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Stimulating User Activity on Company Fan Pages in Online Social Networks

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STIMULATING USER ACTIVITY ON COMPANY FAN PAGES IN ONLINE SOCIAL NETWORKS

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Abstract

Due to the popularity and intensive usage of Online Social Networks, more and more companies try to get in touch with existing as well as potential customers and to market their brands and products within these networks. Especially Facebook provides an extensive user base and the opportunity to implement fan pages, which allow companies to leverage a broad range of technical features and media types to interact with users. However, the success of company fan pages varies and is by far not guaranteed. Therefore, it is necessary to measure whether a company's efforts to stimulate user activity on fan pages are successful or not. Hence, we deduce and hypothesize factors influencing the number of active users on fan pages and take different technical features and media types companies can use into account. To test our hypotheses empirically, we draw on publicly and non-publicly available data of a global insurance company's fan page within Facebook. The results suggest that based on the number of current fans companies can particularly stimulate user activity and engagement by using company wallposts with its different media types as well as by commenting on already existing wallposts. Finally, both theoretical and practical implications are discussed.

Keywords: Online Social Networks, Facebook, Fan page, User activity, Multiple linear regression analysis.

1 Introduction

In the last couple of years, the active usage of Online Social Networks (OSN) in general and Facebook in particular has reached enormous scales. With more than 800 million active users, Facebook became the largest OSN worldwide (Thadani and Cheung 2011). Users spend on average 7 hours per month on Facebook (Nielson 2010) and 50% of all users log on every single day (Facebook 2011a). Thus, Facebook became the second most popular website (Alexa 2011) and the most popular OSN in the world (Thadani and Cheung 2011).

Due to the widespread use and popularity of Facebook, more and more companies aim at presenting their brands and products within the OSN to leverage their popularity (Boyd and Ellison 2007; Waters et al. 2009; Wen et al. 2009). A very popular way to do so is to set up a fan page, which allows companies to create profiles with similar abilities as user profiles within Facebook (Segrave et al. 2011). In combination with technical features such as wallposts, comments, or likes, fan pages allow new means of advertising and market research: On the one hand, fan pages are used to promote products as well as to underpin brand positioning and perception (Fournier and Avery 2011; Gallaugher and Ransbotham 2010; Singh et al. 2010; Wen et al. 2009). On the other hand, users in OSN provide valuable feedback on brands and products and are considered as key communication partners (Li and Bernoff 2008; Segrave et al. 2011).

Despite these promising opportunities to market brands and products and to get in touch with (potential) customers, the success of fan pages varies and is by far not guaranteed (Chui et al. 2009; Seo and Rietsema 2010). Therefore, it is necessary to measure whether a company's efforts to stimulate the interaction with existing and potential customers via fan pages in OSN are successful or not (cf. e.g., Culnan et al. 2010; Hoffman and Fodor 2010; Larson and Watson 2011). For this purpose Facebook provides a key metric called "number of active users" that comprises prior research on the measurement of a website's reach and the success of OSN in general (cf. e.g., Drèze and Zufryden 1998; Hoffman and Fodor 2010). Since this key metric considers the attention and the viral impact that a fan page creates (i.e., the extent of marketing efforts within Facebook), companies try to maximize the number of active users on their fan pages. However, prior work mostly researched user activity in OSN in general (cf. e.g., Cheung and Lee 2010; Ganley and Lampe 2009; Heidemann et al. 2010) or private user-to-user activity (cf. e.g., Schoendienst and Dang-Xuan 2011). Even though a few studies take a look at fan pages and companies within OSN (cf. e.g., Yu and Kwok 2011), the driving factors behind the number of active users on fan pages are still unexplored. Thus, we empirically investigate – from a company perspective – the factors influencing the number of active users on fan pages taking into account the different technical features and media types companies can use in order to stimulate users' activity and engagement on their fan pages in OSN.

