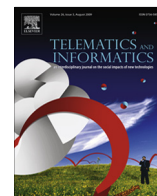




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Logistics service design for cross-border E-commerce using Kansei engineering with text-mining-based online content analysis

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ARTICLE INFO

Article history:

Received 1 July 2016

Received in revised form 31 July 2016

Accepted 5 August 2016

Available online xxxx

Keywords:

Kansei engineering

Text mining

Cross-border logistics service

Service design

Partial least squares

ABSTRACT

With the rapid development of cross-border e-commerce, the demand for and importance of cross-border logistics service (CBLS) also increase. A satisfactory CBLS can help promote business activities in cross-border e-commerce. Because customers' logistical needs are increasingly complex and the logistics market is increasingly competitive, a CBLS provider has to be devoted to continually improving and differentiating services to maintain its competitive advantage. Kansei engineering (KE) is an approach to design the elements which satisfy customers' affective and emotional perceptions into services and products. In this study, the KE approach is applied to derive ideas for the development of CBLS. For this purpose, Partial Least Squares (PLS) is used to analyze the relationships between the feelings of customers and service elements of CBLS. Moreover, this study demonstrates the applications of text mining techniques to analyze the online contents regarding CBLS. Online content mining assists in identifying the service elements and Kansei words for CBLS. Importantly, the relationship between the feelings of customers and service elements of CBLS obtained by online content mining provides complementary results for CBLS design.

Relevance to industry: this study offers an exemplification on applying the integration of Kansei engineering and online content analysis to obtain ideas for the process Kansei design in service industry. Our findings imply that in addition to conventional customer survey, user generated online content analysis should be effective way of catching customer-oriented design elements; they provide complementary effects for Kansei design.

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1. Introduction

The emergence of the Internet facilitates global online shopping. Customers are able to directly purchase products and services that may be unavailable or expensive in their home countries from merchants located in other countries and jurisdictions via websites and online marketplaces, despite the fact that different languages and currencies are used between customers and merchants. This phenomenon, known as cross-border e-commerce, has been growing in recent years because of advances in reducing problems associated with international payment security and payment methods, logistics and

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<http://dx.doi.org/10.1016/j.tele.2016.08.002>

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reverse logistics, language barriers, and so on. In fact, any e-commerce startup today with multi-billion-dollar ambitions must be cross-border from day one, because local markets are already locked up by entrenched homegrown giants. According to a report titled “Cross-border B2C E-commerce Market Trends” by Accenture (a global consulting firm) and AliResearch (the Alibaba Group’s research division) in 2015, the global B2C cross-border e-commerce market will balloon in size to \$1 trillion in 2020 from \$230 billion in 2014. Also, by 2020, more than 900 million people around the world will be international online shoppers, with their purchases accounting for nearly 30 percent of all global B2C transactions.

In cross-border e-commerce, the sellers and customers are located in different countries and customs territories. The trading activities are conducted online via e-commerce trading platforms, and the goods are delivered to customers by cross-border logistics services (CBLS). The business of CBLS is an extension of domestic home delivery service (HDS). In addition to covering the main functions of HDS, including package pick-up service, package tracking service, and package delivery service (Chen et al., 2015a), CBLS further handles cross-border transportation and customs declaration and clearance. With the rapid development of cross-border e-commerce, the demand and importance of CBLS is also increasing. Customers often have high expectations for effective logistics, which has repeatedly proven to be a strong competitive advantage for online sellers. Customers believe that sellers are responsible for ensuring that the goods reach them in a timely, reliable, and predictable manner. Therefore, for cross-border e-commerce, the quality of CBLS is likely to become a critical factor determining customers’ purchase intentions. Satisfactory CBLS can play a role as a promoter of prosperous business activities in cross-border e-commerce. In addition, customers’ logistical needs are increasingly complex, and the logistics market is increasingly competitive. For CBLS providers, how to increase customer loyalty and further attract new customers so as to enhance the utilization of logistics capacity and achieve operational economies of scale is an urgent issue. Understanding and satisfying customers’ CBLS requirements to further influence their decision-making and retention behaviors is particularly important and is the only way to earn a profit (Garver et al., 2012).

