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In search of a reciprocal relationship in dessert cafés: linking customer perceived innovativeness to value co-creation behavior

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This study examined a conceptual model encompassing perceived innovativeness, perceived values, attitude, and customer value co-creation behavior in the context of dessert cafés. An online survey was conducted with customers of dessert café chains based in Malaysia. The results indicated that menu innovativeness had the highest contribution to perceived innovativeness, followed by experiential innovativeness. The study found that perceived innovativeness improved the value of money, evoked positive emotions, and enhanced social image. In highly innovative dessert cafés, positive emotions led to a positive attitude and, in turn, increased willingness to co-create value. This study provides valuable insights for dessert café businesses by emphasizing the need to foster innovation and create emotionally satisfying experiences to enhance customer engagement in co-creation activities.

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Introduction

Modern consumers have varying values and lifestyles, prompting the food service industry to diversify and satisfy the needs of all influential groups (Choe (Jacey) and Kim (Sam) 2018). Recently, the food service industry has shifted its focus to restaurants, cafés, and bars with a friendly ambiance, high-tech service, and appealing interiors in order to provide diners with a better dining experience (Chad 2022; Ong 2022). The popularity of coffee shops, tea houses, and cafes has led to their designation as the “third place” between homes and workplaces because they offer a pleasant environment for people to converse, work, read, and connect (Smith 2021). In Malaysia, it is trendy to visit a café before or after a meal for social gatherings and leisure, which has led to a significant rise in the popularity of dessert cafés. A dessert café refers to a specialty café that provides dessert as its main menu, such as gelato ice cream, waffles, soufflés, and chocolate among others. The founders of Malaysian dessert café brands were primarily influenced by dessert shops in Taiwan, Japan, Korea, and Europe, where they launched the concept of a café selling exclusively desserts (Cho et al. 2020), introducing dessert café into the Malaysian market.

Malaysia's dessert café market is now highly competitive, particularly with the emerging comparable dessert café shops in the urban regions (e.g., Klang Valley). If a café does not differentiate itself from its rivals, there is a significant possibility that it will fail to attract customers' interest (Verdict Food Service 2021). Extensive restaurant industry analysis has been conducted as part of food service research, but dessert cafés have been disregarded. Although both cafés and restaurants serve food and beverages, they differ in focus, ambiance, pricing, and level of service. A dessert café serves desserts and drinks in a cozy, trendy setting for socializing and enjoying a sweet treat, while a restaurant offers appetizers, entrees, and desserts for a more formal dining experience. Dessert cafes may offer counter service or self-service, while restaurants offer full-service dining with staff. Notably, dessert cafés tend to cater to a more niche market of customers finding sweet treats.

With the fierce competition and imitation issue in the dessert café industry, innovative offerings are critical in providing a competitive advantage for each dessert café. Scholars have demonstrated the significant impact of innovative characteristics on the financial performance and competitiveness of a restaurant (Hallak et al. 2018). Dessert cafes are unique establishments known for their creativity and innovation in the dessert industry. However, there is a scarcity of studies that investigate perceived innovativeness within the context of dessert cafes. Therefore, the present study attempts to examine the multidimensional perceived innovativeness of local dessert café chains. This examination encompasses menu innovativeness, technology-based service innovativeness, experiential innovativeness, and promotion innovativeness. This multi-dimensional approach captures all the innovative activities happening within the dessert cafe.

Another literature gap lies in the mechanism by which perceived innovativeness influences customer value co-creation behavior. Value co-creation gained interest in the service sector (González-Mansilla et al. 2023), as this concept highlights the customers' active role in business, which implies the customer is an active partner as they can provide valuable feedback, preferences, and suggestions. In the context of the dessert café, value co-creation can occur between customers and dessert café employees or owners. Customers can be involved in providing feedback and suggestions, sharing information and experience, advocating to others, and assisting other dining companions when visiting a dessert café. Some studies provide insights into the relationship between perceived innovativeness and value co-creation behavior. For example, Yen et al. (2020) examined the

influence of innovativeness on customer value co-creation behaviors and found that customer engagement mediated this relationship. Kim et al. (2018) confirmed that perceived innovativeness was the key predictor of customer behavior for value co-creation. Although these studies provide some insights, research gaps still exist in the quest to understand the relationship between perceived innovativeness and value co-creation behavior. There remains a gap in understanding the mediating mechanisms that explain how perceived innovativeness influences value co-creation behavior. While the relationship between perceived value and attitude is frequently examined in the context of understanding consumer behavior, the impact of perceived innovativeness on this relationship remains to be empirically established. Research has demonstrated that perceived innovativeness exerts a favorable influence on customer satisfaction (Vo-Thanh et al. 2022) and customer loyalty (Kim et al. 2019) within the food service industry. Based on the theoretical support that perceived value has been associated with satisfaction and loyalty in customer-centric food service marketing (Akbara et al. 2021; Kwun, 2011), it is suggested that innovative dessert offerings can potentially increase the perceived value of the dessert café experience.

Taken together, this study developed a conceptual framework that verifies the interrelationships among perceived innovativeness, perceived values, attitudes, and value co-creation behavior within the context of dessert cafés. Understanding the intricate connections between these constructs enhances the comprehension of how these factors interact and influence one another in the context of dessert cafes. This, in turn, sheds light on the complex decision-making processes of customers. From a practical standpoint, this study offers dessert café owners and marketers actionable insights that can positively impact their businesses. By discerning how perceived innovativeness and perceived values influence consumer attitude and, subsequently, value co-creation behavior, dessert cafés can strategically allocate resources to the areas that most significantly impact customer attitude and, consequently, value co-creation behavior. In the competitive landscape of dessert cafés, the ability to co-create value effectively with customers is a significant advantage. The insights derived from this study can help dessert cafes stand out and thrive by crafting customer-centric strategies, elevating customer experiences, and gaining a competitive edge in the dynamic food service industry.

Literature review

Theoretical development. The value co-creation concept is grounded in the service dominant logic (SDL) theory, which highlights the active role of customers in businesses and creates a personalized experience by collaborating with the service provider. When a firm adopts a service-focused perspective, it builds relationships with consumers to create personalized value propositions to meet particular needs, which leads to ongoing improvements in the firm's services and performance (Chuang 2023; Lho et al. 2022; Vargo and Lusch 2004). The conceptual model of this present study adopted SDL theory in linking the path of customers' perceived innovativeness and value co-creation behavior, which is supported by past studies, recognizing the role of the innovation paradigm and its significant contribution to value co-creation (Kim et al. 2019; Yen et al. 2020). These previous works have shown that perceived innovativeness has a positive impact on value co-creation behavior. Therefore, the current study expands the model framework by integrating equity theory and the value-attitude-behavior (VAB) model. Perceived value and attitude constructs are incorporated such that

the integrated framework can examine the mechanism by which perceived innovativeness can impact values and attitude, which eventually improves value co-creation behavior. Equity theory refers to the trade-off between benefits and sacrifices (Bolton and Drew 1991) and the input-output ratio (Adams 1963). This theory links the innovativeness construct as input, while the customer perception of value is reflected in the output. Equity connects innovativeness and values; as perceived innovativeness rises, positive values viewed by customers can be built on. Next, the VAB model is guided by Homer and Kahle (1988), where the hierarchy order of VAB was adopted in the current conceptual model, connecting perceived values, attitude, and customer value co-creation behavior. From the theories of integration, perceived values, and attitude could mediate the relationships between perceived innovativeness and value co-creation behavior. In essence, our study takes an integrative approach by combining the principles of self-determination theory with equity theory and the VAB model. We aim to shed light on how the perceived innovativeness of dessert cafes can lead to a positive impact on customer behavior. Specifically, we explore how this perceived innovativeness influences customer attitude and perceived values, which ultimately drive value co-creation behavior in dessert café settings.

