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Abstract. This research aims to study the interrelated concepts of adoption & usage of social media platforms and extend the discussion towards social media engagement and usage in different business sectors in India. Firms from five industries, banking, information technology, automobiles, telecommunications, and consumer goods in the Bombay Stock Exchange 500 index were selected to study the social media engagement. For all the selected firms the social media presence data was collected from Facebook, Twitter, YouTube, LinkedIn and Instagram. The study indicates a relationship between social media engagement & year-on-year sale variance; whereas different factors affecting the predictability of variance are discussed while replicating the model of corporate social media use. The paper shares implications for marketing professionals and researchers.

Keywords: Social media usage, Degree of social media usage, Social media presence score.

1 Introduction

Social media has transformed the Internet from the platforms of information to platforms of influence (Alalwan et al. 2017; Dwivedi et al. 2015; Kapoor et al. 2018; Rathore et al. 2016). The huge user base on a variety of social media platforms has influenced the businesses across a variety of industries as well (Abed et al. 2015ab; 2016). It was only a few years ago that social media was a place where consumers were speaking extensively whereas not many business firms were at a comfortable space (Kaplan, & Haenlein, 2010). Today firms do realize that more than just another form of media, social media can be a strategic instrument capable of transforming an organization (Nair, 2011). This transition is visible across a variety of businesses that are putting efforts to integrate their business strategies with social media platforms. Social media is useful for companies to generate stakeholder dialogue and engage-

ment as well. Thus, for better communication companies now need to consider social media platforms as well as traditional modes (Hoffman & Fodor, 2010).

In this paper, we try to identify the presence of different business sectors on social media platforms. For the study, we select five different platforms namely, Facebook, Twitter, YouTube, LinkedIn and Instagram. We study all the firms included in the BSE 500 index from five industries namely banking, information technology, automobiles, telecommunications and consumer goods. To measure the impact of social media, we study the relationship between year-on-year sales variance & social media engagement. While replicating the model of corporate social media use (Aichner & Jacob, 2015) for the Indian companies, we use the metrics for social media applications including the number of visits, tags, page views, members/fans, impressions, incoming links, impressions-to-interactions ratio, and the average length of time visitors spend on the website.

2 Research Context

According to Statista report (Statista, 2018), India has 19% the share of Internet users visiting social networking sites as on January 2018. Facebook is the leading social media networking site to share user-generated content. India is the leading country based on the number of Facebook users with 250 million users followed by United States & Brazil (Statista, 2018, a). The country is in the second position in terms of a number of active Twitter users with 10.1 million on monthly active users in 2018 (Statista, 2018, b), just below the United States. YouTube had 1.47 billion monthly active users. India ranked second with 7.13% of desktop traffic to the website as on December 2017. The United States, which ranked first had 28.35%. India still has a long way to go for the penetration & engagement to the LinkedIn Website. Photo-sharing social media mobile application Instagram is slowing gaining popularity in India.

3 Literature Review

Social media research can be driven based on roots from multiple disciplines that include information systems, social sciences, psychology, and management research. Aral, Dellarocas, and Godes, in their proposed framework for research in social media coin four activities and three levels of analysis to conceptualize social media research landscape (Aral, Dellarocas, & Godes, 2013). Social media and user behaviour mostly creating level 'consumers and society' is studied extensively (for instance, Boyd & Ellison, 2007; Barker, 2009). Adoption, motivation, personality traits of the user are mostly the focus of these studies. Researches around level 'firms and industries' are mostly implication based and draw roots from economics, marketing, strategy and social sciences. Studies suggest a significant effect of social media marketing on brand post popularity, financial, operational, corporate social performance, firm's share value, and customer equity (De Vries, Gensler, & Leeflang, 2012; Paniagua & Sapena, 2014; Kim & Ko, 2012). Researchers have been working on ways to use

social media and social media data to the advantage of business decision makers (Hanna, Rohm, & Crittenden, 2011; He, Zha, & Li, 2013). In a discussion over ways to measure social media, Nair (2011) describes complexities involved with the decision on time and manner of engagement. Thomas Aichner and Frank Jacob in their paper provide a model that measures social media usage for corporates around the world on different social media platforms (Aichner & Jacob, 2015). Aichner & Jacob model can help the organizations to analyze a single brand and to compare with the competitors and the industry average.

