MODELING SALES OF AUTOMOBILES

WITH

CUSTOMER ENGAGEMENT IN FACEBOOK

Dr. Tuhin Chattopadhyay

Abstract

The paper measures customer engagement in Facebook and assesses its impact on the sales of automobiles. The metric 'People Talking About This' (PTAT) is used to measure customer engagement with a Facebook page. The PTAT scores were taken from the official pages of the automobile brands for the month of October. Their respective sales figures were further taken for the same month. A bivariate regression was applied on the sales as the dependent variable and their PTAT scores as the independent variables. The study was done with various homogeneous groups like Maruti cars, Toyota cars, Mahindra cars, hatchbacks, sedans, sports utility vehicles as well as heterogeneous groups like brands of all companies. The study revealed that there is a positive, significant and linear relationship between sales and customer engagement strategies in Facebook. It was also found that customer engagement explains a large amount of variation in sales in all the cases. The paper further recommends managers to take their Facebook page seriously and take necessary steps to engage with their potential and existing customers in the social networking sites since the research proved that their customer engagement in social media translates into sales.

Key Words: Customer Engagement, Facebook, Automobile, Sales, Regression.

1. INTRODUCTION

Customer engagement in the social media is the buzzing area in the marketing literature in the recent times. Customer engagement is defined as "behaviors [that] go beyond transactions, and may be specifically defined as a customer's behavioral manifestations that have a brand or firm focus, beyond purchase, resulting from motivational drivers" (van Doorn et al., 2010). The S-O-R model suggests that the websites influence users' online experience and subsequently affects responses (i.e. intention to purchase) (Eroglu et al., 2003; Parboteeah et al., 2009). Facebook was founded by Mark Zuckerberg in February 2004, originally for connecting the students of Harvard College, where users can populate their own profile page with personal information and build up a set of friends (Hopkins, 2012). Dekay (2012) observed that on the wall of a Facebook page, corporations generally post five types of entries, or discussion threads:

(1) Direct marketing of products or services;

(2) Promotion of sponsored events;

(3) Surveys;

(4) Informational announcements; and

(5) "Fun" postings, usually in the form of questions related to recent or upcoming events.

Baird and Parasnis (2011) observed that a company on Facebook can establish a rapport with existing and potential clients, post sales information, promotions, and new product announcements and promote those products with engaging drawings and giveaways. Witek and Grettano (2012) opined that Facebook is a powerful contact zone for information literacy. Coulter and Roggeveen (2012) observed that marketers create social network product pages, and encourage customers to join these pages in order to establish long-term relationships. Gummerus et al. (2012) revealed that customer engagement behavior such as liking content, writing comments and reading messages in Facebook communities influenced positively all relationship benefits which ultimately lead to satisfaction. So the present research considers Facebook as a powerful virtual interface to track the customer engagement strategies by the automobile companies.

2. PURPOSE OF RESEARCH

A recent research conducted by Haigh, Brubaker and Whiteside (2012) claimed that stakeholders' purchase intent was significantly bolstered after interacting with organizations' Facebook pages. The purpose of this research is to explore whether the tremendous craze with the popular social media sites like Facebook actually translates into sales. It assesses the effectiveness of the customer engagement strategies employed by various automobile companies in their official Facebook page, in driving sales. The specific objectives of the research paper are as follows:

i. To assess the impact of customer engagement by Maruti in the official Facebook pages of their brands, on the sales of those Maruti cars.
ii. To find out the impact of customer engagement by Mahindra in the official Facebook page of their brands, on the sales of each of those Mahindra cars.
iii. To find out the impact of customer engagement by Toyota in the official Facebook page of their brands, on the sales of those Toyota cars.
iv. To assess the impact of customer engagement by the hatchbacks (irrespective of their parent company) in their respective official Facebook page, on the sales of those hatchbacks.
v. To find out the impact of customer engagement by the sedans (irrespective of their parent company) in their respective official Facebook page, on the sales of those sedans.
vi. To find out the impact of customer engagement by the SUVs (irrespective of their parent company) in their respective official Facebook page, on the sales of those SUVs.
vii. To find out the impact of customer engagement of all the types of cars i.e. hatchbacks, sedans, MUVs, SUVs, coupe etc. (irrespective of their parent company) in their respective official Facebook page, on the sales of those cars.
viii. To assess the impact of the customer engagement strategies employed the automobile companies in their official Facebook page (and not on the Facebook page of their individual brands) in bringing sales (the total sales achieved by each of the automobile companies).

