UNDERSTANDING CONSUMERS' INTENTION TOWARD SMART PARCEL LOCKER FOR LAST-MILE DELIVERY SERVICES: AN EMPIRICAL STUDY IN HO CHI MINH CITY, VIETNAM

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Abstract

Despite being the most costly and time-consuming phase of shipping process, last-mile delivery plays a crucial role in ensuring overall customer satisfaction. Moreover, the spike in e-commerce in metropolis such as Ho Chi Minh has resulted in severe effectss including environmental issues, increasing expenses and prolonged delivery durations. Within this context, smart parcel lockers were found to improve those problems. This study aims to explore the elements that have influence on the intention to use smart lockers of residents living in Ho Chi Minh City.

The research framework, developed by Tsai & Tiwasing, integrates the theories of resource matching, innovation diffusion and planned behavior to comprehend customers' tendency to use smart lockers. 330 customers in Ho Chi Minh city who had known about smart lockers in last-mile delivery took part in the survey and the collected data then was analyzed using the PLS-SEM method (Partial Least Squares Structural Equation Modeling) via Smart PLS 4.0 software. The findings revealed that eight variables including attitude, perceived behavioural control, complexity, relative advantage, compatibility, privacy security, reliability and convenience significantly influence consumers' intentions to use smart lockers. Additionally, the study unveiled the moderating role of innovativeness on attitude and usage intention. This research not only inspires future theoretical exploration of self-service in logistics but also offers valuable insights for investigating consumer behavior.

Key words: last-mile, smart locker, consumers' intention.

JEL Code: M2, M16, M31

1. Introduction

Logistics and supply chain management plays a crucial role in both micro and macro levels of the global business and finance sectors. E-commerce has grown quickly as a result of the COVID-19 epidemic, and it is now an essential part of the supply chain. According to Kantar Worldpanel's Vietnam E-commerce Outlook 2023 research, e-commerce revenue in Vietnam increased by 50% from 2020 to 2023, reaching almost 17.7 billion USD. It is anticipated that by 2023, B2C e-commerce income in Vietnam will make up between 8.5% and 9% of all retail sales of goods and services across the country. By 2025, it's expected that Vietnam's e-commerce sales will reach a potential 25 billion USD. As consequently, it is evident that Vietnam's e-commerce scenario is improving steadily in comparison to prior years and will keep thriving in the near future.

Despite its growth potential, Vietnam's e-commerce industry faces several challenges that need to be addressed for greater success. The increasing demand for timely delivery of goods, especially in urban areas, has put immense pressure on logistics systems, especially last-mile delivery (Taniguchi, 2014). Last-mile delivery, the process of completing orders, is the most expensive and lowest efficient rate in the supply chain management, making up 28% of delivery expenses (Ranieri et al., 2018). Home delivery, the most popular last-mile delivery procedure, has been criticized by scholars and practitioners for its inefficiency and rigidity (Agatz et al., 2008).

Home delivery expects clients be present at their residence or the scheduled location during the primary delivery period; otherwise, the delivery rate will suffer. The shipper must re-deliver as an outcome of the aforementioned (Zhang & Lee, 2016). In addition to causing delays in delivery, which are inconvenient for customers, logistics companies, and online retailers, it exacerbates air pollution and traffic congestion in cities. There is a high geographic correlation between the consequences of transportation-related air pollution emissions and the factors that influence them locally. These elements include the volume of traffic and the accessibility of transit choices. The impacts of the emissions are evaluated by examining the diseases and environmental harm associated with a unitary increase in air pollution concentration (Ranieri et al., 2018).

Many private corporations support innovative methods to prevent delivery failures and enhance the efficiency for their businesses (Dieke et al., 2013). Mangiaracina et al. (2019) found ten options for inventive last-mile delivery strategies after literature review procedure. These options included reception boxes, parcel lockers, drones, pick-up places, and crowd-sourced logistics. The parcel locker, also known as a smart locker, is one of the most talked-about choices. Customers may select the time and location that is most convenient for them, making it a more convenient location for package pickup. Additionally, aiming to avoiding delivery issues, logistics service providers may also install smart lockers in convenient locations for the customers.