Customer's perceived innovativeness. A customer's perceived innovativeness is defined as the customer's subjective evaluation of a firm's ability to provide novel and innovative products and services (Kim et al. 2018). Customers may perceive a business as innovative if its differentiated products, services, designs, and marketing strategies perform successfully in the market (Kunz et al. 2011). Kim et al. (2018) established and validated a multi-dimensional scale of customer perceived innovativeness (i.e., menu, technology-based service, experiential, promotional) to measure the uniqueness of the dessert offerings, integration of new technology into service, creative environment and ambiance, and new marketing programs. Then researchers adopted the innovativeness construct to understand its influence on customer intention (Lin, 2015). In the present study, the multi-dimensional perceived innovativeness is adapted to the setting of dessert cafés with the validated scales of menu innovativeness, technology-based service innovativeness, experiential innovativeness, and promotion innovativeness (Choi et al. 2020).

Customer value co-creation behavior. Customer value co-creation behavior is referred to as the customer behavior to generate values through interacting and sharing experiences with the service provider (Payne et al. 2008). Values can be co-created by the customer-firm relationship (Kim et al. 2018; Im et al. 2012). Firms could collaborate with customers to determine the production technique, service procedure, and advertising strategies (Prahalad and Ramaswamy 2004). Customer value co-creation behavior is conceptualized as multi-dimensional in a third-order model, with two second-order factors (i.e., participation and citizenship), each comprised of four dimensions, demonstrating a hierarchical conceptualization (Yi and Gong 2013). Customer participation behavior and citizenship behavior reflect task and conceptual performance, respectively, where participation behavior refers to the expected and essential customer behaviors (i.e., information seeking, information sharing, responsible behavior, personal interaction) that lead to the successful delivery of products and services, while citizenship behavior involves voluntary activity and higher customer involvement (i.e., feedback, advocacy, helping, tolerance).

Hypotheses development. The present study proposes that innovativeness can positively influence customer willingness to engage in value co-creation activities in the dessert café setting. Specifically, this study examines the process of improving value co-creation behavior through perceived innovativeness, perceived values, and attitude. Much less research has been conducted on how customers perceive the innovation effort, the value received, and their attitude toward the dessert café. Past scholars verified the positive influence of innovation on a firm's financial performance (Lee et al. 2016), which prompted the current study, which assesses innovative attributes and how they affect customer perceptions of value. Equity links innovativeness and values, with high perceived innovativeness potentially leading to positive perceived values. Customers' perceptions of innovativeness can serve as input, while the value received is output. Additionally, three influential aspects of perceived value (i.e., functional, emotional, and social) were investigated in a prior study in the context of a dessert café (Kwon et al. 2017). The three aspects of customer perceived value measure the customer's evaluation of products and services, not only in terms of intended quality performance but also including the emotions derived from the product and its social consequences (Sweeney and Soutar 2001). Hence, this study adopts multi-dimensional perceived innovativeness as the influential factor towards the outcome variables: functional value, emotional value, and social value, as the following hypotheses are proposed:

H1: Perceived innovativeness has a positive influence on functional value.

H2: Perceived innovativeness has a positive influence on emotional value.

H3: Perceived innovativeness has a positive influence on social value.

Moreover, an innovation that is well-received by customers may encourage a positive attitude because it improves the firm's offerings and gets closer to the customers' specific wants and needs (Radic et al. 2022; Yu et al. 2022). Chou et al. (2012) provided empirical evidence that attitudes toward green practices were significantly influenced by perceived innovation characteristics. In the current study, perceived innovativeness is expected to impact customer attitude towards the dessert café positively. Customers' attitudes towards dessert cafés may improve if innovation is well utilized to improve products and services. Innovative dessert cafés could possibly enhance customer evaluation and perception of the dessert café chain. Indeed, innovation encourages interactions between service owners and customers, building customer behavior in value co-creation activity. A firm's innovation is anticipated to increase customer involvement and citizenship behavior during the delivery of products and services, which is supported by SDL theory and previous work of Kim et al. (2019). Through the reinforcement of customer experience with the service providers, value co-creation can occur with the value exchange from the customers' supportive remarks, suggestions, and commitment. With high innovation of offerings, customers are expected to be motivated to interact and co-create value with the firm. Based on the theoretical and empirical evidence, the following hypotheses are developed:

H4: Perceived innovativeness has a positive influence on attitude.

H5: Perceived innovativeness has a positive influence on customer value co-creation behavior.

Following the hierarchy of the VAB model suggested and adopted by a number of past scholars, perceived values are the foundation for customer attitudes, which in turn influence customer behavior (Cheung and To 2019; Kim and Yun 2019). The ample empirical evidence demonstrated in the hospitality

industry supported the relevance of positive value perceptions as a predictor of positive attitudes. For example, Kim and Yun (2019) verified the significant impact of customer perceived value on the customer attitude towards environmental behavior on the theme of pro-environmental concerns in coffee shops. Shin et al. (2017) demonstrated the substantial effect of customer value on attitude in organic-themed restaurants. Grounded with the VAB model, perceived values served as the basis of positive customer attitude. When customers receive high value, they develop favorable attitudes towards the firm. Therefore, the present study postulated customers with strong perceptions in terms of functional, emotional, and social value could positively induce favorable attitudes. Functional value refers to the dessert café's quality, value of money, and convenience perceived by the customers, so high received functionality can predict positive customer attitude. Dessert café patronage could increase customer happiness (Han and Yang 2017), and the improved emotional value can substantially impact customer attitude towards the dessert café. The positive social image might enhance customers' attitudes toward the dessert café brand. Customers who perceive outstanding desserts, improved mood, and a good social impression during their dessert café experience may have a more favorable opinion of the dessert café. These hypotheses are developed:

H6. Functional value has a positive influence on attitude.

H7. Emotional value has a positive influence on attitude.

H8. Social value has a positive influence on attitude.

