statistical analysis that favorably concerned with correlation coefficients and entropy. This in turn helps to determine the correlation and entropy among the response towards the social media network.

Key words: Social media; Advertising; Universities; Correlation analysis; Entropy analysis

AMS subject classifications. 62L10

1. Introduction. Nowadays, Online Social Networks (OSNs) [9-12], which involves Facebook, Sharechat, Digg, Twitter, and Instagram have become more popular. The users tend to post the photos, videos, news, and so on in OSN, and such users have some followers whose views and comments on that posted information. So far, many OSNs [13-15] host are available on online applications. By using this hosted application, the advertiser can make post job information, and the users can invite associates for online games. The information offered by the users is termed as information producers, and one who views this information is referred to as information consumers. The most recent successful targeted information on advertising systems is provided to the producers and consumers, which facilitates the producers to target users based on profile information, online activities, and user demographics. The advertised information is then clicked on by the targeted users, as the personal interest of the user matched with the ad. The potential benefits have been attained by information producers, because of the clicks and e-commerce activities performance of the customers.

Currently, in our complicated society, both the consumers and businesses need the advertisement factor because it evolves as a core communications system [24-25]. Further, it acts as the main factor in most of the organization's marketing programs as of its tendency to delivering cautiously prepared messages to destination audiences. Based on the suitable advertising plan, the entire advertising activities [16-19] are made sure, which can effectively lead the organization's advertising programs to be efficient and cost-effective. The suitable messages are delivered by an advertising plan via suitable media or vehicles to suitable audiences. Therefore, in any of the advertising plan, media planning is concerned as the major component.

The classification of conventional media selection models [20-23] is given in the following: (1) models that are based on experience and judgment since are not capable on considering the huge count of media combinations, (2) clean quantitative models that might not integrate qualitative criteria like experience and knowledge on the decision. In contrast, the selection process of advertising media has incorporated uncertain, inaccurate,

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and information like experience and judgment of individuals. Therefore the media selection decision causes a dilemma, where its solution depends on human judgment and thus becomes more complicated to resolve by only using human judgment. Still, various case studies are evolved in this social media advertising concept, yet the researchers are not concentrated over the prediction phase.

The core contribution of this framework is delineated as follows:

- This paper mainly attempts to introduce a novel tactic over social media advertising among college students from diverse universities.
- In this, the analysis is handled under six factors called (i) Personal Profile (ii) Usage (iii) Assessment (iv) Higher Order statistics (v) Trustworthiness and (vi) Towards advertisement.
- The first stage includes questionnaire preparation on the topic of social media networking, which concerns more on social media sites and advertising.
- The second stage is about the distribution of organized questionnaires among college students of diverse universities and is then subjected to analysis.
- To the end, based on higher-order statistical analysis, the analysis is carried out that focused on correlation coefficient and entropy function, which leads to finding the correlation and entropy among the response towards the social media network.

The organization of the work is as follows: Section 2 expresses the related works on social media advertisements. Section 3 depicts the review of social media networking. Section 4 explains the perspectives of social media usage and advertisement. Section 5 delineates the enquired conclusion on the impact of social media advertising. Section 6 ends the paper.

2. Literature Survey.

2.1. Related Works. In 2020, Sydney Chinchanachokchai, and Federico de Gregorio [1] have developed a rapid growth of advertising on Social Media Platforms (SMPs). The consumer socialization framework adopts to investigate predictors of advertising avoidance on SMPs such as Facebook, Twitter, and Instagram via an online survey. Results show that the effects of SMP usage, susceptibility to social media influence, and susceptibility to peer influence on SMP ad avoidance are all mediated by attitude toward social media advertising in general. Greater SMP usage and higher susceptibility to social media influence are positively related to SMP advertising attitudes, while greater peer influence susceptibility is negatively related.

In 2017, Gupta et al. [2] have made an effort for computing the importance of multimedia tool named YouTube. The crucial success factors were determined based on the Content analysis of hundred YouTube advertisements. Some of the crucial success factors were Visual Category, Message Appeals, Audio content, Content category, and the response of viewers via the number of views and likes. In accordance with this, a methodology has been implemented, which might aid the managers who have improved the promotional strategies for the association. This research work has been verified by deploying the Attention, Interest, Desire, and Action (AIDA) model.

In 2020 Sreejesh S et al. [3] have used social media platforms as a promotion channel and allows consumers to socialize and network better. In this media, attention is often restricted towards primary purpose and it affects consumer response towards the advertisement. The media interactivity can affect the reaction of customers towards social media. Since high interactivity in this medium directs the users to involve more into the primary purpose of socialization, this feature of the media adversely affects the advert and its effectiveness.

In 2017, Richard et al. [4] have introduced a novel method for questioning the correlation among monopolistic behavior and the social optimum, while admitting the advertisement. Further, a common outcome has been obtained that creates the dozen special cases of interest to users, by featuring conditions regarding consumer preferences and using the uncommon method over comparative static analysis. Further, the reasonable preference specification has shown enough performance by generating this case. The derivations of outcomes were made, which pursues the advertisement complementary other than influential advertising paradigm that has possessed stable quasilinear preferences by the consumers.

In 2018, Lee [5] has scrutinized the efficiency of Social-Local-Mobile (SoLoMo) advertising and Location-Based Advertising (LBA). The outcome has depicted the effectiveness of SoLoMo advertising than LBA. In this research work, the differences in the reaction of customers to the ads on diverse situational platforms and contexts were determined. In the literature, it has lacked in the straight distinguishing of efficiency of LBA

and SoLoMo advertising, which has contributed to the main academic of this framework. This was the initial step that was taken in comparing among the ads over LBA and SoLoMo. This framework further investigated the factors that connected with the advancement of brand interaction, modern smartphone functionalities, sociability, perceived location awareness, and influences the attitudes towards ads. Moreover, the telecommunication promotion effectiveness was exhibited by investigating the customers that react following ads in diverse situational contexts on diverse platforms. To the end, the practical suggestions were also defined in this paper.

In 2016, Lin and Kim [6] have presented the study on the impacts of advertising the consumer attitudes, such as perceptions of privacy risk, and purchase intent. The Technology Acceptance Model (TAM) derives the testing model. This learning further determined the intrusiveness and privacy focus were both suitable antecedent variables for perceiving the usefulness, yet not apparent accessibility of sponsored advertising. The privacy concerns can purchase the product when both antecedent variables as well influenced the consumer attitudes over sponsored advertising. The theoretical correlations among perceived usefulness, attitudes, ease of use, and purchase intentions have also been verified.

In 2018, Javan et al. [7] have introduced a two-phase methodology to advertise the media selection, which integrates the human-based information by incorporating the quantitative and qualitative models, when the associated complexity with media selection decision was reacted. The initial stage has determined the top media for advertising the hierarchy process based on four assumptions of AIDA. The second stage determines the optimum media mix by incorporating the fuzzy linguistic decision approach. Finally, implemented approach has been evolved empirically over the real-world case with acceptable outcomes.

In 2020, Fevzi Bitiktas, and Okan Tuna [8] have stated business-to-business (B2B) markets which rapidly increase the business world as in the lives of individuals. It can evaluate the current social media behaviors of container shipping companies to help practitioners to increase their relation to the algorithms of these platforms. After identifying container shipping companies that use social media most actively, to analyze their Facebook messages in terms of branding, message appeals, direct-sales, and information cues.

