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Article

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Determinants of consumers' purchase intention on digital business model platform: evidence from Ethiopia using partial least square structural equation model (PLS-SEM) technique

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Abstract

Online digital market platform business model designers, marketers, and retailers can further expand their marketing strategies to draw in and keep customers to gain a competitive edge globally if they are aware of the elements influencing consumers' purchasing intentions. The purpose of this research is to identify the crucial variables impacting Addis Ababa University, Graduating Engineering Students' desire to purchase on online digital market platforms, and narrow the research gap on determinants of online purchase intention of Ethiopian consumers. This study adopted a descriptive and inferential survey design, epistemology assumption, and employed the positivism research philosophy approach to test the research hypotheses. The primary study technique used to collect relevant data was a closed-ended 5-point Likert scale questionnaire. The information was gathered from 100 Ethiopian, Addis Ababa University, graduating engineering students. With the use of SPSS version 23 and SmartPLS version 3.0 software, the data were examined using descriptive statistics and the inferential partial least square structural equation modeling (PLS-SEM) technique. The results of this study highlighted five useful decision-making elements that have an impact on the selected consumers' intention to buy on online digital market platforms including Website Design, Perceived Usefulness, Perceived Ease of Use, Trust, and Subjective Norms. The Practical Implication of this research is that with a clear understanding of the key determinants of consumers' purchase intention on online digital market platforms; manufacturers, online marketers, and retailers can create effective market strategies, enhance technology, and make smart marketing choices that will help them gain global competitive advantage. This study is unique in that it uses a new conceptual research framework and the partial least square structural equation modeling (PLS-SEM) technique to analyze relationships between determinant variables and consumers' intention to purchase on online digital market platforms. The major finding of this research provides empirical evidence towards the key determinant variables of consumers' purchase intention on online digital market platforms. The small sample size is one of the limitations to generalize the finding of this research. Future studies

should focus on enlarging the sample size and assessing more determinant variables to get a generalizable result.

Keywords: Digital business model, Online digital market platform, PLS-SEM, Online purchase intention

Introduction

Being a global platform for communication, the Internet is quickly evolving into a cutting-edge tool for promoting goods and services (Dwivedi et al., 2021). Due to the increasing usage of technology and the Internet worldwide, online shopping is gaining popularity (Ofori & Appiah-Nimo, 2019). The conventional nature of retail purchases has taken on a new dimension as a result of the Internet. The types of business models today may vary depending on how technology is used. With digital technology, businesses may reach many individuals for little cost. Owners of online businesses have created entirely new business models that rely on recently invented or existing technology.

Over the past few decades, digital technology has emerged as the most transformative and disruptive force in all businesses and economies (Hanna, 2020; Sewpersadh, 2023). In this new world of doing business, where the status quo is being destroyed, the rise of platforms as a business model has dramatically altered how we communicate and go about our everyday lives compared to 10 years ago (Deloitte, 2019). The standard today is a personalized, real-time, integrated, and seamless experience that leads to quick developments in products and services and necessitates responsive platform business models that can meet demand (Deloitte, 2019).

The application of new digital technology to ongoing business issues or processes is known as digital innovation (Olokundun et al., 2022). Innovation in a digital business model creates value for clients by utilizing digital technologies. A big benefit that customers are prepared to pay for is what the digital solution aims to deliver. Businesses facing digital disruption and digitalization must prioritize developing digital business models (Rachinger et al., 2019; Teece & Linden, 2017).

Online digital market platforms offer a number of benefits over conventional buying methods (Ennew et al., 2005). If online digital market platform marketers and merchants are aware of the elements influencing consumers' purchase intents, they can improve their marketing strategies to draw and keep customers to gain a competitive advantage abroad (Ennew et al., 2005). Because of the tremendous opportunities that online shopping has created, consumers may now shop anytime, anywhere, and in a truly global economy (Ofori & Appiah-Nimo, 2019). Ethiopia is not alone among consumers who are quickly embracing online marketplace platform shopping. Organizations investing in or considering investing in the online shopping platform industry need to be aware of the factors affecting consumers' purchasing decisions to develop more effective marketing strategies that will convert potential customers into active customers and retain existing ones. Globally speaking, the likelihood of success can be increased if businesses can increase their understanding of consumers' preferences for online shopping before joining the online market.

Many works of literature already published concentrated on finding the factors influencing consumers' online repurchase intentions in industrialized nations. There are not many studies on how consumers in developing countries behave when shopping online.

Firms must first and foremost have a thorough awareness of Ethiopian online users' interests and thinking to fully capitalize on the country's online market. There is a conceptual gap in the literature regarding the critical factors that determine the online purchase intention of this consumer segment due to the paucity of published research on the key variables influencing Ethiopian consumers, specifically Addis Ababa University graduating engineering students.

This study aims to close the conceptual gap in the context of online market platform purchasing intention determinant variables by identifying the key factors influencing the technology-friendly Ethiopian, Addis Ababa University, graduating engineering students' desire to purchase on online digital market platforms. The results of this study pave the road for practitioners and scholars to comprehend the critical factors that influence Ethiopian customers' desire to make a purchase on an online digital market platform.

This study investigated the determinant variables of Addis Ababa University graduating class (GC) engineering students' online purchase intention using a conceptual framework formulated based on the technology acceptance model (TAM), Theory of Planned Behavior (TPB), and literature review. The specific research question was as follows:

Q1: What are the key variables that determine the online purchase intention of the targeted engineering students of Addis Ababa University?

There are five sections in the remaining portion of this study. The “[Theoretical framework and hypothesis](#)” section synthesizes the existing literature and theories to adopt the theoretical framework and develop hypotheses of this research. Subsequently, the “[Research methodology](#)” section describes the process of data collection and methods used to analyze the data. In the “[Results](#)” section, the results are presented, the “[Discussion](#)” section discusses the findings in detail, presents the implication and future research directions, and conclusions are made in the “[Conclusion](#)” section.

Theoretical framework and hypothesis

Technology acceptance model (TAM)

The technology acceptance model (TAM) is an information systems theory that describes how people come to accept and use technology. TAM attempts to assist academics and practitioners in determining why a certain technology or system may be acceptable or unsuitable and in taking the necessary actions by offering explanations in addition to predictions (Lai, 2016). TAM has been shown empirically to be a useful model for understanding end-user adoption of technology and for studying the uptake of new and developing technology by users with a variety of characteristics in various industries (Alomary & Woollard, 2015).

Real system usage is the point at which people interact with technology. People utilize technology because of their behavioral intentions. The attitude, which is the broad perception of the technology, influences the behavioral intention. According to the concept, when consumers are faced with new technology, a variety of variables impact their decision about how and when to use it, most notably Perceived Usefulness (PU) and Perceived Ease-of-Use (PEOU) (Davis, 1989). External elements such as social influence have a significant role in determining attitude. People will have the attitude and intention to use technology once these items are in place (Davis, 1989).

The TAM has been continuously studied and expanded the two major upgrades being the TAM 2 (Venkatesh & Davis, 2000) and the Unified Theory of Acceptance and Use of Technology (or UTAUT (Venkatesh et al., 2003)). A TAM 3 has also been proposed in the context of E-commerce with an inclusion of the effects of trust and perceived risk on system use (Venkatesh & Bala, 2008).

Despite its widespread use, TAM has been heavily criticized, prompting the original proposers to seek to reinterpret it multiple times. TAM's critics point to its poor heuristic value, low explanatory and predictive capacity, triviality, and lack of practical utility (Chuttur, 2009).

Theories of reasoned action and planned behavior

The two closely associated theories the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980) and the Theory of Planned Behavior (TPB) (Ajzen, 1991) suggest that a person's intention to perform a behavior (behavioral intention) is predicted by a person's attitude towards the behavior and subjective norms regarding the behavior. Subjective norms are the outcome of a person's perceived control over their conduct as well as their social and environmental circumstances. In general, positive attitudes and subjective norms improve perceived control and the likelihood of intentions influencing behavioral changes.

Perceived usefulness (PU)

This was defined by Davis (1989) as the degree to which a person believes that using a particular system would enhance their job performance. It denotes whether or not someone considers the technology to be beneficial for the task at hand. Within the context of online purchasing, we may infer that the individual behavioral intention of online purchasers believe that the system will be advantageous in their personal life.

Davis (1989) showed that the capacity to attract and keep technology customers is mostly dependent on the technology's usability and usefulness. The perceived utility of online shopping applications or tools can also impact whether online customers continue to purchase online or rely on traditional ways. When it comes to online purchasing, perceived usefulness refers to how much a person feels that engaging in online transactions would improve his or her performance.

The empirical findings of the study entitled "Consumer attitudes towards online shopping" by Al-Debei et al., (2015) indicate that consumer attitudes towards online shopping is determined by perceived usefulness. Another study results by (Dewi et al., 2020) showed that perceived usefulness is one of the influential factors and has a higher path coefficient in both the male and female groups. The online field survey by (Al-Maghrabi & Dennis, 2011) showed that perceived usefulness determines consumers' continuance intention to e-shopping. The study of (Oly Ndubisi et al., 2011) also confirmed that perceived usefulness has a positive influence on customers' online repurchase intentions. The study of Aziz and Wahid (2018) sought to identify the determinants of online shopping behavior among tertiary students through the lens of the technology acceptance model (TAM) and the finding of the study showed that perceived usefulness significantly affects consumers' online purchase intention. The finding of the study by Nguyen et al. (2022) showed that perceived usefulness and intention to purchase online

are significantly correlated. PU has a positive association with online purchase intention (Moslehpour et al., 2018).

