

Psychographic Segmentation of Facebook Users : A Cluster Analysis

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Abstract

Purpose: The aim of the study was to identify the usage pattern and purpose of using Facebook by individuals and to investigate the intentions of these segments to discuss brands during their daily social media communications.

Design /Methodology/Approach: This study is a combination of both qualitative and quantitative approach. The qualitative approach used the netnography technique to examine the Facebook community; 1120 respondents comprising of current students and faculties from an engineering college, arts college, and 3 B-schools participated in this study. The study gathered information on users' characteristics and factors affecting purpose of using Facebook. The screening question was asked to clarify the unit of analysis in order to make sure that the respondents had only one Facebook account.

Results: The findings from this study were analyzed using cluster analysis to identify groups of similar people in terms of how they responded to Facebook fundamental hooks like new referrals, games, groups & links, public networking, sharing emotions, performance sharing, information sharing, private networking, entertainment, amusement, socializing, and these results indicated the presence of three significant segments of Facebook users : Entertainers, Networkers, and Expressers.

Originality/Value: This paper showed how and why people use social networking sites. The study can be used by brands and organizations to communicate effectively with customers by developing appropriate features, targeting ads, and apps to attract followers.

Keywords: Facebook, psychographic, netnography, entertainers, expressers, networkers, cluster analysis

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The word “Social Media” refers to an extensive array of Internet based and mobile services that permit users to share, exchange, and contribute user- created content, or join online communities. These include blogs, social bookmarking, social networking sites, and virtual world content, and status update services. The most popular social networking sites are Facebook, Twitter, LinkedIn, Google Plus, and Pinterest (Boyd & Ellison, 2007).

Facebook has become the blood of the current generation that we are living in. It has entered into the life of each and every individual - right from that of a youngster to that of an old aged person. Facebook is a social networking site which has spread its wings and is now a part of every life. It has not just restricted its usage to creating friends or for chatting, but it is something far beyond just networking and connecting. On Facebook, we can tag our friends, refresh our memories with pictures of our families and friends, and stay in touch with friends and family. The other thing that Facebook does is that it helps us to get a view of the new collections of clothes, shoes, or jewellery, and so forth. It helps us to express our views to the whole world at a single click. We can share our opinions about current

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issues ; our likes and dislikes - all are given preference on Facebook. Facebook also provides entertainment as well (games can be played on Facebook). We can invite our friends for being a part of a game and make it more lively and filled with fun. We can also share a lot of information through Facebook, which at times may be useful to others as well (Kumar & Singh, 2013). Facebook has created an impact on the lives of each and every individual. It helps a lot in knowing the kind of person you are, the kind of personality you hold, which at times will help you to find employment as well. Today, most of the companies check for the candidates' profile and background on Facebook. Facebook fan pages help an organization/celebrity to know where they stand in positioning. A lot of people spend time on pages like sports pages, brand pages, recipe pages, and so forth, and these pages reflect a person's area of interests (Kumar & Singh, 2013).

It is a known fact that the number of Facebook users in India is increasingly every year. The usage pattern of Indian Facebook users is different from that of other countries. Facebook is not only used as a marketing tool, but is a social networking tool that can reshape the culture and brand of an organization, which in turn can lead to better employee productivity and satisfaction (Bennett, Owers, Pitt, & Tucker, 2009). Social networks drive internal communication and improve employee engagement (Lee, 2013). To understand the personality of different users, social media websites-commerce retailers can present the information in such a manner that users will be more interested. For example, the presentation of Facebook's ads can be adjusted according to the users' preferences (Golbeck, Robles, & Turner, 2011). All Facebook users will not use the site in the same way; they may be motivated by different propositions. Understanding the different types of Facebook users is the first and foremost step to communicate with them effectively and provide appropriate features for engaging the users.