The remainder of this paper is organized as follows: In the next section, we specify the problem context, review related work, and identify the research gap. To address this gap, we present our hypotheses and research model in section 3. Afterwards, we conduct an empirical study based on publicly available and non-publicly available objective data and discuss both theoretical and practical implications. Finally, we conclude with a summary, limitations, and starting points for future research.

2 Problem Context and Related Work

According to Boyd and Ellison (2007, p. 211)[1], we define OSN as "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of

[1] While Boyd and Ellison (2007) use the term Social Networking Site, we are using the term OSN throughout the paper synonymously.

connections and those made by others within the system". Thus, they provide a basis for "maintaining social relationships, for finding users with similar interests, and for locating content and knowledge that has been contributed or endorsed by other users" (Mislove et al. 2007, p. 29). The visibility and searchability of the users' social networks and the viral diffusion of information are distinctive features of OSN that allow to "create substantial value for the individuals who participate in them, the organizations that sponsor them, and the larger society in multiple ways" (Agarwal et al. 2008, p. 243).

Although OSN were originally designed for private users (Bughin and Manyika 2007), there is an explosive growth in the number of companies trying to leverage on their popularity (Boyd and Ellison 2007; Wen et al. 2009). Especially Facebook, the most popular OSN in the world (Thadani and Cheung 2011), attracts reams of companies who present their brands and products within the OSN in order to get in touch with existing and potential customers (Richter et al. 2011; Waters et al. 2009). Therefore, the most popular way for companies is to set up a fan page, which can be described as kind of a corporate profile (Kim et al. 2010) with similar abilities as user profiles (Segrave et al. 2011). In the case of Facebook, users can "like" the fan page and thereby become a "fan" of the company. Companies can benefit from their fan page as it constitutes a powerful tool for advertising and market research: For advertising, fan pages are used to promote products and services as well as to underpin brand positioning and perception (Fournier and Avery 2011; Gallaugher and Ransbotham 2010; Singh et al. 2010; Wen et al. 2009). For instance, fan pages allow companies to conduct customized and targeted one-to-one advertising by better knowing their fans and their preferences (Li and Bernoff 2008). Moreover, latest studies illustrate that not only companies themselves, but also users of OSN advertise (Hanna et al. 2011; Singh et al. 2010). Berthon et al. (2008) further highlight that users are more and more willing to co-create marketing ideas with companies and even generate content with advertising character autonomously. This engagement plays an important role for advertising effectiveness (Calder et al. 2009). Harris and Dennis (2011) even suppose that users' engagement adds a new dimension to the traditional AIDA model (Awareness – Interest – Decision – Action) defined by Kierzkowski et al. (1996), as companies can obtain valuable information about users' preferences whilst interacting with them. In the context of market research, companies consider users in OSN also as key communication partners, since they provide valuable feedback on products and services (Li and Bernoff 2008; Segrave et al. 2011). Fan pages allow to enhance market research, as they enable companies to gain deeper insights into users' opinions and experiences, which are crucial for the development of successful products (Gallaugher and Ransbotham 2010). Summing up, fan pages in general and within Facebook in particular have been found to support advertising and market research and thereby the marketing strategy of companies.

By creating a fan page within Facebook, companies can profit from a range of technical features (Boyd and Ellison 2007). Prior research highlights that these technical features allow for a viral distribution and an interactive exchange of information (Gallaugher and Ransbotham 2010): First, a company can initiate the interaction with users by publishing a company wallpost, i.e., writing on a fan page's message board (so-called "wall"). Thereby, companies can choose between a range of media types (e.g., status, link, photo, or app wallpost) in order to spread information the most adequate way (Yu et al. 2011). Second, also the users of Facebook can interact with a company, for example by commenting on a company wallpost. These user comments are listed directly below the corresponding company wallpost in reverse chronological order. Moreover, some companies even allow users to create own user wallposts. In both cases, companies can monitor and even mediate the dialog with users, for instance by reacting with company wallposts or comments (Gallaugher and Ransbotham 2010). Furthermore, users can endorse company wallposts by liking them (Joinson 2008) and thereby pushing them in real time into the news feeds of their friends (Debatin et al. 2009; Schoendienst and Dang-Xuan 2011). Besides this, users can actively and virally spread company wallposts among their friends via Facebook's implemented "share" button. In the context of Twitter, Kwak et al. (2010) found that 50% of the viral distribution occurs within an hour and 75% within less than one day. In the case of Facebook, it has been further shown that 70% of all likes on wallposts happen within 4 hours and about 95% are received within 22 hours (Miller 2011). Thus, the majority of users' reactions on company wallposts and company comments can be assumed to happen within one day. Third, users

