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The intangible values of live streaming and their effect on audience engagement

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Abstract

Although live streaming via social media offers consumers real-time shopping experiences and potentially increases sales volume, the intangible values carried by live streaming from the streamer's perspective are relatively unknown. Building upon the Trust Transfer Theory, this study examined the values behind Instagram live streaming that could potentially build young consumers' trust in and engagement with social commerce sellers. Known for its visually appealing content, simplicity, speed, and mobility, Instagram is unlike other social media platform. More importantly, its targeting ability makes it an influencer dominant social media platform. Analysis using dual-stage PLS-SEM and ANN from 209 respondents revealed that utilitarian and symbolic values significantly influence trust, which subsequently builds customer engagement. Hedonic values and economic values, on the other hand, were found to play no significant role in building trust and customer engagement.

Keywords Live streaming · Social media influencers · Perceived (intangible) values · Trust · Engagement · Instagram

Introduction

Instagram distinguishes itself from contending social media platforms in multiple significant ways. Instagram, in contrast to social media sites such as Facebook and Twitter, focuses extensively on visual content such as photos and videos. Instagram is distinct from platforms that are primarily accessible via desktop computers because it was designed from the beginning with mobile use in mind. Instagram is favored by visual artists, photographers, and other creatives because its filters, editing tools, and other features encourage innovation and individuality. Many Instagrammers utilize their fame to endorse brands and products via partnerships. This distinguishes it from services such as Snapchat and TikTok in which users compose and share videos. Instagram markets itself as a mobile-first, visually driven, creative self-expression platform with a strong emphasis on influencers' power. Instagram's growth and prominence in recent years are largely attributable to the fact that it occupies a niche market, making it the second most downloaded social media app worldwide in 2022 (McLachlan 2022). Instagram is also the first choice for brands that engage in influencer marketing (Santora 2022), making Instagram the dominant influencer marketing platform.

As technology progresses, social media like Instagram is no longer merely a platform for communication and

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discussion; instead, it has evolved into a selling platform. Social commerce, better known as "s-commerce" on social media, has become a potential substitute for e-commerce because individual sellers no longer require web designing skills or a formal business registration to sell a product online. S-commerce is also quite different from conventional businesses that necessitate quality control and/or return policies (Wongkitrungreung and Assarut, 2020). However, due to risks associated with purchasing from non-business sellers with no physical store (i.e., low-quality products, product delivery issues, etc.) on the buyers' side, consumers often trust large and established firms more than they do individual sellers (Jarvenpaa et al. 2000).

Since its inception, live streaming technology has been enabled on various s-commerce sites (e.g., Instagram) and e-commerce sites (e.g., Taobao). Live streaming is widely used to display different product views, demonstrate product functions, and respond to customers' questions almost instantly. It ensures a closer interpersonal connection with customers for customer engagement (Wongkitrungrueng and Assarut 2020). Live streaming also offers an effective way to pull influencers into marketing campaigns (Olenski 2017). In fact, while influencers have helped brands previously, brands and sellers are creating their own influencers in today's virtual setting (Kadekova and Holienciova 2018). According to the McKinsey report by Arora et al. (2021), apparel and fashion is by far the leading category (35.6% live streamers) in live stream events, followed by beauty (7.6% live streamers), fresh food (7.4%), consumer electronics (4.6%) and others.

Several studies have examined the live streaming phenomenon by assessing the factors influencing user engagement in live streaming. For instance, Wongkitrungrueng and Assarut's (2020) review concluded that recent studies on live streaming have primarily focused on the influence of entertainment, knowledge, experience sharing, and gifting behavior in motivating live streaming users (Hilvert-Bruce et al. 2018; Hu et al. 2017; Todd and Melancon 2018; Tu et al. 2018; Wohn et al. 2018). Meanwhile, Xue et al., (2020) summarised the various factors that potentially affect purchase intention in s-commerce live broadcasting, including content, interactivity, humour, immersion and presence, and perceived values. These studies, however, have neglected the evaluation of the perceived value, which has an intangible nature in the context of live streaming and their effect on streamers' engagement. Wongkitrungrueng and Assarut (2020) live streaming analytics examined the functions of symbolic, utilitarian, and hedonic values in building trust and subsequently engagement, they did not address the economic value of live streaming.

From the practical perspective, our study differs from past research as we sought to answer the questions of what the perceived (intangible) values of live streaming are and how

these values build users' trust in sellers, and subsequently, increase users' online engagement. Further to that, considering the seller's central role in live streaming, our study focused on trust within the context of small or individual online sellers. More importantly, the findings of this study are specific to Instagram, an influencer dominant platform where most sellers are influencers themselves. Theoretically, we expand the application of the Trust Transfer Theory to the live streaming virtual setting by revealing the antecedents of trust, which in this case are perceived values, and their capability to change users' level of engagement. The purpose of this study is to fill this knowledge gap by investigating the ways in which customers' trust in sellers is influenced by utilitarian, hedonic, symbolic, and economic values (Sashi 2012). Thus, this study fills a gap in the literature by examining how customers respond to and interact with online sellers using Instagram Live, with a focus on trust and customer-perceived value.

Literature review

Trust and trust transfer theory

"Trust" is the common view that other people will act socially and ethically, rather than opportunistically, in a social exchange (Gefen et al. 2003; Hwang and Kim 2007). In the context of sales including B2B, B2C, or even C2C, trust is a relational sales concept that represents customers' confidence and belief that they can rely on a salesperson to do their best in taking care of their interests. Trust thus denotes the belief that the partner in the sales relationship will behave fairly, honestly, and reliably (Palmatier, 2008). The Trust Transfer Theory postulates that trust transfer takes place when the "the unknown target [is] being perceived as related to the source of the transferred trust" (Stewart 2003, p. 6). This process can occur in either a cognitive or communicative interaction. Cognitively, as soon as the trustor experiences a sense of connection towards a trustee, a trust transfer may take place (Stewart 2003). When the individual experiences a linkage with others through a form of communication or social interaction, then there might be a communicative trust transfer (Kuan and Bock 2007). Trust transfer is also possible when there is a contextual sense of relatedness between two parties (Pavlou and Gefen 2004).

