

Web-Based Self-Service Technology, Customer Satisfaction and Customer Loyalty in the Green Hotels: Guiding the Way to Sustainable Tourism.

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ABSTRACT

This research looks at the green hotel experiences (WBSST) as the antecedents of customer loyalty to Malaysia's green hotels. WBSST allows green hotels to initiate contacts with customers and respond to their needs proactively. Customers enable to quickly access the services they want online, at any time and place, thus enhancing overall service efficiency. Data from 208 green hotel customers were analyzed using Structural Equation Modeling with Partial Least Squares (i.e., PLS-SEM) through a self-administered structured questionnaire. The findings revealed that: (1) integration of standardization and customization of service offerings is critical for improved service quality; (2) standardization has a higher impact on service quality when compared to customization; (3) functional quality has a more significant influence on customer satisfaction rather than technical quality; and (4) customer satisfaction has a significant effect on customer loyalty in green hotels.

KEYWORDS: Web-Based Self-Service Technology, Customer Satisfaction, Customer Loyalty Green Hotels

I. INTRODUCTION

Hotels are a vital element of the tourism industry. Hotels are the most common accommodation for tourists, and the hotel industry is intricate to tourism. An academic literature review indicates that very few studies have analyzed the environmental dimension of sustainability of hotels in Malaysia even though existing research is increasingly focused on tourism sustainability. The environmental division is indeed an essential facet of the Malaysian tourism industry. This paper presents Web Based Self Service Technology (WBSST) findings and customer loyalty in Malaysia green hotels. The propagating use of the Internet and the development of cloud computing have changed our lifestyles and have impacted how the green hotel industry relates with its customers. WBSST has been integrating into today's service industry. Understanding how customers perceive WBSST and improving its quality is crucial for both researchers and practitioners. According to (Meuter et al., 2000) customers interact with firms to create service outcomes. Given that the academic literature's emphasis has focused significantly on service encounters' interpersonal dynamics, there is much to be learned about customer interactions with technology-based self-service delivery options. Technology replaces human service through self-service technology (SST), and this wave crosscuts every industry nowadays. SST refers to technological interfaces that allow customers to access services independent of direct service employee involvement (Meuter et al., 2000). The key driver behind the introduction and adoption of WBSST is cost savings (de Leon et al., 2020). The customer-centric feature of WBSST was appreciated to allow selections and customizations of products and personalize their consumption experience (Niininen et al., 2007). The fourth industrial revolution evolving in the hospitality industry at an exponential pace and was characterized by technological revolution with the breakthrough in robotics, artificial intelligence, the Internet of things, and many more. Moreover, the third industrial revolution has transformed agricultural societies into industrial and then into service-based organizations (Shiwen et al., 2021). Hospitality and Tourism studies have highlighted enhancing WBSST, service quality, customer satisfaction, and customer loyalty results in corporate achievement and competitive advantage (Hamid, Ong, Razak, Ismail, et al., 2020). Consequently, studies for enhancing service quality, customer satisfaction, and customer loyalty in green hotels must be done for more explicit guidance. However, (Hamid, Ong, Razak, Jamil, et al., 2020) presented that studies on WBSST have tended to focus on adoption. It is significant to inspect WBSST from service quality, customer satisfaction, and customer

loyalty relationships, an approach rarely observed in current literature. This study utilized the five dimensions of delivering quality service by (Berry et al., 1988). The SERVQUAL scale is a survey instrument that claims to measure the service quality in any service organization on five dimensions: tangibles, reliability, assurance, responsiveness, and empathy (Berry et al., 1988). The SERVQUAL was used as a scale to analyze the influence of the service quality of WBSST on customer satisfaction and loyalty (Chee, 2019). As such, when a firm delivers service quality that meets or exceeds customers' expectations, the possible result will be customer satisfaction and loyalty. (Famiyeh et al., 2018) argue that service quality determines whether the consumer ultimately remains with the company (loyalty) or defects to a competitor. Thus, a service organization's long-term success is essential to decide on its ability to expand and maintain a large and loyal customer base (Li, 2020) through service quality that meets or exceeds customer expectations. This study's outcome can be a reasonable basis for green hotel industry information in monitoring their services and improve their service quality.