Literature Review

Many papers have examined what motivates people to use Facebook. Ellison, Steinfield, and Lampe (2006) found that students used Facebook for fun, for killing time, to stay in touch with old friends, and for maintaining a relationship. Viswanath, Mislove, Cha, and Gummadi (2009) investigated the ways in which Facebook users interacted and how different types of interactions affected the overall structure. The study sought to give great insights into understanding the segmentation of people in terms of social media types. Vinerean, Cetina, Dumitrescu, and Tichindelean (2013) investigated the online activities of social media users, and they used a linear model to examine how different predictors related to social networking sites had a positive impact on perception of online advertisements. Stagno (2010) aimed to provide information to a higher educational institution about the use of social media by students as a networking platform, information source, and communication tool. Fridolf and Arnautovic (2011) found that social media in marketing communication helps the customers to create communication with each other easily, and this helps to strengthen the corporate identity to build confidence and create a relationship.

Perey (2008) found that community platforms seek to differentiate their services in order to attract new members seeking to participate in the networks. Pesonen (2012) analyzed online marketing importance in the tourist industry. The author pointed out that social media can be segmented into 10 segments, and these 10 segments differ from each other. Brandtzaeg and Heim (2011) identified and described the various ways in which people use social media and they segmented social media users as five types of users - sporadic, lurkers, socializers, debaters, and actives. Alarcón-del-Amo, Lorenzo-Romero, and Gómez-Borja (2011) identified individual behavior on social networking sites and found four segments of users. One section of users was introvert ; novel users were more occasional; the versatile users performed differently ; and expert communicators performed a great variety of activities at a high frequency.

Objectives of the Study

The aim of the study is to identify the usage pattern and purpose of using Facebook by individuals. The study has the following specific objectives :

- (1) To design and validate an instrument to measure the Facebook involvement scale,
- (2) To identify the different groups of users of Facebook.

Methodology

➤ **Procedures :** We conducted a survey by considering 1120 respondents who comprised of current students and faculties from an engineering college, an arts college, and three B-schools. The time period of the study is from March to July 2013. The sample consisted of 347 males and 773 females. The sample comprised of 895 students and 225 faculty members in the age group of below 20 years (448 respondents) ; 467 respondents fell in the age group of 21-30 years ; and 205 respondents were in the age group of 31-40 years. The study gathered information on user characteristics and factors affecting the purpose of using Facebook. The screening question was asked to clarify the unit of analysis in order to make sure that the respondents had only one Facebook account. This is because the respondents who had more than one account may use different accounts for different purposes and not really show their true self while using their Facebook account.

➤ **Instrumentation :** The instruments of this study involved two parts: the first section of the instrument consisted of forced-choice questions about demographic characteristics: gender, marital status, age, occupation, and who the respondents were living with. The second section of variables were chosen for this study in order to measure the purpose of using Facebook by the respondents. This section contained 49 items and was characterized into 12 sub scales : (a) games (items 1 to 10), (b) networking (items 11 to 19), (c) groups (items 20 to 24) ,(d) chatting (items 25 to 27), (e) sharing & news referrals (items 28 to 32), (f) private networking (items 33 to 35) ,(g) sharing emotions (item 36 to 37) ,(h) socializing (item 38 to 39), (i) information sharing (item 40 to 42), (j) performance sharing (item 43 to 44), (k) entertaining (item 45 to 47) , (l) amusement (item 48 to 49). The Facebook involvement scale dimension - 49 items were evaluated on a 5-point Likert scale ranging from 1 to 5 , using the anchors : 5=*strongly agree*, 4=*agree* , 3=*neutral*, 2=*disagree* , 1= *strongly disagree*.

Analysis and Results

The Statistical Package for the Social Science (SPSS) for Microsoft Windows 20.0 was used to conduct the data analysis. The first step was to use exploratory factor analysis; the main application of this technique is to detect structure in the relationships between variables and also reduce the number of variables (Hair, Black, Babin, & Anderson, 2010), which suggests that a statistically significant value of Bartlett's test of sphericity must be present to indicate the presence of correlations among the variables. Moreover, the KMO value must exceed 0.6 to quantify the degree of intercorrelations among the variables and to show the appropriateness of exploratory factor analysis. For communality, its value must be higher than 0.5 to indicate that the variables are suitable to be included in the factor analysis.