Hence based on TAM and the aforementioned evidence from the literature the following hypothesis has been done.

H1: Perceived usefulness positively and significantly affects the online purchase intention of consumers.

Perceived ease of use (PEOU)

Davis (1989) described this as the degree to which a person feels that utilizing a specific system will be painless when technology is simple to use, obstacles are reduced. No one is going to like it if it is difficult to use and has a complicated feature. In an online purchasing setting, we may infer that the unique behavioral purpose of customers buying online reflects their trust in the ease with which they can order products online. Davis stated that PEOU has a causal effect on PU, which is confirmed by several studies (Athapaththu & Kulathunga, 2018; Celik, 2014; Venkatesh & Davis, 2000). PEOU can have a substantial direct influence on PU, since when choosing between two systems that execute the same set of operations, a user should prefer the one that is simpler to use (Davis, 1989).

According to Davis, among the multiple components mentioned in his model, judgments of ease of use have a considerable effect on perceived usefulness; a crucial predictor of one's inclination to adopt new technology (Venkatesh et al., 2003). Simply said, perceived ease of use impacts perceived utility, which influences the consumer's propensity to purchase online. Online consumers consider online buying to be simple if it gives sufficient product information, facilitates product/service comparison, has simple-to-learn and use apps, and has sites that are simple to use and flexible to engage with (Shanthi & Kannaiah, 2015).

The study results by Dewi et al. (2020) confirmed that PEOU is one of the influential factors and has a higher path coefficient in both the male and female groups. The study (Aziz & Wahid, 2018) sought to identify the determinants of online shopping behavior among tertiary students through the lens of the technology acceptance model (TAM) and the finding of the study showed that PEOU significantly affects consumers' online purchase intention. The study confirmed also that effect of PEOU on PU was very significant as the same has been predicted by the technology acceptance model.

The finding of the study by Nguyen et al. (2022) showed that PEOU and intention to purchase online are significantly correlated and PEOU determines PU. According to the findings of Moslehpour et al. (2018) PEOU has a positive association with online purchase intention. Therefore, based on the empirical findings of the previous studies and TAM the following hypotheses have been formulated.

H2: PEOU has a positive effect on online purchase intention.

H3: PEOU has a positive effect on PU.

Subjective norms (SN)

The pressures that people experience from their friends, families, and society to act in a specific way or not are known as subjective norms (Woraphiphat & Roopsuwankun, 2023). It refers to a person's opinions regarding whether peers and important individuals

in his or her life believe he or she should engage in the conduct (Ajzen, 1991). According to Icek Ajezen's theory of planned behavior, subjective norm affects the behavioral intention of an individual.

The results of the study by Dewi et al. (2020) showed a positive and significant relationship between subjective norms and behavioral intention towards online shopping in both male and female contexts. The findings of the study by Al-Masaeed et al. (2021) support that subjective norm is important to shape online purchase behavior among customers. An online survey by Al-Maghrabi and Dennis (2011) showed that subjective norms determine consumers' continuance intention to e-shopping. The study result of Fairouz (2016) indicated that subjective norm has a positive direct impact on consumers' intention. According to Nguyen et al. (2022) intention to shop online and subjective norms are significantly correlated. Hence, based on the theory of planned behavior and the aforementioned confirmatory studies the following hypotheses have been made.

H4: Subjective norms affect the online purchase intentions of consumers positively and significantly.

H5: Subjective norms affect perceived usefulness

Trust

In every partnership, trust is a crucial component, because the foundation of commerce is the development of shared confidence. In the online marketplace, where transactions are carried out between buyers and sellers who have never met, trust is crucial to both the smooth operation of the transaction and the durability of the relationship. Building trust is completed by maintaining the security that has been attained.

In an online setting, where the customer has no direct control over the vendor's actions, trust should be a key component. Lack of trust in online business model is one of the main reasons consumers avoid making commercial transactions online. As a result, a crucial factor in determining buyers' intentions to use online usage patterns is how trustworthy they feel about an online vendor.

The online survey findings of Goyal et al. (2013) showed that Trust significantly determines the online purchase intention of consumers. Another research result of Santo and Marques (2022) showed that the intention to continue purchasing in online digital market platforms is partly explained by trust in e-commerce sites. The study of Jadil et al. (2022) showed that Trust has a significant direct effect on consumers' online purchase intention. The study of García-Salirrosas et al. (2022) regarding trust showed a positive relationship with online purchase intention. Customers' trust had a positive influence on online repurchase intention (Alvarez-Risco et al., 2022). The empirical findings of the study entitled "Consumer attitudes towards online shopping" by Al-Maghrabi and Dennis (2011) showed that trust significantly determines perceived usefulness. According to Alvarez-Risco et al. (2022) customer trust has a positive effect on online repurchase intention. Referencing the aforementioned studies, the following hypotheses have been made.

H6: Trust affects the consumers' online purchase intention positively and significantly.

H7: Trust affects the consumers' perceived ease of use of the online platform.

H8: Trust affects the consumers' perceived usefulness of the online platform.

Website design (platform design)

The website is the main communication channel between online service providers and consumers. A high-quality website can result in satisfied customers and help turn web browsers into buyers. According to a study by Afshardost (2013), the point of view of customers about website quality is based on features in a website that meet customers' needs, and requirements, and attracted to the total excellence of that website.

Website design refers to the qualities and appearance of a website that fulfill and meet the expectations of online consumers (Hasanov & Khalid, 2015). The effect of site quality on PEOU is positive and significant (Al-Maghrabi & Dennis, 2011). Based on the empirical evidence in the literature the following hypotheses have been formulated.

H9: Website design has a positive impact on consumers' perceived usefulness of the online platforms.

H10: Website design has a positive impact on consumers' perceived ease of usefulness of online platforms.

Online purchase intention (PI)

Purchase intention is a state that exists between a consumer and a seller when the customer is ready to enter into a transaction with the seller. Purchase intention is described as a consumer's desire to purchase an item or service, because the shopper has an intention to locate a certain item or benefit or has a favorable attitude towards, or even a favorable opinion of the product or service. The purchase intention of the online shopper is the final stage, after various prompts of the online shopper (Athapaththu & Kulathunga, 2018). According to Indiani and Fahik (2020), the final stage of online transactions is the intention to use a website and purchase a product. As a result, online purchase intent is critical in determining online customer behavior.

Conceptual framework

Figure 1 depicts the conceptual research model created in this study. Based on prior literature, the theory of technology acceptance model (TAM), and the Theory of Planned Behavior (TPB), this model hypothesized that consumers' online market platform Purchase Intention (PI) is influenced by Website Design (WD), Trust (TR), Subjective Norms (SN), Perceived Usefulness (PU), and Perceived Ease of Use (PEOU). In analyzing the link between dependent and independent factors, the dependent variable is Purchase Intention (PI) on the online platform, while the independent variables are WD, TR, SN, PU, and PEOU. Furthermore, WD and TR are exogenous factors, but SN, PU, and PEOU act as both endogenous and exogenous (see Fig. 1).

Research methodology

Research philosophy

To investigate the research problem, this research follows the epistemology assumption and employed the positivism research philosophy approach to test the research hypotheses.

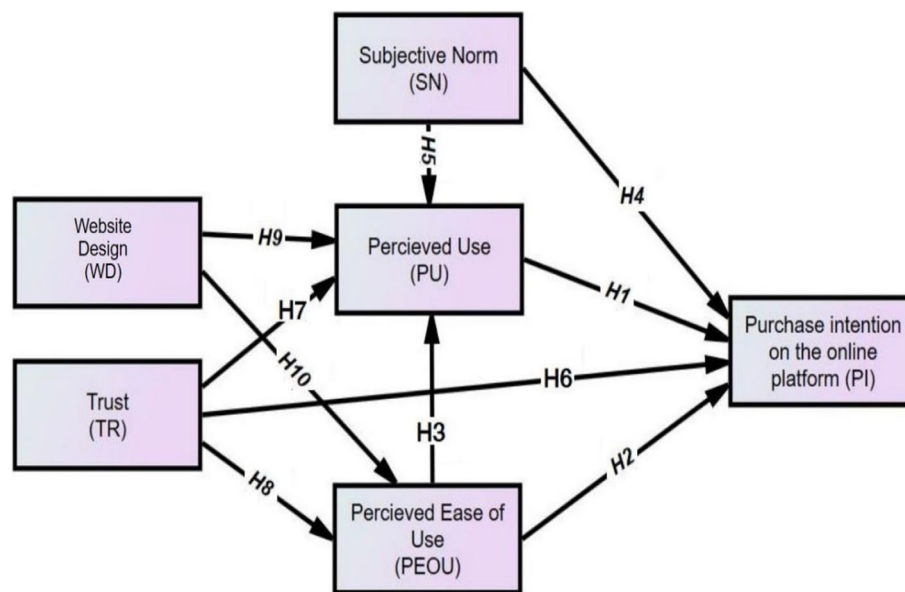


Fig. 1 Research conceptual framework

Sample size and sampling procedures

The sampling technique applied for this research was purposive sampling. The key informants for this study were selected based on their online purchase experience, the emerging digital market platform literacy, and convenience. To determine the minimum number of data required for analysis using PLS-SEM (Kock & Hadaya, 2018; Rana-tunga et al., 2020) produced a table for researchers to determine the sample size of their research using partial least square structural equation modeling (PLS-SEM). This procedure was given the name R-Squared minimum technique. The minimal sample size is determined by three factors; the first component is the number of arrows pointing at the latent variable, the second element is the chosen significance level, while the third element is the model's minimal R^2 . In this research framework, there are four arrows pointing to a construct (see Fig. 1). The significance level used is 5%. Taking minimum R^2 in this model to be 0.25 and referring Table 1 this research required 65 samples to reach 80% prediction power for identifying R^2 values of at least 0.25 with a 5% chance of error. The researchers believe that the collected 100 data are pretty good being more than the minimum requirement.