According to Mostakim et al., (2019), a highly adaptable, 24/7 self-service pickup tool is the smart package locker. It is a useful, reasonable, secure package delivery and replenishment solution for apartments, stores, office ttowers, and university campuses (Chen et al., 2020).

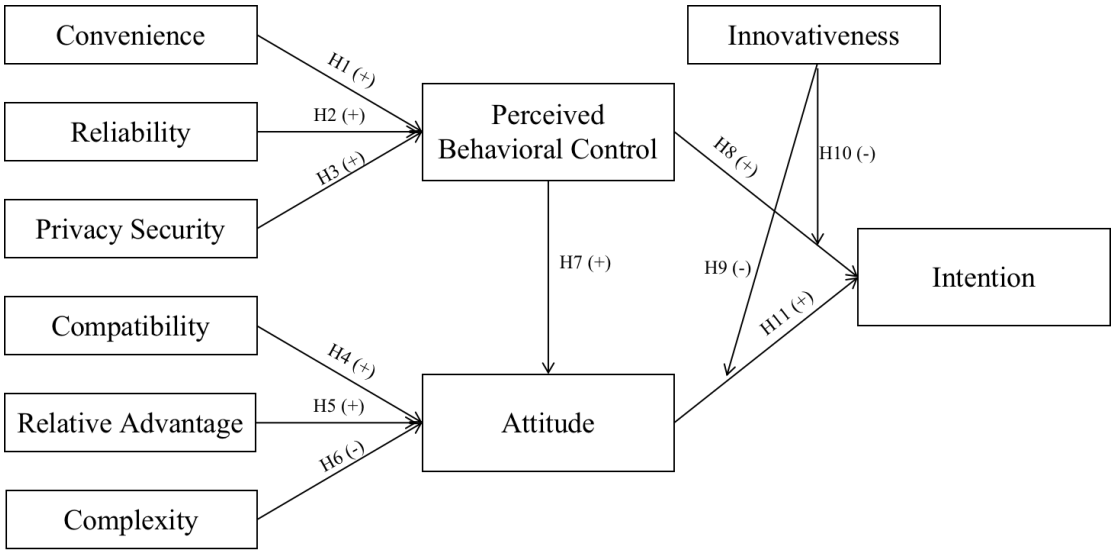
This research addresses knowledge on the smart parcel lockers stations (self-collection delivery) as a solution to the "last-mile delivery" problem. This work aims to examine the factors that have impact on the intention to use smart lockers in Ho Chi Minh City.

This paper includes 5 secctions. First, the introduction and research context are presented. Then, the reviews of literature will be clarified in the literature review part. Third, the methodology of this research will be explained. After that, the discussion of analysis and statistical findings, hypothesis evaluation will be provided in the result section. Finally, the implications and limitations, will be indicated in the last section.

2. Literature review

The research model of this study is presented in Figure 1. This model is built based on the research paper of Alkawsi et al. (2021) and Tsai & Tiwasing (2021). Ten variables of this researched are illustrated in Figure 1.

Figure 1: The research model



2.1. Hypothesis Development

2.2.1. The effect of Convenience, Reliability and Privacy on Perceived Behavioral Control

Convenience and perceived behavioral control are closely intertwined. Collier and Kimes (2012) suggested that customers' time and effort invested in completing a task determines convenience. For instance, if self-service alternatives are positioned in an awkward place, customers could not enjoy them and have a bad experience. Environmental issues must thus be taken into account, which may require more time and resources. By reducing client effort and time, self-service technologies placed in handy locations can improve the transaction experience. The

location of pickup and delivery locations has a big impact on e-commerce success since it impacts client preferences and operating expenses, claim Xu et al. (2019). Customers frequently choose to pick up items from office buildings on their way home (Wu et al., 2015). Moreeover, Tsai & Tiwasing (2021) explored that convenience positively impacts perceived behavioral control.