II. LITERATURE REVIEW

Measuring Service Quality Scale (SERVQUAL) : The SERVQUAL scale is a survey instrument that claims to measure the service quality in service organizations using five dimensions: tangibles, reliability, assurance, responsiveness, and empathy (Berry et al., 1988). The SERVQUAL scale was developed by (Berry et al., 1988) in 1985 and refined in 1988, 1991, and 1994. The outcome from a one-off study is a measure that tells the company whether its customers' expectations are exceeded or not. SERVQUAL results are merely to identify which components of service the company is particularly good or bad. In monitoring service quality over time, it is good to compare performance with that of competitors, compare performance between different branches within a company, or measure customer satisfaction within a particular service industry. Irrespective of the wide acceptance and application of the SERVQUAL scale, its disconfirmation approach has been keenly contested. (Cronin et al., 2000a) believe that the conceptualization of service quality as a gap between expectations and performance is inadequate. They argue that service quality should be customers' attitude towards the service since the concept of satisfaction is defined as a gap between expectations and performance or disconfirmation of expectations. An attitude-based conceptualization would argue for either an importance-weighted evaluation of specific service attributes (Cronin et al., 2000b). They suggested that service quality is measured by performance-only measures (SERVPERF). Though (Cronin, J., Taylor, 1992) never altered the five dimensions of the SERVQUAL, they believe that perceptions only are better predictors of service quality. (Cronin, J., Taylor, 1992) meant that the SERVQUAL scale's expectations component must be separated instead of simultaneously using both performance and expectation components. Therefore, (Ladhari, 2009) argue that the SERVQUAL scale will explain a more significant variance in the overall service quality with a single-item scale.

Some academics argue otherwise it is generic to measure service quality using SERVQUAL (see, e.g., (Asubonteng et al., 1996; Cronin et al., 2000a, 2000b; Ladhari, 2009), cross-research area findings indicate that the scale is also country-specific. Therefore, (Ma, 2007) argued that empirical results concerning facets of service quality indicate acceptance of the SERVQUAL dimensions, subject to additional dimensions that emanate from industry-specific contexts. Similarly, (Cronin, J., Taylor, 1992; Ladhari, 2009) all argued that an important aspect needed for different service settings is a modification of the instrument. (Babakus & Mangold, 1992) argue that significant wording changes in the SERVQUAL scale may be the only necessary input for individual service settings. Within Asia, service quality researchers that based their studies on the SERVQUAL have mostly demonstrated that the dimensional structure and the item assignment are not always generic as contended by its originators. Whereas (Carman, 1990) identified three dimensions of service quality: reliability, interaction quality, and tangibles. (Debata et al., 2015) found that reliability, responsiveness, and tangibles are three important attributes of service quality in China's fast food industry. Still, (Etemad-Sajadi & Rizzuto, 2013) also found that five dimensions of SERVQUAL were found within the Chinese fast-food industry. (Cronin, J., Taylor, 1992) identified customer-focused quality, tangibles, delivery quality, communication quality, and customer care quality as the service quality dimensions within the South African vehicle servicing sector. Within the healthcare service context in Japan (ep Koubaa Eleuch, 2011), SERVQUAL is a three-dimensional construct comprising staff behavior when delivering services, technical quality, and physical appearance. Given these research pieces of evidence, the scale's dimensional structure tends to be context-specific and varies across studies. (Santouridis & Trivellas, 2010) Consequently, the debate on service quality is still far from complete, and there is always an avenue for a potential contribution to service quality literature. On this critical note, it becomes timely and necessary to guide service industries within specific contexts, especially non-western settings, on the dimensions of service quality to stress most.

