

DYNAMICS OF CUSTOMERS' ONLINE MEDICINE PURCHASE INTENTION

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ABSTRACT

The outbreak of COVID-19 and the availability of online buying sites encouraged people to order products staying from home. It has been observed that people even buy their medicine online by uploading their prescriptions. Despite the importance of online medicine purchase, scant attention is given to investigate the factors motivating customers to use such advancement. As a result, drawing on the technology acceptance model (TAM) and other contemporary literature directions, the study identifies four factors that might influence customers' online medicine purchase intention. Consequently, data were collected from 160 respondents for empirical investigation. Using PLS-SEM, the data analysis reveals that perceived usefulness, ease of use, and security issues play a vital role while customers intend to order medicine through online platforms. The factor of website layout design does not produce any significant effect. The study contributes by extending TAM theory and addressing the gap by advancing the business and management information system literature in the aspect of online medicine purchase intention. Practically managers of firms will likely be able to engage more customers in online platforms advancing such factors. The study of online medicine purchase intention is novel during the COVID-19 pandemic in a specific country context.

Keywords: Purchase intention, Online medicine, Extension of TAM, E-medication retail management

INTRODUCTION

Technological advancement accelerates firms' performance in the competitive business environment (Aydiner, Tatoglu, Bayraktar, Zaim, & Delen, 2019; Ferraris, Mazzoleni, Devalle, & Couturier, 2019; Urban, Timoshenko, Dhillon, & Hauser, 2020). Technology, especially the internet of things (IoT) and firms' capability, provides ample opportunity for firms to move from brick and mortar to online stores (Braojos-Gomez, Benitez-Amado, & Montes, 2015; Ho, 2021; Wu & Chang, 2016). Conducting business via an online platform has gained significant popularity in the COVID 19 pandemic (Guoxio, 2020; Verma & Gustafsson, 2020). Firms continuously try to create value for the customers on the online platform by managing technology infrastructure (Akman, Plewa, & Conduit, 2018; Wu & Chang, 2016). Evidence suggests that customers' buying habits have sharply changed in the pandemic, and buyers prefer to use online instead of physical stores to purchase their regular items (Mariani & Castaldo, 2020; Naeem, 2021). One such essential item is medicine.

In this pandemic situation, it has been observed that individuals and families had to stay in home isolation if they were in close contact with any COVID patients or tested positive (CDC, 2021). Thus, the habit of

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buying medicine online is growing among customers (Jairoun et al., 2021). Evidence suggests people are not fully satisfied with online shopping due to the complexity of use, security issues in online transactions, and so on (Casaló, Flavián, & Guinaliú, 2007; Hossain, Akter, Kattiyapornpong, & Dwivedi, 2020c). Extant studies adapted the technology acceptance model (TAM) to tackle such issues (Kamal, Shafiq, & Kakria, 2020; Tung, Chang, & Chou, 2008). Using TAM, previous research discusses several technology-related issues in top-tier journals, such as *Information & Management*, *International Journal of Human-Computer Studies*, *MIS Quarterly*, *Information Systems Research*, *Journal of Management Information Systems*, *Decision Sciences*, *Management Science*, and others. However, despite the importance of online medicine and customers' buying intention of online medicine, a lack of research exists in this aspect using TAM. Although extant literature reveals, TAM alone is insufficient to trigger customers to buy from any particular online site (Kamal et al., 2020; Rese, Schreiber, & Baier, 2014). Other factors, along with TAM antecedents, might shape human behaviour while dealing with technology advancement. Yet, extant literature does not have concrete evidence on the topic of customers' online medicine purchase intention. Therefore, this research formulates the following question to address the research gap.

RQ1: What are the factors influencing most customers while they intend to buy online medicine?

This research answers the above question through empirical evidence. The following sections develop the hypotheses, methods and discuss the research findings. The study contributes both in theory and practice. The empirical evidence of the research extends TAM's theoretical viewpoint in the context of online medicine purchase intention. Further, in practice, managers will be aware of the crucial factors for online medicine retail services so that they will be able to engage more customers and advance profitability by introducing such components.

