

# Sharing in Social News Websites: Examining the Influence of News Attributes and News Sharers

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**Abstract**— Social news websites (e.g. Digg, Reddit) have become a new and influential global phenomenon. Such websites present opportunities for individuals to participate in news creation and diffusion and thus have fundamentally transformed the ways people consume and share news. Yet, despite the popularity of these websites, factors influencing news sharing are not well documented. Hence, the objective of this study is to understand the determinants of news sharing in social news websites by examining the influence of news attributes as well as news sharers. A sample of 552 news stories was collected from a well-known and established social news website. Regression analysis was employed to analyze the data. Results indicated that in terms of news attributes, both the salience of news content and types of news were significant predictors of news sharing in social news websites. Specifically, news stories attracting more comments from users were more likely to be shared. We also found that soft news (e.g. sports and entertainment) were more frequently shared than hard news (e.g. politics and business). Contrary to expectations, the influence of news sharers did not significantly impact the extent of news sharing. The implications of the findings and directions for future research are discussed.

**Keywords**— *Social Media; Information Sharing; Virtual Communities; Social Sharing; Social News Websites*

## I. INTRODUCTION

The proliferation of social media has brought changes to individual news consumption behavior. In particular, social news websites (e.g. Digg, Reddit) present opportunities for individuals to not only access various news stories but to also participate in the process of news production and diffusion. These websites have fundamentally transformed the way people consume and share news and have become a global phenomenon since a piece of news can be distributed and discussed by people globally within minutes. Because information processed from news stories can influence individuals' cognitions, affections and behaviors, understanding how news stories are diffused on social news websites has significant social, economic and political importance, and has become an important research area across multiple disciplines [1].

Traditional media studies concerned with news diffusion has mainly focused on understanding the relationship between mass media and interpersonal communication and assumed that audiences were passive receivers [2]. That is, audiences had to passively receive what were delivered in mass media channels. Previous research in the traditional media context (e.g., printing media and television) has identified several factors that

influenced the news diffusion process, including types of news and news salience. For types of news, Tewksbury and Althaus' [3] study found that audiences preferred to read soft news stories in online versions of newspapers compared to their offline counterpart. In addition, perceived salience, or perception of importance of a news story, has been found to influence individual news sharing behavior [2]. A news story that is perceived as being critical by individuals will drive them to tell others and further seek more information.

However, whether those findings are applicable to explain news sharing in social news websites remains unclear. This is because social news websites have changed the role of individual readers in the news consumption process and have blurred the boundary between mass media and interpersonal communication [4]. In contrast with traditional media channels, individuals are able to access a variety of news stories that are submitted and evaluated by users themselves in social news websites [5]. They can thus actively select news stories that are in accordance with their own interests. Moreover, individuals can also share and discuss the news stories with their friends or other people who are connected within the same online community [6].

These new patterns of news consumption in social news websites may change the influence of the factors identified to be important in the traditional media context. Essentially, some concepts derived from traditional media may have to be modified to adapt to social news websites. For instance, in the traditional media context, news salience is mainly determined by media organizations and editors. However, in social news websites, users can collectively determine the salience of news stories by the voting or sharing mechanism [6, 7]. On these sites, news stories that have been shared more by users are typically presented in the front page of social news websites. Thus, the effect of news salience, which is now collectively determined, should be examined as it is likely to play an influential role in news diffusion in social news websites.

In addition, social news websites may also bring new influential factors that impact news sharing in the online context. For instance, social news websites help to connect users with others within a virtual community in which news stories are spread [4]. Here, the social network within the online community may impact the news diffusion process [6]. Specifically, influential users may play a vital role in how news stories are disseminated. As news sharing is an effective way to promote or improve an individual's status in a virtual community, some users could establish their social positions in

the community through news sharing [8]. In particular, opinion leaders, or individuals who transmit information about a topic to other people, play crucial roles in the process of information sharing [9]. In the offline context such as face-to-face communication, the underlying networks are not directly visible but inferred by self-report. However, because self-reported data may not accurately reflect respondents' actual social status, the reliability of research may be affected [10]. However, social news websites reflect these connections through users' online profiles and thus provide the opportunity to explore individuals' influence reflected through the features of network structures.