Trust can be transmitted from one source to another both offline and online (Chen et al. 2020; Tan et al. 2019). The central concept of trust in sales typically involves the exchange of actual physical products/services between customers and companies; in this regard, online trust can be transferred via social networks as well as online communities through online shopping (Chow 2015). In the online setting, Wongkitrungrueng and Assarut (2020) exhibited

how consumers' affective trust in live streamers influences their engagement in the forms of word-of-mouth (WOM) and purchase intention. Chen et al. (2020) also demonstrated that consumers' trust in streamers can propel the former to further action such as WOM recommendations and greater product sales.

Intangible (perceived) values

According to Sanchez-Fernandez and Iniesta-Bonillo (2007), the concept of perceived value is intricate and multifaceted in nature. The authors additionally highlighted that the major characteristics of perceived value encompass: (1) a concept that implies an interaction between a consumer or an object; (2) The value is relative due to its comparative, personal, and situational nature; and (3) the value being preferential, perceptual, and cognitive-affective. These characteristics indicates that perceived value is subjective and abstract nature, and therefore, more intangible in essence. As such, the concept of perceived values is coined as intangible values in this study. Zeithaml (1988) suggested that perceived values in shopping resemble consumers' overall assessment of their shopping experience. Consequently, such values are key factors affecting the communication process of trust transfer.

Utilitarian value signifies the perceived cognitive benefit regarded by a consumer (Nghia et al. 2020). When the expectation of utility in a product or service is satisfied, utilitarian value is observed (Babin et al. 1994). Utilitarian attributes constitute a key success factor in online retailing (Kumar and Kashyap 2018). Wongkitrungrueng and Assarut (2020) cited that in the internet shopping setting, past research evinces that purchasing activities are more closely connected to utilitarian value than to hedonic value (Bridges and Florsheim 2008). Unfortunately, the perceived risk of online shopping is high due to the inability to touch and feel products prior to making a purchase (Lee et al. 2010). In addressing this issue, live streaming's unique 'real-time' feature enables customers to see the seller's face and demeanours. To assist customers in picturing the actual item and settling on a decision to purchase, sellers further demonstrate the utility of the items, for example by putting on the apparel they sell to model it. Live streaming also prohibits sellers from pre-recording or editing content, which makes selling more transparent. Additionally, the interaction via live stream chats allows sellers to better understand the needs and preferences of their targeted buyers (Wongkitrungrueng and Assarut 2020).

Hedonic value refers to the emotional, recreational, and experiential benefits of shopping (Babin et al. 1994). Hedonic values, such as fun and playfulness, represent the affective states that induce trust and the decision to purchase online (Nghia et al. 2020). This echoes the earlier finding of Fiore et al. (2005) that hedonic value enhances

consumers' trust in online shopping. Fiore et al.'s (2005) study also showed that online apparel retailers' image interactivity in the form of virtual models and mix-and-match features can lead to higher online purchase intention. In live streaming, in particular, brands can create an entertaining and exciting experience for customers by using available special effects such as filters and masks (Wongkitrungrueng and Assarut 2020). The interactive nature of live streaming makes these activities even more entertaining and engaging. In fact, sellers can engage more through live streaming than standard conversations, as the former involves laughter and amusement.

Symbolic value showcases the social characteristics of customer value because it embodies the meaning of a product or service (Yrjölä et al. 2017). According to Choo et al.'s (2012) review, scholars have identified numerous elements of symbolic value, namely self-identity/worth, personal meaning, self-expression, social meaning, and conditional meaning (Smith and Colgate 2007), self-identity value, materialistic value, conspicuous value, and prestige value (Wiedmann et al. 2009), as well as outer-directed and self-directed value (Tynan et al. 2010). Since shopping is a social activity, shoppers' experience with a product or a service is closely related to their personal identity. When applied into the online shopping setting, consumers who buy through live streaming would identify with the stores or sellers (Hedhli et al. 2013). Hence, like Wongkitrungrueng and Assarut (2020), we agree that by allowing customers to view sellers' appearance and personality, live streaming's perceived symbolic value can increase customers' trust in sellers.

Economic value involves various aspects of cost (e.g., economic cost and psychological cost) as well as personal risk that customers undertake to attain advantages from the consumption process. As costs are indirectly reflected in the perception of benefit, these perceptions overlap with other dimensions of value (Cham et al. 2022a, 2022b; Choo et al. 2012). Economic value also relates to price, and perceived price value is an important antecedent to behavioral intention (Choi et al. 2019). For example, Kim et al. (2017) demonstrated that perceived value is affected by both price and quality, and in turn, impacts individuals' intention to engage in an online transaction. Prior research indicates that price can be an effective strategy for increasing the perceived value of services and enhancing consumers' overall perception of value (Chen and Dubinsky 2003). Specifically, studies have shown that pricing strategies can positively affect the perceived value of services and ultimately improve consumers' perceptions of the service's benefits (Duman and Mattila 2005).

In the context of live streaming, perceived values can act as stimuli that trigger consumers' internal process. Specifically, the adoption of live streaming is motivated by utilitarian value (i.e., product information, interactivity,

visualisation and demonstration, communication immediacy and synchronicity), hedonic value (i.e., enjoyment and excitement) and social value (i.e., trendsetting, social identification, need for community, and social presence) (Wongkitrungrueng et al. 2020). Singh et al. (2021) found that convenience value, monetary value, emotional value, and social value influence overall perceived value, which subsequently leads to the continuous intention to use live streaming. According to Wongkitrungrueng and Assarut (2020), live streaming that offers prospective shopping value in the form of hedonic, utilitarian, or symbolic benefits is likely to have a positive effect on customers' attitudes and behaviors, including trust and engagement. This is especially important in the context of social commerce (s-commerce), where customers seek assurances that the supplied information is accurate and trustworthy, and that they can rely on the seller's recommendations. By providing consumers with authentic, responsive, and visually engaging experiences, live streaming can aid in resolving identity and product doubts. Customers are consequently more likely to have confidence in the seller and their products. In this study, apart from utilitarian, hedonic, and symbolic values, economic value was also considered, as the perception of price is important in e-commerce transactions (Kim et al. 2017; Choi et al. 2019). With reference to our theoretical underpinning of the relationship between perceived value and trust in seller under the Trust Transfer Theory, we posit that the perceived values of live streaming are antecedents to consumers' trust in sellers. Thus, the following hypotheses were accordingly derived:

H1 The utilitarian value of live streaming has a positive influence on customers' trust in seller.

