AN INTEGRATED MODEL OF C2C E-COMMERCE USAGE FOCUSING ON PERSONALITY, USABILITY, RISK, SOCIAL INFLUENCE, AND INSTITUTIONAL FEATURE DIMENSIONS

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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.
CHAPTER 1: INTRODUCTION

1.1 Insight of electronic commerce

In the current Internet era, buying and selling products and services online are becoming very popular, since many people are familiar with broadband Internet access and even mobile Internet access. The quantity of Internet users is increasing. According to an annual report of Miniwatts Marketing Group ("World Internet users and population statistics," 2013), by December 2013, the number of Internet users in the world was about 2.8 billion, that is 40% out of the total population of about 7 billion.

With the growth in the number of Internet users, the use of the Internet in electronic commerce (e-commerce) has created a new online environment that is highly efficient and effective. In terms of consumers’ convenience, e-commerce enables consumers to shop or make transactions 24 hours a day, all year at any location. It provides consumers with more choices and allows them to have quick comparisons. For these reasons, the transactional scale of the e-commerce websites has grown rapidly. The transactional scale through e-commerce websites in the United States reached approximately $262 billion in 2013, up 13.4% from $231 billion in 2012, according to Forrester Research Inc. (2013). In 2017, e-commerce spending will reach $370 billion that represents a nearly 10% compound annual growth rate from 2012 and account for 10% of all retail sales in the United States.
1.2 Research problem

Recently, C2C e-commerce has become popular (K. Jones & Leonard, 2008; Kwahk, Ge, & Park, 2012; H. Li, Ye, Law, & Wang, 2010). Particularly, in China, C2C e-commerce has been more popular than B2C in that the C2C transaction volume made up 64.9% of the whole online shopping market in 2013 (CNNIC, 2013). Total volume of C2C transaction made up 80% of the Chinese online sales in 2014 (Baker, Toonkel, & Vlastelica, 2014). Taobao Marketplace is China’s largest C2C e-commerce platform similar to eBay and Amazon. It is operated by the Alibaba Group founded by Jack Ma. In September 2014, Alibaba’s IPO was priced at $68, raising $21.8 billion for the company and investors. Alibaba is the biggest U.S. IPO in history. According to Alexa.com (2014), with around 760 million product listings, Taobao Marketplace is one of the world’s top 10 most visited websites as of November, 2014.

A typical C2C e-commerce is using online websites such as Amazon.com or eBay as an online auction to sell or buy products or services. In addition, C2C e-commerce might occur through various types of activities in chat rooms or discussion forums in online communities. In comparison, B2C e-commerce refers to an online transaction involving an established business enterprise such as Sears, JC Penny, Macy’s, Wal-Mart, and so on. In B2C e-commerce, business enterprises have established sound return policies that can protect customers who are not satisfied with their products or services. Moreover, these enterprises have provided online customer services that can help customers 24 hours a day, 7 days a week. On the other hand, since the website of C2C e-commerce usually plays mediating roles between sellers and buyers, the
website could not actively control both sellers and buyers (Kwahk et al., 2012). Therefore, it is not easy for a buyer to return a product and get a refund if a malicious seller sent an inappropriate product. As a result, it might cause customers to have less motive to purchase products or services in C2C e-commerce than in B2C e-commerce. Hence, C2C e-commerce has to be considered as a distinct area of research requiring a new frame of orientation. So far, the mainstream literature has focused mostly on B2C e-commerce (K. Jones & Leonard, 2007; Leonard, 2012).

The second research issue concerns the critical factors influencing customers’ acceptance of e-commerce. Prior studies have attempted to understand external factors (i.e., security, usability, or social influence) affecting customers’ acceptance of online shopping to help business establish or develop successful online channels. For many years, the issue of individual characteristics received little attention in the Information Systems (IS) field. The recent advances in personality psychology suggest that it is meaningful to integrate individual traits into the IS model and adopt the five-factor model (FFM), a comprehensive framework of personality. However, no research has been conducted on the effects of the individual characteristics of customers in e-commerce. Different types of people have different adoption rates, experience different levels of satisfaction, and experience different performance outcomes from using technology (Blank & Dutton, 2012; Uffen & Breitner, 2013).

In prior research, most researchers have tried to find significant factors that influence e-commerce usage by using structural equation modeling (SEM) which focuses on covariance-based SEM (CB-SEM) analyses with software
such as AMOS, EQS, LISREL, Mplus, and so on. CB-SEM develops a theoretical covariance matrix based on a specified set of structural equations. The technique focuses on estimating a set of model parameters in such a way that the differences between the theoretical covariance matrix and the estimated covariance matrix is minimized. The CB-SEM model estimation requires a set of assumptions to be satisfied with the multivariate normality of data, minimum sample size, and so on (J. Hair, Black, Babin, Anderson, & Tatham, 2006). Therefore, we need to consider another useful approach, that is, partial least squares SEM (PLS-SEM). PLS-SEM is a causal modeling approach aimed at maximizing the explained variance of the dependent latent constructs. It is contrary to CB-SEM’s objective of reproducing the theoretical covariance matrix, without focusing on explained variance. If CB-SEM assumptions are not met, or the research objective is prediction rather than confirmation of structural relations, then PLS-SEM is the preferred method.

The third research problem concerns interaction effects among factors influencing customers’ intention to use C2C e-commerce. Although many customers have perceived the risk in making transactions in C2C e-commerce due to security or privacy issues, they have been willing to use websites for C2C e-commerce such as eBay or Amazon.com to buy or sell products or services because of their usefulness, convenience, or the buyer protection program provided by the websites. In this case, perceived usefulness of C2C e-commerce might moderate the relation between perceived risk and C2C e-commerce use. This interaction effect occurs when the effect of an independent variable on a dependent variable varies according to the level of another
variable (Baron & Kenny, 1986). This effect has been widely involved in behavioral research in order to find various conditions that influence the strength of the relation between a predictor and an outcome. However, few research in the e-commerce field have considered the interaction effects among various factors influencing customers’ belief, intention or attitude. Therefore, it is meaningful for researchers to determine whether or not customers’ intention to use C2C e-commerce can be moderated by the relation among various factors.

The last research problem concerns practical solutions. Most research in the e-commerce field have tried to provide theoretical frames showing consumer behavior without providing practical solutions (AlGhamdi, Drew, & Al-Ghaith, 2011; Benamati, Fuller, Serva, & Baroudi, 2010; Chang & Chen, 2009; M.-Y. Chen & Teng, 2013; Devaraj, Fan, & Kohli, 2002; Fang et al., 2014; Fujinoki, Chelmecki, & Henry, 2014; Gefen, 2004; Karson, 2015; Y. H. Kim, Kim, & Hwang, 2009; Lai, Ulhas, & Lin, 2012; Lei, Hu, & Zhou, 2013; Leonard, 2012; McKnight, Choudhury, & Kacmar, 2002; Sexton, Johnson, & Hignite, 2002; Sharma, Bhadoria, & Srivastava, 2014). In these research, most researchers studying e-commerce have focus on active e-commerce users to investigate whether or not the research models developed by them are significant. In order to develop more effective strategies for e-commerce companies, both e-commerce users and non-e-commerce users should be studied. In addition, practical solutions based on theoretical implications should be provided by conducting a scientific analysis or an engineering method.
1.3 Research purpose and question

This research aims at addressing these limitations in existing research by developing a quantitative model of factors associated with C2C e-commerce usage. We suggest that personality traits and cognitive determinants on customers’ intention to use C2C e-commerce might be integrated into a single model. In this model we consider five dimensions (i.e. personality, usability, risk, institutional feature, and social influence), which have been found as main factors from previous research that influence IT adoption. Therefore, we make a theoretical framework by conceptualizing that customers’ intention to use C2C e-commerce are significantly driven by these five dimensions and the interaction effects between dimensions. Based on the theoretical framework, we also provide practical solutions to help C2C e-commerce website managers to increase their company’s revenues. Therefore, we explore the following questions:

- Which factors influence C2C e-commerce usage?

- Can personality as individual traits influence C2C e-commerce usage?

- Can customers’ intention to use C2C e-commerce predict their actual usage of C2C e-commerce?

- Are there interaction effects between factors that positively or negatively influence C2C e-commerce usage?

- Are there differences in perceptions toward C2C e-commerce usage between C2C e-commerce users and non-C2C e-commerce users?
- Can customers' purchase intention in C2C e-commerce be improved by redesigning C2C e-commerce websites?

This dissertation is organized as follows. Chapter 2 includes a literature review of the concept of e-commerce, the differences of B2C from C2C e-commerce, and five dimensions (i.e., personality, usability, risk, institutional feature, and social influence) that can influence C2C e-commerce usage. Chapter 3 presents the integrated model of C2C e-commerce with hypotheses proposed. Chapter 4 describes the research methodology and statistical methods that was used in this research. Chapter 5 presents the results. Finally, Chapter 6 discusses results and the contributions that this study provides to research and practice. The conclusion, limitations and future research are discussed in Chapter 7.
CHAPTER 2: LITERATURE REVIEW

This chapter provides a review of research from existing literature. It sets the stage for further discussion of model development and methodology for this research.

2.1 Electronic commerce

E-commerce spending in the United States reached approximately $262 billion in 2013, up 13.4% from $231 billion in 2012, according to research from Forrester Research Inc. In 2017 (FORReSTER, 2013), e-commerce spending is forecasted to reach $370 billion, which represents a nearly 10% compound annual growth rate from 2012. Forrester forecast that e-commerce transactions in the United States will account for 10% of all U.S. retail sales in 2017. That compares with 8% in both 2012 and 2013.

![Figure 1: Forecast: US e-commerce retail sale, 2012 to 2017.](image)

As shown on the Figure 1, the total volume of e-commerce retail sales has been
growing. According to Forrester, two factors are driving this growth. The first is the increasing use of smartphones and tablets, which are boosting the amount of time that consumers spend online. More than half of online consumers in the United States have smartphones (Thaler & Tucker, 2013). They are using them to research purchases, find stores, and find the best prices available. Some of them complete a transaction directly on the device. Tablet owners are also spending their leisure moments shopping online.

The second factor contributing to growth is traditional retailers' increased investments in their online sales department (Pozzi, 2013). Particularly, large retailers are trying to develop omni-channel retail experiences, allowing store associates to save a sale by ordering out-of-stock merchandise through online back-ends, and allowing online shoppers to pick up goods in local stores. Therefore, e-commerce retail sales have been gradually growing and its role in the current business environment has been becoming more important.

2.1.1 The concept of e-commerce

E-commerce consist in the sale and the purchase of products and services by means of telecommunication networks, particularly when online payment systems are employed. Products and services can be both physical and digital, and even meta-services that are required in other e-commerce application.

E-commerce provides several advantages with respect to traditional commerce with both service providers and customers:
- Product distribution is improved and made cheaper. In particular, the distribution cost of digital goods is reduced dramatically.

- It eases communication with customers and customer support. Customers can communicate with service providers and purchase 24 hours a day from their homes and workplaces.

- It eases price comparison, allows to retailers from all over the world, and allows the automation of the process of finding the best deal.

On the other hand, the main disadvantages that discourage customers use are the lack of hands-on product inspection and security / privacy concerns. Customers are not able to touch and feel the products, and colors might look different depending on the browser or the condition of monitors that is used. Product and money are not exchanged immediately at the counter. Generally speaking, a buyer should transfer money first, and then a seller ships the products purchased by the buyer. These transactions are mediated by technology and it might cause technical failures or miscommunication.

### 2.1.2 Two types of e-commerce: B2C VS C2C

Recently, C2C e-commerce has become more popular (K. Jones & Leonard, 2008). Particularly, in China, C2C e-commerce has been more popular than B2C in that the C2C transaction volume made up 64.9% of the whole online shopping market in 2013 (CNNIC, 2013). A typical C2C e-commerce is using online websites such as Amazon.com or online auction such as e-Bay to sell or
buy products or services. In addition, C2C e-commerce might occur through various types of activities in chat rooms or discussion forums in online communities. According to Jones & Leonard (2007), the following is an example of C2C e-commerce. “One consumer recalled a recent C2C e-commerce transaction conducted in a web-based discussion forum. He indicated to the other participants that he had a car part to sell. Another participant indicated a need for that part. They exchanged address information through the forum. Once the seller received the check from the buyer, he sent the part to him. While the payment and product was sent via postal mail, all interaction regarding the transaction was completed within the web-based forum” (Jones & Leonard, 2007, p. 40).

B2C e-commerce refers to an online transaction involving an established business enterprise on the enterprise website such as Sears, JC Penny, Macy’s, Wal-Mart, and so on. In B2C e-commerce, business enterprises have established sound return policies that can protect customers who are not satisfied with their products or services. Moreover, the enterprises have provided online customer services that can help customers 24 hours a day, 7 days a week. On the other hand, since the website of C2C e-commerce usually plays mediating roles between sellers and buyers, the website cannot actively control both sellers and buyers (Kwahk et al., 2012). In the example above (Jones & Leonard, 2007), it is not easy for the buyer to return the product and obtain a refund if a malicious seller sends an inappropriate product. As a result, it might cause customers to have less trust in C2C e-commerce than in B2C e-commerce. Hence, transaction in C2C e-commerce has to be considered as a distinct area of research requiring a new frame of operation. However, the

2.2 Customers’ intention to use e-commerce

In this research, we tried to find critical factors that can influence customers’ intention to use C2C e-commerce. Therefore, we need to discuss how customers’ intentions can be motivated and how these intentions influence their actual behavior based on two main theories previously developed and widely utilized: The Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). It is very meaningful to understand customers’ behavior in C2C e-commerce that we try to find determinants of intention to use C2C e-commerce since this intention influences their actual behavior (usage of C2C e-commerce).

Both the TRA and TPB focus on theoretical constructs concerned with individual motivational factors as determinants of the likelihood of performing a specific behavior. Both TRA and TPB posit that the best predictor of a behavior is behavioral intention. Now, we will further discuss each theory in the chapters below.
2.2.1 Theory of Reasoned Action

The Theory of Reasoned Action (TRA) was developed to better understand relationships between attitudes, intentions, and behaviors (Fishbein & Ajzen, 1975). The TRA is a model for the prediction of behavioral intention, spanning predictions of attitude and predictions of behavior. The TRA focuses on theoretical constructs concerned with individual motivational factors as determinants of the likelihood of performing a specific behavior. The components of TRA are three constructs (Figure 2): behavioral intention, attitude, and subjective norm. TRA suggests that a person’s behavior intention depends on the person’s attitude about the behavior and subjective norms.

![Diagram of Theory of Reasoned Action (TRA)](image)

Figure 2: Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975).

Behavioral intention measures a person’s relative strength of intention to perform a behavior (Fishbein & Ajzen, 1975).

According to the TRA, attitude is seen as a critical factor that affects behavioral intention, that is, individual behavior is predicted by their attitude towards that behavior and how they think other people would view him if they performed the
behavior. Individuals’ attitude is determined by the individuals’ beliefs about outcomes or attributes of performing the behavior, weighted by evaluations of those outcomes or attributes. Hence, those who hold strong beliefs that positively (or negatively) valued outcomes will result from performing the behavior will have a positive (or negative) attitude towards the behavior. This positive (or negative) attitude can influence their intention and behavior in order.

Subjective norm is an antecedent that influences individuals’ behavioral intention. This construct is a combination of perceived expectations from individuals or groups along with intentions to comply with these expectations. Individuals’ subjective norm is determined by their normative beliefs. For example, an individual who believes that certain referents think he or she should perform a behavior and is motivated to meet expectations of those referents will hold a positive subjective norm. Therefore, an individual’s attitude, combined with subjective norms, forms his behavioral intention.

### 2.2.2 Theory of Planned Behavior

As shown above, the important determinant of behavior is behavioral intention. Direct determinants of individuals’ behavioral intention are their attitude towards performing the behavior and their subjective norm associated with the behavior. The theory of Planned Behavior (TPB) adds perceived control over the behaviors. The TPB was proposed by Ajzen (1985). This theory was developed from the TRA. According to the TRA, if individuals evaluate the suggested behavior as positive (attitude), and if they think that others want them to perform
the behavior (subjective norm), this results in a higher intention (motivation) and they are more likely to do the behavior. However, behavioral intention does not always lead to actual behavior since behavioral intention cannot be a significant determinant of behavior where an individual’s control over the behavior is incomplete (Icek Ajzen, 1985). Therefore, Ajzen introduced the TPB by adding new component, “perceived behavioral control”. By adding this, the TPB could explain non-volitional behaviors for predicting behavioral intention and actual behavior.

Figure 3: Theory of Planned Behavior (TPB) (Icek Ajzen, 1985).

Perceived control is determined by control beliefs concerning presence or absence of facilitators and barriers to behavioral performance, weighted by their perceived power or the impact of each control factor to facilitate or inhibit the behavior. Perceived control is an independent determinant of behavioral intention, along with attitude towards the behavior and subjective norm.
2.3 Antecedents of customers’ intention to use C2C e-commerce

The research model for this study was designed to investigate the main factors that affect the intention to use C2C e-commerce and interaction effects among the main dimensions. As discussed in the previous chapter, an individual’s beliefs are important determinants to influence their behavioral intention. Based on this theoretical background, we developed our research model including customers’ various perceptions towards C2C e-commerce usage and personality traits. Therefore, this research model incorporated 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) institutional feature dimension, including buyer protection policy and third part recognition, and (5) green concern as a social influence dimension. This study also provides a theoretical framework to explain the role of personality and investigate the interaction effect between factors that can positively and negatively influence customers’ intention to use C2C e-commerce. Therefore, in the following sections we offer a discussion of the underlying theory motivating inclusion of each dimension in the model.

2.3.1 Personality dimension

Personality is defined as a set of characteristics unique to an individual. An individual’s perceptions, intentions, attitudes, motivations, and behaviors are
influenced by his or her personality (Ryckman, 2007). In other words, an individual’s attitudes, beliefs, cognitions, and behaviors are in part determined by their personality (Devaraj, Easley, & Crant, 2008). Personality traits are generally conceptualized as underlying individual characteristics that influence human behavior in a consistent manner across a variety of situations. Personality reflects the unique facets of each human being, the traits that define our essence, and it could be reflected in all of people’s thoughts and actions. Therefore, it is reasonable to expect that personality will play a part in an array of information systems (IS)-related processes and outcomes since traits play a ubiquitous role in human cognition and behavior.

Some studies exist in IS that incorporate traits such as personal innovativeness, self-efficacy, playfulness, or cognitive absorption. For instance, previous studies that have investigated factors affecting the adoption decisions of various technologies indicated that personal innovativeness, which is one of individual personality traits, is a significant predictor influencing the adoption of IT (Agarwal & Prasad, 1999; Crespo & Del Bosque, 2008; J. Lu, Yao, & Yu, 2005). Innovative individuals are more prone to try out any new IT (Agarwal & Prasad, 1999) and are viewed as “communicative, curious, dynamic, venturesome, and simulation-seeking” (C. Kim, Mirusmonov, & Lee, 2010). Thus, personal innovativeness is an important construct in studying individual behavior towards innovation. Some individuals are more innovative than others and these differences can be explained by personality traits (Agarwal & Prasad, 1998).

However, research on narrow personality traits has been subjected to criticism
concerning the discriminant validity of the various traits. Further, personality researchers have questioned whether or not domain-specific personality traits can really be considered as personality traits since they do not examine the impact of these traits beyond a specific range of behavior.

In particular, researchers interested in incorporating personality into IS theories are confronted with an overwhelming number of potential personality variables (Azam, Qiang, & Sharif, 2013; Devaraj et al., 2008), and there is a lack of grounded theory to guide a researcher in choosing which specific traits to include in a particular model. Fortunately, recent advances in personality theory have illuminated these choices.