Customer Satisfaction : The academic literature posits that customer satisfaction is has been the focus of researchers in different related disciplines, including marketing, information systems, and management studies. Thus, customer satisfaction is essential in maintaining customers' loyalty and other favorable behaviors

(Santouridis & Trivellas, 2010). Customer satisfaction is a level of feeling where someone declares the result of a comparison between customers' expectations and the actual performance of a product or service [(Meuter et al., 2000)]. Meanwhile, (Tam, 2000) outlined that customer satisfaction is crucial through customer service selection. In general, customer satisfaction is the customer estimations or beliefs on what will be received or consumed from the products of goods or services. According to (Cronin et al., 2000a; Meuter et al., 2000), satisfaction is a positive and effective state resulting from the appraisal of all aspects of a party's working relationship with another. Customer satisfaction relates to factors such as service/product/industry quality, customers' emotion, price, and service delivery time. In the hotel service industry, customers' satisfaction is an essential dimension through hospitable environments and employees (Ong et al., 2019; Rasidah et al., 2018), standardized housekeeping services, room services, delicious meals, and so on. Consequently, customer satisfaction must be a strategic target for hotels to grow and continue to exist in a very competitive industry. Customer satisfaction can set the direction, encouragement, and motivational purpose for hotels to be innovative, competitive, and maintain excellent performance (Rasidah et al., 2018).

Customer Loyalty : As the hotel industry continues to attract investors both locally and internationally, the number of hotels grows sporadically. Therefore, maintaining customer loyalty is crucial and challenging as alternative hotel services consistently emerge. However, when customers feel satisfied with a hotel's services, they are likely to be loyal and remain with the hotel. According to (Famiyeh et al., 2018), customer loyalty refers to customers' positive mindset and favorable attitudes toward a company to show their commitment to repurchase its service and recommend the service to others. Therefore, customer loyalty is an indication of favorable customer attitudes and positive behaviors. Customer loyalty somehow become a focus of every serious organization because it defines consumers' willingness to repurchase and recommend a product and service. For the hotel service industry, loyal customers may revisit and recommend a hotel to other prospective patrons (Chee, 2019; Shahid Iqbal et al., 2018). Besides, customer loyalty has been explained through customers' commitment to pay a price premium (Kandampully et al., 2015). Customer loyalty has to function in previous studies as both behavioral and attitudinal factors (Famiyeh et al., 2018). Attitudinal loyalty weighs customers' favorable inclination towards a service relative to other firms offering the same service (Chee, 2019). Customers with attitudinal loyalty anticipate defecting when they found an alternative service with better quality and lesser price. Meanwhile, behavioral loyalty cites customers' strong commitment to purchasing the product/service despite the availability of alternatives in the market (Chee, 2019). In general, both attitudinal and behavioral loyalty means customers' willingness, commitment (and readiness to purchase, repurchase, and recommend a service to others. Therefore, this study considers customer loyalty as a combination of attitudinal and behavioral loyalty.

III. METHODOLOGY

Quantitative analysis and survey methodology were used in this study as suggested by (Creswell, 2012; J. F. Hair et al., 2017) since this study wanted to investigate the effect of targeted latent constructs quantitatively (i.e., structured questionnaire). A total of 208 respondents agreed to participate in this study where they were selected by using a convenience sampling technique. The survey was collected using a face-to-face data collection method to ensure they answered all the structured questionnaire questions. Structural Equation Modeling with Partial Least Squares (i.e., PLS-SEM) estimation multivariate data technique was successfully utilized for this study. Since the sample size for this study can be considered as relatively small ($n < 300$) and the researcher intends to explore the conceptual framework of this study simultaneously (Fornell & Larcker, 1981; J. F. Hair et al., 2017; Hair Jr et al., 2016a). The significance test in this PLS-SEM analysis was computed using the Bootstrapping method, where this method can be considered more robust compared to the conventional t-test method (Joe F. Hair et al., 2011; Hair Jr et al., 2016b). Therefore, 5000 replications of samples were computed as suggested by (Hair Jr et al., 2016b) for getting reliable results for empirical t-statistics and Bias Corrected (i.e., BCa) bootstrap. In term of measuring the effect of mediating, (Joe F Hair et al., 2014) suggested to test the significance of the indirect effect coefficient via bootstrapping and as for deciding the mediating effect, (Joe F. Hair et al., 2012; Henseler et al., 2016) suggests that:

- 1) If the independent variable's path to the dependent variable was not significant and the indirect effect is substantial, the mediating effect was a full mediation effect.
- 2) If the independent variable's path to the dependent variable was significant and the indirect effect is significant, the mediating effect was a partial mediation effect.