2.2. Review. Table 2.1 determines the pros and cons of the conventional model cases on social media networking. SMPs [1] can able to loosely target people in a particular field or internet area and ability to reach a younger age demographic, however, it is not right for all research projects and very little control over the message once posted. AIDA [2] poses better efficiency and an understanding of factors that attract the customers. Yet, it cannot catch much attention. Social media platforms [3] provide real time feedback and cost-effective with consumers, however, it can be dangerous if it is misused. The monotone comparative static approach [4] has a better capturing of the problematic condition and permits a wide variety of testing of the alternate hypothesis. Though, it requires similar identification potential and further needs research on empirical implementation. SoLoMo advertising [5] is considered to be more effective and discovers the difference between the customer's review of ads. But has privacy issues and difficulty in creating one campaign for all of them. TAM [6] has a successful explanation of the relation between interactive platforms and is more useful and easier to be used by the customers. But, there is a need for defining the threshold and needs help advertisers to formulate the social media advertising strategy. Genetic algorithm [7] poses a better determination of optimum media mix and further declines the complexity related to the decision process. However, it needs to more improved models on optimization. B2B [8] have less inventory and reduced transaction cost and it requires prequalification Low order conversion rates are the main drawbacks that considered in this methodology.

2.3. Problem Statement. Social Media sites like Facebook, Instagram is probably popular among varied age groups. More research works are in rush to analyze the impact of social media advertising, however, some sort of analysis are still under a crisis that should be dealt with effective manner. Here, some of the problems that to be rectified in the future are explained in this section in brief. Not many research works were under went for the usage constraint of the social media site. Usage constraints include visiting, usage time, and access time. In the literature, there is no record on usage analysis of social media sites over how much visitors visiting the social media, how much time they are spending averagely in a day, and which time they are accessing these sites. Similarly, for which purpose the social media sites are mostly used among the users is also still not determined. If having this information in advance, then it will lead the researchers to develop an improvement over the advertisement field in social media. Owing to the amount of time spending on these sites for the present time with last year helps in the precise prediction of user assessment for the following year. As the

TABLE 2.1
Features and Challenges of traditional models regarding the Social Media Advertising Factor

Author[citation]	Methodology	Features	Challenges
Sydney Chinchanachokchai, and Federico de Gregorio [1]	SMPs	Able to loosely target people in a particular field or internet area Ability to reach a younger age demographic	Not right for all research projects very little control over the message once posted
Gupta et al. [2]	AIDA	Better efficiency A better understanding of factors that attracts the customers	Cannot catch much attention
Sreejesh S et al. [3]	social media platforms	Real time feedback cost-effective with consumers	Awareness of discussions and interactions are needed among consumers It can be dangerous if it is misused
Richard et al. [4]	Monotone comparative static approach	Better capturing of problematic condition Permit a wide variety of testing of the alternate hypothesis	Requires similar identification potential Needs further research on empirical implementation
Lee [5]	SoLoMo advertising	More effective Discovers the difference among the customer's review on ads	Issues on privacy Difficulty in creating one campaign for all of them
Lin and Kim [6]	TAM	Successful explanation on the relation among interactive platforms More useful and easier to be used by the customers	Need for defining the threshold Help advertisers to formulate the social media advertising strategy
Javan et al. [7]	Genetic algorithm	Better determination of optimum media mix Further declines the complexity related to the decision process	Needs more improved models for optimization
Fevzi Bitiktas, and Okan Tuna [8]	B2B	Less inventory Reduced transaction cost More efficient pricing	Requires prequalification Low order conversion rates

same, analyzing the community in terms of finding people, cultivating, relationships, and sharing the feeling aids the researchers to find on more intimate feelings of the users about the advertisement in social media sites. On checking the connectedness issues of the users over the social media sites will aid to resolve the critical issues like content sharing, editing and communicating information, etc. On finding the priority of users over social media in terms of product, information gathering, and sharing the needs, it also paves the way for crucial development over the business field, as most of the users intently depend on these social media sites for their everyday works. Further, analyzing the trustworthiness of the users over these network sites will help the future work to enhance the trust problems. Notably, the person's attitude towards the advertisement is also the major course for business development. On confining the awareness and positive feeling towards the advertisement on products or brands, reaches the superior performance over the social media advertising field for the researchers. The response towards advertisement by the clients or users to purchase, recommendation, and sharing of the product is also considered the most viable research area, by using their response more intend work can be made in the future work over advertising. Moreover, the risk prediction is the main task that needs more attention in this following field, as the user's privacy issues, money values everything depends on this. Hence, more intimate research will be needed for these risk issues. After this, the users feeling or intention towards the advertisement has also not yet analyzed, this lacks the research many times. Therefore more advancement is in need over the social media advertising that concerns the researchers to do well for future work.

3. Review Towards Social Media Networking.

3.1. Organized Questionnaire. The constructed questionnaire is comprised of 54 questions and are classified as, the usage of social media sites with 3 questions, Assessments of social media sites having 4 questions, Higher-order statics analysis that involves the Community, Connectedness, Openness, Dependence, and Participation with 4 questions each, Trustworthiness over social media sites that consists of Trust, Perceived

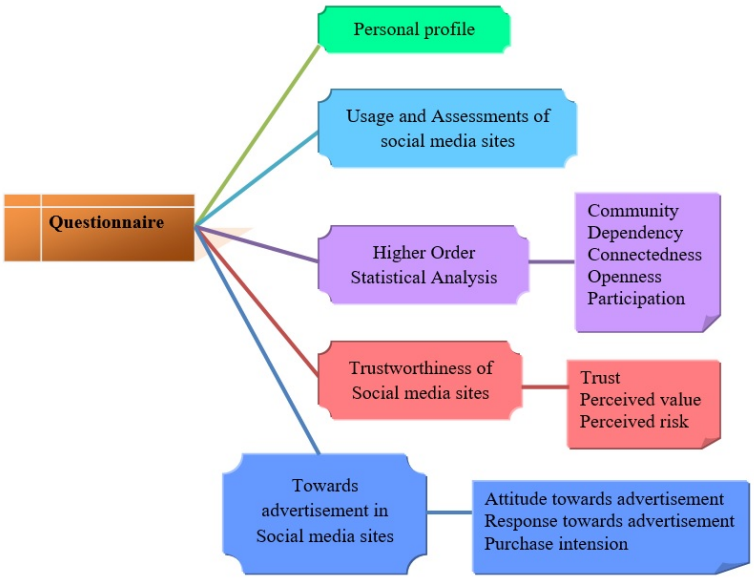


FIG. 3.1. *Art on Constructed Questionnaire*

TABLE 3.1
Personal Profile of college students

	Personal Profile
1	Name
2	Gender
3	Age group
4	Education level
5	Educational institution5 Educational institution

TABLE 3.2
Usage of Social Media Sites

1.	Since when you have been visiting these social media sites? Facebook
2.	Since when you have been visiting these social media sites? Instagram
3.	How much time you spend on social media site in a day? Facebook
4.	How much time you spend on social media site in a day? Instagram
5.	Between what times do you access social media sites mostly? Facebook
6.	Between what times do you access social media sites mostly? Instagram

TABLE 3.3
Assessments of Social Media Sites

1.	Which of the following are you connected with on social media networks?
2.	Comparing last year, have you increased or decreased or spent same amount of time using social networking sites
3.	Looking at the next twelve months, compared to the last year for product information search do you think you will be increasing, decreasing or spending the same amount of time using social networking sites?
4.	What type of products you like to stay connected through social media sites?

value and Perceived risk with 4 questions each, and Towards advertisement over social media sites which includes Attitudes towards advertisement, Response towards advertisement and Purchase intention with 4 questions each. The overall artistic representation of the constructed questionnaire is illustrated in Fig. 3.1, and the corresponding categories of the questionnaire are symbolized in Tables 3.1-3.6.