3. METHODOLOGY

Initially, the marketers in Facebook used to measure customer engagement through a number of metrics like 'Likes', 'Active Users', 'Comments' etc. However, in October, 2011 Facebook introduced the metric 'People Talking About This' (PTAT) to track customer engagement with a Facebook page. PTAT is a measure of the number of people who have created a story about the page. The Facebook Page Insights enlists that PTAT includes everyone who:

- Liked your Page
- Liked, commented on, or shared your Page post
- Answered a Question you've asked
- Responded to your event
- Mentioned your Page
- Tagged your Page in a photo
- Checked in or recommended your Place

From the last spring, Facebook also includes friends of fans who interact with a brand's post to account of the viral potential of the social network (Creamer, 2012). Hussein Fazal (August 31st, 2012), CEO of AdParlor, noted that the essential value in PTAT is that it encompasses the engagement and activity a page sees. Matthew Creamer (November 15th, 2012) of Advertising Age further confirmed that PTAT metric is a kind of proxy for engagement. In the light of the above discussion, the present paper, too, measures customer engagement with the help of PTAT metric.

Besides the PTAT score, the paper also takes into consideration the actual sales of the different brands of the automobiles in the month of October, 2012. To satisfy each of the eight objectives, a few brands from each of the categories (as specified in the objectives) were taken by simple random sampling. Their respective PTAT scores were taken from their official Facebook page. A bivariate regression was applied on the sales of the automobiles as the dependent variable and their respective PTAT score as the independent variable. The specific results mentioned below are in response to the pre-specified objectives.

4. FINDINGS

Table 1 provides the sales of Maruti cars and the brand's PTAT scores in their official Facebook page.

Table 1

Maruti Cars

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Alto 800	1438	4462
A-Star	587	2308
Swift	15433	32466
Ertiga	7289	15960
Estilo	1217	4325
Kizashi	35	1160
SX4	695	3050

Table 2 reveals that a significant regression was achieved with R^2 of 99.9% which shows that the relationship between sales of Maruti cars and PTAT score is almost linear and 99.9% of the variation of sales of Maruti cars is explained by PTAT score.

Table 2

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1.000[a]	.999	.999	156.132

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 3 given below. PTAT score is significantly different from zero ($t = 89.15$, $p < .05$).

Table 3

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-715.329	77.863		-9.187	.000
	PTAT	.497	.006	1.000	89.156	.000

a. Dependent Variable: Sales

Table 3 further reveals the relationship between sales of Maruti cars and their respective PTAT score which is as follows: Sales of Maruti cars = -715.329 + .497 PTAT score

Table 4 provides the sales of Mahindra cars and the brand's PTAT scores in their official Facebook page.

Table 4

Mahindra Cars

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Scorpio	4681	220000
Thar	686	55575
Verito	1553	106000
XUV500	4320	145000
Xylo	2044	50314

Table 5 reveals that a significant regression was achieved with R^2 of 75.7% which shows that the relationship between sales of Mahindra cars and PTAT score is almost linear and 75.7% of the variation of sales is explained by PTAT score.

Table 5

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.870[a]	.757	.675	1000.637

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 6 given below. PTAT score is significantly different from zero ($t = 3.05$, $p < .1$).

Table 6

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	146.186	936.022		.156	.886
	PTAT	.022	.007	.870	3.054	.055

a. Dependent Variable: Sales

Table 6 further reveals the relationship between sales of Mahindra cars and their respective PTAT score which is as follows: Sales of Mahindra cars = 146.186 + .022 PTAT score

Table 7 provides the sales of Toyota cars and the brand's PTAT scores in their official Facebook page.

