

# **The Mediating Role of Brand Trust in Business Model Innovation and Brand Loyalty---A Case Study of Guizhou Hot Spring Health Tourism Industry in China**

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## **Abstract**

Studying the factors affecting customer brand trust(BT) and brand loyalty(BL) can provide some directions and strategies for merchants to develop and enhance brand loyalty. Based on Guizhou hot spring hotel in China as an example, we studies the influence relationship between different business models (novel business model and efficiency business model) and brand trust and brand loyalty, and studies the intermediary effect relationship of brand trust in the influence of novel business model and efficiency business model on brand loyalty. Previous literature research framework and cross-sectional research survey methods were used to study the proposed hypothesis. A total of 305 questionnaires were collected from the users of Guizhou hot spring hotel. Data were analyzed by SPSS27.0 and AMOS26.0 software, and the relationship between them was tested by the structural equation model. The results show that novel business model and efficient business model have significant positive effects on brand trust and brand loyalty, and brand trust has significant intermediary effects in the influence of different business models (novel business model and efficient business model) on brand loyalty.

**Keywords:** Brand Trust; Business Model Innovation; Brand Loyalty; Mediating Role

## **Introduction**

In recent years, the health tourism industry in Guizhou, China, has witnessed a significant shift towards innovative business strategies aimed at enhancing visitor experiences and engagement. The "Guizhou Provincial Tourism Industry Plan" (Guizhou Provincial Tourism Bureau, 2018) outlines the strategic vision for leveraging the province's extensive hot spring resources to establish Guizhou as a leading destination for wellness tourism. This plan underscores the potential of the Guizhou hot spring health tourism industry to drive regional development and attract global visitors seeking health and relaxation experiences. Furthermore, the Guizhou provincial government has articulated a vision to transform the region into "China's Hot Spring Province and a Global Wellness Destination" (Guizhou Provincial Government, 2019), reflecting the province's commitment to developing its hot spring resources and wellness tourism offerings as key components of its economic and cultural strategy. Addressing the challenges and opportunities within the Guizhou hot spring health tourism industry requires a comprehensive approach that considers the unique qualities of Guizhou's thermal waters, the integration of traditional Chinese medicine, and the development of evidence-based wellness therapies. Zhang and Wang (2020) discuss the sustainable development of hot spring tourism in Guizhou, emphasizing the need for enhancing the

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therapeutic and recreational appeal of hot springs while ensuring sustainable development practices.

This research incorporates the theoretical insights of Zott and Amit, particularly their NICE model, which emphasizes the significance of novelty and efficiency in creating value through business model innovation (Zott & Amit, 2010). By applying the NICE framework to the Guizhou hot spring health tourism industry, the study aims to explore how these dimensions of business model innovation(BMI) can influence brand trust and loyalty, providing a foundational perspective for understanding the dynamic interplay between innovative business practices, customer perceptions, and market competitiveness in the context of health tourism.

Supporting this exploration, Balboni et al. (2019) emphasize the importance of pursuing higher efficiency over the life cycle of a start-up, although not at the moment of its establishment. This insight is crucial for understanding how efficiency-based BMI can be strategically implemented in the wellness tourism sector to enhance brand loyalty over time. Additionally, the study by Hu and Chen (2016) on the effects of efficiency and novelty on technological innovation performance in Chinese manufacturing firms underscores the positive relationship between these business model themes and performance, suggesting a similar potential impact within the tourism industry.

Moreover, Ma et al. (2018) highlight the moderating effects of novelty-centered and efficiency-centered business model design themes on the relationship between green product innovation and firm performance. This finding suggests that a balanced approach to incorporating novelty and efficiency in business model innovations can significantly enhance firm performance, which can be extrapolated to the context of health tourism in Guizhou to foster brand trust and loyalty.

Chaudhuri and Holbrook (2001) examine the chain of effects from brand trust and brand affect to brand performance, including the role of brand loyalty, and find that purchase loyalty and attitudinal loyalty are critical in leading to greater market share and a higher relative price for the brand. This underscores the importance of brand trust in mediating the relationship between business model innovation and brand loyalty.

Ball, Coelho, and Machás (2004) show that customer loyalty can be explained substantially by customer satisfaction, trust, and communication, highlighting the direct and indirect effects among these constructs (Ball, Coelho, & Machás, 2004). This supports the notion that brand trust plays a crucial mediating role in the development of brand loyalty, especially in the context of innovative business models.

Delgado-Ballester and Munuera-Alemán (2001) focus on brand trust in the context of consumer loyalty, suggesting the key role of brand trust as a variable that generates customers' commitment, particularly in high involvement situations where its effect is stronger compared to overall satisfaction.

Zhang et al. (2020) further explore the mediating effects of brand equity and travel motivation on the relationship between novelty and travel intention, providing valuable insights into how novelty in tourism management can enhance brand equity and intrinsic motivation, thereby increasing tourists' travel intentions. This research supports the notion that novelty-based BMI can play a crucial role in attracting and retaining tourists in the competitive wellness tourism market.

These studies collectively underscore the transformative potential of business model innovation in the health tourism industry, particularly within the unique cultural and economic context of Guizhou, China. By leveraging novelty-based and efficiency-based innovations, the Guizhou Hot Spring Health Tourism Industry can enhance brand trust and loyalty, contributing to sustainable growth and a loyal customer base.

