

Online trust-building mechanisms for existing brands: the moderating role of the e-business platform certification system

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Abstract This study investigates how the e-business platform certification system affects online trust-building mechanisms for existing brands. Integrating theories of online trust and brand knowledge, we propose that brand awareness and brand image, two sub-dimensions of brand knowledge, contribute to building brand trust in online stores. The effectiveness of e-business platform services also contributes to consumers' trust in the online channel. Instead of regarding the platform guarantees as the antecedents of online trust, we hypothesize that the e-business platform certification system positively moderates the effects of building online trust. We test the research hypotheses using questionnaire data collected through an online survey and use structural equation modeling to analyze the data. The findings support our proposed model. The theoretical and managerial implications are identified based on the results.

Keywords Brand knowledge · Brand awareness · Brand image · Online trust · Effectiveness of e-business platform services · E-business platform certification system

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1 Introduction

Electronic business has been widely studied in the past few years. Abundant studies have examined online shopping from the consumers' perspective, and have shown that the Internet has changed consumers' shopping styles, especially those of the younger generation. Other studies have looked into the profit-making mechanisms of online channels and empirically analyzed emerging business models in the e-business context.

We have witnessed a rapid development of e-business, e.g., eBay, Amazon, etc. Due to the advantages of e-business, some brands now originate on the Internet, and existing brands are developing online channels. According to the new Nielsen Global E-commerce and the New Retail Survey,¹ more than half of the respondents (55 %) are willing to order groceries online; people in the Asia-Pacific regions are the most willing to use online retailing options (60 %). On November 11, 2015,² China's Singles' Day, also named Double 11 Day, China's e-commerce giant Alibaba set a new record, with a gross merchandise volume of \$14.3 billion. Millions of online shoppers purchased goods from Alibaba's Tmall platform during the shopping event. Statistics from Alibaba's Tmall platform show that on this Singles' Day there were more than 40,000 merchants selling 30,000 brands from 25 countries.

The number of users and the gross merchandise volume has increased for every Singles Day since 2009, demonstrating that the B2C e-business model has been widely adopted by consumers. Consumers can purchase a brand product through multiple channels: offline retailers, offline distributors, online retailers, and online distributors. E-business platforms such as Alibaba's Tmall promote online transactions, and the official online stores of established brands face competition from plenty of distributors' online stores. It is worth investigating what factors affect consumers' choice of a trustworthy purchasing channel. This study examines trust-building mechanisms in the e-business context from the perspective of an existing brand.

Reichheld [83] claimed that "Price does not rule the Web, trust does." Research has shown that trust directly increases purchase intention [34]. Trust is crucial in business transactions, especially in online platforms, where the buyer-seller relationship contains an element of risk [34, 56, 83]. Earlier studies found that trust plays a critical role in building buyer-seller relationships [31] and reducing perceived risks [47, 56]. McKnight et al. [70] developed an e-commerce trust model showing that trusting beliefs can lead to trust intentions such as making purchases.

There have been examples of physical brands successfully migrating online. Bustillo and Fowler [13] forecast that Walmart would dominate online retailing as it dominates strip malls. Flavián et al. [29] indicated that a consumer's preference for a bank has a remarkable effect on the choice of online bank, and buyers are more willing to pay online stores that have a picture of their physical address [95].

¹ <http://www.nielsen.com/us/en/press-room/2015/more-than-half-of-global-consumers-are-willing-to-buy-groceries-online.html>.

² <http://www.bbc.com/news/business-34773940>.

This study examines how consumers develop trust in an online channel of an existing brand, and how this process relates to consumers' established brand knowledge. Consumers' trust in an online channel determines the consumers' willingness to take any risk to use the online channel. Thus, consumers' trust in an online channel lies in two aspects: their willingness to purchase the products and services of the existing brand online and their willingness to use the e-business platform to make the transaction. In other words, consumers' trust in an online store is a combination of their brand trust and their trust in the e-business platform.

The main purpose of this study is to examine how offline brand trust can be transferred to online trust, and how institutional trust in an e-business platform can be migrated to trust in the online channel of an existing brand. That is to say, we examine how a business can operate multi-channels and use the brand value gained offline to encourage the use of the online channel. To be specific, can traditional brands sustain their brand value online on a specific e-business platform; can they use established brand trust to increase consumers' online purchase intentions?

Consumers gain brand knowledge through experience. They unconsciously recognize a brand's name, logo, design, and many other symbols. According to the associative network memory model [4, 94], consumers' purchasing experiences are stored as memory nodes in their minds. When consumers think about the brand, a network of connected nodes is activated, with links of various strengths. Consumers became familiar with a brand through their accumulated interaction with brand knowledge. Abundant studies have investigated the formation of trust and demonstrated that familiarity eventually leads to consumers brand trust. For example, Luhmann [62] showed that familiarity is the precondition of trust; Chen et al. [17] and McAllister [68] both found that recognition is the antecedent of trust.

Recent studies of e-commerce trust have focused on trust-building mechanisms such as website design, the quality of online services, the authenticity of branded products, security of payment system, and so on. Studies of online trust have shown that it relies closely on Web-based services and the relationship between online sellers and buyers. Ou et al. [76] demonstrated that online services provided by an e-business platform, as one of the main attributes of institutional trust, can increase consumers' perceptions of interactivity and presence on the platform, which leads to consumer trust. Services provided by an online platform stimulate institutional trust [100] and are used to build consumer confidence in electronic transactions [64]. Pavlou and Gefen [80] demonstrated that the formation of institutional trust in an e-business platform, the perceived effectiveness of feedback mechanisms, escrow services, payment guarantees, and trust in intermediaries all contribute to consumers' trust in online sellers.

As both consumers' brand knowledge and the perceived effectiveness of online services provided by an e-business platform contribute to online trust in an existing brand's online channel, we hypothesize that a brand's loyal consumers will be apt to trust its online channel and willing to make online purchases, given the price advantage, as long as the online channel actually belongs to the brand. As we know, the existence of many counterfeit products on the market brings online purchases a high level of risk. Thus, a crucial factor that can transform brand trust and institutional trust in an e-business platform into trust in a brand's online channel is

the assurance of the authenticity of the “branded” online channel. For example, China’s Alibaba launched its B2C platform Tmall in 2012 with the assurance that it would demand a certificate of authenticity from the online stores before they began legal operation on Tmall. This was in response to complaints about the counterfeits sold on its C2C platform Taobao. Thereafter, the gross merchandise volume of Alibaba’s e-business platform on the Double 11 shopping festival has grown steadily. In this case, the certification system provided by an e-business platform that guarantees that the brand online stores are authentic and offer the same products and services as the registered brand can increase consumers’ trust propensity.