H2 The hedonic value of live streaming has a positive influence on customers' trust in seller.

H3 The symbolic value of live streaming has a positive influence on customers' trust in seller.

H4 The economic value of live streaming has a positive influence on customers' trust in seller.

Customer engagement

Customer engagement is a psychological state of mind wherein customers are emotionally invested in a brand or product. This state of engagement typically leads to customers' frequent interaction with the brand as well as motives beyond transaction (i.e., repurchase intention, product/service review, and participation in the co-creation of products and services) (Thakur 2018). Unfortunately, as cited by Addo et al. (2021), e-commerce's lack

of personal and social cues (e.g., emotions, facial expressions, and body language) contributes to customers' low engagement with this platform. In contrast, s-commerce provides opportunities for customer engagement to arise naturally in online communities in the form of eWOM, product referrals, and 'likes' (Kang et al. 2021; Li et al. 2022). The emergence of the live streaming platform with rich media in the form of text, image, and video is therefore an important and engaging component of s-commerce on social media (Hu et al. 2017). Hu and Chaudhry (2020) considered affective commitment to have a positive impact on consumer engagement. In this regard, the extent to which a shopper trusts a seller and the seller's products will make them connect more with the seller (Fam et al. 2023; Wongkitrungreung and Assarut 2020). Trust towards sellers is important for s-commerce as it engenders better interactions between buyers and sellers, encourages customers to frequently scroll through the sellers' sites, and stimulates purchase decisions on s-commerce platforms (Wongkitrungreung and Assarut 2020). Following these arguments, we hypothesised that:

H5 Customers' trust in seller has a positive influence on customer engagement.

The mediating role of trust

The evolution of customer management begins with a transaction, which has recency, frequency, and monetary value (Lacap et al. 2021; Pansari and Kumar 2017). This transaction then evolves into a relationship comprising trust and commitment, which subsequently develops into engagement in the form of satisfaction and emotion. Studies on the antecedents and outcomes of trust in the virtual environment, such as those by Leung et al. (2019) and Chen et al. (2020), have corroborated the role of trust as a significant mediator in the online setting. Hence, with reference to the Trust Transfer Theory, the evolution of customer management, and prior evidence from the virtual environment, we proposed that customers' trust in sellers links their perceived values of live streaming (as antecedents of trust) to their engagement (as an outcome of trust). We hypothesised the mediating role of trust as follows:

H6 Trust in seller mediates the relationship between the utilitarian value of live streaming and customer engagement.

H7 Trust in seller mediates the relationship between the hedonic value of live streaming and customer engagement.

H8 Trust in seller mediates the relationship between the symbolic value of live streaming and customer engagement.

H9 Trust in seller mediates the relationship between the economic value of live streaming and customer engagement.

Methods

Measurement

The questionnaire includes measurement items for the perceived value of Instagram Live, customer trust in Instagram sellers, and customer engagement towards Instagram live streaming. Following Wongkitrungrueng and Assarut (2020), the measurement items were adapted from past research. Specifically, items for utilitarian value were adapted from Featherman et al. (2006), Fiore et al. (2005), Liu (2003), and Song and Zinkhan (2008), the items for hedonic value were derived from Arnold and Reynolds (2003), Babin et al. (1994), Chiu et al. (2012), and Hausman and Siekpe (2009), and the items for symbolic value were sourced from Lu et al. (2010) and Rintamaki et al. (2006). Meanwhile, the items for economic value were adapted from Tynan et al. (2010). Trust in seller was measured using items from Ba and Pavlou (2002), Gefen et al. (2003), and Kim and Park (2013), while customer engagement items were adapted from Calder et al. (2009), Hausman and Siekpe (2009), Gummerus et al. (2004) and Zeithaml et al. (1996). All items were rated on a a five-point Likert scale ranging from "1—Strongly Disagree" to "5—Strongly Agree." A summary of the measurement items used in this study is presented in Appendix 1.

Sampling and demographics

The focus of this study was the effectiveness of the live streaming function of Instagram for selling products. Through live streaming, consumers can connect with sellers in real time, which shapes a better shopping experience and strengthens the buyer–seller connection. Sellers can also create a social presence by selling on Instagram Live, even without physical human interaction. To gather experiential evidence on this phenomenon from young Instagram users in Malaysia, the purposive sampling technique was applied in this study.

The target population for this study consists of Malaysians between the ages of 18 and 35 who had experience with Instagram live broadcasting. A method of purposive sampling was used to identify 230 individuals from the target population. Hair et al. (2011) suggested the "10-times rule" method as a minimum sample size estimation method, where samples size should be larger than 10-times the maximum number of inner/outer model links pointing to any latent variable in the model in partial least squares structural

equation modeling (PLS-SEM). Therefore, the sample size of 230 is justifiable.

To be eligible to participate in this study, participants must have prior experience with Instagram live broadcasting. Participants were given a variety of questionnaires, dependent on whether they met the requirements for this study. The method of purposive sampling was selected because it permits the selection of participants with specified characteristics that correspond to the research question. In this instance, the target audience consisted of Malaysians who had experience with Instagram live broadcasting and fell within a specific age demographic. By selecting participants with pertinent characteristics, the results of this study are more applicable to the intended population and provides greater insight into the behaviors and attitudes of the target group. Respondents were recruited if they fulfilled the age demographic criteria of 18 to 35 years old and had experience viewing Instagram live streaming. Out of 230 distributed questionnaires, 209 returned ones were usable. From this sample, a majority of the respondents were female (64.4%), in the age range of 21 to 25 years old (73.2%), and held a bachelor's degree (58.9%). Approximately half the participants were university students. Correspondingly, the age range with the least respondents was 31 to 35 years old (0.5%). A substantial proportion of the respondents (77%) reported spending between 31 and 45 min on Instagram Live events on a daily basis. Moreover, a significant majority of the participants (60%) indicated that they engage in searching for apparels through Instagram live events at least twice a week.

Data analysis

Common method variance analysis

Common method variance (CMV) is a serious potential issue in any study that collects data for all its variables from the same type of respondents (Low et al., 2021; Tehseen et al. 2017). Thus, we used two statistical remedies to detect CMV, namely the correlation matrix suggested by Bagozzi et al. (1991) and the full collinearity assessment proposed by Kock (2015). Using the correlation matrix approach, we found that inter-correlations were lower than 0.90, evincing that no CMV was present. Likewise, in the full collinearity assessment, the VIF values of all the studied factors were reported to be less than 3.3, which also negated the issue of CMV. Both these tests suggest that the findings and implications of this study do not suffer from common method bias and are therefore reliable.