## **Research Objectives**

This study seeks to unravel the intricate dynamics between business model innovation, brand trust, and brand loyalty within the burgeoning sector of the Guizhou hot spring health tourism industry. The central inquiries aim to dissect the mechanisms through which novelty and efficiency in BMI foster brand trust and, subsequently, how this trust translates into brand loyalty.

Based on the above research background, we propose the following research questions as below.

1. How does novelty-based business model innovation influence brand trust among consumers in the Guizhou hot spring health tourism industry? This question probes the ability of unique and innovative offerings to elevate consumer trust, a critical component in the brand loyalty equation.

2. In what ways does efficiency-based business model innovation impact consumer trust within the Guizhou hot spring health tourism industry? This inquiry focuses on the operational side, examining how improvements in service delivery and process optimization contribute to building trust with the brand.

3. Does brand trust mediate the relationship between novelty-based business model innovation and brand loyalty in the Guizhou hot spring health tourism industry? By exploring this question, the study aims to understand whether the trust built through innovative offerings effectively translates into sustained loyalty from consumers.

4. Is there a mediating role of brand trust in the pathway from efficiency-based business model innovation to brand loyalty among consumers of the Guizhou hot spring health tourism industry? This question delves into the operational efficiencies of businesses and their capacity to engender loyalty through the establishment of trust.

5. What is the combined effect of novelty and efficiency in business model innovation on brand loyalty, mediated by brand trust, in the context of the Guizhou hot spring health tourism industry? This comprehensive question aims to capture the overarching relationship between BMI, brand trust, and loyalty, considering both the innovative and operational dimensions of business models.

Through these questions, the study endeavors to offer nuanced insights into how business model innovation — both from the angles of novelty and efficiency — can serve as a lever for enhancing brand trust and, by extension, loyalty within the specific context of health tourism in Guizhou. This exploration is crucial for businesses aiming to leverage BMI for strategic differentiation and to cement long-term relationships with their customers in a competitive landscape.

## Hypotheses of Research

### **Hypothesis 1: Novel business models have a positive impact on brand trust.**

Based on the literature review and the conceptual framework, the first hypothesis posits that novelty-based Business Model Innovation (BMI) positively affects brand trust. This hypothesis is grounded in the understanding that innovative business models, particularly those centered around novelty, can significantly enhance customer perceptions of a brand, thereby fostering a higher level of trust.

One pivotal study supporting this hypothesis is by Ma et al. (2018), who explored the moderating effects of novelty-centered and efficiency-centered business model design on the relationship between green product innovation and firm performance. Their findings suggest that a novelty-centered design theme better fits firm performance, implying that innovative approaches to business models can enhance brand perception and trust.

Additionally, Balboni, Bortoluzzi and Pugliese et al. (2019) examined how changes in business model design themes, including novelty, impact a start-up's growth performance. Their research highlights the importance of novelty in the initial stages of a start-up, suggesting that innovative business models can play a crucial role in building brand trust and loyalty from the outset.

Im, Bhat, and Lee (2015) further contribute to this hypothesis by examining consumer perceptions of product creativity, emphasizing the role of novelty. They found that novelty influences perceptions of coolness, which in turn affects consumers' attitudes towards the product. This suggests that novelty in business models, by making a brand appear more "cool" and innovative, can significantly enhance brand trust.

Gronum, Steen, and Verreyne (2016) investigate the relationship between innovation in the business model, business model design themes, and firm performance. They advocate for novelty-centered design themes, arguing that such innovations unlock and translate value from innovation to firm performance more effectively than efficiency-centered themes. This underscores the potential of novelty-based BMI to enhance brand trust by delivering unique value to customers.

Hock, Clauss, and Schulz (2016) delve into the impact of organizational culture on a firm's capability to innovate the business model. They find that novelty-oriented cultural values foster capabilities in favor of business model innovation, suggesting that a culture inclined towards novelty can enhance brand trust by fostering innovative practices.

These studies collectively support the hypothesis that novelty-based Business Model Innovation has a positive effect on brand trust. By introducing innovative and novel elements into their business models, firms can significantly enhance how consumers perceive and trust their brands.

### **Hypothesis 2: Efficient business models have a positive impact on brand trust.**

Efficiency-based Business Model Innovation (BMI) has a positive impact on brand trust. This hypothesis suggests that when companies streamline their operations and focus on improving the efficiency of their business models, they can enhance the trust that customers place in their brands.

Supporting this hypothesis, Spieth, Roeth, and Meissner (2019) conducted a study that explored how different dimensions of BMI, including value offering innovation (VOI), value architecture innovation (VAI), and revenue model innovation (RMI), affect customers' brand perceptions. Their findings indicate that revenue model innovation, which is closely related to

efficiency improvements, has a positive impact on brand trust. This suggests that efficiency-based innovations in the business model can significantly enhance the trust customers have in a brand.

Guo, Pang, and Li (2018) examined the role of top management team diversity in shaping the performance of business model innovation, focusing on both novelty-centered and efficiency-centered business models. Their findings highlight that efficiency-centered business model innovation has a significant positive relationship with firm performance, suggesting that such innovations, by improving operational efficiency, can enhance brand trust indirectly through improved performance.

Balboni, Bortoluzzi, Pugliese, and Tracogna (2019) focused on the role of efficiency and novelty design themes in the growth performance of high-tech start-ups. Their research underscores the importance of pursuing higher efficiency over the life cycle of a start-up, implying that efficiency-based innovations are crucial for building a trustworthy and successful brand.

