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Keywords

Attitude, Information Overload, Information Characteristics, Network Characteristics, Facebook, Social Network Sites

ABSTRACT

This research paper analyzes the impact of information and network characteristics on the affective, cognitive, and behavioral attitude towards information overload (IO) on Facebook. By using an information overload model and the data of 300 active Facebook users it can be shown that the various categories of attitude are influenced by different factors. The level of determination of the behavioral attitude towards IO is lower than the level of determination of the affective and cognitive attitude towards IO. The identified antecedents of IO explain up to 36 per cent of the variance of IO. Results indicate that affective and cognitive attitude towards IO are more influenced by these antecedents as the behavioral attitude towards IO. Furthermore, results reveal that the amount of information an individual receives is the major predictor of all three dimensions of attitude. Several implications for adoption research are discussed.

INTRODUCTION

"*The online spaces used for shared public interpersonal communications [...] are of significant social, organizational, and economic importance*" (Jones et al. 2004, p. 194). In accordance with Jones et al. (2004) we argue that the nature of virtual spaces, with its rising number of active users, has an impact on individuals' attitude. For example, in 2005 Facebook had one million active members. Six year later, more than 750 million users spend up to two and a half hours per day on Facebook (Raacke and Bonds-Raacke 2008).

Due to these developments, Facebook users are constantly confronted with information technologies, which can lead to the feeling of being overloaded by the technology (Ragu-Nathan et al. 2008). Additionally, the characteristics of Facebook such as user generated content, private messaging, and instant messaging show also sources of being overloaded. For instance a plenty of Facebook users generate lots of content. This creates situations in which the amount of information exceeds the capacity of individuals, who receive the information, so that the feeling of being overloaded by too much information occurs (Koroleva et al. 2010). Here, information overload (IO) is defined as *"the ability of users to select relevant information is inhibited because of the high amount and low value of information on Facebook"* (Koroleva et al. 2010, p. 4), and thus represents an aspect of the dark side of Facebook as it dissatisfies and demotivates individuals to use Facebook continuously. In order to predict the user response to this phenomenon we investigate the influence of identified antecedents on the attitude towards IO, because attitudes lead to a set of intentions and behaviors (Fishbein and Ajzen 1975). The attitude towards an object is mostly measured by an one-dimensional manner. In the majority of cases, attitude is understood as the affective component of attitude towards an object (e. g. TAM (Davis et al. 1989, p. 984)) (Fishbein and Ajzen 1975, p. 341). To obtain a complete view of attitude this construct has to be monitored more closely. For this reason, the attitude concept is divided into the three categories: affective, behavioral, and cognitive (Ajzen 2005). As feelings and cognitions towards a given object can differ (Kothandapani 1971), we investigate the various categories of attitude towards IO. The affective attitude towards IO contains the feelings against the reception of too much information. The cognitive attitude towards IO encompasses the

individuals' perception that they receive too much information. The last category, behavioral attitude towards IO, includes action tendencies towards the amount of information. These categories of attitude are used to understand the attitude towards IO better than in the one-dimensional case. Thus, we investigate the antecedents of the cognitive, affective, and behavioral attitude towards IO to understand which dimension of attitude is influenced by which antecedent.

We follow the call of Eppler et al. (2004), who encourage a consistent transfer from empirical to conceptual research and vice versa in the context of IO. Accordingly, the research presented in this paper is based on the conceptual information overload model of Koroleva et al. (2010) in order to argue how the identified antecedents of IO influence the different attitudes towards IO. The objective of this article is to discuss the influences of different information overload sources on an individual's attitude towards IO in such way that we intend to answer the following research question:

> *Which factors influence the affective, cognitive, and behavioral attitude towards information overload?*

THEORETICAL BACKGROUND

Attitude and the tripartite view

Attitude has been used to account a wide variety of interpersonal behavior. In the area of information systems (IS) the attitude concept is known since the theory of reason action (TRA) (Fishbein and Ajzen 1975) and the theory of planned behavior (TPB) (Aizen 1985). Fishbein and Ajzen (1975) define attitude as "*a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object*" (Fishbein and Ajzen 1975, p. 6). The understanding of the attitude concept varies between researchers (Krönung and Eckhardt 2011). Nevertheless they agree that the characteristic attribute of attitude is its evaluative nature (Ajzen 2005; Fishbein and Ajzen 1975). Because of the fact that two people may show equally favorable feelings towards an object but may have different cognitions about the object we have to monitor the attitude concept closer for getting a complete understanding of an individual's attitude towards an object. Therefore, the attitude concept is divided into the following three categories (tripartite view): affective, cognitive, and behavioral or conative (Kothandapani 1971; Ajzen 2005; Fishbein and Ajzen 1975). The first category, that is the affective attitude, encompasses the "*evaluation of, and the feelings towards, the attitude object*" (Ajzen 2005). Moreover, the affective component includes the thought to emotional relationship, the feelings towards an objective or activity, an emotional response, a gut reaction, and a sympathetic nervous activity (Breckler 1984; Bagozzi 1978). The cognitive attitude considers the perceptions of the attitude object, thoughts about the attitude object, knowledge structures and, perceptual responses (Ajzen 2005; Bagozzi 1978; Breckler 1984). The behavioral attitude includes action tendencies one has developed in order to approach or avoid an object. This encompasses past actions, future intentions, and predicted behavior in hypothetical situations (Bagozzi 1978).The definition of Fishbein and Ajzen (1975) of attitude shows that an individual has an attitude towards a given object. They also argue that once a person forms beliefs about an object, she automatically and simultaneously acquires an attitude towards the object.

