

KANO모형을 활용한 박물관 ICT 서비스 품질 속성에 관한 실증연구: 한국-오스트리아 비교

(An Empirical Study on the Quality Attributes of Museum Service by ICT: Comparisons of South Korea and Austria)

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(Lee ChoHee and Kim SangWook)

요 약 그간 박물관은 전시 큐레이팅 중심으로 이루어져왔다. 그러나 최근 방문자 맞춤형 전시가 증시되면서 앱 기반 고객센터 및 QR코드 인식을 통한 전시 설명 등 다양한 서비스가 제공되고 있다. 이러한 추세에 맞추어 스마트폰이나 소셜네트워크를 이용한 박물관 서비스 관련 연구는 종종 시도되었다. 그러나 정보기술 기반 서비스와 연계한 방문객 만족요인에 관한 연구는 거의 없었다. 따라서 본 연구에서는 ICT 기반 박물관 서비스 품질요인들을 식별, 분류하고 KANO모형에 근거하여 이들의 품질속성을 밝히고자 하였다. 나아가 한국과 오스트리아를 대상으로 표본설문조사를 실시하여 그 차이를 비교하였다. 그 결과 문화 차이가 서비스요인별 품질속성차원에 영향을 준다는 사실을 확인할 수 있었으며, 같은 차원으로 분류된 요인도 지각된 서비스 품질에는 차이가 있음을 알 수 있었다. 이러한 결과는 박물관 경영에도 문화적 차원을 고려해야 함을 시사한다.

핵심주제어 : 박물관 ICT 서비스, SERVQUAL, Kano 모델, 품질 속성, 문화적 차원

Abstract Museum management has been centered on curated exhibitions. Today, however, visitor-tailored exhibitions are all the rage, and various ICT-based services such as museum app's and exhibition explanation through QR code are being provided. To this trend, research on museum services using smartphones and SNS has been conducted. But there have been few studies of technical influence on the museum service satisfaction factors. This study, therefore, attempted to identify and classify the satisfaction factors of museum services with Kano model which explains service quality attributes. Samples from South Korea and Austria were analyzed. There was a significant gap in quality factors according to cultural differences and a notable difference in perceived quality even for the factors in the same dimension. It implies that cultural differences need to be taken into account for the priority of museum services.

Key Words : Museum ICT Service, SERVQUAL, Kano's Quality Attributes, Cultural Dimensions

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1. Introduction

Museums today play a critical role in representing the cultural status of a nation

and exposing its identity. In addition, museums as organizations of a special kind provide enjoyment and education to the public and enhance the quality of life[1]. To this end, a museum, previously focused on cultural artifact exhibition, turns its attention to enhancing visitors' satisfaction by differentiating itself as a space that provides experiential opportunities to visitors. This is mainly because people are recently visiting museums simply for common knowledge or leisure rather than for academic purpose and they want to participate in events or programs more actively than before, having more communication between curators.

Such change in visitor's demands requires a new paradigm of museum service management which entails development of new professional skills, reprioritization of resource allocation, and reconceptualization of museum policies and plans. For that matter, a considerable body of research in this arena has been conducted to identify dormant service needs through survey on visitors' experience with museum. The evaluation of museum exhibitions and service provision is now recognized as a distinct field of museum practices[2]. The earlier studies to date however remain at identifying the aspects of visitor's satisfaction with the quality of services via new media smart devices, mostly on the assumption satisfaction is the opposite to dissatisfaction; and the users are satisfied when the service is functionally fulfilled; and dissatisfied otherwise. But this assumption is basically misleading because it is not always the case[3]. Some quality attributes provide satisfaction when fully accomplished, but do not cause dissatisfaction if not fulfilled. And other quality attributes are taken for granted when fulfilled but result in dissatisfaction when not fulfilled[4]. Another which needs to be pinpointed is that the previous studies did not take it into account that service quality