In sum, factors derived from news attributes and news sharers have potential influence on the extent of news sharing in social news websites. Compared to news sharing that takes place through face-to-face communication in the traditional media context, news sharing in social news websites can influence a much wider scope of audiences faster. However, despite the pervasiveness of social news websites and their increasing importance, the factors influencing news sharing in such sites are not well documented in the literature. Hence, the objective of this study is to investigate the following general research question: *What are the attributes of news stories and news sharers that influence the extent of news sharing in social news websites?*

## II. LITERATURE REVIEW

### A. Social News Websites and News Sharing

Social news websites, as a type of social media, refer to the participatory medium in which users collaboratively create, evaluate, and distribute news content [11]. Specifically, users of social news websites post news or links to news stories, discuss them and share their opinions [6]. The popularity of social news websites has brought many changes to the way people access and share news content as well as the way they interact with other users.

First, social news websites have diversified the availability of content through users' collective contributions. In mainstream news sites such as CNN and BBC, the number and content of news stories are limited due to the constraints of their editorial resources. On the contrary, social news websites allow multitudes of users to contribute, aggregate, and share news stories from a variety of sources online. Furthermore, they also allow users to contribute multimedia content (e.g., video, image, etc.).

Second, users are now actively participating in sharing news stories. In the traditional media context, news stories are delivered mainly through mass media channels (e.g., television, radio, newspaper), and further spread through interpersonal communication as individuals talk about news events with each other. The extent of news sharing is constrained by the availability of media resources and one's real-world social network [2]. Consequently, the news sharing procedure is short-lived and may cease within a few hours/days after the news event happens [2, 12]. With the advent of social news websites, users can now keep identifying and sharing news content as long as the news event is available on these sites.

This may prolong the process of news sharing and enable news to spread to a larger group of users.

Third, social news websites have transformed news consumption from a personal activity to an interpersonal one. In the traditional media context, individuals mostly read the news alone in their spare time. The news they read may fade from memory before getting a chance to be shared. On the contrary, in social news websites, users connect with each other and consume news in a collaborative manner [11]. Here, users can immediately share news to their social network if they feel others may also be interested. They are also able to interact with other users by leaving comments on others' submissions. More importantly, social news websites enable users to not only share news content but also to collectively filter and highlight news stories [6]. Put differently, this means that users collaboratively filter news content and help to organize news submissions in social news websites.

In sum, the features brought by social news websites can impact the news sharing process. Specifically, types of news, news salience, and the influential news sharers within an online community have the ability to affect the extent to which a news story is shared. The following sections elaborate those concepts and their potential influences on the news sharing process.

### B. News Attributes

Based on previous studies on the impact of news attributes, the present study intends to explore how such attributes may exert influence on users' sharing behavior in social news websites. Specifically, types of news and news salience, which have been found to be influential factors of news sharing in the traditional media context, are reconsidered in the context of social news websites in the present study.

#### 1) Types of News

Generally, news types can be categorized into two groups, hard news and soft news. Hard news refers to "national, international, and local affairs of government, as well as other matters, such as criminal acts or trials, that journalists consider urgent, collective concerns" [13]. Hard news is characterized as having a high level of newsworthiness, and demands immediate publication (e.g., politics, economics and social matters). In contrast, soft news is defined as being "typically more sensational, more personality-centered, less time-bound, more practical, and more incident-based than other news" [14]. Such news refers to events that have a relatively low level of informational value and are not necessarily time-sensitive (e.g., gossip, human interest stories).

In the traditional media context, news diffusion studies have mainly focused on hard news and explored its diffusion process through interpersonal communication channels, such as the assassination of a U.S. president, the Challenger disaster, the Columbia shuttle breakup [12]. This may be because hard news stories are given more exposure time in mass media, which is determined by media organizations and their small set of editors [2]. Thus, it is easy for audiences to remember these news stories and further share with others. However, social news websites have transferred the control of news flow from a few persons to large numbers of users who collectively determine the exposure of news stories.

With regards to news consumption in the Internet, previous studies have different answers to what types of news people prefer to access and share. For instance, Tewksbury and Althaus [3] showed that readers of the online version of the New York Times were less likely to spend a large portion of their reading time with international, national and political news. Instead, they selectively read more content concerned with entertainment and other soft news types. Thelwall, Byrne, and Goody [1] also found that people tended to talk more about soft news stories (e.g., sport, culture, environment) in blogs. In social news websites, users can share news stories based on their interests. However, it is not clear which type of news is more likely to be shared. Here we propose the first specific research question of the present study:

RQ1: What is the relationship between types of news and the extent of news sharing in social news websites?

## 2) News Salience

News salience is “the degree to which a news event is perceived as important by an individual or individuals” [2]. Salience has been identified to be positively related to the extent of news diffusion: the more salient the news event was, the more rapid and widespread the diffusion became [2].