To sum it up the attitude concept can be divided into three categories, all correlating with beliefs. Furthermore, a person may have an affective, cognitive, and behavioral attitude towards a given object. Again, we argue that the beliefs towards a given object are involved with the perception of this object (Smith 2001). Consequently, we claim that the perception of a given object also influences the attitude towards this object.

Information Overload

According to Eppler et al. (2004) the information overload phenomenon is investigated in distinct research areas and builds up on two different concepts. The first one goes back to Schroder et al. (1967), who explain the phenomenon information overload with an inverted U-curve. This concept implies that the performance of an individual correlates positively with the amount of information received at least up to a certain point. The performance of an individual will rapidly decline if further information is provided. All information provided beyond this point will no longer be integrated into the decision-making process and information overload will be the result. (Schroder et al. 1967; Eppler and Mengis 2004; Sun et al. 2010; Brennan 2011) The second conception goes back to Miller (1956). He argues that the span of absolute judgment and the span of immediate memory impose severe limitations on the amount of information that we are able to receive, process, and remember. According to the concept of the magical number seven by Miller (1956) an individual can process seven (plus or minus two) chunks of information.(Jones et al. 2004; Cowan 2010) These are the two general concepts that depict the way in which IO occurs.

Information overload is a problem in social network platforms like Facebook. Koroleva et al. (2010) develop a conceptual model of information overload on Facebook. They "*recognize that IO occurs when the ability of users to select relevant information is inhibited because of the high amount and low value of information on Facebook*" (Koroleva et al. 2010, p. 4).

In the following, we will propose a research model for investigating an individual's cognitive, affective and behavioral attitude towards information overload.

RESEARCH MODEL AND DESIGN

Research Model

Based on a conceptual model proposed by Koroleva et al. (2010) we developed the following research model that indicates that the affective, cognitive, and behavioral attitude towards IO on Facebook is influenced by network and information characteristics. Network characteristics encompass the relationship between Facebook users and the network size. The relationship also includes the level of closeness between the individual and one's "Facebook-Friends". The network size reflects the number of "Facebook-Friends" a user is linked to. The information characteristic contains the information amount, information value, and information understandability. The information amount encompasses the quantity of information an individual perceives. The perceived value of information considers the novelty of information and the interest from an individual in given information. The last construct, called information understandability, measures the format of information and its comprehensibility.

In line with Koroleva et al. (2010) we maintain that a user may have an affective, cognitive, and behavioral attitude towards IO. Therefore, we combine the information overload literature and the attitude literature as follows. The literature of attitude indicates that a person automatically and simultaneously acquires an attitude towards a given object. The affective attitude towards IO encompasses the feelings towards the reception of too much information. An individual feels overloaded by the information on the Newsfeed (Koroleva et al. 2010).

The literature of IO shows that various researchers have focused on strategies to get over with this amount of information (Edmunds and Morris 2000; Koroleva et al. 2010). Consequently, the second category of the tripartite view of attitude towards IO contains the future action tendencies in relation to the amount of information on Facebook. An individual wants to change his behavior related to the receipt of information in the future because it receives too much information on the Newsfeed.

The cognitive division of the attitude concept considers the perception of IO. The conditions of IO could affect some or all of the cognitive processes such as attention to or storage of information (Gu et al. 2007). Additionally the phenomenon of IO occurs when higher cognitive effort is needed (Kock 2009). Above all, "*overload refers to an individual's perception that they cannot perform a task because they lack critical resources*" (Ahuja and Thatcher 2005, p. 435). In conclusion, cognitive attitude towards IO encompasses the individuals' perception that they receive too much information as well as their perception of the amount of time and effort for information processing. The information overload model (Koroleva et al. 2010) indicates that the antecedents of IO, which are declared on the beginning of this section, influence the three categories of attitude. Below we describe in detail why and how the antecedents of IO have an influence on the affective, cognitive, and behavioral attitude towards IO.

Firstly, we consider the construct called information value. This construct measures the level of interest in information and the novelty of information. For us, interest in information means that the information addresses the user needs (Al-Hakim 2007, p. XV). The novelty of the information is defined as "*new answers to the potential questions representing a user's request or information need*" (Li and Croft 2006, p. 2). Thus, this construct influences the affective part of the attitude towards IO because old and uninteresting information leads to reluctance and frustration towards the receiving process of information. This information induces bad feelings about the receiving process of information on Facebook. (Glassey and Azzopardi 2011) Furthermore, the information value has an impact on the cognitive attitude towards IO. An individual perceives this uninteresting and old information as negative information. Such unwanted information induces a perception of getting too much information. In general, negative information tends to influence stronger than comparably positive information (Ito et al. 1998). Thus, the individual perceives the negative information more than the positive information as overload. Additionally the last category of attitude is affected by the information value because uninteresting information does not address the needs of an individual (Al-Hakim 2007). Consequently, the action tendencies with regard to the receiving of information are influenced by this information because the user does not want this information in the future. Thereby, the first hypothesis is:

> H1: *The perception of the information value has a direct positive effect on (a) affective, (b) behavioral, and (c) cognitive attitude towards information overload.*

