

Effect of mass media, word-of-mouth and town rumor in social media reputation analyzed using social physics approach

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Searching for equations describing the behavior and decision making of people in society is a major goal of social physics. Since interest in entertainment is far away from the daily life of people, it can be said that it is the simplest problem as people's decision making in society. There is a mathematical model of hit phenomenon as the theory of social physics dealing with this problem[1]. In the mathematical model of the hit phenomenon, we think that there are three means for people in society to get information, influence of mass media, information from friends, and rumors in town.

Consider a differential equation describing the interest of a person with specific topics. We treat the influence of mass media as external force. Information from a friend is considered to be a two-body interaction with a friend. Rumors in the street are considered by three body interactions, thinking that another person hears the conversation of the two people. The mathematical model of the hit phenomenon thus constructed well describes people's interest in entertainment[2].

In this research, we take hydrogen water which was popular in Japan in May 2015 as an example. Think about the role of mass media, information from friends, rumors in town, and how they each play their roles by comparing model calculations with analysis of hydrogen water on actual social media. Actual reputation on social media is analyzed by the mathematical model of hit phenomenon. In model calculation, analysis of actual reputation and parameters are changed to investigate the difference.

As a result obtained, there was a limit to becoming a reputation on social media only by the influence of mass media, and it was shown that word-of-mouth and town rumors are important.

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[3] A. Ishii, T. Koyabu, K. Uchiyama, *Proc. Adapta* **2**, 389 (2014).