In the VAB model, a person's attitude helps to reinforce their behavior, which is revealed and verified by past studies (Choe and Kim 2018; Kim et al. 2020; Shin et al. 2017). These past scholars explained how consumer attitude could significantly affect behavior towards a particular product, company, or act. For example, Kim et al. (2020) investigated environmentally friendly eating-out behavior at restaurants, revealing the positive influence of attitude on waste reduction towards environmentally friendly eating-out behavior. In a similar vein, the current study examines the path of attitude towards customer value co-creation behavior, wherein as a result of their positive attitude towards dessert café, the customers engage in and co-create with the firm. Customers are more inclined to communicate and collaborate with a dessert café if they have a pleasant attitude about visiting it. The following hypothesis is developed:

H9. Attitude has a positive influence on customer value co-creation behavior.

A serial mediation model is proposed in the current study, where the indirect effect of perceived values and attitude in the relationship between perceived innovativeness and value co-creation behavior was considered. A multiple mediation model can achieve a more comprehensive framework as it considers several potential mediators and assesses the exogenous construct's total effect on the endogenous construct (Hair et al. 2017). The serial mediation model was adopted in food service research. For example, Nagaraj (2021) verified the significant serial mediation path of "health consciousness → food safety concern → consumer attitude → purchase intentions" in the organic product industry. In the current study, the path of "perceived innovativeness → perceived values → attitude → customer value co-creation behavior" was designed for the present study, wherein the serial mediators (i.e., perceived values, attitude) were anticipated to be significant. Perceived values and attitude have been widely served as mediators separately in previous works (Chen and Peng 2018; van Tonder et al. 2020). Thus, the current study links them to serial mediate perceived innovativeness and value co-creation in the integrated framework. At the same time, three aspects of perceived value (i.e., functional, emotional, and social) were incorporated into three path series in order to

determine the mediating effect of different aspects of perceived value while connecting with attitude, respectively. Thus, these hypotheses were developed:

H10. Both functional value and attitude significantly mediate the relationship between perceived innovativeness and customer value co-creation behavior.

H11. Both emotional value and attitude significantly mediate the relationship between perceived innovativeness and customer value co-creation behavior.

H12. Both social value and attitude significantly mediate the relationship between perceived innovativeness and customer value co-creation behavior.

Based on the literature review and hypotheses development, this study proposed an integrated conceptual model as shown in Fig. 1.

Methods

Research instrument. This quantitative study adopted a deductive approach by utilizing survey data and statistical analysis to test the relationships between observed variables and contribute to the empirical understanding of the targeted population's behavior. The measures of this study were obtained from previous research, where they were modified and reworded in accordance with the nature and concept of a dessert café. The customers' perceived innovativeness construct was adapted from Kim et al. (2018) and reworded to the dessert café setting, with a total of 17 measurement items pertaining to the menu, technology-based service, experiential, and promotional innovativeness. The multi-dimensional construct was measured with a seven-point agreement Likert scale ranging from "strongly disagree" (1) to "strongly agree" (7). Then three aspects of customer perceived value, which are functional, emotional, and social relating to the dessert café experience, were adapted from Sweeney and Soutar (2001) and Yang and Mattila (2016). This study adopted the measures of Shin et al. (2019) and Zadeh et al. (2019) to evaluate customer attitude with a slight alteration to the dessert café experience. The attitude construct was measured on a seven-point semantic differential scale ranging from "very negative attitude" (1) to "very positive attitude" (7). The multi-dimensional construct of customer value co-creation behavior was adapted from Yi and Gong (2013) to fit the context of a dessert café, with two dimensions, namely customer participation behavior and customer citizenship behavior. The willingness and likelihood of customers to co-create with the dessert café were assessed using a total of 29 measurement items on a seven-point Likert scale of likelihood ranging from "very unlikely" (1) to "very likely" (7). The questionnaire included demographics, such as age, gender, education level, and dessert café's visiting background (e.g., the most recent visit's menu, location, and price). These questionnaire items were refined through a pre-test with three academic professionals, one industry practitioner (i.e., a dessert café employee), and a customer focus group. In addition, a pilot study was conducted with 35 dessert café customers. The results of the pilot study yielded good reliability of the multiple-item constructs (Cronbach's alpha > 0.70).

Sample and data collection. Sampling for dessert café stores was conducted by searching the keywords "dessert café in Malaysia", "innovative dessert café", and "recommended dessert café" on Internet browsers as of July 18th, 2021. A total of 175 cafes were recommended from the 25 website articles or food blogs such as EatDrink, KL Foodie, KLOOK, and Fun N' Taste, and a screening process was carried out using several criteria, including serving desserts as the main menu, being founded by Malaysians, having more than one location, and being in operation for at least a year.

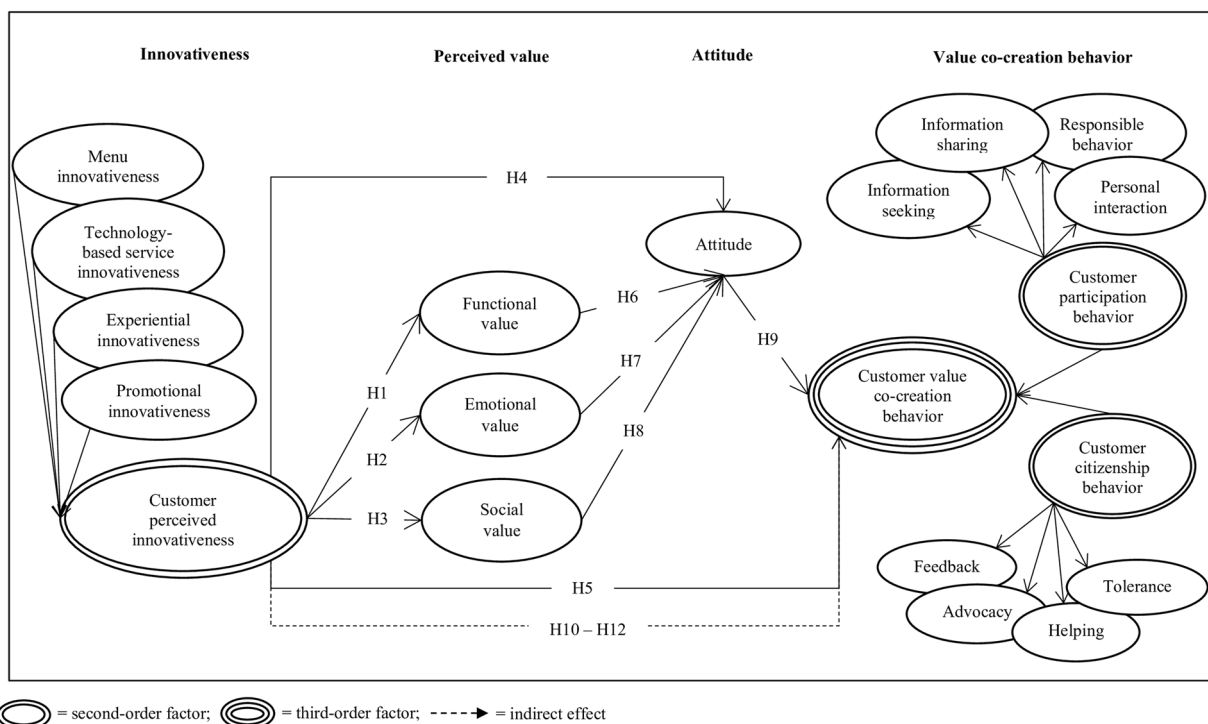


Fig. 1 Research model (H1-H12).