Hock, Clauss, and Schulz (2016) explored the impact of organizational culture on a firm's capability to innovate its business model, linking cultural values to the firm's innovation capabilities. While their study primarily highlights the role of novelty-oriented values, the emphasis on strategic sensitivity and resource fluidity as capabilities fostered by an efficiency-oriented culture suggests that such a culture can enhance brand trust through more efficient business practices.

Latifi, Nikou, and Bouwman (2021) investigated the causal mechanisms through which business model innovation affects firm performance in SMEs. Their findings indicate that efficiency growth, as a result of BMI, plays a crucial role in enhancing firm performance, which can be linked to increased brand trust as customers value efficient and reliable operations.

These studies collectively support the hypothesis that efficiency-based Business Model Innovation positively impacts brand trust. By focusing on efficiency improvements, companies can not only enhance their operational performance but also strengthen the trust that customers have in their brands.

### **Hypothesis 3: Novel business models have a positive impact on brand loyalty.**

The impact of novelty-based Business Model Innovation (BMI) on brand loyalty, suggesting that innovative approaches to business models, particularly those that introduce new and unique elements, can significantly enhance customer loyalty to a brand.

Pappu and Quester (2016) investigated how consumers' perceptions of brand innovativeness affect brand loyalty, with a specific focus on the mediating role of perceived quality. Their findings reveal that perceived quality fully mediates the impact of brand innovativeness on brand loyalty, indicating that innovative brands that are perceived as high quality can foster stronger loyalty among consumers.

Hasan, Shams, and Rahman (2020) examined the influence of consumer trust and perceived risk on brand loyalty in the context of voice-controlled AI, like Siri. While their study primarily focuses on trust and risk, the novelty value of using Siri was found to significantly influence brand loyalty, especially among consumers who are less brand-involved and more innovative. This suggests that the novelty of a product or service can enhance brand loyalty, particularly when it introduces innovative features that appeal to consumer innovativeness.

Murray, Elms, and Teller (2017) compared new and established store design prototypes of the same retailer to examine their impact on retail brand loyalty. Their findings suggest that store novelty and complexity can promote both store design pleasure and retail brand loyalty outcomes, indicating that novel and complex store designs can enhance brand loyalty at the retail level.

Elsäßer and Wirtz (2017) explored the rational and emotional factors influencing customer satisfaction and brand loyalty in a B2B setting. While their study focuses on a different context, the inclusion of novel and innovative elements in a brand's offering is implied to have a positive impact on brand loyalty, suggesting that novelty in business models can foster loyalty in both B2C and B2B markets.

Hu, Huang, Yan, Liu, and Zhang (2020) discussed how business model design can achieve customer loyalty through the mediating role of customer citizenship behavior. Their findings show that both efficiency-centered and novelty-centered business model designs are antecedents of customer loyalty, indicating that novel approaches to business model design can directly and indirectly affect customer loyalty through enhanced customer engagement.

These studies collectively support the hypothesis that novelty-based Business Model Innovation has a positive impact on brand loyalty. By introducing innovative and novel elements into their business models, firms can not only enhance the perceived value of their offerings but also foster stronger loyalty among their customer base.

#### **Hypothesis 4: Efficiency oriented business models have a positive impact on brand loyalty**

The efficiency-based Business Model Innovation (BMI) has a positive impact on brand loyalty. This hypothesis is grounded on the premise that improvements in operational efficiency, through innovative business models, can lead to enhanced customer satisfaction and loyalty by providing better value, service, and experience.

Hashim, Tajuddin, and Zainol (2020) explored the innovative roles of community engagement as a moderator in the consumer perspective model for Malaysia-origin fashion brands. Their study, while focusing on community engagement, indirectly supports the notion that efficiency in engaging consumers through innovative business models can strengthen brand loyalty. The research highlights the importance of efficiently managing consumer-brand relationships to build strong brand equity and loyalty.

Rezaei, Jayashree, and Fouladivanda (2016) examined the impact of contractual switching costs, price fairness, and brand image on telecommunications subscribers' satisfaction and loyalty. Their findings suggest that efficiency in pricing and contractual terms, as part of an innovative business model, can significantly influence brand loyalty. This underscores the role of efficiency-based innovations in enhancing customer perceptions and loyalty to a brand.

Pappu and Quester (2016) investigated how brand innovativeness, which includes efficiency improvements, affects brand loyalty. Their study found that perceived quality fully mediates the impact of brand innovativeness on brand loyalty, indicating that efficiency-based innovations that enhance perceived quality can lead to increased brand loyalty.

Spieth, Roeth, and Meissner (2019) conducted a study on how business model innovation affects customers' brand perceptions, including brand loyalty. Their research suggests that innovations in the business model, particularly those that improve efficiency, can positively impact brand loyalty by enhancing brand trust and equity.

Milojević, Todorović, and Lutovac (2016) discussed the challenge of brand management in the globalization process, emphasizing the importance of efficiency and innovation in branding strategies. Their analysis implies that efficiency-based business model innovations can strengthen brand loyalty by adapting to global market demands and enhancing competitive advantage.

These studies collectively support the hypothesis that efficiency-based Business Model Innovation positively impacts brand loyalty. By focusing on improving operational efficiencies, companies can enhance customer satisfaction and loyalty, thereby securing a competitive edge in the market.

