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Eco-Innovative Museums and Visitors' Perceptions of Corporate Social Responsibility

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Abstract: This study assumes that green technologies at tourist destinations are a part of corporate social responsibility (CSR). It investigates how technology-based eco-innovation is related to sustainable development goals (SDGs) and how eco-innovative CSR performance affects tourists' perceptions of destinations, emotions, and WOM (word of mouth) intentions in the context of sustainability and smart tourism. A dataset collected from the Handok Museum in South Korea was analyzed via a partial least squares (PLS) method, using structural equation modeling. This study examines the link between museum visitors' awareness of CSR and green technology. The constructs (perceived quality, image, and reputation) are positively correlated with CSR; museum visitors' emotions are in a parallel relationship with WOM intentions. The results confirm that the green technology implemented in the tourist destination is perceived as CSR by visitors. These technologies have a positive impact on environmental sustainability and contribute to a positive tourist experience. Thus, this paper encourages social responsibility practices at tourist destinations, as well as the development of green technology. This is the first empirical study that demonstrates how the profit-related concept of CSR can be applied to nonprofit organizations, Furthermore, for the first time, the managerial concept of CSR has been reviewed with technology-based eco-innovation in a museum setting.

Keywords: corporate social responsibility; sustainable development goals (SDGs); technology-based eco-innovation; emotion; WOM intentions

1. Introduction

The tourism and hospitality industry is one of the driving forces in the global economy. It has many environmental and social effects [1]. Due to tourism's significant social impact, many tourism enterprises emphasize sustainable development through corporate social responsibility (CSR). CSR, despite the potential restrictions on the corporation, will eventually reap corporate benefits.

Therefore, it is not a surprise that the World Tourism Organization [2] includes among its sustainable development goals (SDGs) inclusive and sustainable economic development, sustainable consumption and production, and the sustainable use of oceans and marine resources. With this in mind, we studied museum visitors' perceptions of corporate social responsibility to reveal how museums can contribute to SDGs.

Although some scholars have defined CSR as a company´s obligation to be accountable for its impact on the community and environment [3,4], CSR is defined here as a company's voluntary responsibility to the societal good, beyond its legal obligations [5,6]. The growing interest in CSR in environmental and societal concerns is associated with eco-innovation [7] and intensifies environmental sustainability and firms' competitiveness.

However, neither the relationships between eco-innovation and CSR, nor its influences on tourists' behavioral intention have been explored in the tourism literature. Most studies on CSR concentrate on financial performance or employees' attitudes and behaviors [8,9]. Only a few studies have examined the precedents and ramifications of CSR [10,11]. Given the scarcity of museum studies [12], this research is the first to explore the relationship between eco-innovation and CSR in the museum context.

Eco-innovation in museums can be discussed with green technology in the context of smart tourism [13], which reduces the environmental footprint. Museum visitors' experience with eco-innovative technologies goes beyond physical experience (the economic, environmental, and social phases), and can affect the thoughts, impressions, and emotions that a visitor has during their time at a museum. In this sense, a museum that uses eco-innovation strategies such as near-field communication (NFC) or Beacon can be regarded as undertaking CSR practice both to attain environmental sustainability and to maintain competitiveness [14].

Museum visitors' perceptions of CSR and the subsequent effect on visitors' WOM intention are therefore worth investigating. The objectives of this research were to examine the relationship between visitors' perceptions of technology-based eco-innovation and CSR, and the effects on visitors' emotions and WOM intentions.

2. Literature Review

2.1. NFC as a Technology-Based Eco-Innovation and Its Relation to CSR Perceptions

CSR is a company's voluntary responsibility, and corporations, including tourist destinations, tend to undertake CSR practices. CSR has been mainly considered in economic, environmental, and governmental terms, but it also prioritizes managerial and academic functions. In the tourism industry, growing interest in CSR practices mirrors environmental and societal concerns, and CSR performance at tourist destinations is directly associated with growth in tourism. As in Fusco-Girard and Nijkamp [14], CSR practices affect destination ecology, economic prosperity, and socio-environmental compensation.

Many companies include innovations to improve performance as part of their CSR policy. According to the literature [15], museum management, museum practices, exhibition organization, and museum services directly affect visitors' perceptions of CSR. It can be assumed that a museum that uses eco-innovations will meet visitors' expectations and needs.

Rennings [7] defines eco-innovation as a process of developing new ideas or services that contribute to the reduction of the negative environmental impact; other research emphasizes [16,17] that eco-innovation in the era of information technologies favors the interconnectivity between environmental performance and competitiveness, along with the reduction of environmental impact.

