



## Deciphering Key Factors Impacting Online Hotel Ratings Through the Lens of Two-Factor Theory: A Case of Hotels in the Makkah City of Saudi Arabia

Harman Preet Singh<sup>1\*</sup>, Ibrahim Abdullah Alhamad<sup>1</sup>

<sup>1</sup> Department of Management and Information Systems, College of Business Administration, University of Ha'il, SAUDI ARABIA.

\*Corresponding Author (Emails: [drharmanpsingh@gmail.com](mailto:drharmanpsingh@gmail.com), [h.singh@uoh.edu.sa](mailto:h.singh@uoh.edu.sa))

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Dissatisfiers; PLS-SEM.

### Abstract

This study deciphers the key factors influencing online hotel ratings in religious destinations such as Makkah by utilizing the two-factor theory. Satisfiers and dissatisfiers are two distinct and mutually exclusive factors in the two-factor theory. According to the classification and logic established in the literature, the current study categorizes factors as satisfiers or dissatisfiers. As a result, breakfast, cleanliness, comfort, and facilities are satisfiers, while free Wi-Fi, location, staff, and value for money are dissatisfiers. This study mined the online review data from 172 hotels in Makkah, empirically validated the model using the PLS-SEM method, and found it substantially accurate ( $R^2 = 0.982$ ). This study's findings indicate that both satisfiers and dissatisfiers influence hotels' review scores, but satisfiers have a slightly greater effect than dissatisfiers. The current study contributes to the literature by empirically validating the factors contributing to guest satisfaction and dissatisfaction in the hotel industry, particularly in religious destinations such as Makkah. This study also has practical implications for Saudi Arabia and other countries, as hotels in religious destinations such as Makkah can use this study's findings to boost their hospitality and religious tourism industries.

**Disciplinary:** Business Management and Information Systems, Hotel Management, Tourism and Hospitality.

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# 1 Introduction

Web 2.0 technologies have enabled a flood of user-generated content in travel blogs and online tourist reviews in recent years (Huang et al., 2010). Due to the tourism industry's heavy reliance on the information, Web 2.0 has created enormous opportunities for tourists to collaborate and share information in previously unimaginable ways. Tourists' online travel reviews are a critical component of collaboration and information sharing (Leung et al., 2013).

Nowadays, tourists rely on online reviews to mitigate the risk associated with hotel, restaurant, and attraction site selection. According to a TripAdvisor study, online travel reviews significantly influence booking decisions. According to the study, 72% of travelers read online reviews before choosing a place to stay, eat, or do something. Additionally, the study reports that 81% of travelers consult online reviews before making hotel reservations (TripAdvisor, 2019). Online User Generated Content (UGC) can be a trustworthy and valuable source of information for travelers and hotels due to the increasing acceptance of online reviews. As a result, travel websites that encourage online user-generated content contribute to the spread of electronic word of mouth (e-WOM). With the increase in Internet users and usage (Singh, 2017; Singh, 2018a; Singh, 2018b; Alshammari & Singh, 2018; Singh, 2019; Singh & Alshammari, 2020), E-WOM is now playing a critical role in influencing consumer perceptions.

The hospitality and tourism industries are significant revenue and employment generators globally and contribute to a country's economic and social development. This is particularly beneficial for Saudi Arabia, which has been attempting to boost its religious tourism to increase non-oil revenues as part of its Saudi Vision 2030 program (Saudi Gazette, 2016).

While previous research in religious destinations such as Makkah has focused on the factors that influence online hotel ratings (Alhamad & Singh, 2021a; Alhamad & Singh, 2021b), the application of a theoretical lens to study consumer satisfaction and dissatisfaction in religious destinations remains limited. Herzberg et al. (1959) established a useful theoretical framework in this regard with their two-factor theory. It has been used to study consumer satisfaction, and dissatisfaction in a variety of industries (Swan & Combs, 1976; Maddox, 1981; Johnston, 1995; Babin & Griffin, 1998; Crompton, 2003; Chan & Baum, 2007), but only a few attempts have been made in the hotel industry (Balmer & Baum, 1993). The current study addresses this research gap by utilizing the two-factor theory to decipher the key factors influencing online hotel ratings in religious destinations such as Makkah.