There is considerable agreement among personality psychologists that the domain of personality can be described by five unique constructs. This theoretical approach to personality classification has come to be known as the Five-Factor Model (FFM), and the dimensions are often referred to as the big five. The FFM has been validated and used to predict an individual’s behavior across situations in a large number of empirical studies and meta-analyses in psychology. Within the field of psychology, the FFM is the most widely accepted personality taxonomy. It consists of five factors: openness, conscientiousness, extraversion, agreeableness, and neuroticism which have been meta-analytically found to subsume all other personality traits (McCrae & Costa, 1987). This taxonomy has contributed substantially to explaining human behavior in a variety of situations.
2.3.1.1 Five-Factor Model (FFM)

There are a number of different dimensions or traits present in various personality measures, definitions, and models. The FFM of human personality is one of the most established personality models (McCrae & Costa, 1987) and it is well accepted and widely used in research (Azam et al., 2013; Judge, Heller, & Mount, 2002). Recent advances in personality psychology suggest that a fruitful way to integrate individual traits into IS models and theories would be to adopt the FFM (Devaraj et al., 2008). The FFM can identify an individual's personality through a mix of traits (McCrae & Costa, 1987). An individual's personality can be described with five basic traits (Table 1). This model includes the five basic factors: openness, conscientiousness, extraversion, agreeableness, and neuroticism.

Table 1: Description of personality traits in the five-factor model.

<table>
<thead>
<tr>
<th>Personality traits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness</td>
<td>Associated with experience of new situations, flexibility, intelligence, propensity to try new ideas, and imaginativeness.</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>Defined as a tendency to show self-discipline and act dutifully and trustworthily.</td>
</tr>
<tr>
<td>Extraversion</td>
<td>Encompasses more specific traits like being sociable, energetic, outgoing, and assertive.</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>Defined as a tendency to be kind, considerate, likable, helpful, and cooperative.</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>Sometimes called emotional stability, neuroticism is characterized by being tense, moody, or anxious.</td>
</tr>
</tbody>
</table>

(Azam et al., 2013; Devaraj et al., 2008; McCrae & Costa, 1987; Svendsen, Johnsen, Almås-Sørensen, & Vittersø, 2013; Uffen & Breitner, 2013)
These traits provide systematic measures of an individual's personality which can be derived from a reliable and valid survey, the Adjective Check List (ACL) (Gough & Heilbrun, 1983). An individual's personality can be described by a specific value of each trait. Each trait's score exists along a continuum (K. D. Jones, 2010) (Figure 4).

Personality is described through a mix of traits in terms of profiles. The term profile is used to describe the specific mix of personality traits (K. D. Jones, 2010). Figure 4 shows examples of individual personality profiles.

Taken together, an individual's score on each of the FFM continua shows their unique personality profile. Figure 4 identifies two individual's scores for each personality factor with a sliding box. The first profile is the personality profile of an individual who is more open to new things than average, very conscientious, slightly more introverted than extraverted, relatively agreeable, and not very neurotic. On the other hand, the second profile is the personality profile of an individual who is relatively closed to new things, slightly less conscientious than average, slightly extraverted, very agreeable, and more neurotic than average. These profiles illustrate how individual factor values or scores can be taken together to provide a measure of personality. Now, we need to discuss each factor in the FFM to determine research hypotheses and incorporate them into our research model.
Figure 4: Examples of personality profile.

- **Openness**

Openness goes from "Closed" to "Open". A closed person tends to shy away from new situations, while an open person tends to be more flexible and open to new experiences and activities (K. D. Jones, 2010). Therefore, individuals
described as high on the openness dimension of personality are willing to try new and different things. They actively seek out new and varied experiences, and value change (McCrae & Costa, 1987). In terms of making decisions, people who score high on openness are more likely to make liberal decisions while people low openness tend to make more conservative and moderate decisions (Azam et al., 2013). It means that people who are more open could be more willing to embrace new concepts and be more careless with new situations and experiences. Compared to the traditional transaction, C2C e-commerce is a relatively new technology, and openness could lead to more transactions in C2C e-commerce.

• Conscientiousness

Conscientiousness is described along the "Unconscientious" to "Conscientious" continuum. Conscientious people are more likely to be self-disciplined and goal-oriented. On the other hand, those who are unconscientious tend to be more lackadaisical and undisciplined (McCrae & Costa, 1987). In terms of making decisions, individuals high on conscientiousness tend to be more serious and cautious since they are more likely to be responsible, dutiful, and trustworthy (Svendsen et al., 2013). According to Devaraj, Easley, and Crant (2008), a person with the conscientious trait is intrinsically motivated to achieve, perform at a high level, and take actions to improve their job performance. In C2C e-commerce, buyers could find more options in choosing products or services than options in the traditional market, by searching different websites or choosing products or
services provided by different sellers in the same C2C e-commerce website. In this case, buyers should spend more time and make more efforts in order to find better options, including cheaper options. Therefore, we expect conscientious people to tend to be more likely to make transactions through C2C e-commerce because conscientiousness reflects an intrinsic motivation to improve job performance wherever possible.

**Extraversion**

Extraversion goes from "Introverted" (reserved, repressed, quiet, or shy) to "Extraverted" (K. D. Jones, 2010). Extraversion can be defined as how sociable, outgoing, assertive, or energetic people are. People high in extraversion are social, active, and outgoing, and place a high value on close and warm interpersonal relationships (Behrenbruch, Söllner, Leimeister, & Schmidt, 2013; Watson & Clark, 1997). A meta-analysis found that more extraverted people have a particularly high performance in jobs with a social component, such as management and sales (Barrick, Stewart, & Piotrowski, 2002). In addition, extraversion is found to be associated with social use of the Internet such as SNS (Social Networking Site) because of the reasons discussed above (Svendsen et al., 2013). However, the use of C2C e-commerce is totally different from the use of SNS. In terms of activities in C2C e-commerce, buyers’ activities should not be shared with others because such information could be used by malicious hackers (Panis et al., 2002). Therefore, we would not expect that people high in extraversion are more likely to use C2C e-commerce than those low in extraversion even though extraversion is found to be associated
with social use of the Internet. On the contrary, considering the nature of introverted people, introversion might be more likely to be associated with C2C e-commerce. There may be cases where people are weighing costs and benefits and are willing to make trade-offs between traditional transactions in local stores or markets and C2C e-commerce. For example, introverted people might prefer transactions through C2C e-commerce to transactions in traditional markets. As mentioned above, people low in extraversion tend to be more reserved, quiet, and shy (Behrenbruch et al., 2013; Watson & Clark, 1997). This trait could make introverted people prefer transactions in C2C e-commerce to transactions in traditional markets in that they do not need to meet and see sellers face to face. Compared to extraverted people, it is more likely for introverted people to use C2C e-commerce, which is less associated with interpersonal relationships than transactions in traditional markets.

- **Agreeableness**

Agreeableness can be defined as a tendency to be kind, considerate, helpful, and cooperative (McCrae & Costa, 1987). Agreeable people tend to be more compassionate. On the other hand, those who are disagreeable show little to no concern for others in thought or action (K. D. Jones, 2010; McCrae & Costa, 1987). A meta-analysis suggests that agreeableness has significant effects on a person’s attitude involving considerable interpersonal interaction and teamwork, particularly when the interaction involves helping and cooperating with others (Barrick et al., 2002). According to Azam, Qiang, and Sharif (2013), those who score high on agreeableness have positive beliefs towards others.
while those who are low on agreeableness have little respect for others’ interests and well-being. In addition, individuals having respect for others tend to believe that others also have respect for them, that is, people scoring high in agreeableness tend to be more trustful. In C2C e-commerce, trust issues are very critical (Lee, 2009; C. Liao, Liu, & Chen, 2011; Shandan, Dan, Yunyun, & Yonghai, 2012). A general lack of trust has a negative effect inhibiting online transactions (AlGhamdi et al., 2011) and it is emerging as one of the significant obstacles to success in internet shopping (Alshehri, Drew, & Alfarraj, 2012). Research has shown that high levels of consumer trust encourage the use of C2C e-commerce and help retain online customers (K. Jones & Leonard, 2008). As mentioned above, those who are high in agreeableness tend to be more trustful and this trait could make them more likely to use C2C e-commerce.

There is one more aspect which could show relationship agreeableness and C2C e-commerce use. In C2C e-commerce, information asymmetry might make customers hesitant to purchase products or services. As buyers and sellers are separated by time and distance, buyers can only evaluate items through sellers’ descriptions, and the quality of a seller on fulfillment is unknown before transacting (Ghose, Panagiotis, & Sundararajan, 2008). Therefore, a sellers’ good reputation can reduce consumers’ concerns about risk and increase transactions through online. In C2C e-commerce, buyers could participate in evaluating sellers by providing scores on the item description, communication with the seller, and shipping. Through cooperation among customers, sellers’ reputation has been evaluated and provided to customers. As discussed, agreeableness has significant effects on a person’s attitude which involves helping and cooperating with others (Barrick et al., 2002). This
trait could show that people high in agreeableness are more likely to make transactions through C2C e-commerce while cooperating with other buyers.

- **Neuroticism**

Neuroticism is characterized by being tense, moody, or anxious (McCrae & Costa, 1987). Neuroticism is described along the “Unneurotic” to “Neurotic”. An unneurotic person is emotionally stable, while a neurotic person is tense, moody and anxious (McCrae & Costa, 1987). An individual who is emotionally stable could remain calm in various situations and feel secure even when risks occur (Behrenbruch et al., 2013). Those who are emotionally unstable show the tendency to experience vulnerability. According to Zhou and Lu (2011), an individual scoring high in neuroticism (low emotional stability) feels a lack of control and will not readily build trust in e-commerce. As we recognized, there were a lot of errors while making transactions and after transactions through e-commerce (Fang et al., 2014). In traditional markets, customers could easily make a correction whenever they have any problems. If they want to return products which they purchased, they can do it and easily get refunded. In C2C e-commerce, however, the process for returning products is not easy and needs more time than returning in traditional markets. Particularly, customers have experienced errors on financial transactions in C2C e-commerce in which they are billed twice for the same goods or services. Sometimes, the shipping takes more time than what customers expected and the product could be delivered to the wrong address. In these cases, those who are high in neuroticism tend to be more anxious and angry. Therefore, this trait can cause
them to be hesitant to make transactions in C2C e-commerce in the future, that is, people high in neuroticism are more likely to negatively respond and categorize the same stimulus in a more negative fashion.

2.3.2 Usability dimension

Compared to the traditional offline market, C2C e-commerce is viewed as one of the most effective ways to operate transactions because it offers many benefits including faster transaction speed, lower or no transaction handling fees, and cheaper price of goods or services (Lee, 2009; Turban, King, Lee, Warkentin, & Chung, 2004). These benefits can positively influence the customer’s inclination towards C2C e-commerce use. For the usability dimension, we identified perceived usefulness (PU), perceived ease of use (PEU), and perceived website quality (PWQ) as important factors influencing intention to use C2C e-commerce.

2.3.2.1 Perceived Usefulness (PU) & Perceived Ease of Use (PEU)

The technology acceptance model (TAM), originally developed by Davis (1986) attempts to explain technology usage and technology acceptance behaviors using two primary factors, PU and PEU (Figure 5). Davis defined PU as “the degree to which a person believes that using a particular system would enhance his or her job performance (F. D. Davis, 1989, p. 320)”. In terms of PEU, it was defined as “the degree to which a person believes that using a
particular system would be free of effort (F. D. Davis, 1989, p. 320)’. According to the TAM, users’ adoption of computer system depends on their behavioral intention to use, which in turn depends on attitude, consisting of two beliefs, namely perceived ease of use (PEU) and perceived usefulness (PU). PU and PEU are fundamental determinants of system use in an organization. These constructs also provide more appropriate measures for predicting and explaining system use than other constructs (F. D. Davis, 1989).

From an initial study investigating the acceptance of word-processor technology, the TAM was extended to personal computers (Igbaria, Livari, & Maragahh, 1995), the World Wide Web (Chau & Hu, 2001), telemedicine technology (Y. S. Wang, Wang, Lin, & Tang, 2003), Internet banking (Cheng, Lam, & Yeung, 2006; Lee, 2009; Z. Liao & Cheung, 2008), and e-commerce (Benamati et al., 2010; Devaraj et al., 2002; Gefen & Straub, 2000; Hartono, Kim, Na, Simpson, & Berkowitz, 2013; June Lu, Lu, Yu, & Yao, 2014; Pavlou, 2003; Shih & Chen, 2013). The other studies of applying the TAM in Internet banking use were conducted (Cheng et al., 2006; Lee, 2009; Z. Liao & Cheung, 2008; Yoon & Steege, 2013) and showed PU and PEU as having positive and direct effects on Internet banking which is part of e-commerce.

As discussed above, several previous studies have used PU and PEU in their models and investigated the relation with e-business. They found that both of these factors have significant influences on e-business (Chang & Abdul Hamid, 2010; Y. S. Wang et al., 2003). These findings show that both PU and PEU have been widely used for predicting the acceptance and use of information systems, and have been well applied to predict Internet adoptions.
In our study, we argue that PU could make a customer smoothly fulfill his or her task through C2C e-commerce, that is, they could meet their needs such as cheaper product price, on-time and accurate delivery, and so on. In terms of PEU, we believe C2C e-commerce websites have a good information system design which could facilitate customers’ interaction with the website and provide good quality e-service. Therefore, we expect that both factors should be important determinants influencing intention to use C2C e-commerce.

2.3.2.2 Perceived website quality

Aladwani and Palvia (2002) defined the website quality as a user’s positive evaluation of a website’s features, ensuring it meets the user’s needs and reflects the overall excellence of the website. They identified three dimensions of web quality: technical adequacy, web content, and web appearance. According to Zhong and Ying (2008), the website quality includes the website features that present measures of quality such as system, information, and service quality. Several researchers have posited that website quality includes
multiple dimensions, such as information quality, system quality, security, ease of use, user satisfaction, and service quality (Aladwani & Palvia, 2002; Delone, 2003; Hoffman & Novak, 2009; Urban, Amyx, & Lorenzon, 2009). Furthermore, Floh and Treiblmaier (2006) found that website quality including web design, structure and content plays an important role in influencing customer perceptions and attitude. Schaupp, Fan, and Bellanger (2006) conducted a survey to investigate whether or not the information quality and system quality affect customers’ perception towards the website. The results showed that information quality and system quality significantly influenced customers’ website satisfaction and willingness to use the website. In terms of the actual impact of the website quality on user satisfaction, Li and Jiao (2008) found that the website quality affects the actual use of online services. According to Alshehri and his colleagues (2012), the quality of government websites has become a key indicator of users’ satisfaction and acceptance of e-government services. Moreover, the perceived website quality has been reported to influence behavioral intention and usage decisions in many studies (Ahn, Ryu, & Han, 2007; Collier & Bienstock, 2009; Nelson, Todd, & Wixom, 2005; Parasuraman, Zeithaml, & Malhotra, 2005; Wixom & Todd, 2005; Yoon & Occean, 2015). As far as the website quality as an antecedent of trust in e-channels goes, some studies have shown that customers’ perception of the website quality influence their trust in the online transactions (Everard & Galletta, 2006; K. Jones & Leonard, 2008; Schlosser, White, & Lloyd, 2006). Therefore, we expect that the quality of C2C e-commerce websites is an essential factor and it needs to be investigated and included in the proposed model. If C2C e-commerce website design has a professional standard with
high quality, then it will promote customers’ trust and facilitate adoption.

2.3.3 Risk dimension

Although C2C e-commerce has become more popular, most customers perceive that shopping in websites is still riskier than shopping in traditional ways (Andrews & Bianchi, 2013; D.J. Kim, Ferrin, & Rao, 2008; Utz, Kerkhof, & van den Bos, 2012). Online markets are risky environments and there are plenty of opportunities for problems to arise. Forsythe (2006) found that customers’ perception of risk towards online shopping negatively impacts on their intention to purchase products or services online. Therefore, we need to discuss risk issues as the negative factor that cause customers to hesitate a transaction in C2C e-commerce websites. For risk dimension, we identified perceived security and perceived privacy as important factors influencing intention to use C2C e-commerce.

2.3.3.1 Perceived security

Perceived security in the context of C2C e-commerce usage and our model is defined as “a perceived potential loss due to fraud or a hacker compromising the security of e-commerce” (Lee, 2009, p. 2) and it refers to the customer’s subjective evaluation of the C2C e-commerce’s security. The concept of consumer-perceived security has been widely dealt with using an IT device or e-commerce and has been shown to influence consumer behavior in varying
According to Kim et al. (2010), for example, security statements are significant factors for improving customers’ perceived security, and in turn customers’ perceived security is positively influenced by their perceived trust in e-payment systems. Financial transactions are one of the primary activities in e-business (C. Liao et al., 2011). Making financial transactions using IT devices presents numerous risks for consumers since criminal acts can be performed with extremely high speed, and without any physical contact (K.-C. Cheung et al., 2013). In fact, many customers believe that they are vulnerable to identity theft using e-commerce such as Internet banking (Einwiller & Will, 2001). If an unauthorized person is able to get access to the Internet banking portfolio of a user, tremendous financial information may be in jeopardy and there might be considerable financial loss. Therefore, the most important categories of e-channels are likely to be a security risk related to the potential loss because of deficiencies in the operating system or misappropriation of funds through illegal external access (Littler & Melanthiou, 2006; Rotchanakitumnuai & Speece, 2003). As the number of products and services offered through the Internet grows rapidly, consumers are increasingly concerned about security issues. According to numerous studies (Grabner-Kräuter & Faullant, 2008; Howcroft et al., 2002; C. Kim et al., 2010; Lee, 2009; Treiblmaier et al., 2004; Yoon, 2009; Yoon & Steege, 2013), security issues have proven important barriers to the use of online services. Accordingly, security risk is widely considered the most important factor related to the use of C2C e-commerce (C. M. K. Cheung & Lee, 2006; Lee, 2009; Sayar
2.3.3.2 Perceived privacy

When buying some products on ebay.com, the website could automatically recommend other similar things to customers; when searching for information through Amazon.com, the website could offer other special products that may be of interest to customers. These services are based on customers’ privacy using cookies, trace of browser history, GPS and so on. For instance, Amazon.com stores, analyzes the previous transaction histories of customers, and calculates the similarity between customers to provide personalized recommendations (L. Chen & Liu, 2015). According to U.S. Consumer Confidence Index (TRUSTe®, 2014), ninety-two percent of Internet users are concerned about their online privacy and eighty-nine percent of consumers avoided doing business with companies they did not believe protect their privacy online. Basically, consumers are wondering about what kind of data is collected, what purpose, how long data is recorded for, how and what purposes their data is processed for. Customers online often hesitate to disclose personal or financial information to retailers because they feel that those retailers could make unauthorized use of it or divulge it to other retailers (Alharbi, Zyngier, & Hodkinson, 2013). Research in the information systems field has argued that information privacy is one of the most important issues in the current technology-based environment (Drennan, Sullivan, & Previte, 2006; Eid, 2011; Fujinoki et al., 2014; Karson, 2015; Krause & Horvitz, 2010; C. Liao et al., 2011; & Wolfe, 2007).
Miyazaki & Fernandez, 2001; Shin, 2010). Privacy issues include unauthorized sharing of personal information, spam from the online retailer, and disclosure of the patterns of buyer shopping behavior online (Miyazaki & Fernandez, 2001). During transactions through e-commerce websites, sellers could take advantages of personal information to gain an edge and buyers could view this as an invasion of privacy.

In this study, we define perceived privacy as “a perceived potential loss of privacy as a result of a voluntary or surreptitious information disclosure from C2C e-commerce websites”. Fundamentally, this privacy issue includes the customers’ activities and consists of information collection, sharing, use/reuse, and storage of data such as transaction histories, personal details, and demographic information.

2.3.4 Institutional feature dimension

According to the signaling theory, a signal is what a firm sends out to deliver its abilities. Generally, companies use several measures such as warranties, advertising, third party seals, and return policy to signal a products position or quality, decrease customers’ negative perception towards products or services, and increase customers’ intention to use C2C e-commerce. In our study, we argue that the third party recognition of security or privacy in C2C e-commerce websites and customer protection policy such as sound return policy by C2C e-commerce websites could have a positive effect on customers’ intention to use the website. For institutional dimension, we identified the third party recognition
and the buyer protection policy as important factors influencing intention to use C2C e-commerce.