As Hume [17] highlights the crucial role of the information technologies in museum exhibitions, one of the most frequently used eco-innovations is near-field communication (NFC). NFC is a short-range wireless communication technology that offers electronic interaction between users and their environment; as a green technology, NFC has the potential to improve the competitiveness of a tourist destination by contributing to sustainable development, with an enhanced visitor experience and improved well-being. In this sense, museums that are using technology-based eco-innovations are engaged in CSR practices. In museum exhibitions, NFC plays an important role in visitors' enjoyment and the museum's long-term sustainability. Museums using NFC do not need to print exhibit materials, information brochures, or vouchers, so they use less paper. Venkatesh et al. [18] show how the NFC app can save 15,000 acres of forest per year if implemented in just the G8 countries.

Among the museums applying NFC technology are the Museum of London, Manchester Museum, and Horniman Museum and Gardens. The use of eco-innovations can be perceived as a CSR practice since visitors can easily see the museum's sincere interest in meeting their needs and in relationship building [19]. Visitors can also understand the museum's attempts to reduce their environmental footprint.

Siu, Zhang, Dong, and Kwan [19] described visitors' perceptions of the new museum services in terms of novelty and meaningfulness. A museum that uses NFC is more innovative than museums that are still using brochures. Visitors can appreciate the environmental benefit of wireless technology by experiencing NFC. This study therefore hypothesizes that museum visitors are likely to perceive the implementation of NFC as CSR practice:

Hypothesis 1 (H1): *Newness of NFC technology is positively associated with a museum's CSR.*

Hypothesis 2 (H2): *Meaningfulness of NFC technology is positively associated with a museum's CSR.*

2.2. CSR and Museum Perceived Quality, Image, and Reputation

The perceived quality of a museum is defined as the discrepancy between the museum visitors' initial expectations and the feelings experienced from a museum service provider. Perceived quality has been investigated by various service industries as it enables retention of the relationship with customers, attracts new customers, decreases costs, increases profits, improves corporate image, and engenders positive recommendations [20]. Perceived quality is formed on the basis of technical, functional, and environmental qualities, and it is perceived by the outcome, the process-creating outcome, and the physical environment of the service. Many studies take three dimensions of perceived quality—quality experience, environment facilities, and personnel services—into consideration. Following Chen and Tseng [21], a museum's perceived quality is visitors' subjective evaluation based on goods, services, and experiences.

We suppose that while assessing museum quality with reference to CSR, visitors are likely to prefer museums that are engaged in CSR practices to museums that are not. This assumption is similar to the positive correlation between CSR and customers' service quality evaluations; a company whose behavior is perceived to be ethical earns customers' trust, which results in a better assessment of quality and services [22]. Hence, we hypothesize the following:

Hypothesis 3 (H3): *CSR perceptions have a positive effect on museum perceived quality.*

Aaker and Myers (1982) defined image as the net result of the interaction of a person's beliefs, ideas, feelings, and impressions of an object. The image is therefore produced by a variety of physical and behavioral attributes. The image of a company enables us to differentiate it from other companies, establish and maintain loyal relationships with stakeholders, and even obtain support from society [23,24]. Based on this, a museum's image is conceptualized by visitors' immediate perceptions of that museum.

Combining CSR practices with the image, CSR is likely to contribute to the formation of a positive image of a museum; Huang et al. [22] provide empirical evidence of CSR practices and a company's favorable image, demonstrating that a company's exercise of societal roles influences consumers' perception of the company's image. In the same context, this study assumes that museum visitors' perceptions of CSR are likely to influence the formation of a positive museum image. This leads to the following hypothesis:

Hypothesis 4 (H4): *CSR perceptions have a positive effect on museum image.*

Reputation is defined as stakeholders' evaluations of a company over time [25]. These evaluations are based on the customers' everyday impression of that company. Previous studies [25–27] show that positive organizational reputation is an important motivational factor for both employees and customers, and that corporate reputation is often evaluated by the assessment of the company's financial performance and societally responsible practices. Along with the positive relationship between CSR practices and reputation, museum reputation is defined as a representation of public opinion that responds to visitors' expectations. Based on previous studies exploring the relationship

between CSR and reputation [28,29] this study assumes that if visitors perceive a museum as adopting CSR practices, their image of that museum is likely to be more favorable, and they will evaluate a museum's reputation highly. This leads to the next hypothesis:

Hypothesis 5 (H5): *CSR perceptions have a positive effect on museum reputation.*

2.3. Emotions: The Broaden-and-Build Theory of Positive Emotions

Emotions are extensively investigated in the research on leisure and tourism [30]. Fredrickson's broaden-and-build theory claims that positive emotions broaden people's momentary thought-action repertoires and build their enduring social and psychological resources [31]. Wu and Li's study of museum quality reveals that better perceptions have a positive influence on visitors' emotions [32]. From this, we can deduce that perceived quality can enhance positive emotions and reduce negative emotions. Thus, we hypothesize the following:

Hypothesis 6 (H6): *There is a positive relationship between museum perceived quality and visitors' positive emotions.*

Hypothesis 7 (H7): *There is a negative relationship between museum perceived quality and visitors' negative emotions.*

We also suppose that visitors who have positive images of a museum are more likely to be satisfied with their visit than are visitors harboring negative images. We therefore postulate that museum image has a significant influence on visitors' emotions and hypothesize the following:

Hypothesis 8 (H8): *There is a positive relationship between museum image and visitors' positive emotions.*

Hypothesis 9 (H9): *There is a negative relationship between museum image and visitors' negative emotions.*

Studies of reputation [26,33] state that a positive relationship with the consumer reputation is a strong predictor of attitude and behavior, and that positive emotion can be engendered by good reputation, simultaneously reducing negative emotions. This means that reputation improves positive emotions and mitigates negative ones. If museum visitors know that they are visiting a museum that has a good reputation, they are likely to have positive emotions about it. Based on the discussion, we state the following:

Hypothesis 10 (H10): *There is a positive relationship between museum reputation and visitors' positive emotions.*

Hypothesis 11 (H11): *There is a negative relationship between museum reputation and visitors' negative emotions.*

2.4. Word-of-Mouth

Word-of-mouth (WOM) is consumer-dominated informal communications, whereby individual consumers experience goods and services and evaluate their experience independent of the market [34,35]. Research shows that customers' emotions are significantly linked to WOM intentions, either negatively or positively [36]. Based on this, we postulate the following:

Hypothesis 12 (H12): *Positive emotions positively affect WOM intention.*

Hypothesis 13 (H13): *Negative emotions negatively affect WOM intention.*

3. Methodology

3.1. Measurements

The measurement model was used to examine the relationship between the latent variables and their corresponding items [37]. The characteristics of CSR perception and perceived qualities in this study are conceptualized as the second-order level of abstraction and reflective constructs. Based on the previous study, measuring the construct of CSR, we highlighted three dimensions: economic, social, and environmental. Measuring NFC dimensions and CSR perceptions, previous studies [19,22,28,38–40] were studied and 50 measurement items were adopted. The constructs relevant to manifest these concepts are newness, meaningfulness, CSR perceptions, perceived quality, image, reputation, positive emotions, negative emotions, and WOM intention, which were adapted from past studies and modified for the research model and the context. Given the difficulty of bundling all items through a unidimensional latent variable and the possibility of measurement error in the resultant construct [41,42], we used higher-order modeling, where the contribution of each dimension to a higher-level construct could be assessed and delineated.

All items were measured on a seven-point Likert scale ranging from strongly disagree (1) to strongly agree (7). Moreover, 10 items of demographic variables were measured on the nominal scale. Three academic experts were invited to verify the validity of the preliminary items, and modifications were made accordingly.

3.2. Data Collection

Handok Museum in South Korea was the research site for this study. The museum is renowned for its socially responsible practices and green technologies such as NFC and Beacon. The data were collected via on-site surveys conducted among Handok Museum visitors who used NFC or Beacon while there. Only 250 questionnaires were collected during the survey period. The location of the museum and undeveloped transportation might explain the small number of visitors. All questionnaires were examined, all invalid data were removed, and a final sample of 161 questionnaires was used for the analysis.

4. Data Analysis and Results

4.1. Data Analysis

We used several statistical techniques to analyze the data. The research model was tested using structural equation modeling. All descriptive statistics were analyzed through SPSS 21, and the hypotheses were tested via a partial least squares (PLS) method using the PLS-Graph 3.0 program. PLS is one of the most widely used analytical techniques. As PLS estimates the model parameters minimizing the residual variance of the dependent variables, and does not require any parametric conditions or a large sample size, it was well suited to this study.