This study examines how brand knowledge of an existing brand and institutional trust in an e-business platform together build trust in a brand’s online channel. This is important in the e-business era, as there are many online channels for purchasing a brand, e.g. the official channels on different e-business platforms or well-known distributors’ online channels. Specifically, this study tests the role of the e-business platform certification system on online brand trust-building mechanisms. We investigate how the e-business platform certification system moderates the relationship between brand trust and brand knowledge in terms of its sub-dimensions, brand awareness, and brand image, and the relationship between consumers’ trust in an online channel and the perceived effectiveness of e-business platform services, mainly in terms of the security of payment and guarantee of consumer rights.

Integrating theories of trust and brand knowledge, we set up a conceptual model to illustrate how traditional brands gain online trust and in turn affect consumer purchasing behavior. Specifically, the research model explains the following:

- a. how brand knowledge and the effectiveness of e-business platform services build brand trust online;
- b. how the e-business platform certification system plays a moderating role on building brand trust online.

The rest of this paper is organized as follows. In the next section, we review the constructs and concepts that underlie our research model and propose our research hypotheses. Subsequently, we introduce the methodology used to test our model and then we present the data collection procedures and the empirical results of our analyses. Finally, the managerial implications and some future research directions are discussed.

2 Theoretical foundations and model development

Our research model proposes that consumers’ brand knowledge and the effectiveness of e-business platform services build brand trust online, and this in turn influences consumers’ purchase intentions. Building on previous studies of brand knowledge and online trust, we propose four main hypotheses. We also consider third party certification, i.e., the e-business platform certification system, as a moderator rather than an antecedent of online trust, as it has been seen in previous

studies (e.g., [48, 54]. We hypothesize that e-business platform certification system moderates the brand trust-building mechanisms.

2.1 Brand trust online

2.1.1 Trust

Trust has been conceptualized in different academic disciplines, such as sociology, psychology, economics, and marketing. Sociologists see trust as a property of relationships among people [39] or institutions [100]; psychologists discuss trust in terms of the attributes of trustors and trustees and focus on internal cognitions [87]; and economists view trust as either calculative [99] or institutional [75]. In this study, we consider trust in the context of the electronic market.

Trust, from a working relationship perspective, is a general belief that another party can be trusted [6, 71, 74]; it is a belief that one's partners are credible, benevolent [31], and honest [57]. From the interpersonal perspective, trust is a set of specific beliefs about a person or institution, such as a belief in their benevolence, honesty, and ability, and a willingness to depend on the person or institution [58, 67–69]. We conceptualize trust as a willingness to be vulnerable [88] or to behave according to others' expectations [63] when facing risk.

Following previous studies [24, 25, 30], Mayer et al. [67] proposed a generic typology of trust with three dimensions: ability, benevolence, and integrity. As the three dimensions tap into different elements of the cognitive and affective abstraction of trust, they are conceptually distinct and together represent a comprehensive yet parsimonious set of dimensions for trust formation. Many other dimensions can be subsumed within these three dimensions, and this generic typology has been widely adopted in scales for measuring online and physical trust.

2.1.2 Online trust

Online trust is the foundation of e-commerce [51]; it has been considered an essential element of online transactions, as it is a key component of social capital [67]. In recent years, online trust has received tremendous attention from academia and practitioners. There are abundant studies of online trust formation and outcomes in the online consumer behavior literature. In general, these studies focus on two aspects of online trust. The first examines trust in the online environment, i.e., online trust is displayed when consumers know the risk of online transactions, but still believe that e-commerce is safe [55]. The second set of studies see trust as an aspect of consumers' perceptions, i.e., online trust means that consumer believe e-commerce will result in satisfaction with the provided services and products, so they are willing to shop online [34, 70]). In both perspectives, online trust is the trustor's belief in the trustee's ability, benevolence, and integrity [9, 36, 67]. Thus, trust plays an important role in helping consumers to overcome perceived risk, and make their purchase decision [70]. In contrast, lack of trust online deters consumer adoption of e-commerce [9].

2.1.3 Brand trust online

Brand trust is consumers' confidence that a brand's products and services are dependable and competent [42]. It has two components: brand reliability and brand intentionality [23]. When facing risks, consumers are willing to rely on a brand they trust [59] because they are confident the brand will meet their expectations [22]. Hawass [41] concluded that brand trust is a rational chemistry upon which the consumer is emotionally and rationally attached to a specific brand name. It has been demonstrated that brand trust brings about brand credibility [26] and leads to brand loyalty [15, 32]. Brand trust is also an indispensable part of a successful marketing relationship [97]. When people trust a brand, they assume that the brand's products and services are of high quality and that the seller of this brand is acting with ability, integrity, and benevolence.

In this study, we define that brand trust online exists when people who have gained brand knowledge of an existing offline brand, believe that the brand's online channel is authentic, the branded products or services sold in the online channel on a particular e-business platform are of the desired quality, and that the sellers on the e-business platform act with ability, integrity, and benevolence.

2.1.4 Antecedents of trust

As we are examining the online trust-building mechanism of existing brands, the antecedents of trust identified in previous studies are important references. The antecedents identified in previous studies are summarized in Table 1.

Below we discuss the factors that contribute the most to trust formation based on Table 1.

2.1.4.1 Familiarity Luhmann [63] first suggested that familiarity is a precondition of trust. Gefen [34] expanded this to online trust. In a follow-up study, Gefen et al. [38] further demonstrated that knowledge-based familiarity has a positive effect on online relationships. Extending the idea of knowledge-based familiarity into brand trust, Hsu and Cai [46] found that when people are familiar with a brand, they develop brand trust. Similarly, Rempel et al. [84] and Garbarino and Johnson [32] held that trust evolves from past experiences and prior interactions. That is, consumers gained brand knowledge based on their past experiences of purchasing this brand. Hsu and Cai [46] claimed that brand knowledge generated from prior interactions with a brand can be an antecedent of brand trust.