After screening, twelve dessert cafés were selected: Bean Jr, Chewie Mellow, Crème De La Crème, Dáo, Inside scoop, Kakiyuki, Miru dessert café, Molten Chocolate Café, Mykōri dessert café, Piccoli Lotti, Snowflake, and The Soybean Factory. An online survey was conducted from August 2021 to September 2021. The survey included screening questions to target customer sample who (1) had visited one of the selected chains, (2) were familiar with it, (3) were aware of the latest news and updates of the dessert café brand, and (4) perceived the dessert café brand being innovative. The questionnaire was distributed online through Facebook foodie groups such as Bakeries & Cafés MY, *Malaysia Cari Makan*, *Tempat Makan VIRAL & Sedap*, Chill Out & Tasty Foodie, Dessert Heaven, and Dessert World. Moreover, the foodie website admin, foodie page, and customers who visited these dessert cafes observed from social media were invited to this survey. The foodie website or admin included Malaysia Foodie, KL Foodie, EatDrink, I Love Malaysian Food, Rilekiah, Rojak Daily, and Malaysian flavors. Then, customers were searched and invited from social media through the hashtag, pinned location, or tagged (#dessertcafemalaysia, @dessertcafemalaysia). A total of 460 responses were collected from the online survey, where 82 unusable responses were observed due to unfit sample, incomplete data, lack of engagement with the survey, and outliers, which left 378 valid responses in the dataset, yielding an 82.2% survey completion rate.

Results

Respondent’s profile. The descriptive findings showed that more female customers participated (84.9%) in the dessert café survey research than male customers (15.1%). The majority of respondents were between the ages of 18 and 34 (89.7%), followed by 7.1% between 35 and 44 years old, and 3.2% at 45 years old and above. The descriptive results revealed that more females participated in the dessert café survey research, which could be explained by Wang and You (2021)’s prior work, where they discovered that female consumers make up the majority of dessert

café patrons. Most of the respondents (77.2%) had tertiary education (bachelor’s/master’s/doctorate), followed by 15.6% with post-secondary education, and 7.1% had secondary education. The occupation categories of the survey respondents were students (38.1%), followed by managerial/ executives (21.2%), professionals (20.9%), self-employed (11.6%), secretarial/ clerical (3.2%), technical workers (1.3%), and others (3.6%). Lastly, the majority of respondents’ personal monthly income fell from MYR2,000 to 4999, accounting for 38.4%. The rest of the respondents earned less than MYR1,000 (31.0%), MYR 1000 to 1999 (12.2%), MYR5,000 to 9999 (15.6%), and more than MYR10,000 (2.9%).

Measurement model assessment

Reflective model. A variance-based partial least square structural equation modeling (PLS-SEM) technique was used in this study with SmartPLS 3.0 software to analyze the measurement model, structural model, and mediation assessment. The PLS-SEM approach can investigate the causal relationship and make a prediction (Hair et al. 2017). The predictive accuracy, relevance, and power of the conceptual model in this study were determined by using the PLS-SEM technique. In marketing research, the technique can be used to test a theory (i.e., explanation) while providing suggestions for industry practitioners (i.e., prediction) (Hair et al. 2017), and it has been widely accepted in behavioral studies.

As shown in Table 1, the composite reliability (CR) ranged between 0.826 and 0.986, and the Cronbach alpha’s (α) ranged between 0.70 and 0.930, showing that all constructs were reliable at the internal consistency value above 0.70. Indicator loadings of more than 0.708 were ideal as it implies 50% of the indicator’s variance. If item loadings could lead to the average variance extracted (AVE) at least the value of 0.50, loadings from 0.40 and 0.70 can be accepted (Hair et al. 2010; Hulland, 1999). Nevertheless, the item “This dessert café offers a customizable menu (e.g., can choose your own topping, dessert size, sugar

Table 1 Composite reliability, item loading and AVE values.

Variables	Loading (r)	Cronbach' alpha	CR	AVE (r ²)
Customer Perceived Innovativeness (Second-order)				
Menu Innovativeness				
This dessert café offers new combinations of desserts. (e.g., menu that is different from others)	0.768	0.732	0.826	0.602
This dessert café consistently introduces new menu items. (e.g., ice cream café introduces pancakes)	0.832			
This dessert café offers new flavors.	0.766			
This dessert café offers innovative food presentation.	0.679			
Technology-based Service Innovativeness				
This dessert café offers new apps or online ordering tools.	0.787	0.843	0.895	0.681
This dessert café has combined innovative technologies with services. (e.g., Ipad)	0.822			
This dessert café delivers cutting-edge services. (cutting-edge = at the latest or most advanced stage)	0.851			
This dessert café has its own way of ordering menu items.	0.839			
Experiential Innovativeness				
This dessert café provides creative physical designs.	0.746	0.825	0.884	0.657
This dessert café's employees interact with customer in its own unique way. (e.g., the way you are greeted or served)	0.842			
This dessert café has special events (e.g., in conjunction with Parents Day/Plastic Bag Free Day/ Anniversary).	0.817			
This dessert café has its own way to help the customers for a better dining experience. (e.g., solve customers' problems, eating/storage instruction)	0.832			
Promotional Innovativeness				
This dessert café has an innovative marketing program.	0.898	0.857	0.913	0.777
This dessert café offers new deals.	0.889			
This dessert café provides innovative communication platforms (e.g., online communities) allowing customers to make suggestions.	0.858			
Functional Value				
This dessert café is aesthetically appealing. (aesthetically = in a beautiful or artistic way)	0.846	0.914	0.936	0.745
The dessert provided is outstanding.	0.905			
This dessert café provides attentive service.	0.869			
This dessert café is easy to locate.	0.858			
This dessert café offers good value of money.	0.846			
Emotional Value				
My mood improves when visiting this dessert café.	0.897	0.926	0.948	0.821
I feel pleasure when visiting this dessert café.	0.836			
I enjoy myself when visiting this dessert café.	0.941			
I am delighted to visit this dessert café.	0.945			
Social Value				
The choice of this dessert café increased acceptance by others. (e.g., follow trend)	0.819	0.930	0.951	0.828
This dessert café improves the way I am perceived by others.	0.934			
This dessert café helps me make good impression on people.	0.940			
This dessert café helps me improve social approval.	0.942			
Attitude				
Unattracted-attracted	0.838	0.907	0.935	0.782
Unfavorable-favorable	0.901			
Negative-positive	0.896			
Bad-good	0.901			
Customer Value Co-Creation Behavior (Third-order)				
Customer Participation Behavior (Second-order)				
Information Sharing				
I will try my best to explain what I want the employee to do.	0.821	0.717	0.838	0.644
I will try my best to give the employee proper information.	0.851			
I will provide necessary information so that the employee can perform his/her duties.	0.925			
I will answer the employee's service-related questions as much as possible.	0.875			
I will perform all required tasks to help the dessert café for the successful delivery of service (e.g., do self-service tasks)	0.869	0.907	0.935	0.782
I will have appropriate manners to help the dessert café delivers a better service to customers (e.g., teach kids to be well-behaved).	0.896			
I will fulfil responsibilities to the dessert café to help them for a successful delivery of service (e.g., avoid no-show reservations)	0.874			
I will follow employees' instructions (e.g., assign seating place)	0.834			
I will be friendly to the employee(s).	0.867	0.867	0.910	0.716
I will be kind to the employee(s).	0.807			
I will be polite to the employee(s).	0.874			
Responsible Behavior				
I will follow employees' instructions (e.g., assign seating place)	0.807	0.982	0.986	0.933
I will be friendly to the employee(s).	0.675			
I will be kind to the employee(s).	0.967			
I will be polite to the employee(s).	0.977			
I will be polite to the employee(s).	0.974			