## 2 Theory, Literature, and Hypotheses

### 2.1 Two-Factor Theory

Herzberg et al. (1959) laid the groundwork for the two-factor theory. Herzberg et al. (1959) assert that motivation and hygiene factors influence job satisfaction and performance. Motivational factors are referred to as satisfiers, whereas hygiene factors are referred to as dissatisfiers. Satisfiers and dissatisfiers are mutually exclusive and have varying effects on

workplace motivation. Employees are motivated to work harder and are more satisfied with their jobs when they are satisfied. Dissatisfiers do not cause job satisfaction, their absence results in dissatisfaction. Soliman (1970) further developed Herzberg et al. (1959) theory. He distinguished satisfiers from dissatisfiers as higher-order needs and dissatisfiers from lower-order needs. Zhang & Dran (2000) discovered evidence in website design supporting the two-factor theory. According to the two-factor theory, satisfiers and dissatisfiers each contain a distinct set of factors (Herzberg et al., 1959; Soliman, 1970; Zhang & Dran, 2000). This assumption of the two-factor theory prompted researchers to conduct a thorough examination of online reviews from websites to identify a distinct set of factors contributing to consumer satisfaction and dissatisfaction (Levy et al., 2012; Li et al., 2013).

## **2.2 Application of Two-Factor Theory in Industrial Research**

In industrial research, the two-factor theory has been extensively applied to the study of customer satisfaction and dissatisfaction to demonstrate distinct satisfiers and dissatisfiers (Swan & Combs, 1976; Maddox, 1981; Johnston, 1995; Babin & Griffin, 1998). Certain studies identified the characteristics of the two-factor theory's satisfiers and dissatisfiers. Howard & Crompton (1980) used the two-factor theory to explain how key factors affecting visitors' satisfaction with recreational facility experiences affect their satisfaction. Crompton (2003) developed a conceptual framework for the effects of satisfiers and dissatisfiers on event quality perceptions. Johnston (1995) applied the two-factor theory to banking. Chan & Baum (2007) examined the eco-lodge service industry through the lens of the two-factor theory. Balmer & Baum (1993) applied the two-factor theory to the hotel industry to ascertain customer satisfaction.

## **2.3 Characteristics of Satisfiers and Dissatisfiers Dimensions of Two-Factor Theory**

Numerous studies on the two-factor theory have established that the satisfiers and dissatisfiers are mutually exclusive and independently determined individually (Herzberg et al., 1959; Soliman, 1970; Zhang & Dran, 2000; Levy et al., 2012; Li et al., 2013). The applications of the two-factor theory in various industries have established that the two-factor theory's satisfiers and dissatisfiers are distinct sets of factors (Swan & Combs, 1976; Howard & Crompton, 1980; Maddox, 1981; Johnston, 1995; Babin & Griffin, 1998).

According to Howard & Crompton (1980), satisfiers are psychological characteristics, while dissatisfiers are physical characteristics. Crompton (2003) classified satisfiers as distinctive characteristics and dissatisfiers as infrastructure components. According to Johnston (1995), satisfiers are associated with interpersonal service characteristics, whereas dissatisfiers are associated with operational or physical service characteristics. According to Chan & Baum (2007), satisfiers are intangible elements, whereas dissatisfiers are tangible. Balmer & Baum (1993) defined satisfiers as sophisticated services and dissatisfiers as basic services in the hotel industry.

## 2.4 Satisfiers Factors for Online Hotel Ratings

Balmer & Baum (1993) identified hotels' sense of belonging and flexibility as satisfier. They are regarded as contributing to a pleasant stay at the hotel. Additionally, comfort is a psychological and intangible factor. As a result, we regard comfort as a satisfier.

According to Crompton (2003)'s characteristics, the hotel's location maybe its distinguishing feature. As a result, we regard location as a satisfier.

Balmer & Baum (1993) recognized hotel staff as a satisfier. The hotel staff provides intangible, distinctive, interpersonal, and sophisticated services. As a result, we regard the staff as a satisfier.

Balmer & Baum (1993) determined that hotels' service orientation is more satisfying. Free Wi-Fi provided by hotels can be a good indicator of their service orientation, especially if the connection is of high quality. Additionally, complimentary Wi-Fi is a distinguishing feature and sophisticated service. Thus, we regard complimentary Wi-Fi as a satisfier.