can "like" a whole fan page (instead of liking a single company wallpost) and become explicitly a fan of this company. This "opt-in mechanism" for ongoing communication establishes a close contact to the company's fans (Harris and Dennis 2011; Poynter 2008). As every company wallpost is automatically pushed into the news feed of all fans, they can be easily kept up-to-date and a large audience can be reached. (Debatin et al. 2009; Gallaugher and Ransbotham 2010). Taken together, the described technical features of fan pages within Facebook allow companies to distribute and exchange information virally and highly efficient within the OSN.

However, as mentioned in the previous section, the success of company fan pages varies and is not guaranteed (Chui et al. 2009; Seo and Rietsema 2010). Therefore, multiple authors emphasize the necessity to measure whether companies' efforts within Facebook are successful or not (cf. e.g., Culnan et al. 2010; Hoffman and Fodor 2010; Larson and Watson 2011). In the context of (company) websites, it has consequently been proposed to draw on the number of unique users to quantify the reach of a website (cf. e.g., Drèze and Zufryden 1998). Prior research directly related to OSN suggests to measure the success of an OSN by its number of active users (cf. e.g., Hoffman and Fodor 2010). With respect to fan pages, Facebook provides a (non-publicly available) key metric for companies, which comprises these prior findings, that is the number of active users. In accordance to Facebook (2011b), we define the number of active users as the number of unique users (including fans and non-fans) that have directly visited the fan page, interacted with a company wallpost in their own news feed (i.e., without directly visiting the fan page), or reacted on a company wallpost (e.g., liked, shared, or commented). Thus, the usage of the full range of technical features is considered and a sound key metric for the attention and the viral impact that a fan page creates (i.e., the full extent of marketing efforts within Facebook) is provided. Consequently, companies try to maximize the number of active users on their fan pages. However, prior work mostly researched user activity in OSN in general without having a dedicated look on fan pages or companies within OSN (cf. e.g., Cheung and Lee 2010; Ganley and Lampe 2009; Heidemann et al. 2010). Further existing studies that investigate the impact of Facebook's technical features on user's activity often focus solely on private user-to-user wallposts and comments but not on fan pages and company wallposts or comments (cf. e.g., Schoendienst and Dang-Xuan 2011). Finally, a few studies take a look at fan pages and companies within OSN, but only measure the effects of single company wallposts on the number of corresponding likes and comments this particular wallpost or comment receives (cf. e.g., Yu and Kwok 2011). To the best of our knowledge, the driving factors behind the number of active users on fan pages are thus still unexplored. Therefore, we investigate – from a company perspective – the factors influencing the number of active users on fan pages.

3 Research Model and Hypotheses Development

In the following, we hypothesize the relationships between possible factors of influence and the number of active users based on relevant literature. First, we focus on the number of total fans a fan page has as a potential factor influencing the number of active users. In most cases "the usefulness of a communication system increases with each additional adopter" (Rogers 1986). In the context of the OSN Twitter, for instance, Suh et al. (2010) discovered that more fans (named "followers") lead to a greater diffusion and an intense discussion of messages. Similarly, "liking" a fan page and thereby becoming a fan of a particular company (cf. section 2) allows to push information automatically into the news feed of all fans (Debatin et al. 2009; Gallaugher and Ransbotham 2010). However, not only fans can be directly stimulated (direct effect) to interact with the fan page (e.g., by liking, sharing, and commenting). Via Facebook's news feed feature, so-called network effects – a fairly well-researched field (cf. e.g., Bampo et al. 2008; Katz and Shapiro 1985; Wasserman and Faust 1994) – are facilitated and also the fans' private network of friends can be activated (indirect effect). Hence, we hypothesize:

H1: *The number of total fans a fan page has positively influences the number of active users on the fan page.*

Besides the number of total fans, also the number of company wallposts might influence the number of active users. Company wallposts initiate subsequent interaction such as shares and comments. A fan page will consequently just capture attention and induce interaction (e.g., via Facebook's news feed), if company wallposts appear. O'Neill (2011) therefore suggests to post on a fan page's wall on a regular basis to increase the number of active users. Furthermore, previous work found that particularly company wallposts induce for instance subsequent likes and user comments (Yu et al. 2011; Yu and Kwok 2011). Since the number of likes and user comments a company wallpost receives counts into the number of active users (cf. section 2), we hypothesize:

H2: *The number of company wallposts positively influences the number of active users on the fan page.*

In the following, we further differentiate a company wallpost according to its media type (i.e., status, link, photo, and app wallpost). The media type status wallpost represents the very basic one, and contains solely a text message. Yu and Kwok (2011) highlighted that status wallposts are often used for marketing purposes (e.g., to highlight products) and for communication (e.g., greetings, suggestions, or questions). The major goal of such a status wallpost is to attract attention of fans or other users within the OSN and to engage with them. Similar to a company wallpost in general, we hypothesize that a status wallpost induces user activity measured by the number of active users:

H2a: *The number of company status wallposts positively influences the number of active users on the fan page.*

The second media type, the link wallpost, includes a hyperlink to every kind of possible (external) website. A link wallpost leads to an implemented preview of the linked website on the fan page as well as within a fan's news feed. With the possibility to like, share, and comment a link wallpost very easily, users are encouraged to interact with other users and to discuss about the website the link leads to. Suh et al. (2010) showed that within the OSN Twitter messages containing links are intensively shared. Indeed, Facebook is one of the largest sources of visits to news and media websites (Hopkins 2010) and refers to more video streams than Yahoo, therewith taking second place after Google (Watson and Burch 2010). Thus, we assume that posting links increases the number of active users:

H2b: *The number of company link wallposts positively influences the number of active users on the fan page.*

The third media type, the photo wallpost, occurs when the company uploads one or more photos to the fan page. Prior research already highlighted the importance of photos within user profiles on OSN (Krämer and Winter 2008). Photos touch people on an emotional level (Reeves and Nass 2000) and are thus more often shared by users (Rimé et al. 1992). In addition, photos can increase the credibility of content (Fogg 2003) and attract more attention than text (Riegelsberger et al. 2002). In summary, posting photos seems to be a reasonable way to increase the number of active users:

H2c: *The number of company photo wallposts positively influences the number of active users on the fan page.*

The fourth media type, the app wallpost, occurs as soon as the company suggests an app on its fan page. Such apps are used to promote brands and test advertisement (Zhang 2009). Particularly surveys, as a special kind of app, are used to receive valuable feedback, to give customers a chance to express their opinions, or to discuss product experiences. According to O'Neill (2011), a survey is consequently one of the best ways to engage users with a fan page. Thus, the usage of app wallposts should lead to more active users:

H2d: *The number of company app wallposts positively influences the number of active users on the fan page.*

After taking a look at the different media types of a company wallpost, we focus on the possibility for companies to comment these wallposts. Thereby, a company can perpetuate a conversation resulting from a previous company wallpost (Joinson 2008). Figuratively speaking, a company comment allows to "heat up" an already ongoing discussion. This enforces the viral visibility of a fan page (Smith 2010) and should consequently lead to more interaction and to more active users:

H3: *The number of company comments positively influences the number of active users on the fan page.*

Our complete research model is presented in Figure 1 and tested empirically in the following.