Table 1 (continued)

Variables	Loading (r)	Cronbach' alpha	CR	AVE (r ²)
I will be considerate to the employee(s).	0.973			
I will be empathetic towards the employee(s).	0.938			
Customer Citizenship Behavior (Second-order)		0.767	0.848	0.589
Feedback	0.786	0.707	0.834	0.630
If the dessert café hopes to get my feedback on how they can improve, I will try to let them know.	0.858			
When I receive good service from the employee, I will give positive feedback.	0.855			
When I experience a problem with dining at the dessert café, I will try to reach out to the employees. (e.g., the dessert quality is not served right)	0.650			
Advocacy	0.792	0.919	0.949	0.861
I will say positive things about this dessert café and the employees to others.	0.919			
I will recommend this dessert café and the employees to others.	0.938			
I will encourage friends and family/relatives to visit this dessert café.	0.927			
Helping	0.766	0.917	0.942	0.801
If other customers need my help when using the dessert café's services, I will assist them. (e.g., to use the new technology)	0.910			
If other customers seem to have problems when using the dessert café's services, I will help them. (e.g., help in self-service tasks)	0.918			
If needed, I will teach other customers to use the dessert café's services correctly. (e.g., write reviews based on your experience)	0.905			
If other customers are using the dessert café's services incorrectly, I will give them advice.	0.846			
Tolerance	0.724	0.836	0.901	0.753
If service is not delivered as expected, I would be willing to tolerate it.	0.868			
If the employee makes a mistake during service delivery, I would be willing to be patient and wait for corrections.	0.853			
If I must wait longer than I normally expected to receive the service, I would be willing to adapt.	0.881			

Note: Composite reliability (CR) and Cronbach alpha's (α) > 0.70; Loading > 0.70; Average Variance Extracted (AVE) > 0.50.

level)” was removed because its’ loading was less than 0.50 ($r = 0.408$), which caused the AVE of the construct of menu innovativeness to be less than 0.50 ($r^2 = 0.499$). The first-order indicator “*information seeking*” was also removed as it showed a poor loading of 0.360 for second-order consumer participation behavior, which resulted in an AVE of the higher-order construct that was less than 0.50. Discriminant validity was assessed based on Heterotrait-Monotrait ratio of correlations (HTMT), where all HTMT values were below the value of 0.90, confirming the discriminant validity between the variables, as shown in Table 2.

Formative model. The third-order formative-reflective-reflective construct of customer value co-creation behavior and the second-order formative-reflective construct of customer perceived innovativeness were adapted in the current study. Both constructs were theoretically driven and evaluated formatively in a higher-order model to investigate the weight and contribution of the lower dimensions. The formative model measured the contribution of all the lower-order dimensions towards the higher-order constructs, and each formative dimension reflected unique characteristics of the concept. A redundancy analysis was performed, in which a path coefficient of higher than 0.70 ($r = 0.789$) verified the relationships with the reflective endogenous variable (Ramayah et al. 2018). All the outer VIF values of the formative indicators ranged between 1.711 and 2.533 ($VIF < 3.3$), and no collinearity issue was detected. Weight and significance reported in Table 3 refer to the contribution of the lower-order formative indicators towards the higher-order construct. For the second-order customer perceived innovativeness construct, both menu and experiential were significant ($t > 1.96$), while technology-based service and promotional were non-significant ($t < 1.96$). The outside weights should be significant, but if the item loading is larger than 0.50, the insignificant dimension should remain and subsequently be interpreted as “absolutely important” with theory-driven conceptualization (Hair et al. 2017). Thus, the

loadings of technology-based service and promotional were 0.641 and 0.825, respectively, which were described as “absolutely important” towards the second-order construct. In addition, the weights of all formative indicators (CPB, CCB) were significant ($t > 1.96$) towards the higher order construct customer value co-creation behavior.

Structural model assessment. There was no issue with collinearity for the structural model among latent variables, as the inner VIF value ranged between 1.380 and 2.850, above the threshold value of 3.33. Then, the predictability in the structural model was assessed through predictive accuracy (R^2) for the endogenous latent variables (Hair et al. 2017). The R^2 values of attitude (0.500) and customer value co-creation behavior (0.518) showed moderate predictive accuracy, providing 50% of changes in attitude, and 51.8% of changes in customer value co-creation behavior can be explained by its predictors. Next, the model’s out-sample predictive relevance (Q^2) was evaluated using the blindfolding procedure, where data points were omitted since they were regarded as missing values and treated accordingly in the PLS algorithm. Table 4 shows that the Q^2 values of attitude (0.374) and customer value co-creation behavior (0.406) were higher than zero, indicating a predictive relevance of the endogenous constructs (Cohen 1988; Hair et al. 2017). In addition, PLS prediction was conducted to assess the statistical model’s predictive model (out-sample) of the major endogenous construct, i.e., customer value co-creation behavior. The prediction technique applies the principle of k-fold cross-validation ($k = 10$ folds), training and testing data, creates linear model (LM) predictions, and compares error with the study’s proposed model in PLS-SEM (Shmueli et al. 2019). PLS-SEM-based predictions exceeded the most naïve benchmark, as indicated by the $Q^2_{predict}$ value of PLS-LM exceeding zero. Thus, the proposed model was reported as a medium predictive powder as CCB’s RMSE of PLS-SEM was positive. (Shmueli et al. 2019).