Next, the impact of information understandability on individuals' attitude towards IO is described. Understandability is thereby defined as "*the ease of comprehending the information*" (Al-Hakim 2007, p. XV). The incomprehensibility of

information on Facebook can occur because this platform is non-administrated. Users themselves create the content on Facebook and are consequently responsible for the information provided. Therefore, a post underlines no quality control or any format guidelines on Facebook (Brandtzæg et al. 2010). An individual may receive incomprehensible posts or messages in a foreign language because she/he has friends in foreign countries and does not understand the language. In addition, some information that is posted is solely understandable for a small group of users. Sometimes users post information about a situation in the last holiday spent with some friends. For all the other friends she/he is linked with this information about a situation during the holidays is incomprehensible. No other friends understand inside jokes of this little group and that is the reason why several posts on Facebook are incomprehensive. The affective attitude towards IO is influenced as follows. The receipt of incomprehensible posts leads to an irritation, frustration by the amount of information, which an individual receives. The cognitive attitude towards IO is influenced by the understandability of the information because the perception of unintelligible information is not as easy as compared to understandable information (Moenaert and Souder 1996). Consequently, the processing capacity of an individual is used more by receiving incomprehensible information than by comprehensible. Thus, an individual can handle more understandable information as incomprehensible because the end of the processing capacity is sooner obtained than in the case of the comprehensible information. As a result, the information understandability has an influence on the cognitive attitude towards IO because this information is harder to handle so the perception of getting too much information will be influenced. The unstructured format and the comprehensibility of posts make it difficult to process this information. Furthermore, maybe the information is so incomprehensive that an individual cannot handle this information. Consequently, the understandability of information influences the behavioral attitude towards IO because it is hard to process this kind of information with the result that the individual should receive less in the future, so that we assume that:

> *H2: The perception of the information understandability has a direct positive effect on (a) affective, (b) behavioral, and (c) cognitive attitude towards information overload.*

The information amount is the quantity of information an user receives on Facebook especially on the newsfeed (Koroleva et al. 2010). A huge amount of information occurs on Facebook because the users can post as much as they want. The quantity of posts per user is not limited (Brandtzæg et al. 2010). By login into Facebook, an individual may have several new private messages, the Newsfeed is full with a huge amount of posts and perhaps somebody sends you news via instant messaging (Koroleva et al. 2010). In addition, the amount of information increases as events and meetings are coordinated through Facebook's event coordination (Khan and Jarvenpaa 2010). This situation on Facebook indicates that an individual may receive a lot of information. This enormous amount leads to irritation and frustration of the users because they cannot record all the information neither can they react on it (Edmunds and Morris 2000). Consequently, the information amount influences the affective attitude towards IO because the individual is irritated and frustrated of the huge amount of information because she/he cannot record and react on all of this information. The relation between the amount of information and the cognitive attitude towards IO is clearly stated. The higher the amount of information the higher is the perception of receiving too much information. In addition, the behavioral attitude towards IO is influenced by the amount of information because the individual cannot handle this huge amount of information (Eppler and Mengis 2004). Therefore, the individual will receive less information in the future and so the action tendencies will be influenced, therefore we assume that:

> *H3: The perception of the information amount has a direct positive effect on (a) affective, (b) behavioral, and (c) cognitive attitude towards information overload.*

Relationship encompass the closeness between an individual and his "Facebook-Friends". *"The closer [the] relationship between people, the more likely they are to disclose personal information to one another"* (Vangelisti and Caughlin 1997, p. 685). It is known that *"SNS profiles mix friends, family, coworkers, and business contacts, with no simple and adequate way to separate them and keep some parts of the information private, which might exacerbate the privacy dilemma."* (Brandtzæg et al. 2010, p. 1007). Therefore, an individual has close relationships as well as distant relationships on Facebook. The construct relationship influences the cognitive attitude towards IO because the individual knows that some of his relationships with "Facebook-Friends" are weak-tie relationships and so she/he perceives the receipt of too much information. The information from distant friends (weak tie) tend to lead to perception of receiving too much information rather than from close friends (strong tie) because the relationship between distant friends and the user is not that emotional (Constant et al. 1996). This indicates that the relationship between an individual and his "Facebook-Friends" influences the affective attitude towards IO. The individual knows these friends only casually (weak tie) and therefore the user consider the information from these friends as irrelevant. Strong ties exist between people with similar preferences. People with the same preferences are likely to know the same things and are unlikely to know dissimilar things (Constant et al. 1996). Consequently, the relationship influences the behavioral attitude towards IO because the information from distant friends is irrelevant and the user is unlikely to know this information. Therefore, the user will receive less information in the future. Thereby, the following hypothesis can be formulated:

> *H4: The perception of the relationship has a direct positive effect on (a) affective, (b) behavioral, and (c) cognitive attitude towards information overload.*

The construct "network size" is similar to the size of an one level egonet for a user which is defined as *"the set of users who interact directly with the user (neighbors)[...]"* (Jamali and Rangwala 2009, p. 4). According to that, the number of an users' "Facebook-Friends" represents the network size on Facebook. The more extensively the network of an individual is spread, the bigger is the amount of information which an individual receives (Singh 2000). On Facebook the users see all new status updates, likes and comments of their friends. Therefore, a large network leads to more posts on the Newsfeed and more messages. The more "Facebook-Friends" an individual has the more information one receives. Consequently, the network size has an impact on the affective attitude towards IO because the user feels frustrated due to the increase in provided (Koroleva et al. 2010). The user knows that another new friend on Facebook leads to more information. Therefore, the network size influences the cognitive attitude towards IO because an individual thinks that a huge number of friends lead to much more information. Because of the fact that many "Facebook-Friends" produce more posts on the Newsfeed the user will receive less information in the future. Hence, the network size has an impact on the behavioral attitude towards IO. This influence of the high number of users in virtual spaces on experiences and perceptions is identified recently in IS research (Animesh et al. 2011). The resulting hypothesis is:

> *H5: The perception of the network size has a direct positive effect on (a) affective, (b) behavioral, and (c) cognitive towards information overload.*

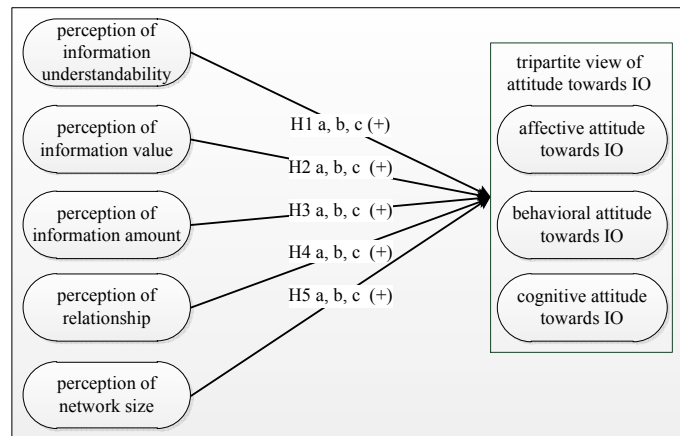**Figure 1: Research Model**

Research Design and Participants

We developed an online study to collect data for the evaluation of the hypotheses derived above. The questionnaire was sent to people who already had participated in a prior technology acceptance study of our department. The survey was designed to target actual Facebook users. Consequently, we surveyed participants who have declared themselves as Facebook users. Those who had no Facebook account were not considered. The evaluation did not include incomplete data samples. To improve the response rate we raffled a navigation device and a digital camera among the participants. For the data analysis SmartPLS (Ringle et al. 2005) was used. Table 1 illustrates the demographic characteristics of the 300 participants who took part in the study.

Gender	Men	58.3%	**Demographics**		
	Women	40.0%		hourly	9.3%
Age	<19	11.7%		serveral times a day	51.0%
	19-24	35.0%		once a day	12.7%
	25-34	41.0%	Frequency of Usage	several times a week	12.3%
	35-44	6.0%		once a week	4.7%
	45-54	3.3%		serveral times a month	3.7%
	>54	3.0%		once a month	5.3%

Table 1: Demographics of the 300 participants

RESEARCH RESULTS

Measurement Model

Each of the constructs used within this study was measured with a reflective indicator. Therefore, content validity, indicator reliability, construct reliability, and discriminant validity will be validated within this section (Bagozzi and Burnkrant 1979).

Content validity

While developing the questionnaire we used items that were already validated and utilized in prior empirical research projects. A mixture from already existing questionnaires from the IO literature measured the three constructs of IO. Those questions were fitted to the Facebook context and additionally extended based on Piderit's (2000) attitude semantic. A mixture from different empirical research also measured the questions of the information characteristics and the network characteristics constructs. Likewise, we fitted this into the study context. The used items are illustrated at A-Table 1 in the appendix.

Indicator reliability

The indicator reliability represents the rate of the variance of an indicator that has its origins in the latent variables. In order to explain at least 50 per cent of the variance of a latent variable by the indicators, each value has to be 0.707 or more (Carmines and Zeller 2008). New scales could include loadings greater than 0.6 (Hulland 1999).The items IO_A-6, IV-1, and R-4 have to be removed because they do not fulfill this condition. All other loadings are over 0.707 (see table 2) and have a significance level of p < 0.001 and are highly significant. This was calculated by using a bootstrap method with 5,000 samples.

Construct reliability

For determining the quality at the construct level the Composite Reliability (CR), which should contain values over 0.7 (Bagozzi and Yi 1988), and Average Variance Extracted (AVE), which should contain values higher than 0.5 (Fornell and Larcker 1981), were observed. The validity of these two aspects can be seen in table 2.

Items		Loading	Mean	AVE	CR	Latent Variable Correlations							
IO_A	IO_A-1	0.796											
	IO_A-2	0.804											
	IO_A-3	0.850											
	IO_A-4	0.786											
	IO_A-5	0.697											
	IO_A-6												
	IO_A-7	0.879	4.293	0.646	0.916	0.804							
IO_B	IO_B-1	0.909											
	IO_B-2	0.871											
	IO_B-3	0.925											
	IO_B-4	0.901											
	IO_B-5	0.843											
	IO_B-6	0.837											
	IO_B-7	0.886	4.538	0.778	0.961	0.882	0.733						
IO_C	IO_C-1	0.917											
	IO_C-2	0.843											
	IO_C-3	0.893											
	IO_C-4	0.862											
	IO_C-5	0.868											
	IO_C-6	0.851											
	IO_C-7	0.908	4.078	0.771	0.959	0.878	0.786	0.831					
IU	IU-1	0.880											
	IU-2	0.867	3.608	0.763	0.865	0.873	0.261	0.241	0.238				
IV	IV-1												
	IV-2	0.939											
	IV-3	0.927	4.245	0.870	0.931	0.933	0.183	0.268	0.224	0.448			
IA	IA-1	1.000	4.310	1.000	1.000	1.000	0.568	0.511	0.565	0.177	0.089		
R	R-1	0.920											
	R-2	0.787											
	R-3	0.888											
	R-4			3.707	0.751	0.900	0.867	0.100	0.117	0.063	0.171	0.303	0.000	
N	N-1	1.000	4.160	1.000	1.000	1.000	-0.033	-0.093	-0.047	-0.192	-0.174	0.080	-0.106