THEORETICAL UNDERPINNING AND HYPOTHESES DEVELOPMENT

The technology acceptance model (TAM) holds two key antecedents that influence customers' using intention of any particular technology-oriented services. The core of the TAM comes through users' beliefs. The earlier study acknowledged that individuals hold many beliefs, but their attitude might be influenced by a small number of beliefs (Ajzen, Fishbein, & Heilbroner, 1980). Davis (1989) proposes the concept of TAM for the very first time, where the main idea manifests that an individual accepts a technology when they perceive it is useful and easy to use. Extant research introduces TAM in various study contexts, including online banking (Hossain, Bao, Hasan, & Islam, 2020b; Lee, 2009), electronic commerce (McCloskey, 2004; Pavlou, 2003), online education context (Liu, Chen, Sun, Wible, & Kuo, 2010; Martín-García, Martínez-Abad, & Reyes-González, 2019), mobile commerce (Chi, 2018; Shih & Chen, 2013), and social media (Florenthal, 2019; Rauniar, Rawski, Yang, & Johnson, 2014). Frequently, existing research presents other factors along with the TAM viewpoint as researchers argue only TAM cannot shape customers' attitudes (Florenthal, 2019; Manis & Choi, 2019). Overall, scant attention exists in the literature under the theoretical framework of TAM and other variables on the topic of customers' online medicine purchase intention. Although, purchasing online medicine has created a buzz recently, especially in the current Covid 19 pandemic sphere (UNB, 2020). Thus, this study has attempted to conceptualize a model to show how customers are influenced when they have the intention to purchase online medicine. Following TAM's viewpoint of usefulness and ease of use, the further extensive systematic literature review identifies there might be an influence of website security and website layout design when customers intend to order online medicine items. Therefore, the following sections develop the hypotheses in this aspect.

Perceived Usefulness and Ease of Use

Perceived usefulness in the technology aspect is generally defined as an individual's belief that the particular technology-oriented service is beneficial to solve their problem adequately (Davis, 1989; Hossain et al., 2020b; Lee, 2009). Customers generally believe useful service can be provided by ensuring excellent value that might offer them quick relief on any particular issue (Davis, Bagozzi, & Warshaw, 1989; Rese et al., 2014). Customers also believe the useful service will likely be able to provide perfect solutions and inspiring experiences. Further, perceived ease of use in the technology aspect is defined as an individual's belief that the specific technology-oriented service they can afford without any significant effort (Davis, 1989; Manis & Choi, 2019). Customers believe the service is easily controllable, understandable, flexible, user-friendly, and easily navigable (Lee, 2009; Rauniar et al., 2014; Rese, Baier, Geyer-Schulz, & Schreiber, 2017). TAM is generally explained through perceived usefulness and ease of use. The study mentioned above that TAM, particularly the usefulness and ease of use, has been acknowledged in various research areas. Extant research found that these two factors influence customers' purchase intention or behavioural intention (Alzubi, Al-Dubai, & Farea, 2018; Vahdat, Alizadeh, Quach, & Hamelin, 2021). However, the evidence is lacking in the context of online medicine retailing. In line with the prior study, we assume that the two factors that represent TAM may also be appropriate for customers' online medicine purchase intention. Thus, we postulate the following hypotheses for further empirical investigation.

H1: Perceived usefulness of online medicine service positively shapes customers' purchase intention.

H2: Perceived ease of use of online medicine service positively shapes customers' purchase intention.