2.1.4.2 Online services An important antecedent of online trust is online services, including feedback systems, credit card guarantees, and so on. As Pavlou and Gefen [80] demonstrated, feedback mechanisms, escrow services, and credit card guarantees can build consumers' trust in online sellers. Gefen [35], and Ba and Pavlou [7] also proved this point.

Table 1 Antecedents and outcomes of trust

Sources	Antecedents of trust	Trust target	Outcomes of trust
Ba and Pavlou [7]	Feedback profile	Online sellers	Price premiums
Burt and Knez [12]	Relation strength, third party	Trust in a relationship	
Chellappa and Pavlou [16]	Perceived security, limited financial liability	E-commerce transaction	Online transaction
Garbarino and Johnson [32]	Competence, care, consensual values (including prior interaction).	Hazard-related trust	
Gefen [34]	Familiarity, disposition to trust	E-commerce	Online inquiry or purchase
Gefen [35]	Service quality	Customer trust in e-commerce	Customer loyalty
Gefen et al. [38]	Calculative-based and institution-based structural assurance, institution-based situational normality, knowledge-based familiarity	Online shopping	Online shopping intention
Gefen and Straub [37]	Social presence	E-commerce	Purchase intention
Hong and Cho [44]	Competence, benevolence, integrity	Trust in intermediary vs. online seller	Purchase intention and customer loyalty.
Hsu and Cai [46]	Brand knowledge	Brand trust	Brand loyalty
Jiang et al. [48]	Perception of third-party certification identifying logos, current level of trust in online shopping	Offline trust transfer to online seller	
Kimery and McCord [54]	Third party assurances, individual disposition to trust, perceived risk, and attitude toward online seller.	Online trust	Purchase behavior
Luhmann [63]	Familiarity	Trust in general	
Mayer et al. [67]	Ability, benevolence, integrity	Trust	Risk taking in relationships
Ou et al. [76]	Interactivity and presence	Trust the online seller	Repurchase intention
Palmer et al. [77]	Trusted third parties, privacy statements	Supplier and consumers in E-commerce	
Pavlou and Gefen [80]	Feedback mechanism, escrow services, credit card guarantees, trust intermediary	Online sellers	Transaction intention
Rempel et al. [84]	Experiences in close relationships	Interpersonal trust	Believe partners

2.1.4.3 Third-party certification Burt and Knez [12] confirmed that a third party can contribute to building trust. In the online market environment, consumers face various risks [34, 56, 83], such as price discrimination, information asymmetry, payment risk, and so on [38]. These risks increase consumers' uncertainty in an

online environment, and thus third-parties play an increasingly important role in the relationships between online buyers and sellers. Some scholars have proven that consumers trust online sellers who use third-party identification logos [48], trusted third parties, and third party assurances [54].

Studies have shown that other factors, such as perceived consumer security [16], the sense of social presence [37], and interactivity [76], are positively related to the process of trust building, especially online trust.

In this study, we build on previous studies and consider familiarity with a brand, formally known as brand knowledge, and online services as the two main components of online trust formation. Although third-party certification has been identified as an antecedent of online trust by earlier researchers (e.g., [54]), we regard it as a moderator in our research model instead.

2.2 Brand knowledge

Brand knowledge is conceptualized as linked brand nodes stored in consumers' minds; these nodes represent types of information about the brand [52]. Brand knowledge can be formed by study or by outside stimuli, such as advertisements, promotions, and so on [19]. Brand knowledge, together with perceived quality and brand loyalty, make up brand equity [11, 78], i.e., brand knowledge is an important antecedent of brand equity. Previous studies have explored the relationship between brand knowledge and other brand-related constructs. For instance, brand knowledge had a positive effect on brand marketing [96]; was positively associated with brand purchases [27, 73, 93]; and, as we discussed above, was found to be an antecedent of brand trust [46].

Keller [52] divided brand knowledge into two dimensions, brand awareness and brand image. Abundant studies have examined the relationship between these sub-dimensions of brand knowledge and consumers' decision behavior; they have found, for example, that brand awareness leads to willingness to choose the brand [66, 93] and that brand image nourishes consumers' purchase intentions [27, 73]. We use brand awareness and brand image as two independent variables that directly generate online trust through their relationship with brand knowledge and online trust, respectively.

2.2.1 Brand awareness

Keller [52] found that brand awareness consists of brand recognition and brand recall. Brand awareness is the main attribute of a brand [72]; it is a measure of the strength of information about a brand in consumers' minds [1, 52]. Rossiter and Larry [86] defined brand awareness as the consumers' ability to identify a brand under different conditions. Keller's study [52] not only examined the conditions of brand recognition, but also measured brand recall, which is consumers' ability to retrieve brand information from their memory. In the online environment, a consumer surfing online may see a familiar brand for sale on an e-business platform; when he/she recognizes the brand name, he/she will recall his/her experience with the brand. This process represents the formation of brand awareness.

Brand awareness plays an important role in the consumer decision-making process. People think of the brand when they see its products, brand logo, brand advertisements, etc., and this brand awareness affects their selection of a consideration set [45]. Alamro and Rowley [3] found that brand awareness is an antecedent to brand preference, which is positively associated with brand trust. Esch et al. [27] found that brand awareness has a positive effect on brand trust. These studies have uncovered a relationship between brand awareness and brand trust in the context of traditional retailers' physical stores. In this study, we propose that brand awareness associated with a traditional existing brand has a positive effect on building brand trust in its online channel. Thus, we propose the following hypothesis.

H1 Consumers' brand awareness of an existing brand is positively associated with their brand trust in the online channel.

2.2.2 Brand image

Brand awareness is necessary for the creation of brand image, which is a series of associative links in consumers' minds [52]. Consistent with the definitions of many researchers, Keller [52] defined brand image as a group of perceptions about brand associations deeply rooted in memory, which are informational nodes linked to brand nodes in consumers' minds. Specifically, brand image consists of the types, favorability, strength, and uniqueness of brand associations. Brand image has been widely recognized as very important for marketing [50]. Any product has a distinct image, and every brand has a unique brand image [79].