Research instrument

A close ended 5-Point Likert scale questionnaire was utilized as the major research instrument to obtain pertinent data concerning the identification of the factors of consumers' online digital platform purchasing intention. Following the creation of the conceptual framework for the research (see Fig. 1), the questionnaire for data collection was designed. The questionnaire is divided into two pieces. Section 1 contains information regarding the respondents' demographic characteristics, whereas Section 2 addresses questions about the factors of consumers' online purchase intention from digital market platforms.

Table 1 Reduced version of the table for estimating minimum sample size on “Minimum R-Squared Method”

Maximum number of arrows pointing at a construct	Minimum R^2 in the model			
	0.1	0.25	0.50	0.75
2	110	52	33	26
3	124	59	38	30
4	137	65	42	33
5	147	70	45	36
6	157	75	48	39
7	166	80	51	41
8	174	84	54	44
9	181	88	67	46
10	189	91	59	48

Source: Ranatunga et al. (2020)

The questionnaire was adapted from previously used well-tested questionnaires including Lai (2016), McKinney (2004), Venkatesh et al. (2003), Melorose et al. (2015), Phuong (2020), Dewi et al. (2020), Ahmad Wani and Wajid Ali (2016), Xu et al. (2021), (Celik 2014) in the literature concerning various determinants of consumers’ online purchase intention. The questionnaire was peer-reviewed and pilot-tested using 10 respondents. Based on the input, the questionnaire was adjusted and enhanced, such as by removing unnecessary questions and enhancing question clarity. In the end, the final questionnaire (see Appendix-A) was used to collect the required data.

Data collection and processing

The self-administered primary data collection instrument, the questionnaire was completed by final-year engineering students at Addis Ababa University in Ethiopia who had online purchasing experience. This is a purposive sampling based on conveniences and students’ literacy towards emerging technologies and online digital market platforms. The goal of the study was made apparent throughout data collection, and respondents’ consent was ensured using official letters issued from the School of Mechanical and Industrial Engineering, Addis Ababa Institute of Technology, Addis Ababa University, Ethiopia. The questionnaire was distributed to the target sample of 115 respondents. Among distributed questionnaires, 100 were collected showing the response rate to be 86.95%.

Following the data collection procedure, the data were analyzed using the partial least squares structural equation modeling (PLS-SEM) approach. The rationale behind selecting this technique for data analysis is that PLS-SEM is one of the most widely used methods of multivariate data analysis and has an exceptional capability for working with small samples (Hair et al., 2021). Moreover, PLS-SEM is the preferred method even when the study object does not have a well-developed theoretical base, particularly when there is little prior knowledge of causal relationships. PLS-SEM requires neither a large sample size nor a specific assumption on the distribution of the data, or even the missing data unlike that of Covariance-Based Structural Equation Modeling (CB-SEM) and multilinear regression analysis (Hair Jr et al., 2014). Users with small sample sizes

Table 2 Profile of respondents

Profile		Number of respondents	% of Respondents
Gender	Male	76	76.0
	Female	24	24.0
Sub-total		100	100.0
Age	20–25	96	96.0
	26–30	3	3.0
	31–35	1	1.0
Sub-total		100	100.0
Department	Mechanical	49	49.0
	Electrical	51	51.0
Sub-total		100	100.0

Table 3 Descriptive statistics (*N*, minimum, maximum, mean, standard deviation)

Variable	<i>N</i>	Minimum	Maximum	Mean	Std. Deviation
PU	100	1.00	5.00	4.3840	0.59352
SN	100	2.33	5.00	3.8456	0.60197
PEOU	100	2.22	5.00	3.7478	0.61141
WD	100	2.60	5.00	4.1250	0.58247
PI	100	3.00	5.00	4.0673	0.53986
TR	100	2.10	5.00	3.9880	0.54741
Valid <i>N</i> (listwise)	100				

and less theoretical support for their research can apply PLS-SEM to test the causal relationship. The algorithm of PLS-SEM is different from the common SEM, which is based on maximum likelihood. When the sample size and data distribution of research can be hardly used by a common SEM, PLS-SEM has a more functional advantage (Fan et al., 2016; Hair Jr et al., 2014).

Concerning the analysis results: Table 2 contains the respondents' profile and associated information, Table 3 has the mean and standard deviations, and Table 4 contains the correlations between the variables. Table 4 displays the results of the construct reliability, validity, and collinearity tests. Table 6 displays the results of the discriminant validity test. Path coefficients are shown in Table 7. Table 8 displays the path analysis total effects findings, Table 9 displays the path analysis total indirect effects results, and Table 10 displays the special indirect effects results. Table 11 displays the R^2 and R^2 adjusted findings, Table 12 displays the f^2 values, and Table 13 displays the Q^2 values. The data were analyzed in this manner using SPSS Version 26 and Smart PLS 3.0 software.

Results

In this section, the descriptive and inferential statistics results obtained from the deep analysis of the data collected in the study have been presented.

As indicated in Table 2, the majority of respondents, 76 (76.0%), were males, with the remaining 24 (24.0%) females. The majority of students, 96 (96.0%), were between the ages of 20 and 25, 3 (3.0%) were between the ages of 26 and 30, and the remaining 1

Table 4 Correlations

		PU	SN	PEOU	WD	PI	TR
PU	Pearson Correlation						
	Sig. (2-tailed)						
	N						
SN	Pearson Correlation	0.403**					
	Sig. (2-tailed)	0.000					
	N	100					
PEOU	Pearson Correlation	0.367**	0.375**				
	Sig. (2-tailed)	0.000	0.000				
	N	100	100				
WD	Pearson Correlation	0.403**	0.287**	0.463**			
	Sig. (2-tailed)	0.000	0.004	0.000			
	N	100	100	100			
PI	Pearson Correlation	0.508**	0.575**	0.669**	0.395**		
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		
	N	100	100	100	100		
TR	Pearson Correlation	0.370**	0.357**	0.678**	0.488**	0.643**	
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	
	N	100	100	100	100	100	

**Correlation is significant at the 0.01 level (2-tailed)

(1.0%) were between the ages of 31 and 35. The majority of the students, 51 (51.0%), were from the electrical engineering department, with the remaining 49 (49.0%) from the mechanical engineering department.

As demonstrated in Table 3, the mean values for all variables are greater than the five-point Likert scale's midpoint of 3 and have modest standard deviations. This demonstrates the respondents' high degree of agreement on the factors of consumers' purchase intention from online digital market platforms.

Table 4 shows that all of the correlations between the determinant factors and the customers' online digital market platform purchase intention are significant at 0.01 level. This demonstrates that the determinant characteristics are effective predictors of customers' online purchasing intentions.

Evaluation of measurement model

The outer model (measurement model) is evaluated first in PLS-SEM analysis. The goal is to see how effectively the items (questions) load on the hypothetical concept. The outer model is evaluated by looking at the reliability of individual items (indicator reliability), the reliability of each latent variable, internal consistency (Cronbach alpha and composite reliability), construct validity (loading and cross-loading), convergent validity (Average Variance Extracted, (AVE), and discriminant validity. Cross loading (Fornell–Larcker criterion, HTMT criterion) (Hair et al., 2017).

To assess the measurement model's internal consistency and convergent validity; composite reliability, individual indicator reliability, and Average Variance Extracted (AVE) were all employed. To measure discriminant validity, the Fornell–Larcker criteria and cross-loadings were utilized.

Indicator reliability

According to a common rule of thumb for indicator reliability, a latent variable should explain a significant part, usually at least 50%, of each indicator's variance (Hair et al., 2013). Therefore, the outer loading of an indicator should be more than 0.708, because that value squared $(0.708)^2$ equals 0.50. As shown in Table 5 and Fig. 2, Except for WD5 (0.657), TR1 (0.672), TR2 (0.651), SN5 (0.609), and SN6 (0.614) all the indicators for the constructs in this model were well above the minimum acceptable level for outer loadings.

