Active Contributors in Online Social Networks – An Empirical Study on German Gen Y's Facebook Usage

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Abstract. Every day, millions of users especially from the generation Y visit Facebook. They do not only read the contributions and shared data of friends and other community members in a passive way but many of them generate own content in an active way. Active users upload private photos and reports as well as they post status updates and create comments to other contributions. Although Facebook's handling of private data has often been criticised, the intensity of user generated content seems to be uninfluenced. Therefore the question arises what are the determining factors of active use in Online Social Networks and how important is the influence of trust and risks in social network providers. Do own negative experiences influence the kind of usage of OSN? To answer these questions we conducted an empirical study on Generation Y's use of Facebook in Germany and analysed the impact of motivation, trust, risks and negative consequences on the usage behaviour. Results show that Generation Y largely mistrusts Facebook and its security functions. Therefore, the active use is low in comparison to the passive use. But, as we could show that passive use is a strong driver of active use, the improvement of passive usage leads to active usage over time and explains Facebook's success.

Keywords: Online Social Networks · Facebook · Active usage · Usage behaviour

1 Introduction

In 2014, 890 million people worldwide logged in and visited just Facebook each day [11], not counting the billions of people visiting other social networks and social media sites. As those sites are free of charge, business models apply that are based on advertising, data mining, and information selling [8]. Therefore, OSN are reliant on recurrent users who regularly perform actions in the OSN so that advertisements can be sold and usage data can be collected. This only happens if users are attracted by new content and interaction with other users [8, 19]. In particular, so-called Generation Y (Gen Y), people born between 1981 and 1999, made this success of online social networks possible. This group of digital natives is said to be more active and create therefore more personal information due to online interaction [38]. Obviously, Gen Y is a key for analyses of social media usage as they are early adopters that influence the

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success of such sites and are interesting as marketing target group. For OSN providers it is therefore crucial to know what enhances and inhibits their use of OSN.

In particular, this question holds in front of the numerous data leaks of the past years (i.e. Sony 2011, ebay 2014, yahoo 2016). One can ask to what extent these data leaks affect the users' future behaviour because these events severely harm the integrity of and therefore the users' trust in the firms [6, 23]. If users fear that their personal data are not secure, they may reduce frequency and duration of their visits up to a complete migration to other sites [8]. Because the fund model of OSN is dependent on continuous activities their providers must be interested in building and maintaining a trustful relation to their users [6]. While much research was done investigating who participates in social media sites and why, literature analyzing the role of privacy and data risk aspects as well as the characteristics of OSN for the usage behaviour is scarce. In this paper, we therefore aim to answer the following research questions:

1. *What influences users to participate actively in OSN?*
2. *Which role does the data risk play for the usage of OSN?*

We focus on Facebook as the most important representative of OSN in our analysis because it is very popular in Gen Y and has become a steady part of many people's daily life. We conducted a survey among Gen Y users of Facebook that analysed their different kinds of usage and the influence of motivational aspects and perceived risk and trust on it. Previous research was mainly restricted on personal traits of OSN users. In contrast, this paper focuses on the characteristics of the OSN Facebook itself. We analyse how these characteristics are perceived by users and how this perception influences their usage behaviour. We aim to shed light on the role of data risk aspects and the reputation of the network provider influence and how they impact the behaviour of OSN users. In particular, we have a look at the experience of users. In our study we investigate how the perceived data risk impacts the usage behaviour of Gen Y members and what factors drive them to actively participate in OSN.

The remainder of this paper is organised as follows: In the next section, we give an overview of the related literature in the field of OSN usage identifying four different streams of research in this field. Then, in Sect. 3, we develop the research that is analysed in Sect. 4 with the help of a survey conducted in 2015. The results are discussed in Sect. 5 where we derive managerial implications, point to some limitations and give an outlook on future work.

2 Literature Review

Online Social Networks are web-based services that offer users the possibility of building and managing a personal profile, administering a list of other users with whom they are in relationship, and to communicate with other users. Then, the set of users and their connections build a (social) network. In addition, OSN usually offer the possibility to build groups, share multimedia resources and comment postings or shared resources of others. During the past years, several authors investigated the reasons why and which people join OSN and what makes them actively participate in those networks. Within this field, four different streams can be distinguished.