Website Layout Design and Security

Extant research suggests that website layout design is vital to enhancing customers' buying intention from any particular online site (Hasan, 2016; Wu, Lee, Fu, & Wang, 2014). Thus, retail brands emphasize more on online store atmospheric that includes visual design, colour, and aesthetic layout, providing customers with a better impression of the retail firm's online existence (Karimov, Brengman, & Van Hove, 2011; Teng, Ni, & Chen, 2018). Further, it is essential to ensure the security of the site. Secure perception generates a secure feeling in customers' minds while making online transactions with the firm (Casaló et al., 2007; Wang, Wang, Su, & Ge, 2020). A leading firm like Amazon uses Hadoop software that protects customers from their credit card identity theft (Hossain, Akter, & Yanamandram, 2020a). Customers' secure data management has received significant attention these days (Hossain, Akter, Kattiyapornpong, & Dwivedi, 2019). Despite the importance of website layout design and security, extant research does not have any empirical evidence of whether they influence customers, online medicine buying. Thus, the study proposes the following hypotheses for further empirical investigation.

H3: Website layout design of online medicine service positively shapes customers' purchase intention.

H4: Website security of online retail medicine service positively shapes customers' purchase intention.

The study proposes the following conceptual research model based on the above discussion.

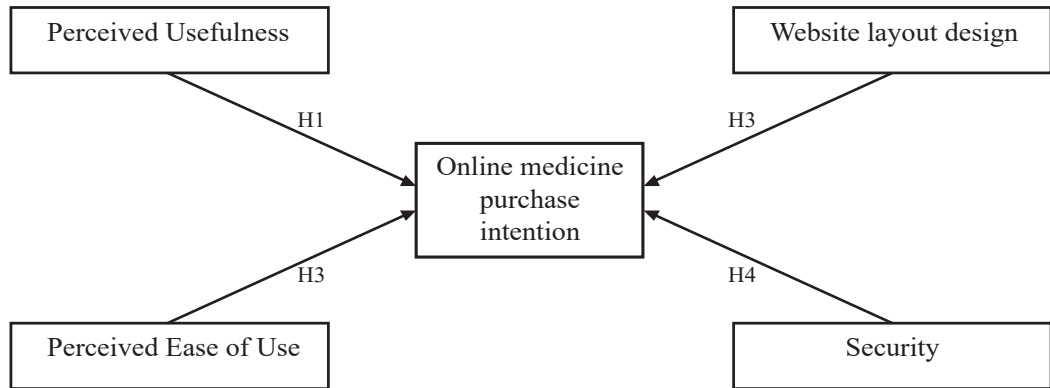


Figure 1: Research model

RESEARCH METHODS

Measurement Scales and Control Variables

Research instruments were adapted from prior studies. Perceived usefulness (PRU) instruments were taken from Davis et al. (1989) and Rese et al. (2014) studies. Perceived ease of use (PEU) measures were extracted from Davis et al. (1989) and Rese et al. (2017) studies. Website layout design (WLD) items were adapted from Wu et al. (2014) and Zhou, Lu, and Wang (2009) studies. Security (SEC) instruments were adapted from Casalo et al. (2007) and Hossain et al. (2020c) studies. Purchase intention (PIN) items were extracted from Rahman, Mannan, Hossain, and Zaman (2018) and Vijayasarathy (2004) studies. Following the guideline of prior studies, the research was dropped a few items to enhance the response rate and adapted a few phases to confirm the face validity of the question in this study context (Hossain, Akter, & Yanamandram, 2021; Ou, Verhoef, & Wiesel, 2017). The study used seven-point Likert scales for independent and dependent variable measures and applied multiple-choice options for demographic variables. In line with prior studies guidelines, this research considered respondents' gender and age as control variables (e.g., Carlson, O’Cass, & Ahrholdt, 2015).

