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No More Myth: Unveiling the Knowledge-Based Customer Value Co-Creation Prototype of SME Hotels

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Abstract

The rapid integration of modern technology, coupled with the pandemic, has triggered a seismic shift in the landscape of SME hotel business, profoundly influencing the mindset and actions of hotel entrepreneurs and their customers. This study aims to identify the factors affecting customer value creation of SME hotels and links customer needs with hotel operators and local communities. 415 completed survey respondents from an initial screening of 655 active social network accounts who have been SME hotel customers in the past 12 months account for a 63.4% response rate. The findings reveal how the four factors designated by customers and SME hotels influence customer value co-creation: information sharing, participation, knowledge management from local expertise, and expanding local community networks knowledge. The novelty of this study is to develop and validate precise factors for creating value, which will affect the value that customers receive. This study demonstrates methodological advances through Structured Equation Modeling (SEM) and highlights customer preferences that can be implemented to improve SME hotel strategy and promote long-term sustainability. Further research will enable the idea of an innovative model of customer value co-creation to continue for service and other retail businesses.

Keywords: Customer Value Co-Creation; Entrepreneur; SME Hotels; Innovation; Technology.

1. Introduction

The COVID-19 situation, combined with intense competition in the current business world and the influence of online social networks, has altered business paradigms and consumer behavior [1]. The COVID-19 pandemic has significantly impacted the global tourism industry, with the number of foreign travelers dropping 72 percent, by 900 million, from January to October 2020. The sector can initially generate an economic value of up to 10.40 percent of the world's GDP and contribute up to 10 percent of the total employment rate before the pandemic [2]. Tourism has become one of the industries most affected by this epidemic [3]. SME hotels are instrumental to tourism and business travel in many countries tremendously, and hotel operators have begun to find new ways to find customers and minimize negative effects on sustainable SMEs' performance in the market [4]. More than 110 countries around the world have banned travel from the pandemic to the first half of 2020. The World Tourism Organization estimates that the decline will be

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60–80% compared to 2019, when millions of SME businesses, especially the hotel and tourism industry, are in danger, with more than half in Asia [5]. For the survival of hotels facing various uncontrollable changes in economic uncertainty and customer lifestyles, it is imperative to differentiate SME hotel businesses and offer new services according to customer needs through co-creation. After the global outbreak, the hospitality and tourism industry has emerged as a source of economic recovery for many countries [6]. In 2023, the Travel & Tourism sector continuously contributed 9.1 percent to the global GDP [2]. In Thailand, travel contributes up to 18 percent of the country's GDP. Consequently, SME hotels play a significant role as key impact drivers for the tourism and travel industry [7]. Given the various uncontrollable changes in terms of economic uncertainty and customer lifestyles, it is necessary for small hotel businesses in the country to create distinct business offerings and provide new services tailored to customer needs through co-creation [8]. Unfortunately, there are currently no customer co-creation service platforms available on the market for SME hotel businesses that could serve as direct tools to assist SME hotels and their customers, especially in a post-pandemic world.

Moreover, there is a research gap from the literature review in Value Co-Creation in Web-Based Multisided Platforms: A Conceptual Framework and Implications for Business Model Design of Kelly School of Business, Indiana University [9] in addressing this research gap and helping SME hotels to adapt and stay competitive by emphasizing and synthesizing factors that drive shared customer value for SME hotels. Creating a shared value applies the Service-Dominant Design Logic (SDL) concept to focus on creating value between the customer and the business, creating interactions in the service, and value acceptance [10]. The customer values co-creation in the service business, which requires three fundamental components: customers, business, and customer-business interactions. Based on the concept of value creation and the use of technology, the three elements of value creation [11] are value creation from the customer, the business or entrepreneurial side, and customer-business interaction (see Figure 1). A shared value requires interaction and synthesizing insights to enable an efficient process of creating shared value of co-creation [12]. This study utilized the three main elements from the abovementioned theory to develop and extend the conceptual framework for managing customer value co-creation for SME hotel businesses. Building business capabilities to understand relationships between customers, businesses, stakeholders, and community networks should create superior experiences and synergize values [13].

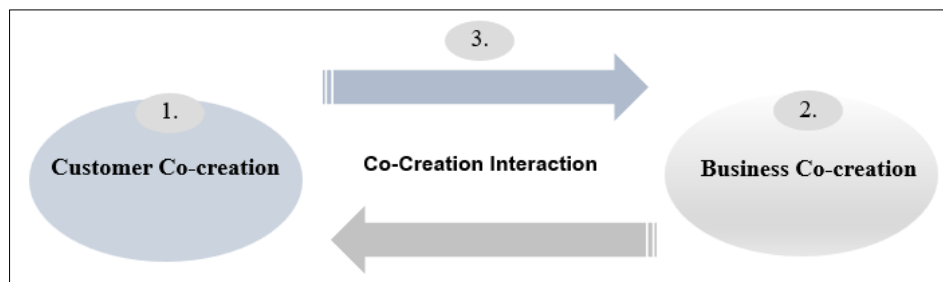


Figure 1. The Concept of creating value in the service business (adopted from Ramaswamy & Gouillart (2010) [11])

This research aims to develop a prototype design for an innovative model of customer value co-creation for small hotel businesses. The full-blown research involves four steps. The first step conceptualizes the value co-creation idea to explore the needs of customers and hotel entrepreneurs and the factors influencing customer value co-creation for small hotel businesses through qualitative studies. The second step examines the factors that affect the creation of shared customer value, with a strong emphasis on the co-creation of value between customers and hotels derived from quantitative studies. The third step is to develop an innovative customer value co-creation model prototype using design thinking [14]. The fourth step tests the prototype by gauging customer acceptance of the service at selected SME hotels before proceeding to the commercialization process. Nevertheless, this paper details the quantitative research and findings of the second step and provides a glimpse of the first draft of the customer value co-creation prototype platform.

In the first step of the qualitative study, an in-depth interview was used to comprehensively understand customer and SME hotel operative perspectives toward customer value co-creation [15]. The factor selection of our study was selected from a literature review and an in-depth interview. Fragmented literature is reviewed and synthesized to establish a deeper, insightful understanding from the in-depth interview data from 20 respondents, consisting of 10 small hotel owners and 10 small hotel customers or users. The qualitative study collects information from twenty in-depth interviews and identifies the common patterns across the transcribed interviews. The influencing factors identified from the qualitative study are reconfirmed in the second step, which is the present quantitative study. These factors will eventually be used to develop a technology-based prototype design for SME hotels in the third step. The prototype's acceptance will be assessed in the fourth and final step before the platform is commercialized. It is important to note that the factors confirmed in this study are crucial for smaller hotels to offer new customer-centric services and distinguish themselves, which is essential for their business survival in the long run. The central new insight of this work is focused on the concept, which has been studied and researched from both the perspective of hotel operators and customers. This study

started by applying theory, developing our hypothesis, testing it, and developing an innovative model to create mutual value for hotel operators affected by the changing conditions to create a strategic advantage that can be applied to SME hotels for customer value co-creation (Figure 2).