Additionally, normality testing was necessary, given that we chose partial least squares structural equation modeling (PLS-SEM) as the analytical approach in this study. This technique is suitable for non-normal datasets that require

non-parametric analysis (Ramayah et al. 2018; Hair et al. 2017). Thus, based on the recommendation of Ramayah et al. (2018), multivariate kurtosis and skewness were examined using the Webpower software available at https://webpower.psychstat.org/models/kurtosis/. The results revealed that our data did not follow a multivariate normal distribution, since Mardia's multivariate skewness was 7.172 and kurtosis was 75.254. Therefore, we decided to proceed with the PLS-SEM analysis.

After testing for CMV and non-normality, the full hypothesised model was analysed using SmartPLS software version 4.0. Both the measurement model and structural model were assessed according to the steps proposed by Hair et al. (2017) and (2019). The results of these models are explained below. To further validate the findings of the hypothesis testing, the Artificial Neural Network (ANN) will be applied using SPSS version 26. The inclusion of both PLS-SEM and ANN Analysis allowed us to gain deeper insights into the relationships between variables, validating the outcomes through a complementary and comprehensive lens.

Results

Evaluation of measurement model

The four elements assessed in the measurement model were factor loadings, item and construct reliability, convergent validity, and discriminant validity (Ringle et al. 2018). Reliability aims to measure the relationships between constructs and their corresponding items as well as to indicate the correlations between measures and their respective theoretical concepts. Internal consistency reliability was the first criterion to be evaluated using the traditional measure called Cronbach's alpha (i.e., inter-correlations among the observed indicator variables) as well as the true reliability measure called rho_A (i.e., reliability between Cronbach's alpha and composite reliability). Next, convergent validity was computed as the degree to which multiple items are in agreement in measuring the same concept. Reflective constructs' convergent validity can be evaluated by considering the indicators' outer loadings and the constructs' average variance extracted (AVE) (Hair et al. 2017). AVE is defined as the grand mean value of items' squared loadings related to the latent variable. A value of 0.50 or higher for AVE shows that, on average, more than half the items' variance is explained by the latent variable.

In this study, items with outer loadings between 0.40 and 0.70 were retained (Hair et al. 2014). The internal consistency of the constructs is determined by composite reliability (CR). Greater CR value reveals higher reliability of constructs. Whereas, Cronbach's alpha generates lower values than CR and does not determine constructs' reliability very

accurately. The "rho A" is another accurate measure of reliability of constructs that lies between value of Cronbach's alpha and CR. The threshold values of CR and rho A are values of above 0.7 (Hair et al. 2019).

Table 1 shows that all item loadings were above 0.4 and the AVE values of all constructs exceeded the threshold value of 0.5 (Hair et al. 2017). Thus, convergent validity was achieved. As the final step in the measurement model assessment, the Fornell–Larcker criterion was used to assess the constructs' discriminant validity. As shown in Table 2, the off-diagonal values of the constructs' correlation were lower than diagonal ones in bold, which represent the square root of AVE. Thus, discriminant validity was established for this model (Fornell and Larcker 1981; Hair et al. 2017; Ramayah et al. 2018).

Evaluation of structural model

The structural model was assessed based on Hair et al.'s (2019) recommendations for the values of the variance inflation factor (VIF), path coefficient (β) and significance, coefficient of determination (R^2), predictive relevance (Q^2), and effect size (f^2). VIF values were analysed to detect potential collinearity issues in the structural model. Specifically, VIF values should not surpass 5.0 to rule out collinearity (Hair et al. 2017). The VIF values in this study, as computed using the PLS Algorithm, were all less than 5.0, indicating no issues of collinearity among the constructs.

Table 3 presents the results of hypothesis testing. We found the positive and significant impact of utilitarian value ($\beta = 0.314$, t value = 3.795) and symbolic value ($\beta = 0.379$, t value = 5.280) on trust in seller. Thus, H1 and H3 were supported. On the other hand, H2 and H4 were not supported due to the non-significant impact of hedonic value ($\beta = 0.126$, t value = 1.252) and economic value ($\beta = 0.081$, t value = 1.224). The findings also revealed the positive and significant influence of trust in seller on customer engagement ($\beta = 0.630$, t value = 15.320), which confirmed H5. Among the four mediating impacts, only two exhibited significance. As shown in Table 3, trust in seller significantly mediates the relationships between utilitarian value and customer engagement ($\beta = 0.197$, t value = 3.781) as well as between symbolic value and customer engagement ($\beta = 0.239$, t value = 4.964). Thus, H6 and H8 were supported. However, trust in seller plays no mediating role in the effects of hedonic value ($\beta = 0.080$, t value = 1.225) and economic value ($\beta = 0.051$, t value = 1.207) on customer engagement. Consequently, H7 and H9 were not supported. Figure 1 shows the significant and non-significant relationships in the hypothesised model. Considering the nature of this study where demographic characteristics may impact customer engagement, we have included two demographics variables, namely, gender and education, as control

Table 1 Item loadings, reliabilities, and convergent validity

Constructs	Items	Loadings	Cronbach's Alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Customer engagement	CE2	0.806	0.823	0.829	0.882	0.652
	CE4	0.824				
	CE6	0.764				
	CE8	0.835				
Economic value	EV1	0.880	0.741	0.746	0.885	0.794
	EV3	0.902				
Hedonic value	HV2	0.848	0.778	0.780	0.871	0.692
	HV4	0.825				
	HV6	0.823				
Symbolic value	SV2	0.755	0.817	0.817	0.872	0.577
	SV3	0.796				
	SV5	0.762				
	SV6	0.715				
	SV7	0.770				
Trust in seller	TIS1	0.717	0.698	0.722	0.813	0.524
	TIS2	0.701				
	TIS3	0.632				
	TIS4	0.830				
Utilitarian value	UV2	0.788	0.824	0.827	0.876	0.587
	UV4	0.758				
	UV6	0.784				
	UV8	0.785				
	UV10	0.712				

Table 2 Fornell–Larcker criterion

	1	2	3	4	5	6	7	8
1. Customer engagement	**0.808**							
2. Economic value	0.641	**0.891**						
3. Education	0.139	0.189	**1.000**					
4. Gender	0.238	0.213	0.150	**1.000**				
5. Hedonic value	0.664	0.679	0.198	0.205	**0.832**			
6. Symbolic value	0.705	0.638	0.196	0.303	0.684	**0.760**		
7. Trust in seller	0.653	0.599	0.174	0.191	0.674	0.739	**0.724**	
8. Utilitarian value	0.735	0.605	0.239	0.203	0.752	0.713	0.725	**0.766**

variables. The result showed that while gender significantly impact customer engagement, the impact of education does not.