elements are possibly influenced by the cultural differences. Considering more foreigners are coming to museums and their touring is for fun; and the perceived fun would be different according to their cultural background[5], the influence of cultural differences on the service quality elements deserves examination to reflect them in shaping policies and strategies of a museum. This study objective, therefore, is twofold. The first is to comprehensively extract the ICT-based museum service quality factors from the previous literature and empirically classify them into KANO's service quality attributes. The second is to examine the influence of cultural differences on the service quality attributes classified by testing two sample groups from S. Korea and Austria respectively and to postulate implications in managerial context by comparing the results of surveys on the two sample groups.

2. Theoretical Foundations

Enormous changes have taken place in museums across the world. Museums are changing from static store for artifacts into dynamic learning environment. This change implies a radical reorganization in the museum functions which is all mutate to accommodate new ideas and new approaches. Accordingly, the research for museum management started putting its focus more on visitors as well as collections[2].

2.1 Museum Service Quality Elements

It is noted that the issues surrounding service quality posit a natural step towards the advancement of museum management. As stated by Pratibha et al., museums should be systematized to assess their service quality,

which should be a critical part of the museum's official role[6]. Literature on museum service is, however, hardly found. Among the limited amount of literature some books and scholarly articles are found worth our attention. A book of essential writings by some of the leading authors in the field, postulates the challenges museums currently face and the key areas of future development[7]. Kotler et al.(1997) present how to develop a visitor-centered museum[8].

As for the service quality assessment, Paulus suggested a museum performance model which has five dimensions- validity, reliability, feasibility, externality and integrity; and did case analysis of 14 museums in the US and France[9]. Yucelt measured service quality, visitor needs, satisfaction for 24 museums[10]. Nowacki, taking cultural products and heritages themselves as service quality in a broader sense, presents staff competence, accessibility and comfortable surroundings as key factors influencing the service quality[11]. Kim[12] tested 9 factors for museum service including those by Nowacki, within the framework of SERVQUAL with a belief that the service quality (E-P) perceived by visitors is a degree of differences between their expectation (E) and perception (P). Kim & Kim[13] tested museum education service of 29 elements in 7 dimensions with SERVQUAL developed by Parasuraman et al.[14]. On the other hand, Moon & Jung[15] applied SERVPERF proposed by Cronin & Taylor[16], concentrating only on the customers' perception.

After removing duplications of the museum service elements presented in the previous studies, we extracted the 25 elements and came up with final 19 elements, discarding the elements which are not relevant to ICT applications as shown in Table 1.

Table 1 Museum Service Quality Elements

Museum Service Elements		References
1	Direction Signs	[17] [18]
2	Exhibition Information via Web-site	[14] [19] [20] [21] [18]
*	Admission fee	
*	Ease to buy tickets	
*	Convenient transportation	
3	The Line of Visitor Flow	[16]
4	Guidebook and Leaflets	[16] [18]
5	Informational Accuracy of Exhibition	
6	Exhibition Layout	[16]
7	Atmosphere(noise, illumination, etc.)	[11] [21] [22] [23]
*	Food and Beverage facilities	
*	Amenity Facilities(toilet, rest area)	
*	Souvenir Sale Store *	
8	Presence of 3D display (Holography)	British Museum Web Site, [24]
9	NFC-based Exhibition Description (Ex. DS Audio Guide)	France Louvre Museum
10	Exhibition Description with QR-code	Korean History Museum Web Site
11	Experiential Program with VR	[25]
12	Digital Film for Exhibition Contents (EX. Artifact restoration process video)	Nat'l Museum of S. Korea, American Museum of Natural History
13	Presence of AR (Augmented Reality) (Ex. for Ruins, Buildings, Landscapes, Ancient People)	Korea Nat'l Palace Museum Web Site
14	Exhibition Explanation by staff (Docent)	[1], [17]
15	Information Availability on Upcoming Exhibition Programs via SNS	[26]
16	Quick Response to Visitor's Inquiry	[17], [23]
17	Membership Benefits by Mobile Service (EX. Earning Points and Mileage)	[1]
18	Exhibition Artwork Collections for Sale	[21]
19	Expertise in replying to visitor's inquiry	[16], [18]