TABLE 3.4
Higher Order Statics over Social Media Sites

	Community
1.	Finding people of the same interest or background on social media sites is easy
2.	Cultivating more intimate relationship with others on social media is easy
3.	Sharing emotions and communicating feelings with friends on social media sites is easy
4.	It is easy to be part of the community or interest groups on social media sites
	Connectedness
5.	Same social media identity (login ID) is used to login different social media sites
6.	Sharing contents from one social media site and posting it in other social media by sharing or through links is easy
7.	Special advanced skills are not required to use social media sites
8.	Editing and communicating information on the social media sites in the form of text, picture, video is easy
	Openness
9.	Joining social media sites is easy
10.	It is easy to join the groups and communities that I am interested in social media sites
11.	Information can be acquired on social media platform freely
12.	Publishing posts on social media sites can be done freely
	Dependence
13.	When choosing products, social media is my first priority for gathering information
14.	Searching information about products through social media sites is easy
15.	More time is being spent on social media than other online media such as company websites, online shopping website
16.	Making comments or sharing experience with my friends about the products through social media sites is done frequently
	Participation
17.	I am willing to help friends who have problems regarding the use of social media
18.	I often participate in the discussion about products proposed by my friend on social media site
19.	I am subscribed to updates and alerts regarding a brand or product through social media site
20.	Product information is searched through social media sites often

TABLE 3.5
Trustworthiness over Social Media Sites

	Trust
1.	Information on social media is trustworthy
2.	I will share my experience with my friends about buying products or acquiring information on social media
3.	I trust the opinion on social media when considering the product
4.	The probability of getting poor quality products through social media platforms is low
	Perceived value
5.	It is possible to find products that are more suitable for my personal quality and styles on social media site
6.	It is possible to save a lot of money acquiring information about product on social media site
7.	The probability of leaking my privacy in purchasing products through social media platforms is low
8.	After I acquire information about products from social media, I know their quality and function
	Perceived risk
9.	The financial risk in buying products through social media sites is low
10.	The probability of wasting time on obtaining information about products through social media sites is low
11.	The probability of harming my physical health by purchasing products (long exposure to mobile or computer screen) is low
12.	The probability of getting me under social pressure in purchasing products through social media is low

3.2. Data Acquirement. On considering the data acquisition, 100 samples are gathered using Google form from various college students under different universities. The questionnaires are filled with proper responses by college students from diverse universities. The appropriate response can be given by them when the questionnaire was sent in advance. Additionally, the data can be collected via another method called personal interview. In reality, the doubt from the college students associated with the questionnaire can be made clear through this personal interview, and hence the honesty of the responses can be enhanced.

4. Perspectives Of Social Media Usage And Advertisement.

4.1. Personal profile of College students. Fig. 4.1 signifies the personal profile of various college students regarding their gender, age group, educational level, and educational institution. From Fig. 4.1.(a), among the total gender group, 65% of them are female students and the rest 35% are male students. On

TABLE 3.6
Towards Advertisement in Social Media Sites

Attitude towards advertisement	
1.	Social media advertisements make me more aware about various brands and new products
2.	The advertisements displayed on social media gives a positive feeling
3.	The social networking sites are targeting the advertisements to specific audience based on their interest
4.	Brands that use social media for marketing purpose are more innovative than others who are not using it
5.	I prefer brand that is advertised on social media sites
Response towards advertisement	
6.	I talk about the product to my friends
7.	I purchase the product
8.	Just view the produc
9.	Recommend the products to others
10.	Take part in events posted by the company
Purchase intension	
11.	I like to try a product recommended on social media
12.	Seeing social media advertisements increases my interest in buying the same product
13.	I am very likely to buy products shared by my friends on social media platform
14.	Using social media platform help me make decisions better before purchasing products
15.	Social media advertisements greatly influence the purchase choice

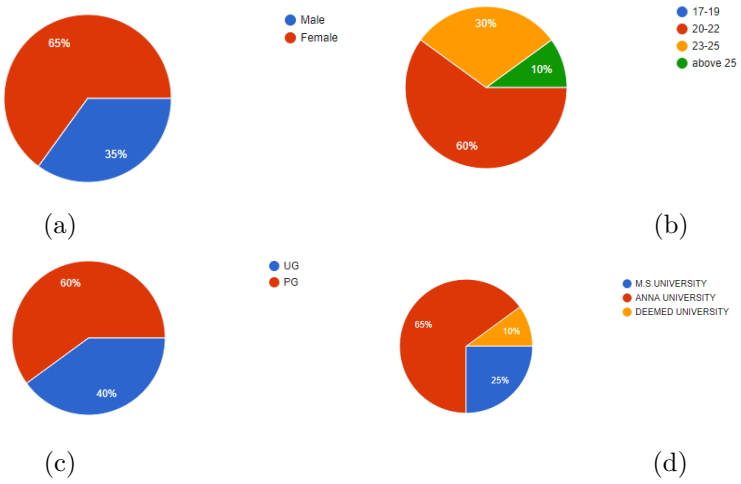


FIG. 4.1. *Personal Profile of College students (a) Gender (b) Age group (c) Education level and (d) Educational Institution*

considering Fig. 4.1.(b), most of the students belong to the age group among 20-22 and is given as 60%. Other than that, 30% of students are among the age group 23-25 and 10% of them are above 25 age. Similarly, while taking their educational qualification, the majority of the students are from PG degree i.e. 60%, the rest 40% of them are undertaking their UG degree. Finally, the educational institution is discussed in brief as follows: 65% of the students are doing their major from Anna University and only 25% and 10% of the students are from M.S. University and Deemed University, respectively.

4.2. Usage of Social Media Sites. Fig. 4.2 depicts the usability of social media sites by college students under three sets of questions. The first question explains on the year since the students visiting social media sites like Facebook and Instagram. For this respective question, 40% and 60% of the students are using Facebook and Instagram for less than a year, 5% and 30% are using them for 1-2 years, only 20% and 50% of them are using these social media for 3-4 years and 35% and 5% of the students are interested in this Facebook and Instagram for above 5 years. The second question is about the average time that spends by the students on social media sites within a day. Most of them use social media sites for less than an hour and that is exemplified as 45% and 70% for Facebook and Instagram, respectively. 40% and 20% of the students utilize them for 1-3 hrs. 15%

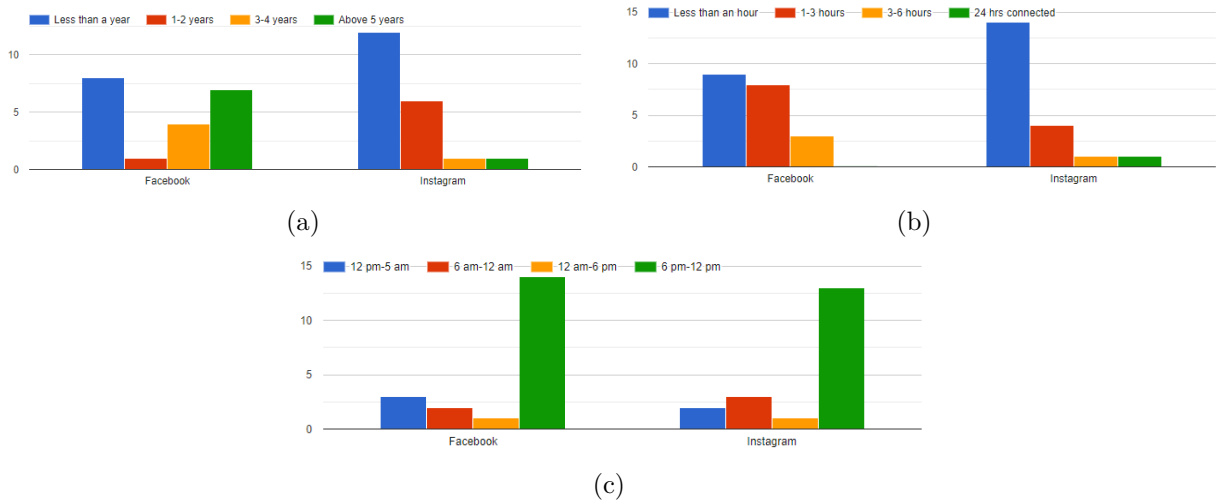


FIG. 4.2. *Usability of Social Media sites (a) year since the students visiting the social media sites (b) average time spend by the students on social media sites in a day and (c) access time of the students for a day*