4.2. Respondent Profile

Table 1 shows the demographic characteristics of the respondents ($n = 132$). There were slightly more female than male participants: 94 (58.4%) and 67 (41.6%), respectively. The largest percentage of respondents (82%) was 20–29 years old. A majority of the respondents ($n = 129$, 80.1%) graduated from two-year colleges. Single people ($n = 131 / 81.4\%$) greatly outnumbered married people and those who chose not to respond ($n = 30 / 18.6\%$). Most of the respondents were students ($n = 134 / 83.2\%$), and, predictably, the largest group ($n = 125 / 77.6\%$) had an average monthly income of less than one million Korean won (USD835). The proportion of respondents who had previously used NFC ($n = 86 / 53.4\%$) was quite similar to the proportion of those who had not ($n = 74 / 46.0$). Most respondents, however ($n = 133 / 82.6\%$), reported that they had never used Beacon before.

Table 1. Demographic characteristics of the respondents.

Characteristics		Frequency	%
Gender	Male	67	41.6
	Female	94	58.4
Age	Under 20	1	0.6
	20-29	132	82.0
	30-39	8	5.0
	40-49	8	5.0
	50-59	5	3.1
	Over 60	7	4.3
Education	Middle and high school	8	5.0
	Two-year college	129	80.1
	University	14	8.7
	Graduate school	10	6.2
Marital Status	Married	24	14.9
	Single	131	81.4
	No answer	6	3.7
Occupation	Student	134	83.2
	Office worker	4	2.5
	Services	2	1.2
	Technician	3	1.9
	Professional	8	5.0
	Homemaker	10	6.2
Monthly Income	Less than 1 million won*	125	77.6
	1-1.9 million won	15	9.3
	2-2.9 million won	5	3.1
	3-3.9 million won	6	3.7
	4-4.9 million won	3	1.9
	Over 5 million won	3	1.9
	No answer	4	2.5
NFC Experience	Yes	86	53.4
	No	74	46.0
	No answer	1	0.6
Beacon Experience	Yes	23	14.3
	No	133	82.6
	No answer	5	3.1
Total		161	100.0

* Note: 1 U.S. dollar = 1100 Korean won.

4.3. Measurement Model

The measurement model was assessed to confirm the reliability and validity of the research model. Table 2 shows that all standardized loadings are above the minimal threshold of 0.70 and are statistically significant at $p<0.05$. Table 3 shows that all of the constructs in the model satisfied the reliability requirements, with a composite reliability greater than 0.70, and the discriminant validity requirements, with an average variance extracted (AVE) greater than 0.50. Finally, Cronbach's α for all constructs exceeded the minimal threshold of 0.70. Additionally, as can be seen from Table 4, the square

root of the AVE of each construct was greater than the squared correlations of other constructs [43]. Thus, the reliability and discriminant and convergent validity were supported.

Table 2. Standardized loadings of the constructs.

Constructs		Measured Items	Std. Loadings	*t*-Value
Newness	NEW 1	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum are novel.	0.865	40.72
	NEW 2	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum are innovative.	0.873	37.759
	NEW 3	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum are creative.	0.874	39.963
	NEW 4	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum differ significantly from other museums in terms of ways of providing explanations about an exhibition.	0.792	18.641
	NEW 5	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum are exceptional.	0.859	30.366
Meaningfulness	MEAN 1	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum offer unique advantages to the visitors.	0.841	29.529
	MEAN 2	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum offer higher-quality exhibition services than other museums.	0.802	15.079
	MEAN 3	Exhibition services facilitated by NFC and Beacon technologies at Handok Museum offer higher value exhibition services than other museums.	0.857	41.609
	MEAN 4	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum solve visitors' problems related to the exhibition.	0.759	13.411
	MEAN 5	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum allow museum visitors to understand the exhibition simply.	0.838	25.593
	MEAN 6	Exhibition services facilitated with NFC and Beacon technologies at Handok Museum provide a lot of benefits to the visitors.	0.683	10.14
Corporate Social Responsibility	Eco_CSR 1	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum provides services necessary to the country.	0.833	27.776
	Eco_CSR 2	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum contributes to the economic development through re-investing profits.	0.855	38.413
	Eco_CSR 3	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum is operationalized effectively.	0.862	33.457
	Env_CSR 1	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum provides eco-friendly exhibition services that are different from ones provided by the museums using paper pamphlets.	0.891	45.849
	Env_CSR 2	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum seems to take responsibility for environmental protection since it prevents excessive use of natural resources.	0.925	65.316
	Env_CSR 3	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum tries to reduce its negative environmental impact through replacing paper pamphlets.	0.894	33.904