Also shown in Table 3 are f^2 values, which determine the level of impact of a specific exogenous latent variable on the endogenous construct. It represents the change in R^2 after omitting the exogenous latent variable from the model (Hair et al. 2014). An f^2 value of 0.025 is considered small, whereas values of 0.15 and 0.35 are interpreted as medium and large effects, respectively (Cohen 1988). The f^2 values of economic value and hedonic value were found to be 0.014 and 0.010, respectively, revealing no importance of these factors for the construct of trust in seller. Conversely, the f^2 of trust in seller was found to be 0.663, indicating the substantially large importance of this construct for customer engagement. The f^2 of utilitarian value was found to be 0.096 while it was 0.163 for symbolic value, suggesting these constructs' medium level of importance for trust in seller.

Additionally, R^2 and Q^2 values were assessed. The R^2 value is a measure of the model's predictive accuracy, which is calculated as the squared correlation between predicted and actual values of a certain endogenous latent variable (Hair et al. 2014; Hair et al. 2018). This coefficient reveals the combined influence of the exogenous latent variables on a certain endogenous latent variable. Stone-Geisser's Q^2 is another way to determine predictive accuracy, as it assesses

Table 3 Results of hypotheses testing

Hypothesis	Relationship	Std β	SE	t value	p values	LL	UL	Decision	f^2
H1	Utilitarian value → trust in seller	0.314	0.082	3.795	0.000	0.180	0.450	S	0.096
H2	Hedonic value → trust in seller	0.126	0.098	1.252	0.105	− 0.033	0.288	NS	0.014
H3	Symbolic value → trust in seller	0.379	0.072	5.280	0.000	0.259	0.495	S	0.163
H4	Economic value → trust in seller	0.081	0.071	1.224	0.111	− 0.037	0.195	NS	0.010
H5	Trust in seller → customer engagement	0.630	0.041	15.320	0.000	0.561	0.695	S	0.663
H6	Utilitarian value → trust in seller → customer engagement	0.197	0.052	3.781	0.000	0.114	0.284	S	N/A
H7	Hedonic value → trust in seller → customer engagement	0.080	0.063	1.225	0.110	− 0.021	0.185	NS	N/A
H8	Symbolic value → trust in seller → customer engagement	0.239	0.048	4.964	0.000	0.160	0.318	S	N/A
H9	Economic value → trust in seller → customer engagement	0.051	0.045	1.207	0.114	− 0.023	0.124	NS	N/A
Control	Education → customer engagement	0.012	0.053	0.238	0.406	− 0.075	0.098	NS	N/A
Control	Gender → customer engagement	0.243	0.115	2.107	0.018	0.050	0.430	S	N/A

S supported, *NS* not supported
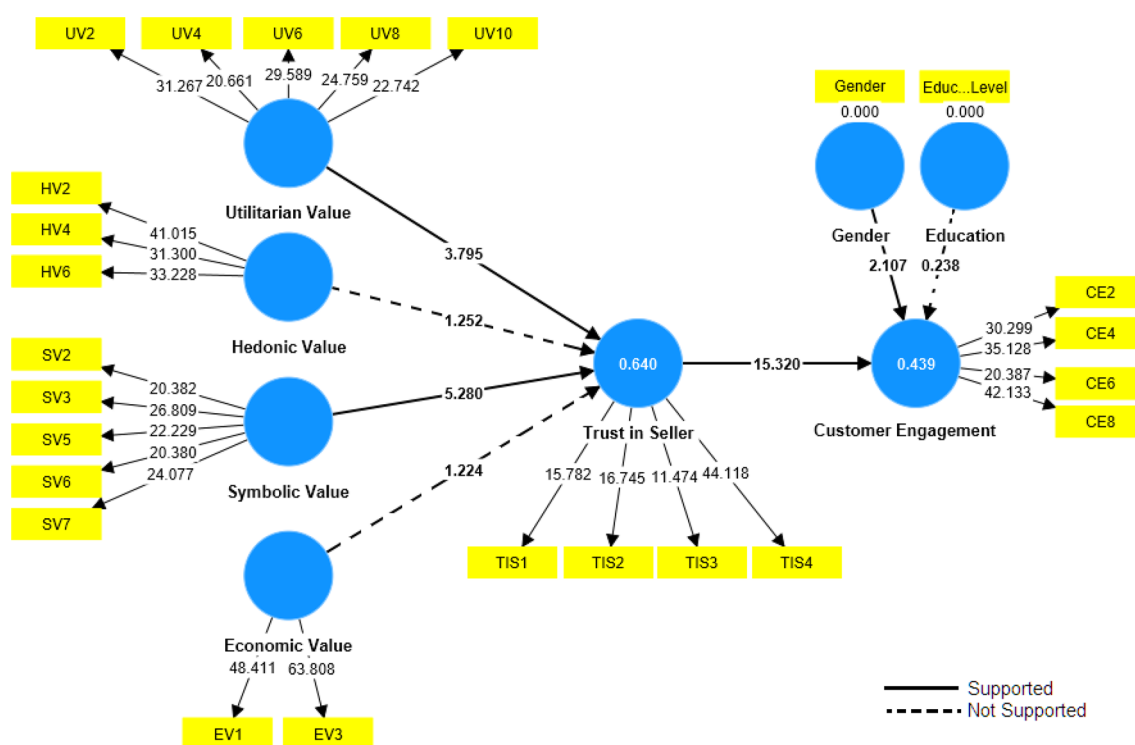
Fig. 1 Structural model

the model's out-of-sample predictive power. The model's predictive performance was examined through PLS Predict analysis. Values of R^2 and Q^2 above zero are acceptable, according to Cohen (1988). In this study, the R^2 values of trust in seller and customer engagement were found to be 0.640 and 0.439, respectively. This means that 64% of the variance in trust in seller is explained by its four predictors, i.e., utilitarian value, hedonic value, symbolic value, and economic value, while 43.9% of the variance in customer engagement is explained by the trust in seller construct.

