People, Technologies, and Organizations Interactions in a Social Commerce Era

Nick Hajli, Yichuan Wang, Mina Tajvidi, and M. Sam Hajli

Abstract—Social commerce, a powerful combination of customer-oriented social computing technologies and new commercial features, is having an increasing impact on e-commerce, potentially generating substantial economic benefits. Drawing on socio-technical theory, this study establishes a research framework to help understand the social and technical factors affecting consumers' intention to purchase on social commerce sites. Our results demonstrate that familiarity, user experience, learning and training, and social commerce constructs all have a positive effect on consumers' perceptions of ease of use and usefulness, thereby enhancing their trust and intention to purchase. For systems designers and engineers, our results highlight the importance of social commerce features for building consumers' trust of social commerce sites and supporting their intention to purchase.

Index Terms—E-commerce, social commerce, socio-technical theory, technology acceptance model (TAM), trust.

I. INTRODUCTION

SOCIAL commerce, a powerful combination of customer-oriented social computing technologies and new commercial features, is having an increasing impact on e-commerce and is now beginning to generate substantial economic benefits for many online retailers [1]. Social commerce is defined as "the forms of Internet-based social media that allow people to actively participate in the marketing and selling of products and services in online marketplaces and communities" [2, p. 215]. In general, social commerce can be viewed as a virtual shopping center that creates economic value by making the shops more accessible to browse with social tools and empowering customers by facilitating interactions with others on the platforms [2]; and computer-mediated social environments, where sustained social interactions exist among community members. Social commerce has great potential for not only influencing consumers' behavior and intention to adopt a brand, but also as a business strategy to increase companies' sales and brand values [3], [4]. However, customers' roles can vary significantly across different social networking sites (SNSs), ranging from simply visiting a site, through contributing to its content by posting product reviews and recommendations or serving as brand ambassadors by sharing user experiences and stories with others, to purchasing from online stores [2]. Many social commerce websites are making huge investments in social technologies to encourage their prospects to convert from visitors to purchasers and thus generate substantial sales growth, but this remains a challenge. Understanding the determinants of consumer purchase on social commerce sites is thus a priority in social commerce research.

Traditional e-commerce platforms primarily use Web technologies, which rely far less on the interaction between buyer and seller [5], and the process of acquiring product and shopping information is similar to window shopping [6]. Consumers interact with online vendors and base their decisions on information provided by the vendors' websites [7]. When it comes to social commerce, the explosion of social media applications use provides an opportunity for researchers and practitioners to think long-term value beyond that of a traditional e-commerce site [8]. Social commerce, where Web 2.0 technologies are used intensively, encourages a more interactive environment for consumers [9]. Even if social commerce is now more influential than traditional e-commerce systems, sustainable growth is not assured with simply adding shopping buttons to companies' profile page without offering any benefits to their customers. In this regard, it is imperative to revisit consumers' adoption behaviors and develop a new model from a social commerce perspective.

To date there has been limited attention given to improving our understanding of why consumers make a purchase on social commerce sites [10]. Thus, we seek to fill this gap by examining factors that influence consumer intention to purchase on social commerce sites. We apply socio-technical theory to the social commerce context. It focuses on the identification of important social and technical factors that affect consumers' perceptions, trust, and intention. Specifically, we integrate social commerce features such as forums and communities, ratings and reviews, and recommendations and referrals as technical enablers of social commerce with social enablers of social commerce such as user experience, familiarity, and learning and training identified from the literature on e-commerce into the trust and technology acceptance model (TAM).

The remainder of this paper is organized as follows. The following sections present the theoretical background to this study, explaining the development of the research model and the associated hypotheses. We then move on to describe the

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methodology adopted and the results obtained. The paper concludes by discussing our findings and their implications for theory and practice.

II. Theoretical Development and Research Model

Socio-technical theory posits that a system consists of two subsystems: the technical subsystem and the social subsystem [11]. The technical subsystem comprises the processes, tools, and technologies that enable users to transform inputs into outputs and complete specific tasks within the system; the social subsystem comprises the users' skills, knowledge, values, and relationships, as well as the reward system. The technical subsystem focuses on the technical capabilities of a system, whereas the social subsystem focuses on a more human perspective; these two subsystems need to work well together to produce optimized outputs [11].

Following this line of reasoning, we consider a social commerce site as a socio-technical system. The technical subsystem of social commerce consists of the social media tools and functionalities that empower consumers to share product information with each other [12], while the social subsystem encompasses consumers' skills, previous experience and knowledge regarding online shopping, and perceptions of value, as well as their social relationships and interactions. A good fit between the technical and social subsystems should lead to success in eliciting consumers' participation in social commerce platforms [13]. However, online shopping service providers usually consider the design features of e-service to be the most important element for successful customer engagement, which leads to a tendency to focus on the technical aspects of e-service. As shopping on social commerce sites is by its very nature a social activity, we consider that the social factors should assume a greater prominence when building a consumer purchasing behavior model for social commerce.