*Discarded as not relevant to ICT applications

It is important to realize that service refers to an activity that has value in its own right, especially in that the competition in the museum market is getting more intensified[27]. In this light, Reynolds's definition of the basic features of experience in tourism would be

equally applicable to museums[28]. A museum experience is intangible; It consists of activities rather than things; It is produced and consumed simultaneously; Visitors should be present and take part. In this sense, the PZB’s service quality scale over five dimensions as in Table 2 is well fit to the measurement of museum service quality[14].

Table 2 SERVQUAL Dimensions

Attributes	Descriptions
Tangibles	Appearance of physical facilities, equipment, personnel & communication materials
Reliability	Ability to perform the promised service dependably and accurately
Responsiveness	Willingness to help customers and to provide prompt service
Assurance	Employees’ knowledge and courtesy and their ability to convey trust and confidence
Empathy	The provision of caring, personal attention to customers

2.2 Visitor Satisfaction

Another conceptual issue relates to the differential effects of service quality on the customer satisfaction which is in turn believed to affect visitor’s behavioral consequences. Some studies thus far were conducted to examine such differential effects[29,30]. And the findings are somewhat different across these studies. More research therefore is needed to investigate the possible mediating role of service quality in the relationship with visitors’ satisfaction and their behavioral intentions. What is more critical than this issue, however, lies in that scales for service quality employed for these studies are based on the assumption of “the more, the better.” This assumption is misleading unless the addressed service feature is a vector attribute[5]. In reality, the higher performance is not

always the better. Instead, user satisfaction varies depending on the nature of service quality attributes, which are classified roughly into three categories such as threshold (must-be), performance (one-dimensional), and excitement (attractive)[31].

Threshold (must-be) attributes, if properly fulfilled, but do not contribute to increase in user’s satisfaction as they are taken for granted; if not fulfilled, they cause extreme dissatisfaction. In case of one-dimensional attribute the better fulfillment, the higher user satisfaction and vice versa. Of the user’s needs, most fall into this category. Excitement (attractive) attributes are unspoken and unexpected by users but can result in high levels of user satisfaction, whereas their absence does not lead to dissatisfaction. In fact there two more categories of user needs for service such as indifference and reversion. The former is, however well it performs, indifferent to customers’ satisfaction; and the latter refers to a high degree of achievement resulting in dissatisfaction. But they are disregarded for this study because such cases are applicable only when price change is accordingly involved and thus they would hardly happen in case of museum services.

2.3 Cultural Difference

As for the universal categories of culture, numerous scholars have presented so far distinct dimensions of culture. Among these, the Hofstede model[32] is the most comprehensive and widely-used one. According to his model, the common cultural elements across countries to clarify the culture of a country and explained it based on five dimensions. In 1980, he conducted empirical studies surveying about 100,000 employees at 40 global companies to determine cultural differences from managers’

perspectives and find alternatives and came up with four dimensions in cultural difference such as (1) power distance, (2) uncertainty avoidance, (3) individualism vs collectivism, (4) masculinity vs femininity, with (5) long vs short-term orientation added in 1988 and (6) indulgence vs. restraint in 2010, more or less complementary to the fifth dimension.

(1) Power Distance represents the inequality of power distribution accepted and expected by the members of organizations and institutions (like the family). (2) Uncertainty Avoidance deals with a society's tolerance for ambiguity and unstructured situations and thus is different from risk avoidance. (3) Individualism as opposed to collectivism is the degree to which people in a society are integrated into groups. (4) Masculinity as opposed to femininity means the extent to which a range of solutions are found in the distribution of values between the genders. (5) Long-term as opposed to short-term orientation refers to how people in a society put value on their solutions in terms of the time-orientation. (6) Indulgence as opposed to restraint represents the extent to which people allows relatively free gratification of basic and natural human desires related to enjoying life and having fun.