2.3.4.1 Third party recognition

Zuckers (1986) suggests that intention to use e-commerce reflects the security customers feel about a situation because of guarantees, safety measures, and other structures such as third party recognition including security and privacy issues. Customers might believe that success is more likely since impersonal structures are in place to facilitate customers’ belief and attitude related to trust (K. Kim & Prabhakar, 2004). For example, consumers are worried about exposing their personal information and security of online transactions when they make a transaction through the Internet. In this case, the customers are concerned whether or not online transactions are safe when deciding to purchase some products or services through C2C e-commerce websites. They hope that the C2C e-commerce websites could provide effective measures to protect privacy or security. Controlling security or privacy problems can be an important role of the website since the security of information and disclosure of information during and after the transaction process might increase online consumers’ perceived risks (Kuo & Chen, 2011; Schneider, 2002). The third party institutions can reduce consumers’ perceived risks on security or privacy problems through online transactions (K. Jones & Leonard, 2008). When customers see such web assurance seals displayed on an unknown online vendor, they are more likely to make transactions via websites (S. Wang, Beatty,
Previous studies suggest three major issues in online transactions: privacy, security, and transaction integrity (Hu, Wu, Wu, & Zhang, 2010; D. J. Kim, Sivasailam, & Rao, 2004). The third party recognition such as web assurance seals can attempt to guarantee one or more of those three issues. For instance, a privacy assurance function is used to reduce customers’ perceived risk of leaking personal information via websites and TRUSTe, a third party institute, provides a privacy assurance seal assuring which any websites displaying its symbol conforms to its privacy standards (Figure 6). In terms of a security assurance function, it makes sure that the website uses a special protocol (i.e., HTTPS) to secure transactions and database to protect sensitive information such as users’ pass codes or credit card numbers. VeriSign, a third party institute, assures customers that websites displaying its symbol complies with its encryption and authentication standards. A transaction integrity assurance function is related to assuring fair transaction before, during, and after transactions via websites. For example, BBBOnline (Better Business Bureau in Online) guarantees that websites showing its symbol follow the rules by Better Business Bureau in online contexts. Many e-commerce websites have utilized the third party recognition to signal trustworthiness to customers and a third party web assurance seal have guaranteed more than one of these assurance functions within a single seal reassure (Hu et al., 2010; Wu, Hu, & Wu, 2010; Yoon, 2009).

Several studies have explored impacts of the third party recognition towards consumers’ belief and attitude in e-commerce. When customers perceive that a website makes a lot of efforts in addressing the security, privacy, and transaction integrity by utilizing the third party recognition, their perceived risk
in online shopping are likely to be reduced (D. Kim & Benbasat, 2003). With a higher level of perceived web assurance, consumers feel less anxious and become more confident in making transactions in websites (Wu et al., 2010). In terms of the third party recognition as an antecedent of trust in e-commerce, previous studies demonstrate that it contributes positively to consumers’ trust in e-commerce towards websites (Gefen, Karahanna, & Straub, 2003; Hu et al., 2010; McKnight, Kacmar, & Choudhury, 2004; Wu et al., 2010).

Consistent with findings from the previous research with regard to the relationship between the third party recognition and intention to use C2C e-commerce, we expect that the third party recognition should have a positive effect on intention to use C2C e-commerce.

Figure 6: Example of the Third Party Recognition (TPR) in eBay website.
2.3.4.2 Buyer protection policy

Because the inability to directly look at the physical product in an online environment, customer protection policy by a retailer plays a very important role in customers’ intention to purchase (Pei, Paswan, & Yan, 2014). According to interneteretailer.com (2014), online retailers have recognized that returns are a part of doing business and sound return policy is becoming a strong strategic tool to enhance sale, increase customer loyalty, and drive incremental revenue. Davis, Hagerty, and Gerstner (1998) found that a return policy increase companies’ profit under certain conditions. Mulkhopadhyay and Setaputra (2007) conducted a research on the optimal price and return policy and found that a return policy can help retailers to improve their profit. These meaningful results could show why retailers should provide customers with sound return policy to increase customer loyalty and their profit.

In the traditional markets or B2C e-commerce, as discussed before, retailers have established sound return policies which can protect customers who are not satisfied with their products or services. In addition, they have provided online customer services that can support customers 24 hours a day, 7 days a week. On the other hand, it is not easy for buyers to return products or services purchased through C2C e-commerce since C2C e-commerce websites are limited to mediating roles between sellers and buyers. There are few studies that show importance of providing sound return policy to protect customers in e-commerce. According to Wood (2001), the return policy helps to reduce time customers spend for searching products and increase their pre-purchase expectations of product quality. Bonifield, Cole, and Schultz (2010) studied the
relationship between e-retailer quality and its return policy leniency and found that their return policy positively influenced customers’ perception towards e-retailer quality. In order to make customers’ intention to use C2C e-commerce increase, C2C e-commerce websites actively provide the customer protection program. For example, eBay provides customers with the eBay money back guarantee (Figure 7). According to eBay (2014), buyers who purchased products or services through ebay.com can use the eBay money back guarantee when they do not receive an item or they receive an item that does not match the listing description. Most sellers work with buyers to actively resolve issues by accepting return and replacing products. However, if a buyer is not satisfied with it, eBay works with sellers to ensure that the buyer either receives the item he or she paid for or receives a refund. This guarantee program could play an important role as a strong signal to both buyers and sellers. By recognizing this program, buyers can trust transactions through the website since they can get return or refund whenever they have any problem with sellers. It means that this customer protection program could provide a positive signal to customers to make them actively participate in transactions through the website. For sellers, this program makes them accurately describe and ship products and services which are provided by them. Based on these reasonable discussions, the buyer protection program could have a positive effect on intention to use C2C e-commerce.
2.3.5 Social Influence dimension

Social influence may occur when an individual’s opinions, feelings or actions are affected by other people. Social influence, also known as subjective norm, is defined as perceived pressures from most people to make or not to make a certain behavioral decision (I. Ajzen, 1991; J. Lu et al., 2005). Previous research has shown that subjective norm has a significant impact on intention, attitude, and behavior for certain IT use (Agarwal & Prasad, 1998; Chan & Lu, 2004; Devaraj et al., 2008; Lee, 2009; Malhotra & Galletta, 2003). Limayem, Khalifa, and Frini (2000) also suggest that subjective norm, including mass media, advertisements, and friend influences, affects purchase intention in e-commerce; that is, it influences customers’ behavior. Previous research identifies two sources of social influence, namely, external and internal sources, which affect technology adoption behavior (Rogers, 1995). External sources are sources from mass media, advertisements, and other marketing-related
information. On the other hand, internal sources are defined as word-of-mouth influence from friends, family, and others. In this study, we consider green concerns as a construct related to social influence and incorporate it in our research model. Considering both external and internal sources of social influence, C2C e-commerce use might be encouraged by these sources.

With increasing pressure from various stakeholders in recent years, some organizations are concerned about their impact on the environment and have devoted their time and resources to support environmentally sustainable business activities. Some of the largest banks are also looking for ways to save the environment and resources (Todorova, 2010) and encourage their customers to go green by making transactions through online (Skonctue, 2010). For example, receiving online statements instead of paper transaction statements by mail is one way to preserve the environment and the e-commerce agent are trying to provide customers with this information by using external sources of social influence such as advertising through their website and sending e-mail to customers. Previous studies found that companies’ green efforts play an important role in improving customer satisfaction, loyalty, trust, and attitude (Maignan & Ralston, 2002; L. M. McDonald & Rundle-Thiele, 2008; Sen, Bhattacharya, & Korschun, 2006).

Today, consumers tend to associate “environmentally friendly” with product quality (Creyer, 1997; López-Nicolás, Molina-Castillo, & Bouwman, 2008) or for measuring a company’s concern for the consumer and society (G. D. Kang & James, 2007). More people are willing to “go green” to protect the environment. Further, people’s behavior towards green concerns is influenced by how other
people such as friends, family, co-workers, and others will view them. In this study, we expect customers use C2C e-commerce because they believe it is one way to save the environment, following other people who practice going green.

2.4 Interaction effects in e-commerce research

In this section, we have to discuss interaction between negative and positive factors influencing C2C e-commerce usage. According to the theory of risk and benefit judgments (Slovic & Peters, 2006), risk and benefit tend to be negatively correlated in people’s minds and judgments, that is, high risk is associated with low benefit and vice versa. It implies that people judge a risk not only by what they think about it but also by how feel about it. If affect guides perceptions of risk and benefit, then providing information about benefit should change their perception of risk and vice versa (Figure 8). If people perceive that an activity is beneficial, their perception of risk on the activity should be reduced. If people perceived that an activity is risky, their perception of benefit on the activity should be reduced. For example, information stating that benefit is high for C2C e-commerce should lead to more positive overall affect, which should, in turn, decrease perception of risk on C2C e-commerce.
In real life situations, although many customers have perceived the risk in making transactions in C2C e-commerce due to security or privacy issues, they have been willing to use websites for C2C e-commerce such as eBay or Amazon.com to buy or sell products or services because of its usefulness or the buyer protection program provided by the websites. In this case, perceived usefulness of C2C e-commerce might moderate the relation between perceived risk and C2C e-commerce use. This interaction effect occurs when the effect of an independent variable on a dependent variable varies according to the level of another variable (Baron & Kenny, 1986). This effect has been widely involved in behavioral research in order to find various conditions that influence the strength of the relation between a predictor and an outcome. However, few research in the e-commerce field have been consider the interaction effects among various factors influencing customers’ belief, intention or attitude. Therefore, it is meaningful for researchers to determine whether or not customers’ intention to use C2C e-commerce can be moderated by the relation among various factors.

When the moderating influence is tested, this influence should be modeled by creating a new variable that is the product of the variable which is being
moderated (X) and the variable which is moderating (Z). This interaction term (XZ) is then entered into the equation model after the linear main effects on the outcome (Y) of the moderating (Z) and moderated variables (X) are estimated. If the effect of XZ is statistically significant, then the effect of X on Y is dependent upon the levels of Z. Therefore, to test the moderating effects in our research model, we followed a product-indicator approach (W.W. Chin, Peterson, & Brown, 2008).

In Figure 9 presented at the next chapter, we created three interaction variables (i.e., the interaction variable between usability and risk, the interaction variable between social influence and risk, and the interaction variable between institutional feature and risk) by cross-multiplying the items in four dimensions (i.e., usability, social influence, institutional feature, and risk dimension). After creating three interaction variables, we tested whether or not the interaction variables influence intention to use C2C e-commerce. As a result, we need to consider customers’ perceived risk including perceived security and privacy as a moderator between other antecedents and customers’ intention to use C2C e-commerce.
CHAPTER 3: RESEARCH MODEL AND HYPOTHESES

In this research, we develop a quantitative model of factors associated with C2C e-commerce usage. To justify the need for this model, we addressed limitations in existing research in chapter 1. Based on these research problems and limitations, six research questions were proposed; which factors influence intention to use C2C e-commerce; can personality as individual traits influence intention to use C2C e-commerce; can customers’ intention to use C2C e-commerce predict their actual usage of C2C e-commerce; are there interaction effects between factors that positively or negatively influence intention to use C2C e-commerce; and are there differences between C2C e-commerce users and non-C2C e-commerce users? These research questions lead to the following hypotheses.

**Hypothesis 1.** A customer’s openness positively influences the intention to use C2C e-commerce.

**Hypothesis 2.** A customer’s conscientiousness positively influences the intention to use C2C e-commerce.

**Hypothesis 3.** A customer’s extraversion negatively influences the intention to use C2C e-commerce.

**Hypothesis 4.** A customer’s agreeableness positively influences the intention to use C2C e-commerce.
Hypothesis 5. A customer’s neuroticism negatively influences the intention to use C2C e-commerce.

In terms of personality traits presented in chapter 2: openness, conscientiousness, extraversion, agreeableness, and neuroticism, those factors in the FFM were integrated into C2C e-commerce model. These factors were tested to explain the role of personality that could influence customers’ intention to use C2C e-commerce.

From a usability dimension, we expect that customers’ perceptions of usefulness, ease of use, and website quality can significantly influence customers’ intention to use C2C e-commerce. As discussed above, PU and PEU have been widely used for predicting the acceptance and use of various e-channels. Perceived website quality also has been found to influence behavioral intention and usage decisions in a lot of previous research. Therefore, we propose the following hypotheses.

Hypothesis 6. A customer’s perceived usefulness positively influences the intention to use C2C e-commerce.

Hypothesis 7. A customer’s perceived ease of use positively influences the intention to use C2C e-commerce.

Hypothesis 8. A customer’s perceived website quality positively influences the intention to use C2C e-commerce.

We discussed risk dimensions including customers’ perception of security and privacy towards C2C e-commerce use in the previous chapter. These risk
factors could make customers hesitate to make transactions in C2C e-commerce websites. Hence, we propose the following hypotheses.

**Hypothesis 9.** A customer’s perceived security negatively influences the intention to use C2C e-commerce.

**Hypothesis 10.** A customer’s perceived privacy negatively influences the intention to use C2C e-commerce.

As also discussed, third party seals and buyer protection programs could be used as a strong strategic tool to reduce customers’ negative perception towards productions or services. In this study, therefore, we expect that the third party recognition and the buyer protection policy could positively influence the intention to C2C e-commerce and propose the following hypotheses.

**Hypothesis 11.** The third party recognition positively influences the intention to use C2C e-commerce.

**Hypothesis 12.** The buyer protection policy positively influences the intention to use C2C e-commerce.

Today, consumers tend to associate “environmentally friendly” with product quality (Creyer, 1997) or for measuring a company’s concern for the consumer and society (G. D. Kang & James, 2007). More people are willing to “go green” to protect the environment. Further, people’s behavior towards green concern is influenced by how other people such as friends, family, co-workers, and others will view them. In this study, we expect customers use C2C e-commerce because they believe it is one way to save the environment, following other
people who practice going green. Therefore, we propose the following hypothesis.

**Hypothesis 13.** A customer’s green concern positively influences the intention to use C2C e-commerce.

As we discussed, it is very meaningful to understand customers’ behavior in C2C e-commerce that we try to find determinants of intention to use C2C e-commerce since customers’ intention influences their actual behavior. Therefore, we propose the following hypothesis.

**Hypothesis 14.** A customer’s intention to use C2C ecommerce positively influences his or her actual usage of C2C e-commerce.

In the previous chapter, we discussed interaction effects among factors influencing customers’ intention to use C2C e-commerce. Therefore, we need to consider three interaction effects (i.e., the interaction between usability and risk, the interaction between social influence and risk, and the interaction between institutional feature and risk). In order to test whether or not the interactions effects are significant, we propose the following hypotheses.

**Hypothesis 15-A.** A customer’s perceived security concern moderates the relation between the perceived usefulness and intention to use C2C e-commerce.

**Hypothesis 15-B.** A customer’s perceived security concern moderates the relation between the perceived ease of use and intention to use C2C e-commerce.
Hypothesis 15-C. A customer’s perceived security concern moderates the relation between third party recognition and the intention to use C2C e-commerce.

Hypothesis 15-D. A customer’s perceived security concern moderates the relation between buyer protection policy and the intention to use C2C e-commerce.

Hypothesis 15-E. A customer’s perceived security concern moderates the relation between the green concern and intention to use C2C e-commerce.

Hypothesis 15-F. A customer’s perceived privacy concern moderates the relation between the perceived usefulness and intention to use C2C e-commerce.

Hypothesis 15-G. A customer’s perceived privacy concern moderates the relation between the perceived ease of use and intention to use C2C e-commerce.

Hypothesis 15-H. A customer’s perceived privacy concern moderates the relation between third party recognition and the intention to use C2C e-commerce.

Hypothesis 15-I. A customer’s perceived privacy concern moderates the relation between buyer protection policy and the intention to use C2C e-commerce.

Hypothesis 15-J. A customer’s perceived privacy concern moderates the
relation between the green concern and intention to use C2C e-commerce.

In order to develop more effective strategies for e-commerce companies, both e-commerce users and non-e-commerce users should be studied by investigating differences in C2C e-commerce usage between them. Therefore, we propose the following hypothesis.

**Hypothesis 16.** There are differences in perceptions toward C2C e-commerce usage between C2C e-commerce users and non-C2C e-commerce users.

In this study, we expect that an engineering solution to increase customers’ intention to use C2C e-commerce can be increased by redesigning C2C e-commerce websites. Therefore, we propose the following hypothesis.

**Hypothesis 17.** Customers’ intention to use C2C e-commerce can be increased by redesigning C2C e-commerce websites.

The research model that depicts seventeen hypotheses is illustrated in Figure 9. This model is a quantitative model of C2C e-commerce 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 part recognition. This research provides a theoretical framework to explain the role of personality and investigate customers’ perceived risk including perceived
security and privacy as a moderator between other antecedents and customers’ intention to use C2C e-commerce.

Figure 9: Integrated model of C2C e-commerce.
CHAPTER 4: METHODOLOGY

In this study, we tried to find significant factors that influence C2C e-commerce testing the research model we proposed and to investigate differences between C2C e-commerce users and non-C2C e-commerce users. In addition, we tried to provide the engineering solution as a practical implication. Therefore, we conducted three sub-studies: study 1, study 2, and study 3. In study 1, we conducted to test the proposed research model using PLS-SEM. In study 2, an independent variable t-test was performed to see whether or not differences existed in the C2C e-commerce usage for C2C e-commerce users compared to non-C2C e-commerce users. Finally, in study 3, we conducted a field experimentation to find how we can make customers effectively perceive the buyer protection program and third party recognition by comparing two C2C e-commerce website designs: the current eBay website and a new website design in which information of BPP and TPR are enhanced. Now, we will discuss methodologies for these three sun-studies respectively.

4.1 Study 1: Research model testing

In prior research, most researchers have tried to find significant factors that influence e-commerce usage by using structural equation modeling (SEM) which focuses on covariance-based SEM (CB-SEM) analyses with software such as AMOS, EQS, LISREL, Mplus, and so on. CB-SEM develops a
theoretical covariance matrix based on a specified set of structural equations. The technique focuses on estimating a set of model parameters in such a way that the differences between the theoretical covariance matrix and the estimated covariance matrix are minimized. The CB-SEM model estimation requires a set of assumptions to be satisfied with the multivariate normality of data, minimum sample size, and so on (J. Hair et al., 2006).

There is another useful approach, that is, partial least squares SEM (PLS-SEM) to be used for exploring causal relationships. PLS-SEM is a causal modeling approach aimed at maximizing the explained variance of the dependent latent constructs. It is contrary to the CB-SEM’s objective of reproducing the theoretical covariance matrix, without focusing on explained variance. If CB-SEM assumptions cannot be met, or the research objective is prediction rather than confirmation of structural relations, then PLS-SEM is the preferred method.

Now, we need to discuss a more appropriate statistical method that can be utilized in this study.

4.1.1 Why use SEM

There are different methods of analyzing the relationship between a given set variables namely (W.W. Chin et al., 2008; J. Hair et al., 2006):

- Multiple regression analysis (MRA)
- Path analysis (PA)
- Factor analysis (FA)
Structural equation modeling (SEM).

SEM is a multivariate method that allows the simultaneous examination of the relationships among the exogenous (independent) latent variables and endogenous (dependent) latent variables within a model (W.W. Chin et al., 2008; Fornell & Bookstein, 1982). A latent variable (LV) is an unseen construct that is responsible for the correlation among the measured variables. SEM modeling approach may be used to test the model by estimating errors in the measurement of LVs and errors in the hypothesized relationships between the LVs (the paths) (Fornell & Larcker, 1981).

