

# Comparing and visualizing the social spreading of products on a large social network

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*Abstract*— By combining mobile traffic data and product adoption history from one of the markets of the telecom provider Telenor, we define and measure an adoption network—roughly, the social network among adopters. We study and compare the evolution of this adoption network over time for several products – the iPhone handset, the Doro handset, the iPad 3G and videotelephony. We show how the structure of the adoption network changes over time, and how it can be used to study the social effects of product diffusion. Specifically, we show that the evolution of the Largest Connected Component (LCC) and the size distribution of the other components vary strongly with different products. We also introduce simple tests for quantifying the social spreading effect by comparing actual product diffusion on the network to random based spreading models. As videotelephony is adopted pairwise, we suggest two types of tests: transactional- and node based adoption test. These tests indicate strong social network dependencies in adoption for all products except the Doro handset. People who talk together, are also likely to adopt together. Supporting this, we also find that adoption probability increases with the number of adopting friends for all the products in this study. We believe that the strongest spreading of adoption takes place in the dense core of the underlying network, and gives rise to a dominant LCC in the adoption network, which we call “the social network monster”. This is supported by measuring the eigenvector centrality of the adopters. We believe that the size of the monster is a good indicator for whether or not a product is going to “take off”.

