



Facebook an Anti-Stereotyping Tool: A Case Study

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Abstract

Facebook, the most popular social media (SM) platform has penetrated every nook and corner of the world. SM is now treated as the 'fifth Estate', other than legislative, executive, judiciary, and mainstream media. The power of SM as a critique is widely acknowledged. Establishments are finding it difficult to deal with it at times. Due to its ease of usage and relative anonymity, the general public finds it very convenient to put across their viewpoints, even if it's against the establishment. Some establishments at times are at loggerheads with champions of freedom of speech including civil rights activists. SM has been used for propaganda, marketing, and awareness campaigns. In this paper, we are proposing to use this powerful tool towards social change. Through a case study, a detailed process is being proposed for using social media particularly Facebook as an anti-stereotyping tool. The response to an online survey, the outcome of opinion mining, and the enthusiastic response to our case study by the targeted audience validate our hypothesis that Facebook can be effectively utilized as an anti-stereotyping tool.

Keywords

Social media, stereotyping, sentiment analysis, pangal, social change.

1. Introduction

In 1954, the term "Social Network" was coined by Barnes [1]. With the advent of Web 2.0, social networking sites exploded and attracted unprecedented interest from people all over the world [2]. The community driven uprisings including Arab Spring (in 2011), Occupy Wall Street (in 2011), Spanish Los Indignados (in 2011), Umbrella Movement (in 2014), Bersih movement (in 2007), and other successful awareness campaigns like Movember (in 2003), Bostonstrong (in 2013), The ALS Ice Bucket Challenge (in 2014), Me too (in 2017) and the infamous Tool kit case (in 2021) in India were all successful campaigns through Facebook. Facebook is primarily used for social purposes [2]. Among the social media platforms Facebook is the most popular [3]. Impact of social media in consumer perception management is widely studied. The social media can be successfully used for propaganda and perception management [4]. Social media can become an effective alternative tool for social mobilization [5].



The Pangals have been in Manipur since 615 A D, although the majority of them arrived at 1606 AD and were given the local Meitei, the original Manipuri women to marry [6]. The Pangals have migrated to other states and also to Bangladesh during the seven years devastation (1819 -1826 CE). The Pangals follow Islam and they have a unique and original culture which has resulted from adopting the local Meitei culture so the Pangals become one of the original inhabitants of Manipur. The changing status of Pangals over the period of time and the existence of the various circumstances of stereotyping of Pangals is the reason why the study of the community is particularly undertaken. During the king Khagemba's reign there were great agricultural developments and Manipur society was more diverse and plural with the settlement of Pangals. Pangals contributed to the enrichment of the economy and cultural life of Manipur. Thus, Pangals enjoyed an equal social status with other communities [6]. Of late, Pangals started facing discrimination, marginalization, stereotyping from political leaders and fellow Manipuri. The common stereotypes held by Meitei and other non Pangals is that they are anti socials and prone to thievery. There are several instances of stereotyping against this community. In 1993 Pangal Massacre, 130 Pangals were killed [7]. In 2016 Yangbi Garden, Mayang Imphal incident, two Pangal students were killed. In March 2016 Holi incident, six Pangal boys were beaten up [8]. Md Hasmad Ali, a primary school teacher was killed alleging as cow thief [9]. In April 2018 Eviction of Awaching Kshetri Bengoon Mamang Village incident, 74 houses were destroyed and 400 Pangals were rendered homeless. In April 2018 Mantripukhri Eviction incident, several Pangal youths were beaten up. In 2018 a young pangal entrepreneur was killed by a mob at Thouraojam village alleging him as a thief [10]. In May 2018, in the Bill Drafting Committee for the Protection of Manipur People no representatives of Pangals were included. In Jun 2018, Inner Line Permit Bill Definition of Original settlers Pangals were not included. In July 2018 State Delimitation Committee, Pangals were not included. In October 2020 DM University admission list vacancy marked for Meitei Pangal were allotted to Meitei, which lead to the demand for 4 pc reservation in education for Pangals. Manipuri Muslims or Meitei-Pangal is the category in the census and as such colloquial words – Pangal, Hao, have in time acquired prejudices by what majority community prefix and suffix with these words, that most people with political sensitivity now prefer the English replacement – Muslim, Tribal [11].