Table 2. *Cont.*

Constructs		Measured Items	Std. Loadings	*t*-Value
Corporate Social Responsibility	Env_CSR 4	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum reduces the negative environmental impact as much as possible through reducing the use of paper pamphlets.	0.903	46.346
	Soc_CSR 1	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum makes various social contributions via providing an exhibition experience.	0.908	64.606
	Soc_CSR 2	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum contributes in different ways to the local community via providing an exhibition experience.	0.899	44.072
	Soc_CSR 3	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum has a positive influence on the community, providing an exhibition experience.	0.927	80.015
	Soc_CSR 4	Providing exhibition services via technologies such as NFC/Beacon, Handok Museum focuses not only on economic profits but also plays an important social role.	0.878	37.096
Museum Perceived Quality	QUAL 1	Handok Museum provides medicine-related scientific knowledge.	0.809	21.663
	QUAL 2	Handok Museum continues to update the museum's facilities.	0.82	26.812
	QUAL 3	Handok Museum organizes experience activities or programs.	0.726	10.946
	QUAL 4	Handok Museum provides high-quality experiences.	0.898	58.689
	QUAL 5	Handok Museum provides different exhibition services using media resources.	0.817	24.407
	ENV 1	Handok Museum provides a good atmosphere.	0.929	47.685
	ENV 2	Handok Museum provides good quality facilities.	0.942	68.359
	ENV 3	Handok Museum keeps the environment clean.	0.933	52.503
	PERS 1	Staff at Handok Museum have confidence and professional knowledge.	0.847	29.131
	PERS 2	Staff at Handok Museum can efficiently handle customer complaints.	0.862	33.372
	PERS 3	Staff at Handok Museum provides friendly service.	0.913	67.833
Museum Image	IMG 1	I have a good impression of Handok Museum.	0.845	13.939
	IMG 2	Handok Museum is trustworthy.	0.917	61.723
	IMG 3	Handok Museum has a better reputation than the other medical museums.	0.896	35.613
	IMG 4	I have a good overall image of Handok Museum.	0.904	49.977
Museum Reputation	MR 1	I think that Handok Museum's management system is good.	0.879	38.417
	MR 2	I think that Handok Museum provides the most innovative exhibition guidance services.	0.91	45.388
	MR 3	I think that Handok Museum has the potential to grow.	0.891	39.934
	MR 4	I think that Handok Museum provides high-quality exhibition services via innovative technologies.	0.914	54.601
Positive Emotions	POS 1	The visit to Handok Museum made me happy.	0.921	63.831
	POS 2	The visit to Handok Museum made me joyful.	0.902	45.599
	POS 3	The visit to Handok Museum delighted me.	0.898	34.571

Table 2. *Cont.*

Constructs		Measured Items	Std. Loadings	*t*-Value
Negative Emotions	NEG 1	The visit to Handok Museum made me upset.	0.874	27.284
	NEG 2	The visit to Handok museum made me nervous.	0.94	61.903
	NEG 3	The visit to Handok museum made me angry.	0.867	16.946
Word-of-Mouth Intention	WOM 1	I want to recommend Handok Museum to others.	0.954	98.54
	WOM 2	I want to encourage my friends or relatives to visit Handok Museum.	0.951	95.197
	WOM 3	I want to spread positive word-of-mouth about the experience I had at Handok Museum.	0.942	72.047

Table 3. Descriptive statistics of the constructs.

Construct		Composite Reliability	AVE	Cronbach's α	Mean	STD
Newness		0.930	0.728	0.906	5.390	1.08
Meaningfulness		0.916	0.687	0.886	5.320	0.97
CSR	Economic CSR	0.887	0.723	0.807	5.050	0.94
	Environmental CSR	0.946	0.816	0.925	5.621	1.05
	Social CSR	0.947	0.816	0.924	5.366	1.03
Perceived quality	Quality experience	0.908	0.666	0.872	5.448	0.88
	Facilities	0.954	0.873	0.927	6.008	0.98
	Personnel services	0.907	0.764	0.844	5.271	1.03
Image		0.939	0.794	0.913	5.627	0.99
Reputation		0.944	0.808	0.921	5.742	1.02
Positive emotions		0.933	0.822	0.892	5.240	1.03
Negative emotions		0.923	0.800	0.872	2.232	1.17
WOM		0.964	0.900	0.944	5.400	1.08

Table 4. Correlation among constructs.