Here is an example of the research model (Figure 10) for showing causal relationships in Internet banking use with a smart phone. In this model, customers’ perceived security issues were found to negatively influence Internet banking use with a smart phone and both PU and PEU were found to have a positive impact on Internet banking use. In Figure 8, the paths (straight arrows) are the hypothesized relationships between the independent LVs and the dependent LV. The path coefficients (β1, β2, β3...) are similar to the path coefficient in path analysis. The rectangular boxes represent the latent variables which are evaluated by the individual items (indicators or measurement items) on the questionnaire. In Figure 8, the latent variable ‘Perceived security concern (in rectangular items)’ is measured by seven individual items on the questionnaire.
Although, the model (Figure 10) is not as complex and there are no hypothesized relationships among the independent latent variables, SEM was considered a suitable option because all the variables of the model are latent rather than observed variables. In testing such model, there is need for a methodology that recognizes the latent variables in their theoretical networks, gain meaning from their definition, the specific theoretical context in which they are embedded, and from their manifest variables (Wynne W Chin, 1998). The methodology should be able to handle error in measurement and recognize error in theory such as surplus meaning in latent variables and unexplained variance.

Figure 10: An example of the research model for Internet banking use with a smart phone (Yoon & Occena, 2014).

Factor analyses (FA), multiple regression analysis (MRA) and path analysis (PA) are not suitable for the following reasons: MRA deals with relationship between single dependent variables and many independent observable variables. MRA
does not provide any test on validation or reliability for measuring latent variables (Lehman, 1991). PA and MRA deal with observed variable rather than LV and assume that the data used is normally distributed. The data for this study involves perceptive rating which is of unknown distribution.

FA could detect underlying latent variables from manifest variables and could provide information on the relationships (loadings) between the detected latent variables and their corresponding observed variables forming them (an equivalence of the loadings of the measurement items in the SEM measurement model). However, FA would provide no information about the relationship among the latent variables detected (the structural model).

Also, SEM was used because it allows a simultaneous assessment of the reliability and the validity of the measurement items of each latent variable of the model and at the same time can estimate the relationships among the latent variables (Barclay, Higgins, & Thompson, 1995) and the dependent variable. SEM approaches provide the capability to advance understanding by combining theoretical with empirical knowledge to an extent not possible with multiple regressions, factor analysis, and path analysis.

4.1.2 Structural equation modeling: CB VS PLS

There are two approaches that may be used for SEM analysis (Haenlein & Kaplan, 2004):
• Covariance-based structure analysis (as implemented by the LISREL and AMOS software programs and referred to as covariance-based SEM)

• Component-based analysis using partial least square estimation (as referred to as PLS-SEM and implemented by PLS-Graph 3.0 or SmartPLS software programs).

In this study, PLS-SEM with partial least square estimation was employed to test the model developed. PLS is a structural path estimation approach (Wynne W Chin, 1998) that is becoming a tool of choice in the social sciences as a multivariate technique for non-experimental and experimental data (McIntosh, Bookstein, Haxby, & Grady, 1996). PLS-SEM was developed by Wold and Jöreskog (Jöreskog, 1982; H Wold, 1975; Herman Wold, 1980). Similar to covariance-based SEM, it may be used to model the relationships among multiple latent variables (LV). It has the capability of working with unobservable latent variables and can account for measurement error in the development of latent variable (Wynne W Chin, 1998). PLS-SEM is used in this study for the following reasons:

4.1.2.1 Estimation assumption

Covariance-based SEM approach calculates the path coefficients by minimizing the differences between the sample covariance and those predicted by the theoretical model. Thus the model fit in covariance-based SEM makes use of maximum likelihood estimation approach. Similar to MRA and PA, covariance-based SEM are sensitive to deviation from normality so
that the results may not be an accurate reflection of the actual relationships among the latent variables (Norman & Streiner, 1996). Thus covariance-based SEM approach assumes multivariate normality (Fornell & Bookstein, 1982).

On the other hand, PLS-SEM uses a component-based approach, similar to principal components factor analysis (Compeau, Higgins, & Huff, 1999). PLS does not presume any distributional form of measured variables (Wynne W Chin, 1998; Herman Wold, 1982). PLS is distribution-free hence suitable for data from non-normal or unknown distributions (Falk & Miller, 1992). In this study, most of the measurement items (refer to Chapter 4.1 Measurement) are perception-based measured on a Likert scale. They are of unknown distribution, and since normality cannot be demonstrated, PLS-SEM was considered preferable to covariance-based SEM.

4.1.2.2 Sample size

Covariance-based SEM approach is sensitive to sample size. A smaller sample size could reduce the statistical power. Moreover, when the sample size is small, normality assumption which is required by covariance-based approach might not be strictly demonstrated. On another hand, with a large sample size, covariance-based approach may over-fit (Norman & Streiner, 1996). Muthen and Kaplan (1992) show that the usual \( \chi^2 \) test statistics for covariance-based structural equation models would depart from a \( \chi^2 \) distribution under the conditions of a small and a larger model. Two hundred samples are proposed
as a critical sample size from which to make accurate assessments of model fit in covariance-based SEM (Hoelter, 1983).

PLS estimates the model parameters using the original sample. However, to statistically validate the estimated model, PLS make use of resampling method to determine the confidence interval of the model parameters. Resampling are methods of validating models by using random subsets of data (Wynne W Chin, 1998; Kleijnen, Cheng, & Bettonvil, 2001) such as bootstrapping. Bootstrapping is a robust alternative to statistical inference based on parametric assumptions (such as normality) when those assumptions are in doubt (Mooney, Duval, & Duval, 1993). Hence, PLS is suitable where the sample size is relatively small (Fornell & Bookstein, 1982) and normality assumption is in doubt. Lohmoller (1993) presents examples where a model with 26 constructs and 96 indicators was appropriately estimated with 100 data cases. In another research conducted by Aibinu and Al-Lawati (2010), a model with 6 constructs and 17 indicators was significantly estimated by using 64 samples. The sample is not large enough for covariance-based SEM analysis.

4.1.2.3 Measurement assumption

PLS-SEM was preferable because covariance-based SEM assumes that the observed measures have random error variance and measure specific variance components, which are not of theoretical interest and are excluded from the measurement model (Anderson & Gerbing, 1988). Whereas, PLS-SEM assumes that the explanation of all observed measure variance is useful.
Because of the reasons discussed above, PLS-SEM has the capacity to deal with very complex models with a high number of constructs, indicators, and relationships (Aibinu & Al-Lawati, 2010; W.W. Chin et al., 2008; Garthwaite, 1994) and has been widely used in behavioral research field (J. F. Hair, Ringle, & Sarstedt, 2011).

4.1.3 Basic algorithm of PLS-SEM

PLS-SEM aims to estimate the relations among \( Q (q=1,…,Q) \) blocks of variables that are expression of unobservable constructs. In particular, this modeling is made of a system of interdependent equations based on simple or multiple regressions (J. F. Hair et al., 2011). It could estimate not only the network of relations among the latent variables, but also the links between the measured variables and their own latent variables (Kline & Santor, 1999).

Formally, let us assume \( P \) variables \((p=1,…,P)\) observed on \( N \) units \((n=1,…,N)\). The resulting data \((x_{npq})\) are collected in a partitioned data table \(X:\)

\[
X = [X_1,...,X_{q},...,X_Q]
\]

where \( X_q \) is the generic q-th block made of \( P_q \) variables.

In the PLS-SEM, the structural model can be written as:

\[
\delta_j = \beta_{0j} + \sum_{q,j} \beta_{qj} \delta_q + \varepsilon_j \tag{1.1}
\]

where \( \delta_j (j=1,…,J) \) is the generic endogenous latent variable, \( \beta_{qj} \) is the
generic path coefficient interrelation the $q$-th exogenous latent variable to the $j$-th endogenous one, and $\varepsilon_j$ is the error on the inner relation (i.e., disturbance term in the prediction of the $j$-th endogenous latent variable from its explanatory latent variables).

4.1.3.1 The quality indexes

PLS-SEM lacks a well identified global optimization criterion so that there is no global fitting function to assess the goodness of the model. Furthermore, it is a variance-based model strongly oriented to prediction (Wynne W Chin, 1998). Therefore, model validation generally focuses on the model predictive capability. As a result, each part of the model needs to be validated: the measurement model, the structural model and the overall model. That is why, PLS-SEM provides three different fit indexes: the communality index, the redundancy index and the Goodness of Fit (GoF) index (Kline & Santor, 1999).

For each $q$-th block in the model with more than one observed variable (i.e., for each block with $Pq > 1$) the quality of the measurement model is assessed by means of the communality index:

$$Com_q = \frac{1}{P_q} \sum_{p=1}^{Pq} cor^2(x_{pq}, \delta_q) \forall q : P_q > 1$$  (1.2)

This index measures how much of the observed variables variability in the $q$-th block is explained by their own latent variable scores $\delta_q$. Moreover, the communality index for the $q$-th block is nothing but the average of the squared correlations (squared loadings in case of standardized manifest variables)
between each manifest variable in the q-th block and the corresponding latent variable scores.

It is possible to assess the quality of the whole measurement model by means of the average communality index, i.e:

\[
\overline{Com} = \frac{1}{\sum_{q:P_q>1} P_q} \sum_{q:P_q>1} P_q Com_q
\]

(1.3)

This is a weighted average of all the Q block-specific communality indexes with weights equal to the number of observed variables in each block.

In view of linking the prediction performance of the measurement model to the structural one, the redundancy index computed for the j-th endogenous block, measures the portion of variability of the observed variables connected to the j-th endogenous latent variable explained by the latent variables directly connected to the block, i.e.:

\[
Red_j = Com_j \times R^2 (\hat{\delta_j}, \hat{\delta_q} q \rightarrow j)
\]

(1.4)

A global quality measure of the structural model is provided by the average redundancy index, computed as:

\[
\overline{Red} = \frac{1}{J} \sum_{j=1}^J Red_j
\]

(1.5)

where J is the total number of endogenous latent variables in the model.

As mentioned, there is no overall fit index in PLS-SEM (Aibinu & Al-Lawati, 2010). However, a global criterion of goodness of fit called as GoF has been proposed (Amato, Esposito Vinzi, & Tenenhaus, 2004). This index has been
developed in order to take into account the model performance in both the measurement and the structural model and thus provide a single measure for the overall prediction performance of the model. For this reason the GoF index is obtained as the geometric mean of the average communality index and the average $R^2$ value:

$$\text{GoF} = \sqrt{\bar{\text{Com}} \times \bar{R}^2} \quad (1.6)$$

Where the average of $R^2$ is obtained as:

$$\bar{R}^2 = \frac{1}{J} \frac{1}{2} R^2(\hat{\delta}_j, \hat{\delta}_q: \hat{\delta}_q \rightarrow \hat{\delta}_j) \quad (1.7)$$

As it is partly based on average communality, the GoF index is conceptually appropriate whenever measurement models are reflective. However, communalities may be also computed and interpreted in case of formative models knowing that, in such a case, we expect lower communalities but higher $R^2$ as compared to reflective models. Therefore, the GoF index can be interpreted also with formative models as it still provides a measure of overall fit (Wynne W Chin, 1998).

According to (1.3) and (1.7), the GoF index can be rewritten as:

$$\sqrt{\frac{\sum_{q:p_q \geq 1} \sum_{p=1}^{p_q} \text{Cor}^2(x_{pq}, \hat{\delta}_q)}{\sum_{q:p_q \geq 1} p_q} \times \frac{1}{J} \sum_{j=1}^{J} R^2(\hat{\delta}_j, \hat{\delta}_q: \hat{\delta}_q \rightarrow \hat{\delta}_j)} \quad (1.8)$$
4.1.3.2 Prediction-based model assessment

Now, we will show a very simple model with only three latent variables: $\delta_1$, $\delta_2$, and $\delta_3$ (Figure 11). The structural model defined in Figure 11 are formalized by the following equations:

\begin{align*}
\delta_2 &= \beta_{02} + \beta_{12} \delta_1 + \varepsilon_2 \quad (1.9) \\
\delta_3 &= \beta_{03} + \beta_{13} \delta_1 + \beta_{23} \delta_2 + \varepsilon_3 \quad (1.10)
\end{align*}

Where $\beta_{qj}$ (q=1,2 and j=2,3) stands for the path coefficient linking the $q$-th latent variable to the $j$-th endogenous latent variable, and $\varepsilon_j$ is the error term associated to each endogenous latent variable in the model.

![Figure 11: Path diagram of the structural model specified in (1.9) and (1.10).]

Equation (1.9 and 1.10) defines a structural model with only three latent variables and with three structural paths. Now, we will discuss hypothesis testing on the whole set of path coefficients.
4.1.3.3 Hypotheses testing on the whole set of path coefficients

Following the structure of the model defined in Figure 11, the null model is the model where: $\beta_{12} = \beta_{13} = \beta_{23} = 0$, while the saturated model coincides with one in Figure 11 (Nachtsheim, Neter, Kutner, & Wasserman, 2004).

\[ H_0 : \beta_{12} = \beta_{13} = \beta_{23} = 0 \] (1.11)

\[ H_1 : \text{At least one } \beta_{ij} \neq 0 \] (1.12)

We need to properly deflate $X$ in order to estimate $\Phi^{(B)}$. In particular, each endogenous block $X_j$ has to be deflated according to the specified structural relations by means of orthogonal projection operators. The block of observed variables linked to $\delta_2(X_2)$ has to be deflated by removing the linear effect of $\delta_1$ on $\delta_2$. On the other hand, the block of observed variables linked to $\delta_3(X_3)$ has to be deflated by removing the linear effect of both $\delta_1$ and $\delta_2$. However, the deflated block $X_{2(1)}$ has to be taken into account when deflating $X_3$:

\[ X_{2(1)} = X_2 - X_1 (X_1'X_1)^{-1}X_1'X_2 \] (1.13)

It is always possible to build blocks that verify the null hypothesis by means of a proper sequence of deflations (Wynne W Chin, 1998). The test is performed at a nominal confidence level $\alpha$, by comparing the GoF value for the model defined in (1.9) and (1.10) to the $(1 - \alpha)^{th}$ percentile of $\Phi^{(B)}$ build upon $\hat{F}_{X_1,X_{2(1)}X_{3(1,2)}}$. If $\text{GoF} > \Phi^{(B)}_{(1-\alpha)}$, then the null hypothesis is rejected. By comparing the GoF obtained for the default model on the bootstrap population with $\text{GoF}_{H_0}$ obtained from bootstrap samples ($b = 1, 2, ..., B$), an empirical $p$-
value can be computed as:

\[ p\text{-value} = \frac{\sum_{b=1}^{B} I_b}{B} \]  \hspace{1cm} (1.14)

where

\[ I_b = \begin{cases} 1 & \text{if } GoF_{H_0}^{(b)} \geq GoF \\ 0 & \text{otherwise} \end{cases} \]  \hspace{1cm} (1.15)

And \( B \) is the number of Bootstrap re-samples.

As stated in (1.11) and (1.12), the above procedure tests the null hypothesis that all path coefficients are equal to zero against the alternative hypothesis that at least one of the coefficient from 0.

\[ 4.1.4 \text{ Measurement} \]

To ensure the content validity of the survey scales, the items selected must represent the concept about which generalizations are to be made (Kerlinger & Lee, 2000). Items selected for measuring the constructs in our study were adapted from prior research to assure valid contents (Table 2). A survey was designed to include a two-part questionnaire as presented in Appendix A. The first part includes nominal scales, and the second part includes seven-point Likert scales, ranging from “strongly disagree” (1) to “strongly agree” (7). The first part is the demographic information comprised of eight questions used to collect data about age, gender, education background, race, frequency of using the Internet and main purpose of Internet usage. The second part of the survey
consisted of fifty-four questions to measure the constructs of personality (including openness, conscientiousness, extraversion, agreeableness, and neuroticism), PU, PEU, PWSQ, perceived security, perceived privacy, green concern, buyer protection policy, third party recognition, and intention to use C2C e-commerce. All items were modified for C2C e-commerce usage since they were originally developed for e-channels such as e-payment systems or general e-commerce. These instruments have been approved for use by the University of Missouri Institutional Review Board (IRB). The approval letter from the University of Missouri IRB can be found in Appendix B.

Table 2: Measurement Items.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Reference</th>
<th>Measurement Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness</td>
<td>McCrae &amp; Costa (1987)</td>
<td>I am curious about many different things.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I like to think up new ways of doing things.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I like to challenge the norms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I like to read challenging materials.</td>
</tr>
<tr>
<td>Extraversion</td>
<td>McCrae &amp; Costa (1987)</td>
<td>I feel comfortable around people</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I start conversations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I talk to a lot of different people at parties.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I do not mind being the center of attention.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am interested in other people’s problems.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I feel others’ emotions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am concerned about others.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I pay attention to details.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I follow a schedule.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I rarely forget to put things back in their proper place.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I change my mood a lot.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I get stressed out easily.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I am much more anxious than most people.</td>
</tr>
<tr>
<td>Perceived Usefulness</td>
<td>Cheng et al. (2006)</td>
<td>C2C e-commerce enables me to accomplish my tasks more quickly.</td>
</tr>
<tr>
<td></td>
<td>Kim et al. (2010)</td>
<td>C2C e-commerce is useful.</td>
</tr>
<tr>
<td>Aspect</td>
<td>Authors (Year)</td>
<td>Description</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>---------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Perceived Ease of Use*</td>
<td>Cheng et al. (2006) Kim et al. (2010)</td>
<td>It is easy to use C2C e-commerce to accomplish selling or buying products or services. C2C e-commerce is easy to use. Learning to operate C2C e-commerce would be easy for me. It is easy for me to remember how to perform tasks with C2C e-commerce.</td>
</tr>
<tr>
<td>Perceived Website Quality</td>
<td>Jones &amp; Leonard (2008)</td>
<td>The C2C e-commerce site I use is of high quality. The likely quality of the C2C e-commerce site I use is extremely high. The C2C e-commerce site I use must be of very good quality. The C2C e-commerce site I use appears to be of very high quality.</td>
</tr>
<tr>
<td>Green concern*</td>
<td>Lopez-Nicolas et al. (2008)</td>
<td>People around me have encouraged me to use C2C e-commerce to promote 'green'. My decision to adopt C2C e-commerce to promote 'green' is influenced by my friends. My decision to adopt C2C e-commerce to promote 'green' is influenced by my family or relatives. My decision to adopt C2C e-commerce to promote 'green' is influenced by my colleagues or peers.</td>
</tr>
<tr>
<td>Perceived Security Concern*</td>
<td>Kim et al. (2010) Eid (2011)</td>
<td>I would not feel safe in making transactions over C2C e-commerce websites. Purchasing on C2C e-commerce websites will cause financial risk. I am worried to use the electronic payment system such as PayPal on C2C e-commerce websites. C2C e-commerce websites do not have sufficient technical capacity to ensure that the data I send cannot be modified by hackers.</td>
</tr>
<tr>
<td>Perceived Privacy Concern*</td>
<td>Kim et al. (2010) Liao et al. (2011)</td>
<td>I would not feel safe providing personal privacy information over C2C e-commerce websites. I am worried to use C2C e-commerce websites because other people may be able to access my account. I am concerned that a person can find my private information I submit on C2C e-commerce websites. I am concerned about submitting information on C2C e-commerce websites.</td>
</tr>
<tr>
<td>Buyer Protection Policy*</td>
<td>Liao et al. (2011) Cheng et al. (2006)</td>
<td>C2C e-commerce sites I use provide me with sound buyer protection policy. I believe that buyer protection policy provided by C2C e-commerce websites can protect my transaction through the websites. Buyer protection policy provided by C2C e-commerce websites meets my expectation. C2C e-commerce websites have the necessary resources for buyer protection policy.</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------</td>
<td></td>
</tr>
<tr>
<td>I think third party recognition bodies (e.g., TRUSTe, Verisign, etc.) of C2C e-commerce are doing a good job.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing third party recognition bodies (e.g., TRUSTe, Verisign, etc.) of C2C e-commerce are adequate for the protection of C2C e-commerce buyes'/sellers' interests.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are many reputable third-party certification bodies available for assuring the trustworthiness of C2C e-commerce websites.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Intention to Use C2C E-Commerce</th>
<th>Kim et al. (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones &amp; Leonard (2008)</td>
<td></td>
</tr>
<tr>
<td>I am likely to purchase the products or services through C2C e-commerce websites.</td>
<td></td>
</tr>
<tr>
<td>I am likely to make another purchase through C2C e-commerce websites if I need the products or services that I will buy.</td>
<td></td>
</tr>
<tr>
<td>I am likely recommend C2C e-commerce website to my friend who want to buy or sell products of services.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C2C E-commerce Use*</th>
<th>Kim et al. (2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am buying products or services regularly through C2C e-commerce websites</td>
<td></td>
</tr>
<tr>
<td>On average I buy products or services through C2C e-commerce website _________.</td>
<td></td>
</tr>
<tr>
<td>(daily / weekly / biweekly / monthly / quarterly / semi-annually / annually)</td>
<td></td>
</tr>
</tbody>
</table>

### 4.1.5 Data collection

To assess the research model in Figure 9, a self-administered survey approach was used to collect data from C2C e-commerce users in the US. Mechanical Turk (MTurk), run by Amazon.com was utilized to distribute the questionnaire. This tool provides an online workforce that allows people to complete survey, or Human Intelligence Task (HITs) in exchange for money. It provides quick, easy, and inexpensive access to online research participants. Participants in MTurk complete HITs, including academic studies allowing rapid data collection for as little as 10 cents per participant (Goodman, Cryder, & Cheema, 2013). Many researchers in psychology, behavioral science, and consumer behavior field have recruited online study participants on MTurk (Buhrmester, Kwang, & Gosling, 2011; Goodman et al., 2013; A. McDonald & Cranor, 2010). According
to Goodman et al (2013), researches from at least 16 of the top 30 US universities had collected behavioral data via MTurk. In our research, 30 cents were provided to participants from individual funds. In this research, participants were given the questionnaire explained above via Amazon MTurk. We selected participants who are older than 20 years old, and are already C2C e-commerce users in the US for the sample population.

