Reconstructing Diffusion Model for Virality Detection in News Spread Networks

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ABSTRACT

In today’s competitive world, organizations take advantage of widely-available data to promote their products and increase their revenue. This is achieved by identifying the reader’s preference for news genre and patterns in news spread network. Spreading news over the internet seems to be a continuous process which eventually triggers the evolution of temporal networks. This temporal network comprises of nodes and edges, where node corresponds to published articles and similar articles are connected via edges. The main focus of this article is to reconstruct a susceptible-infected (SI) diffusion model to discover the spreading pattern of news articles for virality detection. For experimental analysis, a dataset of news articles from four domains (business, technology, entertainment, and health) is considered and the articles’ rate of diffusion is inferred and compared. This will help to build a recommendation system, i.e. recommending a particular domain for advertisement and marketing. Hence, it will assist to build strategies for effective product endorsement for sustainable profitability.

KEYWORDS
Diffusion, Natural language Processing, News Spread Networks, Recommendation System SI model, Social Networks, Virality Detection

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1. INTRODUCTION

The Internet has revolutionized the way in which people interact and communicate with each other. Communication and access to information are easier than it ever has been. This has resulted in the creation of a master novel platform, known as the “social network” which has made a magnificent impact on the life of each and every individual in one way or another in the last half-decade. Social networks have revolutionized the entire communication process and how the information used to spread from one person to another. Earlier, newspapers and news reports on television or radio were the only source to know what is happening in the world and stay updated. Since centuries, people relied on newspapers to get the most recent world news. But in the current scenario, newsfeeds on social media pages of Facebook, Twitter, etc. keep us up to date on all the things happening all around the globe. It doesn’t matter where we are, we can have access to any information we want. One of the most interesting things is that social networks provide users with the power to instantly record and share an event or write articles directly from their phones instantly simultaneously as they happen. In many cases like news about natural disasters, bombing, shooting, product launch etc. reach social media before journalists could even reach the scene or spread the news through their channels. The thing that happens on social media is that once an information article or news is posted on these social networks, the news takes the life of its own. It is shared by the readers across different social media platforms in different ways and it can reach a growing exponential number of people fast. Information flow in the network occurs by replication of articles (sometimes data is modified by users) by different people regularly over a period of time.

Therefore, the study of spread dynamics of information through the internet is an important and interesting task, as it could be valuable to comprehend the factors which determine the journey of information in a social network. A variety of factors control the spread of the news articles like the reputation of the publisher, domain of the news (business, technology, health, sports, fashion etc.), the timestamp of an article and many more. Such extensive information diffusion provides an enormous opportunity to companies and enterprises to exploit the benefits of social media networks to boost their revenues and amplify their presence in the market. It helps businesses to understand their target audience, increase customer engagement and responsiveness and make better business decisions by building a strong strategy for a product launch, product endorsement, customer services etc.

Hence, the aim of this research is to reconstruct SI (Susceptible-Infected) diffusion model to detect virality of news in dynamic news spread network. The overall approach is to analyze the virality of news of four different domains by comparing their respective infectious diffusion rates for product endorsement and extent of virality of news articles. The rest of the paper is structured as follows: section II will provide related work and identified gaps, section III discusses the overall proposed methodology and framework, section IV shows the findings and results and section V will provide the conclusion and the future scope of research.
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