Figure 1 Research Model

4 Empirical Analysis

4.1 Data Collection

For the empirical analysis, we draw on both publicly and non-publicly available data: First, we used non-publicly available data provided by the internal statistics of a global insurance company's German fan page within Facebook. The data spans from October 1, 2010 to September 30, 2011 (365 days) and includes information about the number of active users of the fan page as well as the number of total fans over time. Second, we also collected publicly available information (i.e., company wallposts and the corresponding media types) from the global insurance company's fan page for the same time period. Afterwards, both the publicly and the non-publicly available datasets were assembled. One feature of our dataset is that the global insurance company does not allow for user wallposts on its fan page. Based on the current number of total fans, the number of active users can be consequently traced back to user activity originally initiated by the company. Thus, we are able to investigate the factors influencing the number of active users on this fan page from a company perspective without distorting effects of wallposts initiated by users. After evaluating the merged dataset with experts of the global insurance company, five observations could not be further used (e.g., due to technical issues with the fan page) and needed to be removed. Thus, we finally received an appropriate dataset containing 360 days, which allows us to operationalize the needed variables and to perform the empirical analysis.

4.2 Variables

After obtaining the final dataset, we are able to construct the variables for our research model. Since the majority of users' reactions on company wallposts and company comments can be assumed to happen within one day (cf. section 2), we measure all variables on a daily basis. Consequently, the number of daily (denoted by t) active users on a fan page (represented by the dependent variable $\#ACTIVEUSER_t$) should be mainly influenced by (independent variables in brackets):

- The number of total fans a fan page has at t ($\#TOTALFAN_t$)[2]
- The number of daily company wallposts at t ($\#WALLPOST_t$)
- The number of daily company comments at t ($\#COMMENT_t$)

Furthermore, we differentiate daily company wallposts regarding their media type:

- The number of daily company status wallposts at t ($\#STATUS_t$)
- The number of daily company link wallposts at t ($\#LINK_t$)

[2] The variable $\#TOTALFAN_t$ denotes the number of total fans at the beginning of day t (which equals the number of total fans at the end of the previous day, i.e., t-1).

- The number of daily company photo wallposts at *t* ($\#PHOTO_t$)
- The number of daily company app wallposts at *t* ($\#APP_t$)

In our final dataset, on average 563.05 (standard deviation 698.03) users became active each day (cf. Figure 2). The number of total fans increased from 246 at the beginning (October 1, 2010) to 10,729 at the end of the observation period (September 30, 2011) (cf. Figure 2). Furthermore, the global insurance company created 225 company wallposts (between 0 and 2 per day) and 97 company comments (between 0 and 4 per day) over time. Consequently, on average 0.63 (standard deviation 0.64) company wallposts and 0.27 (0.62) company comments were published per day. Thereby, the media type link wallpost was most frequently used, on average 0.43 (0.57) times per day, followed by photo 0.08 (0.27), app 0.07 (0.26), and status wallposts 0.04 (0.21).

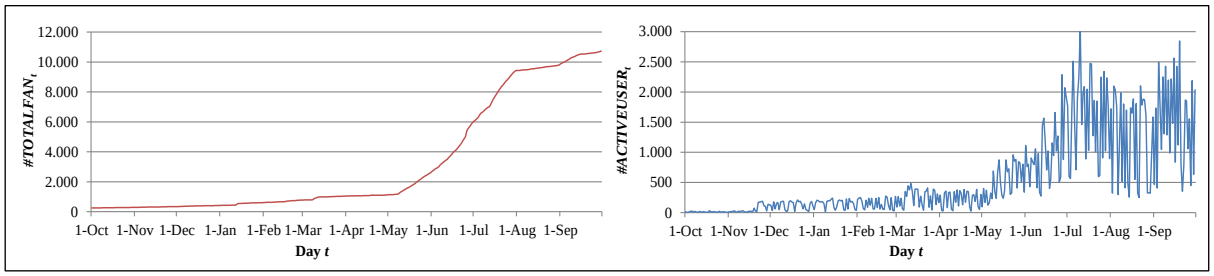

Figure 2 Number of total fans and number of daily active users over the observed time period