Perceived behavioral control is also influenced by reliability. Reliability, a key component of service quality, is crucial for self-service technology. Issues arising from unreliable service can waste customers' time. Chang and Wang (2011) suggest that customers' experiences, whether positive or negative, are tied to reliability. Smart lockers enhance reliability by reducing the likelihood of late deliveries compared to home delivery services. Customers are notified of package availability only when it's ready for pickup, thus minimizing delivery failures (Yuen et al., 2019). Parcel smart lockers also reduce the risk of theft, damage, or loss associated with human interaction during the delivery process (Chang and Wang, 2011). Tsai & Tiwasing (2021) confirmed reliability is the customers' perception of the smart locker's trustworthiness as a delivery service.

One major challenge of online services is customer’s privacy (Jahangir and Begum, 2008). Smart lockers enhance privacy by minimizing human interaction and allowing users to overlook their data (Yuen et al., 2019). Users of smart lockers can control their private information and locker contents, enhancing both functional and hedonic utility (Lee and Lyu, 2016). Smart lockers often employ security features such as data encryption and multi-factor authentication (Vacca, 2016), addressing consumers' growing concerns about data security (Wang and Lin, 2017). According to Tsai & Tiwasing (2021), "privacy security" refers to customers' belief in the ability of parcel lockers to secure their information, influencing perceived behavioral control. Thus, it is hypothesised that:

H1. Convenience has a positive influence on perceived behavioral control

H2. Reliability has a positive influence on perceived behavioral control.

H3. Privacy security has a positive influence on perceived behavioral control.

2.2.2. The effect of Compatibility, Relative Advantage and Complexity on Attitude

A new product or service seems to be compatible means that it aligns with customers' needs, preferences, and past experiences (Chen et al., 2009). According to Rogers' (1983) research, compatibility lessens adoption hesitation by indicating the degree that an invention matches with adopters' wants and ideals. Al-Rahmi et al. (2019) affirned that compatibility is determined by how well learners perceive an innovation to match their expectations and past experiences. In Tsai & Tiwasing (2021) viewpoint, "compatibility" describes students' perceptions of the benefits of using smart lockers for package delivery.

According to Meuter et al. (2005), customers are encouraged to investigate self-service systems further by relative advantage, which frequently comes with incentives or prizes. Because of self-collection services' ecological value, lower opportunity cost, social credibility, convenience, and prior customer satisfaction, they might be more advantageous to customers than home delivery (Yuen et al., 2018). This concept is highlighted in Tsai & Tiwasing (2021) to emphasize customers' preference for using smart lockers to receive parcels over home delivery.

Complexity refers to how difficult an innovation is to comprehend and use (Sonnenwald et al., 2020). When new items have numerous features, users' knowledge decreases (Chen et al., 2009). For example, the self-collection technology for parcel retrieval, as described by Yuen et al. (2018), includes multiple security checkpoints, such as barcode scanning and entering passwords, making package retrieval more challenging. While some customers may find these additional steps manageable, others may find them burdensome, leading to a negative attitude toward the technology or system. Customers perceiving self-pickup systems as complex are less likely to use them. Thus, it is proposed that:

H4. Compatibility has a positive influence on consumers' attitude.

H5. Relative advantage has a positive influence on attitude.

H6. Complexity has a negative influence on attitude.

2.2.3. The effect of Behavioral Control on Attitude and Intention

Perceived behavioral control, is the belief in one's ability to perform a behavior and is a key determinant of intention (Ajzen (2002)). Trafimow and Duran (1998) suggest that perceived behavioral control, reflecting the ease of performing an action, strongly predicts intentions. People's perceptions of the ease or difficulty of performing an action shape their perceived behavioral control. This perception is impacted by past experiences, anticipated barriers, and situational factors (Ajzen, 1991). Tsai & Tiwasing (2021) argue that perceived behavioral control, shaped by personal perceptions and resource constraints, affects future action evaluations. Thus, the below hypotheses were proposed:

H7. Perceived behavioral control has a positive influence on attitude.