Network paradigm is often used to explain a large part of social media space. Studies including the honeycomb of social media (Kietzmann, Hermkens, McCarthy, & Silvestre, 2011) suggest that it is a complex of individual traits, platform design and features, network effects and desired outcomes that drive the social media space. It is important to understand the cross-disciplinary nature and attend the complexities attached (Aral, Dellarocas, & Godes, 2013). The present study focuses on the level of firms and industries and attempts to understand the value derived from social media engagement in terms of year on year sales variance. The extant research indicates a paucity of research on the adoption of social media by Indian businesses (Ilavarasan, 2018). Since the potential predictability of the value is subjected to a complex of variable factors, we intend to contextualize the research to the Indian market and understand social media usage through an existing matrix (Aichner & Jacob, 2015) This will also help in understanding the requirement and applications of an index for social media usage.

4   Methodology & Data Preparation

We first shortlisted a suitable number of firms for the study. For these selected firms we got details about market capital and year-on-year sale variance. We also captured different parameters depicting social media presence, engagement, and usage on five selected social media platforms. To shortlist firms, we followed a study (Kaushik, Hemani, & Ilavarasan, 2017) that suggests that banking, information technology, automobiles, telecommunications and consumer goods sectors are the five sectors with highest social media score. We then looked at BSE 500 (Bombay Stock Exchange) which is an Indian stock market index that covers 500 publicly listed companies covering all major industries of the Indian Economy. BSE 500 listed firms offer a composite mix of small, medium & large capital market. Therefore, we selected firms from the BSE 500 list that fall under the five sectors namely banking, information technology, automobiles, telecommunications and consumer goods.

This gave us a total of 128 firms for analysis out of which 34 firms are banking sector, 24 are Information Technology, 22 from automobiles, 9 are telecommunications, and 39 firms are consumer goods sector. In terms of market capital, 46 firms belong to large-cap, 49 to mid-cap & 33 to small-cap. We captured market capital and year-on-year sale variance from Ace Equity platform for the month of November 2017. Data regarding social media engagement for all the selected firms were collected in the month of February 2018. The recorded parameters included account availa-

bility (1/0) for all the social media platforms, number of followers and posts for Facebook and Instagram, number of posts and tweets for Twitter, number of followers along with a number of employees and number of updates on LinkedIn, number of subscribers and number of videos for YouTube. Based on these we look at the patterns in social media presence and age. We look at social media engagement by performing a simple linear regression analysis to see the predictability of year-on-year sale variance based on social media engagement. We then discuss social media usage based on Aichner and Jacob model.

5 Analysis and Discussion

5.1 Social Media presence

We looked at the social media presence of these 128 firms on five selected social media platforms Facebook, Twitter, YouTube, LinkedIn and Instagram. Social media accounts that were digitally integrated on the public website of the company only were taken into consideration; this ensured recording data for authentic social media accounts. Social media presence score ranged from 0 to 5 by assigning zero for non-presence and one for presence on each one of the five social media platforms. 92 out of 128 firms had a non-zero score for social media presence; i.e. they showed presence on at least one of the five selected social media platforms. We categorized the score of 0-1 as low, 2-3 as medium, and 4-5 as high. Table 1 shows the industry-wise distribution of firms in low, medium, and high social media presence score categories. The table suggests that 75% out of the firms selected under Information technology have a high social media presence score and have a presence on a variety of social media platforms. For consumer goods and Automobile sector though a larger percentage of the firms have a low social media presence.

Table 1. Industry-wise percentage of social media presence

Social Media Presence Score	Banking (34)	Automobiles (22)	Cons-Goods (39)	Info-Tech (24)	Telecom (9)
Low (0-1)	26.4%	45.4%	38.4%	12.5%	33.3%
Medium (2-3)	35.2%	22.7%	46%	12.5%	33.3%
High (4-5)	38.2%	31.8%	15.3%	75%	33.3%

Among the different social media platforms, Facebook and Twitter are most commonly used in general. Instagram is among the lesser used platforms. Table 2 shows social media platform-wise percentage of firms in different sectors considered in the study. 88% of Information technology firms have a social media presence on Twitter, Facebook and LinkedIn. In comparison the presence on Instagram is 8% only.

Table 2. Platform-wise percentage of social media presence of different sectors

Industry Sectors	Social Presence	Twitter	FB	YouTube	LinkedIn	Instagram
Automobile	64%	59%	55%	45%	32%	18%
Banking	76%	71%	71%	47%	47%	24%
Cons-Goods	64%	49%	56%	38%	26%	15%
Info-Tech	88%	88%	88%	75%	88%	8%
Telecom	67%	67%	67%	44%	44%	11%

5.2 Social Media Age

We looked at the social media age of the firms to understand the social media adoption pattern across different industry and sectors. Twitter and YouTube accounts provide details for joining dates on these platforms. Social media age was calculated starting from the date of joining on either of this platform (considering the earlier joining date in case of presence on both the platforms). Out of the 92 firms with non-zero SM presence score, five firms did not have accounts on either of these platforms. For the rest of the firms, Table 3 summarizes the social media age across different market capital segments. The table shows that large capital market companies were among the early adopters of the social media platform, while medium and small-scale sectors are increasingly showing a presence in later times. Till the year 2008, no small and medium market capital firm had a presence on these major social media platforms. Later years show a speedy change in a scenario with some young small and medium sector firms on different social media platforms.