## 2.5 Dissatisfier Factors for Online Hotel Ratings

Balmer & Baum (1993) identified hotel pricing could be a source of dissatisfaction. Pricing is also a fundamental feature. Thus, we regard the value for money (rather than pricing) as a dissatisfier. Balmer & Baum (1993) cited hotel amenities as a source of dissatisfaction. A hotel's facilities could be a fundamental, physical, infrastructure, or tangible feature. As a result, we regard facilities as a dissatisfier.

Balmer & Baum (1993) identified hotel cleanliness as a source of dissatisfaction. Additionally, cleanliness is a fundamental characteristic and a tangible element. As a result, we regard cleanliness as a dissatisfier. Balmer & Baum (1993) classified freebies/extras as dissatisfiers. Free breakfast is a perk/additional service provided by hotels. Breakfast is also a tangible component and a fundamental characteristic. As a result, we regard it as dissatisfier.

## 2.6 Conceptual Model and Hypotheses

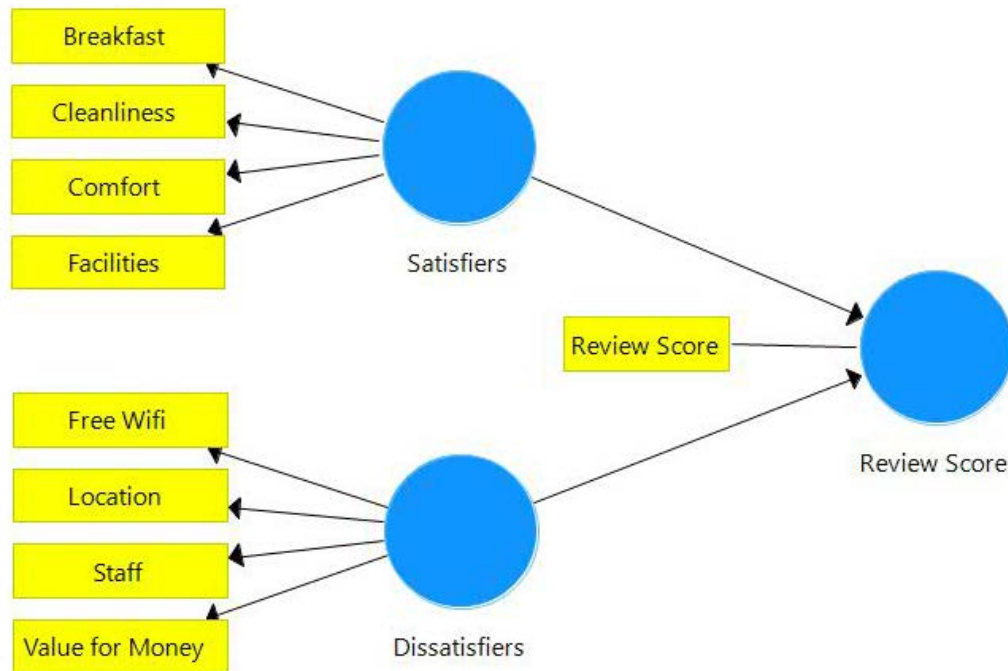
Building on sections 2.4 and 2.5, we build the conceptual model for this study. Figure 1 presents the conceptual model for the study.

As per the conceptual model in Figure 1, the satisfiers and dissatisfiers are:

- Satisfiers: breakfast, cleanliness, comfort, and facilities.
- Dissatisfiers: free Wi-Fi, location, staff, and value for money.

Based on the conceptual model, we propose the following hypotheses:

- H1: Satisfiers have a positive and significant impact on the review score
- H2: Dissatisfiers have a positive and significant impact on the review score



**Figure 1:** Conceptual Model of the Study.

### 3 Research Methodology

We mined online review scores for hotels in Makkah for this study from the popular website Booking.com. Booking.com's platform provides overall ratings for the hotel properties listed on it. Consumers' overall ratings of hotels are the dependent variable in this study. As we hypothesized that the satisfiers and dissatisfiers influence overall hotel ratings, they are treated as independent variables.

Four indicator variables are used to quantify the satisfiers dimension: breakfast, cleanliness, comfort, and facilities. These indicator variables measure the latent independent variable: satisfiers.

Four indicator variables are used to quantify the dissatisfiers dimension: free Wi-Fi, location, staff, and value for money. These indicator variables measure the latent independent variable: dissatisfiers.