H8. Perceived behavioral control has a positive influence on consumers' intention to use smart lockers in last-mile delivery.

2.2.4. The moderating role of Innovativeness

Yun et al. (2016) proposed that customer open innovation played a crucial role in the development of new business models incorporating new technology and penetrating new markets. Empirical studies by Kappor and Dwivedi (2020), Zhang et al. (2022), and Wang et al. (2022) demonstrated that individual behavior significantly contributes to the success of national energy

transition programs, highlighting the influential role of personal innovativeness. Regarding its moderating effect, Xu and Gupta (2009) indicated its influence on the relationships between perceived usefulness and intention, as well as attitude and intention (Tuan Duong Vu et al., 2023). Therefore, the hypothesis was made as follows:

H9. Innovativeness negatively moderate the positive effect of attitude on intention.

H10. Innovativeness negatively moderate the positive effect of perceived behavioral control on intention.

2.2.4. The effect of Attitude on Intention

Attitude is one of the fundamental concepts in social psychology. It acts as an evaluation tool for mental objects and speeds up the processing of information (Bohner and Dickel, 2011). Furthermore, attitude is a judgment of actions and is impacted by beliefs about the results of such actions, according to Trafimow (2000). In addition, attitude which expresses one's behavior is one of the important factors that influences intention, according to Ajzen (1991). Saad'e et al. (2008) agreed that attitude has a positive and strong relationship with behavioral intention in accordance with the concept of planned behavior. Moreover, Liao and Fang (2019) agreed with other researches that an individual's mentality influences their intention to behave. Based on these statements, the hypothesis was developed as follows:

H11. Attitude has a positive influence on consumers' intention to use smart lockers in last-mile delivery.

3. Methodology

To assess the variables, the author used a 5-point Likert scale (1 = "Strongly disagree" to 5 = "Strongly agree"). The survey included ten variables with 31 scale item measures that were in line with previous conceptualizations (Appendix 1). The questionnaire samples included both male and female residents of Ho Chi Minh City, Vietnam, aged between 18 and over 55 years. Out of 352 responses, 22 were excluded, leaving 330 responses for data analysis.

The collected data were analyzed using Smart PLS 4.0 software. For the measurement model, the author analyzed the reliability, convergent validity, discriminant validity, and outer loading. Regarding the structural model (SEM), bootstrapping was applied to assess the significance of the path coefficient.

4. Result

4.1. Sample Characteristics

Table 2. Respondent Characteristics

Characteristics	N=330	(%)

Gender	Male	137	41.52%
	Female	193	58.48%
Age	18 - 25	119	36.06%
	26 – 35	141	42.73%
	36 – 45	59	17.88%
	46 – 55	6	1.82%
	> 55	5	1.52%
Education Level	High school	7	2.12%
	Undergraduate	207	62.73%
	Graduate or above	102	30.91%
	Others	14	4.24%
Employment Status	Student	70	21.21%
	Office worker	140	42.42%
	Business owner	13	3.94%
	Freelance	59	17.88%
	Unemployed	0	0.00%
	Others	48	14.55%
Monthly Income (VND)	< 10,000,000 VND/month	125	37.88%
	10,000,000 – 15,000,000 VND/month	109	33.03%
	From above 15,000,000 – 25,000,000 VND/month	75	22.73%
	From above 25,000,000 – 50,000,000 VND/month	14	4.24%
	> 50,000,000 VND/month	7	2.12%
Online Shopping Frequency (per month)	Less than 3 times	60	18.18%
	From 3 – 8 times	123	37.27%
	From 9 – 12 times	124	37.58%
	From 13 – 16 times	14	4.24%
	Above 16 times	9	2.73%
Product Weight (kg)	< 1kg	155	46.97%
	From 1–3kg	123	37.27%
	From > 3–6kg	37	11.21%
	From > 6–10kg	14	4.24%
	> 10kg	1	0.30%