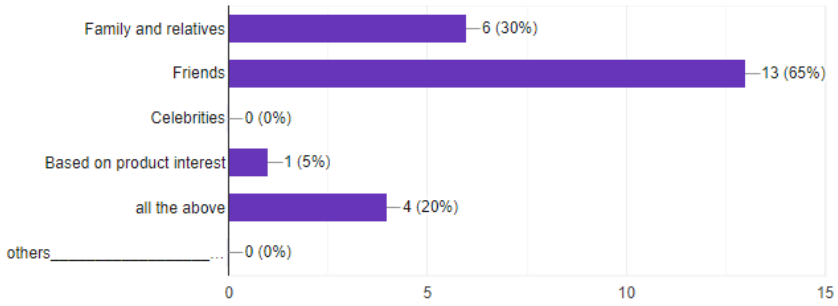
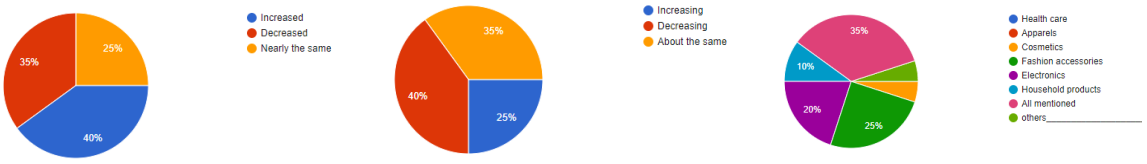


FIG. 4.3. *Assessment of social media sites based on their interest*

and 5% of them use social media sites for 3-6 hrs. Only 5% of the students are using the Instagram site for 24 hrs. The last and final question on this usage is among which times, most of the students are accessing social media sites. Between the times 12 pm to 5 am, only 15% and 10% of the students mostly prefer social media sites. 10% and 15% of them are using these Facebook and Instagram between 6 am to 12 am, only 5% of the overall students are accessing the social media sites among the time 12 am-6 am. Largely, these Facebook and Instagram are preferred at the time between 6 pm and 12 pm and that is 70% and 65%, respectively.

4.3. Assessment of Social Media Sites. Figs. 4.3 and 4.4 delineates the assessment of social networking sites by college student from various universities. Fig. 4.3 expresses the interest of the students on social media networks. In which, 30% are giving preference to family and relatives, the majority of 65% prefer friends, only 5% decide based on the product interest and 20% of the students relies on social media for all these above-mentioned tasks.

Fig. 4.4 exacts the assessment on social media sites under three common questionnaires. The initial question in Fig. 4.4.(a) is about the comparison with last year about the time spending on social networking sites. 40% of the students respond to this question as increasing, 35% as decreasing and 25% says nearly the same as last year. Next one in Fig. 4.4.(b) is regarding the product information search when comparing the last year with the upcoming year, what will you suggest about the time spent on social media sites. For this, only 25% of students suggest as increasing, 40% think on as decreasing and the rest stay about the same. The



(a) (b) (c)

FIG. 4.4. *Assessment of Social Medis Sites*

final question in Fig. 4.4.(c) is on the type of product that the students like to stay connected via social media sites. 10% of the students choose the household products, 5% selects on the cosmetics, 25% prefer on fashion accessories, 20% of students on Electronic products, 35% mentioned on allthe above products and only 5% choose the other.

4.4. Higher Order Statistical Analysis of Social Media Sites. Table 4.1 explains the higher-order statistical analysis of social media sites with the input drivers Community, Connectedness, Openness, Dependence, and Participation. Considering the community, while finding the people with the same interest or background is easier in social media site is the first statement. To this, the response among the student is: only 10% strongly agreed on that fact, 50% only agreed, 10% of them neither agree nor disagree with this statement and 30% disagreed on this report. Next statement says the cultivation of more intimate relation with each other is easier, the level of agreement for this is 25% strongly agree, 45% agreed to this report, 10% neither agree nor disagree on that fact and only 5% disagree on this statement. It is easy to share the emotions and communicate the feelings with friends in social media sites, is the next question. For this, 15% of the students strongly agree, 30% only agreed with this fact, 25% of them neither agree nor disagree, 20% of students disagreed with this statement and 5% of them strongly disagree. To be a part of community or interest group is easier within the social media sites, for this final question on the community, the response of the students are strongly agreed by 25% of them, only agreed by the students of 35%, 30% neither agree nor disagree with this report and 15% of the students only disagreed on this work. Next is the connectedness, for diverse social media sites, 15% strongly agree for the same login ID or identity, 60% only agreed for this identical ID, 5% recommended neither agree nor disagree with this statement, 15% are not interested in using the same ID so disagree for that and 10% strongly disagree on this argument. The subsequent statement is about the sharing and posting of content over the social media site via links and sharing is an easier task, for this, most of them agreed and is 60%, 15% strongly agreed on this and 15% of students neither agree nor disagree for this argument. For using the social media sites, 40% of them strongly agreed on the non-requirement of special advanced skills, where 40% of them also agreed on this report, 15% neither agree nor disagree for this and 5% of them only disagreed on this statement. The next argument is: Editing and communicating information through social media site is easier, and for this 25% of them strongly agreed, 50% only agreed on this statement, 20% of them neither agreed nor disagreed and 5% only disagreed with this argument. The subsequent phase is Openness that includes four questions. The first is joining social media site is easier, the response among the student for this is 25% strongly agreed on this statement, 55% agreed with this argument, 15% of them neither agree nor disagree and 5% disagreed on this report. The next one is on social media sites, joining the interested group and community is easier, where 20% strongly agreed for this, 50% agreed on this statement, 25% neither agree nor disagree on that and 5% disagreed with this report. Information acquirement on social media platforms can be done freely, for this 15% strongly agreed, 60% of students only agreed, 20% of them neither agreed nor disagreed on this report, and 5% on the overall students disagreed and strongly disagreed on this statement. Publishing posts on social media sites can be done freely is the last statement. Owing to this, 30% of the students strongly agreed on this fact, 45% of them only agreed for this and 15% of the students neither agreed nor disagreed as well disagree on this argument. The consequent phase is dependence, where the initial statement is while gathering information on products, 15% strongly agreed that social media site is their first priority, 30% only agreed as their first priority, 10% of the students neither agree nor disagree for this, 35% disagree as that is not their first priority and 10% strongly disagreed on this report. Searching the product information

via social media site is 10% strongly recommended as easier, 40% also agreed as easier, 50% neither agreed or nor disagreed as easier, 5% disagreed on this easier report. The next is about the time spent on social media sites than others media like online shopping websites, company websites, etc, for this 25% strongly agreed on using more time, 40% as well agreed with this long time utilizing, 20% of them neither agree nor disagree, 10% disagreed on this long time usage and 5% strongly disagreed. Making comments or sharing the experience on products among friends on social media site is 20% agreed by them as done frequently, 45% neither agreed nor disagreed on this statement, 15% disagreed and 20% strongly disagreed as they do not do frequently. While taking the participation, helping friends over the problems in social media site is the first statement, and for this 5% are strongly willing to do, 40% agreed to help them, 30% neither agree nor disagree over this, 20% disagreed to help and 5% strongly disagreed on this thinking. Discussion on product proposal of the friend on the social media site, 25% strongly agreed to participate, 20% agreed on to participate in this discussion, 15% of them neither agree nor disagree, 10% disagree on this participation and 25% strongly disagree to participate. Updating and alerting on products or brands on social media site, 5% strongly agreed on subscribing, 30% agreed to subscribe for this, 15% neither agreed nor disagreed on this report, 30% disagreed for subscribing and 20% strongly disagreed to subscribe for this. The searching on product information through social media sites is made often, for this 5% strongly agreed, 45% only agreed for this, 25% of them neither agreed nor disagreed, 10% disagreed on this argument and 20% strongly disagreed for that statement.