In this study, we employ social-technical theory as our overarching theoretical perspective to identify the social and technical enablers of social commerce, adopting the constructs—perceived ease of use (PEOU), perceived usefulness (PU) and behavioral intention, and trust—from the extended TAM developed by Gefen *et al.* [14] to serve as the consequences of the social and technical enablers in our research model. Specifically, we integrate the features of social commerce as the technical perspective and three key elements of users' ability to use the internet for accessing online shopping services (namely familiarity, user experience, and learning and training) as the social perspective into our research model. From a technical perspective, we contend that social commerce constructs enhance consumers' perception of usefulness toward social commerce sites. From a social perspective, we posit that consumers will perceive social commerce sites as easy to use when they are familiar with online shopping procedures and have substantial experience in internet technologies and learning and training on information technologies. Our research model is illustrated in Fig. 1.

III. Hypothesis Development

This study examines the antecedents of intention to buy on social commerce sites. User intention is rooted in TAM and the theory of planned behavior [15], [16] and was originally used for predicting an individual's intention to use a system [17]. Intentions are the determinants of behavior and are defined as "the strength of one's intentions to perform a specific behavior" [18, p. 288]. In social commerce contexts, we define intention to buy as a customer's intention to engage in the online buying process on a social commerce site. Intention to buy is an important outcome of social commerce. In this section, we discuss each antecedent of intention to buy and explore the linkages between these antecedents in detail.

A. Trust in Social Commerce

Trust has been receiving considerable attention in the context of both e-commerce (e.g., [14]) and social commerce (e.g., [19]–[22]) in recent years. In general, trust is defined as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party" [23, p. 712]. Various types of trust, including trusting intentions, trusting beliefs, disposition to trust, and institution-based trust have been proposed in trust research [24], [25]. In this study, we focus on institution-based trust, which refers to "an individual's perceptions of the institutional environment" [25, p. 336]—in this case, social commerce sites.

Prior research has emphasized that institution-based trust is a significant enabler of user participation in online settings. Chen and Shen [19] argue that consumers' willingness to participate in social media activities can be directly determined by the extent to which websites follow established rules and policies. In social commerce, consumers' trust is largely determined by the social commerce environment per se, because some features of social commerce could potentially incur huge consumer privacy concerns [26]. For example, social commerce sites record consumers' profiles (e.g., photographs, and their birthday, location, religion, and personal interests), consumer preferences, and their interactions with sellers and other peers (e.g., transactions, connections, and private messages). If appropriate information protection is not provided by social commerce sites to preserve the site's integrity and protect the confidentiality of consumer data, this might well fuel consumers' concerns regarding the possibility of fraudulent transactions and identity theft [27]. Consumers may be reluctant to engage in any social interaction activities or make purchases if they distrust a website [28]. This has led researchers such as Ng [22] and Chen and Shen [19] to suggest that purchase decisions will more likely be formed when consumers trust the social commerce sites where they are shopping. Thus, consumers with higher trust toward social commerce sites are likely to feel comfortable with peers' or sellers' requests, which will then increase the likelihood of purchase. Following this line of argument, we expect the following.

H1: Consumers' trust toward social commerce sites will have a positive impact on their intention to buy a product.

B. TAM in Social Commerce

TAM is one of the core theories used to investigate a user's intention to work with a system [29]. TAM has been extensively
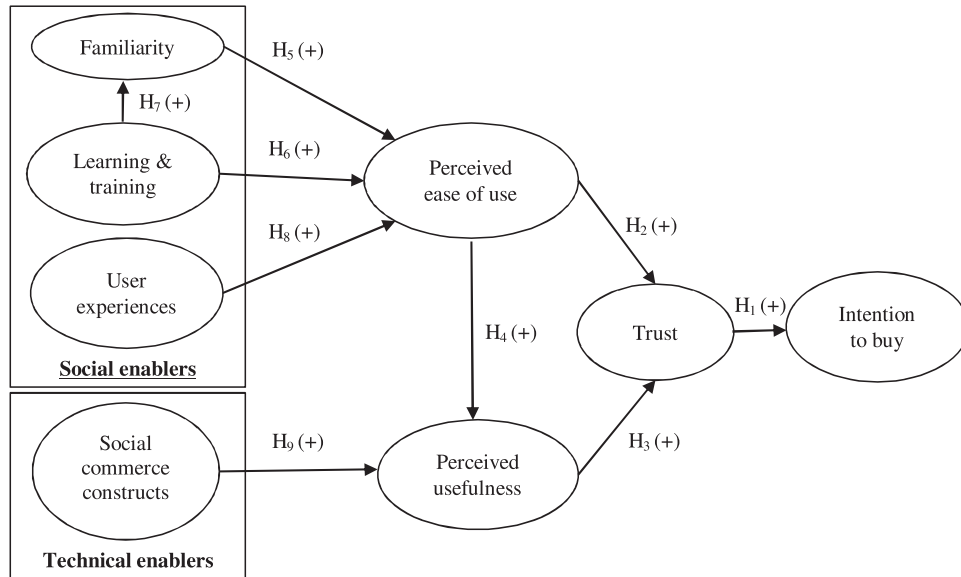
Fig. 1. Research model.

applied and validated in a number of research contexts, including the e-commerce (e.g., [14] and [30]) and information systems adoption (e.g., [27] and [31]). In TAM, two notable factors have been found to influence users' decisions regarding technology usage: perceived ease of use and PU. PU is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance" [29, p. 320], while PEOU refers to "the degree to which a person believes that using a particular system would be free of effort" [29, p. 320].