The unexplained portions of variance in the constructs are described by other factors that were not within the scope of this study. According to Shmueli et al. (2019), predictive validity is an out-of-sample prediction determined through k-fold cross-validation with holdout samples. Shmueli et al (2019) recommended that latent (endogenous) variable Q^2 value should be larger that zero as Q^2 value measures the difference between the items (PLS-LM). The Customer Engagement (CE) Q^2 is 0.513 (> 0) and Trust in Seller (TIS) Q^2 is 0.613 (> 0). Most of the RMSE values of PLS were

Table 4 Indicators' prediction summary

Indicators	Q^2predict	PLS-SEM RMSE	LM RMSE
CE2	0.345	0.595	0.559
CE4	0.321	0.557	0.572
CE6	0.293	0.630	0.633
CE8	0.367	0.605	0.575
TIS1	0.269	0.573	0.584
TIS2	0.321	0.578	0.595
TIS3	0.216	0.595	0.580
TIS4	0.451	0.554	0.578

Table 5 RMSE values

Neural network	Model A		Model B	
	Input: UV, HV, SV, EV		Input: TIS	
	Output: TiS		Output: CE	
	Training	Testing	Training	Testing
ANN1	0.414	0.400	0.443	0.576
ANN2	0.425	0.396	0.474	0.529
ANN3	0.408	0.412	0.468	0.442
ANN4	0.447	0.335	0.415	0.417
ANN5	0.459	0.431	0.490	0.523
ANN6	0.394	0.439	0.491	0.395
ANN7	0.409	0.427	0.468	0.442
ANN8	0.428	0.412	0.470	0.505
ANN9	0.400	0.406	0.477	0.477
ANN10	0.417	0.494	0.475	0.466
Mean	0.420	0.415	0.467	0.477
SD	0.020	0.040	0.023	0.056

less than that of the linear model, and the corresponding predictors' Q^2 values were found to be more than zero, indicating sufficient predictive relevance (see Table 4).

Artificial neural networks (ANN)

Building upon the PLS-SEM may not be appropriate for a complex decision-making process since it can only test for linear relationships. PLS-SEM and Artificial Neural Network (ANN) are coupled in this study to better understand the non-linear connection between the variables. ANN is described as a huge processor consisting of simple processing units known as neurons that can store knowledge for future usage. In this study, two ANN models are constructed to represent the output of TIS and CE. Table 5 shows the mean and standard deviation (SD) of root mean squared error (RMSE) values for the training (learning) and testing (predicting) stages. A RMSE value of < 0.5 indicates good ability of the model to accurately predict the data. The ANN models in this study exhibit accuracy in predicting the relationships since the RMSE mean value for Models A and B varies from 0.415 to 0.477.

A sensitivity analysis is subsequently carried out to rank the exogenous constructs in this study, as seen in Table 6. The results in ANN Model A indicate that SV is the most significant predictor of TIS (100% normalised relative importance), followed by UV (62.182%) and HV (59.818%), while EV is the most insignificant predictor of TIS as it merely occupies 17.241% of the normalised relative importance. As for ANN Model B, there is only a single neuron model, so the sensitivity analysis indicates 100% normalised importance. By comparing the path coefficient and, separately, the normalised relative relevance, Table 7 examines the ranking differences between PLS-SEM and ANN. The results consistently confirmed that UV and SV are the strongest predictors for TIS, and TIS as a predictor for CE.

Table 6 Sensitive analysis

Neural network	Model A				Model B
	UV%	HV%	SV%	EV%	TIS%
ANN1	66.600	62.400	100.000	25.100	1.000
ANN2	86.900	56.600	100.000	13.700	1.000
ANN3	41.300	38.800	100.000	11.200	1.000
ANN4	76.800	56.100	100.000	21.600	1.000
ANN5	77.100	68.700	100.000	21.900	1.000
ANN6	41.800	58.300	100.000	22.100	1.000
ANN7	45.500	52.600	100.000	14.900	1.000
ANN8	75.600	57.600	100.000	12.900	1.000
ANN9	44.100	46.000	100.000	4.800	1.000
ANN10	65.000	100.000	98.200	23.900	1.000
Average relative importance	62.070	59.710	99.820	17.210	1.000
Normalized relative importance (%)	62.182	59.818	100.000	17.241	100.000

Table 7 Results comparison

PLS path	Path coefficient	Ranking (PLS-SEM)	ANN results (%)	Ranking (ANN)	Remark
Model A (output: TIS)					
UV → TIS	3.795	2	62.182	2	Matched
HV → TIS	1.252	Not Supported	59.818	3	Mismatched
SV → TIS	5.28	1	100.000	1	Matched
EV → TIS	1.224	Not Supported	17.241	4	Mismatched
Model B (output: CE)					
TIS → CE	15.32	1	100.000	1	Matched

Discussion

In light of Instagram's dominance as a selling tool in the recently popularised s-commerce setting, our study set forth to examine the perceived (intangible) values of live streaming and their influence on trust in seller and customer engagement. The findings show that the perceived utilitarian value of live streaming can increase customers' trust in Instagram sellers, which corroborates the finding of Wongkitrungreung and Assarut (2020). Previous studies by Kim and Park (2013), Kim and Peterson (2017), and Yahia et al. (2018) have suggested that different attributes of the platform, customer, and firm are important in building online trust. In this regard, our result confirms that consumers prefer sellers who reply to questions and suggestions quickly, such that sellers with the ability to respond fast to customers' requests are more likely to elicit consumers' trust.

Similarly, our results show that symbolic value heightens trust in seller, consistent with the finding of Nicholson et al. (2001) that seller approachability and politeness can build trust. As live streaming enables buyers to observe the seller's presence and behavior, buyers can gauge the reliability of a seller. Trust is a strong variable which demands symbolic value to generate perceptions of emotional investment and see sellers as trustworthy in live streaming (Park et al. 2017).