➤ **Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy :** The KMO measures the sampling adequacy which should be greater than 0.5 for a satisfactory factor analysis to proceed. The KMO (Table 1) measure of sampling adequacy is an index for comparing the magnitudes of the observed correlation coefficients to the magnitudes of the partial correlation coefficients. Large values for the KMO measure indicate that a factor analysis of the variables is a good idea. The KMO measure of sampling adequacy is depicted in the Table 1. The Table 1 reveals that the sample was worth enough to measure the variables. Anti image co-variance for all the statements is >.7. Hence, it shows the statements are unique and homogenous and are not correlated with each other.

➤ **Communalities :** The extraction values of all the 49 variables are >.6. It clearly shows that each variable contributed to 60% of the variance. The cumulative variance is 68%, which means 68% of the measured variables

Table 1. KMO and Bartlett' s Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.807
Bartlett's Test of Sphericity	Approx. Chi-Square	30141.03
	Df	1225
	Sig.	.000

were contributing positively towards the study. However, still there is an error that 32 % of the sample variance could not be measured.

➡ **Exploratory Factor Analysis :** Exploratory factor analysis (EFA) (Table 2) is a special form of factor analysis. It is used to assess the number of factors and the loadings of the variables. A principal component exploratory factor analysis with varimax rotation was performed on the original 49 items. Principal component factor analysis is a statistical technique that transforms data from one set of variables into a smaller set of uncorrelated factors. An orthogonal varimax rotation was conducted because it maximizes the amount of variance described by a factor and minimizes the correlation between factors. The factor analysis of the 50 items revealed a 12-factor structure that explained 68.48% of the total variance. The criteria for retaining the 13 factors were eigen values greater than one

Table 2. Exploratory Factor Analysis of Facebook Users

Particulars	Factor Loading	% Variance Explained
Games		11.21
Facebook games relieve stress.	0.635	
Facebook games give an opportunity to win prizes.	0.692	
Facebook games improve my hand-eye coordination.	0.658	
Facebook games help me to express my personality.	0.683	
I like the mental workout I get while playing games on Facebook.	0.640	
I play games on Facebook and/or invite others to join in these games.	0.640	
I sometimes lose track of time while playing games on Facebook.	0.497	
Facebook games allow me to connect with others.	0.559	
I enjoy the competitive spirit while playing games on Facebook.	0.640	
Facebook games give me a pure gaming experience.	0.644	
Networking		7.29
I use FB to stay in touch with old friends.	0.581	
I use FB to keep myself updated regarding current affairs.	0.653	
I use FB to let other people know of my likes and dislikes.	0.498	
I use FB to know the likes and dislikes of others.	0.798	
I use FB to share my experiences with other people.	0.600	
I upload photos that are public.	0.515	
I give importance to status updates that are public.	0.587	
I invite others to join groups on FB.	0.481	
I joined FB to meet interesting people.	0.577	
Groups		6.37
I frequently use FB to learn about clothing /fashion, new looks, movies, celebrities, political, religious, philosophical happenings around the world.	0.654	
I use FB to let other people know of my daily activities.	0.678	