Table 2 Discriminant validity.

	ATT	CCB	CPB	EI	EV	FV	MI	PI	SV	TI	advoc	feedb	help	infoshar	persint	respbev	toler	
ATT	0.737																	
CCB	0.702	0.899																
CPB	0.518	0.573	0.471															
EI	0.674	0.540	0.698	0.404														
EV	0.564	0.530	0.720	0.521	0.814													
FV	0.627	0.601	0.500	0.753	0.438	0.443												
MI	0.532	0.555	0.442	0.843	0.365	0.384	0.800											
PI	0.497	0.493	0.551	0.480	0.601	0.649	0.460	0.472										
SV	0.434	0.452	0.343	0.672	0.235	0.306	0.475	0.634	0.392									
TI	0.742	-	0.719	0.444	0.575	0.492	0.478	0.411	0.377	0.292								
advoc	0.545	-	0.778	0.469	0.400	0.400	0.515	0.400	0.329	0.360	0.681							
feedb	0.399	-	0.581	0.349	0.273	0.294	0.377	0.412	0.340	0.307	0.460	0.536						
help	0.450	0.693	-	0.365	0.336	0.359	0.417	0.400	0.353	0.318	0.512	0.605	0.500					
infoshar	0.413	0.403	-	0.277	0.661	0.709	0.244	0.172	0.465	0.129	0.393	0.367	0.184	0.287				
persint	0.623	0.819	-	0.359	0.470	0.443	0.401	0.371	0.345	0.284	0.621	0.680	0.561	0.712	0.492			
respbev	0.453	-	0.560	0.416	0.317	0.349	0.393	0.399	0.389	0.371	0.468	0.459	0.537	0.419	0.242	0.537		
toler																		

HTMT < 0.9/HTMT < 0.85.
 The correlation between the reflective first-order dimensions and their second-order measures were not calculated.
 ATT attitude, CCB customer citizenship behavior, CPB customer participation behavior, EI experiential innovativeness, EV emotional value, FV functional value, MI menu innovativeness, PI promotional innovativeness, SV social value, TI technology-based service innovativeness, advoc advocacy, feedb feedback, help helping, infoshar infosharing, persint personal interaction, respbev responsible behavior, toler tolerance.

Additionally, the Q^2 value of CVCCB obtained was 0.406, indicating that the proposed model had adequate predictive power to predict customer value co-creation behavior.

The bootstrapping technique with 5000 subsamples was conducted to test the hypotheses. The hypotheses testing results are recorded in Table 5. The paths from perceived innovativeness to functional value ($\beta = 0.459, t > 1.96$), emotional value ($\beta = 0.406, t > 1.96$), and social value ($\beta = 0.477, t > 1.96$) were significant, supporting H1 to H3. In addition, H4 and H5 which proposed customer perceived innovativeness positively related to attitude ($\beta = 0.377, t > 1.96$) and customer value co-creation behavior ($\beta = 0.127, t > 1.96$), respectively, were supported. Then the results showed a mixed finding in the relationship between perceived values and attitude, where non-significant relationships existed (1) between functional value and attitude ($\beta = -0.022, t < 1.96$) and (2) between social value and attitude ($\beta = 0.031, t < 1.96$), rejecting H6 and H8. A significant link between emotional value and attitude ($\beta = 0.465, t > 1.96$) was revealed, accepting H7. Moreover, H9 was supported by a statistically significant relationship between attitude and customer value co-creation behavior ($\beta = 0.357, t > 1.96$).

Serial multiple mediation testing. In PLS-SEM, the bootstrapping technique can be used to examine the specific indirect effect of the mediator in the relationship between exogenous and endogenous variables. As shown in Fig. 2, the perceived values (i.e., functional, emotional, social) and attitude served as serial mediators in the relationship between perceived innovativeness and value co-creation behavior. Table 5 shows the significant specific indirect effect of emotional value and attitude ($\beta = 0.067, t > 1.96$) while 95% CI did not straddle a 0 in between [LL = 0.038, UL = 0.105], suggesting that there is a mediation, supporting H11. Nevertheless, the non-significant relationship in H10 ($\beta = -0.004, t < 1.96$) and H12 ($\beta = 0.005, t < 1.96$) suggested that there was no serial mediation effect on the combined functional value with attitude and social value with attitude in the relationship. H10 and H12 were rejected. Therefore, the path of perceived innovativeness → emotional value → attitude → value co-creation behavior was significant, where emotional value and attitude each carried an indirect effect on the relationship between customer perceived innovativeness and value co-creation behavior. Both mediators were complementary serial mediators as the indirect effect and total effect of perceived innovativeness on value co-creation behavior was significant (Zhao et al. 2010). In summary, emotional value and attitude mediated complementary in a series in the relationship between perceived innovativeness and value co-creation behavior.

Discussion and conclusion

This study empirically examined the mechanism by which perceived innovativeness influences customer value co-creation behavior through the mediating effect of perceived value aspects and attitude in the setting of a dessert café. The contributions of the first-order innovativeness dimensions were assessed, and the findings provided insightful information on which factor the practitioners should pay the most attention to. Different dimensions of the perceived value construct examined in the conceptual model were not equally influential on the predicted variables, indicating that each aspect of perceived value (i.e., functional, emotional, social) has a distinct influence. In addition, the notion of value co-creation behavior was emphasized in this study, which addressed the active engagement of the consumer in the value-creation process. The findings of this study have extended the existing literature by highlighting the contribution of each innovativeness dimension, various aspects of

Table 3 Outer VIF and weight and significance of the formative indicators.

Second-order construct	First-order construct	Outer VIF	Outer weight	Mean	STDEV	t - value	Loading
CPI	MI	1.849	0.517*	0.513	0.091	5.696	0.890
	TI	1.556	0.159	0.154	0.089	1.799	0.641
	EI	2.371	0.370*	0.369	0.110	3.350	0.869
	PI	2.533	0.141	0.142	0.126	1.118	0.825
CVCCB	CPB	1.711	0.615*	0.616	0.102	6.014	0.928
	CCB	1.711	0.486*	0.481	0.108	4.513	0.883

CPI customer perceived innovativeness, MI menu innovativeness, TI technology-based service innovativeness, EI experiential innovativeness PI promotional innovativeness, CVCCB customer value co-creation behavior, CPB customer participation behavior, CCB customer citizenship behavior. Critical coefficient (t value) < 1.96 indicates nonsignificant relationship. *p < 0.05.

Table 4 Determination coefficients (R²) and predictive relevance (Q²) of endogenous variable (omission distance = 8).

Endogenous variable	R _{adj} ²	Q ²
Functional value	0.209	0.146
Emotional value	0.163	0.128
Social value	0.226	0.178
Attitude	0.500	0.374
Customer value co-creation behavior	0.518	0.406

R² ≥ 0.19 (weak), ≥0.33 (moderate), ≥0.67 (substantial); Q² > 0.

perceived value, and the mechanism through which the customers would engage in value co-creation activities in the dessert café industry. The following sections elaborate on the theoretical and practical contributions of the study’s findings to the dessert café industry.