In this paper, we present a case study of Facebook as an anti-stereotyping tool. The Pangal community of Manipur is taken as the subject of study. We have tried to change the general perception about the Pangals using Facebook thus validating Facebook as an anti-stereotyping tool. The remaining part of the paper is organized as follows. Section II describes the literature survey to identify uses of Facebook in different domains. Section III describes the methodology used in the case study in step by step procedure. Section IV introduces social media particularly the features available in Facebook. These features are utilized in the case study. It also covers the text classification aspects. This will help us in understanding the sentiment analysis of the Facebook comments. Section V discuss the response to the online survey and the outcome of the sentiment analysis. Section VI gives out the result of the case study. Finally, the paper is concluded by giving the future scope of work.

2. Literature Survey

The Literature survey follows the accepted method of Keyword Search from Peer Review Journals and Conferences reports. The most cited ones whose analytical deductions are available are being sorted out. It also includes certain books and government reports. It is basically to bring out the various uses of Facebook in different domains and how is the impact of Facebook in a particular domain is studied. [4] has done a qualitative case study and examined how social media (SM) was used as a platform for propaganda warfare waged by clandestine bloggers and special operations commandos (known as trolls). It uses manipulation of public perceptions of events by controlling an element of rhetoric known as narratives. [5] examines how SM could be deployed for transformational mobilization and development. Role of SM in promoting social mobilization as a means of development in Nigeria was studied. [12] addresses the use of Facebook as a learning tool for higher education students, with emphasis on developing countries such as Malaysia. The purpose of their study was to identify students' per-



ception on using Facebook as a learning tool. [13] discusses the findings of 132 papers (in selected IS journals) on SM and social networking published between 1997 and 2017. This study identifies multiple emergent themes thus furthering the understanding of advances in SM research. They found that Facebook is the most popular SM platform.

[14] introduce a framework for SM impact, which included the most important role in enhancing the deployment of SM in crisis in order to minimize the negative impact on education's sustainability. This framework can be used as strategic decision-making tool for the analysis of the gaps and inefficiencies in any SM plan that is deployed and the management challenges arising from the pandemic. [15] presents a comprehensive review of recent studies that employed Facebook as a tool for teaching and learning in institutions of higher education. [16] present a SM enabled social movement the 'Electoral Reform' in Malaysia and significant role of SM in empowering citizens towards change in their community. [17] present findings from interviews with 26 small NPOs' SM professionals on how they use multiple SM sites to support public engagement. Small NPOs use multiple SM sites to engage with different stakeholders towards various ends. [18] presents a case study of a voice-based community media platform in rural central India and the experiments it has undergone with multiple community mobilization strategies over a period of five years. They analyzed different phases of community mobilization and drew insights related to how technology platforms could be appropriated by special activists to drive their own agenda. [19] describes the module for Analysis of social network Facebook Graph API. The study identified the areas of interest of the user, analyzed comments in Facebook to identify trends. [20] carries out a study on social influence produced by the contents published on Facebook. By executing the Asch experiment, they have illustrated how such social influence could change the behavior of users in Facebook. Through this experiment, they could identify how the social influence type called 'conformity' is present in online social network platforms and how this influence can make changes in the behavior of people. [21] explored the types of consumer engagement with brand pages on Facebook as well as the motivations and antecedents that drive such engagement. Given the participatory and communal nature of social network sites, this study focused on the effects of SM dependency and three social relationship factors, including para-social interaction, perceived source credibility, and community identification on consumer engagement with Facebook brand pages. A web survey was conducted to understand the motivations and antecedents of consumer engagement. The results confirm that, with the exception of perceived credibility, relationship-oriented factors played a significant role in inducing consumer engagement on social networking sites.

Most of the paper reviewed examined the behavioral side of social media, investigated the aspect of reviews and recommendations. The theories used were user and gratification theory, social capital theory and goal setting theory. People have studied about using Facebook for mobilization, awareness campaign, as a communication tool, and as a marketing tool. Impact of social media on social moments have also been studied.