The result of direct impact of Hedonic Value on trust in seller as well as Economic Value on trust in seller were found non-significant. Likewise, the mediating influence of Trust in Seller in the relationship between Hedonic Value and Customer Engagement as well as mediating influence of Trust in Seller in the relationship between Economic Value and Customer Engagement were also found non-significant. These results contradict the findings of existing studies that have found positive impact of these variables.

Hansen et al. (2002) argued that observing and engaging with the seller's activities via live streaming can provide consumers with hedonic value, resulting in a more enjoyable and entertaining shopping experience. This positive response and emotional engagement can also establish an emotional relationship with the seller. Contrary to Yahia et al.'s (2018) finding that consumers' trust in an s-commerce vendor is positively correlated with the vendor's hedonic value, we failed to establish the significant influence of hedonic value on trust in sellers. This is because hedonic value increases trust in e-commerce vendors, but not always. Hedonic value may not affect e-commerce trust for several reasons. First, hedonic value can enhance a consumer's buying experience and generate an emotional connection with the vendor, but it may not be the most important aspect in building trust. E-commerce sellers' reputation, reliability, security, and openness may be more important in creating consumer trust. Thus, hedonic value alone may not generate confidence in an e-commerce business. Second, hedonic value affects trust differently depending on the product or service. For instance, a buyer may buy a car or house based on its durability, safety, and functionality rather than its hedonic worth. Hedonic value may not establish trust in such instances. Thirdly, customer preferences may affect hedonic value's effect on trust. A seller's hedonic worth may not influence a consumer who prefers functional attributes over hedonic value. Risk-averse consumers may value a seller's reputation and reliability over hedonic value. Thus, Hedonic value can increase trust in an e-commerce company, but not always. Reputation, reliability, and openness may be more important in developing consumer trust than hedonic value, depending on the product or service and the consumer's preferences.

Likewise, the direct impact of Economic Value on trust in seller was found non-significant based on study's finding. Economic value, like hedonic value, may not always boost e-commerce trust. Several reasons exist for this. First, economic worth may influence consumer choice but not seller trust. Consumers may value economic benefits like low pricing and discounts, but they may trust a vendor based on their reputation, reliability, and openness. Second, consumers view economic value differently. Some consumers value quality over price, while others value price. Economic value's effect on trust depends on the consumer's preferences and priorities. Thirdly, the product or service may affect the role of economic value in developing trust. Consumers may trust a seller of low-cost, low-involvement products like food or toiletries. For high-involvement products like vehicles and houses, product quality, reliability, and safety may be more

important in developing confidence. Chandrruangphen et al. (2022) found that product cost had a minimal direct positive impact on user purchase intention. Chandrruangphen et al. (2022) also found that a customer's trust in the seller has a positive effect on that customer's trust in the product, which is consistent with the work of Swan and Nolan (1985), who found that salespeople can win customers over by demonstrating their expertise and knowledge of the product.

The mediating influence of trust in seller in the relationship between hedonic value and customer engagement was also found weak and non-significant in this study. This finding is inconsistent with findings in existing studies. For instance, according to Wongkitrungreung and Assarut (2020), the effect of hedonic value on customer engagement may be indirect, occurring first via the path of trust in the merchant and then leading to customer engagement. Likewise, Nitzl et al. (2016) also discovered that seller trust entirely mediates the relationship between hedonic value and customer engagement. Although research has shown a link between hedonic value and consumer involvement via a mediating influence of trust in the seller, it's crucial to highlight that this may not always be the case. The complex link between hedonic value, trust in seller, and consumer engagement may explain why the mediating influence of trust in seller is weak or insignificant. Independent of the mediating influence of confidence in seller, other elements, such as product quality, brand reputation, and customer experience, may also play a role in encouraging consumer engagement. Other factors, such as the nature of the product or service being offered, the consumer's unique tastes and priorities, and the seller's credibility and openness to communication, may mediate the effect of hedonic value on trust in the latter. It is important for future studies to consider the intricacy of the link between these categories, which includes variables like product quality, brand reputation, and customer experience, all of which may play a role in driving consumer engagement.

The mediating influence of trust in seller in the relationship between economic value and customer engagement was non-significant in this study. This non-significant impact could be due to several reasons. For instance, trust in seller may not mediate this relationship since buyers may prioritize other variables over economic value while making purchases. When consumers are price-sensitive or buying frequently used things, they may also pay more for higher quality or better customer service. Economic value, brand recognition, seller reliability, and shopping experience may also affect seller trust. These characteristics may influence customer involvement more than seller economic value. The measurement and operationalization of economic value, trust in seller, and consumer participation may also affect the mediating influence. Thus, seller trust may not always mediate the economic value-customer engagement

relationship. Future study should address the intricacy of the link between dimensions like product quality, brand reputation, and customer experience, which may influence customer involvement more.

In accordance with the Trust Transfer Theory we proposed, despite encountering a few unsupported relationships, our findings ultimately affirm the validity of our hypothesis. Concretely, our findings strongly support the crucial role of trust in sellers, demonstrating a significant positive impact on enhancing customer engagement. Similar to Chen et al. (2020), the mediating role of trust as a mediator in the online setting is evidenced in our study. More importantly, our study shows that not all types of perceived values of live streaming can meaningfully develop trust and subsequently increases engagement in the influencer dominant platform. Specifically, in the context of live streaming, trust in seller mediates the relationship between utilitarian value and symbolic value on boosting customer engagement.

Theoretical implications

First, in support of the Trust Transfer Theory, our findings re-emphasise the crucial role of trust in seller as an antecedent to customer engagement in the context of Instagram live streaming, corresponding with Wongkitrungreung and Assarut's (2020) outcomes in the Facebook live streaming setting. The mediating role of trust in seller between perceived (intangible) values and customer engagement is also significant for utilitarian value and symbolic value.

Second, while this study aimed to extend existing literature gaps by incorporating economic value to the set of perceived values, the effects of hedonic value and economic value on trust in seller, directly, and on customer engagement, indirectly, were not supported. Considering these insignificant findings, there is a need to examine which element of live streaming carries hedonic or economic value that builds trust in sellers. It is also worth identifying potential contextual factors (e.g., types of products) that may affect the influences of hedonic value and economic value on trust in seller. Moreover, it is necessary to ascertain if the transactional nature of economic value (e.g., price of product, involvement in purchase) impacts economic value and its relationship with trust in seller.