I use FB to expand my network.	0.734	
I joined Facebook groups to get peer support from others.	0.619	
I joined Facebook groups to learn about on-campus events.	0.677	
Chatting		5.91
I use FB to know friends more closely.	0.705	
I use FB to chat with friends.	0.721	
I often comment on other peoples' walls.	0.691	
Sharing & News Referrals		5.32
I use FB to re-establish contact with long-lost friends.	0.455	
I use FB to share information about good restaurants ,films, or shops.	0.754	
I am only a member of FB for business purposes.	0.561	
I use FB to know about local places.	0.687	
I spend time on FB for responding to my friends' posts/updates & to agree with/ support them.	0.492	
Private Networking		4.80
I use FB to remember my friends' birthdays.	0.777	
When I communicate with my Facebook friends, I prefer to use private emails instead of posting on public walls.	0.455	
I often post on other peoples' walls.	0.401	
Sharing Emotions		4.46
When I am happy, I post that news on FB.	0.629	
When I am unhappy, I share my feelings on FB.	0.694	
Socializing		4.40
I use FB to make new friends.	0.611	
I use FB to let everyone know of my activities.	0.562	
Information Sharing		3.86
I use FB to share photos or videos.	0.735	
I use Facebook to let other people know my personal opinion about current events (sports, music, celebrities ,books, movies).	0.738	
I like the fun and excitement I get while playing games on Facebook.	0.503	
Performance Sharing		3.85
I use FB to share my rewards and success stories.	0.617	
I invite others to join an event.	0.481	
Entertaining		3.81
I use FB applications to give virtual gifts to friends.	0.421	
Facebook games are an important source of entertainment in my life.	0.531	
I use Facebook to let other people know of my personal accomplishments in education, jobs, etc.	0.738	
Amusement		3.73
I joined a Facebook group to get information about off campus events.	0.677	
I download Facebook applications for entertainment.	0.562	
Total		68.48

and the ability to describe and label each factor. Individual variables were retained for further analysis if they had factor loadings greater than 0.45 and fell into 1 of the 13 interpretable factors. One item was dropped from

Facebook users' segment because all the items were loaded onto an easy to identify factor.

Factor 1 was labelled as Games, and it consists of 10 items. It explains 11.21% of the variance in users' response to games played while they were on Facebook. The fact that the 10 items were originally meant to assess respondents' gaming behaviour on Facebook, it gives some evidence that users responded as expected. Factor 2 consists of nine items and was labelled as Networking. It explains 7.29% of the variance regarding the participants' responses to networking on Facebook. Factor 3 consists of five items and was labelled as Groups. This factor describes how users connected with all the groups on Facebook, and explains 6.37% of the variance regarding users' responses to the groups. Factor 4 consists of three variables and was labelled as Chatting. It explains 5.91 % of the variance regarding users' responses about chatting on Facebook. Factor 5 was labelled as Sharing and News Referrals and contains five variables. It explains 5.32% of the variance regarding how the participants responded about sharing and referring news on Facebook. Factor 6 was labelled as Private Networking and contains three items. It explains 4.80% of the variance regarding how users responded about private networking. Factor 7 was named as Sharing Emotions. The next factor, Factor 8 contains two items and was named as Socializing. Factor 9 contains three items and was named as Information Sharing . Factor 10 contains two items and was named as Performance Sharing . Factor 11 was named as Entertainment, and the factor loadings are from 0.42 to 0.73. The last factor, Factor 12 was named as Amusement.

