

A scalable customer evolution model using deep learning: Can a low-value customer become a high-value customer?

Mainak Sarkar
ESSEC Business School

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Abstract

A key idea of customer relationship management (CRM) is that customers are economic assets and therefore, firms should know who their most profitable customers are. This has led to the development of sophisticated customer lifetime value (CLV) models such as the Pareto/NBD. However, most CLV models suffer from two crucial limitations: (1) CLV models ignore the fact that customers can evolve over time and that a low-value customer can evolve into a high-value customer, while a high value customer can transform into a low value one. (2) CLV is shown as a point estimate: Whether a customer has 100% chance of being worth \$10,000 to a company, or 10% of being worth \$100,000, leads to widely different implications for marketers. Our model uses novel approaches in deep learning to develop a scalable customer evolution model that can predict the evolution of a customer over time. This provides CLV as a distribution of outcomes instead of as point-estimate and also allows marketers to predict the chances of a low-value customer transforming to a high-value customer and vice-versa. We further explore the implications of using the customer evolution model for customer prioritization, salesforce allocation, and risk management.

Keywords: *customer lifetime value; deep learning; customer relationship management*

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