Sampling and Data Collection

The study data were collected using a convenience sampling technique similar to prior studies (e.g., Rahman, Hossain, Fattah, & Mokter, 2021). In the convenience sampling technique, the primary consideration was how easily the possible respondents could be found or recruited (Baker et al., 2013). Convenience in sampling counts time as money and saves resources (Rahman, Hossain, Fattah, & Akter, 2020). In the questionnaire, the researchers retained the screening question to find out the appropriate respondents. Investigators collected responses only from those qualified through the screening questions that they were aware of the online medicine purchasing system or at least visited an online medicine buying site. In total, 200 respondents' responses were collected. Finally, 160 complete responses were retained, and the remaining 40 were deleted as many straight-liners exist in the responses. Among the respondents, 57.5% were male, and 42.5% were female. The highest number of the respondents' age falls between 20 and 30 years (33.8%), followed by 30 and 40 years (26.9%), 40 and 50 years (23.1%), 50 years and above (12.5%), less than 20 years (3.8%).

Common Method Variance (CMV)

Following the guideline of Hulland, Baumgartner, and Smith (2018), the study was applied both priori and post hoc methods to tackle the common method bias issues. As part of priori guidelines, investigators separated the dependent and independent variables from the questionnaire. The respondents' identity was anonymous; data were analyzed at an aggregated level. Random 25% data were taken from the first half and last half of the data set and applied paired t-test that did not produce any significant differences confirm non-response biases do not exist. As part of the post hoc method, the investigator used the marker variable test. We had a theoretically unrelated variable with the study constructs. The result revealed that the study variables' co-relation was low with the marker variable and proved the insignificant relationship (e.g., Lindell & Whitney, 2001). Thus, in this study, researchers assume that common method bias does not have any impact.

DATA ANALYSIS

Data Analysis Technique

The study applied PLS-based structural equation modeling (SEM) to analyze the data. Contemporary survey-based empirical research highly encourages using the PLS software as it is most suitable for analyzing the complex relationships of the construct's variables (F. Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014; Hair Jr, Hult, Ringle, & Sarstedt, 2016). The study used 5000 subsamples in Bootstrapping, a nonparametric procedure to check the research model's overall statistical significance through path coefficients (Hossain et al., 2020c).

Measurement Model Analysis

The items of PRU, PEU, WLD, SEC, and PIN are reflective. PLS algorithm shows all the loadings of the items exceeded the threshold value of 0.70. The value of the composite reliability of each variable is well above 0.80. The results confirm the construct's reliability (Hossain et al., 2021). The average variance extracted (AVE) values of the variables are above 0.50 confirm the convergent validity (See Table I). Collinearity statistics show all variance inflation factor (VIF) values of control variables are below 5. As assessing the discriminant validity of model constructs, the study tested both the Fornell-Lacker Criterion and Heterotrait-Monotrait Ratio (HTMT) (Henseler, Ringle, & Sarstedt, 2015). It has been observed that the square roots of the AVEs are higher than all the inter-construct correlations confirm discriminant validity as per Fornell-Lacker Criterion (See Table II). Further, HTMT shows the values are lower than 0.85 confirms the uniqueness of each variable and establishes the discriminant validity (See Table III).

Table I. Measurement items assessments

Reflective Constructs	Items	Loadings	CR	AVE
Perceived Usefulness (PRU)	<i>I believe an online medicine buying option provides _____</i> <i>PRU1: excellent value in the pandemic.</i> <i>PRU2: quick relief.</i> <i>PRU3: perfect solutions.</i> <i>PRU4: an inspiring experience.</i>	0.883 0.825 0.859 0.840	0.914	0.726
Perceived Ease of Use (PEU)	<i>I consider an online medicine buying option as _____</i> <i>PEU1: easily controllable.</i> <i>PEU2: clear and understandable.</i> <i>PEU3: flexible.</i> <i>PEU4: user-friendly.</i> <i>PEU5: easily navigable.</i>	0.795 0.757 0.741 0.709 0.748	0.865	0.563
Website Layout Design (WLD)	<i>An online medicine purchase website should provide _____</i> <i>WLD1: a well-organized layout.</i> <i>WLD2: a good display.</i> <i>WLD3: attractiveness.</i> <i>WLD4: liveliness.</i>	0.852 0.776 0.809 0.823	0.888	0.665
Security (SEC)	<i>An online medicine purchase option should provide _____</i> <i>SEC1: safe transmission.</i> <i>SEC2: a secure transaction.</i> <i>SEC3: a sufficient technical capacity.</i> <i>SEC4: a highly secured website.</i>	0.843 0.866 0.870 0.832	0.914	0.727
Purchase Intention (PIN)	<i>If I were to purchase medicine in the future, _____</i> <i>PIN1: I would consider the online option as my first choice.</i> <i>PIN2: I would consider the online option as reliable.</i> <i>PIN3: I would consider the online option repeatedly.</i>	0.880 0.842 0.845	0.891	0.732