4.2. Measurement model assessment

Regarding the measurement model, assessment includes the outer loading, average variance extracted (AVE), VIF and the composite reliability (CR). The values of outer loading should be ≥ 0.7, the AVE ≥ 0.5, VIF < 5 and the CR ≥ 0.7. As Table 3, the outer loadings are ≥ 0.7, the AVEs are ≥ 0.5, the VIFs are < 5 and the CRs ≥ 0.7.

Table 3. Outer loading, VIF, AVE and CR

Variables	Outer	VIF	AVE	CR

		loading			
Attitude (ATI)	ATI1	0.864	1.877	0.739	0.895
	ATI2	0.849	1.823		
	ATI3	0.866	1.868		
Convenience (CVN)	CVN1	0.828	1.724	0.680	0.864
	CVN2	0.797	1.683		
	CVN3	0.849	1.433		
Compatibility (CPA)	CPA1	0.888	2.204	0.770	0.909
	CPA2	0.889	2.249		
	CPA3	0.855	1.881		
Complexity (CPL)	CPL1	0.844	2.106	0.712	0.908
	CPL2	0.827	1.930		
	CPL3	0.856	2.188		
	CPL4	0.846	2.075		
Innovativeness (INNOVA)	INNOVA1	0.895	2.356	0.788	0.918
	INNOVA2	0.901	2.423		
	INNOVA3	0.867	2.042		
Intention (INT)	INT1	0.935	3.713	0.840	0.940
	INT2	0.918	3.199		
	INT3	0.897	2.468		
Perceived Behavioral Control (PBH)	PBH1	0.852	1.688	0.667	0.857
	PBH2	0.761	1.327		
	PBH3	0.835	1.679		
Privacy Security (PVS)	PVS1	0.911	3.643	0.779	0.913
	PVS2	0.919	3.781		
	PVS3	0.814	1.558		
Relative Advantage (RLT)	RLT1	0.900	2.083	0.743	0.897
	RLT2	0.829	1.727		
	RLT3	0.855	1.952		
Reliability (RLL)	RLL1	0.846	1.746	0.702	0.876
	RLL2	0.870	1.905		
	RLL3	0.796	1.480		

In addition to the above, the author assessed the discriminant validity by using the Cross-loading. As result in table 4, all variables in the research attain high discriminant value.

Table 4. Cross-loading

	ATI	CVN	CPA	CPL	INNOVA	INT	PBH	PVS	RLT	RLL
ATI1	**0.864**	0.493	0.531	0.562	0.546	0.611	0.577	0.912	0.552	0.662
ATI2	**0.849**	0.455	0.532	0.511	0.547	0.571	0.577	0.810	0.515	0.638
ATI3	**0.866**	0.502	0.538	0.547	0.556	0.627	0.602	0.697	0.554	0.694
CVN1	0.485	**0.828**	0.467	0.420	0.467	0.412	0.485	0.498	0.451	0.497
CVN2	0.335	**0.797**	0.474	0.420	0.472	0.314	0.415	0.335	0.426	0.362
CVN3	0.538	**0.849**	0.633	0.590	0.642	0.507	0.638	0.526	0.606	0.507
CPA1	0.559	0.561	**0.888**	0.682	0.869	0.609	0.844	0.526	0.715	0.561
CPA2	0.546	0.605	**0.889**	0.762	0.887	0.624	0.717	0.534	0.799	0.550
CPA3	0.527	0.543	**0.855**	0.668	0.835	0.565	0.835	0.507	0.703	0.532