Brand images help both companies and consumers, i.e., they help consumers to get clear information, and help companies to achieve differentiation. Richardson et al. [85] found that brand image is usually regarded as a set of external cues of brand equity, and consumers take full advantage of a brand image to deduce brand equity. Therefore, a positive brand image leads to higher perceptions of brand equity, which eventually generates brand trust. Esch et al. [27] showed that brand image has a direct effect on brand trust [46]. Thus, we propose the following hypothesis.

H2 Consumers' brand image of an existing brand is positively associated with their brand trust in the online channel.

2.3 Effectiveness of e-business platform services

E-business platform services include value-added services, e.g., open discussion sections, feedback mechanisms, evaluation systems, post-sale services, fast shipping priorities, optional return policy, computer mediated communications, etc. Previous research has demonstrated that the quality of the online services provided by an e-business platform positively affect its online trust-building mechanism (e.g., [35]; etc.). Shah et al. [92] proved that online services minimize information asymmetry, and are especially useful for effective communication. Ou et al. [76] recently examined the Alibaba C2C platform and found that its computer-mediated

communications increase the users' perceptions of interactivity and presence, which leads to online trust.

In our study, we do not take all the details of online services such as those listed above into consideration for our model constructs, in that we aim to investigate the antecedents of trust in the online channel other than consumers' confidence via product information search. However, the feedback mechanisms, evaluation systems, and discussion forums, etc. only affect consumers' selection of a product or brand preference. To be concrete, a consumer reads the votes, comments, and discussions about a product or a brand only if he/she is not familiar with the product or the brand, and needs to compare alternative products and brands. If the consumer has already gained sufficient brand knowledge about a specific brand, he/she only hesitates over which channel to use when making the purchase. As we are examining the antecedents of online trust from the perspective of existing brands, in our model we only consider payment security and the other factors that promote a particular online channel. Thus, we propose the following hypothesis.

H3 The effectiveness of e-business platform services positively affects consumers' brand trust in the online channel of an existing brand.

2.4 Purchase intention

Purchase intention is a consumer's willingness to buy something. One of the main results of trust is purchase intention (e.g., [44, 54]). Prior studies have empirically demonstrated that brand trust increases consumers' purchase intention [37, 80]; [22]; [59]. Trust intentions result in trust-related behavior, such as making purchase decisions [34]. Thus, we propose the following hypothesis.

H4 Consumers' brand trust in the online channel increases their purchase intention online.

2.5 E-business platform certification system

E-business platform certification systems are guarantees of brand trustworthiness on the certified platform. In other words, they guarantee that all of the brands on the platform are authentic and that the products sold online are of the same quality as the brand standard. Dishonest behavior is punished and online stores that do not comply may be removed from the e-business platform. The prohibition of counterfeit products protects consumers from uncertain risks of remote transactions online [80]. A certification system must guarantee that the products on the e-business platform are certificated goods; that the brand's online and the offline stores are operated by the same seller; and that the products sold and services provided online are not different than those in the recognized offline store. In other words, the e-business platform certification system assures consumers that the online store is a trustworthy source for a brand's products. Such a certification system can enhance trust building online. Accordingly, in our research model, the e-business platform certification system is a positive moderator between brand awareness and brand trust online. Therefore, we propose the following hypothesis.

H5a The positive effect of brand awareness on brand trust online is positively moderated by the e-business platform certification system. That is, the positive effect of consumers' brand awareness of an existing brand on their brand trust in the online channel is stronger when the e-business platform has a certification system to guarantee brand authenticity.

Similarly, when a consumer is aware of an online store, his/her sense of trust comes mainly from the brand image generated by the brand offline. As the e-business platform certification system ensures that the online store is genuine, it undoubtedly accelerates the psychological process of generating online trust. Thus, we propose that an e-business platform certification system positively moderates the relationship between brand image and brand trust online. Accordingly, we make the following hypothesis.

H5b The positive effect of brand image on brand trust online is positively moderated by the e-business platform certification system. That is, the positive effect of consumers' brand image of an existing brand on their brand trust in the online channel is stronger when the e-business platform has a certification system to guarantee brand authenticity.

Such certification systems can reduce social uncertainty by providing an escrow within which the transaction occurs, making it possible to force even unwilling sellers to behave in a socially acceptable manner [38, 63]. This is a trust transference process [40], in which as consumers trust the platform, they may extend that trust to the sellers in this marketplace. As a result, consumers can transfer their brand knowledge from offline to online marketplaces and extend their brand trust to online markets. Therefore, the e-business platform certification system enhances the process of trust building in the online store. The certification system increases the institutional trust perceived by the consumers. That is to say, the certification system can increase the positive effect of platform services on brand trust online. Thus, we propose the following hypothesis.

H5c The positive effect of the effectiveness of e-business platform services on brand trust online is positively moderated by the e-business platform certification system. That is, the positive effect of the effectiveness of e-business platform services on consumers' brand trust in the online channel of an existing brand is stronger when the e-business platform has a certification system to guarantee brand authenticity.

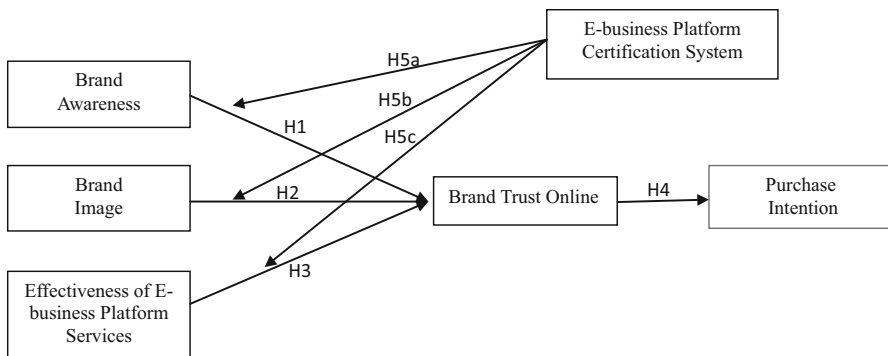
The constructs discussed above that are used in the research model are summarized in Table 2. Figure 1 illustrates the proposed research model.

3 Research methodology

The data used to test the research model are survey data. We use structural equation modeling to analyze the model.