Table 7

Toyota Cars

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Camry	61	125
Corolla	332	3739
Innova	5889	9177
Liva	2491	6095

Table 8 reveals that a significant regression was achieved with R^2 of 85.2% which shows that the relationship between sales of Toyota cars and PTAT score is almost linear and 85.2% of the variation of sales of Toyota cars is explained by their PTAT score.

Table 8

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.923[a]	.852	.778	1267.590

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 9 given below. PTAT score is significantly different from zero ($t = 3.39$, $p < .1$).

Table 9

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-919.066	1113.996		-.825	.496
	PTAT	.651	.191	.923	3.397	.077

a. Dependent Variable: Sales

Table 9 further reveals the relationship between sales of Toyota cars and their respective PTAT score which is as follows: Sales of Toyota cars = -919.066 + .651 PTAT score

Table 10 provides the sales of hatchbacks and the brand's PTAT scores in their official Facebook page.

Table 10

Hatchbacks

Model	**Sales (Oct., 12)**	**PTAT (Oct., 12)**
Alto_800	1438	4462
A-Star	587	2308
Estilo	1217	4325
Micra	449	1128
Fabia	256	195

Table 11 reveals that a significant regression was achieved with R^2 of 95.3% which shows that the relationship between sales of hatchbacks and PTAT score is almost linear and 95.3% of the variation of sales of hatchbacks is explained by their PTAT score.

Table 11

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.976[a]	.953	.937	127.835

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 12 given below. PTAT score is significantly different from zero ($t = 7.8$, $p < .05$).

Table 12

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	136.522	101.307		1.348	.271
	PTAT	.263	.034	.976	7.806	.004

a. Dependent Variable: Sales

Table 12 further reveals the relationship between sales of hatchbacks and their respective PTAT score which is as follows: Sales of hatchbacks = 136.522 + .263 PTAT score

Table 13 provides the sales of sedans and the brand's PTAT scores in their official Facebook page.

Table 13

Sedans

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Kizashi	35	1160
Laura	225	109
Camry	61	125
Corolla	332	3739
Etios	2105	78312

Table 14 reveals that a significant regression was achieved with R^2 of 98.7% which shows that the relationship between sales of sedans and PTAT score is almost linear and 98.7% of the variation of sales of sedans is explained by their PTAT score.

Table 14

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.993[a]	.987	.982	116.540

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 15 given below. PTAT score is significantly different from zero ($t = 14.95$, $p < .05$).

Table 15

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	130.006	59.260		2.194	.116
	PTAT	.025	.002	.993	14.948	.001

a. Dependent Variable: Sales

Table 15 further reveals the relationship between sales of sedans and their respective PTAT score which is as follows: Sales of sedans = 130.006 + .025 PTAT score

Table 16 provides the sales of SUVs and the brand's PTAT scores in their official Facebook page.

Table 16

SUV

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Pajero	119	791
Scorpio	4681	220000
XUV500	4320	145000
Fortunner	1378	27159

Table 17 reveals that a significant regression was achieved with R^2 of 93.1% which shows that the relationship between sales of SUVs and PTAT score is almost linear and 93.1% of the variation of sales of SUVs is explained by their PTAT score.

Table 17

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.965[a]	.931	.896	717.968

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 18 given below. PTAT score is significantly different from zero ($t = 5.19$, $p < .05$).

Table 18

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	562.555	535.249		1.051	.404
	PTAT	.021	.004	.965	5.194	.035

a. Dependent Variable: Sales

Table 18 further reveals the relationship between sales of SUVs and their respective PTAT score which is as follows: Sales of SUVs = 562.555 + .021 PTAT score

Table 19 provides the sales of the brands of the automobile companies and the brand's PTAT scores in their official Facebook page.

Table 19

Brands of the Automobile Companies

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Alto_800	1438	4462
A-Star	587	2308
Estilo	1217	4325
Kizashi	35	1160
Ritz	5809	162000
SX4	695	3050
Pajero	119	791
Quanto	2497	41039
Scorpio	4681	220000
Thar	686	55575
Verito	1553	106000
XUV500	4320	145000
Xylo	2044	50314
Evalia	195	10193
Micra	649	1128
Sunny	1007	1816
Fabia	256	195

Table 20 reveals that a significant regression was achieved with R^2 of 80.7% which shows that the relationship between sales of the brands of the automobile companies and PTAT score is almost linear and 80.7% of the variation of sales of brands of the automobile companies is explained by their PTAT score.

