In recent times, the transactional scale of the consumer-to-consumer (C2C) e-commerce has grown rapidly and C2C e-commerce has become more popular. In C2C e-commerce, customers are likely to face more risk buying fake and poor quality products. However, the main stream of research has focused on business-to-consumer (B2C) e-commerce. In this research, a quantitative model of C2C e-commerce usage was developed, which incorporates five dimensions, namely, (1) personality dimension, including openness, extraversion, agreeableness, conscientiousness, and neuroticism, (2) usability dimension, including perceived ease of use, perceived usefulness, and perceived website quality, (3) risk dimension, including perceived security and perceived privacy, (4) green concern as a social influence dimension, and (5) institutional feature dimension, including buyer protection policy and third party recognition. This study provides a quantitative model to describe C2C e-commerce usage as a distinct area of research from B2C e-commerce. In addition, the result shows customers’ purchase intention to use C2C e-commerce can be increased by redesigning C2C e-commerce websites.