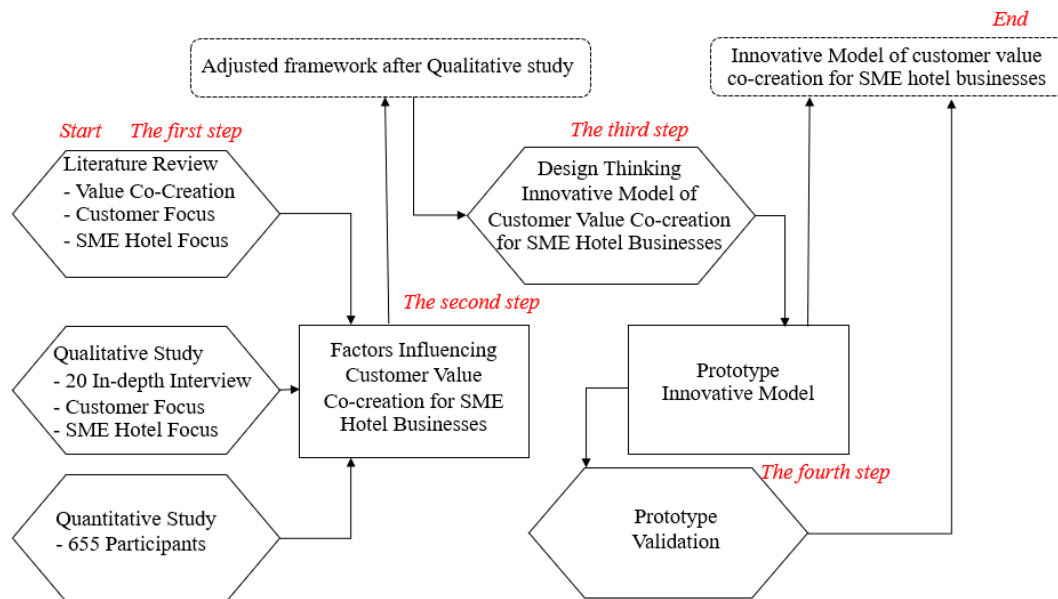


Figure 2. The Research Flowchart

2. Literature Review

2.1. Service Dominant Logic

Service-Dominant Logic (SDL) is an important theory that fosters cooperation and the creation of shared value (Collaborative & Co-Creation) [16]. Creating new business models based on services encourages customers to create value by focusing on their needs [17]. In service delivery, there is a selection process on how to use knowledge to meet customer needs through problem-solving to impress them [18]. Customers are the ones who co-create joint value [19], fostering value co-creation, establishing connections, and exchanging methods to generate new value [20]. They also share knowledge and resources to benefit both businesses and individuals [21]. The ability to gain a business advantage by creating shared value brings into focus the concept of Service-Dominant Design [22], which centers on the process of value creation and interaction between customers and the business [12]. If businesses can engage in co-production during the value-creation process, it will lead to service innovation [23]. Value creation is realized when there is a focus on fostering interactions in service offerings [10], forming joint agreements, and recognizing value [24]. The value creation in service businesses emerges from the interactions between customers and businesses. The technology used by enterprises is also a key element in the value-creation process [25]. Creating shared value involves finding interactions and synthesizing insights to facilitate an efficient value co-creation process [12]. Furthermore, value co-creation also represents an interaction process between people and businesses that drives development [26].

2.2. Customer Value Co-Creation

Viewing a business holistically as an entity comprised entirely of service components is essential for fostering sustainable value and creating superior business performance [27]. Services extend beyond merely offering products [21]; they encompass a distinct business concept that underscores the importance of building relationships between the business and its customers, significantly influencing the design of the service system [28]. Perceived positive service quality can be expected when customers share information, which plays an important role in creating value [29, 30].

Although co-creation can extend beyond companies and their customers to include community networks where the business is located [13], customer-to-business interaction remains the most promising architecture to create value together [25]. Service providers must promote shared resource interaction to create value from co-creation [31]. These SME hotel businesses should constantly look for business opportunities and be ready to face challenges and obstacles.

Numerous studies have explored value creation on web-based platforms to address this research gap. These include the development of a conceptual framework and its impact on the business model design at the University of Indiana [9], as well as strategies that enable SME hotels to adapt and maintain competitiveness by focusing on and integrating factors that drive customer value co-creation in small hotels.

2.3. Conceptual Framework

This study pursues the following objectives: to investigate the nature of the factors and elements of the model for creating customer value co-creation in a small hotel business and to examine the relationship between each factor and element of the model for creating customer value co-creation in a small hotel business. A solid outlook of customer hotel value co-creation is established from the qualitative study and integration of an adjusted conceptual framework in our research. The nature of the research questions determines the research methods. The chosen hotels are SMEs located near a natural tourist destination and not too far from the industrial area. We then establish the criteria for selecting SME hotel owners. These owners have been running their businesses for more than three years and have online secondary sources of information available. The analysis uses ethnographic in-depth interview data of SME hotel owners and customers. The open-ended questions asked the interviewees to explain their views of value co-creation, examples of the factors that induce the co-creation of value, types of needs and experiences a customer might want to have, the specific and unique thing that the hotel would be able to offer to fulfil the needs of individual customers (Figure 3).

The framework for factors influencing customer value co-creation for small hotel businesses is illustrated in Figure 4. It utilizes the three main elements of the SDL theory to develop and extend the conceptual framework for managing customer value co-creation in small hotel businesses [25].

The qualitative study results identified seven factors that can be grouped into customer-focused and entrepreneur-focused factors [15]. Participants from the qualitative study indicated that these factors relate positively to the customer value co-creation for small hotel businesses.

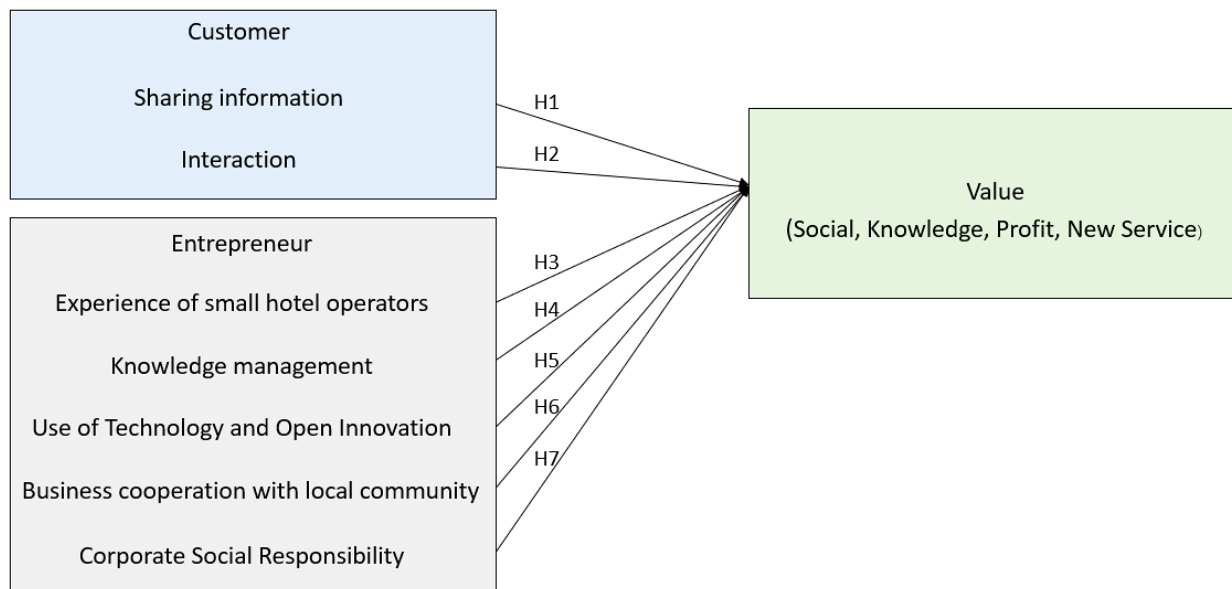


Figure 3. Conceptual framework (From Literature Review)