4.3 Results

According to our presented research model (cf. section 3), we aim at analyzing the influence and its direction for $\#TOTALFAN_t$, $\#WALLPOST_t$, and $\#COMMENT_t$ on $\#ACTIVEUSER_t$. Therefore, we first test if the hypothesized positive relationships (**H1**, **H2**, and **H3**) can be supported. Moreover, we second differentiate $\#WALLPOST_t$ between its four possible media types ($\#STATUS_t$, $\#LINK_t$, $\#PHOTO_t$, and $\#APP_t$) and test again for each of them, if a positive impact on $\#ACTIVEUSER_t$ exists (**H2a**, **H2b**, **H2c**, and **H2d**). For both purposes, we use multiple linear regression analysis based on ordinary least squares (OLS). On the one hand, this method allows to identify the direction of influence of the independent variables (positive or negative coefficient). On the other hand, it enables us to measure and compare the impact of the independent variables on the dependent variable by comparing the corresponding coefficients. Thereby, we are able to examine which media type has the greatest impact on $\#ACTIVEUSER_t$. Furthermore, we can also investigate whether $\#WALLPOST_t$ or $\#COMMENT_t$ has a greater impact on $\#ACTIVEUSER_t$. The resulting two multiple linear regression models are:

(1) $$\#ACTIVEUSER_t = \beta_0 + \beta_1 \#TOTALFAN_t + \beta_2 \#WALLPOST_t + \beta_3 \#COMMENT_t + \varepsilon_t$$

(2) $$\#ACTIVEUSER_t = \beta_0 + \beta_1 \#TOTALFAN_t + \beta_2 \#STATUS_t + \beta_3 \#LINK_t + \beta_4 \#APP_t + \beta_5 \#PHOTO_t + \beta_6 \#COMMENT_t + \varepsilon_t$$

Apart from homoscedasticity and non-autocorrelation of residuals, all assumptions of the multiple linear regression analysis are fulfilled for Model (1) and (2) (cf. assumptions by Greene 2011). Thus, two adaptions had to be made: As Breusch-Pagan's test (Breusch and Pagan 1979) diagnosed a lack of homoscedasticity of residuals, we used Whites' heteroscedasticity-corrected covariance matrices (White 1980). Furthermore, as the Durbin-Watson test (Durbin and Watson 1950) indicated negative serial correlation of the residuals, which is common for time series data (Greene 2011), we performed a feasible general least squares method based on Cochrane and Orcutt (1949). In the following, we present the empirical results of Model (1) and (2) and discuss theoretical and practical implications.

4.3.1 Theoretical Implications

The overall explanatory power of the two multiple linear regression Models (1) and (2) is high with both having an adjusted R-squared of about 78%. Furthermore, the low p-Values of the F-Statistics

indicate that the independent variables are highly related with the dependent variable, i.e., the number of daily active users. Tables 1 and 2 summarize the results. Additionally, estimates for the coefficients, heteroscedasticity-robust standard errors, t-Statistics and p-Values for the independent variables as well as the F-Statistic and the adjusted R-squared are highlighted for each model.

Independent variables	**Coefficients**	**Standard Errors**	**t-Statistics**	**p-Values**
INTERCEPT	-43.2861	21.1346	-2.0481	0.0413**
#TOTALFAN$_t$	0.1410	0.0100	14.0925	0.0000***
#WALLPOST$_t$	215.2542	31.8948	6.7489	0.0000***
#COMMENT$_t$	157.4390	41.8336	3.7635	0.0002***
Notes: F-Statistic: 311.9 on 4 and 355 degrees of freedom (p-Value < 0.0000); Adjusted R-squared: 0.7760 Significance levels: *p-Value < 0.10; **p-Value < 0.05; ***p-Value < 0.01				

Table 1 Results of OLS-Regression (Model (1)) - Dependent Variable: #ACTIVEUSER$_t$