TAM was extended by Gefen *et al.* [14], who integrated consumer trust as an important factor in e-commerce and examined the interrelationships among PEOU, PU, and trust. Their findings suggest that PEOU is expected to have a positive effect on consumers' trust and PEOU can affect PU toward e-commerce sites. Moreover, PEOU affects consumer behavior by influencing their perceptions of e-vendors and the commitments that businesses promise to customers [14]. These perceptions can be created by different characteristics such as the ease of use of a website, the availability of good navigation tools, and the influence of social commerce constructs. Gefen *et al.* [32] mentioned that when e-vendors configure websites that are easy to use and navigate, they are effectively building a relationship with their customers. In accordance with the findings of previous TAM studies [6], [14], [33], [34], we posit that a social commerce website with well explained and easy to understand shopping processes can create consumer trust toward that social commerce site. PEOU will influence PU because an easy-to-use social commerce site is inherently more useful. In addition, when consumers perceive that participating in social commerce websites is useful as it helps them to make purchase decisions, they will eventually trust those websites. Accordingly, we hypothesize the following.

H2: Consumers' perception of ease of use is positively related to their trust in a social commerce site.

H3: Consumers' perception of usefulness is positively related to their trust in a social commerce site.

H4: Consumers' perception of ease of use is positively related to their perception of usefulness of a social commerce site for shopping.

C. Social Enablers of Social Commerce

To understand how consumers construct their intention to buy a product on social commerce platforms, this study explored potential antecedents from the existing literature on the topic. Drawing from the socio-technical theory, we identified three social enablers, namely familiarity, learning and training, and user experience. The three social enablers in social commerce are the focus of this study and will be discussed extensively below.

Familiarity can be viewed as a means of reducing ambiguity and uncertainty and strengthening the relationships with others in the online environment [35]. In general, familiarity is defined as "a specific activity-based cognizance based on previous experience or learning of how to use the particular interface" [35, p. 727]. In the context of e-commerce, familiarity with an online platform refers to the degree to which a consumer comprehends the website's procedures [14]. Previous research has suggested the positive impact of familiarity with an e-commerce vendor and its procedures, which have been shown to enhance both consumers' trust [35] and their continuance intention [36]. Familiarity with websites such as e-Bay can increase the level of trust in people, and as a result can affect the intention to use that website. Familiarity with a website can generate trust when an online shopper demonstrates trustworthy behavior; conversely, familiarity can destroy the relationship if an e-vendor fails to show it [35]. However, Ba and Pavlou [37] provide theoretical evidence that trust is not inherently fragile and can be built without familiarity and personal interactions. Given these mixed results, the effect of familiarity with the online platform on consumers' perceptions would clearly benefit from further investigation [38].

Shopping on social commerce sites can be treated as a technical process as it requires specific procedures such as searching for suitable products, finding other customers' reviews/comments on those products and on their e-vendors, selecting the product and e-vendor, providing the relevant information, and placing the order. These prepurchase activities could be executed in various ways, some of which may be relatively complicated. Complexity in an online environment causes purchase avoidance, while familiarity with the platform enhances customers understanding of the shopping process and reduces the intricacy of the decisions [32]. Martínez-López et al. [39] have indicated that familiarity with a recommendation system enhances PEOU, intention to use a recommendation system, and purchase intentions. As a result, we argue that familiarity with the internet could enhance consumers' perception of ease of use toward a social commerce site.

H5: An increased degree of familiarity with an e-vendor's website is positively associated with consumers' perceived ease of use.

The second social enabler of social commerce—learning and training—is based on the perspective of training and development [40]. This view contends that lack of knowledge and technological skills are barriers to users engaging in e-commerce and that appropriate training and learning can improve the effectiveness of a consumer's interaction with an e-vendor and also increase his or her awareness of the benefits of e-commerce, consequently increasing e-commerce adoption [40]. However, the current literature related to the role of training and learning in e-commerce adoption research is not substantive. In this study, we investigate whether learning and training in computer literacy and e-commerce at user level can help to increase the awareness of customers about the benefits of e-commerce. We suggest that consumers can use, for instance, other friends' comments or the Facebook "like" button to evaluate a product before they make a purchasing decision more easily if they are fully trained in IT and have a better understanding of the benefits related to social commerce. Thus, we hypothesize the following.

H6: Learning and training positively affect a consumer's perception of ease of use.

There is documented evidence in the organizational behavior literature that learning and training activities have a positive impact on individuals' attitudes and motivation [41]. Training refers to a systematic approach to learning and development to improve individual, team, and organizational effectiveness [42]. Prior research on education also suggests that training-related changes should result in the acquisition of new knowledge and skills [43], [44]. In the context of e-commerce, Darch and Lucas [40] emphasize that a range of training and development strategies are required to help users who are moving into e-commerce. Following this line of thought, we argue that consumers who have training regarding using the internet to shop online will be familiar with an e-vendor's website and its online shopping procedures. Thus, we hypothesize as follows.

H7: Learning and training positively affects a consumer's familiarity with an e-vendor's website.

