

THE EFFECTS OF SOCIAL INFLUENCE AND NETWORK TOPOLOGY ON THE DIFFUSION OF INNOVATION

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For the innovation to spread widely, it is important not only the effect of the innovation but also the social influence surroundings such as by word of mouth and the network topology transmission route. In this research, it is shown whether the social pressure and the network topology give the influence of the diffusion level by the multi agent simulation. As a result, it was able to be confirmed to the social pressure that the martingale property was able to be observed, and it gave unexpected like the hot-selling product. Moreover, it was able to be confirmed that the size of the influence changed according to the network topology.

Keyword: innovation, social influence, network topology

Extend Abstract

We are influenced from actions of the surrounding people and act. Therefore, the phenomenon doesn't explain easily by the analysis mainly composed of the individual appears as a whole. Example, certain commodity might become a hit, and get depressed explosively as stock prices do not expect it. And it is very difficult to expect with commodity sold a lot and when stock prices drop sharply. It is clarified that whether it was not only a quality of the commodity and what kind of network the others' influences by information on the commodity and the rumor. Recently, there are researched to focus on the characteristic of information that flows in an individual heterogeneity and the network of the relation between individuals are composed.

Moreover, the information technology evolves, and the network structure has been complicated more and more in recent years. So, it overflows in information that mouth-to-mouth advertizing and commercial on TV. The phenomenon has been generated that the value of the commodity used by a lot of people rise more and more, when there is frequently an exchange of the lending and borrowing of DVD, the telephone, the mail so on, and others. Such a character is called a network externality.

In this research, a consecutive decision making was modeled, and it experimented by the multi agent simulation. And, it is shown whether the social pressure and the network topology give the influence of the diffusion level. At the first, one agent is chosen at random from among an artificial society. The agents buy one commodity with there are two kinds of commodity. The heterogeneous agents are a different respectively the effect when the commodity is bought, and agents are reasonably who try to select the commodity with high effect. However, when agent decides which product is bought, he received the influence from others. In the social pressure, it is assumed that tuning it to the others' behavior is more advantageous. So, the commodity that everyone has is bought easily, and the commodity that doesn't have it is not bought easily. It was updated whenever the agent bought it, and it experimented on steps of the social pressure how many repeatedly. Here, two situations are thought. The agents can repurchase again even if a certain one is selected as the cabinet support rate and the exchange. In the second, it is time when it costs cost large though the product is bought again. Example, it is usual to buy and not to substitute several years when the television is bought once. When the cellular phone is bought once, if changing to the other companies, it takes time to telling the telephone number the change.

As a result of the first experiment, the martingale property that repeated the increase and decrease was able to be confirmed. The long-term forecast of behavior is not to be able to do when selecting it by conforming behavior. If the approval rating is about as much as 30%, it is likely to go up to 50%, and it gets depressed in addition, and might be 20%. And, after long time passes, the probability density distribution of the approval rating becomes uniform distribution, and can take any value. However, it was able to be confirmed that the martingale became small by an individual preference is considered or the network is limited to the social pressure.

In the second, it was able to be confirmed that the diffusion of the product spread in exponential. And, it has been understood that agent's preference is changeable, and the spread speed is faster receiving the social pressure by the few people of a small group than that the social pressure is received from all members in the market and it selects it and selecting it

The information technology develops, and new service is researched using influence of other users of word of mouth ranking and recommendation system now. It is great if used for those technologies by this research.