4.5. Trustworthiness of Social Media Sites. Table 4.2 reveals the trustworthiness of social media sites with trust, perceived value, and perceived risk that contains four questions in each group. In Trust, information on social media is strongly agreed as trustworthy by 10% of students, 15% only agreed, 25% neither agreed nor disagreed as trustworthy, 40% disagreed and 30% strongly disagreed on their trustworthiness. Sharing the experience on product and information within friends on social media site is 5% strongly made among the overall students, 40% of them only agreed for this, 20% neither agreed nor disagreed, 20% only disagreed on this statement and 15% strongly disagreed with that. The expert opinion on product among social media site is 5% strongly agreed as trustworthy, 15% only agreed as trusty, 45% neither agreed nor disagreed, 20% only disagreed on their trustworthy and 15% strongly disagreed. The probability of acquiring poor quality product through social media platform is 5% strongly agreed as low by the students, 25% of them only agreed as low, 25% neither agreed nor disagreed about this report, 15% only disagreed as they think the probability may be high and 30% strongly disagreed on this argument. On considering the Perceived value, finding the suitable product for customer's in accordance to their personal quality and style on social media site is 15% strongly agreed as possible, 45% of them only agreed as possible, 5%, neither agreed nor disagreed as having possibility, 10% disagreed on their possibility and 20% strongly disagreed as they think it is not possible. Saving the money by acquiring product information on social media sites is 15% strongly agreed by them as possible, 45% mostly agreed as possible, 5% neither agreed nor disagreed on this, 10% disagreed as possible and 20% strongly disagreed on their possibility. Leakage of privacy information in purchasing a product via social media platform is low, 10% strongly agreed for this argument, 20% only agreed as having probability, 25% of the students neither agree nor disagree, 30% of them disagree with this probability and 15% strongly disagreed as the probability of this statement is considered by them as low. The quality and function of the product are known only after getting the product information from social media site, for this 10% strongly agreed, 35% only agreed for this, 25% of the students neither agree nor disagree, 20% disagreed with this argument and 10% of them strongly disagreed. In the Perceived risk, about the financial risk on buying a product via social media site is 15% strongly agreed as low, most among the overall students with 35% agreed as low, 10% neither agreed nor disagreed, 30% disagreed on this low value and 10% strongly disagreed on this statement. The possibility of wasting time for gaining the product information from social media site is 15% strongly agreed as low, 30% only agreed as low, 20% both agreed nor disagreed on this low argument, 20% of them disagreed and 15% strongly disagreed with this low statement. The probability on harming the health by buying a product is 5% strongly agreed by the students as low, 20% only agreed as low, 30% of them neither agreed nor disagreed, 35% disagreed for this statement as it may be high, and 10% strongly disagreed. The probability of getting under social pressure in buying a product through social media platform is low, for this statement, 15% strongly agreed, 25% only agreed, 25% of them neither agreed nor disagreed, 15% of the students disagreed on this report and 20% of them strongly disagreed with this argument.

TABLE 4.1
Analysis on Level of Agreement over Higher Order Statistics

Level of Agreement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Community					
Finding people who have same interest or background on social media sites is easy	10%	50%	10%	30%	-
Cultivating more intimate relationship with others on social media is easy	25%	45%	10%	5%	-
Sharing emotions and communicating feelings with friends on social media sites is easy	15%	30%	25%	20%	5%
It is easy to be part of the community or interest groups on social media sites	25%	35%	30%	15%	-
Connectedness					
Same social media identity (login ID) is used to login different social media sites	15%	60%	5%	15%	10%
Sharing contents from one social media site and posting it in other social media by sharing or through links is easy	20%	65%	15%	-	-
Special advanced skills are not required to use social media sites	40%	40%	15%	5%	-
Editing and communicating information on the social media sites in the form of text, picture, video is easy	25%	50%	20%	5%	-
Openness					
Joining social media sites is easy	25%	55%	15%	5%	-
It is easy to join the groups and communities that I am interested in social media sites	20%	50%	25%	5%	-
Information can be acquired on social media platform freely	15%	60%	20%	5%	5%
Publishing posts on social media sites can be done freely	30%	45%	15%*	15%	-
Dependence					
When choosing products, social media is my first priority for gathering information	15%	30%	10%	35%	10%
Searching information about products through social media sites is easy	10%	40%	50%	5%	-
More time is being spent on social media than other online media such as company websites, online shopping website	25%	40%	20%	10%	5%
Making comments or sharing experience with my friends about the products through social media sites is done frequently	-	20%	45%	15%	20%
Participation					
I am willing to help friends who have problems regarding the use of social media	5%	40%	30%	20%	5%
I often participate in the discussion about products proposed by my friend on social media site	25%	20%	15%	15%	25%
The brand on social media site can be subscribed to updates and alerts regarding a product.	5%	30%	15%	30%	20%
Product information is searched through social media sites often	5%	45%	25%	10%	20%

4.6. Towards Advertisement in Social Media Sites. Table 4.3 portrays the level of agreement over the advertisement in social media sites, which comprised of three main factors like Attitude towards advertisement, Response towards advertisement, and Purchase intention. In Attitude towards advertisement, social media advertisement on awareness probability over the new product and various brands is 20% strongly agreed as best, 40% only agreed as good, 10% neither agreed nor disagreed, 15% of them disagreed as bad and rest 15% strongly disagreed as worst. The advertisement displayed on social media is 5% strongly agreed as providing positive feeling, 35% of them only agreed on the same feeling, 30% of the students neither agreed nor disagreed on this positive feeling concept, 20% disagreed on this positive feeling and 10% of them strongly disagreed. The

Table 4.2
Analysis on Level of Agreement over Trustworthiness

Level of Agreement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Trust					
Information on social media is trustworthy	10%	15%	25%	40%	30%
I will share my experience with my friends about buying products or acquiring information on social media	5%	40%	20%	20%	15%
I trust the opinion of experts on social media while considering any product	5%	15%	45%	20%	15%
The probability of getting poor quality products through social media platforms is low	5%	25%	25%	15%	30%
Perceived value					
It is possible to find products that are more suitable for my personal quality and styles on social media site	25%	25%	15%	25%	10%
It is possible to save a lot of money acquiring information about product on social media site	15%	45%	5%	10%	20%
The probability of leaking my privacy in purchasing products through social media platforms is low	10%	20%	25%	30%	15%
After I acquire information about products from social media, I know their quality and function	10%	35%	25%	20%	10%
Perceived risk					
The financial risk in buying products through social media sites is low	15%	35%	10%	30%	10%
The probability of wasting time on obtaining information about products through social media sites is low	15%	30%	20%	20%	15%
The probability of harming my physical health by purchasing products (long exposure to mobile or computer screen) is low	5%	20%	30%	35%	10%
The probability of getting me under social pressure in purchasing products through social media is low	15%	25%	25%	15%	20%