3. Research Methodology

The research methodology used is mixed of qualitative and quantitative approach. Data is collected through Facebook scraping and Online Survey. A Facebook Page targeting Pangal community with proper tagline have been created and it was used to engage the Facebook users by projecting the positive sides of the Pangal community. Projection of the pioneers of the community in various domains was carried out by posting their profiles on the Facebook Page. Ascertaining the public response through online survey gave the validation of our assumption. It was also superimposed by sentiment analysis of the comments on the Facebook post. The methodology involved is given as per the architectural model given in [Figure 1] below:

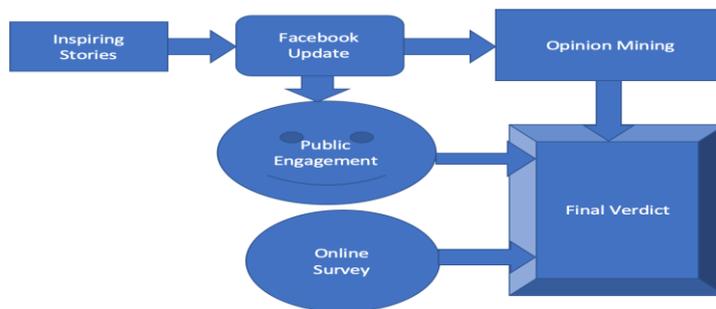


Figure 1: The Methodology

3.1. Inspiring Stories Creation

The original inspiring stories of the pangal community were obtained from two sources. The primary and secondary sources. The primary sources are the individual himself/ herself, family and friends and general public. The method of collection of data is through WhatsApp or e-mail. The secondary sources consisted of books, papers, news reports, and online resources. These were directly collected and properly edited. It was ensured that every positive and inspiring aspects of the profile were adequately highlighted along with testimony. The testimonies were authentic records and original artefacts. All the existing records with respect to the profile were used to make it more appealing to the general public. The presentation of the profile in the Facebook page update was with a suitable catchy tagline. An example of the profile creation is given below as an illustration. [Figure: 2]

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RESEARCH PUBLICATIONS

No.	Title of Research Paper published	Year of publication vol. and Page No.	Name of the Journal	National/International
1	Catalytic Oxidation of Diphenylacetaldehyde: Regioselective Reaction of E-Isomer with Hydroxylamine	2009, 11, 2057-2064	J. Org. Chem.	International
2	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 1, 3520-3524	Chemistry Letters	International
3	Diastereoselective Synthesis of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 22, 1336-1344	Organic Letters	International
4	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 9, 768-792	Asian Journal of Organic Chemistry	International
5	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 102, 1104-1105	J. Indian Chem. Soc.	International
6	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 17, 1012-1017	Chemistry Letters	International
7	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 17, 5881-5884	Organic and Pharmaceutical Chemistry	International
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9	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 37, 2491-2493	Synthesis	International
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15	Reaction of 1,2-Diphenyl-1,2-Ethanedithiolane with Oxidizing Agents	2009, 25, 3444-3470	European Journal of Organic Chemistry	International

Figure 2: Inspiring Story

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3.2. Posting the Profile in the Facebook Page

The profiles which are edited in a proper and appealing format with an attractive tagline to inspire and attract people were posted in the Facebook Page as an update. The related supporting photos or certificates and citations were also included in the post. An illustration of the post is reproduced along with the response of Facebook users.

[Figure :3]