#### 3.1 Data Preparation

The data for one dependent variable and eight indicator variables are presented as unambiguous numerical ratings. As a result, rating data for dependent and indicator variables for 172 hotels in Makkah were mined from Booking.com. There were some missing values in the breakfast and free Wi-Fi indicators, which were assigned the value 0.

#### 3.2 Variables

Two independent, one dependent, and eight indicator variables comprise the dataset used in this research. Table 1 depicts the variables used in this study.

**Table 1: Variables of the Research**

Variable Name	Definition
<i>Dependent Variable</i>	
Review Score (RS)	Consumers online overall aggregated numerical rating of the hotels
<i>Independent Variables</i>	
Satisfiers	The latent independent variable measured by reflective indicator variables: breakfast, cleanliness, comfort, and facilities
Dissatisfiers	The latent independent variable measured by reflective indicator variables: free Wi-Fi, location, staff, and value for money
<i>Indicator Variables</i>	
Breakfast (BR)	Consumers' aggregated numerical rating of hotels' breakfast on Booking.com
Cleanliness (CL)	Consumers' aggregated numerical rating of hotels' cleanliness on Booking.com
Comfort (CO)	Consumers' aggregated numerical rating of hotels' comfort on Booking.com
Facilities (FA)	Consumers' aggregated numerical rating of hotels' facilities on Booking.com
Location (LO)	Consumers' aggregated numerical rating of hotels' location on Booking.com
Staff (ST)	Consumers' aggregated numerical rating of hotels' staff on Booking.com
Value for Money (VM)	Consumers' aggregated numerical rating of hotels' value for money on Booking.com
Free Wi-Fi (FW)	Consumers' aggregated numerical rating of hotels' free Wi-Fi on Booking.com

## 4 Evaluation Results of PLS-SEM Model

We use SMART PLS software v.3.2.8 to conduct our analyses. Partial Least Squares Structural Equation Modeling (PLS-SEM) is developed in two stages. The first stage evaluates the measurement (or outer model). If the results of stage 1 are satisfactory, stage 2 evaluates the structural (or inner) model (Hair et al., 2016).

### 4.1 Reflective Measurement Model Evaluation Results

In stage 1, the internal consistency and reliability of a reflective measurement or outer model are evaluated (Sarstedt et al., 2014). Individual indicator reliability, internal consistency reliability (using composite reliability), convergent validity (using outer loadings of the indicators and/or average variance extracted (AVE)), and discriminant validity (using Fornell-Larcker criterion and/or cross-loadings) are among the specific measures (Henseler et al., 2014; Sarstedt et al., 2014; Hair et al., 2016).

To determine the reliability of individual indicators, we examine their loadings. Loadings greater than 0.7 indicate that the construct accounts for more than 50% of the variance in the indicator (Sarstedt et al., 2014). The outer loadings of all the indicators are above the threshold of 0.7, so the indicator reliability is established (Table 2).

Next, we evaluate the constructs' internal consistency reliability using the measure of composite reliability  $\rho_c$ , following Jöreskog (1971). Composite reliability values between 0.6 and 0.7 are acceptable in exploratory research, whereas values between 0.7 and 0.9 are considered satisfactory (Nunnally & Bernstein, 1994). The composite reliability values of satisfiers (0.860) and dissatisfiers (0.804) show that both reflective constructs have a high level of internal consistency reliability (Table 2).



Next, we examine the convergent validity of the reflectively measured constructs. The presence of an average variance explained (AVE) value greater than 0.5 indicates that the construct accounts for more than half of the variance in the indicators (Hair et al., 2016). AVE values of satisfiers (0.704) and dissatisfiers (0.857) demonstrate a high level of convergent validity.

Lastly, we examine the discriminant validity of the reflectively measured constructs. For this, we use the Fornell-Larcker criterion (Fornell & Larcker, 1981) and examine the indicators' cross-loadings (Hair et al., 2011). According to the Fornell-Larcker criterion, a construct should not have a shared variance greater than its AVE value with any other construct. The results indicate that the square root of the AVE for the reflective constructs satisfiers (0.926) and dissatisfiers (0.839) is greater than their correlations with other latent variables in the path model. The cross-loading results indicate that all indicators have a higher loading value with their corresponding construct but have significantly lower cross-loadings with other constructs. So, discriminant validity is established (Table 2).

Since the evaluation of the reflective measurement model is successful, so we proceed to stage 2.