Table 3. Social Media Age: Joining period of firms from different market capital

Market Capital (No. of firms on SM)	Mar '16-18	Mar '14-16	Mar '12-14	Mar '10-12	Mar '08-10	Mar '06-08
Small (33)	21	17	16	10	5	0
Medium (49)	30	24	19	14	4	0
Large (46)	36	36	31	22	11	4

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Further Table 4 categorizes firms in different business sectors according to their social media age and shows that the early adoption of social media was by Banking & Information Technology sectors. Consumer goods firms are increasingly realizing and opting for different social media platforms.

Table 4. Social Media Age: Joining period of firms from different sectors

Industry (No. of firms on SM)	Mar '16-18	Mar '14-16	Mar '12-14	Mar '10-12	Mar '08-10	Mar '06-08
Automobiles (22)	13	12	11	6	1	0
Banking (34)	24	19	14	9	3	2
Cons-Goods (39)	23	21	17	9	2	0
InfoTech (24)	21	21	20	18	12	2
Telecom (9)	6	4	4	4	2	0

5.3 Social media engagement.

More than mere presence, the power of social media is driven by the number of people one can connect with using the platform. We explore the social media engagement of all the selected firms to explore people's response to their social media activities. When a company posts on social media, the responses in terms of 'likes', 'comments', the number of 'followers' and 'subscribers' show the extent of engagement.

$$Social\ Media\ Engagement\ (Company) = \frac{\sum Number\ of\ posts/video/texts\ on\ all\ platforms}{\sum Number\ of\ followers/subcriber\ on\ all\ platforms}$$

Since corporate social media engagement comes with some set objectives, measuring the output becomes important (Hanna, Andrew, & Crittenden, 2011). In this study, we consider output in terms of year on year sale variance. For all the selected firms from BSE500, year on year sales data was collected from AceEquity platform for November 2017. And data regarding social media engagement for all the selected firms were collected in February 2018 by recording parameters listed in previous sections. A regression analysis was done to see if there is a significant relation between social media engagement and year on year sales variance for a firm.

Ho: There is no relationship between social media engagement & year-on-year sale variance

H1: There is a relationship between social media engagement & year-on-year sale variance

Linear Regression based on YoY Sales & social media engagement Result.

Table 5. Regression Analysis

Coefficients:	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	1.507	3.227	0.467	0.6419
SMEngagement	7.212	3.371	2.14	0.0354

Multiple R-squared: 0.05288,   Adjusted R-squared: 0.04133

F-statistic: 4.578 on 1 and 82 DF,   p-value: 0.03536

Simple linear regression was calculated to predict year-on-year sale variance based on social media engagement. A significant regression equation was found with ($F(1,82)=4.578$, $p<0.035$), with a R2 of 0.05. Null Hypothesis is rejected since p-value is less than 0.05 (Table 5). This implies a significant relationship between social media engagement & year-on-year sale variance. However, the low R2 suggests that according to this model, it is difficult to precisely predict year on year sales variance based on social media engagement.

Possible reasons here can be corporate social media usage since different social media platform do not serve the same objective (For instance, YouTube could be used for product promotion videos; Twitter helps to get feedback from the customers), therefore, it is important to set the right objectives focusing on the right kind of social media platform. The next section focuses on social media usage by Indian corporates, considering their social media activities on different platforms and corresponding responses.

5.4   Social Media Usage

Thomas Aichner and Frank Jacob in their paper provide a model that measures social media usage for corporates around the world on different social media platforms (Aichner & Jacob, 2015). Thirteen different types of social media including blogs, business networks, photo sharing, video sharing and social networks among others are described. All of them might not be equally relevant for all kinds of corporates based on the scope of application of the platform. Since the fast-moving world of social media is full of risks and quite demanding where consumers' reaction can make or break the brand image of the firm; corporates need to be cautious, selective and proficient while using social media. Aichner & Jacob model can help the organizations to analyze a single brand and to compare with the competitors and the industry average. We replicate the model for Indian corporates and their social media usage. Out of the

five social media platforms in the study, Instagram is a platform with quite low corporate presence. Therefore, we continue with the rest of the four relatively more popular platforms Facebook, YouTube, LinkedIn & Twitter. Out of all 128 firms included in the study, three firms were selected based on highest social media presence and the highest number of followers (number of fans in case of Facebook, number of followers for Twitter, number of subscribers on YouTube & number of employees who have an account on LinkedIn).