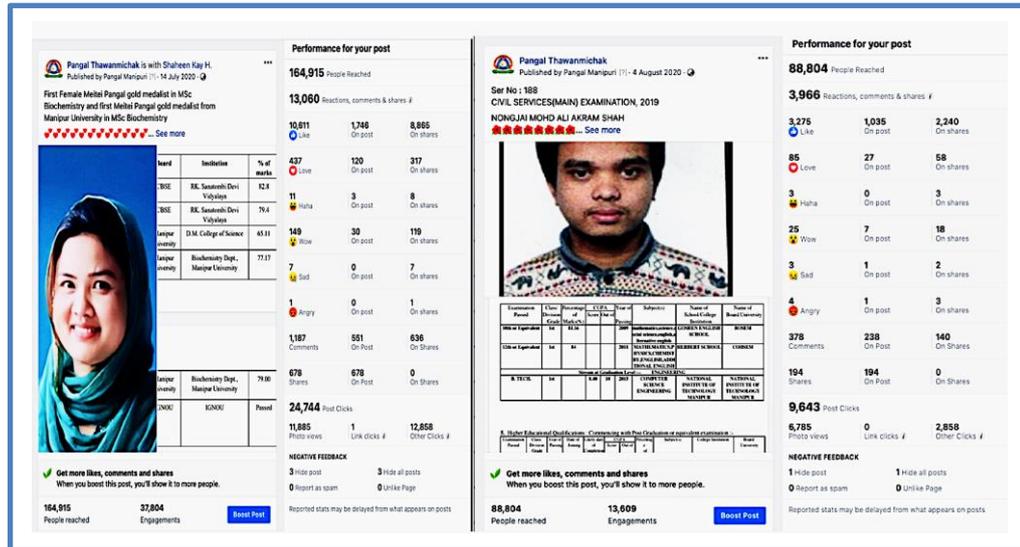


Figure 3: Profile Update

3.3. Study of the performance of the Facebook Page

Certain readymade statistics are available with the Facebook page business suite tools. These statistics are freely available, and it can be used to ascertain the general response to the updates of the page. It also gives insight into the category and geolocation of the followers. The engagement and reach of the page is also captured.

3.4. Online survey through Google Form

A google form was created in order to capture the feedbacks of the viewers. The sample of the response was randomly chosen and included various locations and professional profiles of the users to have a holistic view. It was a random sampling based on voluntary participation. The forms were circulated through a web portal, through Facebook post including personal message through messenger and through WhatsApp messages. The sample size was 600 and it was collected over a period of 6 months to have better exposure of the profiles being hosted on the Facebook page.

3.5. Collection of Comments for Opinion Mining

Scrapping of the Facebook comments was carried out for sentiment analysis. This would give out the positive and negative feedback about the post.

4. Facebook Features and Text Classification

4.1. Facebook

In Feb 2004, Mark Zuckerberg created Facebook called “**thefacebook**” at Harvard University. In 2005 it allowed access to over 800 college and university networks. In 2006 it allowed access to 22,000 commercial organizations. Major expansion was in 2006 when it was allowed to people above 13 years and a valid email. The Facebook Wall was developed in 2004, Facebook Photo in 2005, News feed, API and Mobile App in 2006, Facebook platform and video in 2007 and in 2008, Facebook in Spanish, German, French language were launched. The Like button and payments were introduced in 2009, Facebook place in 2010 and in 2011 Timeline and video calling were introduced. People use Facebook for various objectives, some common objectives are:

- Socializing
- Entertainment
- Self-seeking
- Information
- Education
- Business

4.2. Facebook Page

Page is the primary system of Facebook through which users are exposed to content posted by people across the globe and the news feed. Facebook selects around 1500 updates in the news feed. Facebook page is attached to a personal profile so Facebook knows who owns the page but pages are designed for business or for a cause. It has a number of features available including analytics, advertising and post scheduling.

Six of the options for creating a page :

- Local business or place.
- Company organisation or Institution.
- Brand or Product
- Artist, Band or Public figures.
- Entertainment.
- Causes of Communities.

Each page type has a dropdown menu with an extensive list of categories. The profiles of individuals are updated in the page at regular intervals.

4.3. Text Classification

Text classification is the categorization of the text in some predefined categories. A classifier takes the text input and analyzes it then automatically assigns them in the predefined categories. Mainly three approaches of text classification are available in Natural Language Processing (NLP).

- Rule Based System: Using a handcraft linguistic rule text are separated into an organized group.
- Machine Based Classification: Based on past observation on datasets and continuous learning.
- Hybrid Based System: Uses combination of both Rule based and Machine based methods.

4.3.1. Machine Based Classification

The steps involved in Machine Learning text classification are as follows:

- Pre - processing: Unlike structure data, features are not explicitly available in text data. Thus, pre-processing of the raw data is required.
- Feature extraction: Feature extraction can be done in various ways. The common methods are bag of word and word embedding method.
- Training
- Prediction

Popular Machine Learning Algorithm used in Text Classification are Naïve Bayes group of algorithm, Deep Learning, and Support Vector Machine. For feature extraction common method is bag of word method.