Table II. Correlations and AVEs

	PEU	PRU	PIN	SEC	WLD
PEU	0.751				
PRU	0.697	0.852			
PIN	0.598	0.636	0.856		
SEC	0.677	0.661	0.574	0.853	
WLD	0.587	0.656	0.442	0.656	0.816

*Square root of AVE on the diagonals.

Table III. Heterotrait-monotrait Ratio (HTMT)

	PEU	PRU	PIN	SEC	WLD
PEU					
PRU	0.802				
PIN	0.701	0.747			
SEC	0.778	0.744	0.663		
WLD	0.705	0.765	0.529	0.761	-----

Structural Model Analysis

The study tested the hypothetical relationship of PRU-PIN, PEU-PIN, WLD-PIN, and SEC-PIN following path coefficients and checked the model superiority using coefficient of determination (R^2), blindfolding Stone-Geisser's Q^2 and PLS predict. The study estimates H1: PRU-PIN ($\beta=0.392$, $p<0.001$) is significant, H2: PEU-PIN ($\beta=0.233$, $p<0.05$) is significant, H3: WLD-PIN ($\beta=-0.097$, $p>0.05$) is insignificant, H4: SEC-PIN ($\beta=0.221$, $p<0.01$) is significant (See Table IV). The independent variables impact 47.2% of customers' purchase intention ($R^2=0.472$). The effect size (f^2) results are adequate. Blindfolding Stone-Geisser's Q^2 values which are above 0 confirm the superiority of the model. PLS-predicted model shows the PLS RMSE values of PIN1 1.333, PIN2 1.164, PIN3 1.251, which are lower than the LM RMSE value PIN1 1.445, PIN2 1.308, PIN3 1.311 confirm the error is less in the PLS model (Shmueli et al., 2019). Overall, the above justification and analysis confirm the model superiority where H1, H2, and H4 are significant.

Table IV. Hypotheses path coefficients and t-statistics

Hypotheses	Main Model	Path coefficients	Standard error	t-statistic
H1	PRU \longrightarrow PIN	0.392	0.107	3.646
H2	PEU \longrightarrow PIN	0.233	0.095	2.454
H3	WLD \longrightarrow PIN	-.097	0.095	0.304
H4	SEC \longrightarrow PIN	0.221	0.073	3.042

FINDINGS AND DISCUSSIONS

The study's findings confirm that perceived usefulness, ease of use, and security perception are vital in buying online medicine. It has been observed that customers are not concerned about the website layout; instead, they prefer other factors (e.g., PRU, PEU, and SEC). Among the variables, the perceived usefulness factor generates the highest beta coefficients, following perceived ease of use and security issues. Overall the factors generate the explanatory power of 47.2% to purchase intention. Thus, it is evident that the online medicine purchase option in pandemic provides excellent value to the customers. Customers get quick relief by ordering the essential medicine item online rather than visiting the physical store and avoiding contact with the salesperson and other individuals. This provides an inspiring experience and confirms the perfect solution for the customers. Thus, customers are very confident about the usefulness cue of online medicine buying options. Further, customers consider the pattern of ease of use in this service as they perceive that it is easily controllable over the online platform. Customers also perceive the service as clear, understandable, and flexible. They can easily log into the system to order the medicine whenever they want. They perceive the system as user-friendly and easily navigable. As the service performs online, thus security plays an important role. Security infrastructure covers the customer's privacy issues where a customer expects a secure transaction. They assume their credit card information will be kept safe and secure. They expect their identity will be anonymous. They expect a safe transmission by taking the firm's assistance with sufficient technical capacity. In the extant research on other categories (e.g., luxury goods), we have seen website layout design plays a vital role. Still, in this study, customers are not worried about the website layout design, particularly in buying medicine online. Thus, practitioners may consider website layout design for high involvement products; however, online prescribed medication seems as low involvement; therefore, website design doesn't appear as a vital construct. Further, the study did not find any significant effect of control variables. It seems customers' age and gender differences do not have any influences on the research findings.

