

Uncertainty quantification of the users of electronic commerce over the next few years

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Abstract

Over the last few years, electronic commerce (E-commerce) has become one of the most accepted purchasing systems, having become the easiest way of accessing a large variety of goods. E-commerce provides: the possibility of comparing costs and bids without going to outlets and therefore, saving time and money; the availability of detailed characteristics of goods; the possibility of acquiring new goods available abroad. Moreover, the forms of payments are getting progressively safer and more reliable on the Internet.

Here, we propose an age-structured a mathematical model to study future short-term trends of e-commerce in Spain. To do this, we divide the total population into two age groups, 16-44 year old and 45-74 years old. Also, every age group is divided into two subgroups: the first one consists of people adopting this technology and the second one who do not. Then, we consider a nonlinear diffusion model whose parameters are the innovation coefficients associated with each age group and related to advertising, and the imitation coefficients related to the influence of an adopting technology group on non-adopting group.

These parameters are estimated by fitting probabilistically the available real data from the Spanish Statistic Institute using the technique developed in [1]. Finally, we perform a probabilistic prediction of E-commerce users over the next few years.

References

[1] Juan-Carlos Cortés, Francisco-J. Santonja, Ana-C. Tarazona, Rafael-J. Villanueva, Javier Villanueva-Oller, *A probabilistic estimation and prediction technique for dynamic continuous social science models: The evolution of the attitude of the Basque Country population towards ETA as a case study*, **Applied Mathematics and Computation** 264 (2015) 13–20