

Measuring User Experiences of E-sourcing Platforms in the Apparel Industry: Development of the Apparel E-sourcing Experience Index

Xintong Li, University of Missouri

Li Zhao, University of Missouri

Stacy Lee, Texas Tech University

Keywords: E-sourcing, item response theory, apparel industry, measurement development, supplier experience

With innovations in technology, numerous companies, especially small and medium-sized enterprises (SMEs), have integrated e-commerce as a primary sourcing platform for international trade and for the settlement of outsourcing deals with buyers (Lu & Hirschheim, 2011). In the apparel industry, sourcing activities involved in supply chain management include locating appropriate suppliers to manufacture finished goods, inspecting finished goods, and coordinating logistics (Ha-Brookshire, 2017). Nowadays, e-sourcing platforms aim to expand into East Asian regions, as they are home to numerous textile and apparel export businesses (Lu, 2017). Given that there is a huge potential for e-sourcing growth resulting in revolutionary effects on the apparel industry, it is crucial for researchers, practitioners, and SME business owners to gain a better understanding of the e-sourcing decision-making process from the user's perspective. Grounded in three primary theories, (a) the triangular alignment model, (b) the technology-organization-environment framework, and (c) the 5Rs of apparel supplier selection, this paper aims to develop and validate the Apparel E-sourcing Experience Index (AEEI). Based on a review of the theoretical frameworks, a multi-faceted instrument, i.e., the Apparel E-sourcing Experience Index (AEEI) was proposed as a bi-factor model with one **general E-sourcing experience factor (GEE)**, and six sub-factors representing various facets of experiences in the e-sourcing process. However, it should be noted that the number of factors was based on an arbitrary decision, and therefore, an exploratory procedure is still necessary to empirically determine the number of factors. These factors include and are defined as the following: **Efficiency**. Efficiency overlaps with the transaction dimension of the triangular alignment model (TAM) and supplier selection theory. **Competitiveness**. According to the TOE, organizations must justify their actions and perform according to societal norms and institutional expectations. **IT Capability**. Based on the knowledge-based perspective of the TAM and TOE, firms require a good infrastructure to obtain benefit from marketplace participation. The other three subscales, **friendliness, safety, and predictability**, are drawn from the TAM to evaluate relational perspectives in the online marketplace literature (Pavlou, Liang, & Xue, 2007) and the outsourcing literature (Goo, Kishore, Rao, & Nam, 2009).

A target sample was recruited from those with higher level jobs than managers who are in a position to make decisions about e-commerce business practices. Thus, purposive sampling was

adopted to recruit a target sample that required participants to be in a higher level job than managers, over 21 years of age, and currently working as a manufacturer or supplier in the fashion industry. Data collection for the U.S. and India was commissioned to a research firm, Qualtrics, in 2018 for a period of approximately three weeks, paying 28 U.S. dollars for the U.S. panel, and 23 U.S. dollars for the India panel. A total of 315 observations were collected from the U.S. and India respectively, i.e., a total 630 data sets for analysis, which was determined to be a valid sample size for analysis using current psychometric methods (Jiang, Wang, & Weiss, 2016). More than 97% of the participants in both countries held at least a college degree, and most participants had more than 6 years of work experience. To develop a scale with sound psychometric properties, we followed a three-step procedure. First, the monotonicity and dimensionality of the hypothesized instruments were examined using Mokken Scale Analysis (MSA) and Exploratory Factor Analysis. Second, the parametric Item Response Theory was used to examine the items' properties after the local independence assumption was satisfied. Lastly, the bifactor model was built, and the measurement invariance was examined across the two countries.