User experience refers to "all the aspects of how people use a product: the way it feels in their hands, how well they understand how it works, how they feel about it while they're using it, how well it serves their purposes, and how well it fits into the entire context in which they are using it" [45, p. 11]. In the IT usage literature, user experience with IT has been viewed as an antecedent of user satisfaction and usage intention for the technologies. Deng et al. [46] argue that the more experience a user gains with an IT application, the more satisfied he/she is with that application. In the context of e-commerce, if a user has more experience with the internet that user will have fewer difficulties and barriers to overcome when communicating with e-vendors and buying a product online. Some consumers may prefer to buy from shopping malls rather than online because they lack knowledge regarding how to use online shopping systems [47]. Customers with substantial internet experience also have a sense of comfort with websites, which helps them make purchasing decisions and reduces their perceptions of risk and uncertainty, demonstrating their trust in an e-vendor. Particularly in social commerce, a consumer who has previous experience with internet or online shopping is more likely to consider a social commerce site as an easier way to shop as they have the ability to easily access product reviews to help them make a purchase decision. Conversely, when consumers have less experience with online shopping, their perception of ease of use will be ill-formed. Following this line of argument, we consider user experience to be an important social enabler of social commerce and suggest that a consumer's internet experience will influence their PEOU of a social commerce site. Accordingly, we hypothesize the following.

H8: Consumers' computing and internet experience positively affects their perceived ease of use.

D. Technical Enablers of Social Commerce

The popularity of social media tools has made large-scale social commerce feasible. Social media design features (e.g., rating and referral) have greatly facilitated users' online collaboration and social information sharing [48]. These design features empower consumers to share their shopping experiences and product information with their peers in the social commerce environment [12]. Such social commerce information sharing behavior enhances consumers' interactions and provides information and knowledge in the social commerce environment. Social commerce supports functions that facilitate the sharing of information and establish social support platforms for consumers, as captured by specific mechanisms of social commerce-related information sharing such as forums and communities, ratings and reviews, and referrals and recommendations [1], [20], [49].

Forums and communities are social platforms that enable customers to take part in group discussions and share commercial-related information [50]. These platforms are good resources for consumers seeking relevant product information and evaluations of specific products and brands, thus enhancing their purchase decisions. In addition, these communication channels provide customers with opportunities to discuss opinions in terms of brands, products, and companies, and to reassure each other through information exchange and experiences, thereby increasing their confidence and consequent willingness to purchase [51].

Ratings and reviews shape social commerce information sharing; individuals can easily post their product reviews online and rate products [52] and these reviews and ratings give comprehensive information about products for the benefit of other potential customers [8]. Particularly in an SNS community, members can browse friends' product reviews on a brand page, introducing an emotional aspect that adds a personal touch to the decision-making process of buying. In addition, referrals and recommendations are likely to play a pivotal role in accelerating information sharing in social commerce. Research shows that in an online context, where customers cannot experience the products or services directly, consumers tend to rely more on other consumers' experiences, including their product recommendations [53]. Ratings and reviews, as well as referrals and recommendations, represent user-generated content that conveys positive or negative information related to sellers and products/services that is disseminated and communicated within SNSs. This helps consumers fully understand a service or a product before its consumption and might also shape their expectations of service [54].

Each of these features captures a unique angle of the multifaceted nature of social media information sharing, which when put together reflects a more holistic picture of social commerce that then feeds in to the technical aspect of social commerce. As such, these sharing mechanisms have become the primary means shaping users' commercial information sharing. A previous study has suggested that website elements and strategies are success factors in online marketplaces [55], so there is clearly a need to examine the impact of these social commerce constructs empirically by conceptualizing them as a unique construct. In this study, we define social commerce constructs as the Web 2.0 features of social platforms such as forums and communities, ratings and reviews, and referrals and recommendations [56] that are inherently different in nature from offline or traditional e-commerce. These features of social commerce have changed the user experience and perceptions toward shopping websites [1], [57]. For example, individuals on forums or communities can easily share their product reviews and are able to obtain information about others' user experiences with specific products or services. Forums provide a platform for intense interactions among participants, providing customers with the opportunity to discuss opinions in terms of brands, products, and companies, and to reassure each other through information exchange and experiences, thereby increasing their confidence and consequent willingness to purchase [1], [51]. Following this line of argument, we suggest that these social commerce features will increase users' perception of usefulness toward the websites. Hence, our hypothesis is as follows.

H9: Social commerce constructs will increase a consumer's perception of usefulness towards a social commerce site.

IV. RESEARCH METHODOLOGY

A. Survey Administration and Sample

Given the research objectives, the epistemological foundation of this study was grounded upon the positivist paradigm. A survey-based method is particularly valuable for positivist paradigm research. A survey was conducted in order to empirically test our research model. We recruited research participants who are undergraduate and postgraduate students enrolled at a British university using a mailing list. Although students represent only a portion of online consumers, several studies have demonstrated that they are a reasonable substitute for online consumers [25], [27]. The survey was hosted online by an online survey service provider. The survey link was announced to 1200 students who were randomly selected from the university mailing list. Respondents were asked to use their previous online shopping experiences to answer the questions.

In total, 226 samples were received, for a response rate of 19%. Unfortunately, the data used in our analyses were subject to a number of missing data points. We tested our dataset using Little's missing completely at random (MCAR) test to confirm that it did indeed meet the assumption of MCAR. A listwise deletion was then applied to remove 27 subjects with missing data [58]; complete records were thus available for 199 subjects, of whom 64% were female and 36% male. The demographic characteristics of the respondents indicated that all participants in our sample had previous online shopping experiences. The age range of the sample was predominately under 30.

