Quantifying Virality of Information in Online Social Networks

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ABSTRACT

The aim of this research is to propose a model through which the viral nature of an information item in an online social network can be quantified. Further, the authors propose an alternate technique for information asset valuation by accommodating virality in it which not only complements the existing valuation system, but also improves the accuracy of the results. They use a popularly available YouTube dataset to collect attributes and measure critical factors such as share-count, appreciation, user rating, controversiality, and comment rate. These variables are used with a proposed formula to obtain viral index of each video on a given date. The authors then identify a conventional and a hybrid asset valuation technique to demonstrate how virality can fit in to provide accurate results. The research demonstrates the dependency of virality on critical social network factors. With the help of a second dataset acquired, the authors determine the pattern virality of an information item takes over time.

Keywords: Asset Valuation, Information Item, Social Network, Viral Index, Virality

INTRODUCTION

Virality and social networks are two things in concert very frequently these days. Online social network (OSN) is everywhere now. Social networks bring people with same interest together irrespective of the geographical locations. It has made sharing information a vital part of our life. People share, like and comment on friend’s messages, photos and videos which
increases viral propensity of the information. The concept Virality is a briskly growing phenomenon which is drawing increasing attention from scholars and practitioners from different fields, who seek to understand factors that drive the process of virality (Bardzell, Bardzell, & Pace, 2008; Helm, 2000; Palka, Pousttchi, & Wiedemann, 2009). By understanding what makes information viral and how viral an information item is on internet the benefits of virality can be maximized and threats that viral information poses can be dealt with effectively.

There have been numerous studies to understand the characteristics of virality and factors that make information go viral. Our focus here is to identify the rate at which the information goes viral and deriving a viral index for each information item (a news, video, photo, audio, text material) on an OSN. Even if the stress here is not on what makes information viral there is a need to identify measurable and important characteristics of virality with which viral index of information items on OSNs can be derived. There exist various definitions for virality based on the approaches taken to examine them. It can be simply defined as “Ability of information to be spread to maximum portion of the target population over short duration of time”. However this definition does not provide enough scope to differentiate between viral and non-viral information. So adding a bit complexity and considering the external factors only, virality can be defined as a word-of-mouth diffusion process wherein a message is actively forwarded from person to person, within and between multiple weakly linked personal networks, and is marked by a period of exponential growth in the number of people who are exposed to the message (Hemsley, 2011). This definition holds good for political science, information science and viral marketing. On taking psychological approach virality heavily depends on the emotional value of the information item. Virality is the phenomena which is driven by emotional shape and varies the velocity of information to be shared among peers (Berger & Milkman, 2011). Much of the literature that discusses about virality is centered on either external factors or the emotional factors that can contribute to virality. Out of these, we need to identify critical measurable factors.

In our model we propose a method to quantify virality with these acquired factors. Further, our research provides an insight into how viral index can be fit into information asset valuation. This study shows how virality can play an empirical role in calculating more accurate asset values.

We have structured our paper into 4 major parts. In the research setup section we discuss about the datasets that were used to analyze and come to conclusions. In the “Methodology” section we discuss the actual model we propose to quantify virality. The whole model can be seen as two parts the first one quantifying the critical factors that contribute to virality and the second part is getting a value for virality with the help of the obtained critical factors. In The “Results” and discussion section we apply our model on the datasets and obtain the actual viral index for each set of video. We also calculate viral index for a period of time to study the pattern virality takes with time. The results are explained with the help of graphs and tables. In the final section “Conclusion and future work” we discuss the applicability of our model and explore the advantages of quantifying the viral nature of an information item.

Related Work

Characteristics of Virality

To understand the credibility and dynamics behind virality and its associated factors, we reviewed several literatures that talked about studies on information virality, attributes, virality flow and its diffusion process. Virality is mostly influenced by the nature of the content and not by the source who shared. Further virality in social networks can be decomposed into several components, such as white buzz, black buzz, raising discussions, controversy,
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