Table 2 Model constructs

Construct	Conceptualization
Brand awareness	The consumers' ability to identify a brand or retrieve brand information based on their memory under different conditions
Brand image	Perceptions about brand associations deeply rooted in memory; brand associations are informational nodes linked to brand nodes in consumers' minds
Effectiveness of the E-business platform services	Consumers' perceptions of online service quality, such as payment security, etc. that will encourage them to make online purchases from the platform
Brand trust online	Consumers who have brand knowledge of an existing offline brand believe that the brand products or services sold in the online store of the e-business platform are authentic, and the sellers on the e-business platform have ability, integrity, and benevolence
Purchase intention	Willingness to purchase
E-business platform certification system	A policy promulgated and carried out by the e-business platform to guarantee brand authenticity on the platform

**Fig. 1** Research model

3.1 Survey administration

The questionnaire was created and posted on a professional website of an online survey service that attracts participants by providing them with opportunities to enter a lottery, i.e., to win an iPad Mini 2, after completing each questionnaire. We put a link to the survey on our research center's webpage and invited students and university staff to participate. We informed students in all sections of the *Principles of Marketing* class that three extra points would be added to the final grade of the undergraduate students who completed the survey. We invited university students and university staff to participate in our experiment as they are proficient Internet users and most of them have online purchasing experience. Using these participants does not affect the validity of the findings as (a) university students and IT professionals are proficient Internet users and conduct more online business than

others; (b) students and IT professional are younger and better educated than conventional consumers, which closely resembles the online customer population [70]; and (c) using a homogeneous population can decrease the effect of variance when not exposed to all of the factors existing in the real world [60].

To achieve better reliability and validity, all of the subjects were required to take a screening test to ensure that they had purchased a branded product from the online store on Tmall, and that they had shopped for the same brand in its physical store in the past. Those who satisfied the two conditions were directed to the main part of the questionnaire. Those who did not were asked to quit the survey. If those participants who did not satisfy the two conditions completed the survey to qualify for the lottery, we did not consider their answers valid data to be used in the analysis. We required them to have physical shopping experiences with the same brand, as the purpose of this study was to discover how consumers migrate their brand knowledge from offline to online and build their brand trust in the online channel. The invitees were assured that the results would be reported only in aggregate.

Our questionnaire items were designed to fit the shopping scenario on Tmall. We required the participants to have similar online shopping experiences, including having used similar platform services, policies, and so on. We selected Tmall as the main background platform because Tmall is the largest e-business platform in China, and it has developed professional services for both sellers and buyers. For the businesses, Tmall has a certification system that guarantees the authenticity of the brands that sell products on its platform, and it has efficient customer service modules that provide professional services for consumers. For individual consumers, Tmall provides a secured third-party payment system, rich media for online communication, and a series of post-sale services and policies that protect consumer rights.

3.2 Scale development

There are six constructs in the research model. The measurement items were mostly adopted from the literature. The scales for measuring brand awareness and brand image were selected from the measurements of brand knowledge developed by Aaker and Fournier [2]; we revised the wording to fit the e-business environment.

The effectiveness of e-business platform services was measured with six items based on the scale developed by Pavlou and Gefen [80] to measure the effectiveness of perceived escrow services and of perceived payment security. We select only two of the four dimensions in Pavlou and Gefen [80], as we treat third-party certification as a moderator in our model and our choice of items reflect this definition. Furthermore, as discussed in the model development section, feedback mechanisms do not play a significant role in online trust building when the consumer is already familiar with the brand. Therefore, we only select the two factors that strongly affect consumers' selection of a purchasing channel.

Brand trust online, was measured by three dimensions, ability, benevolence and integrity [91]. Serva et al. [91] 's scale is widely adopted and in our study we adopt it to measure brand trust in the online context for existing brands. Purchase intention was measured by three items from Pavlou and Gefen [80]. The e-business platform

certification system was measured by three new items developed from the definition given above. All of the measurement items are shown in Table 3.

4 Data analysis and discussions

Structural equation modeling (SEM) was adopted as the main data analysis method. Among the common statistical approaches for testing path models, we conducted AMOS-LISREL type search algorithms (covariance-based SEM) instead of the partial least square analysis (PLS, component-based SEM) to test the full nomology of the hypothesized research model. Lowry and Gaskin [61] compared these two approaches of SEM and concluded that covariance-based SEM allows for the comparison between observed and proposed covariance matrices so that has advantages over PLS in terms of assessing the model validation. However, PLS is only preferable to identifying the relationships between latent variables in the model, and thus cannot be used for hypothesis testing [98].

Covariance-based SEM collectively explores several interrelated issues by simultaneously testing the causal relationships between exogenous constructs and endogenous constructs [5]. This method provides more dynamic analyses for model fitting, whereas factor analysis and the path analysis are validated in a two-step approach. We tested the internal consistency of the model constructs as well as the basic descriptive statistics.

After eliminating the 18 subjects who did not satisfy the preconditions and quit after the screening test, we had useful data from 213 participants from the online survey. The demographic information of these subjects is shown in Table 4.

We applied Welch's *t* test to compare the means of the variables grouped by demographic categories (age, income, product categories), and found no significant effect of these factors. Q-Q plots were drawn to check the normality of the measurement items, and no variables were observed to have heterogeneity. Then, we used SPSS to conduct exploratory factor analysis and AMOS for the confirmatory factor analysis and structural equation modeling with moderation test, etc.

4.1 Factor extraction with exploratory factor analysis

We randomly selected half of the data for explanatory factor analysis. Our sample size met the minimum of 100 subjects [65], and the ratio of subjects-to-variables was above 5:1, making the sample suitable for factor analysis [10, 33]. We applied the rotary factor method for principle axis factoring [20], and obtained the measurement of each of the constructs shown in Table 3. Then, we ran an exploratory factor analysis for the questionnaire items of each construct in the research model. The $KOM = 0.948$, which was above the threshold of 0.80 [49] and $Sig = 0.000$, which means that the model was significant. Cronbach's alpha [21] was used to test the internal consistency of the measurements for information accuracy. The result was acceptable and the model was thus suitable for exploratory factor analysis. Table 5 shows the factor loadings; all of them are above 0.60 [28], indicating the significance of the model.