4.3.2. Bag of Word Method

In bag of word method, a dictionary of all the word is created. It first converts each document into a vector. There are three ways to convert word into vectors as given below:

- Count vector method: In this we count the occurrences of each word in the document.
 - Term Frequency Vector Method: It is calculated for each word, it is the frequency of each term in the word
- $$\text{Term Frequency (TF)} = \frac{\text{Number of occurrences of word in the document}}{\text{Total number of words in the document}}$$
- Term Frequency Inverse Document (TF-IDF): In TF-IDF method, it measures how important a word is to the document in the corpus.

$$\text{TF - IDF}_i = \text{TF}_i \times \log(1+N/N_i)$$

where,

N = Total number of documents in the corpus

N_i = Number of documents that contain word i

4.3.3. Naïve Bayes Algorithm

It is the most popular text classification algorithm. The Multinomial Naïve Bayes (MNB) is used for small datasets whose computational resources are low. It is based on Bayes Theorem. The probability of A, if B is true is equal to the probability of B if A is true times the probability of A being true divided by the probability of B being true.



$$P(A/B) = \frac{P(B/A) \times P(A)}{P(B)}$$

Thus, what we are doing is any vector that represents a text that has to contain information about the probabilities of the appearance of certain words within the texts of a given category, so that the algorithm can compute the likelihood of the text's belonging to the category.

4.3.4. Support Vector Machine (SVM)

It is another powerful text classification Machine Learning Algorithm. It requires more computational resources, but results are faster and more accurate. SVM draws a line/hyperplane that divides a space into two subspaces, one subspace contains vectors that belongs to the category, and another subspace contains vectors that do not belong to that category. The best hyperplane is the one with the largest distance between each category.

4.3.5. Deep Learning

These are sets of algorithms and techniques inspired by how human brain works. Two main deep learning architectures for text classification are Convolutional Neural Network (CNN) and Recurrent Neural Network (RNN). Deep Learning requires more training data.

4.3.6. Sentiment Analysis using VADER

Valance Aware Dictionary for sentiment Reasoning (VADER) is a lexicon and ruled based approach developed by C J Hutto and Eric Gilbert in 2014 [22]. Although it is domain agnostic, it is especially suitable for Social Media Analytics. The advantages of VADER are:

- No training data required
- Emoticons, slags, conjunctions, and punctuations etc. are incorporated
- Domain Agonistic
- Best suitable for Social Media

5. Observation of the case study

The popularity of the page can be judged by various insights provided by Facebook. The page has a positive impact to the Pangal community as it could receive an ever-increasing number of followers within a short period of time. The page has a follower of 15k plus and the overall reach of the page is above 100k. People come forward with ideas and suggestions. After just one month of hosting the page, people voluntarily started sharing their achievements through email and WhatsApp messages. Follower of the page is given below. [Figure: 4]



Figure 4: Increasing followers of the Page

The age group of the users the page reached is from 18 years to 44 years which indicates that the target audience is the expected and the desired age group. The percentage of men is 79% and that of women is 21%. The geolocation where the page reached indicates the area where Pangals are populated. However, the reach of the page is worldwide. Thus, it indicates that the perception management will be effective in those areas where Pangals are populated. This also proves that Facebook is effectively reaching the target community and geolocation. [Figure:5]



Figure: 5 Peoples' age group and geolocation reached by the page

The page view summary from 02 June 2020 to 23 February 2021 is given in the following. The maximum people check out the purpose of the page by viewing the home page. [Figure:6]