3. Research Design and Hypotheses

3.1 Research Model

The purpose of this study is two-fold. The first is to identify the quality attributes of the 19 service satisfaction elements (Table 1 above) by classifying them into three stages of museum service - prior, main, and posterior service. And the second is to investigate the effect of cultural differences on the quality service attributes identified. To this end, a

research model with a set of hypotheses was developed as shown in Fig. 1.

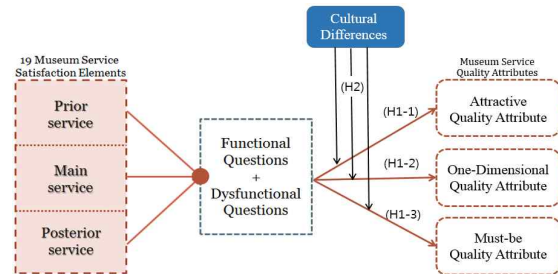


Fig. 1 Research model

3.2 Hypothetical Questions

1) Satisfaction Elements and Quality Attributes

From the previous studies, 19 satisfaction elements were extracted and are rearranged in order of service stages. They are further associated with five service dimensions in one-to-one correspondence as in Table 3.

This is because it could be hypothesized that cultural differences between sample groups affect their perception in terms of tangibles, responsiveness, empathy, reliability, and assurance. Within this framework, an umbrella hypothesis was established that each of the museum service satisfaction elements will have its own unique quality attribute, depending on whether it is fulfilled or unfulfilled. Subsequent hypotheses were set up to identify which quality attribute each service element corresponds to.

H1: The museum service elements have unique quality attributes of their own. If fulfilled, they will be (H1-1): 'Attractive'.

(H1-2): 'One-dimensional'.

(H1-3): 'Must-be'.

Table 3 Museum Service Elements by Stage

Stage	D*	Museum Service Elements	
Prior Service	T	1	Direction Signs
	R ₁	2	Exhibition Information via Web-site
	E	3	The Line of Visitor Flow
	R ₂	4	Guidebooks and Leaflets
	A	5	Information Accuracy of the Exhibition
Main Service	T	6	Exhibition Layout
		7	Atmosphere (noise, illumination, etc.)
		8	Presence of 3D display (Holography)
	R ₁	9	NFC-based Exhibition Description
		10	Exhibition Description with QR-code
	E	11	Experiential Program with VR
		12	Digital Film for Exhibition Contents
	R ₂	13	AR (Augmented Reality) for Ruins
A	14	Exhibition Explanation by Staff	
Posterior Service	T	15	Informing of Exhibition Programs
	R ₁	16	Quick Response to Visitor's Inquiry
	E	17	Membership Benefits by Mobile Service
	R ₂	18	Exhibition Artwork Collections for Sale
	A	19	Expertise in replying to visitor's inquiry
D*: Service Dimension T(Tangibles); R ₁ (Responsiveness); E(Empathy); R ₂ (Reliability); A(Assurance)			

2) Cultural Influence on Quality Attributes

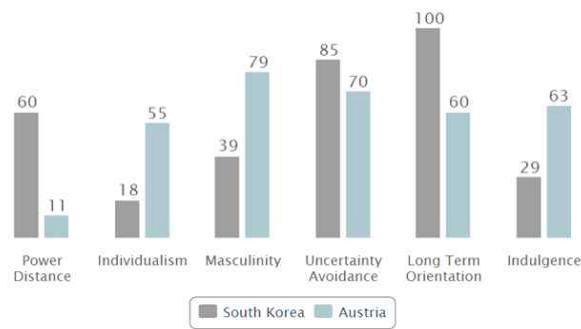
As aforementioned, the quality of services can be measured by the users' perception across 5 dimensions (see Table 2), according to the PZB's service quality scale. Cultural differences influence the perception of user experience[5,33]. If this is the case, another hypothesis can be formulated that cultural differences will affect visitors' perception on the quality of services provided by the museums. This hypothesis if properly tested would be meaningful taking it into account that museums today are frequently visited by foreigners. If two culturally different sample groups reveal a different perception on the quality attributes concerning the museum service elements, this can imply that the