IV. DATA ANALYSIS

Measurement Model Analysis : Table 1 indicated that all items used for measuring the targeted variables in the measurement model were meet the minimum threshold value of .70 factor loading (Joseph F Hair et al., 2012). Besides that, the Average Variance Explain (i.e. AVE) for each construct was above .50 (J. F. Hair et al., 2017).

Both reliability tests (i.e. Composite Reliability and Cronbach's Alpha) for each targeted construct were also above .70 (J. F. Hair et al., 2017; Joseph F Hair et al., 2012). Therefore, it confirms that each variable at this measurement model can be considered to have an optimal uni-dimensionality validity (J. F. Hair et al., 2017).

Table 1: Convergent Validity for Measurement Model

Indicator	Loading	AVE	γ	α
Tangible				
The service process of the firm's self-service technology is clear (TAN1)	.792**	.647	.880	.818
The firm's self-service technology is up-to-date technology (TAN2)	.838**			
The layout of the firm's self-service technology is esthetically appealing (TAN3)	.842**			
The service process of the firm's self-service technology is error-free (TAN4)	.749**			
Reliability				
When I have a problem with this self-service technology, the firm's employee shows a sincere interest in solving it (REA1)	.863**	.709	.907	.862
The firm's self-service technology provide me with all relevant information (REA2)	.879**			
The firm's self-service technology employee is dependable (REA3)	.821**			
When I have problems regarding this self-service technology, the firm's employee is sympathetic and reassuring (REA4)	.802**			
Responsiveness				
The firm's employee keeping informed me about when self-service technologies will be performed (RES1)	.861**	.744	.921	.885
The firm's employee always willing to help me regarding this self-service technology (RES2)	.889**			
The firm's employee always ready for responding to my inquiries regarding this self-service technology (RES3)	.848**			
The firm's employee is never too busy for responding to my inquiries regarding this self-service technology (RES4)	.853**			
Assurance				
The firm providing the self-service technologies is well-known (ASS1)	.782**	.623	.868	.803
The firm providing self-service technologies has a good reputation (ASS2)	.829**			
I feel safe in my transactions with the firm's self-service technologies (ASS3)	.768**			
A clear privacy policy to indicate the firm's self-service technologies (ASS4)	.784**			
Empathy				
The self-service technology has operating hours convenient to me (EMP1)	.798**	.576	.844	.754
The firm's self-service technology has features that personalized for me (EMP2)	.775**			
It is easy and convenient to use a firm's self-service technology (EMP3)	.723**			
The firm's self-service technology understands my specific needs (EMP4)	.738**			
Satisfaction				

Overall, I am satisfied with the self-service technologies offered by the firm (SAT1)	.841**	.712	.881	.798
The self-service technologies offered by the firm exceed my expectations (SAT2)	.848**			
The self-service technologies offered by the firm are close to my idea (SAT3)	.844**			
Loyalty				
I would use this self-service technology again (LOY1)	.782**	.578	.872	.817
I would recommend this self-service technology to any of my friends (LOY2)	.807**			
If I need to use them again, I will come to the self-service technologies (LOY3)	.753**			
I would speak positively about this self-service technology to others (LOY4)	.728**			
This self-service technology is my preferred choice (LOY5)	.727**			

Note: AVE = Average Variance Explained; γ = Composite Reliability; α = Cronbach's Alpha; **p <.01.

As for this measurement model's discriminant validity, Table 2 indicated that each latent variable was totally discriminate to each other since each HTMT ratio value was below .90. Hence, the group of items used to measure specific latent constructs measured the targeted latent construct (Henseler et al., 2015).

Table 2: HTMT Discriminant Analysis for Measurement Model

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	-						
(2)	.473**	-					
(3)	.313**	.331**	-				
(4)	.111**	.191**	.587**	-			
(5)	.177**	.401**	.472**	.797**	-		
(6)	.515**	.465**	.572**	.502**	.578**	-	
(7)	.516**	.581**	.428**	.528**	.703**	.625**	-

Note: (1) = Tangible; (2) = Reliability; (3) = Responsiveness; (4) = Assurance; (5) = Empathy; (6) = Satisfaction; (7) = Loyalty; **p <.01.