Note: All loadings are significant at p<0.001; Square Root of AVE is listed on the first row of the latent variable correlations

Table 2: Measurement Model

Discriminant validity

Discriminant validity describes the extent to which measurement items differ from one another (Campbell and Fiske 1959). Therefore, the square root of AVE is contained within table 2 on the first row of latent variable correlation. The construct correlations should be smaller than the root of the corresponding AVE (Fornell and Larcker 1981; Hulland 1999). Summing up, it could be shown that the measurement models (see table 2) are all valid.

Common method bias

Harman's (Harman 1976) single method test is used to control the presence of common method effect. All the 28 variables were entered into an exploratory factor analysis, using unrotated principal component factor analysis, to determine the number of factors that are necessary to account for the variance in the variables (Podsakoff and Organ 1986; Podsakoff et al. 2003). The test shows that no general factor was apparent in the unrotated factor structure, with factor 1 accounting for less than 45 per cent of the variance. Thus, the design of the questionnaire suggests that common method variance is not of great concern.

Structural Model

The measurement model above will be transformed into a structural model for validating the proposed hypotheses. For the evaluation of this model, the coefficient of determination (R^2) and the significance levels of the path-coefficients need to be observed (Chin 1998). Therefore, table 3 contains the most important data. This shows that 36 per cent of the variance of affective attitude towards IO can be explained by the five used constructs. In addition, in the case of behavioral attitude towards IO 32 per cent of the variance can be clarified. In the last case, 36 per cent of the variance of the cognitive attitude towards IO can be explained. According to Chin (1998) the model provides an acceptable goodness of fit. In this model, seven significant relationships can be confirmed. The first is the positive influence of perception of information understandability on affective attitude towards IO. In addition, the perception of information amount has a positive influence on this dependent variable. The third significant relationship is the negative influence of perception of network size on the behavioral attitude towards IO. In contrast, the perception of information value and understandability has a positive influence of this dependent variable. The sixth and seventh significant relationships are linked with cognitive attitude towards IO. The perception of information value and amount influence this dependent variable positively.

Hypotheses			Path Coefficient	Significance	Construct	R^2
perception of information value	a	Is positive associated with the affective attitude towards IO	0.055	ns	**affective attitude towards IO**	0.36
	b	Is positive associated with the behavioral attitude towards IO	0.172	***		
	c	Is positive associated with the cognitive attitude towards IO	0.133	**		
perception of information understandability	a	Is positive associated with the affective attitude towards IO	0.123	*		
	b	Is positive associated with the behavioral attitude towards IO	0.051	ns		
	c	Is positive associated with the cognitive attitude towards IO	0.072	ns		
perception of information amount	a	Is positive associated with the affective attitude towards IO	0.544	***	**behavioral attitude towards IO**	0.32
	b	Is positive associated with the behavioral attitude towards IO	0.494	***		
	c	Is positive associated with the cognitive attitude towards IO	0.545	***		
perception of relationship	a	Is positive associated with the affective attitude towards IO	0.058	ns		
	b	Is positive associated with the behavioral attitude towards IO	0.047	ns	**cognitive attitude towards IO**	0.36
	c	Is positive associated with the cognitive attitude towards IO	0.005	ns		
perception of network size	a	Is positive associated with the affective attitude towards IO	-0.038	ns		
	b	Is positive associated with the behavioral attitude towards IO	-0.088	*		
	c	Is positive associated with the cognitive attitude towards IO	-0.053	ns		
NS p > 0.05; * p<0.05; ** p<0.01; *** P<0.005						

Table 3: Structural Model: The PLS-results

Limitations

The described results of the empirical research are limited by several issues. The results only represent one example of one particular technology. Here, Facebook is used as technology. This is due to the fact that information overload is a recent phenomenon in Facebook, whereby its antecedents have not been researched so far. Besides, the survey is solely performed in one country.

DISCUSSION AND FURTHER RESEARCH

This research investigates the impact of information and network characteristics on the affective, cognitive, and behavioral attitude towards IO. More detailed, the perception of information value, amount, understandability, as well as the relationship

between the user and one's "Facebook-Friends" and the network size is investigated. Therefore, we propose an information overload model based on Koroleva et al. (2010) and evaluate it with empirical data of 300 Facebook users. Thus, we follow the call from Eppler (2004) who encourages a consistent transfer from empirical to conceptual research and vice versa in the context of IO. The results illustrate that six significant hypotheses can be confirmed.