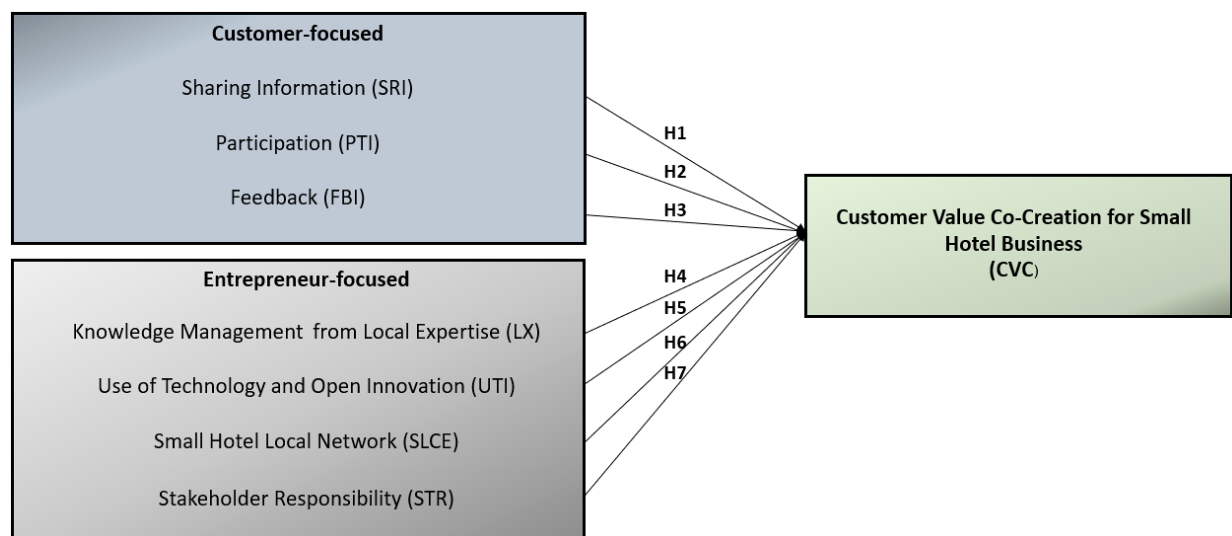


Figure 4. Conceptual framework for factors influencing customer value co-creation for SME hotel businesses (Adjusted framework after Qualitative study result)

A review of the literature (Table 1) related to customer participation in creating shared value reveals that customer sharing behavior and customer relationship behavior are critical behavioral factors influencing the creation of customer value [32, 33]. Customer participation behavior motivates individuals to seek useful information, share knowledge and resources, and engage in interactions [33]. Opportunities and challenges of value co-creation are related to the role of customer involvement and feedback in the service industry [34].

The success of creating a shared value network hinges on the effective output of knowledge [35], which is crucial in the process and necessitates collaboration between two or more parties, encompassing both the business and the customer [36]. Knowledge management is important in creating common values because complex management problems require extensive knowledge [37]. Meanwhile, mutual experience will affect the cognitive process of creating a shared value in the network by learning, transferring knowledge, and using knowledge as a go-between intermediary [38]. Mutual interactions between businesses and customers can enhance responsiveness to customer needs [39]. Collaborating through shared operational methods and technological advancements provides businesses and customers with innovative ways to pool resources and create value [9].

Partnerships with local communities will better meet customer needs [40]. Kramer & Pfitzer (2016) [41] point out that expanding the scope of a shared ecosystem creates value, which leads to challenging coping and, ultimately, competitive advantages. Businesses should also promote technology-enabled development to successfully realize shared value [42]. Corporate social responsibility clearly affects the behavior of customers by helping them become more involved with the business [43, 44]. In addition, an employee's job position significantly moderates the relationship that employee motives share with customer value co-creation attitude [45].

Oertzen et al. (2017) [46] state that measuring the end result of customer collaboration will determine the likelihood of generating revenue and achieving reliable operations. This involves a practical and comprehensive joint analysis across five dimensions: social, knowledge, value, profit, and new service. The total score from the analysis identifies the success of customer's shared value.

Table 1. Literature Supporting the Conceptual Framework

Grouping	Factors/ Construct	Author(s)
Customer-focused	Sharing Information (SRI)	Yi et al. (2011) [32], Yi & Gong (2013) [33], Ham & Han (2013) [47], Buoincontri et al. (2017) [48], Ercsey (2017) [49], Khan (2017) [50], Malone et al. (2017) [51], Assiouras et al. (2019) [52], Vraniaková (2024) [53]
	Participation (PTI)	de Oliveira & Cortimiglia (2017) [9], Grisseman & Stokburger-Sauer (2012) [12], Yi et al. (2011) [32], Yi & Gong (2013) [33], Ma et al. (2017) [34], Ham & Han (2013) [47], Ercsey (2017) [49], Khan (2017) [50], Malone et al. (2017) [51], Assiouras et al. (2019) [52], Hsiao et al. (2016) [54], Im & Qu (2017) [55], Prebensen & Xie (2017) [56], Bharti & Agrawal (2018) [57], Torkzadeh et al. (2021) [58], Taheri et al. (2024) [59]
	Feedback (FBI)	Yi et al. (2011) [32], Yi & Gong (2013) [33], Ma et al. (2017) [34], Su et al. (2017) [43], Buoincontri et al. (2017) [48], Ercsey (2017) [49], Khan (2017) [50], Malone et al. (2017) [51], Hsiao et al. (2016) [54], Prebensen & Xie (2017) [56], Taheri et al. (2024) [59], Li et al. (2020) [60]
Entrepreneur-focused	Knowledge Management from Local Expertise (LX)	de Oliveira & Cortimiglia (2017) [9], Krenz et al. (2014) [35], Wiendahl et al. (2007) [37], Weyrich (2005) [38], Collison & Parcell (2002) [61], Hult et al. (2004) [62], Fidel et al. (2015) [63]
	Use of Technology and Open Innovation (UTI)	de Oliveira & Cortimiglia (2017) [9], Krenz et al. (2014) [35], Weyrich (2005) [38], Su et al. (2017) [43], Collison and Parcell (2002) [61], Hult et al. (2004) [62], Fidel et al. (2015) [63], Rauch and Frese (2007) [64], Killa (2014) [65]
	Small Hotel Local Network (SLCE)	Kramer (2010) [40], Kramer & Pfitzer (2016) [41], Bharti & Agrawal (2018) [57], Siu et al. (2014) [66], Wolf et al. (2021) [67]
	Stakeholder Responsibility (STR)	Chathoth et al. (2016) [39], de Silva & Wright (2019) [42], Su et al. (2017) [43], Luu (2019) [44], Amin et al. (2024) [45], Ham & Han (2013) [47], Im & Qu (2017) [55], Siu et al. (2014) [66], Albus & Ro (2013) [68], Martínez & Rodríguez del Bosque (2013) [69], Luu (2017) [70], Luu (2020) [71]
Dependent variable	Customer Value Co-creation (CVC)	Vargo & Lusch (2004) [16], Vargo & Lusch (2008) [21], Oertzen et al. (2017) [46], Vargo & Lusch (2016) [72], Byoungsoo & Jae (2020), [73], Doyle (2000) [74]

3. Research Methodology

In this study, confirmatory factor analysis (CFA) was employed to evaluate the model's validity and validate the relationships proposed in the conceptual model. Structural Equation Modeling (SEM), one of the most commonly used methods in CFA, was used to analyze the data using SPSS and AMOS software to examine and evaluate the relationships between variables. The structural equation model analyzes complex connections between variables. This analysis aids

in ensuring that the factors influencing the creation of shared value effectively enhance trustworthiness. It rigorously tests assumptions and relationships and confirms findings by examining interactions among complex variables. The Measurement Equation Model and the Structural Equation Model deepen our understanding of the factors that affect customer value co-creation for SME businesses. Moreover, this methodology ensures the research's trustworthiness and enriches the depth and quality of academic discussions. The first part, the Measurement Equation Model, confirms that each factor is measured validly and reliably, whereas the second part, the Structural Equation Model, examines the extent of relationships between these factors and customer value co-creation (Figure 5).