Constructs	1	2	3	4	5	6	7	8	9	10	11	12	13
1. NEW	**0.853**												
2. MEAN	0.661[**]	**0.829**											
3. Eco_CSR	0.569[**]	0.570[**]	**0.850**										
4. Env_CSR	0.532[**]	0.598[**]	0.562[**]	**0.903**									
5. Soc_CSR	0.538[**]	0.598[**]	0.620[**]	0.624[**]	**0.903**								
6. QUAL	0.598[**]	0.644[**]	0.663[**]	0.673[**]	0	**0.816**							
7. ENV	0.528[**]	0.548[**]	0.581[**]	0.652[**]	0.652[**]	0.705[**]	**0.934**						
8. PERS	0.358[**]	0.502[**]	0.539[**]	0.554[**]	0.532[**]	0.624[**]	0.635[**]	**0.874**					
9. IMG	0.613[**]	0.626[**]	0.539[**]	0.533[**]	0.612[**]	0.559[**]	0.620[**]	0.504[**]	**0.891**				
10. REP	0.629[**]	0.648[**]	0.566[**]	0.644[**]	0.669[**]	0.664[**]	0.685[**]	0.486[**]	0.787[**]	**0.899**			
11. POS	0.538[**]	0.540[**]	0.489[**]	0.423[**]	0.535[**]	0.524[**]	0.464[**]	0.461[**]	0.646[**]	0.585[**]	**0.907**		
12. NEG	−0.268[**]	−0.344[**]	−0.357[**]	−0.249[**]	−0.303[**]	−0.223[**]	−0.319[**]	−0.187[*]	−0.454[**]	−0.415[**]	−0.284[**]	**0.894**	
13.WOM	0.492[**]	0.589[**]	0.513[**]	0.542[**]	0.612[**]	0.564[**]	0.557[**]	0.471[**]	0.725[**]	0.696[**]	0.677[**]	−0.331[**]	**0.949**

Note: The diagonal elements in bold in the "correlation of constructs" matrix are the square root of the average variance extracted (AVE). According to Bhattacherjee and Sanford (2006, p. 815), "for adequate discriminant validity, diagonal elements should be greater than their corresponding off-diagonal elements." [**] significance at $p < 0.1$.

4.4. Structural Model and Hypothesis Testing

The structural model was assessed to test the hypotheses. The explanatory power and path significance of the structural model were evaluated using a bootstrapping technique. The results reveal that eco-innovation is positively related with CSR perceptions, which influence WOM intention via visitors' cognition of museum characteristics and emotions. The results are shown in Figure 1 and Table 5.

Table 5. Standardized structural estimates and hypotheses tests.

Hypothesis	Path	Estimates	*t*-Value	Results
H_1	Newness → CSR perceptions	0.326	4.862	Supported
H_2	Meaningfulness → CSR perceptions	0.470	6.917	Supported
H_3	CSR perceptions → Museum perceived quality	0.817	21.666	Supported
H_4	CSR perceptions → Museum image	0.656	10.926	Supported
H_5	CSR perceptions → Museum reputation	0.738	13.438	Supported
H_6	Museum perceived quality → Positive emotions	0.199	2.137	Supported
H_7	Museum perceived quality → Negative emotions	0.094	0.698	*Rejected*
H_8	Museum image → Positive emotions	0.447	5.886	Supported
H_9	Museum image → Negative emotions	−0.361	3.303	Supported
H_{10}	Museum reputation → Positive emotions	0.098	0.958	*Rejected*
H_{11}	Museum reputation → Negative emotions	−0.203	1.658	Supported
H_{12}	Positive emotions → WOM intention	0.635	9.344	Supported
H_{13}	Negative emotions → WOM intention	−0.151	2.153	Supported

H1 and H2 address the structural relationships between technology-based eco-innovation's dimensions such as newness and meaningfulness and CSR perceptions. Both hypotheses are supported, revealing significant, positive relationships between eco-innovation and CSR: newness has a direct impact on perceptions of CSR ($\beta = 0.322$, $p<0.001$), and meaningfulness has a direct impact on perceptions of CSR ($\beta = 0.479$, $p<0.001$).

H3, H4, and H5 are concerned with the relationships between CSR perceptions and museum characteristics such as perceived quality, image, and reputation. The hypotheses indicate that CSR perceptions have a positive effect on a museum's perceived quality ($\beta = 0.817$, $p<0.001$), image ($\beta = 0.656$, $p<0.001$), and reputation ($\beta = 0.738$, $p<0.001$). Therefore, all three hypotheses are supported.

