Studying Paths of Participation in Viral Diffusion Process

Jarosław Jankowski¹, Sylwia Ciuberek², Anita Zbieg³, and Radosław Michalski²

¹ Faculty of Computer Science, West Pomeranian University of Technology, Szczecin, Poland
jjankowski@wi.zut.edu.pl
² Institute of Informatics, Wrocław University of Technology, Poland
{syiwia.ciuberek, radoslaw.michalski}@pwr.wroc.pl
³ Institute of Psychology, University of Wrocław, Wrocław University of Economics, Poland
anita.zbieg@gmail.com

Abstract. Authors propose a conceptual model of participation in viral diffusion process composed of four stages: awareness, infection, engagement and action. To verify the model it has been applied and studied in the virtual social chat environment settings. The study investigates the behavioural paths of actions that reflect the stages of participation in the diffusion and presents shortcuts, that lead to the final action – the attendance in a virtual event. The results show that the participation in each stage of the process increases the probability of reaching the final action. Nevertheless, the majority of users involved in the virtual event did not go through each stage of the process but followed the shortcuts. That suggests that the viral diffusion process is not necessarily a linear sequence of human actions but rather a dynamic system.

Keywords: information diffusion, online social networks, participation model, multistage analysis.

1 Introduction

The studies that direct attention to diffusion of innovation process [25], [7], [32], social influence mechanism [10], [21], [24], [12], [23] social contagion and epidemics outbreaks [5], [6] or cascades of influence patterns [34] investigate a similar phenomenon: a propagation, transmission and adoption of information (content, opinions, behaviours, emotions) within a network of social relations. As the information generated and shared online is gaining steadily in importance [28], more and more researchers are trying to deal with the power of electronic contagions. They are especially interested in social networking sites [26], [9] being recently the most popular online activity that has outnumbered e-mail actions [20], [1]. Because there is a great need to understand mechanisms and factors crucial for the spread of information, researchers search for new ways on how to study the phenomenon. The results from research areas related to dynamics and mechanisms of social transmission and
adoption are successfully adopted to word of mouth process investigation [11], [33], [22] and viral seeding strategies examination [17], [4]. Nevertheless, the empirical network studies seem to be promising, relatively little has been done in this area [31].

The research presented in this paper is targeted to online social platforms with the ability to capture different forms of users’ behaviours: communications, activity and transfers among users. Most of the research in the field of information diffusion and viral contagion is addressed to participants’ characteristics, the structures of network they are embedded in or/and characteristics of information that is transmitted. Rare are studies in which attention is paid directly to the behaviours. The main motivation in the current research is to observe human action systems in more detailed way -by analysing different forms of behaviours related directly and indirectly to viral campaign and stages of the participation for the viral action. The study specifies several social behaviours related to the diffusion process and identifies several stages of participation in viral diffusion, starting from activity before receiving or sending viral information and behaviours after infection towards reaching a final diffusion goal.

2 Related Work

The process of information contagion among individuals and their further participation in particular viral actions can be observed and studied in three-folds [22]. Researchers focus on personal characteristics of people engaged in social contagion, their needs and motivations. Vital for the diffusion process are also social factors such as the characteristics of other people influencing an individual, attributes of the channels through which information flows and attributes of social system in which individuals operate. And finally, researchers consider the characteristics of spread information to be important for the social contagion.

2.1 Personal Characteristics and Stages of Adoption

Under the study there are personal characteristics of an individual who passes the message further as well as the one who is exposed to the message. What matters for the virus propagation are the personality traits like extraversion and innovativeness [4], authority of the sender, activity of the receiver [36] and similarity of sender and receiver demographics traits [29]. Moreover, people share information motivated by the need to be part of a group, but the need to be individualistic and stand out from a crowd is reported as a second reason [18]. Vital for virus propagation is also the need to be altruistic and the need for personal growth [18].

Multistage Models of Engagement

The change of individual’s opinion or behaviour is studied as the process of perceptual adaptation to a new stimuli, e.g. information, opinion, product or technology. The behavioural success of adoption depends on the cognitive processes that engage individual’s attention as well as on personal motivations and emotions that lead to the