**Hypothesis 5: Brand trust has a positive impact on brand loyalty**

This hypothesis suggests that the introduction of novel and unique elements into a business model can enhance brand loyalty, primarily through brand trust. Brand trust acts as a crucial intermediary that translates the positive perceptions generated by novelty-based BMI into stronger loyalty towards the brand. Supporting this hypothesis, Huang (2017) found that sensory experiences, a component of novelty in brand experiences, are a major driver of brand love, which in turn significantly influences brand loyalty. Although this study focuses on brand love, the underlying mechanism of transforming sensory (novel) experiences into loyalty through an emotional connection (such as trust) supports the proposed hypothesis.

**Hypothesis 6: Brand trust has a mediating effect on brand loyalty in innovative business models.**

The brand trust plays a mediating role in the relationship between novelty-based Business Model Innovation (BMI) and brand loyalty. This study highlights the mediating role of brand love, closely related to brand trust, in transforming sensory experiences into brand loyalty (Huang, 2017). Lim and Jiang (2019) explored the effects of dialogic communication of Corporate Social Responsibility (CSR) on brand loyalty, mediated by customers' online brand community engagement and brand trust. Their findings underscore the mediating role of brand trust in enhancing brand loyalty, suggesting that effective communication, which can be a part of novelty-based BMI, strengthens brand loyalty through increased brand trust.

Menidjel, Benhabib, and Bilgihan (2017) investigated the relationships among brand satisfaction, trust, and loyalty, and the moderating effects of personality traits in the context of fast-moving consumer goods. Their findings indicate that brand loyalty is most affected by satisfaction through the mediation of brand trust, supporting the notion that trust can mediate the relationship between novel brand experiences (leading to satisfaction) and loyalty.

Iqbal, Imran, Ahmad, Khalil, and Mushtaque (2021) aimed to understand the development of customer loyalty with the influence of satisfaction and trust in private label brands. Their study found that satisfaction positively influences customer loyalty and that trust partially mediates this relationship, highlighting the importance of trust in translating novel experiences into loyalty.

Veloutsou (2015) examined whether the strength of positive brand relationships can mediate between trust, satisfaction, attitude towards the brand, and loyalty. The study found that consumer brand relationship strength is a strong predictor of brand loyalty, suggesting that trust plays a mediating role in this dynamic, especially in the context of novel brand experiences leading to enhanced loyalty.

These studies collectively support the hypothesis that brand trust mediates the relationship between novelty-based Business Model Innovation and brand loyalty. By fostering trust through innovative and novel business practices, firms can significantly enhance brand loyalty among their customer base.

**Hypothesis 7: Brand trust has a mediating effect on brand loyalty in an efficient business model.**

The mediating role of brand trust in the relationship between efficiency-based Business Model Innovation (BMI) and brand loyalty. This hypothesis posits that efficiency improvements in a business model can enhance brand loyalty through the intermediary effect of brand trust. Brand trust serves as a crucial link, translating the reliability and effectiveness of efficiency-based innovations into stronger loyalty among customers.

Supporting this hypothesis, a study by Hidayanti, Nuryakin, and Farida (2018) investigated the effects of brand experience and brand trust on enhancing brand commitment and brand loyalty. The research found that brand trust supports brand commitment, which in turn supports brand loyalty. This suggests that brand trust can mediate the relationship between the efficiency aspects of brand experience (such as ease of use and reliability) and brand loyalty.

Pappu and Quester (2016) explored how consumers' perceptions of innovativeness, which can be linked to efficiency-based BMI, affect brand loyalty. They found that perceived quality fully transmits the impact of brand innovativeness onto brand loyalty, indicating that brand trust, closely related to perceived quality, plays a mediating role in this relationship.

Huang (2017) examined the mediating roles of brand love and brand trust between brand experiences and brand loyalty. The study found that sensory experience, which can be enhanced by efficiency-based innovations, mainly drives customers' brand trust, further influencing brand loyalty. This underscores the mediating role of brand trust in transforming efficiency improvements into increased loyalty.

Khan, Hollebeek, Fatma, Islam, and Rahman (2019) assessed the mediating role of brand trust and commitment in the relationship between brand engagement, brand experience, and brand loyalty in the online service context. Their findings support the hypothesis by showing that both brand engagement and experience, which include efficiency aspects, exert indirect effects on brand loyalty via brand trust.

Lim and Jiang (2019) explored the effects of dialogic communication of CSR on brand loyalty, mediated by online brand community engagement and brand trust. Their findings indicate indirect effects of dialogic communication on brand loyalty through brand trust, suggesting that efficient CSR communication enhances brand trust, which in turn strengthens brand loyalty.

These studies collectively support the hypothesis that brand trust mediates the relationship between efficiency-based Business Model Innovation and brand loyalty. By improving efficiency, companies can enhance the trust customers have in their brands, leading to increased loyalty.

## Research Methods

### Research Design

The research items are composed of basic information items and core scale items (novel business model, efficient business model, brand trust and brand loyalty scale). The sample method adopts the convenience sampling method in the non-probability sampling method, and combines the online collection method. From April 1, 2024 to May 1, 2024, we collected the cognitive data of five core scales from the comprehensive hotels with a wide coverage and good quality, which are typical of Guizhou and have a combination of ancient and modern business models. A total of 235 responses were collected, of which 225 were valid. Structural equation modeling is used for quantitative analysis to test and confirm hypotheses (Dash & Paul, 2021). The analysis methods include frequency, reliability, validity, structural equation model path relationship study and mediating effect relationship.