2.1 Lurking

The first stream of research deals with reasons why people lurk on social media sites [28, 29, 31]. Lurking means that mem-bers of the network or the community do not actively participate and do not post, share photos etc. They maintained the following reasons for lurking: Beneath some people like just only reading and browsing there are a lot of users that still learn about the group and are too shy to actively participate. That implies that lurking/non-lurking is not a fixed intention but may alter during time. This is underlined by results of [31] who found a significant positive relationship between the level of perceived intimacy and posting.

2.2 Personality Traits

The second stream of research analyses which personality traits of people influence the usage of OSN [1, 27, 34, 36]. All papers have in common that they use the Five-Factor-Model (FFM) with its five personality traits [24]. Due to different research methods like self-reporting questionnaires [34] versus observed behavior [1] some contradictory results occur (e.g. neurotics posting photos versus non-posting). Moore and McElroy [27] are the only ones that do not only examine the impact of personality traits on usage but also on regrets. Seidman [36] extends this research stream by examining how personality traits influence the motivation (belongingness and self-presentation) to use OSN and is therefore also related to the third research stream.

2.3 Personal Needs

The third research stream investigates the motivation of people for using OSN due to their personal needs (emotional, cognitive, social or habitual) [2, 30, 39]. Quan-Haase and Young [30] analyzed the motivations to use Facebook and Twitter and found only little differences. Main gratifications of both media are entertainment, relaxation, and escape. While Cheung et al. [2] identified social presence, meaning the presence of peers in the OSN, as the main factor for usage, Wang et al. [39] found solitude and interpersonal support the main drivers for using OSN.

2.4 Characteristics of OSN

This paper is most related to the fourth stream of research that focuses on the characteristics of the OSN itself as factors for the usage and trust [17, 18, 20, 32]. Kwon and Wen [18] combine personality traits (altruism), motivational factors (social identity and encouragement) with properties of the OSN (telepresence) and classic constructs of the Technology Acceptance Model (TAM) [7]. Their results confirm the TAM and show that the perceived encouragement that users experience in OSN influences the usefulness as well as the usage while altruism and telepresence do not affect the usefulness. Lin and Lu [20] focus their research on network externalities and benefits that users of OSN perceive. Their results indicate that the sheer number of OSN members is less relevant than the number of peers within the network confirming the results of Cheung et al. [2]. Also Rauniar et al. [32] examine and confirm the influence

of peers in the network. Krasnova et al. [17] focus on motivational factors influencing the disclosure of information in OSN. They found that the convenience of cultivating relationships and enjoyment mainly push users to disclose information but that the perceived risk concerning privacy violations can lower this effect. If people trust the OSN and its provider, the perception of risks is reduced.

2.5 Scope of Paper

In contrast to the above mentioned papers, we will mainly concentrate on the usage behaviour of Gen Y. On the basis of users' perception of risks and implicitly suspected negative consequences users judge OSN as dangerous if safety functions are not perceived as useful. In addition, we will have a look at the role of lurking. As previous results show [29, 31], lurkers can be switched to active members indicating that the lurking may have a positive relation to active usage.

3 Research Model

3.1 Usage and Motivation

The use of OSN can be either active or passive. *Passive use* is often termed lurking meaning that persons officially are members of the site but do not contribute to the community by any own content, i.e. sharing photos or posting messages [28]. While reading of posts, watching photos or videos, or just browsing friend lists is a typical lurking behaviour, OSN offer actions that lie between lurking and *Active use*: liking and sharing of posts, photos, brands etc. We understand these functions also as *Passive use* because it doesn't create new content but replicate already existing content. In contrast, *Active use* of OSN means actively creating new content [38], i.e. uploading of own photos and videos, posting of current activities, writing own posts or commenting other posts as well as sending messages to others and chatting. Only a minority of passive users are online with the intention to lurk [29]. As a consequence, passive users can turn to active users over time [9]. Therefore, we hypothesise:

$H_{1:}$ *Passive use of OSN positively influences the Active use of OSN*

One important reason to join OSN is peer pressure [30]. Most people use OSN because their peers are also in the OSN [32] so that they can communicate with [2] and get information about them [30]. OSN are used to connect with peers and to maintain existing offline relationships [10]. Other reasons are self-presen-tation [41], to find new friends [5], or because it is fashionable [30]. We subsume all these reasons to participate in OSN under the term *Motivational aspects*. Therefore we hypothesise:

$H_{2:}$ *The Motivational aspects of users positively influence the Passive use of OSN.*
$H_{3:}$ *The Motivational aspects of users positively influence the Active use of OSN*

3.2 Risk and Trust

Users of OSN are exposed to a variety of threats like identity theft, cyber-bullying, cross-profiling etc. Therefore, people attach importance to privacy and safety in OSN [22]. That means when users participate in OSN, create own content, and disclose information about themselves, they expect others not to abuse these information. Thus, if users perceive a high level of intimacy in the OSN, they are more willing to create own content, post photos etc. [8, 31]. In that way the *Perceived risk* can destroy this intimacy and restrict the OSN usage. In sum, we hypothesise:

$H_{4:}$ *The Perceived risk in OSN negatively influences the Passive use of OSN.*
$H_{5:}$ *The Perceived risk in OSN negatively influences the Active use of OSN*

If the perceived risks come true and the data privacy is violated, OSN users usually face *Negative consequences* that we define as negative outcomes in the private or job-related field whose cause lie in the usage of OSN. We hypothesise:

$H_{6:}$ *The Perceived risk in OSN positively influences the perceived Negative consequences in OSN*

The fear of negative consequences may change the behaviour and users create less content [6, 27]. That means:

$H_{7:}$ *The Negative consequences in OSN negatively influence the Active use of OSN*

Trust is a multidimensional concept [23, 25] Menon et al. [26] see trust as the belief of the trusting person in attributes of the trustee while Fung and Lee [13] understand trust as the truster's willingness to believe the trustee. In other words, trust is "the willingness of a party to be vulnerable to the action of another party […] irrespective of the ability to monitor or control the other party" [23, p. 712]. Thus, in the case of OSN, trust exhibits two facets: The involved parties and the control mechanisms [37]. In general, three parties are involved: The truster, the OSN provider, and other OSN users [17, 37]. The second facet is the control of personal information and self-created information [17]. We define *Perceived control* as the belief of users to what extent they are able to protect their private information. As a result, the better the safety functions are perceived by OSN users, the less they will perceive the risk of OSN and the more they will trust its provider [8]. In sum, *Trust in the OSN and its providers* as well as the *Perceived control* over the personal data decreases the *perceived risk* in OSN [16]. Therefore, we hypothesise:

$H_{8:}$ *Perceived control negatively influences the Perceived risk in OSN.*
$H_{9:}$ *Perceived control positively influences the Trust in networks and providers.*
$H_{10:}$ *Trust in networks/providers negatively influences the Perceived risk in OSN*

The resulting research model is depicted in Fig. 1.

4 Analysis

4.1 Data Collection

We conducted a survey among members of Gen Y in Germany for testing the research model described in the previous section. The questionnaire, consisting of 27 questions for the model measured in a 5-point-Likert-Scale and 20 demographics, was deployed via the Internet and answered by 564 persons belonging to our target group Gen Y. All observations have less than 15% missing values [15], so that the sample size is beyond the recommended sample size of Chin [4] for receiving stable results of the model estimation. Females (males) account for 66% (34%) of the participants. The participants' age was between 18 and 33 years and about 82% of them use Facebook for more than 3 years. More than 95% enters Facebook at least one time a day.

To accomplish the target of proving the theoretical evaluated relationships between unobserved constructs on the basis of the questionnaire, we used a structural equation model (SEM). Smart PLS [33] is used for a variance-based analysis of the collected empirical data and the evaluated theoretical SEM [15]. In addition to the PLS algorithm, a bootstrapping is used for the determination of the significance of weights, loadings and path coefficients with 5000 samples and 564 cases [14, 15, 35]. SPSS was used for the regression analysis for tests on multicollinearity. For missing values case wise replacement was applied.