In the traditional media context, the perceived salience of a news event is largely determined by media professionals’ judgments of news value, though it may vary slightly among individuals with different interests and concerns [2]. For example, a news story presented in bold headlines in the front page or allotted more news space is more likely to be regarded as important news by readers. In other words, how editors present the news event can significantly influence individuals’ perceived salience, which in turn impact the extent of sharing news stories. In contrast, in social news websites, the salience of news is mainly determined by collective filtering and interactive discussion among users, who are empowered to submit, rate and comment on news stories. As long as a news story is important or interesting to many users, it would likely receive more attention as well as comments. However, it remains unclear how news salience may influence users’ news sharing behavior. Hence, we put forward the second specific research question:

RQ2: What is the relationship between news salience and the extent of news sharing in social news websites?

## C. Influential Power of News Sharers

In the present study, news sharers refer to users who make active decisions to contribute or share news stories in social news websites. This is facilitated by the ability to create connections and track other users’ activities [6]. If news sharers are able to disseminate news stories that are in accordance with users’ interests, many may want to follow and connect with such sharers to receive news stories from them. Put differently, a news sharer who has a relatively large number of followers suggests that users within the same network would like to receive information from him/her.

To study the influence of news sharers, we looked at their social network through the lens of opinion leadership. A sharer with a large number of followers may be characterized as an

opinion leader who can influence others’ attitudes or behaviors frequently in a social system [15]. It likely that they may possess more information sources and display higher levels of involvement than their followers [9]. It is assumed that the number of adopters per unit of time will increase once opinion leaders are involved in the diffusion process [15]. Traditionally, the influence of opinion leadership is constrained within a limited number of individuals [9]. However, online communities provide them with a global scope of audiences.

In the context of social news websites, users are able to track or follow the news stories of selected individuals. Further, such sites enable these selected individuals to share news stories with their followers with ease. In a sense, these selected individuals who have a group of followers can be seen to be the opinion leaders [16] because the news sharers have a certain power to dictate the types of news his/her followers consume. Since influential sharers tend to have a large number of followers, they may significantly expand the extent of news sharing in social news websites. However whether such influential power from individual news sharers exists still remains unclear. Hence, we put forward the third research question:

RQ3: What is the relationship between influential sharers and the extent of news sharing in social news websites?

## III. METHODOLOGY

Most previous new diffusion studies employed self-reported data to investigate the sharing process. However, self-reported data may not be sufficient to accurately reflect external environmental factors as well as users’ actual sharing behavior. This is because individuals may lack the ability to remember their past behavior and predict their future actions [10]. Instead, the present study utilizes secondary data of user’s actual news sharing behavior in a social news website. Social news websites provides researchers with massive quantities of data for analyzing dynamics of individual behavior and patterns of the information flow within them [6]. By analyzing the data recording users’ actual sharing behavior and shared news content, it is possible to reveal how informational and social factors may exert influence on the actual sharing behavior in the online context.

### A. Sample

Our data sample of news stories were collected from a social news website Digg (<http://digg.com>). Digg is one of the earliest and most popular social news website. It enables users to submit links of news stories from external websites and rate these submissions by sharing. In this social news website, there are over 16,000 new submissions each day. Around 90.5% of these uploads are news links [5].

Once submitted to Digg, a news story will remain in the “upcoming” list for 24 hours until it accumulates over a certain number of “digg” or number of times shared, after which it is relocated into an appropriate news category. There are ten categories of news stories classified by the website: entertainment, business, politics, gaming, lifestyle, offbeat, science, sports, technology, and world news. In each category, news stories are ordered according to the amount of times each news story is shared, in which most shared stories are placed at

the top of the list. Each news story has an icon which allows users to share it. The website records how many times a news story is shared after it is submitted. In addition, Digg also allows users to form social networks with others, and provides an interface for tracking their connections' activities (e.g., news stories submitted and shared by others). These features of Digg make it an ideal subject for our study to collect sample of news stories.

We collected news stories submitted from November 21 to November 27 in 2010. Since it usually takes 6 to 24 hours for news stories to get full exposure on the website [6], we chose to collect news stories over a 7-day period to guarantee significant variances among the number of times news stories are shared. In fact, not all news stories submitted by users were presented under each news category but just selected ones, according to the filtering mechanism of Digg, so we manually collected all the news stories that were archived in each news category during that seven-day period. In total, 552 news stories were collected. Along with each news story, relevant information was recorded, including the number of times shared, the number of comments accumulated, and category. Additionally, the number of followers that each news sharer had was noted. In our news sample, there were 331 (60.0%) soft news stories while the rest were classified as hard news. In the grouping of soft news, offbeat news was submitted more than any other news topic, followed by entertainment and lifestyle. In terms of hard news, political news was ranked as the favorite news topic.