Structural Model Analysis : The structural model analysis indicated that tangible, reliability, responsiveness, assurance, and empathy could simultaneously explain around 42% of variance explained toward the Satisfaction mediator latent construct. The research also revealed that, in the same way, all these five variables of service quality with Satisfaction mediator latent construct could explain about 50.9% of variance explained toward Loyalty endogenous latent construct. Table 3 indicated that all paths have a small effect size and weak predictive relevance effect in terms of effect size and predictive relevance analysis.

Table 3: Structural Model for Measurement Model

Path	β	t-statistic	p-value	95% Bootstrap BCa	f^2	q^2	Remark
TAN → SAT	0.277	5.713**	<.01	(0.178, 0.367)	.106	.091	Small
REA → SAT	0.122	2.054*	.040	(0.003, 0.235)	.019	.007	Small
RES → SAT	0.224	3.027**	.002	(0.074, 0.365)	.058	.025	Small
ASS → SAT	0.145	2.061*	.039	(0.004, 0.276)	.018	.008	Small
EMP → SAT	0.194	2.996**	.003	(0.060, 0.314)	.036	.017	Small
SAT → LOY	0.134	2.056*	.040	(0.009, 0.264)	.021	.013	Small
TAN → LOY	0.251	4.790**	<.01	(0.149, 0.354)	.092	.084	Small
REA → LOY	0.224	4.495**	<.01	(0.124, 0.322)	.075	.069	Small
RES → LOY	-0.023	0.411 (NS)	.681	(-0.130, 0.089)	.001	.001	Small
ASS → LOY	0.156	2.579*	.010	(0.040, 0.275)	.025	.014	Small
EMP → LOY	0.293	5.316**	<.01	(0.181, 0.394)	.095	.086	Small

Note: TAN = Tangible; REA = Reliability; RES = Responsiveness; ASS = Assurance; EMP = Empathy; SAT = Satisfaction; LOY = Loyalty; NS = Not Significant; β = Standardized Beta Coefficient; f^2 = Effect Size; q^2 = Predictive Relevance; ^aThe bootstrap samples was 5000 samples; *p <.05; **p <.01.

As for the structural path analysis, Table 3 shows that all respective paths have a statistically positive significant influence at a minimum 95% confidence level except for the RES → LOY path. All the t-statistic values were above the 5% level of significance, which is t-statistic >1.96. Besides that, by referring to the BCa Bootstrapping confidence interval analysis, the analysis also aligns with the t-statistical research. The 95% confidence interval did not consist of the value zero except for the RES → LOY path.

Mediating Analysis : The mediating analysis reported at Table 4 indicated that satisfaction statistically simultaneously mediated the relationship between TAN → LOY, REA → LOY, RES → LOY, ASS → LOY, and EMP → LOY. The indirect effect coefficient was significantly at 5% level of error (t-statistics > 1.96) as well as the 95% BCa Bootstrapping confidence interval did not include the zero value. Since the direct effect of TAN → LOY, REA → LOY, ASS → LOY, and EMP→LOY were statistically significant. Hence these four mediating paths can be considered partially mediated. In contrast, as for the mediating path RES → SAT → LOY, this mediating path can be categorized as fully mediated since the direct path of RES → LOY was not statistically significant. Figure 1 and Figure 2 shows the results of an analysis using PLS-SEM theory.

Table 4: Indirect Effect for Structural Model

Indirect Path	IEC	t-statistic	p-value	95% BCa Bootstrap	Direct Path
TAN → SAT→ LOY	0.037	2.561*	.011	(0.012, 0.103)	TAN → LOY**
REA → SAT→ LOY	0.016	2.095*	.037	(0.004, 0.097)	REA → LOY**
RES → SAT→ LOY	0.030	2.507*	.013	(0.017, 0.111)	RES → LOY (NS)
ASS → SAT→ LOY	0.019	2.106*	.036	(0.013, 0.109)	ASS → LOY*
EMP → SAT→ LOY	0.026	2.413*	.016	(0.015, 0.101)	EMP → LOY**

Note: TAN = Tangible; REA = Reliability; RES = Responsiveness; ASS = Assurance; EMP = Empathy; SAT = Satisfaction; LOY = Loyalty; IEC = Indirect Effect Coefficient; NS = Not Significant; **p <.01; *p <.05.

