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Recommended Citation

Harshada Shrivastav, Regina Collins, Starr Hiltz, and Catherine Dwyer, "Facebook News Feed: Relevance or Noise?" (July 29, 2012). *AMCIS 2012 Proceedings*. Paper 18.
<http://aisel.aisnet.org/amcis2012/proceedings/HCIStudies/18>

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Facebook News Feed: Relevance or Noise?

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ABSTRACT

Facebook, with over 800 million active users, is one of the most successful social networking sites. It offers the quick exchange of data among geographically dispersed users to help them build and maintain social relationships. However, with the recent changes to its News Feed, Facebook has inundated users with information. Many users are bewildered and are unable to filter out irrelevant information. The purpose of this study is to explore the extent of information overload experienced by Facebook users. Additionally, this study explores the factors associated with information overload on Facebook users. Results reveal that females experience more Facebook information overload than males. Furthermore, it was found that frequent visitors to Facebook are subject to more irrelevant information and are confronted with excessive information. These findings have implications for the design of user interfaces that could address perceptions of information overload on the Facebook News Feed.

Keywords

Computer Mediated Communication, Facebook, Information Overload, Socio-demographics

INTRODUCTION

In today's Information age, the problem of "Information Overload" is more prevalent than ever before. Information overload occurs when a large amount of data beyond one's ability to absorb it is communicated (Milford & Perry 1977). With the advent of computer mediated communication (CMC) applications, we are constantly subjected to massive amounts of information. CMC applications such as electronic mail, computerized conferencing systems, and message boards are identified as sources of information overload.

Facebook is a CMC application designed to help people communicate more efficiently with their friends, relatives and colleagues (Facebook.com). The central feature of Facebook is the "News Feed" which presents recent information about friends' activities (e.g. status updates, photo updates, videos shared by friends) on the Facebook network. In addition to this, Facebook has a plethora of engaging applications including groups, events, messages, chat, pages and notes. These applications provide various ways for people to communicate and share their feelings, accomplishments or developments in their personal lives instantly with friends and relatives.

In September 2011, Facebook introduced modifications to its News Feed structure; this new News Feed provides updates in the form of 'Top Stories' based on the user's last visit. If a user has been away for a week, it provides a summary of posts; if the user visits Facebook every hour, it provides the most recent stories. These changes have resulted in a constant stream of information on the News Feed, generated through posts shared not only by friends but also through the posts shared by friends of friends. Today, an average Facebook user has 130 friends in his network (Facebook.com); the growing network of friends and the change in the News Feed interface have greatly increased the number of updates from friends of friends which may be of little interest to users. Additionally, there are increased numbers of feeds from highly active users (e.g., videos/photos/ links shared by highly active users) which may be irrelevant to many of those who receive them. Because of these profuse unstructured posts, many Facebook users are overwhelmed and frustrated with the large amount of information, experiencing the problem of information overload.

Facebook is an asynchronous CMC application which allows interaction between users regardless of space and time. With respect to CMC applications, previous studies have identified various factors that contribute to information overload. Some of these factors include a large volume of information and less experience in navigating an application (Franz, 1999). Another factor that contributes to information overload is push technology, which constantly sends notifications and alerts to users with recent information. Push technology is useful for sending targeted advertisements, but some researchers believe

that push technology is a frustrating nuisance which does not add value but instead contributes to information overload (Edmunds & Morris 2000). Hiltz and Wellman (1997) suggest that the asynchronous nature of CMC applications leads to coordination problems which can result in information overload.

Several studies have investigated information overload caused by electronic mail, message boards, and conferencing systems in an organizational setting. However, there have been limited studies that attempt to understand the problem of information overload in social media applications like Facebook. The purpose of this paper is to identify different factors contributing to Facebook information overload. Additionally, this paper empirically investigates the perceptions of information overload among Facebook users. In the next section of this paper, literature related to information overload is discussed. The following sections describe the research model and the online survey methodology. Finally, the results are presented, leading to a discussion and conclusions.

