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News have traditionally been a selection process in which the media as gatekeepers define which issues get on the public agenda. By allocating scarce resources (e.g. broadcasting time) the media sends a signal to its recipients defining the relevant news and they set their own agenda following this news coverage. In the long run the media uses this process to define the public agenda (McCombs, 2004; McCombs & Shaw, 1972). Recent studies have adapted this concept successfully to basic online elements, such as online newspapers (e.g. G. Lee, 2005). Turning to social media elements (e.g. blogs) this process is becoming more complex. Messner and DiStaso (2008) are talking about a "source cycle" in which the media influences blogs and vice versa. With regard to the recipient in this process researchers assume an indirect effect from blogs to journalists via the media to the recipient. This assumption relies (implicit) on the limited coverage of blogs (Woodly, 2008). While a few years ago studies (e.g. Rainie, 2005) showed an increase in the amount of bloggers and blog readership today this trend seems to be declining (see Zickuhr, 2010). What we see though is that it is not so much a decline but a shift to other social media such as Facebook or Twitter (e.g. Kopytoff, 2011) as the place of information consumption. Those new emerging channels offer new and easy recommendation-features such as the like function in Facebook or the Tweet-this function, which are these days integrated throughout all major news websites. Those features allow users to recommend content to their friends in a way, which has never been possible before.

In the possibility to talk to friends about personal relevant issues and to see what bothers them, blogs and other social media elements offer a promising source for researchers: In their content the personal agenda of its contributor gets manifested. But this agenda not only 'exists' - it gets formed by the action of others. In this formation process the consumer himself decides through what or whom he gets influenced. The gatekeepers are his friends or persons he's following. In this function the internet possesses a high potential to fragment the audience by offering access to any kind of information that the user is interested in (J. K. Lee, 2007). Popular commercial applications like the ZITE App, Flipboard, Twittertimes.com or Paper.li boost the reception of interest based information consumption.

Despite these dynamic processes in the field of provision and assessment of news, there's a lack of research studying the direct effect of social media elements on the individual agenda. It remains uncertain how the recipient evaluates information which gets disseminated by his friends compared to news published by the mainstream media. In the classic case of agenda setting it has been the journalist who controlled the incoming information as a gatekeeper and defined the relevant issues. In the world of social media our friends define the relevance of information in posting it and/ or recommending it. If this process influences the personal agenda of the user, a social network based agenda arises.

In our work we present a conceptual framework for an individual, social network based agenda setting. The underlying conceptual framework is based on metrics from the personal (extended) ego network of each twitter user, and the analysis of his interactions with his contacts. We are applying methods from network analysis to derive relevant metrics, which can potentially decide about the news value of a particular news item for the user. We also present the resulting artifact of our work, which is an open software prototype that demonstrates our theoretical approach. We also describe some of the challenges, theoretical and practical issues that we encountered when creating this artifact.

Conceptual Framework

Generally our friend network on twitter decides which tweets we consume from whom, by simply following this person. Based on our resulting friendship (outgoing ties) and follower (incoming ties) network structure, we also interact with users of our personal network. This interaction can either be public in form of @-replies, private in form of private messages (also called direct messages) or in the form of publicly re-tweeting messages of other users. By re-tweeting a tweet the content of the tweet is forwarded to our own followers, but also gives credit to the original poster. In our framework we argue that the structure of the twitter network and the resulting interaction provide important information, which can be used to create the individual agenda for a given user.

Our framework introduces five different factors that are potentially important for the creation of an individualized agenda, which we will now briefly describe below. For this process in a first step, all of the tweets that a user receives from his friends (his public timeline) are analyzed for existence of a link, and then only those are considered for further evaluation, based on the evaluation of the factors.

- The first factor is the actuality (N_A) of the news, which is a simple proxy for the news value (Lippmann, 1922) of information. We assume that the fresher the news the more relevant it is for the user. The theoretically obtained (Kepplinger & Rouwen, 2000) factors in news value theory provide an extended set of criteria which could be potentially used to determine a more detailed news value, but which are neglected at this point of this work.
- The second factor (N_{RTall}) is the overall retweets of a given tweet. If a message has been retweeted often, we can assume that it was generally considered newsworthy and relevant for the readers who promoted it. The total number of retweets of a message is a proxy for the popularity of a message in the general twitter audience. This measure allows us to potentially discover news items, which are considered to be important at a global scale (i.e. breaking news like earthquakes or deaths of celebrities).
- The third factor (N_{RTego}) is constructed by only considering the retweets that were generated through members of the first or second level of the ego network of the user. By narrowing down our focus to the network of the user, we are able to obtain information how the news item was perceived by the focus or peer group.
- The fourth factor (N_{ST}) is determined by the strength of connection between the user and the source of the tweet. According to Granovetter (1983) connections which are perceived as strong ties represent a proxy for trust, thus news items originating from such a friend might be considered more important for the individual agenda of the user. The strength of ties between two users can be measured in twitter based on the number of already performed interactions (@-replies, direct-messages, retweets) between those users. Persons that have a high frequency of interactions are considered to maintain a strong tie to each other.

- The fifth and final factor is the authority or centrality of the friend that provided the news to the user. While some friends might be only peripheral in the ego network of the user, others might play a central role in the group. Social Network Analysis provides a variety of measures like in-degree, closeness, betweenness or eigenvector centrality (Everett & Borgatti, 1999) to define central actors in a network. Literature suggests that such potential opinion leaders (Iyengar, Van Den Bulte, & Valente, 2010) in the network are potentially more influential. We hypothesize that the content that such users provide might be considered more relevant for the user than the content of peripheral members of his ego network. In twitter networks the centrality of users can be determined by analyzing the (first or second level) network of an ego - leaving out the ego - and then computing centrality measures for each member.

Once the potentially relevant factors have been obtained, they are normalized and can be either combined in an additive or multiplicative model in order to create a total score for a news item. The higher the total score the higher the news ranks on the individual agenda of the user. By repeating this news sourcing and ranking based on the factors described above we can produce a e.g. daily newspaper based on the individualized social network agenda of the user.

We expect that the future evaluation of our artifact will allow us to draw conclusions from different experimental approaches to a series of social based agenda setting questions by studying the user interaction with our software. In comparison to evaluating already existing software our prototype can provide insights about which of the presented factors are actually considered relevant by users for the individualized agenda setting. A different evaluation of our artifact might shed light into the question how much the individualized agenda actually differs between different users through time. And finally we can draw comparisons to news received through traditional media to our individualized agenda.

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