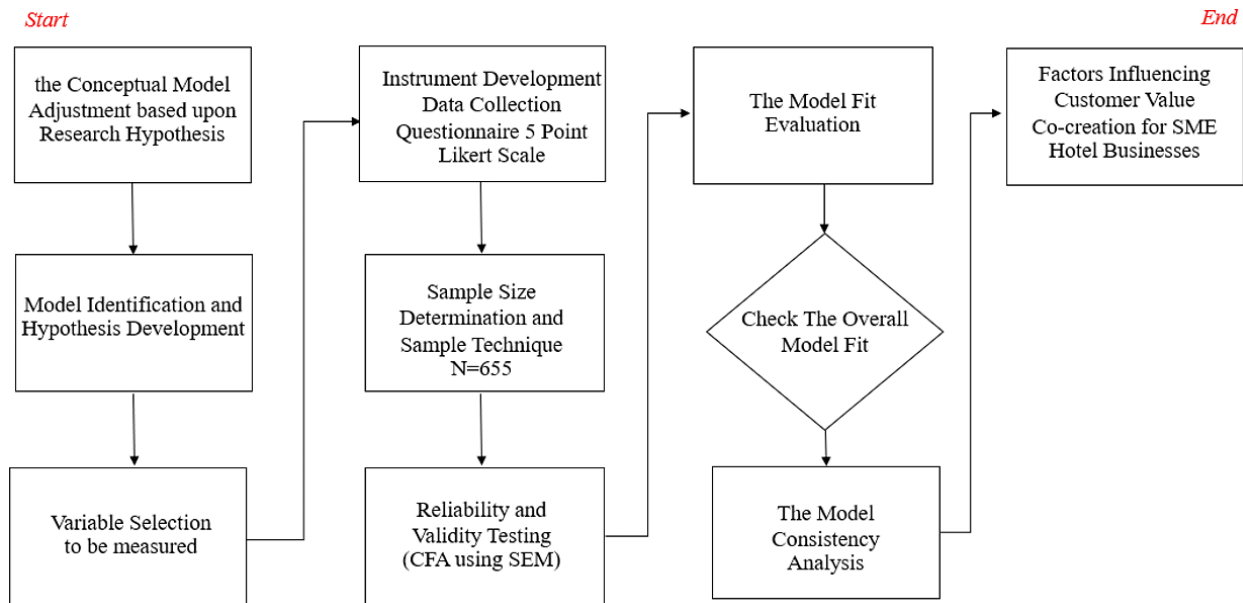


Figure 5. Comprehensive Research Methodology Flowchart

3.1. Sample & Data Collection Procedure

The data collection process was meticulously executed using a convenient sampling method to secure a representative sample from the population of individuals with active online social network accounts. The sample consisted of 655 participants who met specific qualification criteria: customers who had stayed at a small hotel in Thailand within the past 12 months, specifically in regions or cities known for their natural tourist attractions and proximity to industrial areas. Out of these, 415 participants met the criteria and provided complete information, a figure significantly exceeding the minimum respondent count recommended for studies in this academic field.

Based on the empirical guidelines by Hair et al. (2010) [75], confirmatory factor analysis recommends a sample size of at least 5 to 10 times the minimum number of indicators. Additional data was collected to account for potential loss of questionnaires. The sample size of 415 was strategically chosen to avoid limitations in statistical calculations. Consequently, a number greater than the specified minimum [76] was utilized for the SEM models, marking a notable success in standardized collaboration within the context of SEM. This robust methodological approach ensured that the sample size was proportionate to the population composition by age group.

Data was collected in Thailand through online and in-person distribution using a structured questionnaire. The survey was developed by the researchers. The survey instrument consists of four parts: the first part screens participants based on the study criteria, the second part collects general and demographic information, and the remaining parts comprise a 45-question Likert-scale questionnaire. This questionnaire covers factors affecting customer value co-creation for small hotel businesses, the results of creating shared customer value, and an innovative model for such co-creation. Participants responded using a 5-point Likert scale to express their agreement or disagreement, facilitating a comprehensive evaluation grounded in established theory and research.

3.2. Respondent Profile

As shown in Table 2, the sample consisted of 415 small hotel customers who provided questionnaire data. These were predominantly women (66.51%). The study's age distribution revealed that most respondents were between 41 and 50 years old (36.87%), followed by those aged 31 to 40 (36.14%), over 50 (21.93%), 21 to 30 (4.10%), and 20 years or younger (0.96%).

Most of the questionnaire respondents were professionals or company employees (63.37%), followed by private business owners (13.98%) and those retired or unemployed (8.67%). Civil servants comprised 4.34%, while other occupations, including freelancers, pensioners, consultants, university employees, doctors, housewives, and teachers, accounted for 2.89%. Employees of state enterprises comprised 2.65%, hired employees 2.17%, students 1.20%, those involved in trading 0.48%, and those in agriculture, livestock, or fishing 0.24%.

In terms of nightly rate spending, the majority of respondents spent 1,001-2,000 baht (30.36%), followed by 2,001-3,000 baht (26.02%), 3,001-5,000 baht (25.30%), 5,001-10,000 baht (8.19%), up to 1,000 baht (7.95%), and over 10,000 baht (2.18%).

Table 2. Demographic Profile of the Respondents (n = 415)

Demography	Detail	Frequency	Percentages
Gender	Male	139	34.49%
	Female	276	66.51%
Age (Years)	<20	4	0.96%
	21-30	17	4.10%
	31-40	150	36.14%
	41-50	153	36.87%
	>50	91	21.93%
Occupation	Professional	263	63.37%
	Business Owner	58	13.97%
	Retired	37	8.91%
	Civil Servants	17	4.09%
	Others	40	9.66%
SME Hotel Price per Night (Baht)	< 1,000	33	7.95%
	1,001 – 2,000	126	30.36%
	2,001 – 3,000	108	26.02%
	3,001 – 5,000	105	25.30%
	5,001 – 10,000	34	8.19%
	>10,000	9	2.18%

3.3. Descriptive Data of the Construct

Table 3 shows the mean and standard deviation of the constructs in this study. The degree of importance of factors contributing to customer value co-creation for small hotel businesses was rated as very important (mean = 3.82, SD = 0.65). Among the factors, customer feedback was deemed the most important (mean = 3.76, SD = 0.63), followed by information sharing (mean = 3.71, SD = 0.69), stakeholder responsibility (mean = 3.67, SD = 0.89), participation (mean = 3.65, SD = 0.67), local network integration (mean = 3.60, SD = 0.87), knowledge management from local expertise (mean = 3.59, SD = 0.72), and the use of open innovative technologies to create new products, services, and experiences (mean = 3.43, SD = 0.81). The results indicated that opinions on customer value co-creation factors for small hotel businesses varied little, indicating a general consensus.

Table 3. Descriptive Data

Grouping	Factors/Construct	Mean (SD)
Customer-focused	Sharing Information (SRI)	3.71 (0.69)
	Participation (PTI)	3.65 (0.67)
	Feedback (FBI)	3.76 (0.63)
Entrepreneur-focused	Knowledge Management from Local Expertise (LX)	3.59 (0.72)
	Use of Technology and Open Innovation (UTI)	3.43 (0.81)
	Small Hotel Local Network (SLCE)	3.60 (0.87)
	Stakeholder Responsibility (STR)	3.67 (0.89)
Dependent variable	Customer Value Co-creation (CVC)	3.82 (0.65)

4. Result

4.1. Measurement Equation Model

In this study, structural equation modeling (SEM) was conducted using SPSS and AMOS software to examine and evaluate the relationships between variables. The structural equation model analyzes complex connections between variables. The model aims to explain how factors associated with customers and small hotel operators influence value co-creation in small hotel businesses. Seven factors that serve as independent latent variables and a significant predictor of Customer Value Co-creation for Small Hotel Businesses (CVC) include Sharing Information (SRI), Participation (PTI), Feedback (FBI), Knowledge Management from Local Expertise (LX), Use of Technology and Open Innovation (UTI), Small Hotel Local Network (SLCE), and Stakeholder Responsibility (STR).

The study assessed internal consistency, establishing credibility through consistent accuracy and correctness. Using Cronbach's method [77], the alpha coefficient values all exceeded 0.70. Cronbach's alpha values indicated good internal consistency. Pearson's Product Moment Correlation Coefficient, which ranges from 0 to 1, served as a step before confirmatory factor analysis to verify the relationship between variables and confirm if these relationships align with the assumptions. It was found that the correlation coefficient between every pair of variables was positively related ($P < 0.01$), with values ranging from 0.351 and 0.894 (Table 4).