LITERATURE REVIEW

Traditionally, information overload has been considered a critical problem which occurs when the amount of incoming information exceeds one's capacity to process it (Milford & Perry 1977). From a CMC perspective, Hiltz and Turoff (1985) identified two main reasons for information overload: 1) communication of information beyond an individual's processing capacity; 2) information entropy, which occurs when communication is not organized and structured so that the relevance of the information can be recognized. Hiltz and Turoff (1985) also proposed serious consequences of information overload including the inability of an individual to respond to messages, replying inaccurately or erroneously, or quitting.

Eppler and Mengis (2004) in their meta-analysis reported that many researchers from different disciplines (Organization Science, Accounting, Marketing, MIS) have found that the quality of decisions or general reasoning of an individual correlated positively with the amount of information he/she received. If additional information was received, the quality of an individual's decision was degraded. Further, Eppler and Mengis also noted that personal factors including motivation, attitude, satisfaction, skills, ideology, age, and level of social communication contributed to information overload. Milford and Perry (1977) noted that researchers who suggested that personal factors are causes of information overload indicated that an individual's perception of the degree to which they were overloaded was an appropriate measure of overload.

Recently, Koroleva et al. (2010) conducted a qualitative study using a grounded theory approach to understand the main sources and consequences of information overload on Facebook. Additionally, their study attempted to identify the circumstances under which information overload occurs on Facebook. Results of their study indicated that the main source of information overload was users themselves, because users added too many friends to their networks, resulting in unmanageable accounts.

Despite these studies, information overload has not been extensively studied in the Information Systems discipline. Eppler and Mengis (2004) reported that, in the Information System discipline, researchers have concentrated mainly on conceptual studies, with little focus on empirical studies. Previous research has identified socio-demographic variables including level of education, age, gender, and income that correlate to information overload. Heylighen (2002) noted that individuals with higher levels of education were more likely to have a higher position in an organization; this required them to process more information, thereby making them more vulnerable to perceptions of information overload. Griffeth and Allen (1997) proposed that females have to process less information and therefore experienced less information overload in an organizational context.

Research Questions

Previous studies have reported the effects of personal factors, such as gender and level of education, on information overload. However, these studies were carried out in organizational settings and did not involve large social networks such as those represented in Facebook. In order to examine whether personal factors affect the perception of information overload in such a large open network, the following research question is formulated:

RQ1: How do socio-demographic factors (gender, ethnicity and level of education) relate to perceptions of information overload on Facebook?

The Internet has been associated with an increase in the volume of electronic resources, resulting in information overload (Edmunds & Morris 2000). Concurrently, the availability of the Internet has also extensively increased the use of Facebook. People actively share their news and opinions on various topics through various features such as status updates, sharing pictures/videos, and messages/wall posts, etc. The frequency of accessing Facebook, as well as the amount of time spent on the site, could be contributing factors to information overload. This research predicts that a user accessing Facebook several

times a day will be an active user having many friends in her network and therefore be more susceptible to the perception of information overload. This study also expects that a user spending more time per session on Facebook will be at less risk of feeling overloaded with information than those who spend less than 10 minutes a session. Furthermore, this study analyzes whether a more experienced Facebook user who is likely to have a denser network requiring the processing of more information is more vulnerable to the perception of information overload. To investigate whether Facebook usage patterns are factors causing perceptions of overload, the following research question was devised.

RQ2: What is the relationship between Facebook usage patterns (frequency of visits, length of session, and years of membership) and perceptions of information overload on Facebook?

Figure 1 shows the research model used in the analysis for this study. Socio-demographic factors include gender, ethnicity and level of education as independent variables. Facebook usage pattern factors include frequency of visits, length of session, and membership years as independent variables.