Table 3 Measurements of the constructs

Construct	Items to assess the construct	Source
Brand awareness	I know this brand (BA1)	Aaker and Fournier [2]
	I have an opinion about this brand (BA2)	
	I am familiar with this brand (BA3)	
	I know what this brand stands for (BA4)	
	I can recognize this brand in the product class (BA5)	
Brand image	This brand provides good value for money (BI1)	Aaker and Fournier [2]
	There are reasons to buy this brand over its competitors (BI2)	
	This brand has a personality (BI3)	
	This brand is interesting (BI4)	
	This brand is made by an organization I would trust (BI5)	
	I admire the organization that made the product (BI6)	
	The organization associated with this brand has credibility (BI7)	
E-business platform certification system	I know that Tmall has a certification system (TC1)	New item
	I think the Tmall certification system can ensure the authenticity of the brand (TC2)	
	I think the Tmall certification system prohibits counterfeit brands on this platform (TC3)	
Online trust	This online brand seller is competent and effective when selling the product (TR1)	Serva et al. [91]
	This online brand seller performs its role of selling the products online very well (TR2)	
	Overall, this online brand seller is a capable and proficient Internet seller (TR3)	
	In general, this online brand seller is very knowledgeable about the product (TR4)	
	I believe that this online brand seller would act in my best interests (TR5)	
	If I required help, this online brand seller would do its best to help me (TR6)	
	This online brand seller is interested in my well-being, not just its own (TR7)	
	This online brand seller is trustworthy in its dealings with me (TR8)	
	I would characterize this online brand seller as honest (TR9)	
	This online brand seller would keep its commitments (TR10)	
	This online brand seller is sincere and genuine (TR11)	

Table 3 continued

Construct	Items to assess the construct	Source
Effectiveness of E-business platform services	I believe that Tmall service protects buyers in the case of problematic transactions with sellers (TS1)	Pavlou and Gefen [80]
	I am confident that my transactions on Tmall are safe in the case of disputed purchase from sellers (TS2)	
	Tmall will stand by me if problems occur during transactions with sellers in Tmall (TS3)	
	Tmall service can guarantee that I will get what I pay for (TS4)	
	Tmall service can protect me from sellers' inappropriate behavior (TS5)	
	Tmall makes it difficult for sellers to cheat (TS6)	
Purchase intention	Given the chance, I predict that I would bid for a product from the brand seller in Tmall (WTP1)	Pavlou and Gefen [80]
	It is likely that I will actually bid for a product from a brand seller in Tmall (WTP2)	
	Given the opportunity, I intend to place a bid with a brand seller in Tmall (WTP3)	

Table 4 Demographic Statistics

Attributes	Categories	Samples	Percentage %
Age	0–20	22	10.3
	21–30	174	81.7
	31–40	12	5.6
	41–50	4	1.9
	51 and above	1	0.5
Monthly income	Under RMB1500	97	45.5
	RMB1500–3000	61	28.6
	RMB3000–5000	44	20.7
	RMB5000–8000	6	2.8
	RMB8000–15000	2	0.9
	RMB15000 or above	3	1.4
Brand classification	Food	21	9.9
	Clothes	95	44.6
	Household Items	28	13.2
	Digital Products	20	9.4
	Cosmetics	22	10.3
	Others	27	12.7

Table 5 Factor loadings in the rotated factor pattern matrix

	BA	BI	TS	TC	TR	WTP
BA1	0.76					
BA2	0.86					
BA3	0.79					
BA4	0.81					
BA5	0.79					
BI1		0.82				
BI2		0.88				
BI3		0.85				
BI4		0.83				
BI5		0.83				
BI6		0.85				
BI7		0.87				
TS1			0.93			
TS2			0.81			
TS3			0.90			
TS4			0.77			
TS5			0.72			
TS6			0.80			
TC1				0.69		
TC2				0.94		
TC3				0.74		
TR1					0.86	
TR2					0.92	
TR3					0.89	
TR4					0.85	
TR5					0.86	
TR6					0.87	
TR7					0.90	
TR8					0.89	
TR9					0.90	
TR10					0.89	
TR11					0.92	
WTP1						0.86
WTP2						0.89
WTP3						0.93

4.2 Reliability and validity of the measurement model

To validate the measurement model, we ran the confirmatory factor analysis using the other half of the data set. We used Cronbach's alpha to test the internal consistency for all of the constructs extracted in the model. The Cronbach's alpha values, as shown in Table 6, indicated reasonable construct reliability; each

Table 6 Measurement model estimation and validation

Constructs	Items	Factor loading	Cronbach's Alpha	AVE
Brand awareness (BA)	BA1	0.753	0.90	0.64
	BA2	0.867		
	BA3	0.792		
	BA4	0.787		
	BA5	0.794		
Brand image (BI)	BI1	0.767	0.92	0.63
	BI2	0.826		
	BI3	0.804		
	BI4	0.763		
	BI5	0.754		
	BI6	0.817		
	BI7	0.802		
Effectiveness of E-business platform services	TS1	0.814	0.91	0.63
	TS2	0.748		
	TS3	0.794		
	TS4	0.833		
	TS5	0.762		
	TS6	0.820		
E-business platform certification system	TC1	0.634	0.81	0.60
	TC2	0.860		
	TC3	0.808		
Trust	TR1	0.727	0.95	0.62
	TR2	0.860		
	TR3	0.808		
	TR4	0.715		
	TR5	0.685		
	TR6	0.742		
	TR7	0.741		
	TR8	0.842		
	TR9	0.818		
	TR10	0.819		
	TR11	0.877		
Purchase intention	WTP1	0.775	0.88	0.72
	WTP2	0.830		
	WTP3	0.925		

construct's Cronbach's alpha value was higher than 0.80, above the threshold value of 0.70. Furthermore, we examined the average variance extracted (AVE) based on the factor loadings. AVE is commonly adopted as an index to demonstrate the convergent validity of a measurement model in factor analysis. The AVE values ranged from 0.64 to 0.81, well above the acceptable level of 0.5. The results showed

Table 7 Correlation matrix

	BI	TS	BA	TC	TR	WTP
BI	1					
TS	0	1				
BA	0	0	1			
TC	0	0	0	1		
TR	0.562**	0.582**	0.348**	0.373**	1	
WTP	0.479**	0.471**	0.452**	0.328**	0.875**	1

** 0.01 level of significance

Table 8 Hypotheses test results

Hypothesis	Estimate	S.E.	C.R.	P (<0.05)
H1	0.348	0.033	10.682	***
H2	0.562	0.033	17.242	***
H3	0.582	0.033	17.864	***
H4	0.875	0.033	26.34	***

that the reliability and validity of the sample was favorable. Table 6 gives the factor loadings for all of the measurable items from the confirmatory factor analysis, the Cronbach's alpha, and the average extracted for each construct of the measurement model.