MSA indicated that some items were weakly scalable and consistently off-scale together, therefore, those items were deleted from the instrument. Cross-loaded items were also removed. Based on the MSA results, we built a bifactor model with five factors identified in the first step and a common factor indicating the general E-sourcing experience (GEE). The standard error estimates of the general factor (GEE) were based on a bootstrap with 1000 resamples. The items were adequately informative of the GEE, with the item discrimination parameters ranged from 1.56 to 2.77, though some of them did not provide as much information on the five sub-factors. The threshold estimates were also examined, and no anomalies were observed. CFA results showed that the bifactor model of the AEEI provided a good fit to the data, $\chi^2(151) = 531.98, p < .001, CFI = .95, SRMR = .04, RMSEA = .06$. All the factor loadings and factor variances were statistically significant. The measurement invariance of the bifactor measurement model was also examined across country origin. The configural invariance model entailed a multiple group CFA which estimated the same model freely for both groups. The metric invariance model provided an adequate fit to the data, and there was no difference in model fit as compared to the configural invariance model ($\Delta CFI = .01, \Delta SRMR = .01, \Delta RMSEA = .00$). In addition, the scalar invariance was conducted by further constraining the intercepts of the two groups, and the model fit indices

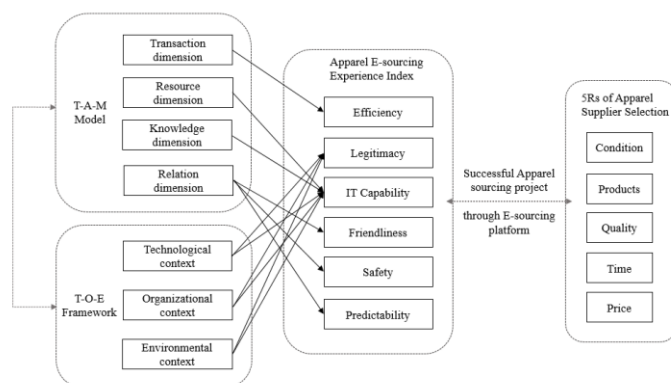


Figure 1: Six Constructs Emerged from Theoretical Frameworks

were not different from the metric invariance model ($\Delta CFI = .01$, $\Delta SRMR = .00$, $\Delta RMSEA = .00$). That is to say, we could compare the means across the two countries using the AEEI measure.

We proposed a six-factor model based on three grounded theories considering the unique characteristics of online sourcing and the apparel industry. To fill the gap in knowledge as to how suppliers experience online-sourcing platforms, a 5-factor structure for the AEEI was suggested based on empirical evidence, including items to measure efficiency, competitiveness, IT capability, friendliness, and reliability. When suppliers demonstrate friendliness and reliability, consumers' active involvement in e-sourcing platforms can be expected, which may lead to stronger firm performances in the long-run. From the perspective of e-sourcing platforms, suppliers' performance and users' experiences can be improved when businesses address the concerns indicated in the five factors. Future studies can consider expanding the AEEI globally into different cultures and countries where online sourcing platforms for international trade activities have not yet been integrated. In terms of limitations, this study was designated to develop AEEI among English speaking regions. Future studies can consider expanding AEEI on a global scale and develop other language versions. This could provide a better understanding as to why suppliers utilize e-commerce platforms.

References

- Ha-Brookshire, J. (2017). *Global Sourcing in the Textile and Apparel Industry*. New York: Bloomsbury Publishing.
- Jiang, S., Wang, C., & Weiss, D.J. (2016). Sample size requirements for estimation of item parameters in the multidimensional graded response model. *Frontiers in Psychology*, 7, 109.
- Goo, J., Kishore, R., Rao, H.R., & Nam, K. (2009). The role of service level agreements in relational management of information technology outsourcing: an empirical study. *MIS quarterly*, 33(1), 119-145.
- Lu, B., & Hirschheim, R. (2011). Online Sourcing: Investigations from Service Clients' Perspective. In *AMCIS*. Proceedings of the Seventeenth Americas Conference on Information Systems, Detroit: Michigan. Available at http://aisel.aisnet.org/amcis2011_submissions/405
- Lu, S. (2017). 5 key trends in world textile and apparel trade. (2017). Accessed on August 2018. Available at https://www.just-style.com/comment/5-key-trends-in-world-textile-and-apparel-trade_id132343.aspx
- Pavlou, P.A., Liang, H., & Xue, Y. (2007). Understanding and mitigating uncertainty in online exchange relationships: A principal-agent perspective. *MIS quarterly*, 31(1), 105-136.