advertisement is mainly targeting the particular audience based on their interest in social networking sites, for this argument, 15% strongly agreed, 50% of the students only agreed with the most count, 10% of them neither agreed nor disagreed, 10% disagreed and strongly disagreed on this statement. Brands that use social media for advertising purpose are more original than others who are not using it, on considering the report, 10% of them strongly agreed, 30% of the students agreed on this report, 25% neither agreed nor disagreed for this statement, 20% disagree for this and 15% strongly disagreed on this argument. The brand that advertised in social media site is agreed as preferable by 15% of the students, 30% of them neither agreed nor disagreed, 30% disagreed on this preference and 20% strongly disagreed as they do not prefer the brand. The subsequent one is the Response towards the advertisement. In this, about the product to a friend, 20% strongly agreed to convey, 25% only agreed to talk on the product, 15% neither agreed nor disagreed on talking, 15% disagreed with this conveying concept, and 15% strongly disagreed to talk about the product. On product purchase, 15% strongly agreed to purchase, 15% agreed to buy, 35% of the students neither agreed nor disagreed, 20% disagreed to buy that product, and 15% of them strongly disagreed on purchasing. On viewing the product, 10% strongly agreed to view, 40% of them agreed on viewing over the product, 20% of the students neither agreed nor disagreed on this report, 10% disagreed on this viewing concept, and 15% strongly disagreed. Product recommendation to others, 15% only agreed to recommend on that, 45% neither agreed nor disagreed, 20% of them disagreed to suggest the product among others and 20% strongly disagreed over this suggesting concept. Take part over the events posted by the company, 5% only strongly agreed for this, 10% only agreed, 15% of the students neither agreed nor disagreed, 35% disagreed on this fact and 35% strongly disagreed for this take part intention. Finally, the purchase intention, the four sets of questions in this is explained with their responses as follows. Try a product suggested over social media, 10% of the students strongly agreed to try that, 40% of them agreed on trying the product, 15% neither agreed nor disagreed, 15% disagreed on try over statement, and 20% of the students disagreed. Social media advertising increases the interest on buying the advertised product, 10% strongly agreed to buy the same product, 30% agreed over this buying concept, 20% of them neither agreed

TABLE 4.3
Analysis on Level of Agreement over Advertisement

Level of Agreement	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Attitude towards advertisement					
Social media advertisements make me more aware about various brands and new products	20%	40%	10%	15%	15%
The advertisements displayed on social media gives a positive feeling	5%	35%	30%	20%	10%
The social networking sites are targeting the advertisements to specific audience based on their interest	15%	50%	10%	10%	10%
Brands that use social media for marketing purpose are more innovative than others who are not using it	10%	30%	25%	20%	15%
I prefer brand that is advertised on social media sites	-	15%	30%	30%	20%
Response towards advertisement					
I talk about the product to my friends	20%	25%	15%	15%	25%
I purchase the product	15%	15%	35%	20%	15%
Just view the product	10%	40%	20%	10%	15%
Recommend the products to others	-	15%	45%	20%	20%
Take part in events posted by the company	5%	10%	15%	35%	35%
Purchase intension					
I like to try a product recommended on social media	10%	40%	15%	15%	20%
Seeing social media advertisements increases my interest in buying the same product	10%	30%	20%	20%	20%
I am very likely to buy products shared by my friends on social media platform	10%	25%	25%	25%	15%
Using social media platform help me make decisions better before purchasing products	10%	45%	20%	10%	10%
Social media advertisements greatly influence the purchase choice	20%	45%	-	20%	15%

nor disagreed, 20% disagreed on this same buying intention and 20% strongly disagreed to purchase the same product. Purchase the product that shared by the friend on social media, 10% of them strongly agreed to do this, 25% agreed to purchase as per their friend's suggestion, 25% of the students neither agreed nor disagreed on this fact, 25% disagreed to buy the product as per their friends intention and 15% strongly disagreed on this concept. Social media platforms aided on making a better decision before purchasing product, 10% strongly agreed as better decision, 45% agreed this as a good concept, 20% of them neither agreed nor disagreed over this, 10% disagreed on this statement and 10% strongly disagreed. Social media advertisements greatly influence the purchase choice, 20% strongly agreed that as true, 45% of them agreed on this fact, only 20% disagreed over this argument and 15% of the students strongly disagreed over this influence concept.

5. Enquired Conclusion On Impact Of Social Media Advertising.

5.1. Simulation Procedure. The implemented analysis was evaluated using MATLAB 2018a after entering the gained raw data from the students. The result of this analysis was mainly concerned over the social media sites under six constraints like a personal profile, usage, assessment, higher order statistics, trustworthiness, and towards advertisement and each constraint was comprised of 4, 6, 4, 20, 12 and 15 questions, correspondingly. In this, the correlation analysis was made by correlating the entire questions in this questionnaire, and the high correlation (rank) was obtained. The mathematical formula for the correlation coefficient for A and B matrix was given by Eq. (1). In this, σ_A and μ_A exemplifies the standard deviation and mean of A. σ_B and mu_A signifies the standard deviation and mean of B. The Entropy is also computed in this analysis and the mathematical expression is stated as per Eq. (2). In this, Boltzmann constant is given ask_b that is equivalent to 1.38065×1023J/K and p_i refers to the probability.

$$\rho(A,B) = \frac{1}{N-1}\sum_{i=1}^{N}\left(\frac{A_i-\mu_A}{\sigma_A}\right)\left(\frac{B_i-\mu_B}{\sigma_B}\right) \tag{5.1}$$

TABLE 5.1
4×4 matrix representation on result of correlation analysis under Personal Profile

1	0.2344	0.2568	0.2899
0.2344	1	-0.6086	-0.1671
0.2568	-0.6086	1	0.3662
0.2899	-0.1671	0.3662	1

TABLE 5.2
6×6 matrix representation on result of correlation analysis under Usage

1	0.3352	-0.4254	0.007	-0.0586	0.0433
0.3352	1	-0.2215	-0.5737	-0.1485	-0.2163
-0.4254	-0.2215	1	0.2349	0.0365	-0.1616
0.007	-0.5737	0.2349	1	0.3155	0.2152
-0.0586	-0.1485	0.0365	0.3155	1	0.7371
0.0433	-0.2163	-0.1616	0.2152	0.7371	1

TABLE 5.3
4×4 matrix representation on result of correlation analysis under Assessment

1	0.2349	0.0365	-0.1616
0.2349	1	0.3155	0.2152
0.0365	0.3155	1	0.7371
-0.1616	0.2152	0.7371	1

$$S = -k_B \sum_i p_i \log p_i \tag{5.2}$$

5.2. Correlation Analysis under Personal Profile. Table 5.1 expresses the correlation analysis under the personal profile of the students for the regarded 4 questions. In this, a 4×4 matrix is constructed on the result of correlation analysis, as four questions are analyzed. The highest correlation obtained by the question is given in Table 3.1, "2. Students Gender".

5.3. Correlation Analysis under Usage. Table 5.2 describes the correlation analysis under the usage of social media sites by students for accounted 6 questions. Owing to this, a 6×6 matrix is constructed as the result of correlation analysis, as six questions are analyzed. The highest correlation gained in the questionnaire is, "5. Between what times do you access social media sites mostly? Facebook" in Table 3.2.

5.4. Correlation Analysis under Assessment. Table 5.3 exemplifies the correlation analysis under assessment of social media sites among students for the constrained 4 questions. In this, a 4×4 matrix is constructed on the result of correlation analysis, as four questions are analyzed. The highest correlation which is attained by the questionnaire in Table 3.3 is, "3. Looking at the next twelve months, comparing to the last year for product information search do you think you will be increasing, decreasing or spending the same amount of time using social networking sites?".

5.5. Correlation Analysis under Higher Order Statistics. Table 5.4 symbolizes the correlation analysis under higher order statistics of students regarding the social media sites for the considered 20 questions. In this, 20×20 matrix is modeled as the result of correlation analysis, as twenty questions are analyzed. The highest correlation accomplished by the question is in Table 3.4 under connectedness, "6. Sharing contents from one social media site and posting it in other social media by sharing or through links is easy".