As discussed in chapter 2, the sample size in PLS-SME method is not sensitive and can be relatively small (Fornell & Bookstein, 1982). In order to figure out appropriate sample size, we considered a guide line by Hair, Ringle, and Sarstedt (2011). According to them, “minimum sample size for PLS-SEM should be equal to the larger of the following: (1) ten times the largest number of formative indicators used to measure one construct: or (2) ten times the largest number of structural paths directed at a particular latent construct in the structural model”(Hair et al., 2011, p. 144). Therefore, we need at least 40 samples because the largest number of formative indicator used to measure one construct is four. However, our model includes interactions between latent variables and so we tried to collect 400 samples.

Participants were asked to indicate on a seven-point Likert scale the degree to which they agreed with the statements. A copy of the survey instrument can be found in Appendix A. As required by the IRB, they were told that the survey is voluntary with a small amount of reward (30 cents) and their responses would be kept anonymous. Participants were asked to provide some demographic information. They were asked to answer the questions about their experiences with C2C e-commerce. The demographic profile of participants is summarized
in Table 3 and the degree of the Internet and C2C e-commerce experience among participants is summarized in Table 4.

Out of a total of 430 potential respondents, 402 chose to participate (93.5%) since 21 respondents did not complete and 7 respondent provided only neutral answers. The respondents’ ages ranged from 20 years to 58 years. In terms of gender of respondents, 246 male respondents (61%) were answered and 156 female respondents (39%) were answered.

94% of total respondents have used the Internet several times a day (62%) or daily (32%). All respondents had purchased an item using C2C e-commerce and about 70 % respondents have never been the seller of a C2C e-commerce transaction. In addition, e-mail, social network service, Internet banking, and online shopping have been mostly used by participants.

Table 3: Demographic profile of participants (C2C e-commerce users).

<table>
<thead>
<tr>
<th>Age</th>
<th>20 years old – 30 years old</th>
<th>31 years old – 40 years old</th>
<th>Older than 40 years old</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>34 (36%)</td>
<td>30 (32%)</td>
<td>30 (32%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>156 (39%)</td>
<td>246 (61%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>Completed elementary school</th>
<th>Completed high school or middle school</th>
<th>Attending college or university</th>
<th>Completed bachelor degree</th>
<th>Attending or completed master or doctoral degree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (0%)</td>
<td>54 (14%)</td>
<td>51 (13%)</td>
<td>221 (54%)</td>
<td>75 (19%)</td>
</tr>
</tbody>
</table>
Table 4: Degree of Internet and e-commerce experience among participants (C2C e-commerce users).

<table>
<thead>
<tr>
<th>Frequency of using the Internet</th>
<th>Several times a day</th>
<th>251 (62%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
<td>127 (32%)</td>
</tr>
<tr>
<td></td>
<td>Several times a week</td>
<td>8 (2%)</td>
</tr>
<tr>
<td></td>
<td>Weekly</td>
<td>8 (2%)</td>
</tr>
<tr>
<td></td>
<td>Monthly</td>
<td>8 (2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage of the Internet (Choose all that apply)</th>
<th>E-mail</th>
<th>384 (95%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Social networking</td>
<td>330 (81%)</td>
</tr>
<tr>
<td></td>
<td>Internet banking</td>
<td>329 (81%)</td>
</tr>
<tr>
<td></td>
<td>Online shopping</td>
<td>312 (77%)</td>
</tr>
<tr>
<td></td>
<td>Web-surfing</td>
<td>291 (72%)</td>
</tr>
<tr>
<td></td>
<td>News</td>
<td>282 (69%)</td>
</tr>
<tr>
<td></td>
<td>Movies / Music</td>
<td>241 (59%)</td>
</tr>
<tr>
<td></td>
<td>Online game</td>
<td>165 (41%)</td>
</tr>
<tr>
<td></td>
<td>Cloud computing</td>
<td>74 (18%)</td>
</tr>
<tr>
<td></td>
<td>Online dating</td>
<td>46 (11%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>16 (4%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C2C e-commerce experience</th>
<th>Buying products or services</th>
<th>278 (69%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Both buying and selling products or services</td>
<td>124 (31%)</td>
</tr>
</tbody>
</table>
4.2 Study 2: Differences between C2C e-commerce users and non-C2C e-commerce users

4.2.1 An independent variable t-test

In this research, we tried to provide useful information showing differences between C2C e-commerce users and non-C2C e-commerce users on independent variables. By doing so, we can deeply understand both C2C e-commerce users and non-C2C e-commerce users and provide useful strategies to make non-C2C e-commerce users actively participate in C2C e-commerce.

For comparison of independent factors between C2C e-commerce users and non-C2C e-commerce users, an independent variable t-test was performed to see whether differences existed in the C2C e-commerce usage for C2C e-commerce users compared to non-C2C e-commerce users. Each independent factor in the research model was used for a comparison between C2C e-commerce users and non-C2C e-commerce users.

4.2.2 Data collection and sample

The survey was conducted by utilizing MTurk like study 1. For study 2, we additionally selected 52 participants who are not using C2C e-commerce and older than 20 years old in the US. Questionnaires were exactly same with
questionnaires used in study 1. However, we removed last two questions (Table 2) to be used for evaluating actual C2C e-commerce usage since it is not appropriate to ask those questions (i.e., “I am buying products or services regularly through C2C e-commerce websites” and “On average I buy products or services through C2C e-commerce website _________”) to non-C2C e-commerce users.

The demographic characteristics of the respondents are presented in Table 5 and their experiences on Internet use are presented in Table 6. The respondents’ ages ranged from 20 years to 62 years. In terms of gender of respondents, 30 male respondents (57%) were answered and 22 female respondents (43%) were answered. 92% of total respondents have used the Internet several times a day (54%) or daily (38%). In addition, e-mail, web-surfing, and news searching have been mostly used by participants.

Table 5: Demographic profile of participants (non-C2C e-commerce users).

<table>
<thead>
<tr>
<th>Age</th>
<th>20 years old – 30 years old</th>
<th>14 (26%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>31 years old – 40 years old</td>
<td>11 (22%)</td>
</tr>
<tr>
<td></td>
<td>Older than 40 years old</td>
<td>27 (52%)</td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>22 (43%)</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>30 (57%)</td>
</tr>
<tr>
<td>Education</td>
<td>Completed elementary school</td>
<td>0 (0%)</td>
</tr>
<tr>
<td></td>
<td>Completed high school or middle school</td>
<td>12 (23%)</td>
</tr>
<tr>
<td></td>
<td>Attending college or university</td>
<td>9 (18%)</td>
</tr>
<tr>
<td></td>
<td>Completed bachelor degree</td>
<td>17 (32%)</td>
</tr>
<tr>
<td></td>
<td>Attending or completed master or doctoral degree</td>
<td>14 (27%)</td>
</tr>
</tbody>
</table>
Table 6: Degree of Internet experience among participants (non-C2C e-commerce users).

<table>
<thead>
<tr>
<th>Frequency of using the Internet</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Several times a day</td>
<td>28 (54%)</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>20 (38%)</td>
<td></td>
</tr>
<tr>
<td>Several times a week</td>
<td>3 (6%)</td>
<td></td>
</tr>
<tr>
<td>Weekly</td>
<td>1 (2%)</td>
<td></td>
</tr>
<tr>
<td>Monthly</td>
<td>0 (0%)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Usage of the Internet (Choose all that apply)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>E-mail</td>
<td>50 (96%)</td>
<td></td>
</tr>
<tr>
<td>Social networking</td>
<td>32 (62%)</td>
<td></td>
</tr>
<tr>
<td>Internet banking</td>
<td>24 (47%)</td>
<td></td>
</tr>
<tr>
<td>Online shopping</td>
<td>14 (27%)</td>
<td></td>
</tr>
<tr>
<td>Web-surfing</td>
<td>42 (81%)</td>
<td></td>
</tr>
<tr>
<td>News</td>
<td>40 (76%)</td>
<td></td>
</tr>
<tr>
<td>Movies / Music</td>
<td>12 (23%)</td>
<td></td>
</tr>
<tr>
<td>Online game</td>
<td>11 (21%)</td>
<td></td>
</tr>
<tr>
<td>Cloud computing</td>
<td>5 (9%)</td>
<td></td>
</tr>
<tr>
<td>Online dating</td>
<td>4 (8%)</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>2 (4%)</td>
<td></td>
</tr>
</tbody>
</table>

4.3 Study 3: A field experimentation

Based on theatrical and statistical results, we tried to provide an engineering solution to increase customers’ intention to use C2C e-commerce. In order to provide an engineering solution, we conducted an experiment.
4.3.1 Research design

In study 3, we tried to find how we can make customers effectively perceive the Buyer Protection Policy (BPP) and Third Party Recognition (TPR) by comparing two C2C e-commerce website designs: the current eBay website and a new website design in which information on BPP and TPR are enhanced.

Table 7: Summary of research design.

<table>
<thead>
<tr>
<th>R</th>
<th>Treatment (Website enhancing information on BPP &amp; TPR)</th>
<th>O_E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental group</td>
<td>No treatment (Current eBay website)</td>
<td>O_C</td>
</tr>
</tbody>
</table>

- R: Random assignment
- Experimental group
- O_E: The degree of intention to purchase products through the website enhancing information on BPP & TPR
- Control group
- O_C: The degree of intention to purchase products through current eBay website

4.3.2 Subject

We selected participants who are older than 20 years old and are already e-commerce users in Columbia, Missouri for the sample population. 60 samples were selected in the public library to participate in the experiment. And then, 30
samples were randomly assigned to each group using a random number generator.

4.3.3 Setting

The experiment was conducted in a silent room in the public library. In the room, a computer and a monitor were set up which provided the participants with C2C e-commerce websites based on the treatment condition.

4.3.4 Assumptions

In order to make the experiment more significant, we set four assumptions and the participants were notified of these assumptions before starting the experiment.

a. Participants are looking for products through a C2C e-commerce website.

b. Participants know that there are different options to purchase products such as local markets or B2C e-commerce websites.

c. Participants recognize that the products’ prices are cheaper than the price from different options (i.e., local markets or B2C e-commerce websites).

d. Participants have enough money to purchase the products.
4.3.5 Treatment

In order to investigate how information on BPP and TPR influence customers’ intentions to use the C2C e-commerce websites, thirty snap shots (Appendix C) for five different products (Apple MacBook, a regular chair, Samsung Galaxy S5 phone, Nikon D7000 camera, and Yankee candle) were shown to participants. Examples of the MacBook snap shots are in Figure 12-17. After looking over these snap shots, they were asked how much they want to purchase the products through the websites.

Figure 12: The snap shots 1 for control group.
Figure 13: The snap shots 2 for control group.

Figure 14: The snap shots 3 for control group.
Figure 15: The snap shots 1 for treatment group.

Figure 16: The snap shots 2 for treatment group.
4.3.6 Procedure

Before starting experimentation, we explained four assumptions. And then, two groups looked at the fifteen different snap shots respectively. For the experimental group, the snap shots with enhanced information on BPP and TPR were provided to participants. For the control group, the snap shots captured from the current eBay website were provided to participants. After that, all participants in both groups were asked how much they want to buy the products through the website.
CHAPTER 5: RESULTS

5.1 Study 1: Research model testing

5.1.1 Validity and reliability of measures

We use latent constructs which are not directly observed but are rather inferred from other variables that are directly measured to explain the determinants of intention to use C2C e-commerce. For instance, neuroticism is a latent construct in this research model. This construct cannot be directly evaluated or observed since it is one of personality traits which is abstract and invisible. Therefore, the level of an individual's neuroticism can be inferred from four observed measurement (questions in questionnaire); I am easily disturbed; I change my mood a lot; I get stressed out easily; and I am much more anxious than most people (Table 2). For estimating such models, we need to simultaneously consider both the measurement and structural components (J. Hair et al., 2006). Generally speaking, covariance-based structural equation models assume multivariate normal distributions (Fornell & Bookstein, 1982). However, studies related to human belief, behavior, and attitude have repeatedly indicated that their measures might be skewed (Peterson & Wilson, 1992) and might not meet the multivariate normality assumptions required by the covariance-based structural equation modeling techniques. Under such conditions, Chin, Peterson, and Brown (2008) recommend the use of PLS path modeling over the traditional covariance-based structural equation modeling approach since PLS employs a component-based approach for model estimation, and is not highly demanding on sample size and residual distribution.
These reasons enable the technique to avoid inadmissible solutions and factor indeterminacy. Therefore, it is more significant for researchers to use PLS path modeling when they try to estimate a larger complex model dealing with attitudes and behaviors. PLS path modeling avoids one incorrectly identified structural path or one construct having weak measures affecting all other estimates throughout as in the covariance-based structural equation model.

For data analysis, Harman’s single-factor test was used to check for any common method variance (CMV) because several variables were collected from the same source. CMV refers to the amount of spurious covariance shared among variables because of the common method used in collecting data. Such method biases are problematic because the actual phenomenon under investigation becomes hard to differentiate from measurement artifacts. Harman’s single-factor test requires that all variables be entered together. It assumes that, if all variables load on one factor accounting for all of the variance or one factor accounts for a majority of the variance, there is a high level of common method variance present. Therefore, we used exploratory factor analysis (EFA) and fifteen factors resulted with an eigenvalue greater than 1.0. The variance explained ranged from 5.451% to 87.767% of the total. This provided evidence that common method variance was not a concern.

Construct validity and reliability should be tested on the multi-item constructs of the model. Principal component analysis (PCA) was used to extract factors. Those with eigenvalues greater than 1.0 were retained. In addition, varimax rotation was conducted using a 0.50 cutoff to indicate high item correlations. Table 8 and 9 show the result of the factor analysis for all factors.
Table 8: Correlation matrix.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach’s $\alpha$</th>
<th>Composite Reliability</th>
<th>Eigenvalue</th>
<th>Mean</th>
<th>Standard Deviation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness (O)</td>
<td>0.793</td>
<td>0.863</td>
<td>1.896</td>
<td>4.55</td>
<td>0.96</td>
</tr>
<tr>
<td>Extraversion (E)</td>
<td>0.815</td>
<td>0.908</td>
<td>1.821</td>
<td>4.78</td>
<td>0.92</td>
</tr>
<tr>
<td>Agreeableness (A)</td>
<td>0.823</td>
<td>0.881</td>
<td>1.785</td>
<td>3.56</td>
<td>1.34</td>
</tr>
<tr>
<td>Conscientiousness (C)</td>
<td>0.702</td>
<td>0.822</td>
<td>1.795</td>
<td>3.45</td>
<td>1.21</td>
</tr>
<tr>
<td>Neuroticism (N)</td>
<td>0.854</td>
<td>0.898</td>
<td>1.315</td>
<td>3.21</td>
<td>1.65</td>
</tr>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>0.812</td>
<td>0.874</td>
<td>3.837</td>
<td>4.88</td>
<td>1.25</td>
</tr>
<tr>
<td>Perceived Ease of Use (PEU)</td>
<td>0.897</td>
<td>0.929</td>
<td>4.110</td>
<td>4.82</td>
<td>1.28</td>
</tr>
<tr>
<td>Perceived Website Quality (PWQ)</td>
<td>0.917</td>
<td>0.941</td>
<td>3.179</td>
<td>4.32</td>
<td>1.67</td>
</tr>
<tr>
<td>Security</td>
<td>0.902</td>
<td>0.931</td>
<td>3.911</td>
<td>3.19</td>
<td>2.35</td>
</tr>
<tr>
<td>Privacy</td>
<td>0.924</td>
<td>0.946</td>
<td>3.704</td>
<td>3.07</td>
<td>2.21</td>
</tr>
<tr>
<td>Third Party Recognition (TPR)</td>
<td>0.793</td>
<td>0.880</td>
<td>2.209</td>
<td>4.67</td>
<td>1.45</td>
</tr>
<tr>
<td>Buyer Protection Policy (BPP)</td>
<td>0.885</td>
<td>0.920</td>
<td>2.928</td>
<td>4.89</td>
<td>1.29</td>
</tr>
<tr>
<td>Green Concern (GC)</td>
<td>0.950</td>
<td>0.958</td>
<td>1.716</td>
<td>3.93</td>
<td>2.01</td>
</tr>
<tr>
<td>Intention to Use C2CE (IU)</td>
<td>0.872</td>
<td>0.922</td>
<td>1.340</td>
<td>4.32</td>
<td>1.48</td>
</tr>
<tr>
<td>Actual C2CE Use (USE)</td>
<td>0.718</td>
<td>0.786</td>
<td>1.784</td>
<td>3.65</td>
<td>1.56</td>
</tr>
<tr>
<td>Construct</td>
<td>AVE</td>
<td>O</td>
<td>E</td>
<td>A</td>
<td>C</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------</td>
<td>-----</td>
<td>----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>Openness (O)</td>
<td>0.611</td>
<td>0.792</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extraversion (E)</td>
<td>0.833</td>
<td>0.491</td>
<td>0.912</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreeableness (A)</td>
<td>0.650</td>
<td>0.538</td>
<td>0.501</td>
<td>0.806</td>
<td></td>
</tr>
<tr>
<td>Conscientiousness (C)</td>
<td>0.609</td>
<td>0.486</td>
<td>0.427</td>
<td>0.456</td>
<td>0.781</td>
</tr>
<tr>
<td>Neuroticism (N)</td>
<td>0.687</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>0.615</td>
<td>0.553</td>
<td>0.392</td>
<td>0.496</td>
<td>0.544</td>
</tr>
<tr>
<td>Perceived Ease of Use (PEU)</td>
<td>0.765</td>
<td>0.493</td>
<td>0.297</td>
<td>0.460</td>
<td>0.540</td>
</tr>
<tr>
<td>Perceived Website Quality (PWQ)</td>
<td>0.800</td>
<td>0.502</td>
<td>0.340</td>
<td>0.485</td>
<td>0.487</td>
</tr>
<tr>
<td>Security (SE)</td>
<td>0.773</td>
<td></td>
<td></td>
<td>0.094</td>
<td>0.028</td>
</tr>
<tr>
<td>Privacy (PR)</td>
<td>0.813</td>
<td></td>
<td></td>
<td>0.170</td>
<td>0.007</td>
</tr>
<tr>
<td>Third Party Recognition (TPR)</td>
<td>0.711</td>
<td>0.417</td>
<td>0.318</td>
<td>0.444</td>
<td>0.436</td>
</tr>
<tr>
<td>Buyer Protection Policy (BPP)</td>
<td>0.743</td>
<td>0.492</td>
<td>0.315</td>
<td>0.438</td>
<td>0.457</td>
</tr>
<tr>
<td>Green Concern (GC)</td>
<td>0.851</td>
<td>0.189</td>
<td>0.419</td>
<td>0.202</td>
<td>0.337</td>
</tr>
<tr>
<td>Intention to Use C2CE (IU)</td>
<td>0.797</td>
<td>0.463</td>
<td>0.222</td>
<td>0.366</td>
<td>0.319</td>
</tr>
<tr>
<td>Actual C2CE Use (USE)</td>
<td>0.658</td>
<td>0.374</td>
<td>0.371</td>
<td>0.343</td>
<td>0.327</td>
</tr>
</tbody>
</table>

The results showed that items have much higher self-loadings (the loading of an item for which it was designed) than cross-loadings (i.e., the loading of an item on a factor other than the one for which it was designed).