### Source of core scale

Brand trust refers to Chaudhuri and Holbrook (2001) and Laroche et al. (2012), which includes six items to measure brand trust. Brand loyalty adopts Algesheimer et al. (2005), which consists of six items to measure brand trust and loyalty. Amit and Zott developed a systematic approach to analyze and evaluate their business model. It stands for novelty, lock-in, complementarity and efficiency, the four key elements that contribute to a successful business model. Novelty refers to the introduction of a new architecture, component, or link in a product or service that generally achieves innovative and value-added effects. It can help a company identify the differences between itself and its competitors. We encourage firms to think outside the box and come up with innovative ideas to capture the attention of their target markets. Six business model innovations were cited in this study to measure novelty. Efficiency is the last element of the business model. We can recognize that cost effectiveness and resource allocation are key to sustainable success. Companies need to find ways to simplify operations, reduce waste and optimize the use of resources, and both novelty business model and efficiency business model also have six items to measure.

### Collection of data

The five hot springs collected are typical representatives of hot springs in Guizhou. Specifically, it covers different regions in Guizhou, China. This reflects the different qualities and benefits of spring in Guizhou, China, for human health. The oldest and modern spa complexes are represented differently. In addition, these five hot springs are typical hot springs with the highest tourism reception volume in Guizhou analyzed by data. Xifeng Hot Spring (long history, rare spring quality, significant benefits to human health); Shiqian Hot Spring (Guizhou has a long history, excellent spring quality, outstanding human health benefits); Jianhe Hot Spring (outstanding spring quality, significant benefits to human health, is an excellent case of upgrading according to customer needs in recent years); Poly International Hot Spring (the highest level of hot spring complex combined with real estate development in Guizhou); Four Seasons Hot Spring (Guizhou Modern Hot Spring Complex).

### Method of analysis

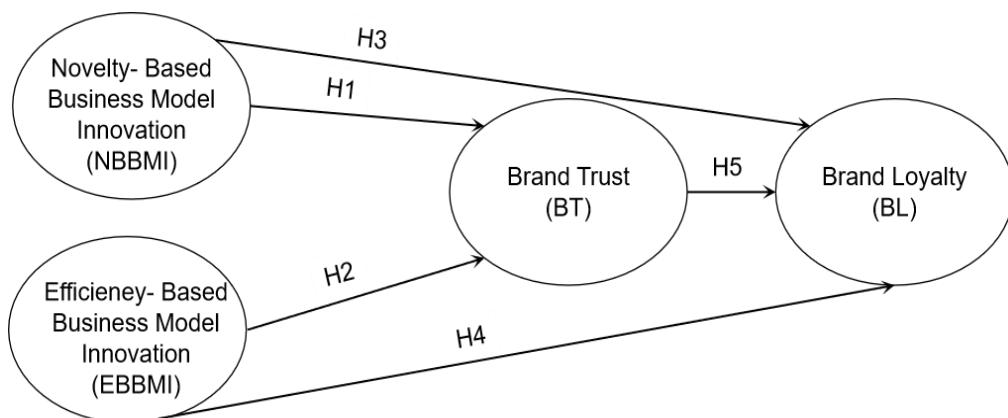
After data preprocessing, SPSS26.0 and AMOS24.0 statistical analysis software tools were used to conduct statistical analysis on the collected questionnaire data, and frequency analysis was used to analyze the basic information of tourist groups. The data reliability and validity of the scale results were analyzed. The Cronbach coefficient method was used to test the internal consistency of the data for reliability, and the confirmatory factor analysis (CFA) method was constructed by AMOS to test the structural validity of the scale data. The

cognitive evaluation of each scale variable was analyzed by descriptive statistics ( $M \pm SD$ ), and the normal distribution of the data was judged by the skewness and kurtosis values. For the continuous data satisfying the normality, the structural equation model is used to test the hypothesized relationship between the variables, and the structural equation model is constructed to study the interaction between the independent variables and the mediating variables on the dependent variables.