Table 20

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.898[a]	.807	.797	721.131

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 21 given below. PTAT score is significantly different from zero ($t = 9.13$, $p < .05$).

Table 21

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	493.665	185.960		2.655	.015
	PTAT	.023	.003	.898	9.137	.000

a. Dependent Variable: Sales

Table 21 further reveals the relationship between sales of brands of the automobile companies and their respective PTAT score which is as follows:

Sales of brands of the automobile companies = 493.665 + .023 PTAT score

Table 22 provides the sales of the companies and the brand's PTAT scores in their official Facebook page.

Table 22

Companies

Model	Sales (Oct., 12)	PTAT (Oct., 12)
Hyundai	35778	122000
Fiat	568	14861
Honda	8085	14840
Volkswagen	5607	52067

Table 23 reveals that a significant regression was achieved with R^2 of 87% which shows that the relationship between sales of the automobile companies and PTAT score is almost linear and 87% of the variation of sales of automobile companies is explained by their PTAT score.

Table 23

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.932[a]	.870	.804	7001.180

a. Predictors: (Constant), PTAT

The result of the linear regression is produced in Table 24 given below. PTAT score is significantly different from zero ($t = 3.65$, $p < .05$).

Table 24

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2370.744	5373.034		-.441	.702
	PTAT	.292	.080	.932	3.651	.068

a. Dependent Variable: Sales

Table 24 further reveals the relationship between sales of brands of the automobile companies and their respective PTAT score which is as follows:

Sales of the automobile companies = -2370.744 + .292 PTAT score

5. MAJOR RESULTS

i. The sales of Maruti cars exhibited a perfectly linear relationship with their PTAT scores in the Facebook page. The R^2 reported by SPSS is 99.9% and the PTAT score is significant ($t = 89.156$, $p < .05$). The relationship between sales and PTAT score is as follows: Sales of Maruti cars = - 715.33 + .497 PTAT

ii. For the Mahindra cars, a significant regression equation was achieved with an R^2 of 75.7% and the relationship is: Sales of Mahindra cars = 146.15 + .02 PTAT

iii. As far as the Toyota cars are concerned, a significant regression equation was achieved with an R^2 of 85.2% and the relationship is: Sales of Toyota cars = - 919.06 + .65 PTAT

iv. Taking the hatchbacks into account, a significant regression equation was achieved with an R^2 of 95.3% and the relationship is: Sales of Hatchbacks = 136.52 + .26 PTAT

v. For the sedans, a significant regression equation was achieved with an R^2 of 98.7% and the relationship is: Sales of Sedans = 130 + .03 PTAT

vi. For the SUVs, a significant regression equation was achieved with an R^2 of 93.1% and the relationship is: Sales of SUVs = 562.55 + .02 PTAT

vii. While taking all the automobile brands together, a significant regression equation was achieved with an R^2 of 80.7% and the relationship is: Sales of Automobiles = 493.66 + .02 PTAT

viii. Considering the customer engagement strategies employed by the automobile companies in their official corporate Facebook page, a significant regression equation was achieved with an R^2 of 87% and the relationship is: Sales of the Companies = - 2370.74 + .3 PTAT

Thus, all the results, suggest a significant relationship between sales of automobiles and their PTAT scores in their official Facebook page. Insights into the above relationship can be gained by exploring the evidences provided by the previous researchers. Huang (2012) observed that in the context of SNSs, affective involvement showed the highest influence on users' intentions to purchase. American Eagle found that Facebook users who 'liked' its products spent 57 percent more on online products than non-users (Taylor, 2011). Thus the previous research papers also lend their support on the evidences found in the present research.