**Table 2: Reflective Measurement Model Summary Results**

Latent Variable	Indicators	Loadings	Indicator Reliability	Composite Reliability	AVE	Discriminant Validity
Satisfiers	Breakfast	0.795	0.632	0.860	0.704	Yes
	Cleanliness	0.960	0.922			
	Comfort	0.967	0.935			
	Facilities	0.969	0.939			
Dissatisfiers	Free WiFi	0.707	0.500	0.804	0.857	Yes
	Location	0.856	0.733			
	Staff	0.932	0.869			
	Value for Money	0.846	0.716			

## 4.2 Structural Measurement Model Evaluation Results

In stage 2, we examine the structural model predictive capabilities and the relationships between the constructs. So, we conduct the following assessments: structural model collinearity issues, relevance and significance of the structural model relationships, level of coefficient of determination ( $R^2$ ), effect sizes  $f^2$ , and cross-validated redundancy (Stone-Geisser's  $Q^2$ ) (Sarstedt et al., 2014).

We apply the tolerance and Variance Inflation Factor (VIF) measures to assess structural model collinearity issues. Collinearity is defined as a tolerance level of less than 0.2 (VIF greater than 5) in the predictor constructs (Hair et al., 2016). Table 3 shows that all VIF values are below the threshold of 5. Thus, collinearity among the constructs is not an issue in the structural model.

**Table 3: Assessment of Collinearity**

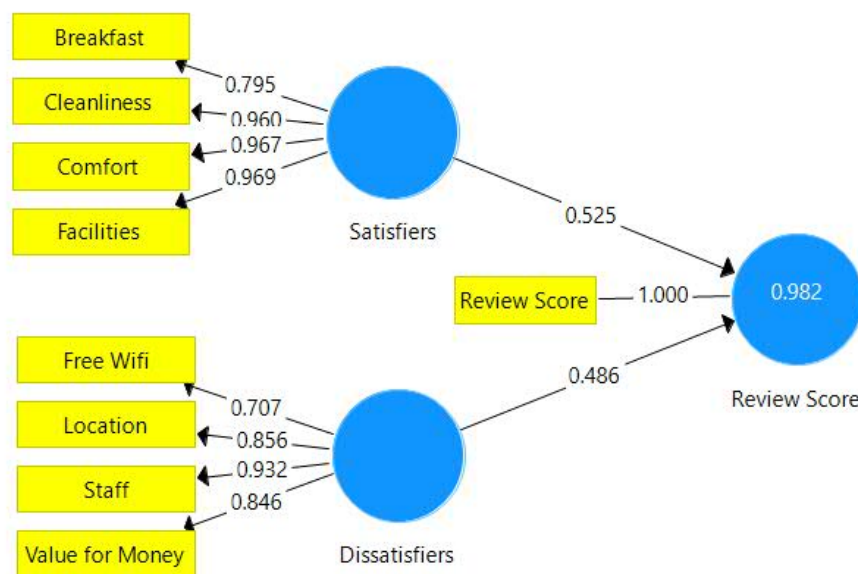
Constructs	VIF
Satisfiers	2.649
Dissatisfiers	2.754

The structural model relationships are then examined using path coefficients to represent the hypothesized relationships between the constructs. By convention, path coefficients with standardized values greater than 0.2 are considered significant, whereas those with less than 0.1 are considered insignificant (Hair et al., 2016). The path and PLS-SEM estimates model (Figure 2) depicts satisfiers (0.525) and dissatisfiers (0.486) both have a moderate significance in predicting the review score (Hair et al., 2016). Therefore, the path coefficients between satisfiers & review scores and dissatisfiers & review scores are significant. We confirm this using the bootstrapping procedure. The significant testing results for the path coefficients based on the bootstrapping procedure are shown in Table 4.

**Table 4: Significant Testing Results of the Path Coefficients of the Structural Model**

	Path Coefficients	t value	p value	95% Confidence Intervals
Satisfiers -> Review Score	0.525	15.624	0.000	[0.452, 0.583]
Dissatisfiers -> Review Score	0.486	14.910	0.000	[0.429, 0.557]

The bootstrapping results at a 5% significance level show that both satisfiers and dissatisfiers significantly impact the review score (Table 4). Therefore, both **hypotheses H1 and H2 are supported**. Further, the scores of the structural model path coefficients show that satisfiers (0.525) are marginally more important than dissatisfiers (0.486) in influencing the review score. So, the effect of the satisfiers on the endogenous latent variable (review score) is marginally higher than the dissatisfiers.