When assessing multicollinearity appropriateness, the correlation coefficient between 3 pairs of variables exceeded 0.850 (absolute value), which might affect multicollinearity [75, 78]. The independence of these variables was validated using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO value was 0.804, which is greater than 0.5, and Bartlett's Test of Sphericity was statistically significant (173.417, $df = 28$, $Sig = 0.000$), indicating that these synthetic variables do not suffer from multicollinearity issues. Therefore, it is appropriate to proceed with further confirmatory factor analysis [75].

Table 4. Correlation coefficient between factors that affect customer value co-creation for small hotel businesses

Variables	SRI	PTI	FBI	LX	UTI	SLCE	STR	CVC
SRI	1							
PTI	0.557**	1						
FBI	0.574**	0.894**	1					
LX	0.544**	0.688**	0.750**	1				
UTI	0.554**	0.657**	0.681**	0.834**	1			
SLCE	0.356**	0.584**	0.520**	0.493**	0.642**	1		
STR	0.486**	0.686**	0.615**	0.567**	0.610**	0.834**	1	
CVC	0.351**	0.492**	0.475**	0.528**	0.424**	0.476**	0.475**	1

** statistical significance at the 0.01 level.

Considering the model for measuring factors affecting the creation of shared customer value in the small hotel business, it was found that there was harmony between the measurement model for these factors and the empirical data. In Table 5, the proportional value of the chi-square statistic was 178.356, with degrees of freedom, df ., at 156, and a p -value of 0.106. The root mean square error of approximation (RMSEA) was 0.019, and the standardized root mean square residual (SRMR) was 0.033. Additionally, the Comparative Fit Index (CFI) was 0.996, and the Tucker-Lewis Index (TLI) was 0.993. These results confirm the reliability and validity of the measurement model for subsequent structural analyses without multicollinearity conflict (see Table 6).

Table 5. Consistency of key components and the indicators of factors influencing customer value co-creation for small hotel businesses in accordance with the AMOS Model Fitness of CFA

Category	Level of Acceptance	Model Fitness	Result
Absolute Fit Indices Relative Chi-square: χ^2/df	$\chi^2/df < 5.00$	1.143	Accept
Comparative Fit Index (CFI)	$CFI > 0.90$	0.996	Accept
Trucker - Lewis Index (TLI)	$TLI > 0.90$	0.993	Accept
Root Mean Square Error of Approximation (RMSEA)	$RMSEA < 0.08$	0.019	Accept
Standard Root Mean Square Residual (SRMR)	$SRMR < 0.08$	0.033	Accept

Table 6. Results of the reliability analysis of the factor component measurement model that influences customer value co-creation for small hotel businesses

Components	Indicators	Factor Loading	Construct Reliability (CR) ≤ 0.7	Average Variance Extracted (AVE) ≤ 0.5	Maximum Shared Variance (MSV)	Average Shared Variance (ASV)
SRI	SRI1	0.75	0.706	0.551	0.496	0.235
	SRI2	0.51				
	SRI3	0.73				
PTI	PTI1	0.70	0.778	0.514	0.458	0.285
	PTI2	0.69				
	PTI3	0.65				
	PTI4	0.63				
	PTI5	0.54				
FBI	FBI1	0.53	0.767	0.517	0.458	0.295
	FBI2	0.76				
	FBI3	0.78				
	FBI4	0.61				
LX	LX1	0.67	0.834	0.559	0.411	0.247
	LX2	0.77				
	LX3	0.83				
	LX4	0.72				
UTI	UTI1	0.84	0.575	0.700	0.611	0.377
	UTI2	0.86				
	UTI3	0.82				
SLCE	SLCE1	0.95	0.885	0.794	0.690	0.320
	SLCE2	0.83				
STR	STR1	0.94	0.900	0.818	0.690	0.316
	STR2	0.87				

Based on assumptions and empirical data, the structural equation model analysis tests the consistency of the results obtained from creating shared customer value for small hotel businesses. It was found that the model for measuring the results of creating shared customer value for small hotel businesses is consistent with empirical data, as indicated by the overall model fit measure shown in Tables 7 & 8. The statistics used to evaluate the model's fitness with empirical data include the chi-square statistic's proportion value (0.053), which passed the specified criterion of less than 0.05. For the group index set at 0.90 or greater, the Comparative Fit Index (CFI) scored 1.000, and the Tucker-Lewis Index (TLI) scored 1.011, both exceeding the specified criteria. Additionally, for the group index set at a level less than 0.08, the root mean square error of approximation (RMSEA) scored 0.000, and the standardized root mean square residual (SRMR) scored 0.001, also meeting the specified criteria. Therefore, the research hypothesis is accepted that the results of the developed customer value co-creation for small hotel businesses align with empirical data, as confirmed by the confirmatory factor analysis.

Table 7. Consistency of key components of the customer value co-creation for small hotel businesses in accordance with the AMOS Model Fitness of CFA

Category	Level of Acceptance	Model Fitness	Result
Absolute Fit Indices Relative Chi-square: χ^2/df	$\chi^2/\text{df} < 5.00$	0.053	Accept
Comparative Fit Index (CFI)	CFI > 0.90	1.000	Accept
Trucker - Lewis Index (TLI)	TLI > 0.90	1.011	Accept
Root Mean Square Error of Approximation (RMSEA)	RMSEA < 0.08	0.000	Accept
Standard Root Mean Square Residual (SRMR)	SRMR < 0.08	0.001	Accept

Table 8. Results of reliability analysis of the customer value co-creation for small hotel businesses

Components	Indicators	Factor Loading	Construct Reliability $7.0 \leq (\text{CR})$	Average Variance Extracted (AVE) ≤ 0.5	Maximum Shared Variance (MSV)	Average Shared Variance (ASV)
CVC	CVC 1	0.75	0.922	0.597	0.000	0.227
	CVC 2	0.81				
	CVC 3	0.80				
	CVC 4	0.85				
	CVC 5	0.80				
	CVC 6	0.69				
	CVC 7	0.77				
	CVC 8	0.70				

4.2. Structural Equation Modeling (SEM)

The construct validity analysis used Pearson correlation coefficients to examine variables in the measurement model. This analysis created a matrix of relationships between observed variables, and preliminary suitability for structural equation modeling analysis was confirmed. The test validity was confirmed by analyzing the correlation, mean, and deviation matrices along with standards for each subcomponent of the observed variables. Results of the structural equation model analysis tested the consistency of results obtained from customer value co-creation for small hotel businesses based on assumptions and empirical data. It was found that the model is consistent with the empirical data due to the overall model fit (Overall Model Fit Measure). Table 9 and Figure 6 show the statistics used to evaluate the model's fit with the empirical data, it was found that the value of the chi-square statistic to the degree of freedom ratio ($\chi^2/\text{df} = 1.062$) met the specified criterion of being less than 5. For the group index set at a level greater than or equal to 0.90, both the CFI (0.998) and TLI (0.996) met the specified criteria. Additionally, for the group index set at a level less than 0.08, both the RMSEA (0.012) and SRMR (0.016) also met the specified criteria. Therefore, the research hypothesis is accepted that the factors and elements of creating shared customer value for small hotel businesses are in harmony with the empirical data.