Theoretical implications. This study ascertained the importance of the four dimensions of innovativeness (i.e., menu, technology-based service, experiential, and promotional) and their association with the second-order customer perceived innovativeness construct. The findings enable the research to comprehend the contribution and importance of each innovativeness dimension to the overall perceived innovativeness. The formatively measured perceived innovativeness construct enhanced the theoretical implementation of knowledge by allowing the prioritization and ranking of each dimension based on its weight and significance. Menu innovativeness was discovered to be the most contributing dimension to the second-order consumer perceived innovativeness construct, adding to the past literature implied that menu innovativeness is the most essential aspect in the food service industry (Ivkov et al. 2016). The result enriches the understanding of such innovativeness attributes by revealing a more effective innovation strategy for improving perceived innovativeness. More precisely, the consumers were shown to perceive higher innovativeness when exposed to dessert café with a higher level of menu novelty. Aside from that, the finding differs from those of Kim et al. (2015) ranked experiential innovativeness as the most influential of the four dimensions in the casual dining restaurant. In contrast, the current study determined that menu innovativeness was the most contributing factor towards the overall perceived innovativeness in the context of a dessert café. The contradictory results demonstrate that consumers have diverse perspectives on innovation across various food service business models. In this study, technology-based service and promotional innovativeness were non-significant toward perceived innovativeness. Technology was considered insignificant probably because customers are less exposed to creative

technology use in food service, which is consistent with the finding of Ivkov et al. (2016) revealed that technology is less emphasized in hospitality innovation. Customers did not perceive technology as highly innovative unless they received cutting-edge service, which the dessert café lacked in this regard, as practitioners do not typically invest heavily in new technology. Some dessert cafés retain traditional ordering procedures while some adopt technology into the service. Similarly, innovative promotional efforts such as dessert discounts, marketing deals, or communication platforms have been found to be less attended by customers. This finding was consistent with the study of Ra (2017), where the scholar revealed that the price perception factor was non-significant to perceived value at dessert café. The rationale behind this finding might be that the market is willing to pay more for better quality and value of the product and service, and the awareness of the high prices for premium desserts.

The study extends the framework of Kim et al. (2019) by including the mediating effects of perceived values and attitudes between perceived innovativeness and value co-creation behavior. This study expands the hospitality literature on customer behavior in value co-creation by emphasizing consumers’ initiative in the value exchange process, as mentioned in the service-dominant logic theory. According to the value co-creation notion, customers are no longer passive recipients but rather active partners in a business. The customer is the value co-creator, generating value such as feedback, knowledge sharing, and advocating for others by assisting the service provider to offer better products and services, eventually supporting competitive advantage and business sustainability. Value co-creation occurs when the enterprise desires monetary gain from customer commitment, while the consumers want enhanced product and service offerings at a cheaper cost or with improved value. In this study, the SDL theory was reinforced with innovativeness, where customers are more willing to engage in value co-creation when they perceive the firm as innovative. It extends prior research by demonstrating that consumers’ intention to co-create value may decline because of the low performance of dessert café innovativeness. Accordingly, innovation played a prominent role in improving customer involvement and engagement in the business and creating a win-win situation in which both parties received and provided value.

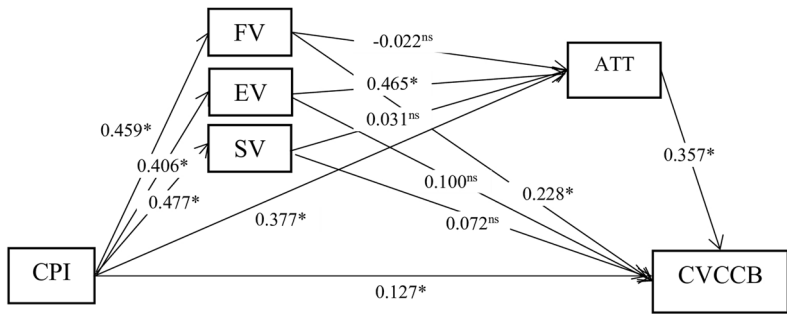
This study also contributes to the literature on the VAB model by integrating perceived innovativeness as an antecedent to customer value. The study highlights the positive relationship between perceived innovativeness and perceived value, thus contributing to the existing literature on equity theory (Boksberger and Melsen 2011; Sukwadi 2017). The significant relationship supported the equity theory as it highlights the input-output ratio, implying that the greater the customer perceived innovativeness, the greater the values of the customer appraised. Therefore, the innovativeness of a dessert café has a marketing

Table 5 Standardized Parameter Estimates.

Hypothesis	Path	Beta value	t-value	f ²	q ²	Sig.
H1	CPI -> FV	0.459	10.555	0.267	-	*
H2	CPI -> EV	0.406	8.100	0.198	-	*
H3	CPI -> SV	0.477	11.174	0.295	-	*
H4	CPI -> ATT	0.377	8.136	0.208	0.123	*
H5	CPI -> CVCCB	0.127	2.104	0.020	0.013	*
H6	FV -> ATT	-0.022	0.305	0.000	-0.005	ns
H7	EV -> ATT	0.465	7.086	0.181	0.107	*
H8	SV -> ATT	0.031	0.632	0.001	0.002	ns
H9	ATT -> CVCCB	0.357	6.084	0.133	0.091	*

Hypothesis	Path	Beta value	t-value	Confidence Interval		Sig.
				LL (2.5%)	UL (97.5%)	
H10	CPI -> FV -> ATT -> CVCCB	-0.004	0.296	-0.030	0.020	ns
H11	CPI -> EV -> ATT -> CVCCB	0.067	3.896	0.038	0.105	*
H12	CPI -> SV -> ATT -> CVCCB	0.005	0.615	-0.012	0.023	ns
	Direct effect CPI -> CVCCB	0.127	2.104	-	-	*
	Total effect CPI -> CVCCB	0.511	9.945	-	-	*

CPI customer perceived innovativeness, FV functional value, EV emotional value, SV social value, ATT attitude, CVCCB customer value co-creation behavior, ns not significant. Critical coefficient (t value) < 1.96 indicates nonsignificant relationship. *p < 0.05, ns not significant.



Note1: CPI=customer perceived innovativeness, FV=functional value, EV=emotional value, SV=social value, ATT=attitude, CVCCB=customer value co-creation behavior.
 Note2: *p<.05, ns=not significant.

Fig. 2 Serial multiple mediator model.

impact by enhancing its value relative to its rivals. Moreover, the study adds to the prevailing literature on the VAB model (Chen and Peng 2018; Cheung and To 2019) by affirming the significant hierarchy order of emotional value-attitude-customer behavior in co-creating value. It provides empirical evidence with remarkable insights supporting the hierarchy path of VAB. The mediation model explains how a customer with positive emotions could co-create value with the firm and improve attitude.