Second, in order to check that the measures used for the various constructs are reliable, we calculated composite reliabilities. As shown in Table 8, the composite reliability scores are highly satisfactory, that is, all scores are over 0.7. Cronbach’s alpha values for each construct were also estimated following...
the approach of Nunnally and Bernstein (1994). They range from 0.718 to 0.958, and all values are greater than the recommended value of 0.7, suggesting adequate measurement reliability.

Third, following Fornell and Larcker (1981), we estimated the average variance extracted (AVE) by each of the different latent constructs. AVE is a measure of convergence among a set of items that reflect a corresponding construct (MacKenzie, Podsakoff, & Podsakoff, 2011). This measure can be calculated using the formula given by Fornell and Larcker (1981) as:

$$\text{AVE} = \frac{\sum_{i=1}^{n} \lambda_i^2}{n}$$  \hspace{1cm} (2.1)

where $\lambda_i$ is the factor loading of the $i^{th}$ item representing a construct and $n$ is the number of items representing a construct.

AVEs are used to test the constructs for convergent and discriminant validity. For the purpose of convergent validity assessment. All latent constructs must have an average variance extracted higher than 0.5 (Fornell & Larcker, 1981; MacKenzie et al., 2011). This shows that the focal construct explains at least 50% of the variance in the items.

Fourth, in order to confirm that there is adequate discriminant validity among the various constructs, the correlations among the various latent constructs are reported in Table 9 as well. In the diagonal element of Table 9, we show the square root of AVEs (italic and bold region) by each of the latent variables is higher than the correlation between the latent variable and all the other latent variables. This demonstrates that the different latent variables extract a higher share of variance from their own indicators than from other latent variables. In
other words, discriminant validity is assured if the square root of AVE for each
constructs in the study (MacKenzie et al., 2011). Since the measurement model
is satisfactory, we can proceed to test the structural model. Next, we discuss
the structural modeling test that are used to evaluate our specified hypotheses.

5.1.2 Validation of the structural model

The path of the structural model was assessed. Each path (Figure 9)
corresponds to a hypothesis. Each hypothesis was tested by checking the sign,
size, and statistical significance of the path coefficients (β) between each latent
variable and the dependent variable. The higher the path coefficient, the
stronger the effect of a predictor latent variable on the dependent variable.

The significance of the path coefficients was tested by checking the significance
of the t-value for each path coefficients. This was conducted using the
SmartPLS 3.0. Table 10 shows the summary of the path results and the
corresponding t-values and estimated p-value associated with each t value.
Table 10 shows that ten out of fourteen paths are significant (i.e., Hypothesis 1,
4, 6, 7, 9, 10, 11, 12, 13, and 14 were supported). On the other hand, we found
that four path coefficients (Extraversion → Intention to use C2CE,
Agreeableness → Intention to use C2CE, Neuroticism → Intention to use C2CE,
PWQ → Intention to use C2CE) were not statistically significant (i.e.,
Hypothesis 2, 3, 5, and 8 were not supported.).
<table>
<thead>
<tr>
<th>Path</th>
<th>Expected sign</th>
<th>Path coefficient (β)</th>
<th>t-value</th>
<th>Sig.</th>
<th>Relevant Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness → Intention to use C2CE</td>
<td>+</td>
<td>0.118</td>
<td>1.997</td>
<td>0.023</td>
<td>H1 supported</td>
</tr>
<tr>
<td>Conscientiousness → Intention to use C2CE</td>
<td>+</td>
<td>0.128</td>
<td>2.533</td>
<td>0.006</td>
<td>H2 supported</td>
</tr>
<tr>
<td>Extraversion → Intention to use C2CE</td>
<td>+</td>
<td>0.015</td>
<td>0.352</td>
<td>0.362</td>
<td>H3 not supported</td>
</tr>
<tr>
<td>Agreeableness → Intention to use C2CE</td>
<td>+</td>
<td>-0.016</td>
<td>0.282</td>
<td>0.389</td>
<td>H4 not supported</td>
</tr>
<tr>
<td>Neuroticism → Intention to use C2CE</td>
<td>-</td>
<td>0.003</td>
<td>0.081</td>
<td>0.468</td>
<td>H5 not supported</td>
</tr>
<tr>
<td>Perceived usefulness (PU) → Intention to use C2CE</td>
<td>+</td>
<td>0.205</td>
<td>2.528</td>
<td>0.006</td>
<td>H6 supported</td>
</tr>
<tr>
<td>Perceived ease of use (PEU) → Intention to use C2CE</td>
<td>+</td>
<td>0.307</td>
<td>3.241</td>
<td>&lt;0.001</td>
<td>H7 supported</td>
</tr>
<tr>
<td>Perceived website quality (PWQ) → Intention to use C2CE</td>
<td>+</td>
<td>-0.015</td>
<td>0.190</td>
<td>0.425</td>
<td>H8 not supported</td>
</tr>
<tr>
<td>Perceived security → Intention to use C2CE</td>
<td>-</td>
<td>-0.181</td>
<td>2.482</td>
<td>0.007</td>
<td>H9 supported</td>
</tr>
<tr>
<td>Perceived privacy → Intention to use C2CE</td>
<td>-</td>
<td>-0.140</td>
<td>1.887</td>
<td>0.030</td>
<td>H10 supported</td>
</tr>
<tr>
<td>Third party recognition (TPR) → Intention to use C2CE</td>
<td>+</td>
<td>0.135</td>
<td>2.281</td>
<td>0.011</td>
<td>H11 supported</td>
</tr>
<tr>
<td>Buyer protection policy (BPP) → Intention to use C2CE</td>
<td>+</td>
<td>0.280</td>
<td>3.557</td>
<td>&lt;0.001</td>
<td>H12 supported</td>
</tr>
<tr>
<td>Green concern → Intention to use C2CE</td>
<td>+</td>
<td>0.189</td>
<td>3.021</td>
<td>&lt;0.001</td>
<td>H13 supported</td>
</tr>
<tr>
<td>Intention to use C2CE → C2CE use</td>
<td>+</td>
<td>0.668</td>
<td>18.659</td>
<td>&lt;0.001</td>
<td>H14 supported</td>
</tr>
</tbody>
</table>

In terms of the interaction effects (Table 11), we found that the third party recognition (TPR) and the buyer protection program (BPP) mediate the relation between perceived security and intention to use C2C e-commerce and the third party recognition (TPR) mediates the relation between perceived privacy and intention to use C2C e-commerce.
As shown in the table above, three interaction effects between security and TPR ($\beta=-0.124$, $p<0.05$), between security and BPP ($\beta=-0.171$, $p<0.05$), and between privacy and TPR ($\beta=-0.131$, $p<0.05$) are significant. In terms of interpretation on the interaction effect between perceived security and TPR ($\beta=-0.124$), if the standardized value of TPR is increased by 1, the regression coefficient between customers’ security concern and intention to use C2C e-commerce will decrease by 0.124. For the interaction effect between perceived security and BPP ($\beta=-0.171$), If the standardized value of BPP is increased by 1, the regression coefficient between customers’ privacy concern and intention to use C2C e-commerce will decrease by 0.131. For the interaction effect

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Independent variable</th>
<th>Moderator</th>
<th>Path coefficient ($\beta$)</th>
<th>t-value</th>
<th>Sig.</th>
<th>Relevant Hypothesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to use C2CE</td>
<td>Perceived security</td>
<td>Perceived Usefulness (PU)</td>
<td>0.057</td>
<td>0.747</td>
<td>0.455</td>
<td>H15-A not supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perceived Ease of Use (PEU)</td>
<td>0.035</td>
<td>0.402</td>
<td>0.688</td>
<td>H15-B not supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Third Party Recognition (TPR)</td>
<td>-0.124</td>
<td>2.005</td>
<td>0.045</td>
<td>H15-C supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buyer Protection Program (BPP)</td>
<td>-0.171</td>
<td>2.209</td>
<td>0.027</td>
<td>H15-D supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green concern</td>
<td>-0.012</td>
<td>0.209</td>
<td>0.835</td>
<td>H15-E not supported</td>
</tr>
<tr>
<td></td>
<td>Perceived privacy</td>
<td>Perceived Usefulness (PU)</td>
<td>0.055</td>
<td>0.742</td>
<td>0.458</td>
<td>H15-F not supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Perceived Ease of Use (PEU)</td>
<td>0.011</td>
<td>0.130</td>
<td>0.896</td>
<td>H15-G not supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Third Party Recognition (TPR)</td>
<td>-0.131</td>
<td>2.167</td>
<td>0.031</td>
<td>H15-H supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Buyer Protection Program (BPP)</td>
<td>-0.104</td>
<td>1.782</td>
<td>0.075</td>
<td>H15-I not supported</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Green concern</td>
<td>0.007</td>
<td>0.142</td>
<td>0.887</td>
<td>H15-J not supported</td>
</tr>
</tbody>
</table>

Table 11: Results of interaction effects.
between perceived privacy and TPR ($\beta=-0.131$), If the standardized value of TPR is increased by 1, the regression coefficient between customers’ privacy concern and intention to use C2C e-commerce will decrease by 0.131. Based on these results, we found that TPR and BPP moderate the relation between customers’ security concern and intention to use C2C e-commerce. In addition, in terms of the relation between customers’ privacy concern and intention to use C2C e-commerce, TPR moderates it.

5.2 Study 2: Differences between C2C e-commerce users and non-C2C e-commerce users

The results shown in Table 12 and Figure 18 provide us with personality profiles. In terms of difference of personality between C2C e-commerce users and non-C2C e-commerce users, only openness was significantly different between the two groups. As discussed above, people who score low on openness are considered to be closed to experience and tend to be conventional and traditional in their outlook and behavior. As a result, those who are more open are more likely to have a positive attitude or behavior toward C2C e-commerce usage since C2C e-commerce is a new technology. However, the other four traits did not show any differences between C2C e-commerce users and non-C2C e-commerce users.
Table 12: Comparison of personality between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Openness</td>
<td>5.26</td>
<td>4.62</td>
<td>2.002</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Extraversion</td>
<td>4.74</td>
<td>4.62</td>
<td>0.521</td>
<td>0.603</td>
</tr>
<tr>
<td>Agreeableness</td>
<td>4.67</td>
<td>4.83</td>
<td>-0.678</td>
<td>0.498</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>5.24</td>
<td>5.00</td>
<td>1.351</td>
<td>0.177</td>
</tr>
<tr>
<td>Neuroticism</td>
<td>4.19</td>
<td>3.77</td>
<td>1.597</td>
<td>0.111</td>
</tr>
</tbody>
</table>

Figure 18: Personality differences for C2CE use between C2CE users and non-C2CE users.

In Table 13, we found that all factors in the usability dimension have significant differences between C2C e-commerce users and non-C2C e-commerce users. It means that C2C e-commerce users differently perceive usability of C2C e-commerce websites from non-C2C e-commerce users; that is, C2C e-commerce users have more positive perception toward C2C e-commerce websites. This result provides us with meaningful implications. By controlling
the usability of C2C e-commerce websites, non C2C e-commerce users could start to use C2C e-commerce.

Table 13: Comparison of usability between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Usefulness (PU)</td>
<td>5.66</td>
<td>4.58</td>
<td>5.381</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Perceived Ease of Use (PEU)</td>
<td>5.98</td>
<td>4.67</td>
<td>6.359</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Perceived Website Quality (PWQ)</td>
<td>5.91</td>
<td>4.75</td>
<td>7.645</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 19: Usability differences between C2CE users and non-C2CE users.

As far as the institutional feature dimension goes, as we expected, we found that both TPR and BPP have significant differences between C2C e-commerce users and non-C2C e-commerce users (Table 14). It means that C2C e-commerce users and non C2C e-commerce users perceived institutional features of C2C e-commerce websites differently. In other words, non-C2C e-
commerce users have a less positive perception of C2C e-commerce websites’ institutional features. This result provides us with meaningful implications as well. If we provide non-C2C e-commerce users with information on TPR and BPP through C2C e-commerce websites, they might be willing to use C2C e-commerce websites to purchase products or services.

Table 14: Comparison of institutional feature between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional feature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buyer Protection Policy (BPP)</td>
<td>5.51</td>
<td>4.42</td>
<td>12.033</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Third Party Recognition (TPR)</td>
<td>5.63</td>
<td>4.30</td>
<td>6.339</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 20: Institutional feature differences between C2CE users and non-C2CE users.

However, there were unexpected results on customers’ perception of risk in
C2C e-commerce usage between C2C e-commerce users and non-C2C e-commerce users. We expected that there would be significant differences in perceived risk between the two groups. However, there is no significant difference in perceived risk between the two groups (Table 15 and Figure 21). This results show that both C2C e-commerce users and non-C2C e-commerce users have same level of risk perception toward C2C e-commerce usage. Therefore, it would not be effective for C2C e-commerce website managers to focus on security or privacy issues in order to make non-C2C e-commerce users participate in C2C e-commerce.

As shown in Table 16 and Figure 22, green concern as a social influence dimension did not have any differences between the two groups. In terms of intention to use C2C e-commerce, there is a significant difference between the two groups (Table 17 and Figure 23).

Therefore, as we expected, there were differences in perceptions toward C2C e-commerce usage between C2C e-commerce users and non-C2C e-commerce users (i.e., Hypothesis 16 was supported).
Table 15: Comparison of perceived risk between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Risk</td>
<td>Perceived Security</td>
<td>3.31</td>
<td>3.33</td>
<td>-0.117</td>
</tr>
<tr>
<td></td>
<td>Perceived Privacy</td>
<td>3.66</td>
<td>3.82</td>
<td>-0.729</td>
</tr>
</tbody>
</table>

Figure 21: Perceived risk differences between C2CE users and non-C2CE users.
Table 16: Comparison of social influence C2CE between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green concern</td>
<td>4.38</td>
<td>4.58</td>
<td>-0.973</td>
<td>0.334</td>
</tr>
</tbody>
</table>

Figure 22: Social influence differences between C2CE users and non-C2CE users.
Table 17: Comparison of intention to use C2CE between C2CE users and non-C2CE users.

<table>
<thead>
<tr>
<th>Factors</th>
<th>C2CE users (n=430)</th>
<th>Non-C2CE users (n=52)</th>
<th>t-value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intention to use C2CE</td>
<td>5.90</td>
<td>4.58</td>
<td>7.683</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Figure 23: Intention to use C2CE differences between C2CE users and non-C2CE users.

5.3 Study 3: A field experimentation

60 total people participated in this experiment. Demographic information of participants is shown in the table below.

Independent variable t-tests were performed to investigate whether differences existed between two different website designs for purchase intention through the website. Each product was used as a comparison between two different
website designs.

Table 18: Demographic profile of participants.

<table>
<thead>
<tr>
<th>Category</th>
<th>Experimental group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years old – 30 years old</td>
<td>8 (27%)</td>
<td>12 (40%)</td>
</tr>
<tr>
<td>31 years old – 40 years old</td>
<td>17 (56%)</td>
<td>15 (50%)</td>
</tr>
<tr>
<td>Older than 40 years old</td>
<td>5 (17%)</td>
<td>3 (10%)</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
<td>13 (43%)</td>
<td>14 (46%)</td>
</tr>
<tr>
<td>Female</td>
<td>17 (57%)</td>
<td>16 (54%)</td>
</tr>
</tbody>
</table>

As shown in Table 19 and Figure 24, there were significant differences between the two groups purchase intention for the MacBook, the Galaxy S5 phone, and the D700 camera, versus the ergonomic chair and the candle. Therefore, Hypothesis 17 was supported.

Based on this result, we found that TPR and BPP play a significant role in customers’ intention to use C2C e-commerce websites when customers try to purchase relatively expensive products such as computers, smart phones, and cameras. On the other hand, TPR and BPP did not influence customers’ intention to use C2C e-commerce websites when they try to purchase relatively cheap items such as the chair and the candle. These results have very practical implications. Whenever customers try to purchase expensive products or services, they might hesitate to make a decision. At this moment, if C2C e-commerce websites automatically show flashing information on TPR and BPP, customers are more likely to purchase the products or services through the C2C
e-commerce website. This can increase revenues of C2C e-commerce companies.

Table 19: Comparison of intention to buy products between two different website designs.

<table>
<thead>
<tr>
<th>Product</th>
<th>Current eBay design</th>
<th>Proposed design</th>
<th>t-value</th>
<th>Sig.</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacBook</td>
<td>4.27</td>
<td>5.73</td>
<td>-6.262</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>Black Executive Ergonomic Chair</td>
<td>4.37</td>
<td>4.20</td>
<td>0.822</td>
<td>0.414</td>
<td>No</td>
</tr>
<tr>
<td>Galaxy S5 Phone</td>
<td>4.23</td>
<td>5.56</td>
<td>-5.633</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>D7000 Camera</td>
<td>3.87</td>
<td>5.33</td>
<td>-6.110</td>
<td>&lt;0.001</td>
<td>Yes</td>
</tr>
<tr>
<td>Candle</td>
<td>4.97</td>
<td>5.13</td>
<td>-0.755</td>
<td>0.454</td>
<td>No</td>
</tr>
</tbody>
</table>

Figure 24: Differences between two different website designs.
CHAPTER 6: DISCUSSION

This study developed and evaluated an integrated model of factors associated with C2C e-commerce usage. The model is differentiated from previous research by not only including five dimensions (i.e., personality, usability, risk, institutional feature, and social influence), but also moderating effects between antecedent factors that influence C2C e-commerce use in the model. In particular, we provided practical implications based on the integrated model we proposed.

6.1 Significant factors influencing C2C e-commerce usage

This study is the first known attempt in published literature to develop a quantitative model to describe C2C e-commerce usage as a distinct area of research involving a new frame of operation. In this research, we showed which factors may motivate customers’ intention to use C2C e-commerce and their actual usage of C2C e-commerce. Therefore, the findings of our study have important contributions to the e-commerce field by demonstrating the roles of various factors that may influence C2C e-commerce usage.

Customers’ negative perceptions of security and privacy have been widely dealt with and have been found to play an important role in IT adoption (Choi & Lee, 2003; Drennan et al., 2006; Forsythe et al., 2006; J.-Y. M. Kang & Kim, 2012; Lee, 2009; Lei et al., 2013; H. Li et al., 2010; C. Liao et al., 2011; Littler &
Melanthiou, 2006; Miyazaki & Fernandez, 2001). Our study provides support for previous research showing that customers’ negative perceptions of security and privacy negatively affect C2C e-commerce usage.

In terms of the usability dimension, we expected that perceived usefulness (PU), perceived ease of use (PEU), and perceived website quality (PWQ) positively influence C2C e-commerce use. However, only PU and PEU were found to be a significant determinant of C2C e-commerce usage. As previously discussed, many previous studies have posited that PU and PEU are significant factors influencing acceptance of an information system. Using e-commerce websites is a typical usage of an information system and provides more comfortable and easier access to e-commerce. In this study, these two factors had significant effects on C2C e-commerce usage; that is, this implies that perceived benefit is the important positive predictor of C2C e-commerce usage. However, our result showed that perceived website quality was not a significant determinant in using C2C e-commerce website. Currently, C2C e-commerce websites have been well organized in design and it makes customers have a positive perception toward C2C e-commerce. Therefore, C2C e-commerce website quality might not be considered as a significant factor in C2C e-commerce usage.