Theoretical Contributions

Extant literature applies TAM theoretical underpin in numerous technology-oriented issues (Davis et al., 1989; Manis & Choi, 2019; Rese et al., 2017; Rese et al., 2014). However, extending TAM, the study conceptualizes a model by acknowledging a unique contemporary topic on online medicine purchase intention. To the best of the authors' knowledge, this research is the first in Bangladesh and theoretically extending TAM by introducing security issues and usefulness and ease of use in the research context. Most earlier research discussed purchase intention and behavioural intention from physical products, brands, and particularly business perspectives (e.g., Arli, Tan, Tjiptono, & Yang, 2018; Pisitsankhakarn & Vassanadumrongdee, 2020). Moreover, this study combines business and information system management aspects to tackle online medicine purchasing issues. Thus, the study creates a new avenue in business, management, and IT literature by forming a robust theoretical framework.

Managerial Implications

In practice, managers of online medicine service providers may introduce user-friendly online services, provide value for customers, ensure a secure transaction, and make a highly secured website to enhance the purchase intention of those customers who intend to buy online medicine. Bangladesh, as a country, has enormous potential in this sector, as the health-related issue is a significant fact in the Covid 19 pandemic, and people expect medicine delivery service even from staying at home isolation. Thus, this sector of online medicine retailing is getting popular, despite retail managers not being aware of the facts influencing

customers most in the online platform. There was a lack of empirical evidence exists. In the country context, this study is one of the pioneers for managers to follow in order to engage more prospective customers and accelerate profitability.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

Alike other studies, this research also has some limitations. The research was a cross-sectional study, and data were collected only once. Thus, future research may apply the longitudinal method so that it'll be able to detect the behavioural changes of the prospective customers. The research collected data on convenient samples of prospective buyers. Future research may attempt to collect the actual customers' information by contacting Ousud.com, banglameds.com, pharmacy.com.bd, epharma.com.bd. The interviews and surveys on genuine buyers of online medicine may provide more insightful information in the future. The study only considered a developing country, namely Bangladesh; thus, future research may extend to other developing and developed nations to find the actual impact. Initial findings of the systematic literature review found security infrastructure itself on the online platform assures privacy (e.g., Ibrahim & Wang, 2019; Liao & Shi, 2017). Thus, in our conceptualization, we have only considered the security aspect. Some other studies investigate the security and privacy pattern separately. Thus, future research may also consider privacy as an independent construct along with security. Further, there is scope to advance research in the future by introducing other factors such as social influence, quick delivery and perceived risk. Future research may also extend the outcome variables by looking at economic and social factors such as service providers' profitability and customers' quality of life due to online retail medicine service advancement.

CONCLUSION

To answer the research questions ("What are the factors influencing most customers while they intend to buy online medicine?"), this study demonstrates a framework for academics and practitioners. The study uses the latest way of exploring on customers' intention in online medicine purchase, especially in developing country context. The study extends TAM, introducing two more variables: security and website layout design (WLD). WLD does not significantly influence buyers' low involvement online medicine purchase intention. Thus, in this context, policymakers should work on the online platform's usefulness, ease of use, and security issues to accelerate their online medicine retail business.