Step 1: Social Media Monthly Active users. An active number of users of each social media data were identified from Statista. An active user is a user who logs into the social media account, regardless of any activity done. For a platform where login is not required such as YouTube, the number of unique visitors to the platform are counted. The list in Table 6, shows the data available in April 2018.

Table 6. Monthly active users of the top 4 important social media as on April 2018

Social Media Name	Website	Active users/month
Facebook	www.facebook.com	2,23,40,00,000
Twitter	www.twitter.com	33,00,00,000
YouTube	www.youtube.com	1,50,00,00,000
LinkedIn	www.linkedin.com	26,00,00,000
Total		**4,32,40,00,000**

Step 2: Social Media Impact Factor. Social Media Impact Factor (SMIF) is the ratio of active users in each platform over the sum of the active users of all the social media platform included in the model. It determines the relative importance of each platform. SMIF is variable with time-based on the number of active users as well the number of platforms taken into consideration for model building. As of April 2018, the SMIF of each of the social media platform considered in the model was calculated as:

$$SMIF_{Facebook} = \frac{2,23,40,00,000}{4,32,40,00,000} = 0.52$$

$$SMIF_{Twitter} = \frac{33,00,00,000}{4,32,40,00,000} = 0.08$$

$$SMIF_{YouTube} = \frac{1,50,00,00,000}{4,32,40,00,000} = 0.35$$

$$SMIF_{LinkedIn} = \frac{26,00,00,000}{4,32,40,00,000} = 0.06$$

Step 3: Platform wise Social Media Use. Social Media Use (SMU) index depends on the type of social media and the functions offered by the platform. It is calculated based on the public information available and corresponding consumer responses. It ranges between zero to one, where zero means 'no use at all' and one means 'full use'. If the result of the equation exceeds the optimum value of one, then SMU is equal to one, that is the optimum usage. For different consumer responses, different weight is assigned that represents the degree of participation. For instance, 'comments' are given five times more weight than 'like', 'share' and 'retweets' were assigned ten times weight. Weights vary through different platforms as well. Likes & comments on YouTube are assigned 100 and 500 weights respectively.

Facebook. Table 7 shows the number of followers, posts including text, picture or video as well as average like comment & share for the three company's Facebook account. Based on these values we will calculate a constant that would be used further to estimate the SMU for Facebook. First, an average number of 'likes', 'share', and 'comments' are multiplied by their respective weights (1,5 and 10 here). Second, the sum of these three values is divided by the average number of total fans. Third, this figure is then multiplied by the average number of posts per month. Fourth, dividing the optimal value from the range of SMU (1) by this value gives us the constant. Here the constant = 1/20[{13244+(148*5)+(383*10)}/7123333]. Then SMU for Facebook for a company can be calculated as:

$$SMU\left(facebook\right) = posts * \frac{\text{Ø 'likes'} + \text{Ø comments} * 5 + \text{Ø shares} *10}{fans} *14.54$$

Table 7. Facebook activities of selected companies in February & March 2018

Company Name	Total		Average per posting		
	Fans'	Postings	'Likes'	Comments	Shares
Bharti Airtel	1,03,60,000	63	5653	245	70
Yes Bank	73,70,000	40	1160	43	100
Axis Bank	36,40,000	18	22920	157	980
Average	71,23,333	40	13,244	148	383

Twitter. Table 8 shows the number of followers, posts as well as an average number of likes & retweet for the three selected companies.

Table 8. Twitter activities of selected companies in February and March 2018

Company Name	Total		Average per posting	
	Followers	Postings	Likes	Retweets

Bharti Airtel	2430000	49	92	20
Yes Bank	3380000	1940	8	1
Axis Bank	250083	194	22	3
Average	**20,20,028**	**728**	**41**	**8**

We calculate the value for the constant in a similar way given above for Facebook. Here retweets are given weight 10. Then SMU for Twitter for a company can be calculated as:

$$SMU\left(Twitter\right) = posts * \frac{\text{Ø 'likes' + Ø retweets*10}}{followers} * 46.01$$

YouTube. Table 9 shows the number of subscribers to the channel, video uploads as well as an average number of views, likes & comments for the three selected companies.