The correlation between the independent and the dependent variables indicates that the different categories of attitudes are variously influenced. The affective attitude towards IO is influenced by the perception of the understandability und the amount of information. By contrast, the behavioral attitude towards IO is affected by the information value, amount and the network size. Above all, the cognitive attitude towards IO is related with the information amount and the value of this. Likewise, these differences can be seen by considering the R² of the three dependent variables. The coefficient of determination of affective and cognitive attitude towards IO is higher than the coefficient of determination of behavioral attitude towards IO. Thus, the antecedents of IO explain the affective and cognitive attitude to a higher degree than the behavioral attitude. In other word this antecedents influence the feelings (e.g. irritation and frustrations) and the perception (e.g. thoughts) largely than the behavioral action (e.g. receive less information in future) which an individual shows when she/he receives too much information. This indicates that an individual has an unfavorable feeling and perception towards the IO but generally, the action tendencies to reduce the IO are not influenced that much by those antecedents. This shows that the division of the attitude towards IO into the affective, cognitive and behavioral category is meaningful because all three categories have different antecedents.

Moreover, the perception of the information amount can be identified as the major predictor for the different categories of attitude. For all three categories of attitude, the information amount is a significant predictor. This goes in line with the information overload literature. So, many researchers define IO as the situation in which an individual receives too much information.

The understandability of the information correlates only significantly with the affective attitude towards IO. For the cognitive and behavioral attitude this path is insignificant. Understandability is defined as "the ease of comprehending the information" (Al-Hakim 2007, p. XV). Thus, the difficulty or impossibility of the user to comprehend the posts on Facebook increases the level of frustration and irritation because they do not understand this information. The cognitive attitude is not affected because the individual does not know if this is important or unimportant so they do not think that he/she receives too much information. In addition, the behavioral component is not affected because the individual does not understand the information and so the actions to receive less information in the future are not influenced.

The construct that measured the information value correlates significantly with the behavioral and the cognitive attitude. The path between this construct and the affective attitude towards IO is insignificant. Therefore, the reason is that the interest in the information and the age of this does not influence feelings about the IO. An individual has to perceive and comprehend the information to analyze the age and the level of interest. Accordingly, the characteristics of the information influence the perceptions of IO and not the feelings of IO. In addition, the behavioral attitude is influenced by the information value because the uninteresting and old information are not wanted and therefore the action tendencies to receive less information are influenced.

Especially to note is that the path from relationship to the dependent variables is insignificant in all cases. The level of closeness between the users does not have a significant influence on the attitude towards IO. The reason for this is the fact that users do not differentiate between digital and real friends. It is not important who posts on Facebook. In individual considers all "Facebook-Friends" as real friends. Thus, the level of closeness and emotional relationships are irrelevant. As just described, the important point is the perception of the information amount and not the person who creates this information. Perhaps the relationship has a direct impact on the information amount and affects the attitude towards IO indirectly.

Surprisingly, the correlation between the network size and the behavioral attitude towards IO is negative and not as expected positive. This result indicates that the more extensively the network of an individual is spread the lower are the action tendencies to reduce the amount of information. A possible explanation is that an individual has consciously an extensive network to get a lot of information. As a result, an extensive network has a negative influence on the behavior to obtain less information through Facebook. According to the affective and behavioral case, the network size has no significant influence on the attitude towards IO.

Based on these results, further research can consider the interplay between the tripartite-view of attitude and further constructs as this five, which reflect further information and network characteristics. In addition, the model presented in this research has to be investigated by using other technologies. Future researches could also consider the interplay between the tripartite view of attitude towards IO and any intention of an individual. Further, the variables *network size* and *relationship*

should be considered as moderator variables in future researches. Lastly, the comparisons with related research have to be addressed in future research.

REFERENCES

1. Ahuja, M. K., and Thatcher, J. B. 2005. "Moving Beyond Intentions And Toward The Theory Of Trying: Effects Of Work Environment And Gender On Post-Adoption Information Technology Use," *MIS Quarterly* (29:3), pp. 427–459.

2. Aizen, I. 1985. "From intentions to actions: A theory of planned behavior," in From cognition to behavior: Perspectives for future research on action control, J. Kuhl (ed.), pp. 11–39.

3. Ajzen, I. 2005. Attitudes, personality, and behavior, 2nd Edition, McGraw - Hill and Two Penn Plaza, New York, NY.

4. USA. Al-Hakim, L. 2007. Information quality management. Theory and applications, Hershey, PA: Idea Group Pub.

5. Animesh, A., Pinsonneault, A., Yang, S., and Oh, W. 2011. "An Odyssey into Virtual Worlds: Exploring the Impacts of Technological and Spatial Environments," *Management Information Systems Quarterly* (35:3), pp. 789–810.

6. Bagozzi, R. P. 1978. "The Construct Validity Of The Affective, Behavioral, And Cognitive Components Of Attitude By Analysis Of Covariance Structures," *Multivariate Behavioral Research* (13:1), p. 9.

7. Bagozzi, R. P., and Burnkrant, R. E. 1979. "Attitude organization and the attitude-behavior relationship.," *Journal of Personality & Social Psychology* (37:6), pp. 913–929.

8. Bagozzi, R. P., and Yi, Y. 1988. "On the evaluation of structural equation models," *Journal of the Academy of Marketing Science* (16:1), pp. 74–94.

9. Brandtzæg, P. B., Luders, M., and Skjetne, J. H. 2010. "Too Many Facebook 'Friends'? Content Sharing and Sociability Versus the Need for Privacy in Social Network Sites," *International Journal of Human-Computer Interaction* (26:11/12), pp. 1006–1030.

10. Breckler, S. J. 1984. "Empirical validation of affect, behavior, and cognition as distinct components of attitude," *Journal of Personality & Social Psychology* (47:6), pp. 1191–1205.

11. Brennan, L. 2011. "The Scientific Management of Information Overload," *Journal of Business and Management* (17:1), pp. 121–134.