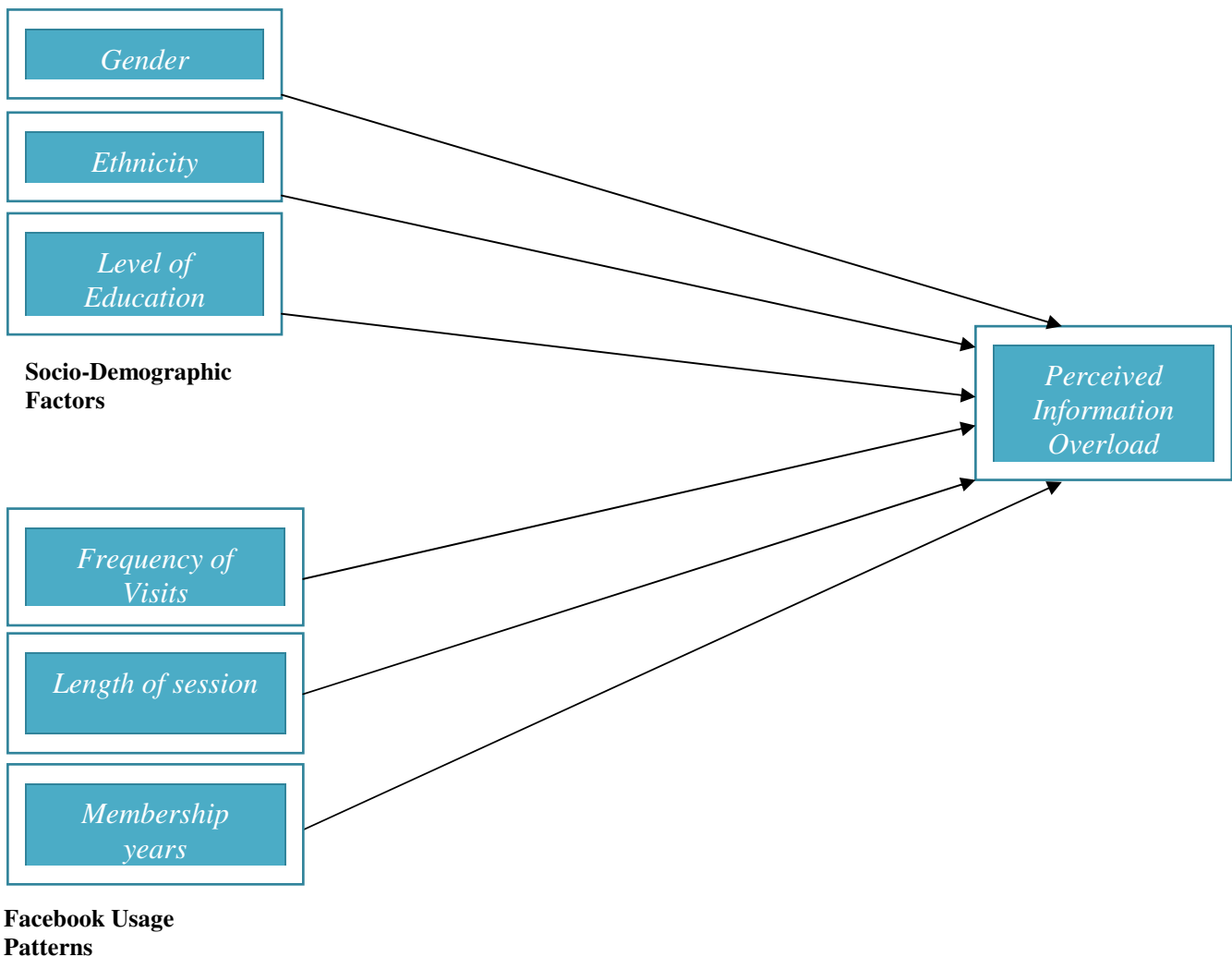


Figure 1 Research Model

RESEARCH METHOD

To study the perceptions of information overload on Facebook, an online survey was conducted. The survey was hosted on Qualtrics (<http://www.qualtrics.com/>) and was circulated using a snowball sampling method. An initial invitation to the survey was distributed by two students and a professor from a northeastern public university in the U.S. Invitations were also distributed at universities in Canada and India. Survey invitations were distributed to e-mail contacts, posted on social networking sites including Facebook, and distributed using survey flyers at two universities. The survey was available for

