FACTORS CONTRIBUTING TO CHANGE IN VIEWERSHIP AMONG COLLEGE GOING STUDENTS OF GWALIOR REGION THROUGH MULTI NOMINAL REGRESSION TECHNIQUE.

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ABSTRACT :

There has not been much extensive research performed on market analysis for behavior pattern among college going students. In today`s scenario where college going students are the leading consumer for film production houses, it is very important to understand their behavior pattern to choose a film. This study thus would assist new film maker to acknowledge factors contributing to the behavior pattern among college going students. Also it can attract the television audience to come back to cinema theatre and enjoy the true film viewing experience. This paper thus concentrates to the concept of mathematical modelling of social sciences using the multinomial logistic regression (MLR) technique. This technique is performed to determine the significant factors on these behavioral patterns focusing on the data filtering and cleaning, factor analysis, data transformation, remedial and the removal of insignificant factors. The variables used would include the viewing frequency, film marketing, film attributes, buying behaviour, genre. The best model (M1.0.2) is obtained based on the deviance goodness-of-fit statistics via the modified eight selection criteria (M8SC) that thus relates the frequency of film viewers with significant factors, namely story, music, lead actor. This study hence will provide the factors contributing to the sustainability of the Indian film industry

Key words : *Film Viewership, Mathematical model, Multinomial regression, Indian cinema*

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1. Introduction :

"You can fool all the people some of the time, and some of the people all the time, but you cannot fool all the people all the time."

-Abraham Lincoln

You can fool all of the people all of the time . . . if the advertising is right and the

budget is big enough. —Hollywood producer Joseph E. Levine

India is the world's largest producer of films by volume - producing almost a thousand films annually. The Indian film industry comprises of a cluster of regional film industries, like Hindi, Marathi, Telugu, Tamil, Kannada, Malayalam, Bengali, etc. This makes it one of the most complex and fragmented national film industries in the world. These regional language films compete with each other in certain market segments and enjoy a virtual monopoly in certain others. The most popular among them is the Hindi film industry located in Mumbai, popularly referred to as "Bollywood".

Lumiere Brothers Cinematographed unveiled six soundless short films at Bombay's Watson's Hotel. Soon after, Hiralal Sen and H.S. Bhatavdekar started making films in Calcutta and Bombay, respectively. Like Lumiere Brothers, Bhatavdekar made India's first actuality films in 1899. Tough there were efforts at filming stage plays earlier India's first feature film Raja Harishchandra was made in 1913 by Dada Saheb Phalke who is known as the Father of Indian Cinema. Regional culture and craving to see-hear a film in one's own language caused the mushrooming of the regional film industries beginning with Bengali, Tamil & Telugu followed by Marathi, Gujarati, Kannada, Malayalam, Oriya, Assamese, English and several other dialects.

Films are said to be getting as a product collectively. On the same lines, proper marketing of film ensures the message which is to be communicated is conveyed with due respect. A combination of promotional skills and creativity is required to hit the targeted audience while using limited resources optimally.

Film marketing is a multi-step process for bringing a film to its audience. It not only defines your product in marketable or sellable terms, it provides the context for fitting the film into the busy marketplace. To be effective, the marketing process must address a great many factors – competitive, political, economic, social, cultural and technological as well.

Film marketing works at 3 levels – traders and distributors, corporate branding and promotions and events for the opening

2. LITERATURE REVIEW :

- **Sudarshan D, Olivier Furrer (2001)** in their article "*Internet Marketing Research : Opportunities and Problems*" developed a topology of internet marketing survey design, which proposes eight different designs based on the objectives of the researchers, the sampling unit and the data collection method. They also identified seven steps of the sampling process and the problem related in sampling on the internet.

- **Rajadhyaksha, A. (2003).** In his research *The'Bollywoodization'of the Indian cinema: cultural nationalism in a global arena. Inter-Asia cultural studies* concluded that it would be the final irony of the Bollywoodization of the Indian cinema that the very demand that the industry has sought for from the government for so many decades could be the reason for its demise. The arrival of corporate-industrial-finance capital could reasonably lead to the final triumph of Bollywood, even as the cinema itself gets reduced only to a memory, a part of the nostalgia industry.

- **Yamashita, M., & Yamada, J. I. (2004, July).** In their work Emergence *of Marketing Strategies in Film Making: Types of Partnership across Boundaries for Integrating Art and Business* had stated that organizational process in marketing formation, highly depends on the characteristics of content. The characteristics of content can be divided into two elements: art and entertainment. The more artistic orientation the film in content development, the more united are the partnerships among the multi-functional players (e.g., production, sales and marketing). Otherwise, the distinctive creativity of artist cannot be shielded from the noise and intervention. In contrast, the more entertainment orientated the film, the more diverse stakeholders are in a single project, and the producer and marketing managers confront all

major conflicts and obstacles. In the case where content and art orientation is not very strong, conflicts can be resolved through business negotiations.