## B. Measurement

### 1) Independent Variables

a) *Types of news.* Based on previous categories of news stories [1], the present study classified the sample news stories into two groupings, hard news and soft news. Here, the category of hard news included business, politics, science, technology and international news, while the set of soft news referred to entertainment, gaming, lifestyle, sports, and offbeat. Put differently, type of news is a binary variable in which hard news was encoded as 0 and soft news as 1.

b) *News salience.* As discussed above, news salience refers to the perceived importance of news stories by audiences. In our study, news salience was reflected by the number of comments each news story received. Indeed, news salience is highly dependent on the amount of discussion the news can generate [17]. In social news websites, stories that are perceived to be salient may attract more comments from users. Hence, the number of comments is assumed to be a reliable indicator for news salience in our study.

c) *Influential sharers.* We utilized the number of followers that a user had as the indicator of the degree of influence the user exerts in his/her online social network. According to the diffusion of innovations theory [15], opinion leaders are characterized as having extensive interpersonal network links with their followers. A person who has more interpersonal links in a social network is more likely to be active in disseminating new ideas and technologies. This helps to establish the individual's status among peers. It is thus reasonable to assume that in social news websites, users who

have a large number of followers are influential in the online community.

### 2) Dependent variable

*Extent of news sharing.* In the present study, we intend to examine how the above factors influence the extent of news sharing in social news websites. Specifically, the extent of news sharing is measured in terms of the number of times each news story is shared by users. Because the times shared increases by "1" through users' intentional clicking of the "digg" button, this number is presumed to be an accurate indicator to what extent a news story has been shared within the online community.

We checked for correlations among the independent variables and the results showed that there was no multicollinearity among them. Next, linear regression was performed to examine the relationships between the proposed influential factors and the extent of news sharing. Here we adopted regression analysis because this method can help to assess the quantitative effect of the estimated relationships between independent and dependent variables. Moreover, this method is capable of assessing the relative contribution of each antecedent variable for predicting news sharing.

## IV. RESULTS

The results of our regression analysis are shown in Table I. First, news salience was the strongest predictor of the extent of news sharing ( $\beta = 0.720$ ,  $p < .001$ ), which means that it accounted for the most variance in news sharing compared to the other independent variables. Further, the relationship was positive, that is, news stories attracting more comments are more likely to be shared by users. In addition, our findings suggest that the type of news influences the extent of news sharing in social news websites. Specifically, soft news was more likely to be shared than hard news ( $\beta = 0.076$ ,  $p < .05$ ). Finally, the number of followers that submitters have was not a significant predictor ( $\beta = 0.024$ ,  $p = 0.422$ ). This indicates that individual sharers have no direct impact on the news sharing process in social news websites. Collectively, these variables accounted for 49.5% of the variance in predicting the extent of news sharing in social news websites.

TABLE I. RESULTS OF REGRESSION ANALYSIS

Independent Variables	Standardized $\beta$	t-values
Types of news	.076	2.427*
News salience	.720	23.03***
Influential sharers	.024	.803
F(3, 548)		180.9***
Adjusted R2		.495

a. Dependent Variable: Extent of news sharing  
b. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

## V. DISCUSSION

The objective of the present study was to explore the factors associated with the extent of news sharing in social news websites. Specifically, we intended to investigate the

influential factors in terms of news attributes and news sharers. This was achieved by analyzing a sample of news stories collected from a popular social news website, Digg.

According to our findings, news salience was the most significant predictor of the extent of news sharing in social news websites. This is not surprising as salient news stories are able to attract the attention of users, and arouse extensive discussions and interactions among users. This finding is consistent with prior work in the traditional media context. However, the difference is that in traditional media, the salience of a news event is mainly determined by editors' evaluation. What and how news stories are presented in the medium platform are in the control of media organizations. In contrast, in social news websites, content is contributed and rated by the users themselves without the intervention of media organizations. Users are empowered and collaboratively determine what news stories to be shown in the front page of websites by voting on or sharing the news stories. In other words, the salience of a news event mainly depends on users' interests, or the "wisdom of crowds" [7]. Here, the collectively determined salience of news stories is found to significantly impact to what extent news stories are shared.