Third, this study was conducted among live streamers, who are mostly small individual sellers or resellers who lack branding. As such, engaging with customers is undoubtedly more challenging for them. It is therefore plausible that the findings of this study differ from conventional customer engagement studies where the focus is on larger organisations or brands (e.g., Habibi et al. 2014; Vohra and Bhardwaj 2019). Specifically, this study contributes to the literature by investigating the factors that motivate consumers to engage with small and individual sellers on s-commerce platforms,

which has not been examined in existing research. As many individual sellers on Instagram are social media influencers, the findings from this research are also particularly important for the body of knowledge on influencer marketing.

Practical implications

This study delivers a better understanding of how social media sellers can use live streaming technology to attract customers, which is an important consideration in the booming live streaming s-commerce environment. A seller's personality, identity, and background can be observed by shoppers during live streaming, which makes the latter trust the former under the belief that the seller is less likely to scam them. Notably, the findings of this study indicate the significance of product functions (utilitarian value) and seller attitude (symbolic value) over entertainment (hedonic value) and product price (economic value) in enhancing the trustworthiness of the seller.

Our findings recommend live streamers to highlight the functions of their product, as utility value can increase trust in seller and subsequently boost customer engagement. Utility value can be enhanced when: (i) the products sold appear to be authentic; (ii) the products are presented via 'seller try-ons' to help users visualise their actual appearance; and iii) the seller is able to immediately attend to questions and provide feedback on product functions to the live stream viewers.

Symbolic value has the strongest indirect impact on customer engagement with Instagram Live sellers. This means sellers' expression of their personality through verbal expression and physical appearance can greatly influence customers' trust and engagement. In addition, ensuring customers have a good experience through interaction and communication can reinforce customers' attachment towards the seller's page. For example, when a seller is reading a customer's feedback, the seller can remember the customer's preferences for future purchases. Apart from that, during live streaming, sellers can ask buyers to offer suggestions for upcoming giveaways or promotions. Such activities create symbolic value that influences customers' trust in the seller, making them useful in garnering better influencer live streaming engagement.

Future research

Our study has filled gaps in the literature by addressing how perceived values (utilitarian, symbolic, hedonic, and economic) affect consumers' trust in sellers and engagement in live streaming. However, the present study was limited to young consumers aged 18–35, as live streaming is a trend among today's generation. Examining the current research model using other age groups may yield unique findings, as various generational cohorts may adopt and interact with live streaming differently. In addition, this research collected data from young users who had used Instagram and watched Instagram Live before. Other social media platforms in different countries, such as Facebook, Twitter, Weibo, and YouTube, can be investigated in future studies. Research in the future can also compare the responses and attitudes of non-buyers with those of buyers with purchase experience in live streaming. Most importantly, as this paper focused on small sellers, it would be valuable to understand how sellers of different sizes (e.g., medium and large firms) make use of live streaming and gain outcomes based on their resources and product/price variations. Lastly, additional variables or mediators, such as the personality attributes of sellers, can be included in upcoming works to extend our model.

Appendix 1: measurement items

Constructs	Items	
Customer engagement	CE1	I am likely to revisit the seller's page to watch their new live videos in the near future
	CE2	I would be likely to try and keep track of the activities of a seller that uses Instagram Live
	CE3	I am likely to recommend sellers that use Instagram Live to my friends
	CE4	In the near future, I will definitely buy products from a seller that uses Instagram Live
	CE5	I would become a fan and a follower of a page that uses Instagram Live
	CE6	I encourage friends and relatives to do business with a seller that uses Instagram Live
	CE7	In the near future, I will definitely buy apparels from a seller that uses Instagram Live
	CE8	I consider a seller that uses Instagram Live to be my first choice when buying this kind of product

Constructs	Items		Constructs	Items	
Economic value	EV1	It is worth the economic investment to buy apparels sold through Instagram live streaming		SV9	I can infer social acceptance of apparels from other customers' comments during the live stream
	EV2	In general, I am satisfied with the price of the apparels that sell in Instagram live	Trust in seller	TS1	I believe in the information that the seller provides through live streaming
	EV3	The apparels sold on Instagram Live are worth their high price		TS2	I can trust Instagram sellers that use live streaming
Hedonic value	HV1	Shopping through Instagram Live is entertaining		TS3	I believe that Instagram sellers who use live streaming are trustworthy
	HV2	I enjoy shopping via Instagram Live		TS4	I do not think that Instagram sellers who use live streaming would take advantage of me
	HV3	While shopping via Instagram Live, I feel a sense of adventure	Utilitarian value	UV1	Sellers that sell through Instagram Live seem like real merchants
	HV4	Shopping through Instagram Live is a way of relieving stress		UV2	Products sold through Instagram Live appear to be authentic
	HV5	I am able to do a lot of fantasizing while watching Instagram Live		UV3	The way a product is presented via Instagram Live (e.g., a seller's try-on) helps me to visualize the appearance of the product on a real figure
	HV6	While shopping through Instagram Live, I am able to forget my problems		UV4	I am able to easily see and visualise the product as it appears on Instagram Live
	HV7	Shopping via Instagram Live is a thrill for me		UV5	The way an apparel is presented online gives me as much sensory information about the apparel as I would experience in a store
	HV8	Activities (e.g., flash sales, freebies) on Instagram Live get me excited		UV6	Apparels sold through Instagram Live seem genuine to me
	HV9	I enjoy getting a great deal when I shop via Instagram Live		UV7	I feel that I can ask the seller selling via Instagram Live to find apparels I want
Symbolic value	SV1	Shopping through Instagram Live makes me feel as though I'm trendy		UV8	Apparels sold through Instagram Live tend to be up-to-date and on-trend
	SV2	I feel that I can identify with the seller		UV9	The online seller asks and gathers customer feedback directly via Instagram Live
	SV3	I feel that the seller recognizes me and remembers my preferences		UV10	Via Instagram Live, the online seller answers my questions immediately
	SV4	I can find apparels that are consistent with my style when I shop via Instagram Live			
	SV5	I can infer social acceptance of products from other customers' comments during the live stream			
	SV6	I am eager to tell my friends/acquaintances about this live shopping			
	SV7	I feel that the seller has the same taste as me			
	SV8	I feel that I belong to the customer segment of the seller's Instagram page			

Declarations

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