Table 5 Construct reliability, validity, and collinearity test result

Latent variable	Indicators	Factor loadings	Collinearity statistics (VIF)	Construct reliability Cronbach's Alpha (α)	Composite reliability (CR)	Average Variance Extracted (AVE)
Website Design	WD1	0.778	1.654	0.841	0.887	0.613
	WD3	0.804	2.342			
	WD4	0.786	2.048			
	WD5	<i>0.657</i>	1.402			
	WD6	0.875	2.510			
	Perceived Usefulness	PU1	0.792			
PU3		0.808	2.369			
PU4		0.816	2.223			
PU5		0.875	2.790			
PU6		0.806	2.360			
PU7		0.807	1.899			
Perceived Ease of Use		PEOU2	0.712	1.656	0.824	0.876
	PEOU3	0.740	1.659			
	PEOU6	0.771	1.851			
	PEOU7	0.836	2.119			
	PEOU8	0.764	1.758			
Trust	TR1	<i>0.672</i>	1.216	0.815	0.870	0.575
	TR2	<i>0.651</i>	1.426			
	TR3	0.810	2.170			
	TR4	0.810	2.161			
	TR5	0.828	2.425			
Subjective Norms	SN1	0.706	1.942	0.768	0.840	0.516
	SN2	0.779	2.100			
	SN3	0.852	2.122			
	SN5	<i>0.609</i>	2.628			
	SN6	<i>0.614</i>	<u>3.110</u>			
	Purchase Intention	PI1	0.807			
PI2		0.801	1.816			
PI3		0.813	1.960			
PI5		0.741	1.706			
PI6		0.760	1.681			

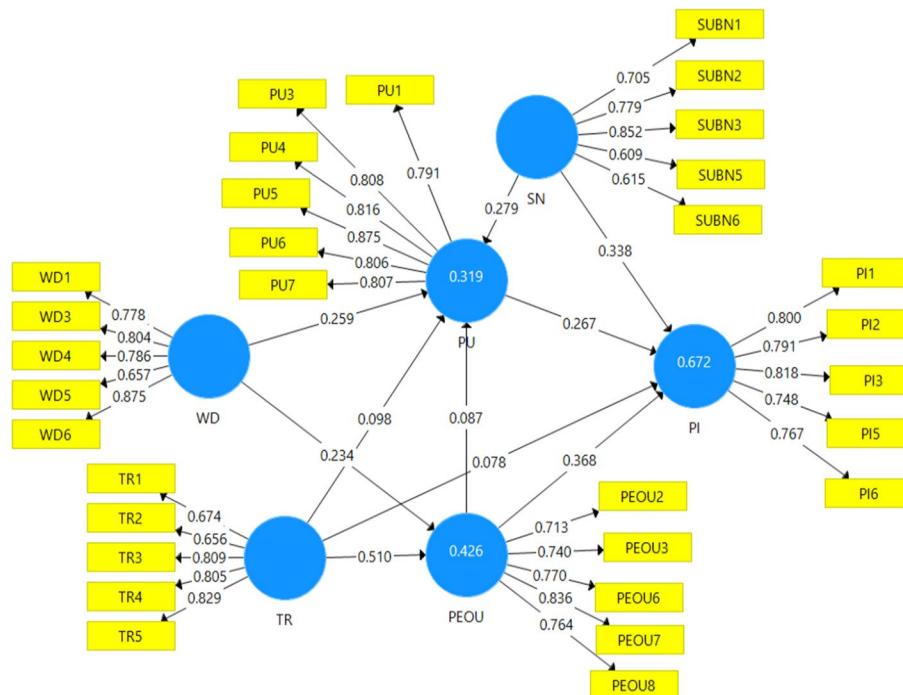


Fig. 2 PLS-SEM factor loadings, path coefficients, and R^2 values

Internal consistency

The most common measurement used for internal consistency is Cronbach’s alpha and composite reliability, which measures the reliability based on the interrelationship of the observed items variables. In PLS-SEM, the values are organized according to their indicator’s individual reliability (Hair et al., 2017). The values range from 0 to 1, where a higher value indicates a higher reliability level. Cronbach’s alpha and composite reliability value >0.70 is acceptable (Cronbach, 1951; Hair et al., 2017; Nunnally, 1978). As shown in Table 5, Cronbach’s Alpha values for all constructs are >0.70 and the composite reliability (CR) of all variables are >0.70 showing the internal consistency of the measurement items.

Convergent validity

Convergent validity is the assessment to measure the level of correlation of multiple indicators of the same construct that are in agreement (Batool et al., 2015). To establish convergent validity, the factor loading of the indicator, composite reliability (CR), and the Average Variance Extracted (AVE) have to be considered (Hair et al., 2017). The value ranges from 0 to 1. AVE value should exceed 0.50, Composite Reliability (CR) and the indicator’s outer loadings should be higher than 0.708, so that it is adequate for convergent validity (Ab Hamid et al., 2017; Hair et al., 2013; Henseler et al., 2009). As shown in Table 5, the values of AVE are greater than 0.5. The factor loading and Composite Reliability (CR) values are >0.708 showing the convergent validity of the measurement model.

Table 6 Discriminant validity

	PEOU	PI	PU	SN	TR	WD
PEOU	0.766					
PI	0.671	0.785				
PU	0.394	0.603	0.818			
SN	0.444	0.661	0.461	0.718		
TR	0.620	0.556	0.396	0.444	0.758	
WD	0.471	0.456	0.452	0.384	0.469	0.783

The diagonal (bold) values are \sqrt{AVE}

Discriminant validity

Discriminant validity is the extent to which a construct is truly distinct from other constructs by empirical standards. Thus, establishing discriminant validity implies that a construct is unique and captures phenomena not represented by other constructs in the model. The Fornell–Larcker criterion is a conservative approach to assessing discriminant validity. It compares the square root of the AVE values with the latent variable correlations. Specifically, the square root of each construct's AVE should be greater than its highest correlation with any other construct. This criterion can also be stated as the AVE should exceed the squared correlation with any other construct. The logic of this method is based on the idea that a construct shares more variance with its associated indicators than with any other construct (Hair et al., 2013, 2017). As shown in Table 6, the diagonal bold values are \sqrt{AVE} and the other values are correlations. The square root of each construct's AVE is greater than its highest correlation with any other construct. Therefore, discriminant validity criteria are fulfilled.

Assessment of structural model

Once we have confirmed that the construct measures are reliable and valid, the next step addresses the assessment of the structural model results. The structural model is evaluated by examining its predictive capabilities as well as the relationships between the constructs. The significance of the path coefficients, level of R^2 values, f^2 effect size, predictive relevance, and Q^2 effect size are the key criteria for evaluating the structural model in PLS-SEM. According to Hair et al. (2013) assessment of a structural model has five steps including the assessment of the structural model for collinearity issues, the assessment of the significance and relevance of the structural model relationships using structural model path coefficients, the assessment of the level of R^2 , the assessment of the effect sizes f^2 , the assessment of the predictive relevance Q^2 and the q^2 effect sizes.

Collinearity assessment

Before conducting the analyses, the structural model must be examined for collinearity. The path coefficients might be biased if the estimation involves significant levels of collinearity among the predictor constructs. If the level of collinearity is extremely

high as indicated by a Variance Inflation Factor (VIF) value of 5 or higher, one should consider removing one of the corresponding indicators (Hair et al., 2013). As shown in Table 5 all constructs have a VIF value of less than 5 showing there is no collinearity issue. SN6 has a relatively highest value of VIF (3.11) but is still within the limit.

Structural model path coefficients

After running the PLS-SEM algorithm, estimates are obtained for the structural model relationships (i.e., the path coefficients), which represent the hypothesized relationships among the constructs. The path coefficients have standardized values between -1 and $+1$. Estimated path coefficients close to $+1$ represent strong positive relationships (and vice versa for negative values) that are almost always statistically significant (i.e., different from zero in the population). The closer the estimated coefficients are to 0, the weaker the relationships. Very low values close to 0 are usually non-significant (i.e., not significantly different from zero) (Hair et al., 2013). Whether a coefficient is significant ultimately depends on its standard error that is obtained by means of bootstrapping. When the empirical “ t ” value is larger than the critical value, we say that the coefficient is significant at a certain error probability (i.e., significance level). Commonly used critical values for two-tailed tests are 1.65 (significance level = 10%), 1.96 (significance level = 5%), and 2.57 (significance level = 1%) (Hair et al., 2013) for this research the critical value used was 1.96 (significance level = 5%).

The path analysis result shows that all variables have a positive relationship with their dependent variable (see Fig. 2 and Table 7); however, not all variables affect statistically. As indicated by the bootstrapping results of PLS-SEM in Table 7: the direct effects of PU, PEOU, and SN on PI are positive and significant, whereas the direct effect of TR on PI is insignificant. The direct effects of PEOU and TR on PU are insignificant. The direct effects of SN and WD on PU, and the direct effects of TR and WD on PEOU are significant (see Table 7). The hypotheses H1, H2, H4, H5, H8, H9, and H10 were supported but hypotheses H3, H6, and H7 were not supported.

As shown in Table 7 except H3 (PEOU \rightarrow PU, $p = 0.326$), H6 (TR \rightarrow PI, $p = 0.474$), and H7 (TR \rightarrow PU, $p = 0.380$) all the variables have a positive and significant direct effect on consumers’ purchase intention supporting 7 of the 10 hypotheses H1, H2, H4, H5, H8, H9, and H10 (Fig. 3).