4.3 Correlation analysis

Table 7 shows the results of the correlation analysis of the main constructs. At the 0.01 level of significance, brand awareness, brand image, effectiveness of e-business services, and purchase intention were highly correlated with trust, and particularly with purchase intention (correlation = 0.875). However, the independent variables, brand awareness, brand image, and effectiveness of the e-business service, were not strongly correlated, which suggests that these variables are relatively independent. These results showed that these constructs were suitable for constructing a model and conducting a path analysis.

4.4 Path analysis

After demonstrating the reliability and validity of the model, we tested the structural equation model. The path analysis provides support for our first four hypotheses. We then tested the moderation effects. The analysis showed that brand awareness of an existing brand had a positive effect on building brand trust online (H1: path coefficient = 0.348). Brand image of an existing brand had a positive effect on migrating brand trust from traditional offline stores to online stores (H2: path coefficient = 0.562). The effectiveness of e-business platform services contributed positively to building brand trust online (H3: path coefficient = 0.582). As expected, brand trust online had a positive effect on consumers' purchase intentions

Table 9 Measurement model across groups

	Sum of squares	DF	Mean square	F	Sig.
Between groups	119.78	2	59.89	54.07	0.000
Within groups	232.59	210	1.11		
Total	352.37	5.60	0.97		

(H4: path coefficient = 0.875). All four of these hypotheses were true at the $P < 0.05$ significance level, as shown in Table 8.

The overall fit of the model showed acceptable indices: $CMIN/DF = 4.107 < 5$, $GFI = 0.958 > 0.90$, indicating that the model's explanatory strength is high [8]; and $NFI = 0.962 > 0.9$, $CFI = 0.971 > 0.95$, indicating a satisfactory model.

4.5 The moderating role of the platform certification system

We classified the survey results of consumer's recognition of the e-business platform certification into three groups: low ($M < 4$), medium ($M = 4$), and high ($M > 4$). Based on this classification, we applied a covariance-based SEM approach [82]. First, the measurement model invariance was tested. As shown in Table 9, we found significant differences across these three groups ($Sig. = 0.00 < 0.05$). This suggests that the measurement models across the groups are comparable [18], and that this classification is reasonable.

To examine whether the platform certification system moderates the positive effect of brand awareness, brand image, and the effectiveness of e-business platform services on brand trust online, we conducted an additional moderation test. We used AMOS to attempt model fitting under these three conditions. We named the model without the moderating effect the default model and that with moderating effect model the moderate model. In the default model, all of the path coefficients were unconstrained and varied freely across the three groups; however, in the moderate model, equal constraints were imposed on all of the path coefficients [81]. The comparison of the default model and moderate model gave the following results: $DF = 6$, $CMIN = 36.44$ and $P = 0.00$. These results indicated that the difference in the Chi square values were significant, the path coefficients across the groups differed significantly [14, 90], and the moderator played a positive role [89].

The results shown in Table 10 indicate that the moderating effects of the platform certification system on the path between brand awareness, brand image, and the effectiveness of the e-business services on brand trust online was significant ($P = 0.000 < 0.05$). That is, H5a was supported; there was a positive association between consumers' brand awareness of an existing brand, and brand trust in its online channel was enhanced by an e-business platform certification system. So was H5b supported; the positive relationship between brand image and brand trust in its online channel was enhanced by the certification system. Similarly, H5c was supported; the e-business platform certification system positively moderated the relationship between the effectiveness of e-business platform services and brand trust online.

Table 10 Moderating Effects of the E-business Platform Certification System

Model	DF	CMIN	P	NFI Delta-1	IFI Delta-2	RFI rho1	TLI rho2
Moderate	6						

4.6 Discussion

This study examined how consumers' brand knowledge of an existing brand and the effectiveness of e-business platform services contribute to consumers' brand trust in the brand's online channel, and how this in turn increases consumer purchase intention. We demonstrated that the e-business platform certification system enhances the migration of consumers' brand trust from offline to online channels.

Based on the empirical evidences, we found that the two important elements of brand knowledge for an existing offline brand, brand awareness and brand image, had a significant positive effect on the migration of consumers' brand trust to the online channel. In addition, consumers' brand knowledge of the existing brand and the effectiveness of e-business platform services made non-negligible contributions to the level of brand trust generated by the online channel. These results are consistent with prior findings that both brand value itself and a third-party platform increase consumers' online trust in an e-business context. Furthermore, the confirmation of Hypothesis 4 showed that brand trust online positively leads to consumers' purchase intention.

We examined the mechanisms through which the e-business platform certification system works on the trust-building mechanism of the online channel for an existing brand. The results supported H1, H2, and H3 in our research model. The results in Table 10 show that the moderating effects were significantly positive at the $P < 0.05$ significance level, as we hypothesized in H5a/b/c. Specifically, a properly working certification system accelerates the process of building consumers' brand trust online for an existing brand.

5 Conclusions

E-business and online trust have been widely studied in a variety of related disciplines. Prior studies have developed distinct e-business models and examined them from different angles. In this study, we consider the e-business model from the perspective of existing brands. We define brand trust online as the trust people develop when, after gaining brand knowledge from an existing offline brand, they believe the products and services sold on the online channel are authentic, and the sellers of the online channel have ability, integrity, and benevolence. From the existing brand's perspective, we examine the mechanisms through which consumers' brand knowledge migrates into brand trust in their online store on an e-business platform. In our model, the e-business platform services are an antecedent to consumers' brand trust online. Furthermore, a certification system of the e-business platform enhances the brand trust-building process. Finally, the

brand trust online directly leads to consumers' purchase intention and this in turn benefits the brand.

5.1 Theoretical implications

Our study contributes to the literature in the following way. First, online trust has been commonly found to be associated with website quality, quality of products, CMC tools, and similar trust-building mechanisms. In our study, building on existing research, we combine two of the main sources of trust building, familiarity and online services, and integrated theories of trust and brand knowledge to develop a model to explain the antecedents of creating an brand trust online for an existing brand.