In terms of the types of news (i.e., hard news and soft news), we found that people are more likely to share soft news (e.g., sports, entertainment) than hard news (e.g., politics, international issues) in social news websites. We attribute our findings to the motivations driving people to read online news. Specifically, previous study found that the major motivations behind online news users are to satisfy their entertainment gratifications [18]. Since soft news stories are more entertaining than hard news stories, this implies that people are less willing to read hard news but are more willing to invest their time on soft news stories because they are online to satisfy their entertainment needs [19]. However, it is noted that the coefficient is low ( $\beta = 0.076$ ,  $p < .05$ ), which means that the relationship between news type and sharing extent is significant but weak. This may indicate that although soft content may motivate users to share news, this influence is not crucial compared to the impact derived from news salience.

Contrary to expectations, our findings suggest that news sharers have little influence on the extent of news sharing in social news websites. Surprisingly, sharers with a large number of followers do not imply that they have significant influence on the extent of news sharing. The concept of opinion leadership is derived from the two-step flow model, which hypothesized that initial ideas firstly flow from mass media channels to opinion leaders, through whom the information is then transferred to their followers [15]. People are willing to turn to opinion leaders for seeking useful information, and opinion leaders are exceptionally important in spreading ideas to others. However, our results indicate that in social news websites, a large number of followers cannot guarantee that the sharers will affect the process of news diffusion. It appears that followers on social news websites may just regard the person as a celebrity and be curious to know what news stories he/she is interested in, rather than to look up to the person like an opinion leader in the traditional context. Also, it is possible that many users are simply lurkers who like to read news stories

contributed by others but are not inclined to share by themselves.

## VI. CONCLUSION

To our knowledge, this is one of the first studies that investigate factors influencing news diffusion in social news websites. Based on our findings, we identified that types of news and news salience can significantly influence the extent of new sharing in social news websites. Specifically, soft news was more likely to be shared by users in such websites. Salient news stories, which were reflected by the amount of comments attracted, were inclined to be spread more widely among users.

For practitioners, our findings may be used to guide developers of social news websites and the presentation of content:

- Social news websites should provide features to help users find salient news stories. Since news salience can be operationalized by the number of comments left by users, social news websites should consider ranking news stories according to this attribute in addition to the number of times shared. Furthermore, social news websites may attempt to evaluate and predict the salience of news stories submitted, based on the features (e.g., popular terms, topics, appearance of certain names) of previous salient news stories. Such recommendations may encourage more sharing by users.
- As advertising is usually the major source of revenue, social news websites may help advertisements reach a wide scope of audiences. For instance, because salient news stories are more likely to be disseminated, advertisers can attempt to embed their advertisements in them. This will likely to attract more attention from users.
- Our finding on the type of news shared on social news websites has implications for practitioners who are concerned with democratic discourse and publicizing of policies. As users in social news websites prefer to share soft news stories rather than hard news, editors may frame political news in a soft or entertaining manner. For instance, they may want to inject an element of entertainment in their hard news stories to encourage more sharing. In fact, Baum [19] noted that soft news stories related to political issues were read by audiences who would otherwise not read political news at all.

There are some limitations in this study that could be addressed in future work. First, only one social news website, Digg, was examined although it should be noted that Digg is the earliest and most established of such sites. However, users of other social news websites (e.g., Reddit, Mixx, etc.) might differ in their sharing patterns which require separate investigations. Additionally, we acknowledge that different data collection periods may result in different sample sizes and possible patterns of findings. For instance, data collected immediately after a major crisis such as the earthquake and tsunami disaster in Japan after March 11, 2011 could result in a

different sample size and exhibit different diffusion trends. Nevertheless, our data sample and results highlight the diffusion patterns of news during a non-crisis, and hence, normal situation. In addition, the number of followers may not be a sufficient indicator of users' leadership in the social news websites. This may call into question the finding concerned with influential users in our study. Lastly, the distinction between hard news and soft news is increasingly blurring due to a trend towards a softening in the reporting of hard news. In some cases, soft news stories may also convey hard news content. This may make the classification of news types inaccurate in our study and hamper the reliability of the results.

Future research can improve the present study in several aspects. More social media platforms with different characteristics can be investigated to increase the research's generalizability. For example, some social networking sites (e.g., Facebook, Myspace, Twitter) are becoming an important platform for people to access and share news stories. Second, future research can examine other characteristics of the sharers. For instance, demographic profiles, motivations [8] and experiential factors [20] may influence of the extent of news sharing in social news websites. Furthermore, revealing influential users by their social network structures and behavioral cues in social news websites can be a challenging and beneficial topic with both theoretical and practical implications.

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