- **Ul Haq, Z. (2012).** In his study *a study of consumer attitude towards affiliate marketing programs among Indian users* articulated that the stronger predictor of the consumer attitude of affiliate marketing is the usefulness, informativeness, incentive and perceived trust. In short the future of affiliate marketing is to a greater extent affected by the consumer's perception of affiliate program usefulness and control over it. This study recommends a need for direct marketers to develop more innovative affiliate links that will elicit a more positive response from the consumers.

- **Noraini.(2015).** Introduced the concept and procedures in mathematical modelling using the multinomial logistic regression technique so as to identify significant factors that affect the sustainability of the Malaysian film industry. She concluded that interest on films genres of various themes, family recreational and getaway social activities would certainly boost the Malaysian film industry while providing various choices in film viewing. While it is only appropriate that all genres and themes of films being produced herewith must be compliant to FINAS perspectives, the factors affecting the behavioural patterns should not be neglected since these would ensure the Malaysian film industry` survival and view ability appeals .

3. METHODOLOGY

3.1 Data Collection

Data samples were collected using questionnaires that is, focusing on the 150 viewers in Gwalior region. The questionnaires comprised of four parts with 75 items. Part 1 of 25 items represented the demographic profiles of respondents, while part 2 represented the film attributes, part three establishes marketing strategies and part four concludes viewers perceptions and factors to watch films. Significant demographic factors would include region, state, location, age, gender, ethnicity, religion, frequency. In this study, there were 400 respondents, comprised of 230 males and 170 females, and aged between 17 to 25 years

3.2 Modelling Technique Using Multinomial Logistic Regression (MLR)

According to Devore (2012), multiple regressions is an extension of the simple linear regression consisting of two or more independent variables relating to the dependent variable (Y), while Agresti (2007) stated that with dichotomous categorical data, the binary logistic regression is more appropriate, giving a general equation as in equation (1)

$$Y = \ln\left(\frac{P_i}{1-P_i}\right) = \Omega_0 + \Omega_1 W_{1i} + \Omega_2 W_{2i} + \dots + \Omega_k W_{ki} + u_i \quad \dots\dots(1.0)$$

for i=1,2,….n with

$$P_i = \frac{e^{\Omega_0 + \Omega_1 W_{1i} + \Omega_2 W_{2i} + \dots + \Omega_k W_{ki} + u_i}}{1 + e^{\Omega_0 + \Omega_1 W_{1i} + \Omega_2 W_{2i} + \dots + \Omega_k W_{ki} + u_i}}$$

Equation (1.0) shows that *Y* is the dependent variable, W_j as the jth independent variable Ω_0 is the constant regression coffecient Ω_j is the j-th regression coefficient of independent variable W_j, u_j is the random residuals and *k* is the number of independent variables where *j =1, 2, ..., k*. All these variables were categorical or qualitative; hence, each independent variable would be accompanied by a corresponding dummy variable denoting the factors affecting the behavioural patterns of the film viewers (Noraini *et al*., 2014). Multinomial logistic regression (MLR) model would involve the dependent variable to be in a nominal scale where it is parameterized to form two logistic regression equations based on the maximum likelihood estimation

3.3 Data Cleaning and Filtering

Data cleaning and filtering would involve two stages, i.e. filtering through column by column and row by row methods. Information which had no numerical values, data with similar categories and unexplained data, such as data with negative values would have to be removed. This will avoid errors during model building and consequently, the misinterpretation of its outcome. However, Zainodin et al.(2011) has considered factors as variables. There were 75 variables that could be used as independent variables in this study.

The number of possible models without interactions can be calculated using the following formula $N = \sum_{j=1}^{q} C_j^q \ldots$ (2.0) where "q"is the number of independent variables and j=1,2,…,q.

The removals of insignificant factors were carried out until the factors that remain have p-values less than 0.05.The best model was then chosen from the selected models that remained based on the deviance statistics of the Modified Eight Selection Criteria (M8SC). The model which had the minimum and satisfied most the selection criteria would be the best.

4. Results And Discussions

The first component containing six factors was chosen for analysis, and was represented by the symbols Y, A, B, C, D and E . In this paper, the factor on frequency in film viewing was chosen as the dependent variable (Y), while the other four factors were the independent qualitative variables. The chosen variables were frequency in viewing film (dependent variable) while film attributes, marketing strategies, buying behavior and genre respectively were the independent variables. Each qualitative factor had its own respective transformed dummy variable.

All the possible 15 models had undergone the statistical tests in the methodology section. Finally the best model was chosen based the eight selection criteria . The coefficient test is carried out to remove any insignificant factors that have p-values greater than 0.05 from the models as in Noraini et al.(2008), until the factors that remain have p-values less than 0.05.