Table 9. Index measures the consistency of the model, the structure, factors and components of customer value co-creation for small hotel businesses in accordance with the AMOS Model Fitness of SEM

Category	Level of Acceptance	Model Fitness	Result
Absolute Fit Indices Relative Chi-square: χ^2/df	$\chi^2/\text{df} < 5.00$	1.062	Accept
Comparative Fit Index (CFI)	CFI > 0.90	0.998	Accept
Trucker - Lewis Index (TLI)	TLI > 0.90	0.996	Accept
Root Mean Square Error of Approximation (RMSEA)	RMSEA < 0.08	0.012	Accept
Standard Root Mean Square Residual (SRMR)	SRMR < 0.08	0.016	Accept

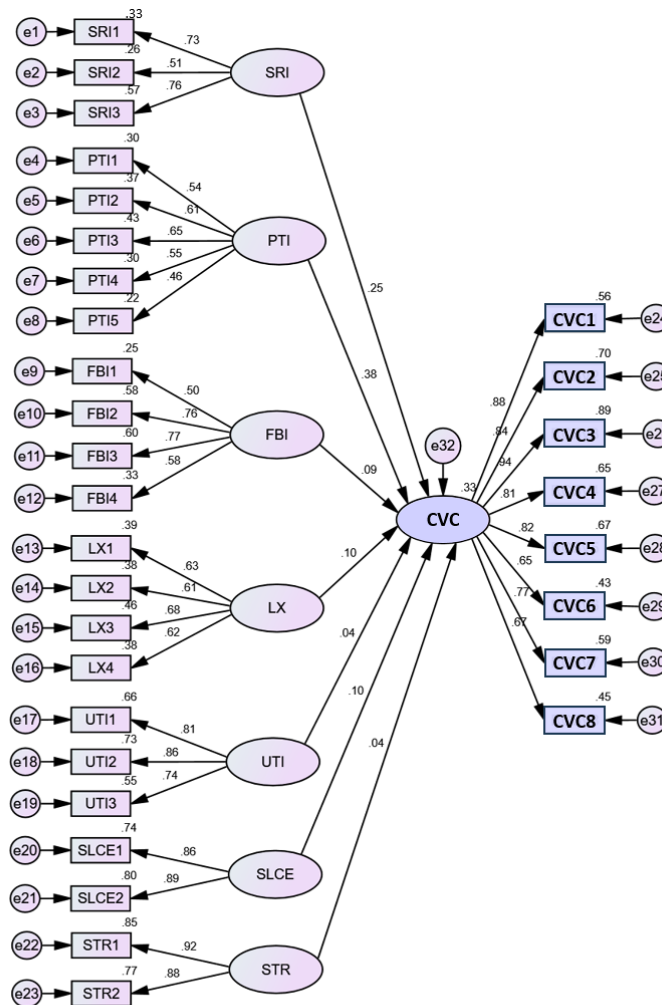


Figure 6. Model of the equation, factor structure, composition of customer value co-creation for small hotel business (adjusted empirical data)

5. Discussion

The factor analysis in Table 10 offers insights into the connections between the observed variables and the outcome variable, which represents the strength and importance of these connections.

Table 10. Insights of the connections between the observed variables and the outcome variable

Hypothesis	Path Coefficient (β)	Standard Error	T	p-value	Result
1. SRI \rightarrow CVC	0.25	0.074	3.183**	0.001	Support
2. PTI \rightarrow CVC	0.38	0.217	2.602**	0.009	Support
3. FBI \rightarrow CVC	0.09	0.356	0.454	0.650	Not Support
4. LX \rightarrow CVC	0.10	0.053	2.349*	0.019	Support
5. UTI \rightarrow CVC	0.04	0.056	0.675	0.499	Not Support
6. SLCE \rightarrow CVC	0.10	0.037	2.251*	0.024	Support
7. STR \rightarrow CVC	0.04	0.028	1.090	0.276	Not Support

* Statistical significance at the 0.05 level,

** Statistical significance at the 0.01 level.

The results of factor analysis provide valuable insights into the relationships between observed variables and factors that affect the customer value co-creation for small hotel businesses. Here are the key findings:

- Hypothesis 1 (H1): Customer's sharing information (SRI) has a positive influence on customer value co-creation for small hotel businesses, significantly ($\beta = 0.25$, $t = 3.183$, $p < 0.01$).
- Hypothesis 2 (H2): Customer's participation (PTI) has a positive influence on customer value co-creation for small hotel businesses, significantly ($\beta = 0.38$, $t = 2.602$, $p < 0.01$).
- Hypothesis 3 (H3): Customer's feedback (FBI) has a positive influence on customer value co-creation for Small Hotel Businesses, insignificantly ($\beta = 0.09$, $t = 0.454$, $p > 0.05$).
- Hypothesis 4 (H4): Knowledge management from local expertise of SME hotel operators (LX) has a positive influence on customer value co-creation for small hotel businesses, significantly ($\beta = 0.10$, $t = 2.349$, $p < 0.05$).
- Hypothesis 5 (H5): Entrepreneurs' use of Technology and Open Innovation (UTI) has a positive influence on customer value co-creation for small hotel businesses, insignificantly ($\beta = 0.04$, $t = 0.675$, $p > 0.05$).
- Hypothesis 6 (H6): Collaboration with the small hotel local network (SLCE) has a positive influence on customer value co-creation for small hotel businesses, significantly ($\beta = 0.10$, $t = 2.251$, $p < 0.05$).
- Hypothesis 7 (H7): Stakeholder responsibility (STR) of the operator towards the community, society, customers, and employees of the small hotel has a positive influence on customer value co-creation for small hotel businesses, insignificantly ($\beta = 0.04$, $t = 1.090$, $p > 0.05$).

From Table 10, it was found that four hypotheses were supported by the results concerning the factors affecting customer value co-creation for small hotel businesses. These four factors include: sharing of information to create shared value (Sharing Information), interaction and participation of customers in creating shared value (Participation), knowledge management, problem-solving, and combining local information from entrepreneurs in the form of local expertise (Knowledge Management from Local Expertise), and cooperation with the local community network of entrepreneurs (Small Hotel Local Network).

From Table 11, it was found that several factors directly influence customer value co-creation for small hotel businesses (CVC): customers' information sharing (SRI), customers' participation (PTI), knowledge management from local expertise of SME hotel operators (LX), and cooperation with the local community network of entrepreneurs (SLCE). The influence sizes for these factors were 0.25, 0.38, 0.10, and 0.10, respectively, with statistical significance at the 0.01 and 0.05 levels. The factors of providing customer feedback (FBI), using open innovation technology by entrepreneurs to create new products, services, and experiences (UTI), and the responsibility of the operator towards the community, society, customers, and employees of the small hotel (STR) have influence sizes of 0.09, 0.04, and 0.04, respectively, but are statistically insignificant.

Table 11. Index measures the consistency of the model, the structure, factors and components of customer value co-creation for small hotel businesses in accordance with the AMOS Model Fitness of SEM

Result Variable	CVC		
	DE (Direct Effect)	IE (Indirect Effect)	TE (Total Effect)
SRI (Customer' s sharing information)	0.25**	-	0.25**
PTI (Customer' s participation)	0.38**	-	0.38**
FBI (Customer's feedback)	0.09	-	0.09
LX (Knowledge management from local expertise of SME hotel)	0.10*	-	0.10*
UTI (Entrepreneurs' use of Technology and Open Innovation)	0.04	-	0.04
SLCE (Collaboration with the small hotel local network)	0.10*	-	0.10*
STR (Stakeholder responsibility)	0.04	-	0.04
Variable structure equation			
R ² (The prediction coefficient)	0.33		

* Statistical significance at the 0.05 level,

** Statistical significance at the 0.01 level.

Considering the prediction coefficient (R^2), the results show that the customer value co-creation for small hotel businesses (CVC) has a prediction coefficient of 0.33. This indicates that the variables in the model can explain 33 percent of the variance in creating customer value co-creation for small hotel businesses.

Discussing the factor analysis in Table 10, Sharing information (SRI) affects customer value co-creation for SME businesses, as a positive influence was observed in our study. The findings indicate that when customers share information about what they need and ask for specific details, The operator can provide helpful information and responsive answers perceived by the customer as a positive value, and the customers are satisfied. Information sharing creates mutual value for customers and engages in customer interactions with SME hotel businesses. In contrast, SME hotel owners tend to be willing to provide such minor details in particular information to their customers. This is consistent with the earlier findings, suggesting that customers sharing information offers advantages for value co-creation [53].