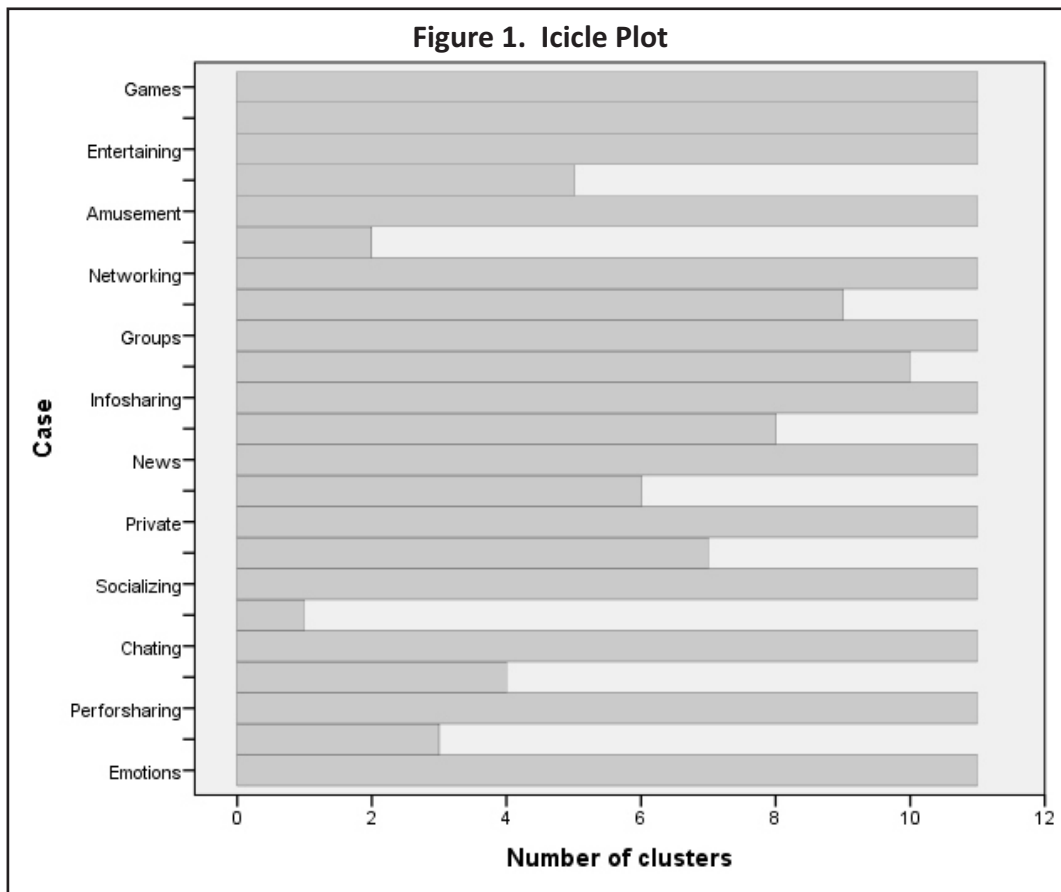
Cluster analysis was used for segmentation of the personality of the respondents. Hair et al. (2010) described that there are two types of clustering techniques - hierarchical clustering and K- means clustering. For the present paper, the clustering technique we used is hierarchical clustering. Hierarchical clustering is a method of cluster analysis, which seeks to construct a hierarchy of clusters. Strategies for hierarchical clustering generally fall into two types: Agglomerative and Divisive. Agglomerative is a “bottom up” approach. Each observation starts in its own cluster, and pairs of clusters are merged as one moves up the hierarchy. Divisive is a “top down” approach ; all observations start in one cluster, and splits are performed recursively as one moves down the hierarchy. The results of hierarchical clustering are usually presented in a dendrogram. The cluster analysis interpretation starts with an agglomeration schedule (Table 3), which provides the solution for every possible number of clusters from 1 to 11. The agglomeration schedule helped us to identify large differences in the coefficients. The agglomeration schedule from top to bottom (stage 1 to stage 11) indicates the sequence in which cases get combined with other groupings of means of one cluster with another cluster. This is repeated until all cases are combined together in one cluster at the last stage. Therefore, stage 11 represents a one cluster solution, stage 10 represents a two cluster solution, stage 9 represents a three cluster solution, and so on. Going up from the last row to first row to identify how many clusters were there in the data, we used the difference in the rows of coefficients.

We looked at this data from the last row upwards because we wanted to have the lowest possible number of clusters for reasons of economy and ease of interpretation. We started at a difference of (8263.494 - 7045.684) in the coefficient between one cluster solution (stage 11) and the two cluster solution (stage 10). It is a difference of 1217.81. The next difference is (7045.684 - 5907.663) in the coefficient between stage 10 and stage 9, and the difference is 1138. The difference between (5907.663 - 4950.131) the coefficient between stage 9 and stage 8 is 957.53. The next difference is (4950.131- 4168.867) in the coefficient between stage 8 and stage 7, and the difference is 781.264. The next difference is (4168.867 - 3408.353) in the coefficient between stage 7 and stage 6, and the difference is 760.514. The difference (3408.353 - 2666.814) in the coefficient between stage 6 and stage 5 is 741.53 . The next difference after that is (2666.814 - 1998.606) in the coefficient between stage 5 and stage 4, and the difference is 668.208, and so on . Therefore, we observed that the differences are smaller between subsequent rows of coefficients. A large difference in the coefficient values between any two rows indicates a solution pertaining to the number of clusters which the lower row represents.