Second, our analysis proves that offline brand knowledge can eventually translate into brand trust online. Although many studies have shown that brand knowledge is closely related to brand trust, our study examines whether offline brand knowledge can lead to online brand trust. Our results demonstrate that brand knowledge is a huge intangible asset for traditional offline brands and it can significantly increase consumers brand trust in the online channel and improve the performance of online stores.

Finally, our research model examines the role of the e-business platform certification systems in building brand trust online. Instead of regarding such systems as antecedents of online trust, we propose that e-business platform certification systems play a moderating role in the process of trust building. Our proposed model has a higher model fit than models that treat certification systems as an antecedent. We find that e-business platform certification systems can facilitate trust building.

The theoretical implications of this study can be summarized as follows: (1) explains the brand trust-building mechanism for an existing brand on an e-business platform; (2) highlights the role of brand knowledge in trust building, especially from an offline brand to its online channel; and (3) uncovers the moderating effect of an e-business platform certification on the online trust-building mechanism.

5.1.1 Implications for building brand trust online for an existing brand

This study conceptualizes brand trust in the online channel of an existing brand. Trust has received abundant attention in previous studies, and online trust is a widely examined topic in the Internet era. In our study we focus on the scenario of brand trust of an existing brand transforming into online brand trust.

As is well known, trust is a predictor of online transactions [76]. Our results verify the mediating role of brand trust online, where brand trust in the online store bridges the relationship between brand knowledge, the effectiveness of the e-business platform, and consumers' purchase intentions.

Prior studies have shown that website quality [97], consumer characteristics [43], CMC tools [76], and other factors influence online trust-building mechanisms. Kim et al. [53] found that technologies, consumers, third parties, websites, products, and logistics are the six factors that contribute to trust online. However, prior studies did

not consider brand knowledge as an important factor for building online trust, especially for existing brands. Our study shows that brand trust online is established with a combination of brand knowledge in the existing brand, especially brand awareness and brand image, and institutional trust in the platform, especially the effectiveness of e-business platform services.

5.1.2 Implications for using brand knowledge

Brand knowledge has long been regarded as part of brand equity [11, 78]. Prior studies have shown that brand knowledge has a positive effect on brand purchase [27, 73, 93], but few studies have examined its role in the process in decision-making. Our study shows that brand knowledge, by integrating its sub-dimensions brand awareness and brand image, can be used to stimulate trust building, typically for an existing brand, and plays a crucial role in online marketplaces.

This study also examines how these processes migrate from offline to online. Some studies have shown that a consumer may prefer online products related to his/her preferred offline brand (e.g., [29, 95], etc.), but these studies did not investigate the connection between online and offline markets. Our study fills this gap. We find that brand knowledge, stored in consumers' minds as nodes, increases consumers' familiarity with a brand, decreases the perceived risk of purchasing product from an online channel, and contributes to brand trust online.

5.1.3 Implications of the moderating effect of the e-business platform certification system

The e-business platform certification system guarantees the authenticity of the online brands, and accordingly enhances the online brand trust-building process for existing brands. Similarly, it strengthens the effect that platform services exert on the online brand trust-building mechanism.

E-business platform certification systems have positive effects on online trust building. Some studies have shown that third-party certification can lead directly to online trust. This study develops a new research model that demonstrates that the certification system are not an antecedent of brand trust that directly leads to brand trust online, but rather positively moderate the brand trust-building mechanism.

5.2 Managerial implications

One of our key findings is the importance of brand knowledge in the online brand trust-building mechanism. Our research is conducted from the perspective of an existing brand, which aims to build brand trust in its online store and increase online transactions under severe competition from online retailers, distributors, and other brands in the Internet era. Our research demonstrates the practical value of brand knowledge by showing the significance of brand knowledge for building brand trust in an online store. Our results suggest that traditional brand owners can fully use brand knowledge to develop online business, as Internet-oriented business is an irreversible trend.

As we discussed, brand knowledge can be formed by self-study or by outside stimuli, such as advertisements, promotions, and so on [19]. Therefore, traditional brands can provide detailed product information and promotion online. To complement this information, the brand can provide consumers with more access to the product offline, which will help consumers to gain brand knowledge, a brand's invisible asset. Subsequently, the brand can integrate the offline and online channels for better cross-channel selling.

As our study demonstrates that the effectiveness of e-business platform services can increase brand trust, and the certification system positively moderates the effect of the institutional trust on brand trust online, e-business platform vendors may want to offer better services on their Web-based platforms and mobile apps, e.g., effective communicating tools, rigorous certification systems, etc.

5.3 Limitations

This study has several limitations. We distributed the survey invitations online, and the participants were frequent Internet users. Therefore, our sample does not include people who are hesitant about shopping online, although the latter group has great potential for traditional brands.

The participants reported the names of brands that they had previously shopped for on- and offline. In our sample these brands cover a wide range of product types that represent typical products purchased online. In our model, we do not use product type as a control variable, which might have a significant effect on consumers' online shopping behavior.

Common method variance is a problem in survey research. Any study in which the constructs are measured by the survey method must consider this bias. A more robust way of solving this problem would be to use objective measures, e.g., real sales data.

5.4 Future directions

Some of the limitations of our study point toward interesting opportunities for future research. First, consumers' sense of brand trust may be affected by brand categories. Thus, in future research, product type could be tested in the model as a control variable, to differentiate the brands and arrive at more precise results.

Second, our study provides evidence that brand knowledge contributes to building brand trust online. Future research can compare the role of brand knowledge with other issues in the online marketplace, such as familiarity, swift relationship, and so on, which could bring more insights for e-business practitioners.

Third, our current model does not include alternative attributes of existing offline brands. We propose that brand knowledge is the leading factor in building brand trust in an online store. In future research, other attributes of a traditional offline brand, e.g., company type, company scale, yearly revenue and profit, etc., could be investigated.

Finally, the data used in this study were consumers' perceptions of brand knowledge, the effectiveness of the e-business platform services, their sense of

brand trust, and their willingness to pay, all of which are subjective judgments. Future studies could collect objective secondary data, such as actual purchase data, to test the real outcomes of brand trust online.

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