approximately one month and announced a \$50 gift card to a randomly drawn participant for each 100 participants who completed the survey. The questionnaire and procedures were reviewed and approved by an Institutional Review Board.

The survey was divided into three sections; the first section covered questions related to the demographics of participants (age, gender, and ethnicity). In the next section, participants were asked questions relating to their Facebook usage patterns, such as: “How often do you visit Facebook?” and “Please estimate how much time you spend on average when you visit Facebook?” The third section of the survey included questions relating to the respondent’s personal settings, for example: “What is your default privacy setting?” “Who is allowed to see that you are available to chat?” Finally, participants were asked to give a rating (based on a seven-point Likert-type scale) on the question, “Thinking about your sessions on Facebook, How frequently have you felt overloaded with information?” Measures for Facebook usage patterns and perceptions of information overload are discussed in the next section.

RESULTS

Participants

In total, 149 participants accessed the survey, of which 117 completed it. Among the participants, 67% were male and 33% were female (Table 1 shows respondent demographics). The mean age of participants was 28, with a standard deviation of 10.9. There were approximately 50% Asian participants and 35% White participants. As shown in Table 1, in our sample population, 32% were undergraduate participants (Freshman / Sophomore/ Junior/ Senior), 51% were graduate participants (Master’s, PhD students and Faculty), and 17% were classified as Others (Staff and not in academia).

	Frequency (Percent) or Mean/SD
Gender	
Male	79 (67%)
Female	38 (33%)
Age	
	Mean = 28 SD=10.9
Ethnicity	
White	41 (35%)
Asian	57 (50%)
Others	17 (15%)
Level of Education	
Undergraduate	38 (32%)
Graduate	60 (51%)
Others	20 (17%)

Table 1 Sample Demographics

	Frequency (Percent) or Mean/SD
Facebook’s new News Feed structure	
More Difficult to find interesting posts	53 (48.2%)
Easier to find posts	18 (16.4%)
No difference	36 (32.7%)
Joined after Aug 2011	3 (2.7%)
How frequently have you felt overloaded with information? (7 point scale – Always to Never)	Mean = 4.37 SD=1.84

Table 2 Facebook information overload summary statistics

Measures for Facebook Information Overload

The perception of Facebook information overload was measured through two questions. The first question asked participants to select statements regarding Facebook’s new News Feed structure; 1=I find it more difficult to look for posts which I am interested in, 2 = I find it easier to look for posts in which I am interested, 3= I do not find it much different from earlier, and 4= I joined Facebook after August 2011 therefore I have never used the previous Facebook structure. The second question, “Thinking about your sessions on Facebook, how frequently have you felt overloaded with information?” measured information overload based on a seven-point Linkert-type scale (1= “Always” to 7= “Never”).

The summary of information overload-related questions is displayed in Table 2. For the measure related to Facebook’s News Feed, 48% of participants reported that it is “More Difficult to find interesting posts”. Furthermore, only 16% of participants found it “Easier to find posts” they were interested in. The mean of the second question, “How frequently have you felt

overloaded with information?” was 4.37. The direction of this mean suggests that, on average, participants were somewhat neutral in regards to their perceptions of information overload; though no label was provided for the mid-point, one can say that, on average, these users “sometimes” feel overloaded. .