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Appendix

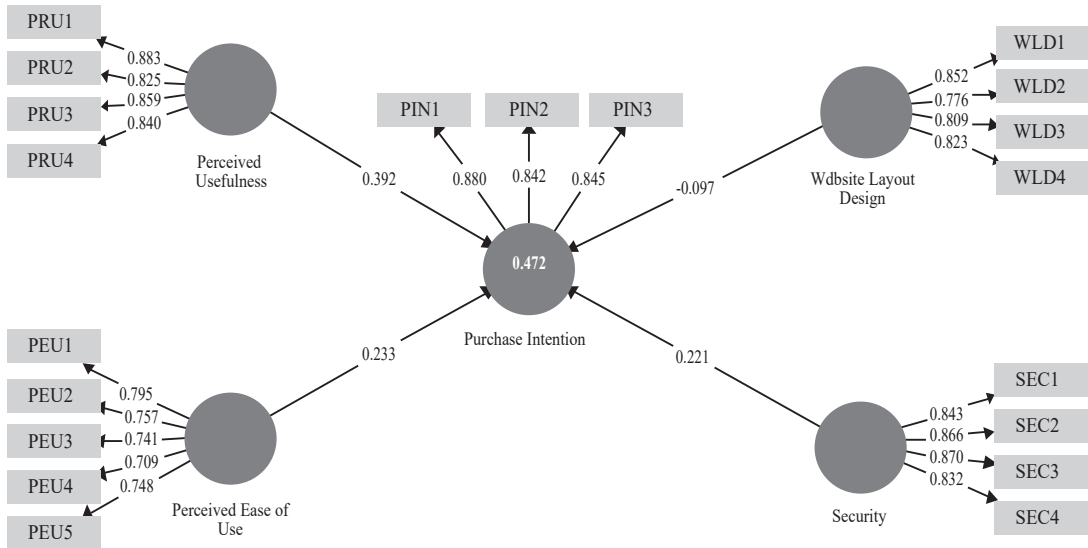


Figure 2: Measurement Model

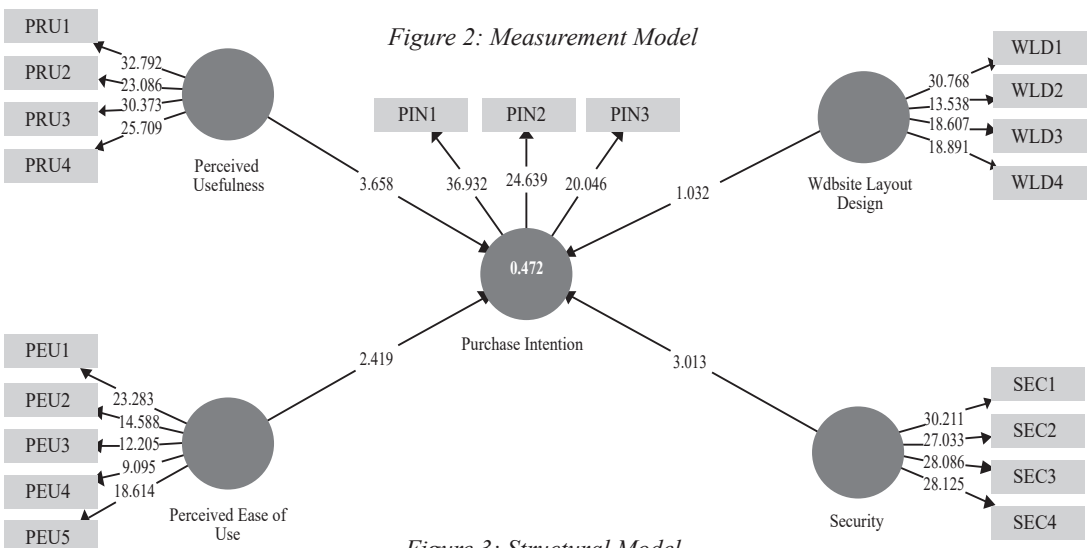


Figure 3: Structural Model

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