12. Campbell, D. T., and Fiske, D. W. 1959. "Convergent and discriminant validation by the multitrait-multimethod matrix.," *Psychological bulletin* (56:2), pp. 81–105.

13. Carmines, E. G., and Zeller, R. A. 2008. Reliability and validity assessment, [Nachdr.], Newbury Park, Calif: Sage.

14. Chin, W. W. 1998. "The partial least squares approach for structural equation modeling.," in *Modern methods for business research*, G. A. Marcoulides (ed.): Lawrence Erlbaum.

15. Constant, D., Sproull, L., and Kiesler, S. 1996. "The Kindness of Strangers: The Usefulness of Electronic Weak Ties for Technical Advice," *Organization Science* (7:2), pp. 119–135.

16. Cowan, N. 2010. "The Magical Mystery Four," *Current Directions in Psychological Science* (19:1), pp. 51–57.

17. Davis, F. D., Bagozzi, R. P., and Warshaw, P. R. 1989. "User Acceptance Of Computer Technology: A Comparison Of Two Theoretical Models," *Management Science* (35:8), pp. 982–1003.

18. Edmunds, A., and Morris, A. 2000. "The problem of information overload in business organisations: a review of the literature," *International journal of information management* (20:1), pp. 17–28.

19. Ellison, N. B., Steinfield, C., and Lampe, C. 2007. "The Benefits of Facebook "Friends:" Social Capital and College Students' Use of Online Social Network Sites," *Journal of Computer-Mediated Communication* (12:4), pp. 1143–1168.

20. Eppler, M. J., and Mengis, J. 2004. "The Concept of Information Overload: A Review of Literature from Organization Science, Accounting, Marketing, MIS, and Related Disciplines. The Information Society," *The Information Society* (20:5), pp. 325–344.

21. Fishbein, M., and Ajzen, I. 1975. Belief, attitude, intention and behavior. An introduction to theory and research, Reading, Mass. [u.a.]: Addison-Wesley.

22. Fornell, C., and Larcker, D. F. 1981. "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error," *Journal of Marketing Research* (JMR) (18:1), pp. 39–50.

23. Glassey, R., and Azzopardi, L. 2011. "Finding interest in the stream," *Proceedings of the American Society for Information Science and Technology* (48:1), pp. 1–4.

24. Gu, B., Konana, P., Rajagopalan, B., and Chen, H.-W. M. 2007. "Competition Among Virtual Communities and User Valuation: The Case of Investing-Related Communities," *Information Systems Research* (18:1), pp. 68–85.

25. Hamre, B. K., and Pianta, R. C. 2001. "Early Teacher–Child Relationships and the Trajectory of Children's School Outcomes through Eighth Grade," *Child Development* (72:2), p. 625.

26. Harman, H. H. 1976. Modern factor analysis, Chicago: University of Chicago Press.

27. Hill, R. A., and Dunbar, R. I. M. 2003. "Social Network Size In Humans," *Human Nature* (14:1), pp. 53–72.

28. Hulland, J. 1999. "Use Of Partial Least Squares (Pls) In Strategic Management Research: A Review Of Four Recent Studies," *Strategic Management Journal* (20:2), pp. 195–204.

29. Ito, T., Larsen, J., Smith, N., and Cacioppo, J. 1998. "Negative information weighs more heavily on the brain: The negativity bias in evaluative categorizations," *Journal of personality and social psychology* (75:4), p. 887.

30. Jamali, S., and Rangwala, H. 2009. "Digging digg: Comment mining, popularity prediction, and social network analysis," *WISM 2009 Proceedings.*

31. Jones, Q., Ravid, G., and Rafaeli, S. 2004. "Information overload and the message dynamics of online interaction spaces: A theoretical model and empirical exploration," *Information Systems Research* (15:2), pp. 194–210.

32. Khan, Z., and Jarvenpaa, S. 2010. "Exploring temporal coordination of events with Facebook. com," *Journal of Information Technology* (25:2), pp. 137–151.

33. Kock, N. 2009. "Information Systems Theorizing Based On Evolutionary Psychology: An Interdisciplinary Review And Theory Integration Framework," *MIS Quarterly* (33:2), pp. 395–A12.

34. Koroleva, K., Krasnova, H., and Günther, O. 2010. "'STOP SPAMMING ME!'-Exploring Information Overload on Facebook," *AMCIS 2010 Proceedings* .

35. Kothandapani, V. 1971. "Validation of feeling, belief, and intention to act as three components of attitude and their contribution to prediction of contraceptive behavior.," *Journal of Personality & Social Psychology* (19:3), pp. 321–333.

36. Krönung, J., and Eckhardt, A. 2011. "The Attitude Construct in IT Adoption Research – A Scientometric Analysis," *ICIS 2011 Proceedings* .

37. Li, X., and Croft, W. B. 2006. "Improving novelty detection for general topics using sentence level information patterns," *Proceedings of the 15th ACM international conference on Information and knowledge management - CIKM '06* .

38. Miller, G. 1956. "The magical number seven, plus or minus two: some limits on our capacity for processing information," *Psychological Review* (63:2), p. 81.

39. Misra, S., and Stokols, D. 2011. "Psychological and Health Outcomes of Perceived Information Overload," *Environment and Behavior* .

40. Moenaert, R., and Souder, W. 1996. "Context and antecedents of information utility at the R&D/marketing interface," *Management Science* , pp. 1592–1610.