B. Measures

The survey instrument was developed on the basis of the existing literature in e-commerce and social commerce. The literature source for each construct is reported in Appendix A. To validate the measurement instruments in terms of face validity, clarity, and appropriateness of measures, a pretest with 30 postgraduate students was conducted before the final survey was sent out. All measures were collected using a five-point Likert scale, where participants were asked to rate the items from 1 = strongly disagree to 5 = strongly agree.

To measure the social aspect of social media, familiarity, user experience, and learning and training were selected based on the prior research. Familiarity was assessed with three items adapted from Gefen [35], while user experience was adopted from Corbitt *et al.* [47]. There is no validated scale for learning and training in the e-commerce literature, so we conceptualize learning and training in terms of online users' learning experience on computer/internet and online shopping. This construct was measured with three items, including: "I have learned to use the internet to shop online" and "my learning and training is/was useful for online shopping."

For the technical aspect of social media, social commerce constructs were assessed using the scale developed by Hajli *et al.* [56], which measures social commerce constructs in terms of: forums and communities; ratings and reviews; and recommendations. This construct was measured with "I use online forums and communities for acquiring information about a product" and "I usually use people ratings and reviews about products on the internet." Trust, PU, PEOU, and intention to buy were measured with scales modified from Gefen *et al.* [14].

C. Nonresponse Bias and Common Method Bias

Prior to the data analysis, we examined the dataset for nonresponse and common method biases. The nonresponse bias was assessed by comparing the early (those who responded to

TABLE I
DESCRIPTIVE STATISTICS AND CORRELATIONS

Constructs	Mean [S.D.]	Alpha	CRs	AVEs	1	2	3	4	5	6	7	8
Familiarity	4.11 [0.63]	0.73	0.78	0.55	**0.74**							
Learning and training	3.72 [0.76]	0.76	0.77	0.52	0.16*	**0.72**						
User experience	4.34 [0.63]	0.80	0.81	0.59	0.36**	0.37**	**0.77**					
Social commerce constructs	3.43 [0.81]	0.75	0.76	0.52	0.19**	0.21**	0.13	**0.72**				
Perceived ease of use	3.88 [0.66]	0.80	0.81	0.51	0.29**	0.32**	0.35**	0.27**	**.71**			
Perceived usefulness	4.07 [0.67]	0.83	0.83	0.55	0.36**	0.30**	0.33**	0.41**	.27**	**0.74**		
Trust	3.73 [0.67]	0.80	0.80	0.50	0.26**	0.17*	0.27**	0.23**	.35**	0.36**	**0.71**	
Intention to buy	3.81 [0.77]	0.73	0.73	0.58	0.26**	0.42**	0.38**	0.26**	0.31**	0.34**	0.28**	**0.76**

Note: $N = 199$; CR: composite reliability; Alpha: Cronbach's alpha; S.D.: standard deviation; The bold values along the diagonal are the square roots of the AVEs; $^*p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

the first mailing) and late respondents (those who responded after the reminder) in terms of gender and educational level using t-tests. The results show no statistically significant difference between the groups, indicating that the nonresponse bias problem is not present in the dataset.

Our data were collected from individual respondents using the same survey instrument, exposing the observed relationships to the threat of common method bias [59]. To reduce this bias, Podsakoff *et al.* [59] suggest utilizing a number of structural procedures during the design of the study and data collection processes. Following these guidelines, we protected respondent–researcher anonymity, provided clear directions, and proximally separated independent and dependent variables [59]. We then assessed the potential effect of common method bias statistically by conducting three tests. First, Harman's one-factor test [60] generated eight principal constructs; the unrotated factor solution shows that the first construct explains only 26.2% of the variance, indicating that our data do not suffer from high common method bias. Second, we performed a partial correlation technique using a marker variable to separate out the influence of common method bias. Following a procedure suggested by Pavlou *et al.* [61], we compared correlations among the constructs. The results revealed no constructs with correlations over 0.5, whereas evidence of common method bias ought to have brought about significantly higher correlations ($r > 0.90$). Consequently, these tests suggest that common method bias is not a major concern in this study.

V. DATA ANALYSIS AND RESULTS

A. Descriptive Statistics, Reliability, and Validity

Table I presents the means, standard deviations, Cronbach's alphas, square roots of the AVEs, and construct correlations. The Cronbach's alphas (ranging from 0.73 to 0.83) show a satisfactory degree of internal consistency reliability for the measures [62]. Construct reliability was assessed using composite reliability (CR) [63]. As shown in Table I, the CRs range from 0.73 to 0.83 and are all greater than the commonly accepted cutoff value of 0.70 [64], thus demonstrating adequate reliability for the measures.

For the measurement property evaluation, exploratory factor analysis (EFA) was conducted to explore the factor structure. An EFA with varimax rotation for all constructs was applied to test construct validity. The initial factor analysis using principal components analysis extracted eight factors that were evident on the screen plot. Factor loadings for each construct are shown in Appendix B. The results indicate that most items loaded on a distinct construct and their factor loadings are all greater than 0.5, showing a good convergent validity. These results confirm the existence of eight observed constructs with eigenvalues greater than 1, signifying that a good discriminant validity was obtained in this study.