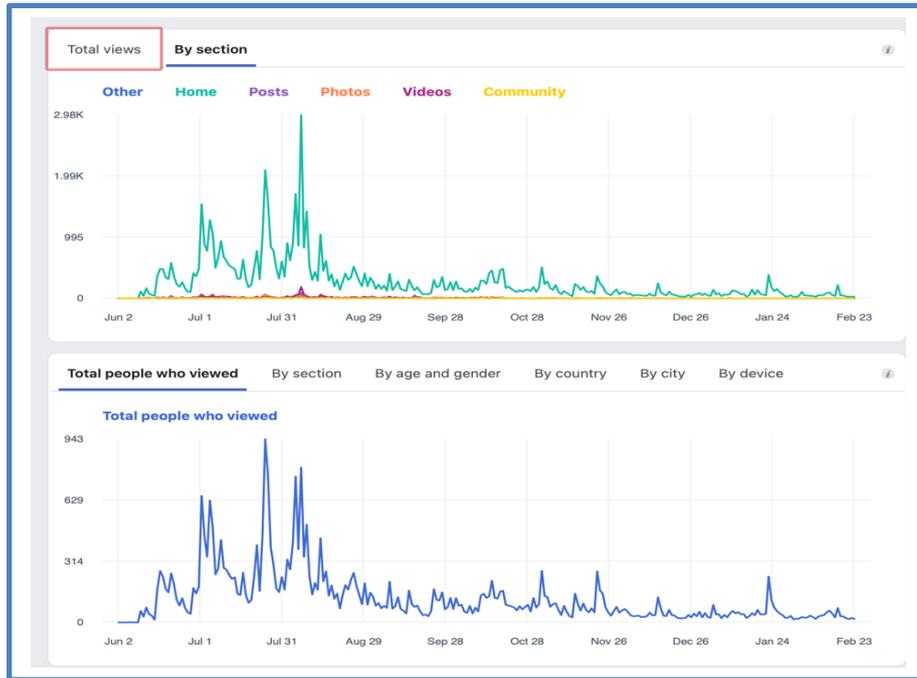


Figure 6: Page View from 02 June 2020 to 23 February 2021.

The post reached for the period 1/6/2020 to 24/2/2021 shows a peak of 100k in August 2020 [Figure: 7].



Figure 7: Post reached from 01 June 2020 to 24 February 2021

The response of the survey clearly shows the positive impact of the page to the general public. The questions in the survey form were close ended and were given multiple choices. This was for the convenience in analyzing of the response. The responses recorded are presented below in the form of pie-charts. Out of total 590 people responded to the question, “Do you think PTM (pangal thawan michak - local name of Pangal Stars is the name of the Facebook page) will inspire young generations? A total of **95.4 %** of the respondents opted “**YES**”. The next question was - Do you think PTM is an effective tool against stereotyping of Pangals? **70.7 %** of the total 590 responses chose “**YES**” [Figure:8].

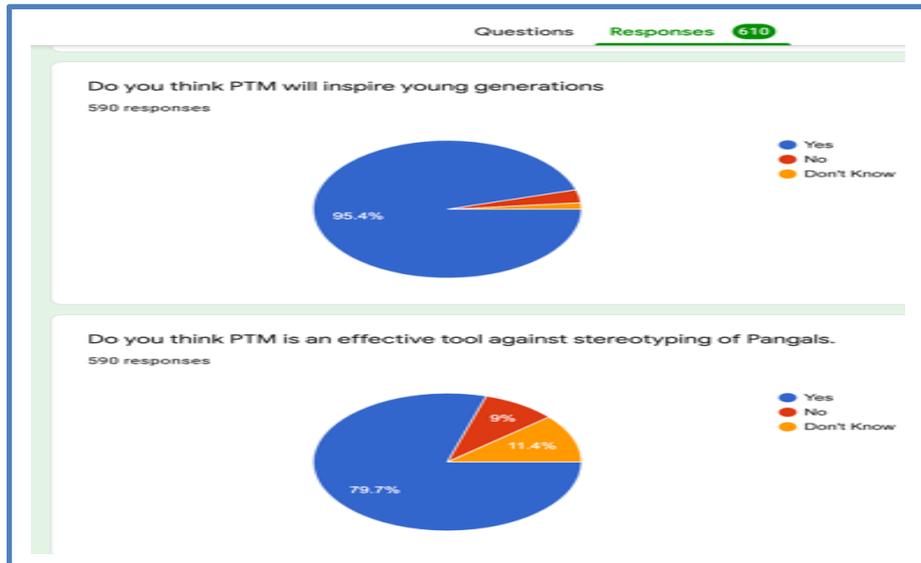


Figure 8: Response to PTM inspiring Young generation and effective tool against stereotyping.