5.6. Correlation Analysis under Trustworthiness. Table 5.5 portrays the correlation analysis under-the trustworthiness of social media sites for the accounted 12 questions. In this, the 12×12 matrix is formed as the result of correlation analysis, as twelve questions are analyzed. The highest correlation that is gained from the questionnaire is in Table 3.5 under perceived value, "7. The probability of leaking my privacy in purchasing products through social media platforms is low".

TABLE 5.4
20×20 matrix representation on result of correlation analysis under Assessment

1	0.3352	-0.4254	0.007	-0.0586	0.0433	-0.0421	0.3764	0.2783	0.0828	-0.1493	0.2837	0.2596	0.0452	-0.2219	0.3437	-0.0295	0.2594	-0.2377	0.1135
0.3352	1	-0.2215	-0.5737	-0.1485	-0.2163	0.255	0.411	0.4837	0.2219	-0.2328	-0.1363	-0.0988	-0.4284	-0.4164	0.1493	-0.4082	-0.4718	-0.2176	0.2056
-0.4254	-0.2215	1	0.2349	0.0365	-0.1616	0.0918	-0.2563	-0.3099	0.0618	-0.0143	-0.3421	-0.0689	-0.2812	-0.1921	0.0059	0.1713	-0.0623	-0.0592	-0.2065
0.007	-0.5737	0.2349	1	0.3155	0.2152	-0.2095	-0.2863	-0.3964	-0.2651	0.3678	0.1126	-0.2374	0.1248	0.3623	-0.0858	0.342	0.4349	0.2101	-0.0386
-0.0586	-0.1485	0.0365	0.3155	1	0.7371	0.3536	-0.3534	-0.4068	-0.0958	0.2392	0.1334	0.0936	0	0.2009	-0.0163	-0.1365	-0.0369	0.3851	-0.0303
0.0433	-0.2163	-0.1616	0.2152	0.7371	1	0.0927	-0.1422	-0.093	-0.0404	0.3142	0.3076	0.2973	0.2428	0.1225	0.1817	-0.1873	0.0912	0.2787	-0.2816
-0.0421	0.255	0.0918	-0.2095	0.3536	0.0927	1	-0.2246	-0.1097	-0.2756	-0.3537	-0.1993	0.0142	-0.1505	-0.2168	-0.2665	-0.4255	-0.1212	-0.1583	0.0145
0.3764	0.411	-0.2563	-0.2863	-0.3534	-0.1422	-0.2246	1	0.4355	0.2879	-0.1031	0.1443	0.0645	-0.3295	-0.3031	0.3989	-0.0607	0.023 -	0.2667	0.0294
0.2783	0.4837	-0.3099	-0.3964	-0.4068	-0.093	-0.1097	0.4355	1	0.3256	-0.1727	0.2257	0.1527	0.1569	-0.2009	0.1798	0.0796	-0.0685	-0.2751	0.1314
0.0828	0.2219	0.0618	-0.2651	-0.0958	-0.0404	-0.2756	0.2879	0.3256	1	0.2703	0.3826	0.4619	-0.2718	-0.3532	0.0185	-0.2185	-0.1607	-0.2238	-0.0228
-0.1493	-0.2328	-0.0143	0.3678	0.2392	0.3142	-0.3537	-0.1031	-0.1727	0.2703	1	0.1287	0.0309	-0.082	0.0088	0.1025	-0.1694	-0.0165	0.1725	-0.3644
0.2837	-0.1363	-0.3421	0.1126	0.1334	0.3076	-0.1993	0.1443	0.2257	0.3826	0.1287	1	0.158	0	0.0068	-0.1022	0.1102	0.2901	-0.0666	-0.0979
0.2596	-0.0988	-0.0689	-0.2374	0.0936	0.2973	0.0142	0.0645	0.1527	0.4619	0.0309	0.158	1	0.1367	-0.3633	0.1377	-0.2545	-0.0413	0	-0.1409
0.0452	-0.4284	-0.2812	0.1248	0	0.2428	-0.1505	-0.3295	0.1569	-0.2718	-0.082	0	0.1367	1	0.3444	0.2185	0.386	0.4387	0.2715	0.1559
-0.2219	-0.4164	-0.1921	0.3623	0.2009	0.1225	-0.2168	-0.3031	-0.2009	-0.3532	0.0088	0.0068	-0.3633	0.3444	1	-0.3445	0.3821	0.0902	-0.0725	0.4592
0.3437	0.1493	0.0059	-0.0858	-0.0163	0.1817	-0.2665	0.3989	0.1798	0.0185	0.1025	-0.1022	0.1377	0.2185	-0.3445	1	0.2523	0.1168	0.1768	-0.3378
-0.0295	-0.4082	0.1713	0.342	-0.1365	-0.1873	-0.4255	-0.0607	0.0796	-0.2185	-0.1694	0.1102	-0.2545	0.386	0.3821	0.2523	1	0.1449	0.0369	0.1628
0.2594	-0.4718	-0.0623	0.4349	-0.0369	0.0912	-0.1212	0.023	-0.0685	-0.1607	-0.0165	0.2901	-0.0413	0.4387	0.0902	0.1168	0.1449	1	0.171	-0.1444
-0.2377	-0.2176	-0.0592	0.2101	0.3851	0.2787	-0.1583	-0.2667	-0.2751	-0.2238	0.1725	-0.0666	0	0.2715	-0.0725	0.1768	0.0369	0.171	1	-0.1312
0.1135	0.2056	-0.2065	-0.0386	-0.0303	-0.2816	0.0145	0.0294	0.1314	-0.0228	-0.3644	-0.0979	-0.1409	0.1559	0.4592	-0.3378	0.1628	-0.1444	-0.1312	1

TABLE 5.5
12×12 matrix representation on result of correlation analysis under Trustworthiness

1	0.1449	0.0369	0.1628	-0.0485	0	-0.0034	0.3262	0.2848	-0.2346	-0.2948	-0.411
0.1449	1	0.171	-0.1444	0.3946	-0.3693	-0.0333	-0.0232	0.1165	0.0028	-0.1801	-0.1763
0.0369	0.171	1	-0.1312	0.4357	0.1929	-0.3975	-0.182	-0.032	-0.4364	-0.091	-0.1754
0.1628	-0.1444	-0.1312	1	-0.2647	0.3897	0.0487	-0.234	0.4236	-0.0053	-0.574	0.0966
-0.0485	0.3946	0.4357	-0.2647	1	0.0362	-0.3201	0.0911	-0.2766	-0.5296	-0.2334	-0.1042
0	-0.3693	0.1929	0.3897	0.0362	1	-0.4651	-0.2949	-0.2422	-0.2828	-0.3605	-0.2842
-0.0034	-0.0333	-0.3975	0.0487	-0.3201	-0.4651	1	0.3602	0.4516	0.51	0.5121	0.469
0.3262	-0.0232	-0.182	-0.234	0.0911	-0.2949	0.3602	1	0.1415	0.0593	0.1598	-0.0795
0.2848	0.1165	-0.032	0.4236	-0.2766	-0.2422	0.4516	0.1415	1	0.0678	-0.2504	0.1101
-0.2346	0.0028	-0.4364	-0.0053	-0.5296	-0.2828	0.51	0.0593	0.0678	1	0.4597	0.3429
-0.2948	-0.1801	-0.091	-0.574	-0.2334	-0.3605	0.5121	0.1598	-0.2504	0.4597	1	0.3278
-0.411	-0.1763	-0.1754	0.0966	-0.1042	-0.2842	0.469	-0.0795	0.1101	0.3429	0.3278	1