Looking at the Icicle plot (Figure 1) and the dendrogram (Figure 2) for the information as to which cases link up in what sequence to form clusters, it was observed that the numbers in column 2 and column 3 of the agglomeration schedule also gave the same information. The dendrogram additionally provides a re-scale decision measure between various cluster combinations at various stages. For instance, for a two cluster solution from the dendrogram, cluster 1 consists of case number 1,11, and 12 ; cluster 2 consists of case number 3, 9,2, and 5. For instance, for a three cluster solution, cluster 1 consists of case number 1,11,12,3,9,2,5,6, and 8 ; cluster 2

Table 3. Agglomeration Schedule

Stage	Cluster Combined		Coefficients	Stage Cluster First Appears		Next Stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	1	11	409.043	0	0	7
2	3	9	850.949	0	0	3
3	2	3	1371.043	0	2	4
4	2	5	1998.606	3	0	6
5	6	8	2666.814	0	0	6
6	2	6	3408.353	4	5	10
7	1	12	4168.867	1	0	10
8	4	10	4950.131	0	0	9
9	4	7	5907.663	8	0	11
10	1	2	7045.684	7	6	11
11	1	4	8263.494	10	9	0



consists of case number 4, 10, and 7.

The Table 4 reveals which factors out of the 12 factors are significantly different across the three clusters. Since there is a divided opinion about the utility of statistical testing in cluster analysis, the researchers' judgment is given priority in order to determine which variables are statistically significant. Based on the assumption that ANOVA is a valid test, the interpretation of clusters and differences across clusters were made on the basis of those variables which were significantly different across clusters at the 0.10 level (Nargundkar, 2004).