H6, H8, and H10 address the relationships between visitors' perceptions of museum characteristics and visitors' positive emotions; H7, H9, and H11 address the relationships between visitors' perceptions about museum characteristics and visitors' negative emotions. Although museum perceived quality has a significantly positive influence on positive emotions ($\beta = 0.199$, $p<0.05$), it does not have a significant influence on negative emotions ($\beta = 0.094$, non-significant): H6 is therefore supported and H7 is rejected. Museum image has a significantly positive influence on positive emotions ($\beta = 0.447$, $p<0.001$) and a significantly negative influence on negative emotions ($\beta = -0.361$, $p<0.001$), thus supporting H8 and H9. In turn, museum reputation does not have a significant influence on positive emotions ($\beta = 0.098$, non-significant), but does have a significantly negative influence on negative emotions ($\beta = -0.203$, $p<0.1$). Consequently, H10 is rejected and H11 is supported.

Finally, H12 and H13 are concerned with the relationships between the emotions and WOM intention of museum visitors. Obviously, positive emotions are positively related to WOM intentions ($\beta = 0.635$, $p<0.001$), while negative emotions are negatively related to WOM intention ($\beta = -0.151$, $p<0.01$). Therefore, both hypotheses are supported.
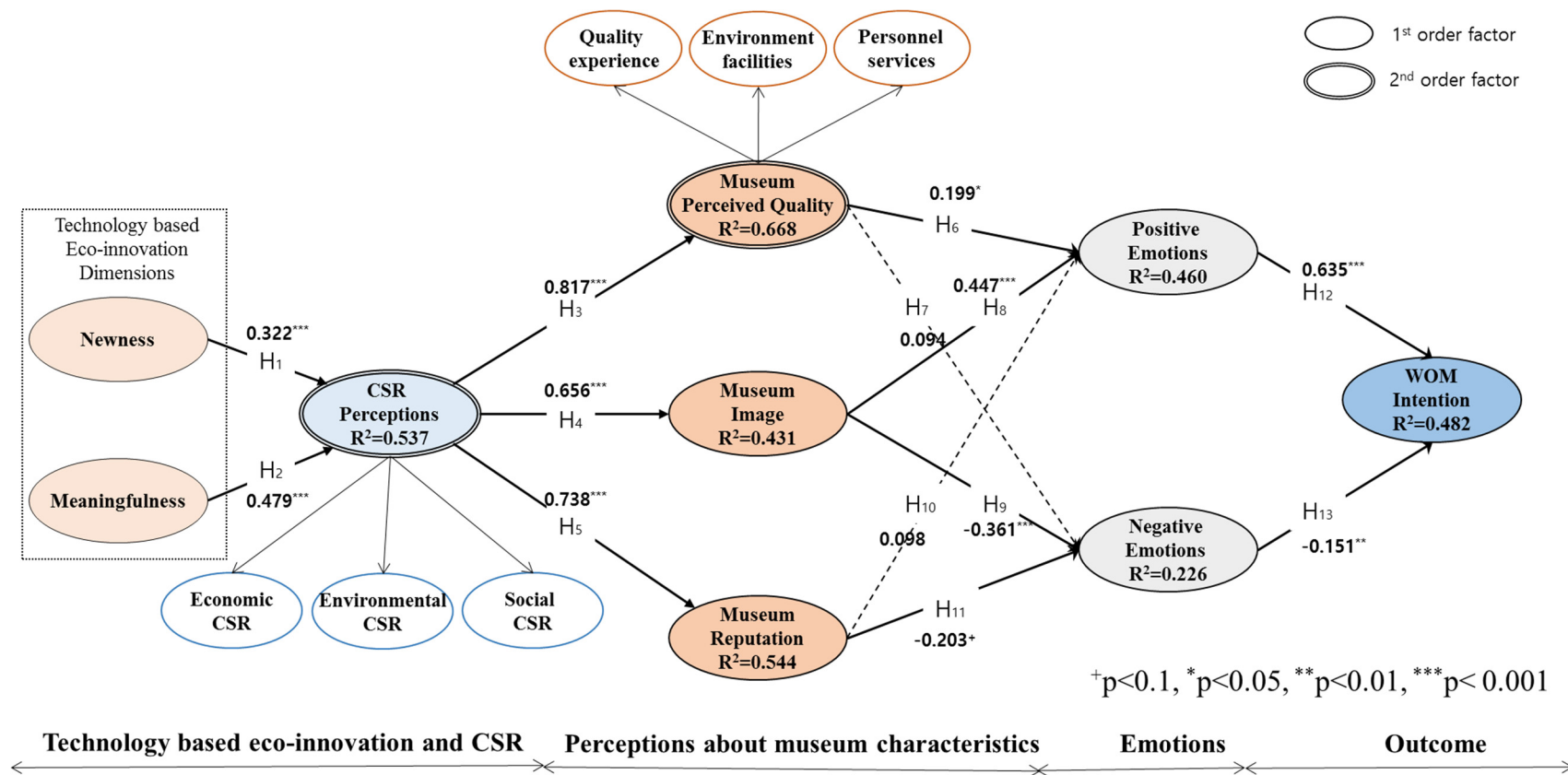
Figure 1. The estimated structural model.