Customer participation (PTI) significantly influences customer value co-creation. The customer will participate if SME hotel operators organize activities. For instance, hotels sometimes organize morning activities. Some customers may want to join, but others may feel reluctant toward exposing outdoor activities. From the customer perspective, it depends on the nature of that activity and how the innkeeper engages customers as a guest to make it stand out or discrete. The activities should encourage the customers to seek more participation in the business. The findings indicate that some activities may interest customers, and some may need to be more exciting. However, they show that SME hotel owners prioritize customers' immediate needs and care. This finding corresponds to previous research that found customer participation influenced customer value co-creation acknowledged by customers [52].

Knowledge management and integration of local expertise (LX) significantly influence customer value co-creation. We found that customers recognized local problem-solving and information integration knowledge of entrepreneurship as local expertise. Our study evaluates the impact of this specific knowledge management. Customers sometimes need direct information from the SME hotel front line or the owner, such as something unavailable on the Internet. Small hotel entrepreneurs have enormous local expertise and community networks; consequently, the customers believe and expect insight from precise local knowledge based on the local area. Some information, such as traditional culture and people's habitat, is mainly expected of customers.

Moreover, if hotel owners can link distributed information to their expertise, integrate it with knowledge management systems, and share information with their customers, shared value creation will occur. On the other hand, customers who were co-creators of the knowledge management system cannot be overlooked because innovative service models may only be recognized with customer approval. Interestingly, the integration of local expertise and knowledge management continues to significantly impact customer value co-creation in the context of SME hotel businesses since the result indicates that knowledge-based essential information of value creation should be provided by hotel owners who are genuine local partners of customers. Our findings support the prior study of knowledge management influencing value co-creation [9, 35, 63]. However, the findings also suggest that knowledge management combined with hotel entrepreneurs' local expertise integration significantly influences customer value co-creation for SME businesses.

The finding of expanding local community networks (SLCE) supports the positive influence on customer value co-creation in the context of SME hotel businesses. The hotel entrepreneur's local community networks aim to share the local economy; interacting with the community provides accommodation and customer activities, making SME hotel

businesses more attractive. This finding corresponds to previous research on local community networks influencing customer value creation [67]. Furthermore, our finding suggests that customers value co-creation in the context of SME hotel businesses by collaborating with the local community to organize activities or tour the community around the hotel, allowing customers to enjoy new knowledge and entertainment while staying at the hotel. In cooperation with other local partners, the ability to provide long-term concessions to local representatives and promising business models will be essential to keep in mind.

However, our findings show that customer feedback (FBI) has little impact on customer value co-creation for SME hotel businesses. The result disagrees with the finding, which explains the value co-creation effect related to the role of customer feedback in the service industry [34]. This is possible when a customer complaint is heard before everything gets worse. Although providing feedback may help improve and develop services that meet customers' needs, the customers may feel embarrassed to give negative feedback.

Entrepreneurs' use of Technology and Open Innovation (UTI) did not significantly impact customer value co-creation in this study. This is possible due to the differences in individually open-minded creativity to create new experiences and services among customers and SME hotel entrepreneurs. Some traditional entrepreneurs may not be comfortable using technology.

According to our findings, SME hotel entrepreneurs' stakeholder responsibility (STR) in terms of employees did not significantly influence customer value co-creation. Our study disagrees with the study of employee recognition and career opportunities affecting customer value co-creation [45]. It is possible that sustainable development enterprise trends are creating good new business opportunities for SME hotel owners. Some traditional entrepreneurs typically start small, emphasize self-reliance and independence, and cannot develop a scalable and sophisticated business model with proper stakeholder responsibility.

Our study shows that these factors of sharing information (SRI), customer participation (PTI), knowledge management and integration of local expertise (LX), and cooperation with local community networks (SLCE) play essential roles in creating customer value co-creation for SME hotel businesses. The study shows the customer value co-creation model for SME hotel businesses is required from both customer-focused and SME entrepreneur-focused factors.

However, our finding has some notable differences compared to the study of the value co-creation model in the context of the educational service. The co-creation model in education shows students value co-creation behaviors consisting of citizenship behavior, participation behavior, and service quality, which contribute to the quality of services and, thereby, influence student performance, satisfaction, and retention [58]. However, one similar factor emerged as the critical influencer of the result of value co-creation performance, which is actual participation behavior.

In addition, considering the value co-creation model in the critical review of service marketing [57], it was found that high customer involvement is essential for effective co-creation. The important factors comprise customer participation, customer involvement, partnership and engagement, proactivity, and receptivity toward the other party in the relationship based on mutual interest. The result of the study of SME hotel businesses, one of the most popular in the service and hospitality industries for economic development, supports this service study with the finding that customer participation and involvement play a vital role in the customer value co-creation model.

In summary, this analysis shows that the factors of sharing information (SRI), customer participation (PTI), knowledge management and integration of local expertise (LX), and cooperation with local community networks (SLCE) all play important roles in creating customer value co-creation for small hotel businesses. Concentrating on how to innovate and meet customer needs to create shared value for all parties; customer value co-creation means building collaboration through the interaction of a combination of customers with SME hotel businesses as service providers and local communities. The factors obtained from this study of customer value co-creation were used to develop ideas in the innovation prototype development process to create shared value with customers for SME hotel businesses.

6. The Building of Customer Value Co-Creation Prototype Platform

6.1. Customer Value Co-Creation Prototype Platform

Based on the four factors affecting customer value co-creation for small hotel businesses identified in the quantitative studies—customer sharing information (SRI), customer participation (PTI), knowledge management from the local expertise of SME hotel operators (LX), collaboration with the small hotel local network (SLCE)—the researcher developed a customer value co-creation prototype platform using design thinking approach [14].

In the design thinking process, the researcher conducted focus groups with 10 small hotel customers to develop service innovation. This formal method aimed to provide practical and creative solutions with the dynamic intent of improving future results from small hotel customers. It involved using protocols to solve problems and discover new competitive opportunities.

The researcher collected and analyzed the focus group data using the detailed elements of design thinking to create prototype platform, which includes five stages. The first stage involves demonstrating empathy by actively listening to small hotel customers' opinions. This approach allows customers to express their thoughts, values, and needs clearly, helping to develop an innovative prototype for customer value co-creation from their perspective. This includes refining the prototype platform's service offerings, designing new activities to meet customer needs during their stay at small hotels and while travelling, and identifying the benefits. The second stage involves understanding small hotel customers' problems, identifying their limitations, and defining the right issues through a series of open-ended questions of Why's, What's, and How's. The third stage focuses on ideating and diversifying a set of ideas generated from customer brainstorming to envision what the prototype will look and feel like in real life, with opportunities to test the design. The fourth stage involves developing ideas that are worth prototyping, transitioning from concepts to detailed design. Finally, the fifth stage tests the prototype with small hotel customers, assessing its qualification and functionality through collaborative design and analysis, and validates the customer-generated innovative prototype platform to ensure it meets customer requirements.

From the design thinking results of the third and fourth steps, the customer value co-creation prototype is divided into two main parts. The first part, focusing on the customer area requires, requires initial data, including customer input from small hotel customers, to define processing requirements. The second part, focusing on the entrepreneur area, involves knowledge-based management derived from the database of local expertise of SME hotel operators. This includes insights from small hotel operators and community partners, as well as secondary information collected and presented to small hotel customers. For instance, small hotel customers focus on technology-enabled interactions and address specific challenges related to limited time and lifestyle while traveling. This innovative prototype acts as a knowledge-based intermediary, enabling small hotel operators to interact with customers by providing personalized travel plans that offer specialized value in terms of new knowledge, services, and local experiences.

6.2. How SME Hotel Operators Practically Implement the Findings

SME hotel operators can adopt and implement this customer value co-creation prototype platform in their daily operations. For instance, when the customer visits an SME hotel, they can scan the customer co-creation application link presented at the front desk by inputting some of their initial data and preference as customer sharing information (SRI), i.e., the purpose of the trip, no. of the member, no. of night, food and traveling preference. This innovative prototype acts as a knowledge-based intermediary, enabling SME hotel operators to interact with customers by providing personalized travel plans and special local privileges that offer specialized trip planners involving knowledge-based management derived from the database of local expertise of SME hotel operators (LX) and discount promotion integration of SME hotel operator local network (SLCE), i.e., local restaurants, local destination, local activities. To elaborate on specific examples, the customer value co-creation prototype platform can be dynamic, allowing customers to adjust their requests and modify their information-sharing preferences (PTI) and generating various types of travel plans on how to go local as a tourist. This design facilitates co-creation and interaction by combining customer data sharing input and preference with SME hotel operators' local knowledge, enabling the prototype platform to generate more insightful and dynamic information about customer co-creation.