Table 7 Path analysis result: direct effects

Hypothesis	Path	Path coefficient	t-statistics	p values	Remark
H1	PU \rightarrow PI	0.282	3.569	0.000	Accepted
H2	PEOU \rightarrow PI	0.403	5.065	0.000	Accepted
H3	PEOU \rightarrow PU	0.089	0.983	0.326	Rejected
H4	SN \rightarrow PI	0.352	4.467	0.000	Accepted
H5	SN \rightarrow PU	0.280	2.925	0.004	Accepted
H6	TR \rightarrow PI	0.078	0.716	0.474	Rejected
H7	TR \rightarrow PU	0.095	0.879	0.380	Rejected
H8	TR \rightarrow PEOU	0.512	4.589	0.000	Accepted
H9	WD \rightarrow PU	0.258	2.627	0.009	Accepted
H10	WD \rightarrow PEOU	0.232	2.325	0.020	Accepted

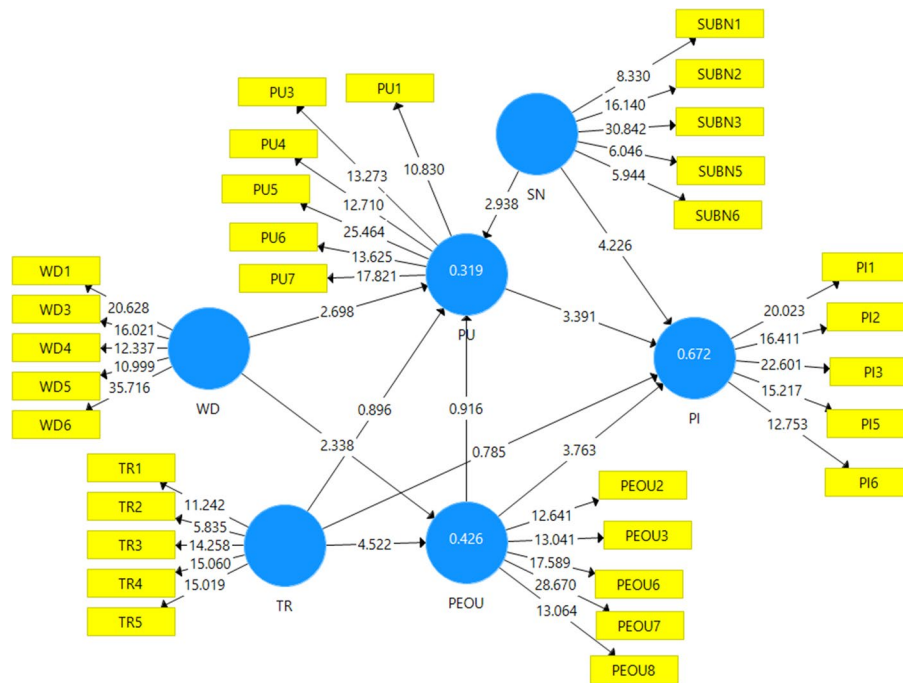


Fig. 3 Bootstrapping result for determinants variables and consumers' online digital market platform purchase intention (t-values), path coefficients, and R^2 values

Table 8 Path analysis result: total effects

Total effect	t-statistics	p values	Remark
PU on PI	3.236	0.000	Significant
PEOU on PI	3.750	0.000	Significant
PEOU on PU	0.928	0.354	Not Significant
SN on PI	4.865	0.000	Significant
SN on PU	2.780	0.006	Significant
TR on PI	2.587	0.010	Significant
TR on PU	1.089	0.277	Not Significant
TR on PEOU	4.286	0.000	Significant
WD on PU	2.815	0.005	Significant
WD on PEOU	2.298	0.022	Significant
WD on PI	2.831	0.005	Significant

Table 9 Path analysis results, total indirect effect

Path	t-statistics	p values	Remark
PEOU→PU→PI	0.820	0.413	Insignificant effect
SN→PU→PI	1.899	0.058	Insignificant effect
TR→PEOU→PI, TR→PEOU→PU→PI, TR→PU→PI	3.00	0.003	Significant effect
TR→PEOU→PU	0.813	0.417	Insignificant effect
WD→PEOU→PI, WD→PU→PI	2.831	0.005	Significant
WD→PEOU→PU	0.859	0.391	Insignificant effect

Table 10 Special indirect effects

Path	t-statistics	p values	Remark
WD→PEOU→PI	1.883	0.060	Insignificant
SN→PU→PI	1.899	0.058	Insignificant
TR→PEOU→PU	0.813	0.417	Insignificant
TR→PU→PI	0.589	0.556	Insignificant
WD→PEOU→PU	0.859	0.391	Insignificant
WD→PU→PI	2.454	0.014	Significant
TR→PEOU→PI	3.275	0.001	Significant
PEOU→PU→PI	0.820	0.413	Insignificant
WD→PEOU→PU→PI	0.746	0.456	Insignificant
TR→PEOU→PU→PI	0.726	0.468	Insignificant

As shown in Table 8, except for the total effects of PEOU on PU ($p = 0.354$) and TR on PU ($p = 0.277$) which are not significant, all the other total effects are significant.

As shown in Table 9 the variables that have a positive and significant total indirect effect on consumers' online digital market platform purchase intention are only Trust (TR) and Website design (WD).

As shown in Table 10, among the variables only Website Design (WD) and Trust (TR) have positive and significant special indirect effects on consumer's online purchase intention as mediated by Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), respectively.

Coefficient of determination (R^2 value)

The most commonly used measure to evaluate the structural model is the coefficient of determination (R^2 value). This coefficient is a measure of the model's predictive accuracy and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. The coefficient represents the exogenous latent variables' combined effects on the endogenous latent variable. Because the coefficient is the squared correlation of actual and predicted values, it also represents the amount of variance in the endogenous constructs explained by all of the exogenous constructs linked to it. The R^2 value ranges from 0 to 1 with higher levels indicating higher levels of predictive accuracy. In general, R^2 values of 0.75, 0.50, or 0.25 for the endogenous constructs can be described as, respectively, substantial, moderate, and weak (Hair et al., 2013, 2021; Henseler et al., 2009). Table 11 shows the R^2 values for all endogenous variables. The Purchase Intention (PI) has a substantial R^2 value (0.676) that is 67.6% of the variance of PI is predicted by the cumulative effect of exogenous variables and the remaining 32.4% is explained by some other unknown variables. Similarly, PEOU (0.426), PU (0.317) have close to moderate R^2 values.

Table 11 R^2 and R^2 adjusted results

Latent variable	R^2	R^2 Adjusted
PEOU	0.426	0.414
PI	0.676	0.662
PU	0.317	0.288

Table 12 f^2 values

	PEOU	PI	PU	SN	TR	WD
PEOU		0.234	0.006			
PI						
PU		0.155				
SN		0.237	0.083			
TR	0.356	0.011	0.008			
WD	0.075		0.070			

Effect size f^2

In addition to evaluating the R^2 values of all endogenous constructs, the change in the R^2 value when a specified exogenous construct is omitted from the model can be used to evaluate whether the omitted construct has a substantive impact on the endogenous constructs. This measure is referred to as the f^2 effect size. Guidelines for assessing f^2 are those values of 0.02, 0.15, and 0.35, respectively, representing small, medium, and large effects (Salkind, 2012) of the exogenous latent variable.

As shown in Table 12 if they will be removed from the model: the f^2 values of PEOU→PI (0.234), PU→PI (0.155), SN→PI (0.237), and TR→PEOU (0.356) will have a large effect; the f^2 values of SN→PU (0.083), WD→PEOU (0.075), and WD→PU (0.070) will have a medium effect, and the f^2 values of PEOU→PU (0.006), TR→PI (0.011), and TR→PU (0.008) will have a small effect on the endogenous corresponding variables.

Blindfolding and predictive relevance Q^2

In addition to evaluating the magnitude of the R^2 values as a criterion of predictive accuracy, researchers should also examine Stone–Geisser’s Q^2 value (Geisser, 1974). This measure is an indicator of the model’s predictive relevance.

The Q^2 values that are greater than 0 indicate that the exogenous constructs have predictive relevance for the endogenous construct under consideration. The values of 0.02, 0.15, and 0.35, respectively, imply that an exogenous construct has a small, medium, or large predictive relevance for a given endogenous construct as a relative measure of predictive relevance (Q^2) (Geisser, 1974; Hair et al., 2013).

By interpreting these results, we can identify the key constructs with the highest relevance to explain the endogenous latent variable(s) in the structural model. Accordingly, from Table 13, we see that PI (0.398) and PEOU (0.234) have large relevance and PU (0.180) has medium relevance.

Table 13 Q^2 values

PEOU	0.234
PI	0.398
PU	0.180
SN	
TR	
WD	

Discussion

This study sought to assess the determinants of online shopping behaviors among graduating class (GC) engineering students at Addis Ababa University, Ethiopia. It proposed a conceptual framework developed from the technology acceptance model (TAM), the Theory of Planned Behavior (TPB), and the literature to investigate what determined students' online shopping intention. The results supported the validity of the developed research framework. The result of the study discloses that the students' intention towards online purchasing is determined by Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Subjective Norms (SN). The total indirect effect of Website Design (WD) and Trust (TR) on online purchase intention (PI) was also significant.

There were two unexpected outcomes in this study. First, Trust was hypothesized to have a direct effect on online purchase intention of the students but there was no empirical evidence supporting this hypothesis in this study. According to this research result, trust does not have a significant direct effect on the online purchase intention of students against the findings of Athapaththu and Kulathunga (2018), Goyal et al. (2013), Santo and Marques (2022), Jadir et al. (2022), García-Salirrosas et al. (2022) Alvarez-Risco et al. (2022), Al-Maghrabi and Dennis (2011), Alvarez-Risco et al. (2022). In fact, the total indirect effect and the total effect of trust on the purchase intention of students were found to be significant. Second, the direct effect of Perceived Ease of Use (PEOU) on Perceived Usefulness (PU) was also found insignificant against TAM and the findings of Nguyen Thi et al. (2022), Moslehpour et al. (2018). The unexpected results can be due to the characteristics of the young, well-trained, technology-friendly university students who are ambitious to experiment and try out new technologies instead of worrying about the trustworthiness and complexity of the digital online market platforms. This has to be proven or disproved through subsequent research.