Table 9. YouTube activities of selected companies in February and March 2018

	Total		Average per video		
Compa-	Subscrib-	Video up-	Views	Likes	Com-
Bharti	494584	13	1640000	124	72
Yes	4410	14	164459	6	1
Axis	22551	23	778508	57	8
Average	**1,73,848**	**17**	**8,60,989**	**62**	**27**

Unlike another platform where the posts are short-lived, the videos posted can be searched and watched repeatedly. Likes & comments here are assigned 100 and 500 weights respectively. Here:

$$SMU\left(YouTube\right) = videouploads * \frac{\text{Ø views + Ø likes*100 + Ø comments*500}}{subscribers} * 0.0237$$

LinkedIn. Table 10 shows the number of followers to the company profile, number of users mentioned as the employee, number of posts as well as the average number of likes & comments for the three selected companies.

Table 10. LinkedIn activities of selected companied in February and March 2018

	Total			Average per post	
Company Name	Followers	Employees	Posts	Likes	Comments
Bharti Airtel	361397	39219	19	208	7

Yes Bank	227043	19085	40	153	2
Axis Bank	313565	42384	43	450	9
Average	**300668**	**33563**	**34**	**270**	**6**

For LinkedIn, a number of employees who have an account on LinkedIn is also considered along with the number of followers.

$$SMU\left(LinkedIn\right) = posts * \frac{\text{Ø likes} + \text{Ø comments}*5}{followers + employees} * 65.46$$

Social Media use index. Corporate Social Media Use (CSMU) index is calculated using Social Media Use (SMU) of each platform and the social media impact factor (SMIF) of the company. The company can choose one or more out of the four social media platforms here. Social media usage index of the selected platforms can be used in the following equation to calculate the Corporate Social Media Use for the firm. The equation to calculate the CSMU including all four platforms here is as follows:

$$CSMU_{company} = SMU_{Facebook}*0.52 + SMU_{Twitter}*0.08 + SMU_{YouTube}*0.35 + SMU_{LinkedIn}*0.06$$

Table 11. Corporate Social Media use index by Airtel, Yes Bank & Axis Bank

	Company Name		
Description	**Bharti Airtel**	**Yes Bank**	**Axis Bank**
$SMU_{Facebook}$	0.33	0.49	> 1 = 1
$SMU_{Twitter}$	0.14	0.24	0.93
$SMU_{YouTube}$	0.53	> 1 = 1	> 1 = 1
$SMU_{LinkedIn}$	0.43	0.92	> 1 = 1
CSMU	**0.39**	**0.67**	**0.99**

Table 11 shows the SMU for each platform as well the CSMU for all three firms Bharti Airtel, Yes Bank & Axis Bank. From, the table it can be seen that Axis Bank is using three out of four platforms in an optimum way and has the highest CSMU (0.99). Yes Bank is using the YouTube platform in an optimum way; the score for LinkedIn is close to one suggesting good use of the platform here. Bharti Airtel has scope to use social media to their potential says this segment of data.

6   Conclusion

The research focuses on the adoption & usage of social media platforms in different business sectors in India. It explains how in Indian market social media usage for business firms can depend on several different factors including the social media age, engagement, usage pattern, type of firm, strategy, type of social media platform, available features, target audience and content among all. Since social media is a broad, dynamic and versatile collection of platform, services and technologies, it allows varied usage and purposes for different people and businesses (Schlagwein & Hu, 2017). It becomes difficult to predict a growth indicator with precision; however, a relationship between social media usage and growth indicator such as year on year sales variance is evident. We study social media presence, social media age, social media engagement and social media usage for different sector across corporate firms listed in BSE500. The collected data clearly shows that the majority of the firms are present on social media through one or the other platform. Social media age shows that large market capital firms were the early beginners on social media, and medium and small capital firms started adopting post 2008. Through social media engagement, we explore the impact of social media on year on year sales of the firm. A simple linear regression analysis suggests that social media engagement and year on year sales are related. However, the predictability of the relation here is dependent on added factors. We consider that the type and nature of the platform affect the way corporate can use social media to reach towards set objectives. To explore the usage pattern in Indian firm we replicate Aichner & Jacob model (Aichner & Jacob, 2015) and find that not all corporate use different social media platforms to their optimum potential. For different firms, the SMU index suggests a degree of usage of various social media platforms.

The scope of this research includes Indian firms and business. This model can be useful to market researchers and marketing managers to compare between with the competitor as well as to understand social media usage better. For future researches, it would be relevant to classify the factors affecting social media usage for business firms and work on the model to target predictability of the growth indicators.

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