The current study includes three perceived value aspects (i.e., functional, emotional, social), allowing the researchers to have more profound knowledge of the distinct influences of each value aspect on attitude and value co-creation behavior. This study was motivated by the framework of Kwon et al. (2017). It investigated three aspects of perceived values simultaneously to provide an empirical examination of the influence of each dimension on outcomes. When assessing different dimensions of perceived value, not all dimensions are equally influential in eliciting their outcome variables. The findings demonstrated that emotional value significantly impacted attitude toward dessert cafés; conversely, functional value substantially affected consumer behavior in co-creating value. Through evaluating perceived

values in distinct components, this research identified how they behave differently in the study context, had varying effects on their outcome variables, and then enhanced the existing theoretical framework.

Meanwhile, assessing the mediating role of perceived value and attitude between the relationship of customer perceived innovativeness and customer behavior to co-create values contributes to the prevalent literature in hospitality management. The current study examined three aspects of perceived value in the relationship between innovativeness and customer behavior, all of which had varying degrees of influence along the hierarchy path. Functional value was identified as a mediator in the relationship between perceived innovativeness and value co-creation behavior, while emotional and social value was insignificant in mediating the relationship. Thus, stimulating different components of perceived values may influence and mediate different outcome factors. Likewise, the study finding provides remarkable insight into supporting the mediator role of attitude in the hierarchical path of VAB. Previous literature on the VAB model implied that an individual's attitude played a mediator role between value and behavior (Chen and Peng 2018;

Shin et al. 2017). This study highlighted the significant role of customer attitude in fully mediating a customer's positive emotions to co-create value with the firm. Additionally, the finding of the current study adds to the serial mediation literature, revealing a serial mediation model of customer perceived innovativeness—emotional value—attitude—customer behavior in co-creating value. This indicated how significant emotional value and customer attitude may guide the customers in the value co-creation process at a highly innovative dessert café.

Practical implications. The current study has comprehended the contribution ranking of each first-order innovativeness dimension, which revealed menu innovativeness as the highest contributor to perceived innovativeness. Dessert café practitioners such as business owners, marketers, and managers could gain reliable information for constructing an innovativeness image with their allocated resources and money investment, especially in the menu and experiential dimension. These two dimensions were shown to be essential in the context of dessert cafés, highlighting the importance of an innovative menu and unique experience for improving customer perception of the dessert café's innovativeness. Both aspects play a crucial part in developing a competitive advantage and reducing the threat of imitation from rivals. In contrast, customers nowadays are moving toward value propositions and are willing to pay more for higher quality and value. Lacking innovative promotion activities and marketing might also make it less likely for customers to regard promotions as innovative, and so technology-based service and promotional innovativeness are not a priority for dessert café customers as they are more attracted by the dessert menu and experiential innovativeness. Dessert café owners should provide creative menu designs and offer personalized experiences for people to enjoy, gather, and unwind. For instance, offering a dessert menu that is different from others with aesthetically pleasing food presentations can attract customers.

The present study emphasizes the value co-creation concept and highlights the customer's active role in business, where the practitioners should establish greater value co-creation activities that could encourage customers to participate. By determining the mechanism of the value co-creation process, the findings revealed that practitioners should focus on evoking emotional value and attitude in boosting the effect of perceived innovativeness on customers' likeliness to co-create value. An innovative dessert café aroused positive emotions generating a positive attitude and consequently maximizing the customers' intention to co-create with the dessert café. Managers and employees of dessert cafés may coordinate marketing activities and encourage value co-creation, particularly in terms of serving and communicating in person with consumers. The current study assists dessert café practitioners in handling innovative product and service delivery, and coordinating the value co-creation process, thereby improving the food service firm's financial performance, market power, and sustainability.

Limitations and future research directions. While this study has made both theoretical and practical contributions, it is important to discuss its findings in the context of several limitations that warrant further investigation and research. Addressing these limitations can guide future research efforts. Despite our efforts to minimize bias in the sampling process, it appears that the survey respondents were predominantly young, single females. Although this limitation impacts the generalizability of our research, it does provide valuable insights into the dessert café patronage patterns in Malaysia, particularly among younger visitors. It is worth noting that our questionnaire sample was limited to customers who visited twelve specific dessert café chains, which may not

represent all dessert café establishments in Malaysia. This restriction affects the overall applicability of our findings.

We carefully selected these twelve dessert cafés to ensure a comparable sample size and minimize the potential for significant variations in correlation directions. However, we focused on dessert café chains with more than two outlets, excluding independent or local dessert cafés. Our study relied on convenience sampling, a non-probability strategy that limits our ability to generalize the findings to the entire population. Convenience sampling can lead to under- or over-representation of the population. Since we didn't have access to the exact population size of all customers at the twelve selected dessert café chains, using a probability sampling method was not feasible. To address this limitation, future research could reduce the number of dessert cafés considered and employ a systematic sampling method based on time and location for questionnaire collection.

Furthermore, our study did not find significant relationships between perceived social value and the outcome variables, including attitude, suggesting that mediation effects were not significant. This might be due to the absence of mediators not included in our proposed conceptual model. Undervalued but potentially significant mediators, such as brand reputation and self-relevant value, could link social value to customer behavior, as suggested by previous studies in the hospitality industry. The connection between perceived values and consumer behavior in co-creating value is a relatively new area, and future research could explore additional factors to enrich the consumer behavior literature.

Our proposed conceptual model also lacks consideration of moderator variables. We specifically addressed the moderator role in the relationship between perceived innovativeness and value co-creation behavior. Future research could explore potential moderators related to the dining experience at a dessert café, such as the café's concept (shops or kiosks). Some dessert café brands operate both types of establishments, which could result in varying dining experiences for customers. Investigating the moderating effect of different dessert café operation concepts could be an intriguing variable to explore.

Lastly, our study relied on a quantitative approach to examine perceived innovativeness, perceived value, attitude, and value co-creation behavior. An online survey was chosen over traditional on-site surveys at dessert cafés due to the pandemic and social distancing measures enforced by the government during data collection. For future research, qualitative methods such as focus groups and in-depth interviews could provide a deeper understanding of the holistic consumer dining experience at dessert cafés and refine specific research components. Additionally, exploring the dessert café industry from a managerial perspective by sampling manager-level personnel in future research may enhance our knowledge of thriving and sustaining businesses in the face of intense competition.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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Author contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis, and interpretation, or in all these areas; took part in drafting, revising, or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Competing interests

The authors declare no competing interests.

Ethical approval

All the procedures were approved by the Universiti Putra Malaysia Ethics Committee for Research Involving Human Subjects (JKEUPM) with the reference number JKEUPM-2021-706.

Informed consent

This article obtained informed consent from all human participants.

Additional information

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