

Abstract

Sale intensity is always one of the major subjects that business is concerned about. We propose a mathematical model based on the concept given by Vidale-Wolfe to characterize the behavior of sale intensity.

Using the sense of diffusion in heat equation, we could characterize the behavior of sale intensity starting from the spontaneous sale intensity caused by the circulating of information. The behavior of changing on sale intensity under the effect of diffusing by the circulating of information and the promoting activities can be generally modeled as nonhomogeneous heat equations. However, because of the great difference between cases, the problem formulating and model solving cannot be generally modeled as one certain nonhomogeneous heat equation and are restricted to be discussed case by case.

The further sale intensity is predictable possibly with sufficient data, but without sufficient data, we can also use the model to appraise the spontaneous sale intensity and the benefit of each advertising strategy in practical.

Different from most previous relevant studies, the model supports the studies of sale intensity diffusing over geographic regions, which is especially of significance in spontaneous sale intensity.

keywords: heat equation, sale intensity, diffusion coefficient