Independent variables	**Coefficients**	**Standard Errors**	**t-Statistics**	**p-Values**
INTERCEPT	-37.8659	22.0636	-1.7162	0.0870*
#TOTALFAN$_t$	0.1388	0.0103	13.5311	0.0000***
#STATUS$_t$	145.4772	61.7419	2.3562	0.0190**
#LINK$_t$	183.0515	35.8509	5.1059	0.0000***
#APP$_t$	324.8276	72.7393	4.4656	0.0000***
#PHOTO$_t$	378.2642	102.6747	3.6841	0.0003***
#COMMENT$_t$	148.4803	41.1425	3.6089	0.0004***
Notes: F-Statistic: 182.8 on 7 and 352 degrees of freedom (p-Value < 0.0000); Adjusted R-squared: 0.7800 Significance levels: *p-Value < 0.10; **p-Value < 0.05; ***p-Value < 0.01				

Table 2 Results of OLS-Regression (Model (2)) - Dependent Variable: #ACTIVEUSER$_t$

Hypothesis **H1** proposes that the number of total fans positively influences the number of daily active users on a fan page. The results in Table 1 (Model (1)) and Table 2 (Model (2)) support this hypothesis, as both regression models report positive and highly significant coefficients for *#TOTALFAN$_t$* (p-Values < 0.01). According to our results, the global insurance company increased the number of daily active users on its fan page on average by about 0.14 with each new fan.

Hypothesis **H2** states that also the number of daily company wallposts has a positive impact on the number of daily active users on a fan page (Model (1)). The results presented in Table 1 support **H2**, since the estimated coefficient of *#WALLPOST$_t$* has a positive sign and is highly significant (p-Value < 0.01). The global insurance company captured attention and induced interaction with users by posting on its wall as the number of daily active users increased on average by about 215 with each company wallpost. Hypotheses **H2a**, **H2b**, **H2c,** and **H2d** further suggest a positive impact of the number of daily company status, link, photo, and app wallposts on the number of daily active users on a fan page (Model (2)). This positive impact is supported for all four corresponding variables (cf. Table 2): The coefficients of *#LINK$_t$*, *#APP$_t$* and *#PHOTO$_t$* are positive and highly significant (p-Values < 0.01). The coefficient of *#STATUS$_t$* is also positive with a lower level of significance (p-Value < 0.05). All in all – regardless of which media type was used – the global insurance company significantly increased the number of daily active users by all its own wallpost activities on its fan page. However, it is eye-catching that according to our results posting a photo or app wallpost increased the number of daily active users on average about twice as much as the two other investigated media types. This could be explained from a psychological point of view: Photos trigger emotions (Reeves and Nass 2000) and these emotions are mostly not kept secret. In most cases, such emotions are shared with others shortly after they occurred (Rimé et al. 1992). Thus, an emotionally touched Facebook user is in favor of liking, sharing, or commenting a company's photo wallpost, thus increasing the number of daily active users. Moreover, using app wallposts seems also to be an efficient way to increase the number of daily active users. The analyzed global insurance company used solely a survey-app to ask its fans about various topics. Hence, the high number of daily active users induced by an app wallpost can be explained by users' willingness to express their opinions and to start intense discussions about the posted questions. However, leveraging the full potential of app

wallposts by using the wide range of possible apps within Facebook (e.g., games), could further increase the positive impact of app wallposts. Taken together, in the case of our global insurance company, posting photos and apps (i.e., surveys) increased the number of daily active users most.