V. CONCLUSIONS

The analysis indicated that if the average level of Tangible were high, it would increase the average level of satisfaction. In the same situation, the research also indicated that when the average level of Reliability, Responsiveness, Assurance, and Empathy was also high, then the average level of satisfaction should also be high. Simultaneously, the analysis also indicated that if the average level of Tangible, Reliability, Assurance, and Empathy were high, then the average level of loyalty should also be high. However, the analysis indicated no change at the Loyalty level for the responsiveness when there is an increased or decreased situation level toward the Responsiveness factor. Besides that, if the average level of satisfaction were high, it would also increase the average level of loyalty. For the mediating effect, if the average level of Tangible, Reliability, Responsiveness, Assurance, and Empathy were high, it will increase the average level of satisfaction, hence simultaneously, the mediator latent construct, which is satisfaction, will indirectly increase the average level of loyalty. This study's contribution is developing an integrated framework to analyze the roles of standardization and customization on service quality. This research concluded that if the quality of the given service according to member's expectations increases the member's satisfaction. Similarly, the results showed the positive effect of customer satisfaction on customer loyalty for WBSST. The study also shows a significant mediation effect of customer satisfaction on SERVQUAL and customer loyalty in WBSST. Therefore, the proposed model helps the hotel operator develop their customer in the WBSST service development program to enhance customer satisfaction and loyalty to increase the industry's profitability.