Recently, green concern efforts to preserve the environment are more important and have been widely recognized by many people and communities (Skonctue, 2010). However, there is little research dealing with this issue. This study suggests customers’ green concerns as a social influence dimension that might influence C2C e-commerce use. Our result showed that green concerns
positively influence intention to use C2C e-commerce. Therefore, we suggest that social influence including mass media, advertisements, and peer influences, affects customers’ purchase intention in C2C e-commerce; that is, we can make customers more active in purchasing products or services through C2C e-commerce by providing appropriate campaigns or advertisements.

As discussed, companies use several measures such as warranties, advertising, third party seals, and return policies to signal a product’s position or quality, decrease customers’ negative perception towards products or services, and increase customers’ purchase intention. In our study, we expected that TPR of security or privacy in C2C e-commerce websites and BPP, such as sound return policies provided by C2C e-commerce websites, have a positive effect on customers’ intention to use C2C e-commerce website. For an institutional feature dimension, therefore, we identified TPR and BPP as influencing C2C e-commerce usage. We found that both TPR and BPP significantly influence C2C e-commerce usage. According to K. Jones and Leonard (2008), consumers may prefer to use structured C2C e-commerce websites to provide some recognition of standards being met. Our results also supported their opinion. Our study is the first trial to consider an institutional feature dimension including TPR and BPP in C2C e-commerce usage. In addition, expanding this perspective by adding other factors can be more significant for understanding customers’ perception, belief, and behavior. For example, C2C e-commerce websites adopt an e-payment system such as PayPal. An e-payment system could be used to facilitate the acceptance of electronic payment for online transaction. By using this system, the C2C e-
commerce website protects customers to make transactions through the websites. Therefore, this system can be a significant determinant that can increase customers’ purchase intention and actual purchase through C2C e-commerce websites.

In particular, no research has been conducted on the effects of the full set of individual characteristics of customers in e-commerce. As discussed, an individual’s perceptions, intentions, attitudes, motivations, and behaviors are influenced by his or her personality. Different types of people have different adoption rates, experience different levels of satisfaction, and experience different performance outcomes from using technology. However, personality has not been widely used in the Information Systems (IS) field even though there are some studies that have investigated e-commerce usage (Benamati et al., 2010; Chang & Chen, 2009; M.-Y. Chen & Teng, 2013; Crespo & Del Bosque, 2008; Devaraj et al., 2002; Du, Lu, Wu, Li, & Li, 2013; Eid, 2011; Fang et al., 2014; Gefen, 2004; Gong, 2009; Herrero Crespo & Rodríguez del Bosque, 2008; K. Kim & Prabhakar, 2004; Y. H. Kim et al., 2009; Leonard, 2012; H. Li et al., 2010; McKnight et al., 2002; Sharma et al., 2014). This research showed how personality traits motivate customers’ intention to use C2C e-commerce. As showed above, customers’ openness and conscientiousness have a positive impact on their intention to use C2C e-commerce. Therefore, this study is the first step to build a theoretical background illuminating the role of personality in C2C e-commerce and can inspire other scholars with a new direction for making the current theoretical frame of e-commerce more robust.
6.2 Interaction effects

Another important issue in this study is to investigate the interaction effects between factors in the four dimensions that may affect C2C e-commerce usage. We expected that all interaction effects would be significant. When considering only simple causal relations provided by previous research, researchers cannot explain complex situations in the current business environment. For example, several research studies found that perceived security concern negatively affects IT adoption. However, there may be cases where people are weighing costs and benefits and are willing to make trade-offs between security concerns and usability/ease of access/environmental impact that motivate their use of C2C e-commerce. These potential trade-offs where users are weighing the importance of different factors and their role in decisions to use or not use an e-commerce technology have not been evaluated in previous models. Through our study, we found that TPR and BPP moderate the relation between customers' perceived security and their intention to use C2C e-commerce. And, we demonstrated that third party recognition moderates the relation between customers' perceived privacy and their intention to use C2C e-commerce as well. It is an important implication that shows there are interaction effects between critical factors that may be representative of this type of trade-off consideration in motivating customers’ intention. For example, the interaction between customers’ perceived security and the buyer protection program on C2C e-commerce may show that customers with high security concerns may be able to trade those off with the sound return policy provided by C2C e-commerce websites.
6.3 Comparison of independent factors between C2CE users and non-C2CE users

In this research, we tried to provide useful information showing differences between C2C e-commerce users and non-C2C e-commerce users on independent variables. By doing so, we can deeply understand the consumer behavior of both C2C e-commerce users and non-C2C e-commerce users and provide useful strategies to make non-C2C e-commerce users participate in C2C e-commerce. As shown in Table 20, the usability dimension and the institutional feature dimension have significant differences between the two groups. Therefore, when companies that own a C2C e-commerce website have limited budgets, they could focus on increasing usability of the website or improving institutional features provided by the website.

Table 20: Summary of differences between C2C e-commerce users and non-C2C e-commerce users.

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Significant difference b/w C2CE users and non-C2CE users</th>
<th>No difference b/w C2CE users and non-C2CE users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personality</td>
<td>Openness</td>
<td>Extraversion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conscientiousness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Agreeableness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Neuroticism</td>
</tr>
<tr>
<td>Usability</td>
<td>Perceived usefulness</td>
<td>Perceived security</td>
</tr>
<tr>
<td></td>
<td>Perceived ease of use</td>
<td>Perceived privacy</td>
</tr>
<tr>
<td></td>
<td>Perceived website quality</td>
<td></td>
</tr>
<tr>
<td>Perceived Risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional feature</td>
<td>Buyer protection program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Third party recognition</td>
<td></td>
</tr>
<tr>
<td>Social influence</td>
<td></td>
<td>Green concern</td>
</tr>
<tr>
<td>C2CE usage</td>
<td>Intention to use C2CE</td>
<td></td>
</tr>
</tbody>
</table>
6.4 Engineering implication

The integrated model can be used to identify motivating factors and barriers to C2C e-commerce usage, and also more complex interactions between factors to better design C2C e-commerce websites and attract customers. Based on our results, C2C e-commerce website managers can enhance significant factors we found to attract more customers. According to the theory of human information processing (Shaki & Gevers, 2011), a variety of attention resources can influence human perception, decision, and response selection. In our research, for example, we found that a buyer protection program is a significant determinant of customers’ intention to use C2C e-commerce (Figure 25). A website manager can actively inform customers how the program can ensure the safety of their transaction. In addition, we found that green concerns are a significant determinant, so the manager can try to show that e-commerce can preserve natural resources. A strong awareness program might help educate consumers that C2C e-commerce is an important way to preserve and protect our environment. This perspective might increase total sales through their website.

In terms of the interaction effects among factors, we can demonstrate more practical implications to C2C e-commerce managers. C2C e-commerce websites provide customers with well-designed interfaces which can be used to make transactions by customers. These well-designed interfaces might be a strong tool to gain competitive advantage. However, in terms of security issues, due to the continuing evolution of Internet hacking techniques, customers may still be concerned with the safety of financial transactions through the websites.
In our study, we found that TPR and BPP can help to moderate the negative relation between perceived security and customers’ intention to use C2C e-commerce. Considering these interaction effects, C2C e-commerce website managers can continually focus on effectively providing customers with information on TPR and BPP. By doing so, customers who are highly concerned about security issues in C2C e-commerce may consider participating in transactions through the websites.

![Figure 25: Human information processing (Shaki & Gevers, 2011).](image)

As shown in Table 19, there were significant differences between the two groups in purchase intention for the MacBook, the Galaxy S5 phone, and the D700 camera versus the ergonomic chair and the candle. Based on this result, we found that TPR and BPP play a significant role in customers’ intention to use C2C e-commerce websites whenever customers try to purchase relatively
expensive products such as computers, smart phones, and cameras. On the other hand, BPP and TPR did not influence customers’ intention to use C2C e-commerce websites when they try to purchase relatively cheap items such as the chair and the candle. These results have very practical implications. When customers try to purchase expensive products or services, they might hesitate to make a decision. At this moment, if C2C e-commerce websites automatically show flashing information on TPR and BPP, customers are more likely to purchase the products or services. This can increase C2C e-commerce company's revenues.

6.5 Comprehensive understanding from three sub-studies

6.5.1 Theoretical implication

In this study, we provided an integrated model of determinants associated with C2C e-commerce usage as a distinct area of research requiring a new frame of operation. This study is the first known attempt in published literature to develop the integrated model. This model focusing on C2C e-commerce enriches the theoretical framework on e-commerce in the IS field by illuminating customers’ intention and behavior in C2C e-commerce. As previously discussed, consumer behavior in B2C e-commerce might be different from consumer behavior in C2C e-commerce. For instance, in B2C e-commerce, business enterprises have established return or refund policies that can protect customers who are not satisfied with their products or services. In addition, the enterprises have provided online customer services that can help customers 24
hours a day, 7 days a week. On the other hand, since the website of C2C e-commerce usually plays mediating roles between sellers and buyers, the website cannot actively control both sellers and buyers (Kwahk et al., 2012). Therefore, it is not easy for the buyer to return the product and obtain a refund if a malicious seller sends an inappropriate product. As a result, it might cause customers to have less trust in C2C e-commerce than in B2C e-commerce. Hence, C2C e-commerce has to be considered as a distinct area of research from B2C e-commerce. By understanding this integrated model focusing on C2C e-commerce, more appropriate marketing strategies for C2C e-commerce can be developed.

In addition, in this study, we provide the solid conceptual frame with five dimensions: personality, usability, risk, institutional feature, and social influence. In this integrated model, we systematically classified determinants associated with customers' perceptions in C2C e-commerce into these dimensions. Based on this classification, we or other scholars could easily expand this integrated model by adding more significant factors that could be associated with C2C e-commerce in the five dimensions. For example, for institutional feature dimension, we could add e-payment systems such as PayPal as another factor that might influence customers’ intention to use C2C e-commerce. By using our classification, the basic C2C e-commerce model can be systematically extended.

In particular, we found that BPP and TPR has an impact on customers’ purchase intention, showing these factors statistically influence customers’ intention to use C2C e-commerce in study 1. However, this result could not
show how to apply the theoretical implication to the real business environment. That is the reason why study 3 with a field experiment was conducted. Through study 3, we showed how C2C e-commerce websites managers should deal with information on BPP and TPR in their websites. The results of study 3 showed visually and aurally enhanced information on BPP and TPR effectively make customers pay attention. It means that the different types of information display could differently influence customers’ purchase intention in C2C e-commerce websites. Therefore, this result from study 3 could reinforce the findings in study 1 by extending its theoretical frame. In study 1, we found BPP and TPR influence customers’ intention to use C2C e-commerce (Figure 26).

![Institutional Feature Dimension](image)

<table>
<thead>
<tr>
<th>Institutional Feature Dimension</th>
<th>Intention to Use C2C e-commerce</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPP (Buyer Protection Policy)</td>
<td></td>
</tr>
<tr>
<td>TPR (Third Party Recognition)</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 26: Relation between BPP/TPR and Intention to use C2CE.**

Considering the results of study 3, we could extend this relation (Figure 26) by adding significant factors (as control variables): “Types of Information Display” and “Quality of Information Display (Figure 27). This implication could make scholars in the e-commerce field have more theoretical insights to extend the basic research model of C2C e-commerce.

In study 1, however, we recognized a limitation. Since we focused on C2C e-commerce users in our data sampling, we could not understand non-C2C e-commerce users’ perceptions toward C2C e-commerce. In this study, non-C2C e-commerce users can be defined as “those who use e-commerce but have
never had any experience to buy or sell products or services through C2C e-commerce websites. While we had insight into the motivations for C2C e-commerce users, we could not develop practical marketing strategies to make non-C2C e-commerce users participate in C2C e-commerce with the findings from study 1. Therefore, study 2 was developed to investigate the differences in perception toward C2C e-commerce between C2C e-commerce users and non-C2C e-commerce users. Through study 2, we found that five factors (i.e., PU, PEU, PWQ, BPP, and TPR) should be focused and controlled in order to motivate non-C2C e-commerce users to participate in C2C e-commerce. In the real business environment, a C2C e-commerce website company may have a limited budget and can benefit from focusing their efforts on these five factors to save cost and increase revenue.

Figure 27: Extending relation between BPP/TPR and Intention to use C2C e-commerce
6.5.2. Practical implications

In study 1, the theoretical framework was developed, but it was not clear how they could be translated into engineering solutions that could solve real problems faced by C2C e-commerce website companies and managers. Therefore, based on the results in study 1, we conducted study 3 to find practical strategies to increase customers’ intention to buy products through C2C e-commerce websites. In study 1, we found that BPP and TPR have a significant mediating role on the negative relation between customers’ security/privacy concerns and their intention to use C2C e-commerce. This implies that the negative relation between perceived security and intention to use C2C e-commerce could be weakened by enhancing customers’ perception of BPP and TPR guarantees provided by C2C e-commerce websites. In order to provide an engineering solution that could increase customers’ intention to use C2C e-commerce, study 3 was developed and conducted. In study 3, we found that visually and aurally enhanced information could make customers effectively pay attention. This factor positively influenced the degree of customers’ perception toward BPP and TPR, and increased their intention to use C2C e-commerce website.

Therefore, there was more of an evolutionary development that took place, starting with the development of the conceptual framework that integrated five dimensions in study 1 to help understand the motivations for C2C e-commerce users, which led to inclusion of study 2 to provide insight into the motivations for non-C2C e-commerce users, and finally to study 3 as an example of how the results in study 1 could be put to practical use. This evolution is represented
In addition, we need to discuss managerial issues. As discussed, BPP and TPR have a significant impact on customers’ intention to use C2C e-commerce websites and a mediating role between customers’ negative perceptions toward
C2C e-commerce and their intention to use the website. Therefore, we provide a recommendation including three ways to positively increase customers’ perception toward buyer protection policy and third party recognition provide by C2C e-commerce websites.

C2C e-commerce websites bury their return policy deep in their websites and load it with technical jargon. The websites continue to make the process far too onerous and fail to give shoppers a reasonable amount of time to return merchandise. As we discussed, buyer protection policies are key to increasing customer purchase intention. Because of the inability to directly look at the physical product and to directly meet sellers in C2C e-commerce transactions, customer protection policy plays a very important role in customers’ intention to purchase (Pei, Paswan, & Yan, 2014). According to interneteretailer.com (2014), online retailers have recognized that returns are a part of doing business and sound return policy is becoming a strong strategic tool to enhance sale, increase customer loyalty, and drive incremental revenue. Davis, Hagerty, and Gerstner (1998) found that a return policy increases companies’ profits under certain conditions. Mulkhopadhyay and Setaputra (2007) conducted a research on the optimal price and return policy and found that a return policy can help retailers to improve their profit. Although not directed to C2C e-commerce, these meaningful results could be applied to C2C e-commerce to provide customers with sound return policy to increase customer loyalty and their profit. Therefore, we strongly recommend C2C e-commerce managers to positively change their mind toward return policies.

Now, we recommend three ways for C2C e-commerce managers to make
return policy more consumer-friendly and increase their intention to use C2C e-commerce websites:

(1) Make return policies easy to find (Figure 29, Red circle).

C2C e-commerce website managers often worry that if they make return policies too prominent on their websites, they will encourage customers to send products back. However, hiding return policies can frustrate customers, as well as create more work for a company's employees. In addition, we recommend the website use “Plain English” to explain the policies. Try to include a clear description of the return policies in the site's terms and conditions, giving customers a concise “step-by-step summary” of how to handle a return. The summary’s main points should include:

- How long returns will be accepted

- How refunds are handled in terms of product exchanges and credit card or cash refunds

- Who is responsible for paying the shipping costs

(2) Ensure customers enough time period for returns.

Allowing enough time may seem like a sure way to encourage more returns. On the contrary, John Lawson, founder of 3rd Power Outlet, an Atlanta-based urban clothing and accessories retailer found that the number of returns slightly decreased, while the number of purchases increased when he lengthened the company's return policy from 14 to 90 days. Extending
the return period could makes customers feel more comfortable about making their purchase.

(3) Ask and check customers for feedback.

Consider sending customers an electronic thank-you card with a discount on a future purchase about a week after processing their return. And, take that opportunity to ask them for comments about their experience. Would they come back again? Would they recommend your business to other shoppers? How do they feel about your return policy? In addition, the C2C e-commerce website managers should regularly update the FAQ section of their website when they notice that customers are writing in with similar questions about purchases and returns. The sites should try to show how their return process is transparent and reasonable.

In terms of TPR, it should play an important role in customers' intention to use C2C e-commerce. C2C e-commerce website managers have adopted the third-party seals of approval, such as TRUSTe, BBBOnlinewe, VeriSign, and so on, because customers consider security and privacy issues in e-commerce important and are more willing to purchase products and provide personal information to the site. Therefore, the website managers need to actively develop and foster consumer trust more effectively with certificates from thrusted third parties.

Here is a recommendation for the websites managers. As we showed in study 3, the information of TPR should be effectively delivered to customers to make them recognize TPR that assures customers that the website they use is a
reliable and credible site to do business. We recommend the managers to actively provide customers with the information by placing the sign, logo, or seal of a trusted third-party with an educational video that introduces TPR on their website (Figure 29, Blue circle).

![Ebay homepage](image)

**Figure 29: Proposed design for C2CE website managers**

In our study, we found that TPR and BPP can help to moderate the negative relation between perceived security and customers’ intention to use C2C e-commerce. As previously explained in Chapter 5, three interaction effects between security and TPR ($\beta=-0.124$, $p<0.05$), between security and BPP ($\beta=-0.171$, $p<0.05$), and between privacy and TPR ($\beta=-0.131$, $p<0.05$) were significant (Table 11). If the standardized value of TPR is increased by 1, the standardized value of relation between customers’ security concern and
intention to use C2C e-commerce will decrease by 12.4%. These results show that there might be cases where customers are weighing costs and benefits and are willing to make trade-offs between their negative security perceptions and TPR/BPP that motivate purchase intention in C2C e-commerce (Figure 30). These trade-offs where customers are weighing the importance of different factors and their role in decisions to use or not use a C2C e-commerce website have not been evaluated in previous research. Our study demonstrates that there are interactions between these factors that may be representative of this type of trade-off consideration in motivating customers’ behaviors. Considering these meaningful results, C2C e-commerce website managers can focus on continually providing customers with information on TPR and BPP. As showed in study 1, there are many significant factors that influence customers’ intention to use C2C e-commerce websites. When C2C e-commerce website managers have limited budgets, they could focus on enhancing information on TPR and BPP provided by the websites. By doing so, customers who are highly concerned about security issues in C2C e-commerce may consider participating in transactions through the websites.
Figure 30: Illustration on interaction effect of TPR and Perceived Security
CHAPTER 7: Conclusion

This study further investigated customers’ intention and behavior in e-commerce by focusing on C2C e-commerce. In this study, a quantitative model of C2C e-commerce usage was developed, which incorporates five dimensions, namely, (1) the personality dimension, including openness, extraversion, agreeableness, conscientiousness, and neuroticism, (2) the usability dimension, including perceived ease of use, perceived usefulness, and perceived website quality, (3) the risk dimension, including perceived security and perceived privacy, (4) the green concern as a social influence dimension, and (5) the institutional feature dimension, including buyer protection policy and third party recognition. This model provides a theoretical frame for describing customer’s intention to use C2C e-commerce as a distinct area of research from B2C e-commerce. The proposed model can be used to identify motivating factors and barriers to C2C e-commerce usage, and also more complex interactions between factors, to better design C2C e-commerce websites and attract customers. In addition, this research investigated the interaction effect between factors that can positively or negatively influence customers’ intention to use C2C e-commerce. For a practical solution, we proposed new website designs for C2C e-commerce in order to increase customers’ intentions to use C2C e-commerce websites to purchase products or services.
7.1 Contribution

The findings have the potential to contribute to various fields. The contribution of this research is six-fold.