Similarly, on the question, " Will PTM change people's perception of Pangals?", **85.7%** of the responses were "YES". On the question of continuation of the PTM initiative, **94.4%** responses were "YES" [Figure:9].

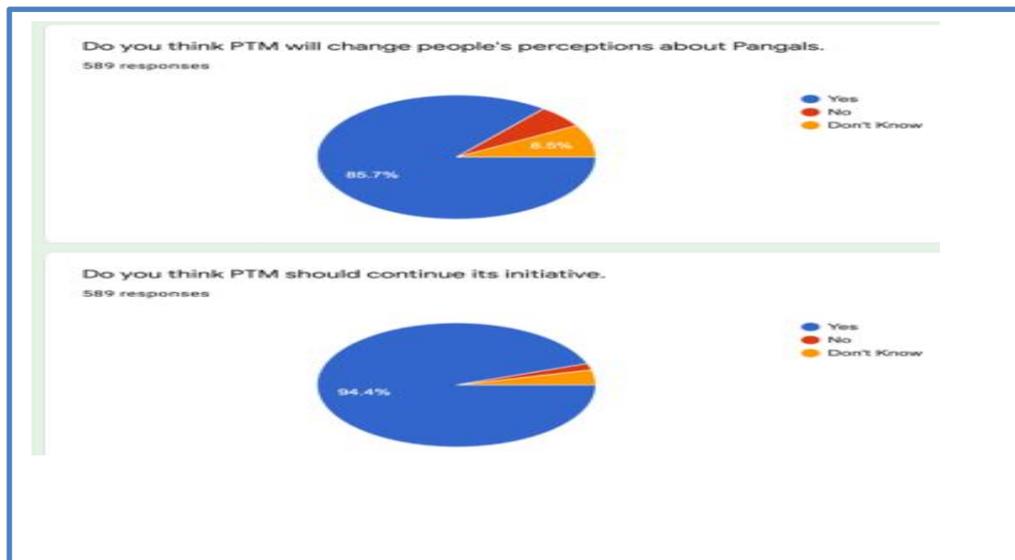


Figure 9: Response to PTM changing people's perception.

On the question of more effectiveness of Social Media in comparison to traditional media, **81.3 %** say "YES" for Social Media. Social Media is the best option available for motivation and inspiring Pangals during Pandemic was agreed by **87.1%** of the respondents [Figure: 10]

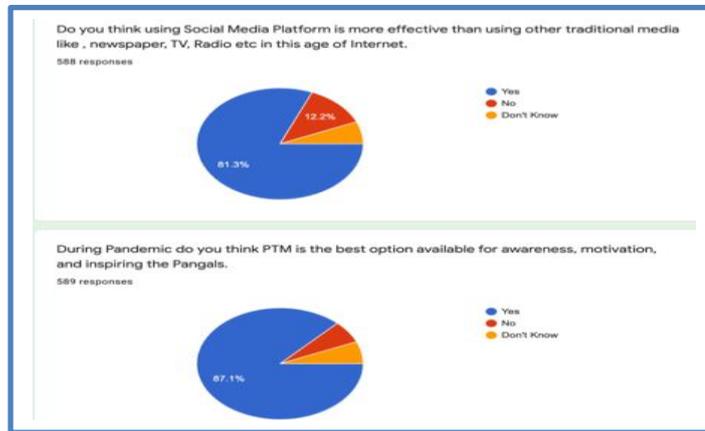


Figure 10: Effectiveness of social media compared with traditional media during the pandemic.

The sentiment of the comments posted in the Facebook page from 01 June 2020 to 31 August 2020, for 500 posts were analyzed. The sentiment analysis shows 46.7 % as positive, 52.7% as neutral and only 0.6 % as negative. The python code and the result of sentiment analysis is given below [Figure: 11].