Since the mid-1980s, service quality has been a priority in both marketing and logistics research (Saura et al., 2008), both of which consider service elements, i.e. those things which customers expect service providers to offer (Jones and Sasser, 1995), to be important determinants of service quality (Brogowicz et al., 1990). This argument is true for design of CBLS. How service elements included in CBLS perform will directly affect customer satisfaction and loyalty, and these factors are important considerations when customers select a provider. However, unlike the design of physical products which are tangible and can be concretely experienced by human senses, the design of CBLS to meet customers’ quality requirements is more challenging because of the intangibility of service. Previous studies in logistics have focused on the effects of service elements on customer post-purchase feelings and behaviors (e.g. satisfaction and loyalty) after experiencing the service (e.g. Saura et al. (2008), Giovanis et al. (2013)). However, the connection between customers’ affective or emotional perceptions and service elements in the pre-purchase phase have not been fully explored. Moreover, service quality or service design related studies focusing on CBLS are very rare. Heskett (1987) indicated that service companies should analyze customers’ feelings to identify their preferences when forming service concepts. Thus, investigating the relationship between customer feelings and service elements can provide a good reference for CBLS providers seeking to offer desirable services and then increase customers’ usage intention in the pre-purchase phase.

Kansei is a Japanese term meaning sensibility, impression, and emotion. Kansei engineering (KE), proposed by Nagamachi (1989, 1995), is a proactive product development method to translate human impressions, feelings and requirements of existing products or concepts into design solutions and concrete design parameters (Nagamachi, 2002; Dahlgaard et al., 2008). KE is mainly a catalyst for systematic development of new and innovative solutions, but can also be used as an improvement tool for existing products and concepts. So far, many applications of KE have focused on the design of physical products, such as automotive interiors (Nagamachi, 1995), telephones (Yang et al., 1999), train interiors (Lanzotti and Tarantino, 2008), kitchen faucets (Demirtas et al., 2009), real estate (Llinares and Page, 2011), mobile phones (Yang, 2011a), CNC machine tools (Wang, 2011), beverage bottles (Luo et al., 2012), sport shoes (Shieh and Yeh, 2013), notebook computers (Huang et al., 2014), and digital cameras (Yang, 2011b; Wang, 2015). However, the applications of KE in service design are less common, because it is difficult to clearly present intangible service elements to stimulate test subjects, who are then requested to express their affective perceptions (However, design elements of physical products can always be transformed into images.) Limited examples of KE research for service design can be found. For example, González et al. (2008) applied data from the National Bank of Spain to demonstrate the KE procedures, and showed how the customer’s voices can be designed into its e-banking system. Hartono and Chuan (2011) introduce an integrative framework of the KE, SERVQUAL, and Kano model, applied to luxury hotel services. Chen et al. (2015a) developed a KE-based procedure for home delivery service design. Chen et al. (2015b) applied KE to provide new ideas for the design of international express services. Although previous KE-related studies focused primarily on physical products, KE is a creative and practical way to improve existing services and innovate new ones (Peranginangin et al., 2009). Schütte et al. (2004) suggested that KE should be applied more broadly to understand the topics of services. KE can offer two advantages in service design. First, customers’ vocabulary is employed to express their perceptions about the service content; this allows the conveyance of customers’ true feelings (Dahlgaard et al., 2008). Second, a quantitative framework can be established (e.g. using regression analysis) to identify the interactive relationship between customers’ affective responses and design features (Nagamachi, 1989, 1995; Demirtas et al., 2009). These are the main reasons that KE was used as the methodology in this study to interpret the relationships between service elements of CBLS and customers’ emotional perceptions and associated behavioral intentions. Customers’ emotional and perceptual reactions can thus be taken into consideration and provide new ideas for the design of CBLS.

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