Hypothesis **H3** proposes that the number of daily company comments also significantly increases the number of daily active users on a fan page. In line with this hypothesis, the estimated coefficients for $\#COMMENT_t$ are positive and highly significant (p-Values < 0.01) in Model (1) and (2) (cf. Table 1 and 2). Our results suggest that the global insurance company succeeded in "heating up" (cf. section 3) an ongoing discussion by commenting an already existing company wallpost. Thereby, the number of daily active users increased on average by 157 (Model (1)) and 148 (Model (2)) respectively. However, by comparing the coefficients of $\#COMMENT_t$ (157) and $\#WALLPOST_t$ (215) (cf. Table 1), it becomes apparent that the number of daily company comments has a weaker impact on the number of daily active users than the number of daily company wallposts. One possible explanation could be that a company comment can just keep a discussion alive by stimulating an already ongoing conversation but will usually not start a new discussion, which attracts further users. Consequently, when a company posts a company comment, particularly users that were already involved in a discussion are likely to visit the fan page again or even post additional user comments. However, since the majority of users' reactions on company comments can again be assumed to happen within one day (cf. section 2), these users are not counted repeatedly in the number of unique daily active users. Hence, in the case of the global insurance company, a company wallpost gathered more attention and thereby contributed more to the number of daily active users on a fan page than a company comment.

4.3.2 Practical Implications

Taken together, the two proposed regression models allow to investigate the factors influencing user activity on fan pages measured by the number of daily active users. Four key findings with corresponding practical implications can be derived. First, we find that all analyzed factors influence user activity on a fan page in a positive and significant way. This result is promising for companies, as all their efforts trying to raise the number of active users by creating company wallposts or company comments are rewarded. Second, we find that the number of total fans constitutes an important basis for attracting active users. With each new fan, the company not only gains a new potential active user but can also reach the fan's private network due to Facebook's technical features. This implies that it is indispensable for companies to increase their fan base in order to achieve extensive awareness for its brands and products. Third, we find that photo and app wallposts have more impact on the number of daily active users than status and link wallposts. Hence, companies should consider the usage of photo and app wallposts as a powerful way to increase the number of active users. Fourth, we find that a company comment on an already existing company wallpost has still a positive impact on the number of daily active users. Thus, a company comment is a useful way to reactivate user activity on a fan page. To sum it up, our findings provide first insights into how companies can stimulate user activity and engagement on a fan page and allow companies to adjust their strategies in OSN such as Facebook in order to get and stay in touch with a high number of potential and existing customers.

5 Conclusion

In this paper we investigate – from a company perspective – the factors influencing the number of active users on fan pages within Facebook. Therefore, we analyzed publicly and non-publicly available data of a global insurance company by applying multiple linear regression analysis. Overall, the two presented empirical models have a high explanatory power and lead to highly significant results. Our empirical results show that the number of total fans, the number of daily company wallposts, and the number of daily company comments all have a significant positive impact on the number of daily active users on the fan page. Moreover, we investigate the impact of different media types and find that photo and app wallposts lead to a higher number of daily active users than status and link wallposts. Finally, we reveal that a company comment on an existing company wallpost has a

lower but still positive impact on the number of daily active users. However, there are also limitations, which leave room for future research. First, the empirical results of this study depend on the investigated global insurance company. In order to check the models' robustness, further validations of the proposed models, incorporating fan pages of other companies, are necessary. Furthermore, it would also be interesting to use control groups in future research to examine the influence of certain variables in more detail. Second, we solely investigated the relationship between the number of daily company wallposts as well as comments and the number of daily active users. Even though prior research found that most of the impact of a wallpost diminishes after one day and though our empirical model has high explanatory power, time-delayed effects of a company's activities and the possible deflection of the variables should be addressed in future studies. Third, although photo and app wallposts generate most user activity on the fan page, companies should not exclusively use these two media types but rather find a balanced mix of media types. Further research should consequently investigate the interplay of different media types and test, if there is a diminishing marginal utility when using one media type too much. Finally, the content of a company wallpost was not considered so far. Even though our models has high explanatory power, future research should also investigate the influence of a company wallpost's content and phrasing. Despite these limitations, our study represents a first step towards identifying and understanding the factors influencing the number of active users on fan pages within OSN. Thereby, we provide valuable insights for companies, which allow for achieving extensive awareness of brands and products as well as getting and staying in touch with a high number of existing and potential customers by stimulating users' activity and engagement.

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