It enriches the theoretical framework on e-commerce in the Information Systems (IS) field. This is the first known attempt to develop a quantitative model to describe customers' intention to use C2C e-commerce as a distinct area of research requiring a new frame of operation.

Second, this study provides an integrated model of IS theory and the five factor model (FFM) in order to explain the role of personality, which has received limited attention in the IS literature. As mentioned, the FFM has been widely used in management and social science research to predict beliefs, cognitions, attitudes, and behaviors. In order to deeply understand customers' intention in C2C e-commerce, we integrate personality into other factors such as usability, risk, institutional feature, and social influence.

Third, we proposed a more appropriate statistical method, PLS-SEM, to maximize significance of data analysis for behavioral research in e-commerce.

Fourth, this study shows the interaction effect between factors in four dimensions (i.e., usability, risk, institutional feature, and social influence) to understand sophisticated situations that cannot be explained by analysis of simple causal relationships.

Fifth, we found how C2C e-commerce users and non-C2C e-commerce users are different from each other in personality and perceptions toward C2C e-
Finally, we proposed new website designs for C2C e-commerce by enhancing information on buyer protection programs and third party recognition for C2C e-commerce website managers and website designers in the e-commerce field.

Therefore, this research provides an integrated view of C2C e-commerce usage, including interactions between factors to reflect complex trade-offs present during human decision-making processes. In particular, the proposed model can be used to identify motivation factors and barriers to C2C e-commerce usage, and also complex interactions between factors. This leads to better design of C2C e-commerce websites, and attracts more customers to increase the usage of C2C e-commerce.

7.2 Limitations and Future Research

This study has limitations. In this study, we tried to find the relation between customers’ intention to use C2C e-commerce and their actual usage of C2C e-commerce via a survey. And, we found that customers’ intention to use C2C e-commerce influence their actual usage of C2C e-commerce. However, in order to investigate causation between these two factors, we need to conduct field experiments. By doing so, we can show whether or not customers’ intention to use C2C e-commerce leads to their actual behavior.

Another limitation concerns about unbalanced sample size in study 2. In study 2, we tried to find differences of customers’ perceptions toward C2C e-
commerce between two groups: C2C e-commerce users and non-C2C e-commerce users. However, sample size for two group were not balanced since difficulty of data collection for non-C2C e-commerce users. It might cause decrease of statistical power for data analysis. For future research, we need to collect same numbers of sample in different groups if we try to compare the two groups to increase statistical power for data analysis.

The third limitation of this study is that we collected data for study 3 from convenience samples for a plot study providing an engineering solution. Even though we randomly assigned samples into the two groups (i.e., the control group and the experimental group), samples were not randomly selected. This may cause selection bias. For future research, samples should be selected from various populations. In terms of data collection, in addition, we need to directly collect data from actual C2C e-commerce websites such as eBay or Amazon.com. As a result, the marginal skewedness of customers’ actual usage of C2C e-commerce could be mitigated.

Researchers in future studies can find more practical solutions to make non-C2C e-commerce users participate in C2C e-commerce to sell or buy products or services by conducting discriminant analysis. For instance, we found that openness and conscientiousness influence customers’ C2C e-commerce usage. This implies that those who scored low in openness and conscientiousness are less likely to use C2C e-commerce. Then, we need to find methods to identify unopen or unconscientious people in order to make them participate in C2C e-commerce. The method could be beneficial to C2C e-commerce websites managers to increase their revenues.
Appendix A. Questionnaire

Part 1: Please, circle relevant answer.

1. Have you ever used Consumer-to-Consumer (C2C) e-commerce? □ Yes □ No
   * C2C e-commerce is using online websites such as Amazon.com or online auction such as e-Bay to sell or buy products or services. It does not include an online transaction involving an established business enterprise such as Sears.com, JCPenny.com, BestBuy.com, Macy's.com, Wal-Mart.com, and so on.
   
   1-1. If yes, choose all transactions that you use for C2C e-commerce.
   
   □ Buying products or services
   □ Selling products or services
   □ Both buying and selling products or services

1-2. If no, you do not need to continue this survey. Please, stop here.

2. Your gender: □ Male □ Female

3. Your age groups:
   
   □ Younger than 20 years old
   □ 20 years old – 30 years old
   □ 31 years old – 40 years old
   □ Older than 40 years old

4. Do you have Internet connection either at home or using other devises (e.g., smart phone or tablet)? □ Yes □ No

5. How often do you use the Internet?
   
   □ Several times a day □ Daily □ Several times a week □ Weekly
   □ Monthly □ Other

6. When you use the Internet, what application(s) do you use? (Choose all that apply)
   
   □ E-mail □ Web-surfing □ News □ E-Commerce □ Internet banking
   □ Online game □ Social networking □ Cloud computing □ Movies / Music
   □ Online dating
   □ Other (Please, indicate. )
Part 2: Please, circle relevant answer.

1. Personality

<table>
<thead>
<tr>
<th>Openness</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am curious about many different things.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I like to think up new ways of doing things.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I like to challenge the norms.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I like to read challenging materials.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Extraversion</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I feel comfortable around people</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I start conversations.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I talk to a lot of different people at parties.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I don't mind being the center of attention.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Agreeableness</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I sympathize others’ feelings.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am interested in other people’s problems.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I feel others’ emotions.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am concerned about others.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Conscientiousness</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am always prepared.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I pay attention to details.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I follow a schedule.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I rarely forget to put things back in their proper place.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neuroticism</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am easily disturbed.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I change my mood a lot.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I get stressed out easily.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am much more anxious than most people.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
### 2. Usability

<table>
<thead>
<tr>
<th>Perceived Usefulness</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. C2C e-commerce enables me to accomplish my tasks more quickly.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. C2C e-commerce is useful.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3. C2C e-commerce is a convenient way to manage my finances.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4. C2C e-commerce eliminates geographic limitation and increases flexible mobility.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Ease of Use</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. It is easy to use C2C e-commerce to accomplish selling or buying products or services.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. C2C e-commerce is easy to use.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3. Learning to operate C2C e-commerce would be easy for me.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4. It is easy for me to remember how to perform tasks with C2C e-commerce.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Website Quality</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The C2C e-commerce site I use is of high quality.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. The likely quality of the C2C e-commerce site I use is extremely high.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3. The C2C e-commerce site I use must be of very good quality.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4. The C2C e-commerce site I use appears to be of very high quality.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

### 3. Social influence

<table>
<thead>
<tr>
<th>Green concern (Environmental protection)</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. People around me have encouraged me to use C2C e-commerce to promote 'green (environmental protection)'.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2. My decision to adopt C2C e-commerce to promote 'green (environmental protection)' is influenced by my friends.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3. My decision to adopt C2C e-commerce to promote 'green (environmental protection)' is influenced by my family or relatives.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4. My decision to adopt C2C e-commerce to promote 'green (environmental protection)' is influenced by my colleagues or peers.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
4. Risk

<table>
<thead>
<tr>
<th>Perceived Security Concern</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  I would not feel safe in making transactions over C2C e-commerce websites.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2  Purchasing on C2C e-commerce websites will cause financial risk.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3  I am worried to use the electronic payment system such as PayPal on C2C e-commerce websites.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4  C2C e-commerce websites do not have sufficient technical capacity to ensure that the data I send cannot be modified by hackers.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perceived Privacy Concern</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  I would not feel safe providing personal privacy information over C2C e-commerce websites.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2  I am worried to use C2C e-commerce websites because other people may be able to access my account.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3  I am concerned that a person can find my private information I submit on C2C e-commerce websites.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4  I am concerned about submitting information on C2C e-commerce websites.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

5. Institutional feature

<table>
<thead>
<tr>
<th>Buyer Protection Policy on return or refund</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  C2C e-commerce sites I use provide me with sound buyer protection policy.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2  I believe that buyer protection policy provided by C2C e-commerce websites can protect my transaction through the websites.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>3  Buyer protection policy provided by C2C e-commerce websites meets my expectation.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>4  C2C e-commerce websites have the necessary resources for buyer protection policy.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Third Party Recognition</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  I think third party recognition bodies (e.g., TRUSTe, Verisign, etc.) of C2C e-commerce are doing a good job.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>2  Existing third party recognition bodies (e.g., TRUSTe, Verisign, etc.) of C2C e-commerce are adequate for the protection of C2C e-commerce buyers'/sellers' interests.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
There are many reputable third-party certification bodies available for assuring the trustworthiness of C2C e-commerce websites.

6. Intention to use C2C e-commerce

<table>
<thead>
<tr>
<th>Intention to use C2C E-Commerce</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I am likely to purchase the products or services through C2C e-commerce websites within 6 months.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2 I am likely to make another purchase through C2C e-commerce websites within 6 months if I need the products or services that I will buy.</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3 I am likely recommend C2C e-commerce website to my friend who want to buy or sell products of services.</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

7. C2C e-commerce use

<table>
<thead>
<tr>
<th>C2C E-Commerce Use</th>
<th>1: Strongly agree</th>
<th>7: Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I am buying products or services regularly through C2C e-commerce websites</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2 On average I buy products or services through C2C e-commerce website _______.</td>
<td>1. annually</td>
<td>2. semi-annually</td>
</tr>
</tbody>
</table>
Appendix B. Approval letter from the University of Missouri IRB

January 14, 2015

Principal Investigator: Hyunshik Yoon
Department: Industrial/ManSys Engr

Your Exempt Application to project entitled: An integrated model of C2C-commerce usage focusing on personality, cognitive, human factor, risk, social influence, and institutional texture dimensions was reviewed and approved by the MU Institutional Review Board according to terms and conditions described below:

IRB Project Number: 1214664
Approval Date of this Review: January 06, 2015
IRB Expiration Date: January 06, 2016
Level of Review: Exempt
Project Status: Active - Open to Enrollment

The principal investigator (PI) is responsible for all aspects and conduct of this study. The PI must comply with the following conditions of the approval:

1. No subjects may be involved in any study procedure prior to the IRB approval date or after the expiration date.
2. All unanticipated problems, adverse events, and deviations must be reported to the IRB within 5 days.
3. All changes must be IRB approved prior to implementation unless they are intended to reduce immediate risk.
4. All recruitment materials and methods must be approved by the IRB prior to being used.
5. The Annual Exempt Form must be submitted to the IRB for review and approval at least 30 days prior to the project expiration date. If the study is complete, the Completion/Withdrawal Form may be submitted in lieu of the Annual Exempt Form.
6. Maintain all research records for a period of seven years from the project completion date.
7. Utilize the IRB stamped consent documents and other approved research documents located within the document storage section of eIRB. These documents are highlighted green.

If you have any questions, please contact the IRB at 573-882-3181 or irb@missouri.edu.

Thank you,
MU Institutional Review Board
Appendix C. The snap shots for experimentation

1. The snap shots for control group

1.1 MacBook
**Item specifics**

**Manufacturer:** Apple  
**Model:** MacBook Pro  
**Processor Type:** Intel Core 2 Duo  
**Processor Speed:** 2.4 GHz  
**Memory:** 4 GB  
**Hard Drive Capacity:** 250 GB  
**Operating System:** Mac OS X 10.5, Leopard

**Detailed item info**

**Product Identifiers**

- **Manufacturer:** Apple  
- **Model:** MacBook Pro  
- **Model Number:** A1286  

**Technical Features**

- **Display:** 13.3"  
- **Memory Technology:** DDR3  
- **Memory:** 4 GB  
- **Video Interface:** PCI Express  
- **Networking:** Ethernet  
- **Battery:** NOTE: battery run time is not included in the sale  
- **Dimensions:** 13.3" x 9.82" x 0.75"  
- **Weight:** 2.5 lbs

**Miscellaneous**

- **Release Date:** October, 2009  
- **Keyboard:** Notebook, Numeric, Trackpad

---

**eBay Checkout: Confirm order**

You're almost done! Until you complete checkout, another eBay user may buy this item.

**Ship to**

Hyun Shin Yoon  
2411 Carrington Dr.  
Cincinnati, OH 45202-1259  
United States  
(513) 888-9003  
Change address

**Pay with**

PayPal:  
Learn more about PayPal

**Add a donation to Alzheimer's Association**

Additional giving amount: $0.00  
Redemption code:  

**Total:** $499.99

---

131
1.2 Ergonomic chair

Description:
Modern and elegant design, great for home and office use.
5pcs 360-degree swiveling castors for easy movement.
Super strong base and with gas lift design.
Comfortable padded seat and fabric mesh backrest.
With stand bars on the back, can be used to hold your bag, etc.
Fully adjustable height (total height adjustable from 84cm/33" to 94cm/37"
Easy to assemble and maintain, super reliable and durable.
Color: Black.

Approximate Size----
Seat Size: 46cm x 43cm x 5.5cm/ 18.1" x 16.9" x 2.2" (L&W&T)
Backrest: 41.5cm x 45.5cm/16.3" x 17.9"
Armrest Part: 25cm x 5cm/9.8" x 2"
Armrest Height: 24cm/ 9.4".

Package included:
1 x Chair (All fittings)
1.3 Galaxy S5 phone
Detailed item info

Product Information
Having a robust processor in combination with Android operating system, the Samsung Galaxy S5 is equipped with a 5-inch Screen, 4 GB of RAM, 16 GB of internal storage, a 13 MP rear camera, and a 2.5 MP front camera. The phone also supports 4G LTE and Wi-Fi for seamless connectivity.

Product Highlights

- **Video**
- **Music**
- **Phone**
- **Camera**

## Product Identifiers

- **Brand:** Samsung
- **Model:** SM-G900A
- **Color:** Black

## Key Features

- **Screen Size:** 5.00 inches
- **Display Resolution:** Full HD, 1080 x 1920 pixels
- **Processor:** Quad-core, 2.5 GHz
- **Graphics:** Adreno 420
- **Camera:** 13 MP rear, 2.5 MP front
- **Storage:** 16 GB internal, expandable to 64 GB
- **Battery Capacity:** 2800 mAh
- **Operating System:** Android 4.4.2

## Memory

- **Supported Memory Cards:** MicroSD

## Battery

- **Battery Capacity:** 2800 mAh

## Display Technology

- **Type:** Super AMOLED

## Other Features

- **Network:** 4G LTE, Wi-Fi, NFC
- **Network Bands:** GSM, UMTS, LTE
- **GPS:** Yes

## Ebay Checkout: Confirm Order

- **Price:** $299.99
- **Payment Method:** PayPal

## Shipping Information

- **Ship to:** Hyun Sik Yoon, 2411 Cameron Dr, Alexandria, VA 22302-1219, United States
- **Shipping Method:** USPS Priority Mail

## Donation

- **Dedication:** A small donation to Alzheimer’s Association.

## Total

- **Total Price:** $299.99
1.4 D7000 camera

Nikon D7000 Digital SLR Camera w/18-55mm Lens 24GB Complete Kit

- Brand: Nikon
- Model: D7000
- Condition: New
- Included: Case or Bag
- Warranty: Yes, Direct Import Item
- Seller: Trusted Professionals at Authorized Repair Center
- Seller Warranty Coverage: Manufacturer defects same as manufacturer warranty

Detailed item info:

Product Information:

- The D7000 is equipped with a Nikon CMOS image sensor and image processing engine EXPEED 2.
- The D7000 is not equipped with a film simulation mode. The camera offers an effective pixel count of 16.2 million pixels and provides 1.15 million pixels, excluding the sensor area, of which 0.3 million pixels are partial pixels. The effective pixel count of the sensor area is 14.2 million pixels.
- The D7000 is not equipped with a film simulation mode. The camera offers an effective pixel count of 16.2 million pixels and provides 1.15 million pixels, excluding the sensor area, of which 0.3 million pixels are partial pixels. The effective pixel count of the sensor area is 14.2 million pixels.
- The D7000 is not equipped with a film simulation mode. The camera offers an effective pixel count of 16.2 million pixels and provides 1.15 million pixels, excluding the sensor area, of which 0.3 million pixels are partial pixels. The effective pixel count of the sensor area is 14.2 million pixels.

- A compact, elegant body that offers both authenticity and flexibility.
- A magnesium alloy body has been selected for the top and rear covers for durability equivalent to that of the D90. All parts on the camera body have also been selected to ensure a high level of durability.
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- A compact, elegant body that offers both authenticity and flexibility.
- A magnesium alloy body has been selected for the top and rear covers for durability equivalent to that of the D90. All parts on the camera body have also been selected to ensure a high level of durability.
1.5 Candle
~~NEW~~ YANKEE CANDLE 3.7 OZ JAR VANILLA CUPCAKE  
BURN TIME 25-40 HOURS

Smoke free home  
If you have any questions please feel free to ask.  
Thank you for viewing and Happy Bidding!!

We ship same day or within 48 hours of payment received.  
Indiana Residents:  
- Add 7.5% sales tax to the auction item final price.
2. The snap shots for experimental group

2.1 MacBook
2.2 Ergonomic chair
Description:
Modern and elegant design, great for home and office use
8-pc 360-degree swiveling casters for easy movement
Super strong base and with gas lift design
Comfortable padded seat and fabric mesh backrest
With stand bars on the back, can be used to hold your bag, etc.
Fully adjustable height (total height adjustable from 84cm/33" to 94cm/37"
Easy to assemble and maintain, super reliable and durable
Material: metal construction, mesh fabric
Color: Black

Approximate Size:
Seat Size: 46cm x 43cm x 6.5cm/18.1" x 16.9" x 2.6" (LxWxH)
Backrest: 41.9cm x 45.7cm/16.5" x 17.9"
Armpit: 25cm x 8cm/9.8" x 3" Amort Height: 24cm/9.4"

Package included:
1 x Chair (All fittings)
2.3 Galaxy S5 phone

![Ebay Listing of Galaxy S5 Phone](image)

**Detailed Item Info**

**Publication Info**

- **Model:** Galaxy S5
- **Operating System:** Android
- **Camera:** 16MP
- **Screen Size:** 5.1"
- **Storage:** 16GB
- **Battery Capacity:** 2800mAh
- **Color:** Black

**Product Highlights**

- Samsung Galaxy S5 Smartphone
- 16GB Storage
- 16MP Camera
- 5.1" Screen
- 2800mAh Battery

**Technical Specifications**

- **Processor:** Snapdragon 801
- **RAM:** 3GB
- **Display:** Super AMOLED
- **Battery:** Non-removable 2800mAh Li-ion

**Additional Features**

- **Water Resistant:** Yes
- **Fingerprint Sensor:** Yes
- **Heart Rate Monitor:** Yes
- **GPS:** Yes

**Additional Information**

- **Condition:** New
- **Brand:** Samsung
- **Retail Price:** $599.95
- **Shipping:** Free

**eBay Protection**

- **Shipping Options:** United States, Canada, United Kingdom, France, Germany, Australia, Mexico, Brazil, Russia
- **Returns:** 10 days money back
- **Payment:** PayPal, Money Order

**Customer Reviews**

- 4.5 out of 5 stars
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2.4 D7000 camera
143
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References


Liao, C., Liu, C. C., & Chen, K. (2011). Examining the impact of privacy, trust and risk...


Hyun Shik Yoon was born in Seoul, South Korea. He holds a Bachelor’s degree in Business Administration from Incheon National University, a Master of Business Administration (MBA) from Kyun Hee University, and a Master of Science in Industrial Engineering from University of Missouri. He pursued his doctoral studies in Industrial Engineering with a concentration in Enterprise Information Systems at the College of Engineering in the University of Missouri. His current research focuses on consumer behavior using digital technologies such as e-commerce, Internet banking, mobile applications, cloud computing, and social network services. He is also interested in evaluating e-commerce website usability, which can increase consumers’ purchase intention through websites by utilizing scientific methods with an eye-tracking device. In addition, he is very interested in Business Intelligence and Analytics, focusing on the use of techniques such as data visualization, big data, predictive modeling, simulation and optimization to solve important problems faced by businesses, government, and non-profit organizations.