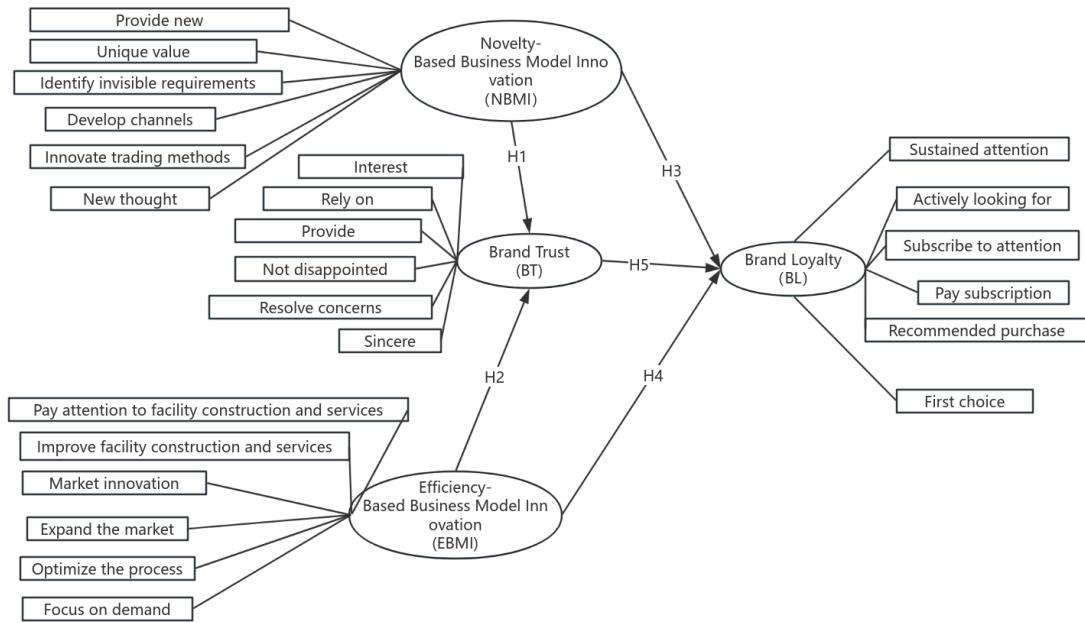
## Research Conceptual Framework

The conceptual framework for this study, as Figure 1 and 2 depict, integrates the intricate relationships and related affecting-factors between novelty-based and efficiency-based business model innovation (BMI), brand trust, and brand loyalty, particularly within the context of the Guizhou Hot Spring Health Tourism Industry. It posits that both forms of BMI can significantly enhance brand trust, which in turn, fosters greater brand loyalty. This framework is supported by various studies that illustrate how innovative business practices, whether focused on novelty or efficiency, can cultivate trustful relationships with customers, ultimately leading to increased loyalty.

The conceptual framework is constructed to examine the influence of two distinct forms of Business Model Innovation (BMI) — novelty-based and efficiency-based — on the development of brand trust and the subsequent effect on brand loyalty. The framework proposes that both forms of BMI exert a sequential impact on brand loyalty, mediated through brand trust. The model demonstrates that innovations in a company's services or efficiency improvements first foster trust among consumers, which is essential for achieving lasting brand loyalty. This systematic approach provides a strategic perspective for the Guizhou Hot Spring Health Tourism Industry, suggesting that trust-building through BMI is a critical step towards ensuring customer loyalty.



**Figure 1** Research Conceptual Framework



**Figure 2** Factors of BMI's Impact on Brand Trust and Brand Loyalty

## Findings and Discussion

### Findings of the study

In this study, the male group is the largest (54.2%), and the age group of 19-60 years old is the largest (36-45 years old: 27.1%; 19-35 years old: 25.3%; 46-60 years old: accounting for 25.3%), with a bachelor's degree at the most (35.6%), an income level of 10,001-15,000 yuan at the most (36.0%), and an income level of 5,000 yuan or less at the least (15 people, accounting for 5.7%); Most of the ordinary employees were employed (34.7%), most of them were married (65.3%), and most of them went to hot springs three times a year (33.3%). Among the hotels they experienced, the number of people who experienced hot springs in Guizhou Four Seasons (23.1%) was relatively balanced. Jianhe Hot Spring (22.7%), Poly Hot Spring Resort (20.9%), Xifeng Hot Spring (19.6%), and Shiqian Hot Spring (13.8%) followed.

The Cronbach coefficient method was used to test the internal consistency of each core scale, and exploratory factor analysis was used to determine its structure, and confirmatory test was used to verify its construct validity. In addition, this study also uses single-factor Harman to test common method bias (CMB). Due to the design of the cross-sectional study, common method bias (CMB) may exist. Therefore, in this study, it is necessary to test the possible existence of CMB bias before data analysis. In this study, Harman's single factor test method is used to reduce the influence of homologous variance, that is, the variance explained by the first factor without rotation is less than 40%, which indicates that there is no serious common method bias in the data. Podsakoff and Organ(Podsakoff, P.M.&Organ, D.W. ,1986) considered that the single-factor explained variation obtained by EFA (without rotation), did not exceed 40%, so CMB was not serious.

From Table 1 of the formal research confirmatory factor analysis model adaptation results, it can be seen that the chi square degree of freedom ratio is  $1.865 < 5$ , and the RMSEA value is  $0.062 < 0.08$ . These two main indicators have good adaptation, with IFI (0.937), TLI

(0.928), and CFI (0.936) in the simplified adaptation, indicating that the model in this study has good adaptability.

**Table1 Adaptability of confirmatory factor analysis model**

Index	Standard scope	Actual measured value	Interpretation	Source of indicators
CMIN/DF	1<NC<5	1.865	Excellent fit	
RMSEA	<0.08	0.062	Acceptable fit	
SRMR	<0.05	0.047	Acceptable fit	
GFI	>0.8	0.858	Acceptable fit	Wu
NFI	>0.8	0.873	Acceptable fit	Minglong
RFI	>0.8	0.857	Acceptable fit	(2010)
IFI	>0.8	0.937	Good fit	
TLI	>0.8	0.928	Good fit	
CFI	>0.8	0.936	Good fit	

The combined reliability tables 2 show good convergence validity. From the results, it can be seen that Novelty Based Business Model Innovation, Efficiency Based Business Model Innovation, Brand Trust, and Brand Loyalty AVE values are 0.567, 0.653, 0.596, and 0.626, respectively. The CR values are 0.887, 0.916, 0.898, and 0.909, respectively. Fornell C, Larcker D F believe that the convergence validity of each variable is greater than 0.7 and the combined reliability is greater than 0.5, and the factor loading coefficients of the items are all greater than 0.5, indicating that this study has good convergence validity and combined reliability. The discriminant validity results are shown in Table 3. It can be seen from the results that the correlation between each variable is less than the square root of AVE, indicating that this model has good discriminant validity.