cultural background influences the way users perceive different quality aspects and its implications will contribute to improvement of museum management in global age.

H2: Cultural differences influence quality attributes of the museum service elements.

To test this hypothesis two sample groups were selected - one from South Korea and the other from Austria. This is not only because Austria is a low-context society in contrast to Korea, a high-context society but because in Austria there is a university in partnership with Chungbuk National University where the authors are affiliated and it is easier to collect sample data for the study.

According to Hofstede's model, the two comparing groups are characterized as follows. As shown in Fig. 2, Korea has greater collectivism and power distance while Austria showed stronger individualism but quite low power distance. In uncertainty avoidance Korea is slightly higher than Austria. On the other hand, Austria is shown as a masculine society in comparison to Korea. Austria has a strong tendency to try to solve this without avoiding conflicts and aim at achievements. Similarly, Austria has a short-term orientation and is practical. Austria tends to try to achieve the desire to enjoy life more. Indulgence is weaker in Korea than in Austria because Koreans tend to suppress personal feelings and actions and also have less leisure time than Austrian. Cultural differences as such would perhaps lead to differences in visitor perceptions of museum services, particularly in terms of service quality attributes.



Source: <http://geerthofstede.com/research-and-vsm/>

Fig. 2 Cultural difference - Korea and Austria

4. Data Analysis and Results

4.1 Data Collection

To identify quality attributes of 19 museum service elements, the survey was designed to measure differences in 10 point Likert Scale between satisfaction if a service element fulfilled and dissatisfaction if unfulfilled. To this end, the survey created in separate parts for the same service element - functional and dysfunctional. Both printed questionnaire and Google document were used to collect data from the samples of Korea and Austria. A total of 119 copies were collected from Korea with 10 copies of void answers excluded and a total of 100 copies were collected from Austria and 19 copies were discarded for the same reason as shown in Table 4.

4.2 Data Reliability & Hypotheses Tests

1) Data Reliability

109 from Korean and 81 from Austrian sample, with void answers discarded, were used for the reliability test. As a result, Cronbach's α is ranged from 0,890 to .932 for Korean sample and ranged from 0.906 to

0.911 for Austrian sample as seen in Table 5. which show that 38 data entries (19 for each of the two sample groups) are all reliable as they are greater than a reasonable threshold (0.7) of reliability[34].

2) Hypotheses Test

In determining whether a museum service element retains unique quality attribute of its own, Kano's framework is not always effective and often suffers from a significant information loss mainly due to the following reasons[35].

Table 4 Basic Statistics

Classification		Freq.	Ratio(%)	Freq.	Ratio(%)
		S. Korea		Austria	
Age	Teenager	8	7.3	1	1.2
	Twenties	70	64.2	73	90.1
	Thirties	18	16.5	6	7.4
	Forties	5	4.6	1	1.2
	Over fifty	8	7.4	0	0.0
Gender	Male	44	40.4	40	49.4
	Female	65	59.6	41	50.6
Occupation	Student	76	69.7	65	80.2
	Business	24	22.0	16	19.7
	Housewife	3	2.8	0	0.0
	etc.	6	5.5	0	0.0
Visits for the last 12 months	None	12	11.0	14	17.3
	1	35	32.1	12	14.8
	2	16	14.7	21	25.9
	3	15	13.8	13	17.2
	4	12	11.0	8	9.9
	5	19	17.4	12	14.8
Reasons for visiting museum	Educational	30	27.5	13	16.0
	Recommended	1	0.9	3	3.7
	Special Event	33	30.2	31	38.3
	Attraction	19	17.4	15	18.5
	Family Fun	7	6.4	2	2.5
	Simply Visit	19	17.4	17	21.0