**Figure 2: Path and PLS-SEM Estimates Model**

The structural model results show that the two constructs' satisfiers and dissatisfiers explain 98.2% variance of the endogenous construct, review score ( $R^2 = 0.982$ ). Therefore, the model's predictive accuracy is substantial (Hair et al., 2011; Henseler et al., 2009).



Next, we compute the effect sizes  $f^2$  values. The values of  $f^2$  for satisfiers (0.452) and dissatisfiers (0.355) can be considered large (Cohen, 1988).

Stone-Geisser's  $Q^2$  is a measure of the model's predictive relevance (Geisser, 1974; Stone, 1974). The blindfold procedure for a certain omission distance (D) is used to obtain the  $Q^2$  value (Henseler et al., 2009). As per the recommendation of Hair et al. (2012), the D should be between 5 and 10. Also, the number of observations used in the model divided by D should not be an integer (Hair et al., 2016). Since our total observations are 172, so we choose an omission distance of 7.  $Q^2$  values greater than zero indicate that the exogenous constructs are predictive of the endogenous construct being considered (Hair et al., 2016). Using the blindfolding procedure, the  $Q^2$  value of the endogenous latent variable (review score) is 0.961. This implies that the model has high predictive relevance for the endogenous construct, review score (Figure 2).

## 5 Conclusion

This study applies the two-factor theory to elucidate the critical factors influencing online hotel ratings. The PLM-SEM method is used to analyze the online rating data from 172 hotels mined via Booking.com to accomplish the research objective. The reflective measurement model evaluation results establish the path model's reliability (indicator and internal consistency) and validity (convergent and discriminant). The structural measurement model assessment results demonstrate that the path model had high predictive accuracy and confirmed this study's twin hypotheses. Thus, the study establishes and empirically validates that breakfast, cleanliness, comfort, and facilities are satisfiers, whereas free Wi-Fi, location, staff, and value for money are dissatisfiers. This confirms previous research indicating that satisfiers and dissatisfiers are unique and mutually exclusive (Herzberg et al., 1959; Soliman, 1970; Zhang & Dran, 2000; Levy et al., 2012; Li et al., 2013). Also, the study's findings broaden the application of the two-factor theory to the hotel industry in general and religious tourism destinations such as Makkah in particular.

Additionally, the study's findings indicate that satisfiers are marginally more influential on the review score than dissatisfiers. Thus, hotels (particularly those in religious destinations) can place a greater emphasis on satisfiers than on dissatisfiers to improve their online ratings. This should enable them to increase consumer trust and confidence (Singh & Agarwal, 2011; Singh & Grover, 2011; Singh et al., 2011a; Singh, 2018c) and thus increase consumer satisfaction (Singh, 2011; 2013; 2016; Singh et al., 2011b; 2015).

The research findings have significant theoretical and practical implications. Applying the two-factor theory to the hotel industry encourages hotels to prioritize both satisfiers and dissatisfiers. As a result, we recommend that hotels consider and prioritize additional factors that could be viewed as either satisfiers or dissatisfiers. However, based on the study's findings, the emphasis should be increased on satisfiers. The study's findings have significant implications for Saudi Arabia's hotel industry, particularly in religious destinations such as Makkah. On the other hand, other countries can use the study's findings to boost their tourism and hotel industries.

## 6 Availability of Data and Materials

On request, the corresponding author can make available the data and materials used in this study.

## 7 Acknowledgements

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**Dr. Harman Preet Singh** has held faculty/research positions at the University of Delhi (India), Fayetteville State University (USA), the University of Warwick (UK), the University of Warsaw (Poland), Debre Berhan University (Ethiopia), and the University of Ha'il (Saudi Arabia). He has authored two books, 34 research papers, 20 papers in proceedings of conferences, nine edited book chapters, and a case study. He is especially interested in data mining, cybersecurity, IT governance, e-Learning, Strategic Management, and Supply Chain Management.



**Dr. Ibrahim Abdullah Alhamad** is Dean of the College of Business Administration, University of Ha'il, Saudi Arabia. Among his published works is the article "Professional or interactive: CEOs' image strategies in the microblogging context," which appeared in the prestigious journal "Computers in Human Behavior." His research interests include Consumer Behavior, Microblogging, Marketing Management, and Online Product Reviews.