TABLE 5.6
15×15 matrix representation on result of correlation analysis Towards Advertisement

1	0.3256	0-0.1727	0.2257	0.1527	0.1569	-0.2009	0.1798	0.0796	-0.0685	-0.2751	0.1314	-0.351	-0.2377	0.0663
0.3256	1	0.2703	0.3826	0.4619	-0.2718	-0.35332	0.0185	-0.2185	-0.1607	-0.2238	-0.0228	0.0817	0.1074	0.0058
-0.1727	0.2703	1	0.1287	0.0309	-0.0802	0.0088	0.1025	-0.1694	-0.0165	0.1725	-0.3644	0.2671	-0.0466	-0.224
0.2257	0.3826	0.1287	1	0.158	0	0.0068	-0.1022	0.1102	0.2901	-0.0666	-0.0979	0.3313	-0.3957	-0.0031
0.1527	0.4619	0.0309	0.158	1	0.1367	-0.3633	0.1377	-0.2545	-0.0413	0	-0.1409	0.117	0.2417	-0.2416
0.1569	-0.2718	-0.082	0	0.1367	1	0.3444	0.2185	0.386	0.4387	0.2715	0.1559	0.2866	0.11	-0.3935
-0.2009	-0.3532	0.0088	0.0068	-0.3633	0.3444	1	-0.3445	0.3821	0.0902	-0.0725	0.4592	-0.1496	0	0.0134
0.1798	0.0185	0.1025	-0.1022	0.1377	0.2185	-0.3445	1	0.2523	0.1168	0.1768	-0.3378	0.1228	0.3056	-0.3264
0.0796	-0.2185	-0.1694	0.1102	-0.2545	0.386	0.3821	0.2523	1	0.1449	0.0369	0.1628	-0.0485	0	-0.0034
-0.0685	-0.1607	-0.0165	0.2901	-0.0413	0.4387	0.0902	0.1168	0.1449	1	0.171	-0.1444	0.3946	-0.3693	-0.0333
-0.2751	-0.2238	0.1725	-0.0666	0	0.2715	-0.0725	0.1768	0.0369	0.171	1	-0.1312	0.4357	0.1929	-0.3975
0.1314	-0.0228	-0.3644	-0.0979	-0.1409	0.1559	0.4592	-0.3378	0.1628	-0.1444	-0.1312	1	-0.2647	0.3897	0.0487
-0.351	0.0817	0.2671	0.3313	0.117	0.2866	-0.1496	0.1228	-0.0485	0.3946	0.4357	-0.2647	1	0.0362	-0.3201
-0.2377	0.1074	-0.0466	-0.3957	0.2417	0.11	0	0.3056	0	-0.3693	0.1929	0.3897	0.0362	1	-0.4651
0.0633	0.0058	-0.224	-0.0031	-0.2416	-0.3935	0.0134	-0.3264	-0.0034	-0.0333	-0.3975	0.0487	-0.3201	-0.4651	1

5.7. Correlation Analysis Towards Advertisement. Table 5.6 explains the correlation analysis towards the advertisement of social media sites for the constrained 15 questions. In this, a 15×15 matrix is designed as the result of correlation analysis, as fifteen questions are analyzed. The highest correlation gained in this questionnaire section is from Table 3.6 under Response towards advertisement, "6. I talk about the product to my friends".

5.8. Overall Correlation Analysis. Table 5.7 demonstrates the overall correlation analysis of the defined topic of social media sites. In the view of the attained correlation of the above six questions, the overall correlation analysis is obtained. Here, a 6×6 matrix is developed as the result of the aforesaid correlation analysis. The finally attained best correlation among the entire questionnaire is from the usage section in Table

TABLE 5.7
6×6 matrix representation on result of correlation analysis under Usage

1	0.3352	-0.4254	0.007	-0.0586	0.0433
0.3352	1	-0.2215	-0.5737	-0.1485	-0.2163
-0.4254	-0.2215	1	0.2349	0.0365	-0.1616
0.007	-0.5737	0.2349	1	0.3155	0.2152
-0.0586	-0.1485	0.0365	0.3155	1	0.7371
0.0433	-0.2163	-0.1616	0.2152	0.7371	1

TABLE 5.8
Entropy Analysis of Overall Questionnaire

Age group																			
0.9341	1.2955	0.971	1.2362	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Since when have you been visiting these social media sites, Facebook																			
1.7394	1.3955	1.4577	1.2568	1.319	1.4166	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Which of the following are you connected with on social media networks																			
1.4577	1.2568	1.319	1.4166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
It is easy to join the groups and communities that I am interested in social media sites																			
1.7394	1.3955	1.4577	1.2568	1.319	1.4166	1.9955	1.5589	1.5589	2.2589	1.6855	1.7345	2.1211	1.8834	1.6955	1.2789	1.6842	1.6805	1.601	1.6805
The probability of getting me under social pressure in purchasing products through social media is low																			
1.6841	1.6805	1.601	1.6805	1.2789	1.6855	2.1261	1.5955	2.0414	1.8577	1.9464	2.2855	-	-	-	-	-	-	-	-
The advertissements displayed on social media gives a positive feeling																			
1.5589	2.2589	1.6855	1.7345	2.1211	1.8834	1.6955	1.2789	1.6842	1.6805	1.601	1.6805	1.2789	1.6855	2.1261	-	-	-	-	-

3.2, "5. Between what time do you access the social media sites mostly? Facebook".

5.9. Overall Entropy Analysis. Table 5.8 describes the entropy analysis of the overall contributed questionnaire. On considering the personal profile of the students, the maximum entropy is gained by the question from Table 3.1 i.e. "3. Age group". Similarly, for the usage section, the obtained entropy is maximum for the question from Table 3.2, "1. Since when have you been visiting these social media sites, Facebook". Subsequently, an assessment section, from Table 3.3, question "1. Which of the following are you connected with on social media networks?" has obtained the maximum entropy of all other questions in that section. While taking the higher order statistics drives like community, connectedness, openness, dependence, and participation, the maximum attained entropy is for Table 3.4 and the question is "10. It is easy to join the groups and communities that I am interested in social media sites". The next section is trustworthiness, where the question that achieved maximum entropy is from Table 3.5, "12. The probability of getting me under social pressure in purchasing products through social media is low". To the end, among towards advertisement section, the maximum entropy gained question is in Table 3.6, "2. The advertisements displayed on social media give a positive feeling". Among these obtained maximum entropies, the overall entropy that gained the maximum value of 2.2516 is for the question in the personal profile section "Age group".

6. Conclusion. In this paper, a new strategy was introduced to make a statistical review on social media advertisements. This analysis was mainly involved with six stages like (i) Personal Profile; (ii) Usage (iii) Assessment (iv) Higher Order statistics (v) Trustworthiness and (vi) Towards advertisement. In the first stage, the questionnaire was prepared by concerning the intimate usage of social media sites and advertisements over the social media network. Then on the next stage, the prepared questionnaire was distributed among the various universitycollege students and suggested to fill up according to their thoughts or responses. These gathered responses were then taken for analysis. Further, the analysis has been made based on the higher-order statistical analysis that auspiciously focused on correlation coefficients and entropy function, which were aided on determining the correlation and entropy between the responses towards the social media network. In the view of the attained correlation of the above six questions, the overall correlation analysis was obtained. Here, the 6×6 matrix was developed as the result of the aforesaid correlation analysis. The finally attained best correlation among the entire questionnaire was from the usage section in Table 3.2, "5. Between what time do you access social media sites mostly? Facebook". Moreover, among these obtained maximum entropies, the overall entropy that gained the maximum value of 2.2516 was for the question in the personal profile section "Age group". In the future we will provide advertising industry, to make the advertising more and stronger.

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