According to the path analysis result the direct effect of trust on perceived usefulness was found insignificant against the research result of (Al-Maghrabi & Dennis, 2011). The direct effect of Perceived Usefulness on Purchase Intention, $PU \rightarrow PI$ ($\beta = 0.282$, $p = 0.000$) was significant in line with TAM and the findings of Al-Debei et al. (2015), Dewi et al. (2020), Al-Maghrabi and Dennis (2011), Oly Ndubisi et al. (2011), Aziz and Wahid (2018), Nguyen et al. (2022), Moslehpour et al. (2018). The direct effect of Perceived Ease of Use on Purchase Intention, $PEOU \rightarrow PI$ ($\beta = 0.403$, $p = 0.000$) is significant and positive complementing TAM and the study of Dewi et al. (2020), Aziz and Wahid (2018), Nguyen et al. (2022), Moslehpour et al., (2018). The direct effect of Subjective Norms on Purchase Intention, $SN \rightarrow PI$ ($\beta = 0.352$, $p = 0.000$) was significantly positive supporting TPB and the findings of Dewi et al. (2020), Al-Masaeed et al. (2021), Fairouz (2016), Nguyen et al. (2022). The direct effect of Subjective Norms on Perceived Usefulness, $SN \rightarrow PU$ ($\beta = 0.280$, $p = 0.004$) was positive and significant. The direct effect of Trust on Perceived Ease of Use, $TR \rightarrow PEOU$ ($\beta = 0.512$, $p = 0.000$) was positively significant. The direct effect of Website Design on Perceived Usefulness, $WD \rightarrow PU$ ($\beta = 0.258$, $p = 0.009$) was also significant in support to the finding of (Al-Maghrabi & Dennis, 2011). The effect of Website Design on Perceived Ease of Usefulness, $WD \rightarrow PEOU$ ($\beta = 0.232$, $p = 0.020$) was positive and significant complementing the result of the study by (Al-Maghrabi & Dennis, 2011).

Refereeing the direct effect of determinant variables on students' purchase intention from Table 7, the effect of Perceived Ease of Usefulness on Purchase Intention, $PEOU \rightarrow PI$ ($\beta = 0.403$, $p = 0.000$) was found to be the most significant followed by the effect of Subjective Norms on Purchase Intention, $SN \rightarrow PI$ ($\beta = 0.352$, $p = 0.000$) and the effect of Perceived Usefulness on Purchase Intention, $PU \rightarrow PI$ ($\beta = 0.282$, $p = 0.000$) consecutively.

Among the 10 hypotheses made in the research framework, the results supported 7 (H1, H2, H4, H5, H8, H9, and H10) hypotheses and rejected 3 (H3, H6, and H7) (see Table 7). The most commonly used measure to evaluate the structural model is the coefficient of determination (R^2 value). R^2 values of 0.75, 0.50, or 0.25 for the endogenous constructs can be described as, respectively, substantial, moderate, and weak (Hair et al., 2013, 2021; Henseler et al., 2009). Table 11 shows the R^2 values for all endogenous variables. Referring to the table, the Purchase Intention (PI) has a substantial R^2 value (0.676) that is 67.6% of the variance of PI is predicted by the cumulative effect of exogenous variables in the developed structural model and the remaining 32.4% is explained by some other unknown variables. Similarly, PEOU (0.426) and PU (0.317) have close to moderate R^2 values.

Theoretical implication

Through the provision of an original, rigorous theoretical framework based on TAM, TPB, and the literature, this study adds to the body of prior studies on the subject of consumers' online purchase intention determinant variables. By offering insights into the variables that appear to influence the targeted consumer group's online purchasing intentions, we improved the body of knowledge on online purchase intention. This study has identified the determinants of Addis Ababa University GC engineering students' online digital market platform repurchase intention and empirically tested the developed framework.

The most significant determinant factors of Ethiopian engineering GC students' online purchase intention have been determined to be PEOU, SN, and PU. The direct effect of Trust on the online purchase intention of this segment of consumers was not significant contrary to previous findings (Alvarez-Risco et al., 2022; Al-Maghrabi & Dennis, 2011; Athapaththu & Kulathunga, 2018; García-Salirrosas et al., 2022; Goyal et al., 2013; Jadil et al., 2022; Santo & Marques, 2022). However, the total (direct & indirect) (see Table 8) effect and the total indirect effect (see Table 9) of trust on the online purchase intention of the students was significant. This is a surprising result which may trigger further study in the area. PEOU has no effect on PU against TAM in the context of Addis Ababa University, GC engineering students. Moreover, using PLS-SEM path analysis we have seen the indirect effect of website design on the online purchase intention of the targeted students through the mediation effect of PU and PEOU which has been little researched by previous studies. The total significant indirect effect of trust as mediated by PU and PEOU has been also identified using this method of analysis.

This study's main contribution is a better understanding of how consumers make decisions related to online digital market platform purchases in the context of Ethiopian GC engineering students, utilizing a new conceptual model based on prior literature and theories. For this study, a theoretical research model of the variables hypothesized to

affect customers' decisions to purchase online or not has been created. The information on the decision factors obtained from the empirical analysis will benefit future researchers who may study consumer behavior in the emerging online digital market platform business models. Moreover, this contribution is especially important as there is only limited published empirical research on the online shopping behavior of Ethiopian consumers.

Managerial implication

This study offers managers useful information regarding the creation of their websites and marketing plans. It is crucial to provide and manage accurate information with concise text and relevant visuals, and this is the main responsibility of designers and marketers of online digital market platforms. Managers and website developers should, therefore, prioritize informative and high-quality content that reflects value and enjoyment. In addition, computer applications such as Internet shopping are prominent in all facets of our lives nowadays.

To successfully retain customers, online digital market platform shoppers will, therefore, increasingly demand usefulness, especially over the long term. This is because customers who never return reduce the firm's customer base and revenues and require significant expenditures to attract them back from rivals. People's e-commerce intended behaviors are still heavily influenced by the suggestions of others. Managers should, therefore, encourage and support positive word-of-mouth on social networks.

This study found that managers cannot overlook either direct (PU, PEOU, SN) or indirect (WD, TR) influences on online purchase intentions if they want to develop long-lasting, ongoing connections with customers who shop online. It is essential for online digital market platform business model designers and online digital market sellers to maintain a user-friendly and informative purchasing experience through clear explanations, and exciting, and attractive interfaces to create favorable attitudes in users. To assess customer satisfaction and make adjustments, it is crucial to design and run customer services with efficiency. In order for customers to quickly perceive the true quality of the product and avoid misconceptions or unrealistic expectations, complete and accurate product information, as well as reliable and authentic reviews from prior buyers, should be readily available.

The shopping websites should be simple to use, not necessarily requiring any specialized knowledge, and a platform for shopping designed especially for students can be developed to provide discounts and other commercial deals to students. This fundamental shift in buying is here to stay as internet usage and information availability continue to climb, particularly in Ethiopia, where it makes life in the retail sector more convenient.

Limitations and ideas for future study

Despite the great effort to maintain the significance of this study, such as other studies, this research also is not without certain limitations that must be addressed in the future researches. First, this study is a cross-sectional study that represents a slice of time and does not show how attitudes of students' online purchase intention may change over time. We recommend utilizing a longitudinal approach in future studies as it would

demonstrate, if any, changes in consumer attitudes regarding using internet shopping over time. Second, the majority of respondents had extensive education and knowledge of the Internet. To validate the more generalized model, future studies may look at a wider range of web users, such as older, less educated, and less experienced online users. Third, despite the importance of this study in supplementing the limited studies in the African continent as compared to similar studies in the Western world based on data from the African continent, the sample size used in this study is small to generalize. Hence, the authors call research using a larger sample size to generalize the findings of this study. Fourth, only five variables including Subjective Norms (SN), Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Website Design (WD), and Trust (TR) have been tested to see the effect of the variables on consumers' online purchase intention. We suggest future studies to focus on enlarging the sample size and variables for a better understating of consumers' behavior towards online digital market platform purchase intention.

Conclusion

The major findings of this research provided empirical evidence towards determinants of consumers' purchase intention in the digital market. The data were collected from 100 Addis Ababa University GC engineering students who have online purchase experience. It was analyzed using descriptive statistics and PLS-SEM. By identifying the useful variables impacting the targeted students' desire to purchase on the online digital market platforms, this study closed the conceptual gap in the context of online market platforms purchasing intention in the selected consumers' segment.

From the findings of the descriptive statistics many of the respondents were male and aged between 20 and 25 from the electrical engineering department. The multivariate inferential statistics analysis using Partial Least Square Structural Equation Modeling (PLS-SEM) showed that the major determinants of consumers' purchase intention on digital market platforms were Perceived Ease of Use (PEOU), Subjective Norms (SN), Perceived Usefulness (PU), Website Design (WD), and Trust (TR). The coefficient of the determinant ($R^2 = 0.676$) to PI shows that the proposed research model was able to explain 67.6% of the variation in consumers' online digital platform purchase intention (PI) showing the hypothetical model has high prediction power.