5. Discussion and Conclusions

This research views NFC/Beacon as a technology-based eco-innovation and has demonstrated that green technology directly and positively influences visitors' perceptions of CSR practices. Museum visitors' perceptions of CSR are assessed in terms of newness and meaningfulness, both of which are important dimensions of eco-innovation. This study has also confirmed the positive influence of CSR on perceived quality, image, and reputation. as in prior studies, the result indicates that museum visitors evaluate a museum's image and reputation in terms of CSR practices, so CSR is important for forming a positive image and confirming the good reputation of public venues.

It is interesting that this study reveals results that contradict the findings of Wu and Li [32] on the relationships between museum characteristics and visitors' emotions. The result shows that perceived quality is related only to positive emotions, but not to negative ones, as supported by Jang and Namkung [44].

Furthermore, this study has found that a museum's reputation has a significant effect on negative emotions, but not positive ones. This result only partially supports an earlier study of the significant relationships between reputation and positive/negative emotions.

A museum's perceived quality and reputation are only partially related to museum emotion. The museum image shows a significantly parallel relationship to positive and negative emotions; image has either a significantly positive influence on positive emotions or a significantly negative influence on negative emotions. Therefore, image is the most influential determinant of visitors' emotions.

Finally, the results pertaining to the relationships between emotions and WOM intention are consistent with the findings of previous research [19], revealing a positive relationship between positive emotions and WOM intention, but a negative relationship between negative emotions and WOM intention.

This study is noteworthy in that not many studies have found a positive relationship between eco-innovation and CSR. Very few studies have empirically explored this relationship.

Furthermore, CSR has been studied primarily in terms of a company's management issues. However, this study looks at CSR practices, from the corporate managerial level to the public setting like museums, by applying the corporate concept of CSR to nonprofit organizations; therefore, we extend the domain of CSR practice from private to public organizations. In addition to broadening the concept of CSR, this paper has applied a management perspective to the information technology perspective (e.g., smart tourism) by incorporating the concept of eco-innovation into CSR (e.g., technology-based NFC/Beacon).

6. Implications and Limitations

This study makes considerable theoretical and practical contributions as one of the few studies that has empirically explored the relationship between eco-innovative NFC/Beacon technologies and CSR perceptions. It makes a contribution to the theory by providing more knowledge about the major determinants of CSR perceptions. It also extends the domains of smart tourism and sustainable tourism by elucidating the crucial role of technology-based eco-innovations in creating a competitive and attractive tourist destination.

Moreover, this study presents one example of how a tourist destination like a museum can contribute to SDGs. Museums with eco-innovations have a positive social impact and ensure sustainable consumption. Furthermore, this research confirms the importance of emotions in the tourism industry, emphasizing that positive emotions favorably affect WOM intention.

In terms of practical contributions, this study's findings encourage companies and tourist destinations to embrace their social responsibilities and to orient their policies and strategies to CSR. In addition, this study contributes to the further development of green technologies and its worldwide use at other tourist destinations.

Despite these important contributions, our study has several limitations. The major drawbacks are the context and samples of the study: the data come from a single museum, and most of the

study participants were students. Obviously, it is difficult to generalize from these findings. Thus, future research should follow up on the relationship between eco-innovation and CSR. We suggest that future studies investigate the relationship between eco-innovations and perceptions of CSR in other contexts, concentrating on demographic peculiarities in the sample. In addition, we suggest interviewing respondents to validate and support the results of this study. We also suggest comparing domestic and international tourists' perceptions of CSR.

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