4.2 Measurement Model

In our model, the two constructs *Perceived control* and *Trust in networks and provider* are reflective constructs. In order to assess the reliability and the validity of a reflective construct, the indicator reliability, the convergence criteria, and the discriminant validity are to be considered [14, 15]. The indicator reliability is composed of the t-statistic and the loading [3]. In our model, all t-statistics exceed the value of 2.57 implying a significance level of 1%. All reflective indicators are significant. As the convergence criterion - consisting of the average variance extracted (AVE), the composite reliability and the Cronbach's alpha [40] - and the discriminant validity - consisting of the Fornell-Larcker criterion [12] and the cross loadings - were in the allowed range, a prediction of the latent variable is obtained through its indicators [4].

The residual five constructs are formative. To analyse the significance of the indicators, the weights have to be greater than 0.1 [4] or smaller than −0.1 [35]. The t-statistics have to comply with the same constraints as reflective constructs. In the constructs *Active use*, *Passive use* and *Perceived risk* the t-statistic of all indicators exceed the limit of 2.57 with a significant level of 1% and have a positive influence on the construct. Concerning the construct *Motivational aspects*, two indicators are significant with a significance level of 1% and one accomplishes a significant level of 10%. Regarding the construct *Negative experiences*, the t-statistics of two indicators are beyond the limit of 2.57, at which one weight is below −0.1 and the other beyond 0.1. One indicator satisfies the limit of 1.96 as well as the weight limit of 0.1. Considering the discriminant validity for the formative constructs, the highest latent variable correlation is between *Active use* and *Passive use* (0.7523) and is below the allowed maximum of 0.9. The investigation regarding multicollinearity [40] is done with SPSS.

We calculated the variance inflation factor (VIF) for all indicators [35]. All values are in the allowed range [14, 15] and fulfil the condition index [15] so that all indicators are sufficiently different and independent.

4.3 Structural Model

For calculating the significance level of the relationship between the constructs, a regression analysis is performed. Thereby, the explanatory power of the model is determined by the coefficient of determination R^2 of the latent variables. 62.2% of the variance of the target construct *Active use* is explained due to the dependent constructs. The R^2 value is moderate for *Active use*. *Passive use* (R^2 = 0.220), *Negative consequences* (R^2 = 0.253) and *Perceived risk* (R^2 = 0.227) achieve a weak level. The R^2 value of the construct *Trust in networks and providers* exceeds as well as *Active use* the threshold of 0.33 and is therefore moderate [4]. The variance inflation factor, VIF, regarding the constructs indicates that there is no multicollinearity [15] so that the regression analysis is performable [40].

The accuracy of our hypotheses is determined by the path coefficients and by the t-statistics. The path coefficients have to exceed the limit of 0.1 [21] ([3] claims a limit of 0.2). To confirm a negative relation between the constructs, the path coefficient has to be less than −0.1 [35, 40]. Figure 1 shows the path coefficients and the significance levels of the hypotheses and the R^2 of all constructs. Seven (H_1, H_2, H_3, H_4, H_6, H_8, H_9 and H_{10}) of ten hypotheses are confirmed with a significance level of 1% and H_8 could be confirmed with a significance level of 5%. Hypotheses H_5 and H_7 could be rejected because the path coefficients do not fulfil the given requirement.

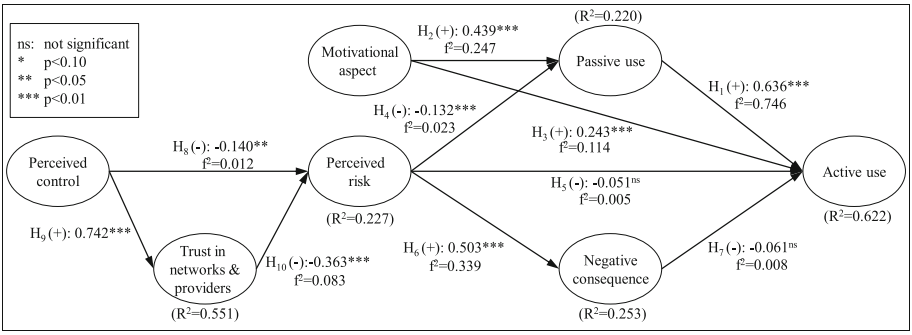

Fig. 1. Research model and results of PLS Algorithm.