The novelty of this study lies in its detailed examination of the relationship between determinants of consumers' purchase intention in the Ethiopian context by developing a new conceptual model quite different from the other researchers. The usage of the PLS-SEM analysis method for inferential statistics analysis to determine the direct, indirect, and total effects of independent variables on dependent variables makes this study unique as well. For those with the skills to effectively manage and utilize it, the Internet has developed into a potent weapon. Businesses must move in that direction, since online shopping is the fastest-growing segment of the market and consumers no longer enjoy spending hours traveling from one retail store to another to buy a product.

Existing research has dealt extensively with the factors affecting customers' online repurchase intention in developed countries. Relatively, the amount of research that

has considered online digital market platforms in developing countries specifically concerning graduating (GC) engineering students consumers segment is small, as such this paper adds value by contributing to the relatively scarce literature in the area by integrating different models from past studies, TAM, and TPB. The results from this study indicate that most of the factors identified in the study influence the intention to repurchase from online digital market platforms. The outcome of this research not only affirms some of the findings of prior studies but is also an advance over many as the integrated model explains a greater amount of variance in repurchase intention than any previous models. As such, the integrated model is more helpful in understanding customers' online purchase behavior.

Appendix

Questionnaires

Addis Ababa University

Institute of Technology

School of Mechanical and Industrial Engineering

Dear respondent,

First, we express our gratitude for your kind support and for sharing your knowledge while answering a few questions below.

We are conducting research entitled "Determinants of Consumers' Purchase Intention on Digital Business Model Platform: Evidence from Ethiopia Using partial least square structural equation model (PLS-SEM) technique." Your responses in this regard: shall help us to complete this research in an efficient way, which will be strictly kept confidential and used for the research purposes only. The results of this study will be reported only in aggregate form (no individual names will be reported). You can also be informed of the outcome of the research study if you desire.

Many thanks in anticipation for all your help, time, and effort without which this research is not effectively possible!

Part I: general information

1. Gender: Male Female
2. Age: <25 26–30 31–35 36–40 >40
3. Department: Electrical and Computer Engineering Mechanical Engineering

Part II: structural equation model items

Instruction: Think of the online market platform you frequently purchased or intend to purchase from and mark the level of your agreement on the following items.

1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree.

See Table 14.

Table 14 Questionnaire items

Variable	Items		Source: Adapted from
	Code	Description	
Website Design	WD1	The online market platform is user-friendly	Lai (2016), McKinney (2004)
	WD2*	The online market platform loads all the texts and graphics that I need	
	WD3	The online market platform is well-designed and visually interactive for me	
	WD4	The online market platform is responsive to my requests and able to conduct purchase at any time, from anywhere	
	WD5	The online Market platform provides relevant information about the products that I want to buy	
	WD6	The online market platform provides up-to-date information	
Perceived Usefulness	PU1	The online market platform Improves the quality of my transaction	Xu et al. (2021), Melorose et al. (2015), Venkatesh et al. (2003)
	PU2*	The online platform Improves performance of the trading	
	PU3	The online marketplace platform provides efficient service	
	PU4	The online marketplace platform Provides effective service	
	PU5	The online marketplace platform is Comfortable	
	PU6	The Online market platform helps me to save my time	
	PU7	The Online market platform saves my costs	
Perceived Ease of Use	PEOU1*	The online market platform is simple to use	Xu et al. (2021) Melorose et al. (2015)
	PEOU2	The online market platform is Straight Forward to use	
	PEOU3	The online market platform is one button touch	
	PEOU4*	The online market platform is easy to register and activate	
	PEOU5*	The online market platform is Easy to understand	
	PEOU6	It is convenient to find what I really want On this online market platform	
	PEOU7	Learning to use the online market platform is very simple	
	PEOU8	I believe that it is easy to get information from the online market platform to do what I want it to do	

Table 14 (continued)

Variable	Items		Source: Adapted from
	Code	Description	
Trust	TR1	This online market platform is a reliable place to shop	Lai (2016) Phuong (2020), Melorose et al. (2015)
	TR2	This online market platform sells the right products, quality and designs as posted	
	TR3	This online market platform complies with the procedures and terms they announced	
	TR4	The online market platform allows checking goods before receiving goods	
	TR5	The online market platform is a trustworthy site to make purchases	
Subjective Norm	SN1	People who influence my behavior think that I should use the online shopping channels	Dewi et al. (2020), Xu et al. (2021), Celik (2014)
	SN2	People who are important to me think that I should use the online shopping channels	
	SN3	People very close to me have been helpful in the use of online shopping channels	
	SN4*	In general, people very close to me supported the use of the online shopping channels	
	SN5	I use the online market platform as people around me use this it too	
	SN6	People around me have a positive attitude towards the online market platform	
Purchase intention	PI1	I always feel excited when shopping from this online market platform	Dewi et al. (2020), Ahmad Wani and Wajid Ali (2016), Xu et al. (2021), Celik (2014)
	PI2	I spend my free time surfing and searching for products on this online market platform	
	PI3	I intend to purchase online in the future from this online market platform	
	PI4*	I intend to make a purchase(s) through the online market platform in the future	
	PI5	I am probably going to keep purchasing products from this online market platform	
	PI6	I predict I would make a purchase(s) through the online market platform in the future	

*Factors excluded from the final analysis model due to low factor loadings

Abbreviations

AVE	Average Variance Extracted
BI	Behavioral intention
CR	Composite reliability
GC	Graduating class
PD	Platform design
PEOU	Perceived Ease of Usefulness

PI	Purchase intention
PLS-SEM	Partial least square structural equation modeling
PU	Perceived usefulness
SN	Subjective norms
TAM	Technology acceptance model
TPB	Theory of planned behavior
TR	Trust
TRA	Theory of Reasoned Action
VIF	Variance Inflation Factor
WD	Website design

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Author contributions

MT is the principal author. He has been at each level of the conception: brainstorming, writing, analysis, and discussions. EB is an associate professor. He has made great support during the writing, analysis, and discussion of all the results. GT is an assistant professor. He has made great support during the data collection, analysis, and discussion of all the results. All authors read and approved the final manuscript.

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Availability of data and materials

The data sets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

The respondents agreed before filling out the questionnaires and the concerned department wrote a letter to collect data.

Consent for publication

The researchers agreed to publish in the journal.

Competing interests

The authors declare that there are no competing interests.

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References

- Ab Hamid, M. R., Sami, W., & Mohmad Sidek, M. H. (2017). Discriminant validity assessment: use of Fornell & Larcker criterion versus HTMT criterion. *Journal of Physics: Conference Series*, 890(1), 012163. <https://doi.org/10.1088/1742-6596/890/1/012163>
- Afshardost, M. (2013). Linking trust, perceived website quality, privacy protection, gender and online purchase intentions. *IOSR Journal of Business and Management*, 13(4), 63–72. <https://doi.org/10.9790/487x-1346372>
- Ahmad Wani, T., & Wajid Ali, S. (2016). Determinants of Online Purchase Intentions: A Study of Indian Buyers. *Amity Journal of Management Research AJMR Amity Journal of Management Research*, 1(1), 94–109.
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior*.
- Al-Debei, M. M., Akrouh, M. N., & Ashouri, M. I. (2015). Consumer attitudes towards online shopping: The effects of trust, perceived benefits, and perceived web quality. *Internet Research*, 25(5), 707–733. <https://doi.org/10.1108/IntR-05-2014-0146>
- Al-Maghrabi, T., & Dennis, C. (2011). What drives consumers' continuance intention to e-shopping?: Conceptual framework and managerial implications in the case of Saudi Arabia. *International Journal of Retail and Distribution Management*, 39(12), 899–926. <https://doi.org/10.1108/09590551111183308>
- Al-Masa'eed, S., Abdeljaber, O., AbYajid, M. S., Shukri, S. M., Al-Adwan, A. S., & Tham, J. (2021). Determinants of online purchase behavior of Malaysian University Student: the mediating role of subjective norms. *International Journal of Business and E-government Studies*, 13(2), 223. <https://doi.org/10.34109/ijebe>
- Alomary, A., & Woollard, J. (2015). *How is technology accepted by users? A review of technology acceptance models and theories*.
- Alvarez-Risco, A., Quipuzco-Chicata, L., & Escudero-Cipriani, C. (2022). Determinants of online repurchase intention in Covid-19 times: evidence from an emerging economy. *Lecturas De Economia*, 96, 101–143. <https://doi.org/10.17533/udea.le.n96a342638>