6. MANAGERIAL IMPLICATIONS

Managers can no more afford to ignore Facebook. The results produced above clearly shows that there exists a significant relationship between customer engagement in Facebook and the sales of automobiles. Therefore, the managers should consider the Facebook page of their brands and the company's Facebook page seriously and employ effective customer engagement strategies to bolster sales. Seung-A Annie Jin (2012) also emphasized the importance of creating social media interfaces that meet consumers' need to promote favorable brand attitudes.

7. LIMITATIONS

The research was limited to those brands of automobiles that have an official page in Facebook. Thus the present research excludes all such brands that do not have an official page.

8. RELEVANCE

The paper bears immense relevance in the present time. First of all, the research paper takes into account the most popular social media site, Facebook, to capture the customer engaging performance of the companies in the social media. Secondly, as a product category, the research paper takes into account the automobile sector which commands huge interest from the target audience. Last but not the least; the paper is based on the most recent data. Both the sales figure of the automobiles and the customer engagement of the different companies are captured from October, 2012.

9. ORIGINALITY

So far, there are very few empirical studies to bridge the real world with the virtual world. In this study, the performance in the real world is assessed with the data taken from the virtual world.

10. REFERENCES

Baird, C. H. & Parasnis, G. (2011),"From social media to social customer relationship management", Strategy & Leadership, Vol. 39 Iss: 5 pp. 30 - 37

Coulter, K. S. and Roggeveen, A. (2012), ""Like it or not": Consumer responses to word-of-mouth communication in on-line social networks", Management Research Review, Vol. 35 Iss: 9 pp. 878 – 899

Creamer, M. (2012), Brand Engagement Rate Still 1%, But Facebook Is OK With That. Retrieved from: http://adage.com/article/digital/brand-engagement-rate-1-facebook/238317/

Dekay, Sam H. (2012),"How large companies react to negative Facebook comments", Corporate Communications: An International Journal, Vol. 17 Iss: 3 pp. 289 – 299

Eroglu, S.A., Machleit, K.A. and Davis, L.M. (2003), "Empirical testing of a model of online store atmospherics and shopper responses", Psychology & Marketing, Vol. 20 No. 2, pp. 139-50.

Fazal, H. (August 31st, 2012). Word of Mouth at Scale with Facebook: Understanding PTAT. Retrieved from: http://www.insidefacebook.com/2012/08/31/word-of-mouth-at-scale-with-facebook-understanding-ptat/

Gummerus, J., Liljander V., Weman E. & Pihlström M., (2012),"Customer engagement in a Facebook brand community", Management Research Review, Vol. 35 Iss: 9 pp. 857 – 877

Haigh, Michel M., Brubaker, Pamela Jo, and Whiteside, Erin (2012),"Facebook: Examining the Information Presented and Its Impact on Stakeholders", Corporate Communications: An International Journal, Vol. 18 Iss: 1

Hopkins, John L. (2012),"Can Facebook be an effective mechanism for generating growth and value in small businesses?", Journal of Systems and Information Technology, Vol. 14 Iss: 2 pp. 131 – 141

Huang, E. (2012),"Online experiences and virtual goods purchase intention", Internet Research, Vol. 22 Iss: 3 pp. 252 – 274

Parboteeah, D.V., Valacich, J.S. and Wells, J.D. (2009), "The influence of web site characteristics on a consumer's urge to buy impulsively", Information Systems Research, Vol. 20 No. 1, pp. 60-78.

Seung-A Annie Jin, (2012),"The potential of social media for luxury brand management", Marketing Intelligence & Planning, Vol. 30 Iss: 7 pp. 687 – 699

Taylor, C. (2011), ''Facebook marketing paying off, company claims'', Vertical Leap, April 8, available at: www.vertical-leap.co.uk/news/Facebook-marketing-paying-off-company-claims/

van Doorn, J., Lemon, K.N., Mittal, V., Nass, S., Doree´n, P., Pirner, P. and Verhoef, P.C. (2010), "Customer engagement behavior: theoretical foundations and research directions", Journal of Service Research, Vol. 13 No. 3, pp. 253-66.

Witek, D. & Grettano, T. (2012),"Information literacy on Facebook: an analysis", Reference Services Review, Vol. 40 Iss: 2 pp. 242 - 257