



## The Role of Social Networks on the Diffusion of Innovation

Semra Gündüç

Department of Computer Engineering  
Faculty of Engineering, Ankara University

### Abstract

Introduction of a new product or ideal requires market research before the product is introduced in the markets. The success of a new product depends on the reactions of the potential customers. In a seminal work, Evert Rogers classified the responses of the prospective customers, and the essential product features for a market success [2]. Bass introduced the first mathematical model of diffusion of innovation [?]. The Bass model is based on Rogers' classification of potential adopters. Bass model considers innovation and imitation as the driving forces of diffusion of innovation. The original Bass model has three free parameters,  $p$ ,  $q$  and  $M$ . Two of the parameters, ( $p$  and  $q$ ) are individual-level characteristics while the third one,  $M$  is the size of the market. The first one of the individual level parameters,  $p$  is named as innovation parameter while the second parameter,  $q$  is known as the imitation parameter. The initial driving force of a new product adoption process is the innovation parameter,  $p$ . Innovation parameter is the representative of the external/global influences such as mass media, online or off-line publicity. Immediately after the initial acceptance of the new product the imitation parameter,  $q$  come into play: The experienced individuals influence the other to adopt the product. In the original Bass model, ignores the social network structures and assumes a homogeneous society.

The relation between the adaptation process and the connectivity of the social networks are subject to more recent investigations [3]. The models which take individual preferences and non-homogeneous connectivity structure are called agent-based models. The agent-based models can consider the differences in the opinion of the individuals as well as the effects of the underlying social interaction networks. To investigate the results of the network and local interactions, recent investigations on the social network structures shed light on the choices. Three social network structures are shown to be the most representative of the social interactions [4]. These are a random network, small-world networks, and the scale-free networks.