41. Piderit, S. K. 2000. "Rethinking Resistance And Recognizing Ambivalence: A Multidimensional View Of Attitudes Toward An Organizational Change," *Academy of Management Review* (25:4), pp. 783–794.

42. Podsakoff, P. M., and Organ, D. W. 1986. "Self-Reports in Organizational Research: Problems and Prospects," *Journal of Management* (12:4), p. 531.

43. Podsakoff, P. M., MacKenzie, S. B., Jeong-Yeon Lee, and Podsakoff, N. P. 2003. "Common Method Biases in Behavioral Research: A Critical Review of the Literature and Recommended Remedies," *Journal of Applied Psychology* (88:5), p. 879.

44. Raacke, J., and Bonds-Raacke, J. 2008. "MySpace and Facebook: Applying the Uses and Gratifications Theory to Exploring Friend-Networking Sites," *CyberPsychology & Behavior* (11:2), pp. 169–174.

45. Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., and Tu, Q. 2008. "The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation," *Information Systems Research* (19:4), pp. 417–433.

46. Ringle, M. C., Wende, S., and Will, A. 2005. "SmartPLS: University of Hamburg," .

47. Roberts, K., and O'Reilly, C. 1974. "Measuring organizational communication," *Journal of Applied Psychology* (59:3), p. 321.

48. Schroder, H., Driver, M., and Streufert, S. 1967. Human information processing. Individuals and groups functioning in complex social situations, New York: Holt, Rinehart & Winston .

49. Singh, R. 2000. "Entrepreneurial opportunity recognition through social networks," New York, London .

50. Smith, A. D. 2001. "Perception and belief," *Philosophy and Phenomenological Research* (62:2), pp. 283–309.

51. Sun, A., Cheng, J., and Zeng, D. 2010. "Maximizing Influence Through Information-Overloaded Online Social Networks," .

52. Vangelisti, A. L., and Caughlin, J. P. 1997. "Revealing Family Secrets: The Influence of Topic, Function, and Relationships," *Journal of Social and Personal Relationships* (14:5), pp. 679–705.

APPENDIX

Items	Question	Reference
IO_A-1	I feel irritated, because I receive more information than I can handle.	(Roberts und O'Reilly 1974)(Misra und Stokols 2011)(Schultz und Vandenbosch 1998)
IO_A-2	I feel irritated, because I am overextended by the information displayed in Facebook.	
IO_A-3	I feel irritated, because it is difficult for me to focus on the essential information in Facebook.	
IO_A-4	I feel irritated, because I overlook important information because of the diversity of information in	
IO_A-5	I feel irritated, because I am confronted with an excessive amount of meaningless information on	
IO_A-6	I feel irritated, because I would be able handling more information on Facebook, if I could receive only	
IO_A-7	I feel irritated, because for me a lot of information I receive/I am receiving on Facebook, is irrelevant.	
IO_B-1	I would like to read less information on Facebook in the future.	(Roberts und O'Reilly 1974)(Misra und Stokols 2011)(Schultz und Vandenbosch 1998)
IO_B-2	I would like to see less information on Facebook in order to avoid being overwhelmed in the future.	
IO_B-3	I would like to receive less information on Facebook in order to focus on essential information.	
IO_B-4	I would like to receive less information on Facebook in order to see any important information.	
IO_B-5	I would like to be confronted with less meaningless information on Facebook in the future.	
IO_B-6	I would like to get less information displayed when it improves the quality of the information.	
IO_B-7	I would like to receive less information on Facebook.	
IO_C-1	I receive more information on Facebook than I can handle.	(Roberts und O'Reilly 1974)(Misra und Stokols 2011)(Schultz und Vandenbosch 1998)
IO_C-2	I am overwhelmed with the information displayed on Facebook.	
IO_C-3	On Facebook, I find it hard to concentrate on essential information.	
IO_C-4	Due to the diversity of information on Facebook, I miss a lot of important information	
IO_C-5	I am confronted with an excessive amount of meaningless information on Facebook.	
IO_C-6	The quantity of information offered on Facebook is significantly higher than the quality of the information.	
IO_C-7	On Facebook I receive too much information.	
IU-1	The information provided on Facebook, is clearly displayed. *	(Wixom und Todd 2005)
IU-2	The information provided on Facebook, is easy to understand. *	(Wixom und Todd 2005)
IV-1	The information I receive on Facebook, is always new for/to me. *	(Doll und Torkzadeh 1988)
IV-2	The information I receive on Facebook interest me/. *	(Doll und Torkzadeh 1988)
IV-3	I consider the information I receive on Facebook as relevant. *	(Doll und Torkzadeh 1988)
IA-1	I receive too much information on Facebook.	(Ahuja und Thatcher 2005)
R-1	With many of my Facebook friends I maintain a friendly relation in real life. *	(Hamre 1994)
R-2	A lot of my Facebook friends turn to me for comfort, if they aren't doing well in real life. *	(Hamre 1994)
R-3	With many of my Facebook friends I talk about personal things. *	(Hill und Dunbar 2003, Vangelisti und Caughlin 1997
R-4	I communicate (eg, poke, chat, send message) regularly on Facebook with many of my Facebook friends.	(Vangelisti und Caughlin 1997)
N-1	About how many total Facebook friends do you have on Facebook?	(Ellison et al. 2007)
* Items are revers coded.		

A-Table 1: Measurement items