**Table2 Convergence validity and combined reliability and discriminant validity and Internal consistency**

Variable	NBBMI	EBBMI	BT	BL
NBBMI	0.753			
EBBMI	0.322***	0.808		
BT	0.437***	0.350***	0.772	
BL	0.524***	0.395***	0.570***	0.791
AVE	0.567	0.653	0.596	0.626
CR	0.887	0.916	0.898	0.909
Internal consistency	0.884	0.918	0.898	0.909

Note: Diagonal angle represents the square root of AVE, \*\*\*P<0.001

### Hypothesis testing Results

The principle of mediating effect test, the first step is to test the influence of the independent variable on the dependent variable, and to test the coefficient c; The second step is to test the influence of independent variables on mediating variables, with a coefficient a

being tested; The third step is to test the influence of independent and mediating variables on the dependent variable, and to test the coefficients  $c'$  and  $b$ . Gradually more rigorous Bootstrap method is used to test the mediators. This article combines the use of structural equation modeling to test the mediating effect of Brand Trust.

According to Hayes' suggestion, the number of iterations for Bootstrap is set to 5000 and the confidence level is set to 95%. If the confidence interval of the 95% the contrary, if the 95% confidence interval for indirect effects includes 0, then the mediating variable does not play a role and there is no mediating effect.

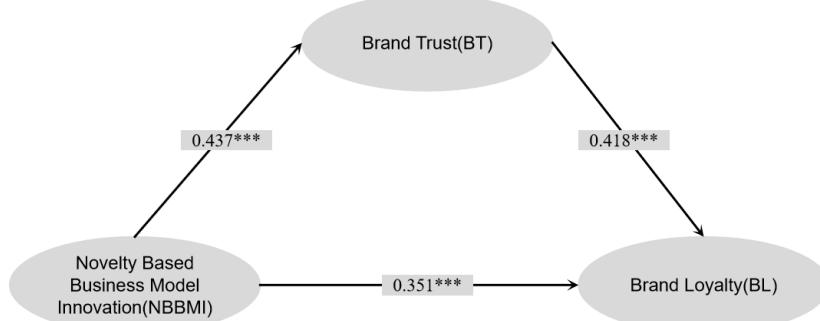
Hypothesis testing results are shown in Table 3.

**Table 3 Hypothesis testing results**

Hypothesis	Relationship	Beta ( $\beta$ )	SE	Bootstrap Lower	95% Upper	Results
H1	NBBMI→BT	0.437***	0.090	0.281	0.594	Accept
H2	EBBMI→BT	0.350***	0.078	0.199	0.500	Accept
H3	NBBMI→BL	0.351***	0.080	0.195	0.493	Accept
H4	EBBMI→BL	0.217**	0.066	0.070	0.377	Accept
H5	BT→BL	0.495***	0.073	0.346	0.633	Accept
H6	NBBMI→BT-BL	0.183	0.043	0.109	0.275	Accept
H7	EBBMI→BT-BL	0.174	0.044	0.093	0.267	Accept

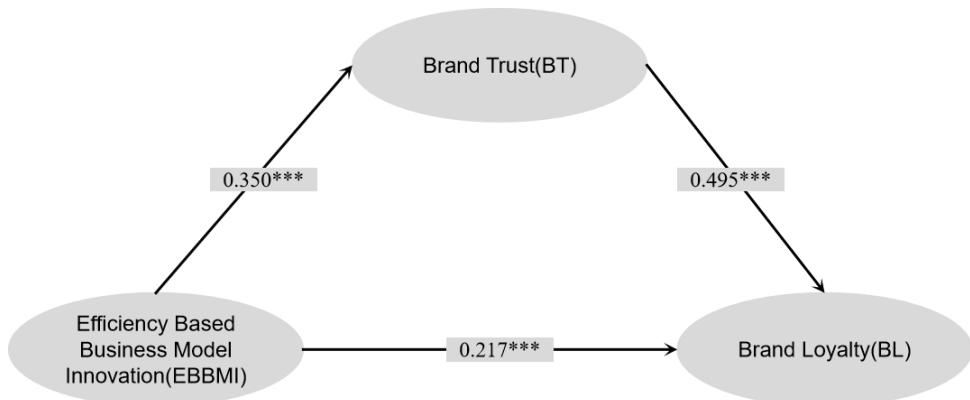
\*\*P<0.01, \*\*\*P<0.001.

The results of the mediating effect of Brand Trust on Brand Loyalty in Novelty Based Business Model Innovation are shown in Figure 3. The results show that Brand Trust has a significant mediating effect on Brand Loyalty in Novelty Based Business Model Innovation. Novelty Based Business Model Innovation ( $B=0.351$ ,  $C.R.=4.774$ ,  $p<0.001$ , 95%CL= ranges from 0.195 to 0.493) has a significant positive impact on Brand Loyalty at a significance level of 0.001; Brand Trust ( $B=0.418$ ,  $C.R.=5.628$ ,  $p<0.001$ , 95%CL= ranges from 0.265 to 0.559) has a significant positive impact on Brand Loyalty at the 0.001 level. Moreover, Novelty Based Business Model Innovation ( $B=0.437$ ,  $C.R.=5.541$ ,  $p<0.001$ ), 95%CL= ranges from 0.281 to 0.594 has a significant positive impact on Brand Trust at a significance level of 0.001.