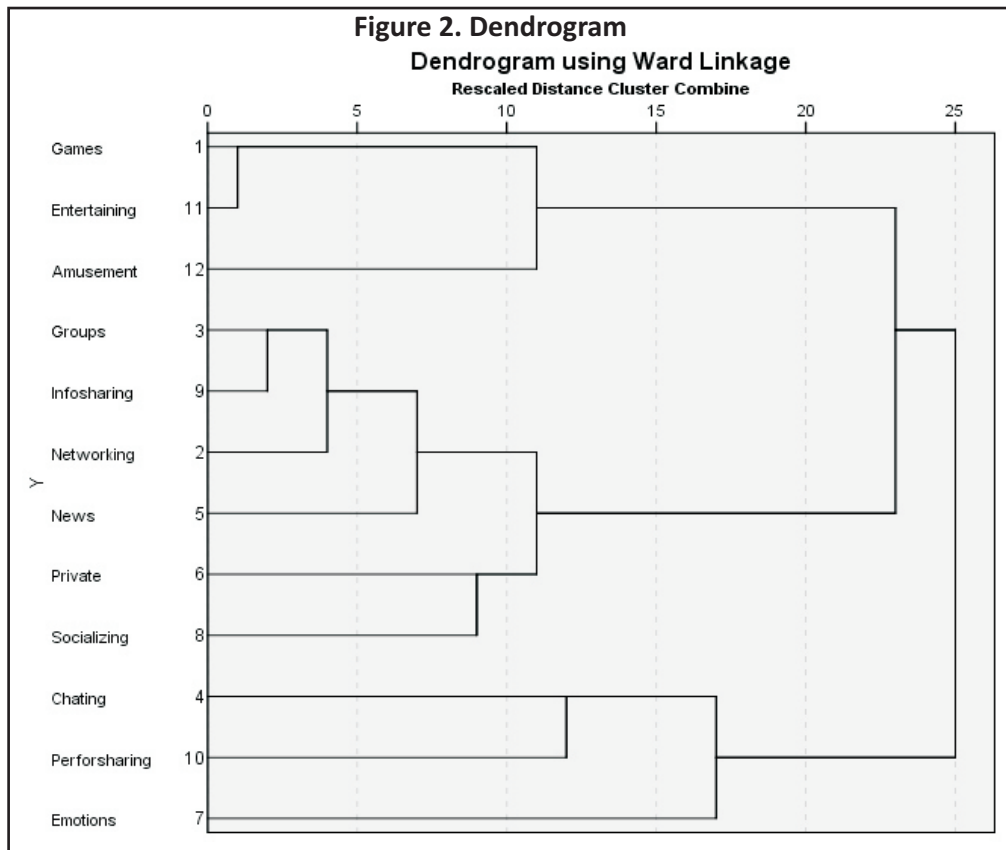


Table 4. ANOVA

Variables	F - value	Significant Value
Games	210.871	0.000
Networking	253.618	0.000
Groups	82.762	0.000
Chatting	125.043	0.000
News Referrals	76.994	0.000
Private Networking	241.154	0.000
Sharing Emotions	138.357	0.000
Socializing	88.975	0.000
Information Sharing	189.166	0.000
Performance Sharing	333.608	0.000
Entertaining	69.472	0.000
Amusement	77.099	0.000

Discussion

By looking at Figure 1 and Figure 2 for the information as to which cases link up in what sequence to form clusters, the numbers in column 2 and column 3 of the agglomeration schedule also give the same information. The Figure 2 additionally provides a re-scale decision measure between various cluster combinations at various stages. For instance, for a two cluster solution from the dendrogram, cluster 1 consists of the following cases : Games , Entertaining, and Amusement ; cluster 2 consists of Groups, Information Sharing, Networking, Sharing & News

Referrals. For a three cluster solution, cluster 1 consists of Games, Entertaining, Amusement, Groups, Information Sharing, Networking, Sharing & News Referrals, Private Networking, and Socializing. Cluster 2 consists of Chatting, Performance Sharing, and Sharing Emotions.

On the basis of the clustering, the respondents were divided into the following segments on the basis of their behaviour on Facebook.

➤ **Entertainers** : Entertainers spend most of the time playing games on Facebook and download applications (apps). They would like to accept invitations to events, they also seek coupons and deals. They are motivated by games, apps, and coupons ; they interact with strangers as often as acquaintances, and though less in number, they log the maximum time on Facebook.

➤ **Networkers** : This cluster of individuals shows a fondness for both business networking and sharing advice, information, and knowledge . This segment of users looks for new entertainment media and fashion information on Facebook. They would like to know about books, blogs, travel ideas, recipes, and current affairs. They join interest groups based on politics, art, and music, and they often link their Facebook account to other websites.

➤ **Expressers** : This segment of Facebook users likes to share their achievements, post their daily activities, and spend most of the time on Facebook. The individuals in this cluster like to build a personal brand. They would like to maintain a positive online image. They share videos and links, and they also place great importance on photo sharing and commenting on status updates.

Conclusion and Implications

Social media has become one of the most powerful places where products and services can be showcased to the customers. The market dynamics keep on changing from one place to other in all dimensions. Now, social media has taken the place of the market after evolution of the Internet. The virtual markets attract more and more people towards new products and services. In the present study, we grouped like-minded people in one cluster. This kind of clustering is helpful in understanding people's likes and dislikes with respect to a homogeneous group. Any organization which wants to promote its products using social media, especially Facebook, has to carefully design its promotional campaign based on the different types of users of Facebook.

Limitations of the Study and Scope for Further Research

The following are the limitations of this study : (a) the study considered only Facebook users, (b) the questionnaire was emailed to the respondents, and the data were not collected on an individual basis, (c) the study was conducted based on a newly developed scale.

Future studies can consider the demographic variables like age, educational qualifications, and marital status of the respondents. Future studies can compare one social media with other social media so that the degree of acceptance and differences can be studied. The influences of different social media may be studied based on the purchase decision making as well.

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