Average Variance Extracted (AVE) was applied to test convergent validity; this should be at least 0.50 [65]. The results are shown in Table I. AVE in all constructs is more than 0.5, indicating that they have satisfied this criterion. Discriminant validity was first assessed by examining the factor correlations. Although there are no firm rules, interconstruct correlations below 0.7 provide evidence of measure distinctness, and thus discriminant validity. Here, no factor correlation is greater than 0.7, which demonstrates discriminant validity (see Table I). Another way to examine discriminant validity is to compare AVE to the squared interconstruct correlation [66]. When the AVE is larger than the corresponding squared interconstruct correlation estimates, this suggests that the indicators have more in common with the construct they are associated with than they do with other constructs, which again provides evidence of discriminant validity. The data again suggests adequate divergent validity of the measures.

B. Measurement Model

We assessed the measurement quality of the multi-item scales using a confirmatory factor analysis (CFA) approach. The measurement model consists of eight latent factors and 25 items. The range of loadings for the familiarity is from 0.455 to 0.873. The range of loadings for the learning and training is from 0.682 to 0.759. The range of loadings for the user experience is from 0.649 to 0.849. The range of loadings for the social commerce constructs is from 0.627 to 0.759. The range of loadings for the PEOU is from 0.651 to 0.746. The range of loadings for the PU is from 0.629 to 0.840. The range of loadings for the trust is from 0.555 to 0.787. The range of loadings for the intention to buy is from 0.745 to 0.778.

The fit indexes indicate that the model fits the data well ($\chi2$ (271) = 330.221, incremental fit index [IFI] = 0.969; comparative fit index [CFI] = 0.968; goodness-of-fit index [GFI] = 0.895; adjusted goodness-of-fit index [AGFI] = 0.864;
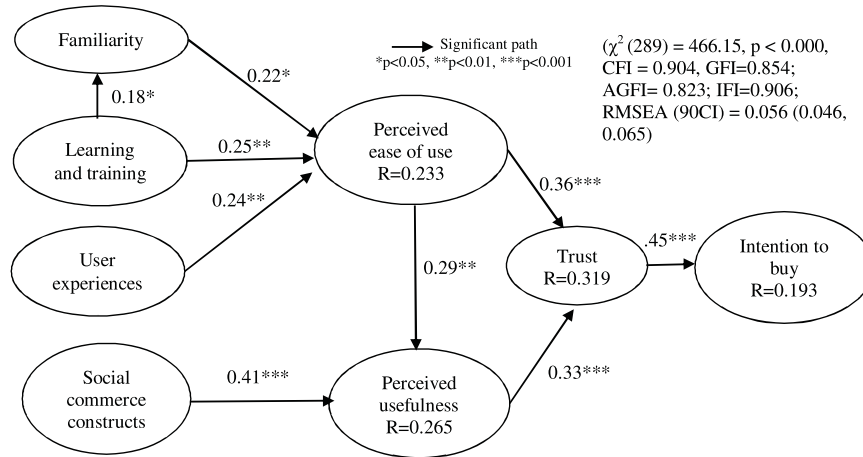
Fig. 2. Estimation results for the structural model.

TABLE II
OVERVIEW OF RESULTS

Hypothesis	Relationships	β	*t*-value	*p*-value	Results
H_1	Trust → Intention to buy	0.451	4.215	0.000	supported
H_2	Perceived ease of use → Trust	0.361	3.955	0.000	supported
H_3	Perceived usefulness → Trust	0.334	4.283	0.000	supported
H_4	Perceived ease of use → Perceived usefulness	0.290	3.149	0.002	supported
H_5	Familiarity → Perceived ease of use	0.219	2.551	0.011	supported
H_6	Learning and training → Perceived ease of use	0.251	3.189	0.001	supported
H_7	Learning and training → Familiarity	0.179	2.396	0.017	supported
H_8	User experience → Perceived ease of use	0.243	3.238	0.001	supported
H_9	Social commerce constructs → Perceived usefulness	0.409	4.943	0.000	supported

two exceed the cutoff value of 0.90 and the other two are over 0.80. Zikmund [67] contends that GFI values lower than 0.90 do not necessarily indicate poor model fits, and Sharma *et al.* [68] recommend that datasets with a large number of items (more than 24) and smaller sample sizes should use more liberal cutoff values. Hence, with 26 items, 8 constructs, and a sample size of 199, a GFI value = 0.895 that is only slightly below 0.9 could reasonably be deemed acceptable. The root mean square error of approximation (RMSEA) is 0.033. Browne and Cudeck [69] suggest that an RMSEA value of 0.05 or less indicates a good approximate fit. Thus, we conclude that our data adequately fit the measurement model.

C. Structural Model Evaluation

After confirming that an adequate fit was obtained for the measurement model, we assessed the fit of our structural model. The goodness-of-fit of the structural model was found to be comparable to that of the previously described CFA model. The hypothesized model thus appears to fit the data well, as shown in Fig. 2. With this evidence of acceptable fit, we proceeded to test our hypotheses.