**Figure 3** The mediating effect of Brand Trust on Brand Loyalty in Novelty Based Business Model

The results show that the estimated total effect is 0.533, and the confidence interval does not include 0. The estimated value of the indirect effect is 0.183, and the confidence interval does not include 0. The proportion of the effect is 34.3% (0.183/0.533). The estimated value of the direct effect is 0.351, and the confidence interval does not include 0. The proportion of the effect is 65.9% (0.351/0.533). This indicates that Brand Trust has a significant mediating effect on Brand Loyalty in Novelty Based Business Model Innovation, and both indirect and inter effects are significant. It indicates that Brand Trust partially mediates Brand Loyalty in Novelty Based Business Model Innovation, and hypothesis H6 is valid.



**Figure 4** The mediating effect of Brand Trust on Brand Loyalty in Efficiency Based Business Model

The mediating effect of Brand Trust on Efficiency Based Business Model Innovation on Brand Loyalty is shown in Figure 4. The results show that Brand Trust has a significant mediating effect on Efficiency Based Business Model Innovation on Brand Loyalty. Efficiency Based Business Model Innovation ( $B=0.217$ ,  $C.R.=3.233$ ,  $p<0.01$ , 95% CL = ranges from 0.070 to 0.377) has a significant positive impact on Brand Loyalty at a significance level of 0.01; Brand Trust ( $B=0.495$ ,  $C.R.=6.511$ ,  $p<0.001$ , 95% CL = ranges from 0.346 to 0.633) has a significant positive impact on Brand Loyalty at the 0.001 level. Moreover, Efficiency Based Business Model Innovation ( $B=0.350$ ,  $C.R.=4.674$ ,  $p<0.001$ , 95% CL = ranges from 0.199 to 0.500) has a significant positive impact on Brand Trust at a significance level of 0.001.

The results show that the estimated total effect is 0.390, and the confidence interval does not include 0. The estimated value of the indirect effect is 0.173, and the confidence interval does not include 0. The proportion of the effect is 44.4% (0.173/0.390). The estimated value of the direct effect is 0.217, and the confidence interval does not include 0. The proportion of the effect is 55.6% (0.217/0.390). The mediating effect of Brand Trust on Brand Loyalty in Efficiency Based Business Model Innovation is significant, and both indirect and inter effects are significant. This indicates that Brand Trust partially mediates Brand Loyalty in Efficiency Based Business Model Innovation, indicating the validity of hypothesis H7.

## Conclusions

Both novelty-based and efficiency-based business model innovations were found to have a significant positive impact on brand loyalty. This suggests that innovative approaches in business models can enhance customer loyalty in the Guizhou hot spring tourism industry. Previous studies have also highlighted that brand innovativeness significantly influences consumer brand loyalty, primarily through perceived quality and satisfaction, indicating that innovative business models can create a competitive edge that fosters loyalty (Pappu & Quester, 2016; Kim, Nicolau, & Tang, 2021).

Similarly, both types of business model innovations significantly influenced brand trust. This indicates that customers perceive novel and efficient business models as trustworthy, which enhances their trust in the brand. Research has shown that business model innovations, particularly those that improve value offerings and revenue models, positively impact brand trust, which in turn enhances customer loyalty (Spieth, Roeth, & Meissner, 2019; Menidjel, Benhabib, & Bilgihan, 2017).

For Novelty Based Business Model Innovation, the total effect on Brand Loyalty was 0.533, with 34.3% being indirect through Brand Trust, and 65.9% being direct. This indicates that while novelty-based innovations significantly enhance brand loyalty directly, a substantial portion of this effect is mediated through the increased trust these innovations engender (Menidjel, Benhabib, & Bilgihan, 2017; Huang, 2017).

For Efficiency Based Business Model Innovation, the total effect on Brand Loyalty was 0.390, with 44.4% being indirect through Brand Trust, and 55.6% being direct. This demonstrates that efficiency improvements in business models not only directly enhance loyalty but also do so significantly by fostering greater brand trust (Spieth, Roeth, & Meissner, 2019; Puspaningrum, 2020).

## Limitations of the Study and Future Research Directions

While the study provides valuable insights into the relationship between business model innovations and brand trust and loyalty, these limitations highlight the need for cautious interpretation and application of the findings. Future research should consider larger and more diverse samples, as well as broader geographic contexts, to enhance the generalizability and robustness of the results.

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Given the limitations of the current study, future research should aim to address these issues to enhance the robustness and applicability of the findings. Some recommendations for future studies include: (1) expanding sample size and diversity; (2) incorporating qualitative methods; (3) exploring longitudinal studies; (4) comparative studies across regions. By addressing these limitations and pursuing these future research directions, the understanding of the impact of business model innovations on brand trust and loyalty in the hot spring tourism industry can be further refined and strengthened. Implementing these recommendations will not only improve the robustness of future studies but also provide richer, more actionable insights for industry practitioners.

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