5 Results and Discussion

The results of the survey are very satisfactory. Eight of ten hypotheses could be confirmed with high confidence while only two hypotheses (H_5 and H_7) could not. Our key target *Active use* can be explained at a medium level (in the upper range), *Trust in networks and providers* also at a medium level and *Passive use* as well as *Negative consequences* and *Perceived risk* still at a weak level.

5.1 Active Usage of Online Social Networks and the Influence of Risks

The aim of this paper was to investigate the active usage of Gen Y members in OSN and to identify the influencing factors on it. For a provider the user activities are essential for his economic success. Members using the OSN actively generate new content and initiate communication processes ("the community is living"). By that, user specific data can be collected, analysed and used for marketing purposes.

If we have a look at our key construct *Active use*, the construct *Passive use* has the highest effect with an effect size of $f^2 = 0.746$ (H_1). That means that an intensive passive usage leads mostly to an active usage, possibly after a time users had entered an OSN. 93% of the interviewees answered that they read status notifications multiple times each day. But only 2.3% publish own posts, 1.06% upload photos, 7.8% comment on posts often or very often. This gap together with the confirmed strong relationship between passive and active use implies that if users are not already active users they will very likely become active soon. This is underlined by the *Motivational aspects* to use OSN. The wish to let others participate in one's life has the strongest effect followed by communication with friends and the wish to find new friends. The *Motivational aspects* as a whole show a much stronger effect on *Passive use* (H_2, $f^2 = 0.247$) than on *Active use* (H_3, $f^2 = 0.114$). This holds even for the indirect path ($H_2 \rightarrow H_1$ versus H_3) through *Passive use* as a mediator and underlines that *Passive use* is a much more important prerequisite for *Active use* than any other factor.

Interestingly, the negative aspects do not seem to influence the active usage behaviour of OSN members. Neither the path coefficients nor the effect sizes of the hypotheses H_5 and H_7, i.e. the relationship between *Negative consequences* and *Active use* as well as between *Perceived risk* and Active *use*, exceed any threshold. There is only an indirect relationship between *Perceived risk* and *Active use* via *Passive use*. We investigated this further and also tested the relationships between the constructs that influence the *Perceived risk*, namely *Perceived control* and *Trust in networks & providers*, on the one side and *Active use* on the other side. In addition, also the relationship between *Negative consequences* and *Passive use* was tested. Again, no significant relationship could be found. Thus, it seems that negative aspects like identity theft or job consequences do not play a role for the decision on actively using OSN. This result is quite surprising and contradicts the findings of [17] who could confirm a relation between perceived risks and the disclosure of private information. Several reasons for this result are conceivable. First of all, time has passed with many data leak scandals over the past years. As a result, users may be blunted by this and commonly accepted the danger of privacy violation. Furthermore, it could be caused by our investigated user group, namely Gen Y people who have a more relaxed attitude towards such risks. Secondly, [17] used reflective indicators for the perceived risk that measure the construct more generally while we used formative constructs so that we can distinguish the influence of the different factors. Doing so, we found that all negative aspects (risks and consequences) are perceived as high or very high by more than 40% of all interviewees for the consequences and more than 57% for the risks. In particular, this is interesting because at the same time users' trust towards OSNs and their providers is very low and they do not feel in control of their data. Only 4–16% report high or very high trust and between 8% and 25% assesses the control

mechanisms as suitable. As a result, the relation between *Perceived control* and *Perceived risk* (H_8) is confirmed without a great effect ($f^2 = 0.012$). Instead, the indirect effect of *Perceived control* ($H_9 \rightarrow H_{10}$ versus H_8) through *Trust in networks & providers* as a mediator on *Perceived risk* is greater.