The nine hypotheses presented earlier were tested collectively using structural equation modeling. We conducted covariance-based structural equation modeling to examine our hypotheses, since this method is recommended for theory confirmation. Table II presents the results of the hypotheses tests. First, for H1-H4, we examine the significance of PEOU and

PU on trust and intention to buy. We find that PEOU and PU significantly influence trust thereby enhancing intention to buy as well as the positive impact of PEOU on PU. This generally supports H1, H2, H3, and H4. In addition, the data analysis supports the contention that the social factors (i.e., familiarity, user experience, and learning and training) have a positive impact on PEOU, supporting H5, H6, and H8). We also confirm that learning and training can help consumers familiar with online shopping process in social commerce sites (H7). Finally, our results reveal that the social commerce features are positively related to consumers' perception of usefulness toward the social commerce site (H9). As shown in Fig. 2, the results indicate that almost 20% of the variance in intention to buy was accounted for by the constructs in the model. Trust has a notable R square value; almost 32% of the variance in trust was accounted for by PEOU and PU. PEOU has an R square value of 23.4%, accounted for by familiarity, learning and training, and user experience, while PU has an R square value of 26.5%, accounted for by social commerce constructs.

VI. DISCUSSION AND CONCLUSION

Our findings extend our current understanding of how purchase intention is formed by examining the impact of social and technical factors of social commerce. We provide empirical evidence to support the contention that consumer purchase intention is enhanced if they are proficient at using internet technologies and familiar with online shopping procedures. This

implies that in enhancing consumer purchase intention in social commerce sites, the importance of users' technical skills and knowledge of IT did influence their acceptance of social commerce. The results of this structural model analysis also show that social commerce constructs, namely forums, communities, ratings, reviews, and recommendations, do indeed influence PU, leading to trust. The trust established through social commerce constructs will affect a customer's intention to buy. This implies that consumers are using the new social commerce functions, which in turn make them more likely to shop online successfully due to the sufficient product information gathered from social commerce sites. This positively increases their trust in social commerce platforms and helps them in their purchasing journey. Our study thus contributes to both theory and practice by providing evidence confirming the influence of social and technical aspects of social commerce on consumer behaviors. The theoretical and practical implications of these findings are presented below.

A. Theoretical and Practical Implications

The theoretical implications of this research are three fold. First, we have conceptualized the design features of social commerce in terms of three key forms, namely forums and communities, ratings and reviews, and referrals and recommendations, to provide further insights into information sharing activities in a social commerce environment. This finding highlights the importance of the technical aspects of social commerce and provide empirical evidence that social interaction driven by social technologies such as participating in forums and online communities or obtaining shopping advice and recommendations regarding a specific brand or product can increase consumers' perception of usefulness toward the social commerce site they are visiting, thereby enhancing their trust and intention to buy. As such, this finding provides a deeper understanding of the kinds of social commerce features that will facilitate consumers' purchase intention. Thus, this study may serve as a foundational model for studying social commerce behaviors and exploring its marketing values in the new digital environment.

Second, as researchers have suggested that TAM needed to be given additional variables to provide a stronger model [70], this study integrated both social and technical enablers of social commerce into Gefen *et al.*'s [14] TAM to develop a better understanding of consumer intention to purchase in social commerce environments. Our results highlight the influence of familiarity, user experience, and learning and training in creating a strong perception of ease of use. Once consumers perceive a high ease of use for social technologies in a social commerce site, resulting high degree of trust increases their intention to buy from that site. This finding shows how purchase intention is formed from a user perspective.

Third, social commerce service providers should be aware of consumers' differences in familiarity, site experience, and learning experience because these factors significantly impact on purchase intention. This suggests social commerce service providers should take action to reduce user resistance in the adoption process by providing sufficient supports. For example, systems designers should provide useful guides or

tutorials to explain how social technologies can be used for searching, deciding, and buying during a shopping journey. More importantly, these guides might also help consumers solve shopping problems, thereby promoting their trust and active participation in social commerce sites.

Finally, this research confirms that institution-based trust is a critical issue in a social commerce context, playing an important role in increasing purchase intentions, systems designers and engineers should devote their attention to developing trust-building plans. These plans could include the following.

1) Implementing a secure payment system.
2) Frequently posting payment security information to the community as a reminder.
3) Making explicit privacy policies about permissions.
4) Providing more openness about privacy settings, allowing consumers to leave anonymous feedback for a certain number of posts or allowing users to control who sees their feedback/ratings in a similar way to the way they control their status updates.
5) Improving third-party payment accreditation and logistics to strengthen consumer trust, leading to more purchases on social commerce sites.

B. Limitations and Directions for Future Research

Other social and technical factors such as the effect of social word-of-mouth [71] and privacy factors [21] could well affect consumer purchase intentions in social commerce environments. However, the focus of this survey was strictly limited to specific aspects in social commerce. Hence, as this research has demonstrated high reliability and good validity for the proposed model, this could provide useful insights for both academics and practitioners. Future research could consider applying qualitative methodologies (e.g., content analysis and focus groups) and exploring other social and technical factors such as the types of product reviews that obtain the most likes or shares using these methods to complement the insufficiency of existing survey methods that limit the making of strong inferences. This research was conducted mainly in the UK and it could usefully be extended to other regions. For example, an interesting follow-up study might involve collecting data from global markets in order to examine cultural differences. Likewise, future research could assess potential differences among age groups by recruiting a more representative sample. For instance, older consumers may be more concerned about their private information sharing. It is likely that for these adults more effort and time may be needed before they can develop a trust in social commerce sites. This may reflect the different effect of intention to buy. Finally, this study treated the social commerce sites investigated as a homogenous online space. Collecting data from different types of online communities, for example professional-oriented online communities, may offer more granular insights into how different communities and social media tools affect user behaviors.