Table 5 Data Reliability (Cronbach’s α)

Museum Service Elements		Korea		Austria	
		F*	D*	F*	D*
1	Direction Signs	.895	.931	.910	.908
2	Exhibition Information via Web-site	.895	.931	.909	.907
3	The Line of Visitor Flow	.897	.931	.909	.907
4	Guidebooks and Leaflets	.893	.931	.910	.909
5	Informational Accuracy on Exhibition	.891	.931	.909	.909
6	Exhibition Layout	.894	.931	.908	.908
7	Atmosphere(Noise, illumination, etc.)	.898	.931	.911	.910
8	Presence of 3D display	.892	.931	.907	.909
9	NFC-based Exhibition Description	.893	.931	.908	.909
10	Exhibition Description w/ QR-code	.893	.932	.910	.911
11	Experiential Program with VR	.893	.930	.907	.907
12	Digital Film for Exhibition Contents	.888	.930	.909	.907
13	AR (Augmented Reality)	.891	.932	.906	.909
14	Exhibition Explanation by Staff	.892	.931	.908	.906
15	Informing on Upcoming Programs	.894	.931	.909	.909
16	Response to Visitor’s Inquiry	.892	.930	.909	.908
17	Membership Benefits by Mobile	.890	.930	.907	.907
18	Exhibition Artworks for Sale	.902	.932	.910	.910
19	Replying to visitor’s inquiry	.893	.932	.911	.908

* F: Functional; D: Dysfunctional

At answering stage, some questions are vague and confusing to answer. For each functional and dysfunctional question as in Table 6, the respondent is supposed to select one of five alternative answers to mark different degrees of perception: ① (L) I like it that way; ② (E) It must be that way; ③ (N) I’m neutral; ④ (A) I can live with it that way; ⑤ (D) I dislike it that way. However, the nominal items like ② (E) and ④ (A) are ambiguous as they share the meaning of ‘Don’t Care’ and thus difficult to precisely to select[36].

At evaluation stage, there is information loss in (5x5) matrix where the answers to each pair of functional-dysfunctional questions are cross-referenced and measured into 6 attributes: Must-be, Atttractive, One-dimensional, Indifferent, Reverse, Questionable. There are cases that semantically different response combinations are treated as the same quality.

Table 6 Kano’s Quality Evaluation Matrix

Quality Attributes		Dysfunctional				
		L	E	N	A	D
Functional	L	Q	A	A	A	O
	E	R	I	I	I	M
	N	R	I	I	I	M
	A	R	I	I	I	M
	D	R	R	R	R	Q

Take A(Attractive) attribute for example. It is determined by the combinations of ‘Neutral’, ‘Expectant’, and ‘Acceptable’ for dysfunctional and ‘Like’ for functional question. A combination of ‘Expectant’ for dysfunctional and ‘Like’ for functional question, however, has semantically O(One-dimensional) as well.

Therefore, in this study, paired sample t-test was applied as an alternative to determination of service quality attributes while remaining within the Kano’s framework. As paired sample t-test is primarily to determine whether there is an average difference between two questions answered by the same person, we decided to focus only on three quality attributes such as ‘Attractive’, ‘Must-be’, and ‘One-dimensional’, discarding the rest which are believed inappropriate for the museum service elements. Paired sample t-test was performed in accordance with the steps as follows.

- Step 1: If p-value of a service element reveals under 0.05 ($p < 0.05$), then it is classified into ‘multidimensional’.