This use case illustrates the hotel's knowledge management on how SME hotels adopt this application of the identified factors in their operations. The hotel considers providing customers new experiences, photography, and good services. The hotel knew that service value would start since the customers booked in. In the past, they had asked what activities the customers wanted, whether through phone calls or social media. When the customer checks out, the staff may rarely collect information from the customer about the experience, comments, suggestions, or additional things the hotel should fix. In this case, the owner can alternatively use the application to provide knowledge and information to customers. Once customers check in at the hotel, they just input initial information sharing to the hotel via the application link, i.e., outdoor activity preference.

Starting with a 2-day, 1-night trip planner when each local outdoor activity is generated and promptly offered to the hotel customer, the hotel owner collects customer feedback, for example, whether the activity is a good idea, immensely popular and well-liked by customers such as riding hotel bicycles to various vantage points in old town, taking customers to top-spot viewpoints, what can be improved, and which activity suits what season for their customers. From the customer's point of view, activities provided by the hotel are favorable, for example, offering local restaurant areas with authentic menus recommended by the hotel owner or taking customers out to see local activities. They can see the hotel's efforts in arranging these co-creation activities for them. This practical application helps SME hotels meet customer needs, analyze target market potential, and reduce costs for SME hotel owners due to the limited budget of front-line employees. This scheme allows the hotel to have better services and customer-perceived value. This form of co-creation value contributes to the activity part and an overview of the entire hotel. This design facilitates co-creation and interaction with SME hotel operators, enabling the prototype platform to generate more insightful and dynamic information about customer co-creation. The feedback loop between SME hotel operators and customers can also be adjusted as needed. Although hotels are understaffed after COVID-19, customers still have opportunities to exchange and receive information, interact with SME hotel operators, and seek assistance when problems arise.

In summary, the researcher obtained valuable insights and detailed feedback from a focus group on customer value co-creation for small hotel businesses. The proposed customer co-creation prototype platform can be dynamic, allowing small hotel customers to adjust their personal requests and modify their information-sharing preferences. This design facilitates co-creation and interaction with small hotel operators, enabling the prototype platform to generate more insightful and dynamic information about customer co-creation.

7. Conclusion

The research aims to demonstrate the factors affecting customer value co-creation for SME hotel businesses. The result from the idea concept phase of the innovative model presented consumers' value co-creation for small hotel businesses. The study started with the perspective of customers and hotel operators to create factors influencing customer value co-creation for small hotel businesses. The study identifies factors that influence customer value co-creation for SME hotel businesses. These findings indicate a significant positive correlation between customers, SME hotel operators, and key factors. This insightful information guides the prototype development phase, enabling factor attributes that are aligned with the customer's requirements.

This study significantly contributes to customer co-creation service model development and strategic marketing by offering valuable insight and practical guidance for SME hotel entrepreneurs. The research findings not only enhance our understanding of customer value co-creation factors in prototype development but also contribute to the advancement of research in customer co-creation and SME hotel businesses and their marketing strategy. The research methodology employed in this study has potential as a reference point for future investigation and contributes to knowledge advancement in the SME business strategic field. The insight derived from this study provides considerable potential for helping SME hotel businesses make their strategy and design marketing decisions based upon the service prototype development, business strategy, and resource allocation due to the limited budget cost of front-line employees and maintenance of the SME hotel database.

SME businesses have common and unique characteristics, i.e., they are directly operated by SME owners [79]. In a cross-cultural setting, the value cultivation of culturally creative hotels generates the advantages of local culture and characteristics, promoting close interaction among culturally creative hotel alliance partners [80]. SME hotels have general characteristics, which should mean that specific basic business policies and attributes adopted in other countries in the region or other countries of the world have some resemblances. Thailand is the first country to implement the UNESCO Sustainable Travel Pledge nationwide, and this pilot initiative is part of a larger partnership between UNESCO and Expedia Group to promote sustainable tourism worldwide [5].

Our finding illustrates that knowledge management from the local expertise of SME hotel operators and their integration with local partners constitute value co-creation in the service ecosystem. This study supports the idea that hotel operators help enrich the local cultural atmosphere, jointly stimulating culture among their local networks and creating a fruitful cycle of value co-creation. From our study, SME hotel owners thoroughly understand the cultural characteristics of local community society and the characteristics of the local culture associated with local network communities in which customer participation could be a part of educating and traveling programs related to local cultural communities and social network sites for commercial and entertainment-oriented purposes.

The world tourism industry is experiencing a resurgence in 2024, with initial estimates pointing to a 2% growth above 2019 levels since tourists gradually return after the pandemic, positioning Southeast Asia as a pivotal player in the global hospitality industry [2]. As a result, hotel operators are employing innovative strategies to attract customers and meet the demands of evolving lifestyle tourism and lifestyles. These findings are of value to those who are responsible for the management of SME hotels in other countries that have virtual local communities. Consequently, the impact of the aforementioned factors and fundamental dimensions of customer co-creation on the overall perception of value can fluctuate among different cultures. By merging these diverse viewpoints, we hold the perspective that the model's overarching structure remains steady and requires ongoing monitoring to establish resilient SME hotels. In conclusion, while the pandemic's effects on travel habits persist, the SME hotel industry is adapting to changing trends by offering exceptional and innovative services. Meeting evolving standards remains essential to ensure optimal efficiency and competitiveness in the market.

The study of customer value co-creation prototype platforms helps customer interaction and enables SME hotel operators to transform their service models to meet customer needs and analyze market potential. As a guideline for commercial deployment for SME hotel operators and tourism promotion, this will create sustainable competitive advantages for SME hotel operators. This research ultimately facilitates the sustainability and continuous growth of SME hotel businesses by helping SMEs hotel operators generates innovative model of customer value co-creation and designated service functions that are well-adopted by SMEs hotel target customers.

On the other hand, the study concentrated on a specification with a limited sample size, meaning that the findings do not readily allow for the generalization of effects to all hotel-sized businesses. The researchers suggest future studies in various sizes of hotel businesses and other service businesses such as retail, hospitality, and other local specialized services. In addition, future studies can consider more related variables to enhance the relationship between the factor of the customer, SME hotel entrepreneur, and the result of customer value co-creation, such as customer lifestyle.

8. Declarations

8.1. Author Contributions

Conceptualization, K.T., M.W., U.T., and K.P.; methodology, K.T., M.W., U.T., and K.P.; software, K.T.; validation, K.T., M.W., U.T., and K.P.; formal analysis, K.T., M.W., U.T., and K.P.; investigation, K.T., M.W., U.T., and K.P.; resources, K.T.; data curation, K.T.; writing—original draft preparation, K.T., M.W., U.T., and K.P.; writing—review and editing, K.T., M.W., U.T., and K.P.; visualization, K.T.; supervision, M.W., U.T., and K.P.; project administration, K.T. All authors have read and agreed to the published version of the manuscript.

8.2. Data Availability Statement

The data presented in this study are available on request from the corresponding author. All participants were informed about the study objective and signed consent forms. Project number 650259 received ethical approval (CAO No. 346/66) by the Research Ethics Review Committee for Research Involving Human Research Participants, Group 2, Chulalongkorn University.

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8.5. Institutional Review Board Statement

Project number 650259 received ethical approval (CAO No. 346/66) by the Research Ethics Review Committee for Research Involving Human Research Participants, Group 2, Chulalongkorn University.

8.6. Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

8.7. Declaration of Competing Interest

The authors declare that there are no conflicts of interest concerning the publication of this manuscript. Furthermore, all ethical considerations, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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