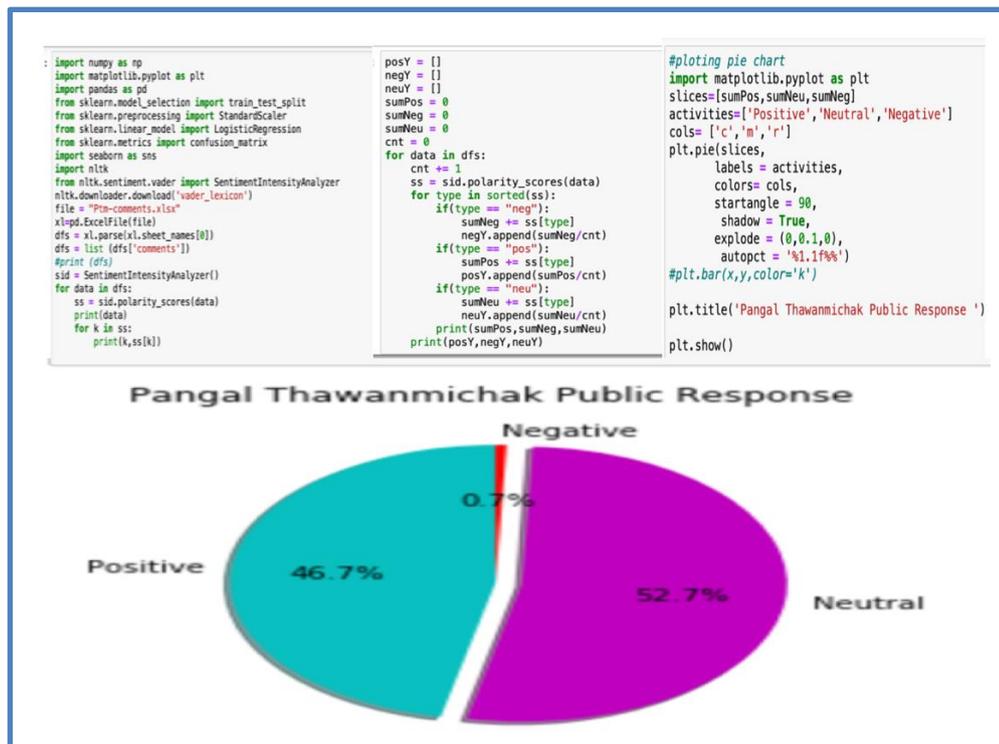


Figure 11: Result of Sentiment Analysis of comments



6. Results and Discussion

The paper has presented a model where Authors have developed a methodology for posting the inspiring stories and record the response from public comments. These comments are analyzed through Sentiment Analysis. Based on the liking of the page and engagement by the public it is quite evident that Social Media is a better tool of communication in comparison to traditional media. The perceptions of the people have changed positively for the target community and the positive post updates have inspired the younger generations. Facebook can thus, be used effectively as an anti-stereotyping tool. This clearly shows that Facebook can be a social change agent. The outcome of the online survey through Google form also reconfirm and validate our assumptions. The final verdict obtained through the model is reproduced in a tabular form as given below [Table 1].

Table 1: Observations and verdict of the case study

Parameter	Positive	Negative	Verdict
Facebook as Anti Stereotyping Tool	79.7%	20.3%	Positive
Social Media a Better Tool in comparison to Traditional Media	81.3%	18.7%	Positive
Positive Facebook Post Inspire Young Generation	95.4%	4.6%	Positive
Facebook Page able to change Perception about Pangals	85.7%	14.3%	Positive
Page followers	Increasing with Time	-	Positive
Sentiment Analysis outcome	99.4%	0.6%	Positive

7. Conclusion

A methodology to use Facebook as an anti-stereotyping tool have been proposed. In order to validate the methodology, a way of online survey and sentiment analysis is suggested. The response and the engagement of the Facebook page created for the purpose shows a very positive outcome. It is strongly observed that Facebook definitely can be used as a social change tool. The method to carry out analytical measurement of the degree of achievements of the desired change in the society can be developed in future. The parameters how the changes have to be measure needs to be defined to have a foolproof methodology. In future the process can be streamlined and proper analytical validation methodology in order to measure the degree of effectiveness of Facebook as a social change agent can be developed. Some suggested areas where it can be used are given below. However, the possibilities of utilizing the process is manifold.

- Perception Management
- Targeted Campaign
- Marketing
- Government

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