To better understand social commerce adoption, a new model based on the integration of socio-technical theory from two dominant theories in the information systems field linked to the trust and TAM has been proposed in this study to explore

social and technical factors related to social commerce users' purchase intention, providing useful insights and implications through the study's findings that both social and technical factors are significant antecedents for social commerce acceptance.

APPENDIX A
MEASURES AND SOURCES

Familiarity (Gefen [35])

FA1: I am familiar with searching for materials on the internet.

FA2: I am familiar with buying materials on the internet.

FA3: I am familiar with inquiring about material ratings on the Internet.

Learning and training (New items)

L1: I have had training to use computers and the internet.

L2: I have learned to use the internet to shop online.

L3: My learning and training is/was useful for online shopping.

User experience (Modified from Corbitt *et al.* [47])

UE1: I perceive myself pretty experienced in using the computer.

UE2: I perceive myself pretty experienced in using the Internet.

UE3: I have been using the Internet for a long time.

Social commerce constructs (Adapted from Hajli *et al.* [56])

SSC1: I use online forums and communities for acquiring information about a product.

SSC2: I usually use people ratings and reviews about products on the internet.

SSC3: I usually use people's recommendations to buy a product on the internet.

Perceived Ease of Use (Adapted from Gefen *et al.* [14])

PE1: It is easy to become skilful at using the Websites.

PE2: Learning to operate the Websites on the internet is easy.

PE3: The Websites that I use for my online shopping is flexible to interact with.

PE4: My interaction with the Web sites in the internet is clear and understandable.

Perceived usefulness (Adapted from Gefen *et al.* [14])

PU1: Searching and buying on the internet is useful for me.

PU2: Searching and buying on the internet makes my life easier.

PU3: The Websites enable me to search and buy materials faster.

PU4: The Websites increase my productivity in searching and purchasing products on the internet.

Trust (Adapted from Gefen *et al.* [14])

T1: Promises made by the Websites that I used for my last online shopping are likely to be reliable.

T2: I do not doubt the honesty of the Website that I used for my last online shopping.

T3: Based on my experience with the online vendor in the past, I know it is honest.

T4: Based on my experience with the online vendor in the past, I know they care about customers.

Intention to buy (Adapted from Gefen *et al.* [14])

IU1: I am very likely to provide the social commerce vendors with the information it needs to better serve my needs.

IU2: I am happy to use my credit card to purchase from a social commerce vendor.

APPENDIX B
CROSS LOADING

	Perceived Usefulness	Trust	Perceived ease of use	User Experience	Learning & Training	Social Commerce Constructs	Familiarity	Intention to buy
PU4	0.792	0.105	0.054	0.051	0.079	0.118	0.090	0.061
PU1	0.769	0.148	0.027	0.138	0.113	0.166	0.225	0.085
PU3	0.735	0.089	0.146	0.040	0.107	0.153	-0.052	0.119
PU2	0.728	0.167	0.052	0.174	0.063	0.158	0.216	0.047
T3	0.158	0.791	0.135	0.089	-0.034	0.008	-0.021	0.088
T2	0.115	0.791	0.046	0.080	0.141	0.088	0.173	-0.039
T1	0.169	0.726	0.149	0.095	0.102	0.179	0.118	0.135
T4	0.040	0.720	0.125	0.037	-0.040	0.009	-0.014	0.070
PE1	0.006	0.156	0.791	0.144	0.009	0.161	0.069	-0.030
PE2	0.104	0.077	0.752	0.216	0.204	0.159	0.027	-0.118
PE4	0.141	0.147	0.744	0.153	0.035	0.088	0.069	0.206
PE3	0.064	0.153	0.701	-0.107	0.194	-0.088	0.209	0.286
UE1	0.078	0.132	0.073	0.836	0.144	0.055	0.137	0.123
UE3	0.094	0.107	0.164	0.804	0.081	0.058	0.100	0.133
UE2	0.175	0.047	0.138	0.712	0.183	-0.072	0.162	0.076
L2	0.120	-0.021	0.100	0.100	0.809	0.122	0.086	0.121
L3	0.162	0.072	0.017	0.110	0.765	0.043	-0.109	0.167
L1	0.032	0.068	0.211	0.181	0.763	0.035	0.108	0.084
SSC2	0.129	0.056	0.095	0.067	0.126	0.810	0.113	-0.010
SSC3	0.198	0.062	0.010	-0.007	0.093	0.806	0.030	0.157
SSC1	0.183	0.106	0.175	-0.019	-0.021	0.716	-0.002	0.051
FA2	0.207	0.031	0.120	0.145	0.087	0.003	0.854	-0.042
FA1	0.195	0.141	0.074	0.181	0.051	-0.031	0.813	-0.041
FA3	-0.008	0.042	0.099	0.079	-0.060	0.212	0.633	0.272
ITB1	0.090	0.142	0.092	0.169	0.194	0.155	-0.003	0.810
ITB2	0.210	0.094	0.108	0.179	0.218	0.047	0.126	0.737

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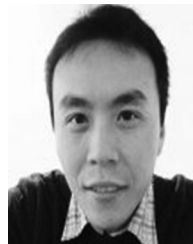
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