CPL1	0.526	0.479	0.693	**0.844**	0.691	0.582	0.667	0.495	0.723	0.558
CPL2	0.526	0.508	0.679	**0.827**	0.683	0.596	0.664	0.521	0.695	0.556
CPL3	0.534	0.547	0.691	**0.856**	0.698	0.586	0.676	0.518	0.766	0.548
CPL4	0.533	0.465	0.646	**0.846**	0.672	0.555	0.607	0.509	0.696	0.531
INNOVA1	0.577	0.561	0.882	0.695	**0.895**	0.628	0.835	0.540	0.726	0.564
INNOVA2	0.561	0.596	0.885	0.770	**0.901**	0.636	0.721	0.551	0.809	0.549
INNOVA3	0.566	0.584	0.855	0.700	**0.867**	0.587	0.834	0.537	0.736	0.554
INT1	0.635	0.471	0.630	0.630	0.638	**0.935**	0.661	0.600	0.644	0.564
INT2	0.644	0.465	0.621	0.608	0.633	**0.918**	0.645	0.616	0.638	0.555
INT3	0.651	0.475	0.628	0.651	0.641	**0.897**	0.659	0.616	0.661	0.587
PBH1	0.604	0.587	0.853	0.680	0.838	0.594	**0.852**	0.576	0.691	0.580
PBH2	0.533	0.429	0.507	0.544	0.509	0.593	**0.761**	0.487	0.536	0.516
PBH3	0.527	0.543	0.855	0.668	0.835	0.565	**0.835**	0.507	0.703	0.532
PVS1	0.791	0.522	0.518	0.540	0.530	0.604	0.564	**0.911**	0.565	0.653
PVS2	0.840	0.501	0.528	0.551	0.543	0.595	0.565	**0.919**	0.543	0.664
PVS3	0.844	0.463	0.527	0.509	0.542	0.563	0.570	**0.814**	0.517	0.646
RLT1	0.627	0.583	0.768	0.767	0.778	0.689	0.729	0.618	**0.900**	0.641
RLT2	0.491	0.511	0.704	0.688	0.713	0.535	0.653	0.470	**0.829**	0.507
RLT3	0.493	0.485	0.703	0.752	0.711	0.589	0.654	0.484	**0.855**	0.546
RLL1	0.706	0.530	0.526	0.569	0.528	0.543	0.569	0.673	0.558	**0.846**
RLL2	0.682	0.445	0.523	0.534	0.526	0.559	0.569	0.651	0.540	**0.870**
RLL3	0.551	0.433	0.521	0.530	0.518	0.454	0.535	0.537	0.562	**0.796**

4.3. Structural model assessment

Following confirmation of the measurements' validity and accuracy, it's critical to evaluate the structural model's capacity for explanatory prediction as well as the importance and applicability of the path coefficients (Hair et al., 2020). R-square is used to assess the accuracy and structural model's quality.

Table 5: R-square results

	R-square
ATI	0.501
INT	0.623
PBH	0.567

Table 5 indicates that the R-square values for ATI, PBH, and INT are 0.501, 0.567, and 0.623, respectively. These values suggest that the explanatory power of the variables for ATI, PBH, and INT is at the average level.

