Influence maximization in large social networks: Heuristics, models and parameters

Sumith N. [a,c,*], Annappa B. [a], Swapan Bhattacharya [b]

[a] Department of CSE, National Institute of Technology Karnataka, Surathkal, India
[b] Department of CSE, Jadavpur University Kolkata, India
[c] Department of CSE, Alva's institute of engineering and technology Karnataka, India

HIGHLIGHTS

- In recent years, lot of efforts are directed to solve influence maximization problem.
- The influence maximization problem aims to fetch the top influential users in the social networks.
- Paper provides a comprehensive analysis on various approaches towards identifying influential users.
- This review concludes with future research directions to improve the existing body of work.

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ABSTRACT

Online social networks play a major role not only in socio psychological front, but also in the economic aspect. The way social network serves as a platform of information spread, has attracted a wide range of applications at its doorstep. In recent years, lot of efforts are directed to use the phenomenon of vast spread of information, via social networks, in various applications, ranging from poll analysis, product marketing, identifying influential users and so on. One such application that has gained research attention is the influence maximization problem. The influence maximization problem aims to fetch the top influential users in the social networks. The aim of the paper is to provide a comprehensive analysis on the state of art approaches towards identifying influential users. In this review, we discuss various challenges and approaches to identify influential users in online social networks. This review concludes with future research direction, helping researchers to bring possible improvements to the existing body of work.

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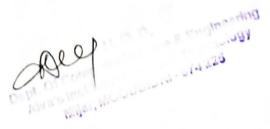
1. Introduction

With the advent of Web 2.0 came a range of applications that are used in many ways by people across different sections of the society. Social networks is one such application that played a very important role in connecting people across the world. It is not just a platform to share ideas, but also plays an important role in the economic growth. Social networks on the realm of crowdsourcing has been discussed by Gatautis and Vitkauskaite [1]. They discuss how companies use their consumers to provide design inputs for their new products. Also, Whitla [2] discusses how consumers are employed to get new products and ideas into the market. Furthermore, Wilson et al. [3] discusses various social media strategy which gives the evidence for the impact of social network on economy. In their work, the ford fiesta movement

is discussed, to prove how the comments of the social network users can result in the vast sale. Also, Qualman [4] discusses how social networks has impact on the business. Thus, in such realm, a new perspective of business named socio economics emerges. The term socio economic is coined to reflect the importance of social networks in major economic transactions. Therefore, in recent years, social network research has gained popularity.

With the popularity of social networks, the impact of user influence is clearly visible in product adoption decisions. On one hand, there are evidences where a group of consumers leave behind a highly opted brand and move to a new brand simply because their friends have opted it. On the other hand, there are cases where consumers are loyal to their brands for the same reason. Doyle [5] gives a scenario where the sales is reduced due to the negative feedback of a consumer, which he/she expressed in the social network. This consumer was an opinion leader. This scenario shows that due to peer influence, a user can stop using a product even though he/she has no negative experience on the product. These aspects of group

* Corresponding author.
E-mail addresses: s.nureshwalya@gmail.com (Sumith N.), annappa@ieee.org (Annappa B.), bswapan2000@yahoo.co.in (S. Bhattacharya).