Measures for Facebook Usage Patterns

In order to assess Facebook usage patterns, the survey prompted respondents to indicate their frequency of checking their Facebook account on the scale of 1=Never and 6=Several times a day (see Table 3). The majority of respondents sign on at least once a day. Furthermore, participants were asked to report how much time on average they spent every time they visited Facebook, on the scale of 1=less than 10 minutes to 4=more than 30 minutes. The modal time per session is less than 10 minutes. Finally, participants reported the total number of years that they have had a Facebook account. The modal category is three years or more. Thus, our sample consists mainly of regular long time users of Facebook.

Facebook Usage Patterns	Frequency (Percent)
How often do you visit Facebook?	
Never	2 (1.7%)
Once in a while	6 (5.2%)
Once a week	9 (7.8%)
Several times a week	21 (18.3%)
Every day	36 (31.3%)
Several times a day	41 (35.7%)
Please estimate how much time you spend on average when you visit Facebook?	
< 10 minutes	49 (41.9%)
10- 20 minutes	35 (29.9%)
20- 30 mins	20 (17.1%)
Over 30 mins	13 (11.1%)
How long have you had an account on Facebook?	
Less than one month	1 (0.9%)
1-11 months	5 (4.3%)
1-2 years	30 (25.9%)
3-4 years	52 (44.8%)
5 years or more	28 (24.1%)

Table 3 Summary statistics for Facebook usage patterns

Information Overload and Socio-Demographic Factors

RQ1: How do socio-demographic factors (gender, ethnicity and level of education) relate to perceptions of information overload on Facebook?

Gender	Frequency of Facebook News Feed Overload			Total +Chi-Square, p-value
	More Difficult	Easier	No Difference or Joined after Aug 2011	
Male	29 (39.7%)	15 (20.6%)	29 (39.7%)	73 (100%)
Female	24 (64.9%)	3 (8.1%)	10 (27%)	37 (100%)
				6.659, 0.035
Cramer's V =0.246				

Table 4 Facebook News Feed overload across gender

The Chi-Square test was used to compare the differences between males and females with respect to perceptions of Facebook information overload. Table 4 shows females are significantly more vulnerable than males to information overload on Facebook ($\chi^2 = 6.659$, p-value = 0.035). When comparing the distribution of males and females based on perceptions of overload as either “More difficult” or “Easier”, we found a significant difference between males and females: only 8.1% of females reported that they found it easier to find the posts, compared to 20.6% of males. Furthermore, Table 4 indicates that 64.9% of females, compared to 39.7% of males, found it more difficult to find interesting posts in the new News Feed. Our findings are contrary to Griffeth and Allen (1997) who noted that females have to process less information in an organization and therefore face less information overload.

In order to further investigate the differences between the usage of Facebook among males and females, we compared gender versus measures of Facebook usage patterns. When comparing gender and frequency of visits, there was no significant difference. Similarly, when gender was compared to length of session, there was no significant difference. However, a comparison of gender and Facebook membership years resulted in statistically significant differences.

Gender	Facebook Membership Years		Total +Chi-Square, p-value
	2 Years or less	3 Years or more	
Male	29 (37.7%)	48 (62.3%)	77 (100%)
Female	7 (18%)	32 (82%)	39 (100%)
			4.700, 0.030
Phi Coefficient= 0.201			

Table 5 Facebook Membership years across gender

Table 5 summarizes the crosstab of Facebook membership years across gender. Results indicate that more females (82%) than males (62.3%) have had a Facebook account for 3 or more years

In order to examine the effect of ethnicity on perceptions of Facebook information overload, an analysis of ethnicity of survey participants with the measure of Facebook information overload was conducted; no significant differences between perceptions of information overload and ethnicity of participants were identified. Furthermore, no significant differences between perceptions of information overload and level of education of participants were identified.

Information Overload and Facebook usage patterns

RQ2: What is the relationship between Facebook usage patterns (frequency of visits, length of session, and years of membership) and perception of information overload on Facebook?