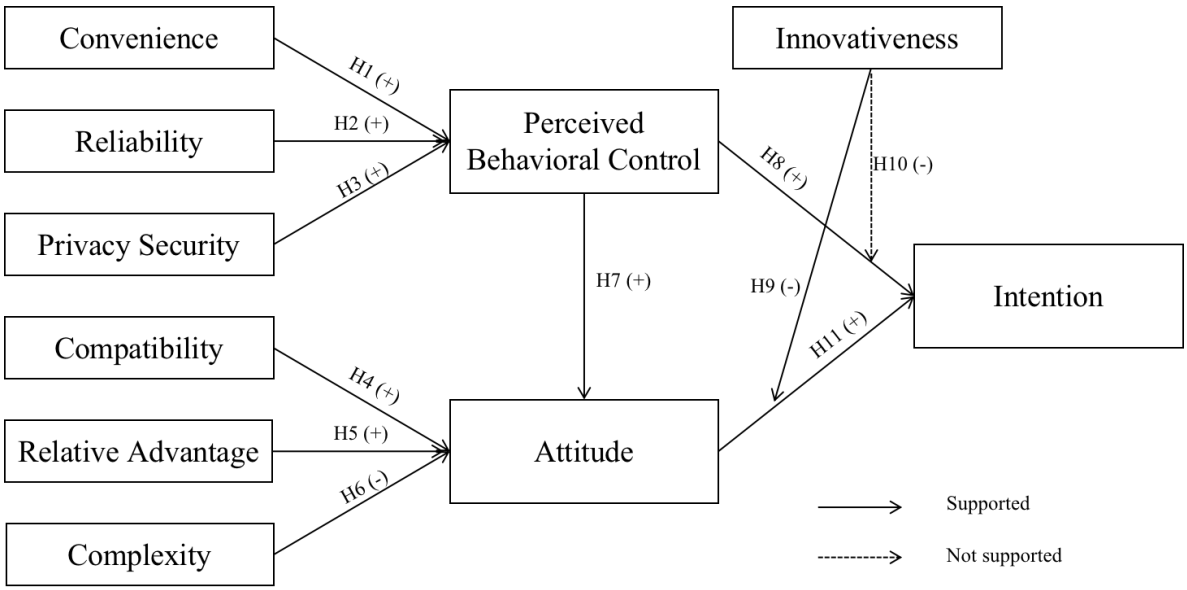
PLS-SEM (Partial Least Squares Structural Equation Modeling) does not assess the statistical significance of path coefficients because it does not assume a normal distribution for the data. Therefore, bootstrapping is necessary to evaluate the significance of path coefficients. Bootstrapping involves randomly sampling from the data to estimate path coefficients multiple times, allowing for the calculation of standard errors and testing for statistical significance (Hair et al., 2013). Table 6 presents the criteria used to test the hypotheses developed in this study.

Table 6: Standard deviation, T-statistics and p-values

	Sample mean	Standard deviation	T statistics	P values	Support
CVN -> PBH	0.345	0.057	5.990	0.000	Supported
RLL -> PBH	0.310	0.060	5.193	0.000	Supported
PVS -> PBH	0.218	0.065	3.387	0.001	Supported
CPA -> ATI	-0.246	0.111	2.221	0.026	Supported
RLT -> ATI	0.200	0.096	2.100	0.036	Supported
CPL -> ATI	0.192	0.091	2.102	0.036	Supported
PBH -> ATI	0.598	0.097	6.168	0.000	Supported
PBH -> INT	0.243	0.082	2.925	0.003	Supported
INNOVA x ATI -> INT	-0.111	0.054	2.041	0.041	Supported
INNOVA x PBH -> INT	-0.003	0.049	0.037	0.970	Not Supported
ATI -> INT	0.369	0.060	6.161	0.000	Supported

Based on the findings presented in Table 6, all the proposed hypotheses have P-values less than 0.05 (indicating that these hypotheses are supported) except for hypothesis H10, the P-value (0.970) is higher than 0.05, suggesting that this hypothesis is not supported. Additionally, the T-statistics for all supported hypotheses are higher than 1.96. Among these, the strongest impact is observed for PBH on ATI with a value of 6.168, while the weakest impact is seen for INNOVA on ATI with INT, with a value of 2.041.

Figure 2. Model analysis results



5. Discussion and Conclusion

5.1. Summary

Perceived behavioral control is positively influenced by convenience, reliability, and privacy security. Moreover, attitude perception is directly related to relative advantage and compatibility in a positive manner, and to complexity in a negative manner. There is also a direct relationship between perceived behavioral control and attitude, both of which influence the intention to use smart lockers. Additionally, the study identified the moderating role of innovativeness on the relationship between perceived behavioral control and intention. Improving perceived behavioral control and consumers' attitude toward online buying are the two key elements that need to be improved in order to increase customers' desire to use smart lockers.