The last suitable model was then found to be the best model given by equation.Finally the best model was chosen based the modified eight selection criteria (M8SC) (Ramanathan, 2002) and is given as

$$M15.0.12 = \Omega_0 + \delta_1 A_1 + \delta_2 A_2 + \delta_4 A_4 + \delta_6 A_6 + \delta_8 A_8 + \omega_1 B_1 + \omega_2 B_2 + \omega_4 B_4 + \pi_1 C_1 + \lambda_2 D_2 + \lambda_3 D_3 + \lambda_5 D_5 + \lambda_6 D_6 \ldots\ldots\ldots\ldots\ldots\ldots\ldots(5.0)$$

Substituting the values of the regression coefficients, equation (5.0) then becomes:

M1.02 : Y1 = 2.78 + 0.165 A1 + 9.34 A2 + 0.32 A4
Y2 = 2.43 + 0.213 A1 + 10.87 A2 + 1.01A4
Y3 = 1.23 + 0.32 A1 + 11. 23 A2 + 1.21 A4

Substituting the original representation of the research factors into equation (6.0), the best model M1.0.2 is implicated by

Y1– Frequency of film viewing 1 time or less in a month;
Y2 – Frequency of film viewing 2 times in a month;
Y3- Frequency of film viewing 3-4 times in a month
A1 – Motivation due to change in Buying behavior
A2 – Motivation due to change in Marketing strategies
A4 – Motivation due to change in Film attributes

The above equation implies that frequency in the viewing model are significantly affected by buying behaviour, marketing strategies and different film attributes. These factors are found to be simplistic factors compared to Noraini et al. (2014) where multiple regression technique was employed on Malaysian audiences. It was found that

majority of the 150 respondents were female with 63.3% and 66.7 % were among the age group of 20-23 years. Among all the factors of film attributes Good music (72%) Good story (54.0 %), Good Dialogue delivery & plot (54%), True incident based movie (53.3%) were immerged as major influencing factors among other film attributes

- The analysis of the data shows that 76.7% of people strongly agreed to the statement that they have seen/heard any promotional advertisement/information of a film on new/social media out of which 90% people feel promoting a film online can also attract audience to the theater hall.
- It depicts that 23.3% people use pc, 36.7 % works on laptop 33.3 % people prefer mobile devices whereas 6.7% uses notepads and I pads and other devices
- Analysis show that 63% of total population spend 2-6 hours per day for social media
- Among all the online techniques online video promo attracts the audience the most while 73.3% of people completely agree with the fact.
- 96.6% people agree that online promotion through social media attracts them towards upcoming movie.

5. DISSCUSSIONS:
In today`s scenario where almost every young intellectual group is connected to social media and world have became a global village with just a touch of your fingers. As from the findings we can easily identify that people do get affected from the online film promotional method as present and latest marketing strategies for a feature film in Indian film industry. This paper introduces the concept and procedures in mathematical modelling using the multinomial logistic regression technique so as to identify significant factors that affect the sustainability of the Indian film industry among youth of Gwalior city

M1.02 :
$Y1 = 2.78 + 0.165$ (Buying Behavior)+ 9.34(Film Attributes) + 0.32 (Film Marketing)
$Y2 = 2.43 + 0.213$ (Buying Behavior) + 10.87(Film Attributes) + 1.01(Film Marketing)
$Y3 = 1.23 + 0.32$ (Buying Behavior) + 11. 23(Film Attributes) + 1.21 (Film Marketing)

These factors give positive and direct contribution to the increase in the frequency in film viewing of the college going students of Gwalior Region. It can be concluded that audiences get attracted towards different film attributes like music, script, acting etc, it also suggest that with a little bit change in buying behavior pattern and marketing strategies the viewership of the audience can be change and increased with time.

6. REFRENCES :

Furrer, O., & Sudharshan, D. (2001). Internet marketing research: opportunities and problems. *Qualitative Market Research: An International Journal*, *4*(3), 123-129.

Ul Haq, Z. (2012). Affiliate marketing programs: A study of consumer attitude towards affiliate marketing programs among Indian users. *International Journal of Research Studies in Management*, *1*(1).

Rajadhyaksha, A. (2003). The'Bollywoodization' of the Indian cinema: cultural nationalism in a global arena. *Inter-Asia cultural studies*, *4*(1), 25-39.

Abdullah, N., Salleh, S., Zainodin, H. J., & Hassan, D. FACTORS RELATING BEHAVIOURAL PATTERNS ON FILM VIEWERS IN EAST MALAYSIA.

Noraini Abdullah and Zainodin H.J. (2013). Multicollinearity Remedial Techniques in Model-Building. *Matematika* (UTM), **29** (1b): 105-115.

Noraini Abdullah, Suhaimi Salleh, Ramzah Dambul and Diana Hassan. (2014). Behavioural and Viewing Patterns of Cinema-Goers in Malaysia. *Proceedings the 2nd World Conference on Islamic Thought & Civilisation: Rise and Fall of Civilisation-Contemporary States of Muslim Affairs*, 18-19 August, Perak, Malaysia, pp.876-883. ISBN: 978-967-5480-10-2.

Gabda, D., Jubok, Z. H., Budin, K., & Hassan, S. (2008). Multiple linear regression in forecasting the number of asthmatics. *WSEAS Transactions on Information Science and Applications*, *5*(6), 972-977.