Frequency of Visits	Frequency of Facebook News Feed Overload			Total and Chi-Square, p-value
	More Difficult	Easier	No Difference or Joined after Aug 2011	
Once a week or less	3 (18.7%)	3 (18.7.8%)	10 (62.5%)	16 (100%)
Several times a week	49 (53.3%)	15 (16.3%)	28 (30.4%)	92 (100%)
				7.403, 0.024
Cramer's V =0.261				

Table 6 Facebook News Feed overload across frequency of visits

In order to answer our second research question, a chi-squared test was used, resulting in a statistically significant difference between perceptions of Facebook News Feed overload and Frequency of visits of a participant ($\chi^2 = 7.403$, p-value = 0.024). When comparing perceptions of overload as “More difficult” or “Easier”, results indicated a significant difference between participants visiting Facebook several times a week and those who visit once a week or less. Table 6 summarizes the results of the comparison between Facebook News Feed overload and frequency of visits.

Length of Session	Frequency of Facebook News Feed Overload			Total and Chi-Square, p-value
	More Difficult	Easier	No Difference or Joined after Aug 2011	
Less than 10 minutes	23 (51.1%)	3 (6.7%)	19 (42.2%)	45 (100%)
10 minutes or more	30 (46.9%)	15 (23.4%)	19 (29.7%)	64 (100%)
				5.788, 0.055

Table 7 Facebook News Feed overload across length of session

Table 7 shows the crosstab on length of session and the measure of News Feed information overload. When comparing the length of the session and perceptions of information overload, those who usually have very short sessions of less than ten minutes are more likely to think that the new News Feed has increased information overload. The difference is significant only at the .10 level, however, so this relationship needs to be further explored with a larger sample. An analysis of the relationship between years of membership in Facebook and perceptions of overload showed no significant differences.

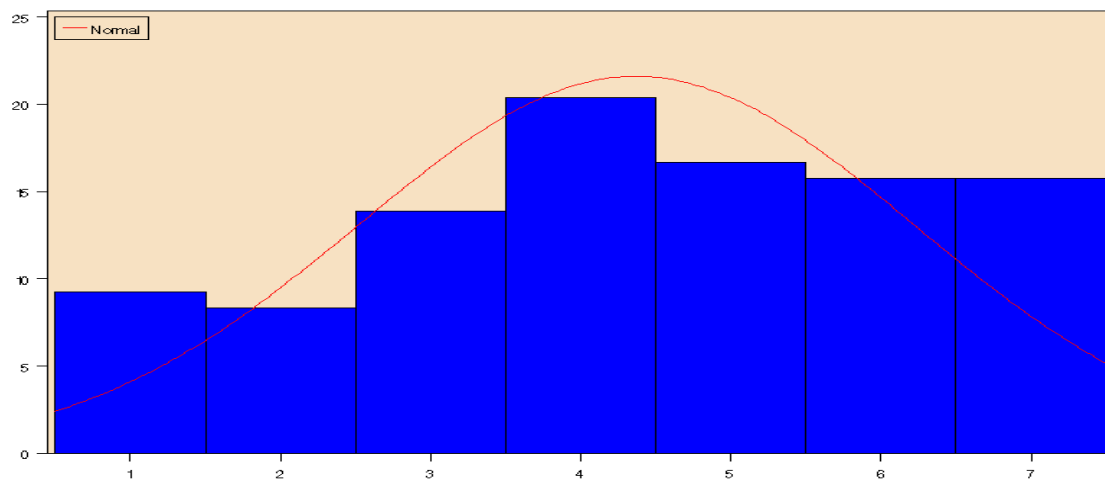
DISCUSSION AND IMPLICATIONS

The results described in the previous section suggest that a large number of Facebook users are feeling overwhelmed with the information presented in the new Facebook News Feed. Table 2 depicts that a large number of participants (48.2%) reported that they were overloaded with information on the new Facebook News Feed and found it difficult to look for relevant posts. It is also interesting to note that only 16% of participants reported that they found it easier to look for posts in the new Facebook News Feed. The results also imply that the redesign of Facebook’s News Feed has widened its focus by including updates from friends of friends, thereby generating enormous amounts of information. A regular user is forced to rummage through huge amounts of incoming information to find relevant posts. The results provide insights for researchers to propose a new user interface for the Facebook News Feed to minimize the flow of irrelevant posts. Additionally, further research should study the user behavior of users consuming information on Facebook and propose alternate strategies to manage information to avoid overload.