5.2 Managerial Implications for the OSN Provider

Several implications can be derived from these results. OSN are usually ad sponsored and therefore benefit from a large number of users who visit the network as often as possible. While 82% of the interviewees visit Facebook multiple times each day, only 2.3% publish own posts, 7.8% comment posts, and 1.06% share photos but more than 93% read posts of other users. Therefore, it is crucial for the providers of OSN to attract active users who regularly provide new content that then can be consumed. The most influential factor to turn a user into an active user who provides content is the passive use itself. If the OSN could manage to attract a user, s/he will most probably turn into an active user by time. This holds in particular, as the most influencing indicator of motivational aspects to use Facebook is – according to our survey – to "let others participate in one's life". Once this wish is strong enough, a user will turn into an active user. As classic network externalities seem to hold for OSN, providers just need to hype these network effects. Therefore, OSN providers should concentrate on two issues: First to get as many passive users as possible by providing low entrance barriers and interesting services that can be consumed. Secondly to make it as easy as possible for users to generate content, i.e. publishing posts and pictures, commenting other posts etc. so that others can react to these actions.

However, this is not a sure-fire success. If prerequisites are missing, people may resign to use OSN. For example, if users do not feel good when using an OSN they may resign to visit it. Serious concerns about the security and privacy or severely bad experiences might be reasons for this. As our results indicate, users mistrust OSNs and their providers. They fear several risks and consequences and do not assess the provided control mechanisms as sufficient. This is an alarming situation for providers. Although all this does not seem to have any direct effect on the active usage behaviour, OSN providers should not neglect this problem. While there are no direct effects of risks and consequences on the active use, there is a slight but significant effect of perceived risks on the passive use that in turn has a strong effect on active use. That means that if risks are perceived as too high, first the passive use may decline and then with it also the active use. Therefore, the quite comfortable situation may change quickly. For example the permanent user complaints about how Facebook has treated private data and privacy during the past years and the broad discussions about that increased the danger to lose passive users and in the consequence active users. A dangerous downward spiral could arise.

As a consequence, OSN should work on improving their privacy functions to protect the users' data. This would reduce the perceived risk and enhance the reputation of providers. Users want to be private in OSN; they do not want their data to be forwarded to third parties [22]. Still, when registering at Facebook for example, many privacy functions are disabled and have to be actively enabled by new users. Although OSN are interested in much user generated content, it would be a better

signal to activate privacy functions in advance. Then, users would probably perceive OSN and its providers as more caring and more reliable than they currently do.

5.3 Limitations and Future Research

As always, some limitations accrue. First of all, our survey was limited to German Gen Y users and can therefore not be transferred to other countries without restriction. Secondly, as we focused on characteristics of OSNs and their providers and motivational aspects, positive and negative experiences and gratifications attained through OSN were not considered. These may better explain the perceived risk as well as the usage behaviour. The explanatory power of these constructs can still be improved. Lastly, interviewees were not asked about their knowledge on safety functions and possible misuse of their data resulting from the use of social networks. This knowledge may moderate the effects of trust and perceived risks on the model.

This points us directly to possible following research. Future research should focus on the relation between positive and negative experiences, trust, perceived risk and usage behaviour. Most probably, there is a time gap between experiences and self-disclosure. This time gap should be considered when examining if users make negative experiences due to self-disclosure or vice versa. Another toehold is the relation between passive and active use. In the current form, we measure passive and active use of the same interviewee. But it seems likely that users become active because of the great number of their peers being in the OSN. The motivational aspect of using OSN as a platform to promote oneself in front of as many peers as possible would be interesting for OSN providers: Then, lurking users would contribute as much as active users to the success of OSN. Due to cultural differences between Germany and other countries, a cross-cultural study should be undertaken. Another interesting research question would be to investigate the factors that influence the active usage negatively and prevent users from visiting OSN like increasing professional content, increasing number of advertising, the usage of personalized advertising etc.

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