5.2. Theoretical implications

This study investigates the intentions of customers in Ho Chi Minh to adopt smart lockers in last-mile logistics delivery. It applies resource matching, innovation diffusion and planned behavior theories. The study suggests that while resources and innovative ideas may forecast the intention of customers, it must be stimulated by elements that drive specific behaviors. Furthermore, the findings indicate that these theories effectively enhance understanding of consumer intention and offer diverse interpretations of intention in various contexts. Additionally, this research establishes a relationship among these above variables to assess the significance of this path.

5.3. Limitations and recommendations for future research

This study contains two noteworthy drawbacks that could be addressed in future research, notwithstanding its scientific achievements. First of all, it shows that characteristics like ease, dependability, and privacy security have a direct impact on consumers' intentions to use smart lockers and influence their inclination to utilize them. Second, future research could examine whether customers in Ho Chi Minh City intend to use automatic or AI last-mile delivery techniques such as robots, drones,... and how these might alter the logistics scale in the city. This is because the last-mile logistics delivery field has been developing steadily due to technological advancements. This can require looking at different sample sizes, criteria, and selection procedures in addition to examining these factors in actual environments where smart lockers are in use.

	Convenience (CVN)	
CVN1	Using smart lockers is easy.	Yuen et al. (2019) Collier and Kimes (2012)
CVN2	Using smart lockers does not require much effort.	
CVN3	Using smart lockers allows me to collect parcels at my convenient time.	
	Reliability (RLL)	
RLL1	Using smart lockers is more reliable than people delivering parcels.	Yuen et al. (2019) Demoulin (2016)
RLL2	Service errors caused by smart lockers are rare.	
RLL3	Using smart lockers offers service accurately.	
	Privacy Security (PVS)	
PVS1	Using smart lockers can keep my personal information confidential.	Yuen et al. (2019)
PVS2	I feel secure when using smart lockers.	
PVS3	I can control my personal information when using smart lockers.	
	Compatibility (CPA)	
CPA1	Using smart lockers is compatible with my lifestyle.	Wang et al. (2012)
CPA2	Using smart lockers is compatible with my needs.	
CPA3	Using smart lockers is compatible with my current situation.	
	Relative Advantage (RLT)	
RLT1	Using smart lockers is the best way to receive parcels.	Wang et al. (2012)
RLT2	Using smart lockers improves my experience of receiving parcels.	
RLT3	Using smart lockers enables me to receive parcels more quickly.	
	Complexity (CPL)	
CPL1	Learning how to use smart lockers is difficult.	Wang et al. (2012)
CPL2	Using smart lockers is frustrating.	
CPL3	Using smart lockers requires a lot of effort and time.	
CPL4	Overall, using smart lockers is difficult.	
	Perceived Behavioral Control (PBH)	
PBH1	I feel confident that I will be able to use smart lockers.	Demoulin (2016)
PBH2	I can choose to use smart lockers if I want to.	
PBH3	I have knowledge necessary to use smart lockers.	
	Attitude (ATI)	
ATI1	I feel that using smart lockers is interesting.	Teo (2012)
ATI2	I look forward to using smart lockers when purchasing online.	
ATI3	Overall, my attitude toward using smart lockers to receive parcels is that they are useful.	
	Innovativeness (INNOVA)	
INNOVA1	If I heard about an innovative technology, I will try it.	Swilley (2010)
INNOVA2	I am not ready to try out new technology and prefer cash transactions.	
INNOVA3	I do not like to experiment with new apps and wallet services.	
	Intention (INT)	
INT1	I intend to use smart lockers to receive parcels in the future.	Yuen et al. (2019)
INT2	I would recommend smart lockers to my friends.	Teo (2012)
INT3	I am planning to use smart lockers often.	

Appendix 1. Mearsure scale

References

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