One of the objectives of this study was to reveal the effect of gender on the perception of Facebook information overload. Previous studies reported that, in an organization, females are less likely to have upper management positions and are therefore required to process less information and hence are less vulnerable to perceptions of information overload. However, this research revealed contrary results. We found that females were more at risk to feel overwhelmed by the information presented on Facebook’s News Feed. In order to further understand this gender effect, a comparison of gender and Facebook membership years indicated that 82% of females compared to 62.3% of males have had a Facebook account for 3 years or more (See Table 5). This indicates that most females have been using Facebook for several years; perceptions of information overload may reflect these experienced users having built up denser networks of friends on Facebook. The result suggests that further research should be conducted to explore the relationship between user network density and the perception of Facebook information overload.

This study also revealed that the frequency with which respondents accessed their Facebook accounts could be a source of information overload. Results suggest that highly active users are more at risk of having to process large amounts of information, making them more vulnerable to information overload on Facebook. One possible explanation for this finding is the new Facebook News Feed structure, which displays recent stories (whether relevant or irrelevant) to users who access the site frequently. Therefore, frequent visitors to Facebook are subjected to more irrelevant stories and find it more difficult to look for the posts in which they are interested. This finding leads to a suggestion for additional research regarding individual preferences and the structure of the Facebook News Feed. For example, in the current Facebook News Feed structure, updates from friends of friends are presented but some users may find such updates extraneous because they do not know the person who is the source of these updates. Therefore, there is a need to conduct further research to understand user preferences and expectations from the Facebook News Feed.

Percent



Scale of perception of Facebook Information Overload (7 point scale – Always to Never)

Figure 2 Facebook overload

The survey also prompted participants to indicate how often they felt overloaded with information on Facebook in general. Figure 2 indicates that a large percentage of participants felt moderately overloaded with information. These results are contrary to the results from the first measure of Facebook information overload. It suggests that a substantial number of participants reported that they frequently found it difficult to locate the relevant information in the new Facebook News Feed structure. One possible rationale for these contrary results could be that, in general, users have adapted to the amount of incoming information from Facebook and are able to process it. However, with the recent News Feed changes, users are finding it more difficult to look for relevant information. The new Facebook News Feed is presenting more information than many users are able to process, thereby causing information overload.

CONCLUSION

The results of this study indicate that the new design of Facebook's News Feed has increased the flow of incoming information and that users are often overwhelmed with all of the information presented to them. This study identifies the effects of personal factors on perceptions of information overload on Facebook. In particular, gender has a significant effect on perceptions of information overload; females on Facebook experience a greater perception of information overload than males. Furthermore, results suggest a significant relationship between the frequency of users' visits and perceptions of Facebook information overload. The findings of this research also indicate that other personal characteristics, including; level of education and ethnicity, are not significant predictors for information overload in a social media application like Facebook.

This study has advanced our understanding of different factors leading to the problem of information overload in Facebook. Moreover, this study has contributed to theory by exploring the application of the concept of information overload to the social networking site environment.

Future research should examine a broader set of psychological and personal factors such as motivation, satisfaction, skills, and network density to determine their effects on Facebook information overload. Additionally, further research should examine whether or not Facebook users are concerned about information overload and what mechanisms they are using to avoid it. A follow-up study could propose enhanced user interface and design structures to improve the management of information on Facebook and other social networking systems.

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