- Athapaththu, J. C., & Kulathunga, D. (2018). Factors affecting online purchase intention: effects of technology and social commerce. *International Business Research*, 11(10), 111. <https://doi.org/10.5539/ibr.v11n10p111>
- Aziz, N. N. A., & Wahid, N. A. (2018). Factors influencing online purchase intention among University Students. *International Journal of Academic Research in Business and Social Sciences*. <https://doi.org/10.6007/ijarbss/v8-i7/4413>
- Batool, H., Rasheed, H., Malik, M. I., & Hussain, S. (2015). Application of partial least square in predicting e-entrepreneurial intention among business students: evidence from Pakistan. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-015-0019-3>
- Celik, H. (2016). (2014). Customer online shopping anxiety within the Unified Theory of Acceptance and Use Technology (UTAUT) framework. *Asia Pacific Journal of Marketing and Logistics*, 1–7.
- Chuttur. (2009). Overview of the technology acceptance model: Origins, developments and future directions. *Sprouts: Working Papers on Information Systems*, 9(37).
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297–334. <https://doi.org/10.1007/BF02310555>
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
- Deloitte. (2019). The business of platforms. *Deloitte*, 44(8), 128–137.
- Dewi, C. K., Mohaidin, Z., & Murshid, M. A. (2020). Determinants of online purchase intention: A PLS-SEM approach: Evidence from Indonesia. *Journal of Asia Business Studies*, 14(3), 281–306. <https://doi.org/10.1108/JABS-03-2019-0086>
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59(June), 102168. <https://doi.org/10.1016/j.ijinfomgt.2020.102168>
- Ennew, C., Lockett, A., Blackman, I., & Holland, C. P. (2005). Competition in internet retail markets: The impact of links on web site traffic. *Long Range Planning*, 38(4), 359–372. <https://doi.org/10.1016/j.lrp.2005.04.009>
- Fairouz, J. (2016). Journal of Internet Banking and Commerce an investigation of factors influencing consumers' intention to use online shopping: an empirical study in south of. In *Journal of Internet Banking and Commerce* (Vol. 21, Issue 2). <http://www.icommercecentral.com>
- Fan, Y., Chen, J., Shirkey, G., John, R., Wu, S. R., Park, H., & Shao, C. (2016). Applications of structural equation modeling (SEM) in ecological studies: an updated review. In *Ecological Processes* (Vol. 5, Issue 1). Springer Verlag. <https://doi.org/10.1186/s13717-016-0063-3>
- García-Salirrosas, E. E., Acevedo-Duque, Á., Marin Chaves, V., Mejía Henao, P. A., & Olaya Molano, J. C. (2022). Purchase intention and satisfaction of online shop users in developing countries during the COVID-19 Pandemic. *Sustainability (switzerland)*, 14(10), 6302. <https://doi.org/10.3390/su14106302>
- Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika*, 61(1), 101–107. <https://doi.org/10.1093/biomet/61.1.101>
- Goyal, A., Maity, M., Thamizhvanan, A., & Xavier, M. J. (2013). Determinants of customers' online purchase intention: An empirical study in India. *Journal of Indian Business Research*, 5(1), 17–32. <https://doi.org/10.1108/17554191311303367>
- Hair, J. F., et al. (2013). A primer on partial least squares structural equation modeling. In *Long Range Planning*, 46(1–2), 184. <https://doi.org/10.1016/j.lrp.2013.01.002>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)* (p. 165). Sage.
- Hair, J. F., Hult, G. T. M., Ringle, C., Sarstedt, M., Danks, N., & Ray, S. (2021). Partial least squares structural equation modeling (PLS-SEM) using R: A workbook. In *Springer*.
- Hair, J. J., Jr., Sarstedt, M., Hopkins, L., & Kuppelwieser, G. V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- Hanna, N. K. (2020). Assessing the digital economy: aims, frameworks, pilots, results, and lessons. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-020-00129-1>
- Hasanov, J., & Khalid, H. (2015). The impact of website quality on online purchase intention of organic food in Malaysia: a WebQual model approach. *Procedia Computer Science*, 72, 382–389. <https://doi.org/10.1016/j.procs.2015.12.153>
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20, 277–319. [https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014)
- Indiani, N. L. P., & Fahik, G. A. (2020). Conversion of online purchase intention into actual purchase: The moderating role of transaction security and convenience. *Business Theory and Practice*, 21(1), 18–29. <https://doi.org/10.3846/btp.2020.11346>
- Jadil, Y., Rana, N. P., & Dwivedi, Y. K. (2022). Understanding the drivers of online trust and intention to buy on a website: An emerging market perspective. *International Journal of Information Management Data Insights*, 2(1), 100065. <https://doi.org/10.1016/j.ijime.2022.100065>
- Kock, N., & Hadaya, P. (2018). Minimum sample size estimation in PLS-SEM: The inverse square root and gamma-exponential methods. *Information Systems Journal*, 28(1), 227–261. <https://doi.org/10.1111/isj.12131>
- Lai, P. C. (2016). Design and security impact on consumers' intention to use single platform E-payment. *Interdisciplinary Information Sciences*, 22(1), 111–122. <https://doi.org/10.4036/iis.2016.r.05>
- McKinney, L. N. (2004). Creating a satisfying internet shopping experience via atmospheric variables. *International Journal of Consumer Studies*, 28(3), 268–283. <https://doi.org/10.1111/j.1470-6431.2004.00368.x>
- Melrose, J., Perroy, R., & Careas, S. (2015). Trust and tam in online shopping: an integrated model 1. *Statewide Agricultural Land Use Baseline*, 1(1), 51–90.
- Moslehpour, M., Thanh, H. L. T., & van Kien, P. (2018). Technology perception, personality traits and online purchase intention of taiwanese consumers. *Studies in Computational Intelligence*, 753, 392–407. https://doi.org/10.1007/978-3-319-70942-0_28
- Nguyen, T. M. A., Nguyen, T. H., & Le, H. H. (2022). Online shopping in relationship with perception, attitude, and subjective norm during COVID-19 Outbreak: The case of Vietnam. *Sustainability (switzerland)*, 14(22), 15009. <https://doi.org/10.3390/su142215009>

- Nguyen Thi, B., Tran, T. L. A., Tran, T. T. H., Le, T. T., Tran, P. N. H., & Nguyen, M. H. (2022). Factors influencing continuance intention of online shopping of generation Y and Z during the new normal in Vietnam. *Cogent Business and Management*. <https://doi.org/10.1080/23311975.2022.2143016>
- Nunnally, J.C. (1978). Psychometric Theory. *Agile Project Management with Azure DevOps*, 37–66.
- Ofori, D., & Appiah-Nimo, C. (2019). Determinants of online shopping among tertiary students in Ghana: An extended technology acceptance model. *Cogent Business and Management*. <https://doi.org/10.1080/23311975.2019.1644715>
- Olokundun, M., Ogbari, M. E., Falola, H., & Ibdunni, A. S. (2022). Leveraging 5G network for digital innovation in small and medium enterprises: a conceptual review. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-021-00181-5>
- Oly Ndubisi, N., Har Lee, C., Cyril Eze, U., & Oly Ndubisi, N. (2011). Analyzing key determinants of online repurchase intentions. *Asia Pacific Journal of Marketing and Logistics*, 23(2), 200–221. <https://doi.org/10.1108/13555851111120498>
- Phuong, V. L. H. (2020). Factors affecting online purchase intention: the case of E-commerce on Lazada. *Independent Journal of Management & Production*, 11(3), 1018–1033.
- Rachinger, M., Rauter, R., Müller, C., Vorraber, W., & Schirgi, E. (2019). Digitalization and its influence on business model innovation. *Journal of Manufacturing Technology Management*, 30(8), 1143–1160. <https://doi.org/10.1108/JMTM-01-2018-0020>
- Ranatunga, R. V. S. P. K., Priyanath, H. M. S., & Megama, R. G. N. (2020). Methods and rule-of-thumbs in the determination of minimum sample size when applying structural equation modelling: a review. *Journal of Social Science Research*, 15, 102–109. <https://doi.org/10.24297/jssr.v15i.8670>
- Salkind, N. (2012). Statistical power analysis for the behavioral sciences. In *Encyclopedia of Research Design*. <https://doi.org/10.4135/9781412961288.n443>
- Santo, P. E., & Marques, A. M. A. (2022). Determinants of the online purchase intention: Hedonic motivations, prices, information and trust. *Baltic Journal of Management*, 17(1), 56–71. <https://doi.org/10.1108/BJM-04-2021-0140>
- Sewpersadh, N. S. (2023). Disruptive business value models in the digital era. *Journal of Innovation and Entrepreneurship*. <https://doi.org/10.1186/s13731-022-00252-1>
- Shanthi, R., & Kanniah, D. (2015). *Journal of Marketing and Consumer Research* www.iiste.org ISSN. In *An International Peer-reviewed Journal* (Vol. 13). www.iiste.org
- Teece, D. J., & Linden, G. (2017). Business models, value capture, and the digital enterprise. *Journal of Organization Design*. <https://doi.org/10.1186/s41469-017-0018-x>
- Venkatesh, V., & Bala, H. (2008). Venkatesh_et_al-2008-Decision_Sciences. *Journal of Decision Sciences Institute*, 39(2), 273–315.
- Venkatesh, V., & Davis, F. D. (2000). Theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, 46(2), 186–204. <https://doi.org/10.1287/mnsc.46.2.186.11926>
- Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. <https://doi.org/10.2307/30036540>
- Woraphiphat, I., & Roopsuwankun, P. (2023). The impact of online design thinking-based learning on entrepreneurial intention: The case of vocational college. *Journal of Innovation and Entrepreneurship*, 12(1), 10. <https://doi.org/10.1186/s13731-023-00278-z>
- Xu, A., Li, W., Chen, Z., Zeng, S., Carlos, L. A., & Zhu, Y. (2021). A study of young chinese intentions to purchase "Online Paid Knowledge": An extended technological acceptance model. *Frontiers in Psychology*, 12(June), 1–13. <https://doi.org/10.3389/fpsyg.2021.695600>

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