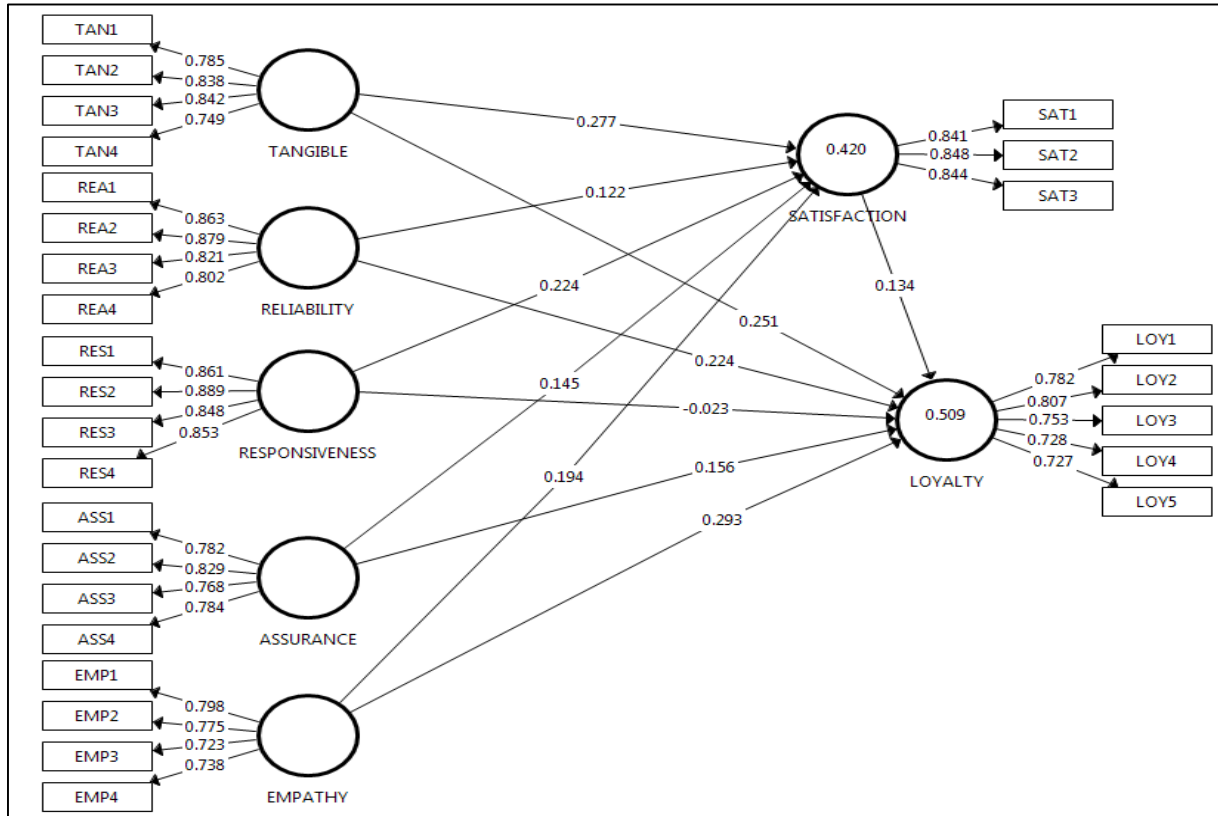


Figure 1: PLS SEM Analysis Output for Loading and Path Coefficient Values

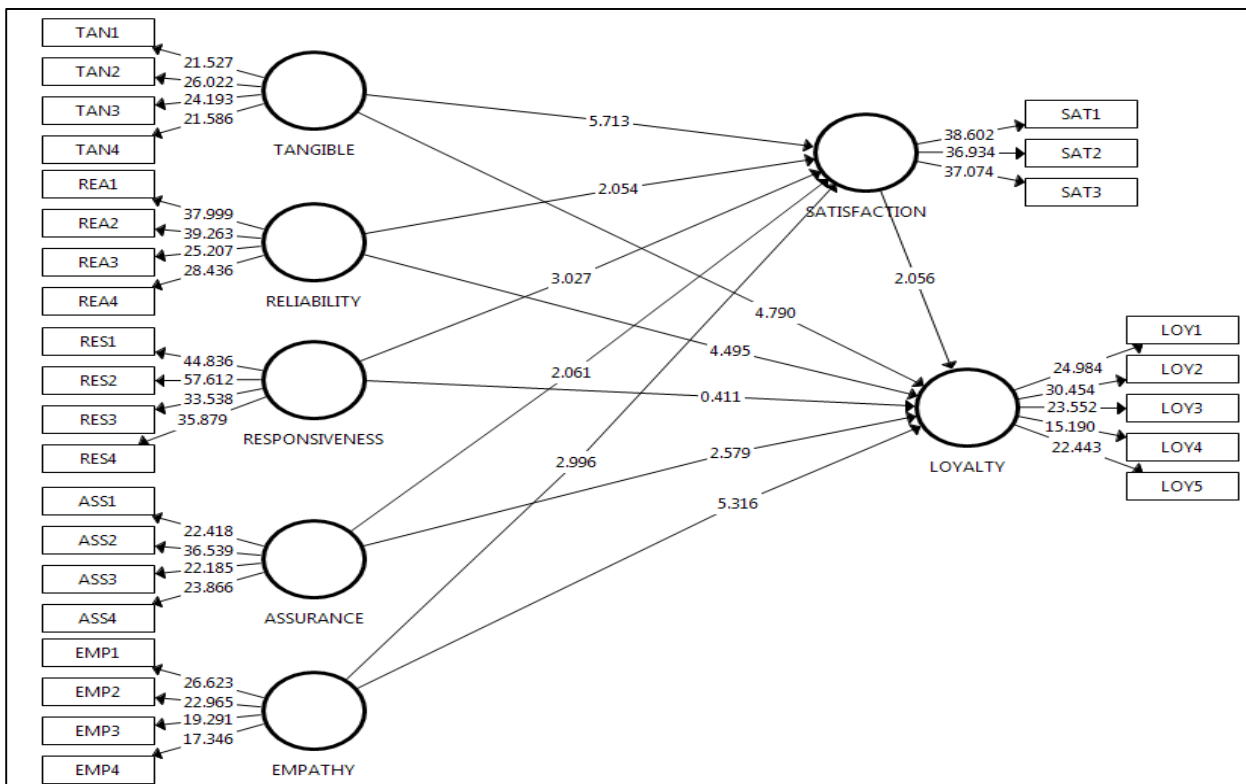


Figure 2: PLS SEM Analysis Output for t-statistic values via Bootstrapping Analysis

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