- Step 2: Mean difference of functional and dysfunctional question scores is calculated. If the difference of mean values is positive, the element is classified into ‘A(Attractive)’ since it represents that the degree of satisfaction if fulfilled is significantly higher than the degree of dissatisfaction if not fulfilled. Similarly, the element is classified into ‘M(Must-be)’ when the difference of mean values is minus.

- Step 3: If p-value of a service element reveals higher than 0.05 ($p > 0.05$), this regards

as ‘O(One-dimensional)’ quality as it fails to show clear distinction between two questions – functional and dysfunctional, meaning that visitor’s satisfaction is in fact likely to vary in direct proportion to the degree of service fulfillment.

As in Table 7, all the museum service elements turned out to have their own unique quality attributes, which indicates that the first hypothesis(H1) is accepted. The second hypothesis(H2) regarding the cultural influence on the visitors’ perception towards service elements is also supported as quality attributes across service elements reveal different patterns between Korean and Austrian samples. In particular, the service elements for prior and posterior stages of the museum service are in notable contrast in terms of their corresponding quality attributes.

Table 7 Differences in Quality Attributes

Museum Service Elements		Korea		Austria	
		p-value	QD*	p-value	QD*
1	Direction Signs	.048	M	.014	A
2	Exhibition Information via Web-site	.938	O	.105	O
3	The Line of Visitor Flow	.300	O	.001	A
4	Guidebooks and Leaflets	.000	A	.000	A
5	Informational Accuracy on Exhibition	.000	A	.015	O
6	Exhibition Layout	.001	A	.156	O
7	Atmosphere(Noise, illumination, etc.)	.000	A	.007	A
8	Presence of 3D display	.000	A	.000	A
9	NFC-based Exhibition Description	.000	A	.012	A
10	Exhibition Description w/ QR-code	.000	A	.000	A
11	Experiential Program with VR	.000	A	.000	A
12	Digital Film for Exhibition Contents	.000	A	.000	A
13	AR (Augmented Reality)	.000	A	.005	A
14	Exhibition Explanation by Staff	.079	O	.330	O
15	Informing on Upcoming Programs	.000	A	.000	A
16	Response to Visitor’s Inquiry	.006	A	.094	O
17	Membership Benefits by Mobile	.000	A	.074	O
18	Exhibition Artworks for Sale	.000	A	.203	O
19	Replying to visitor’s inquiry	.028	A	.936	O

*QD.: Quality Dimension (A: Attractive; O: One-dimensional; M: Must-be)

**In case of Austria sample, this service element is closer to ‘Must-be’ even if it is classified into ‘One-dimensional’ due to p-value is slightly higher above 0.05.

5. Findings and Their Interpretations

Based on the results of hypothesis tests, we came to a conclusion that cultural difference leads to the difference in quality attribute for the same service element, which in turn influences on the level of customers’ satisfaction. Key findings from this empirical study and their implications for museum management are derived by comparing t-values of two sample groups – Korea and Austria.¹⁾

5.1 Findings

Most notable differences in t-value between the two sample groups are found in service elements 1, 3, 5, 16, and 19, as shown in Fig. 5. Service element 1 (Direction Signs) is classified as ‘must-be’ quality element in Korea whereas ‘attractive’ in Austria. On the contrary, service element 5 (Accuracy of Information on the Exhibition) is classified as ‘attractive’ quality element in Korea and ‘must-be’ in Austria. Services 3 (Line of Visitor Flow), 16 (Quick Response to Visitor’s Inquiry), and 19 (Staff’s Expertise in Replying to Visitor’s Inquiry) have similar tendency in quality attribute in both countries. However, service elements 3 and 19 have significant difference of greater than element 2 in t-value, while two groups are showing quite different magnitude in their preference. In case of element 3, Austria is far greater in t-value whereas in case of elements 19 and 16, Korea is far and slightly greater than Austria respectively. Such observations as such imply museum service management should be done

1) The t-value measures the size of the difference relative to the variation in sample data. The greater the magnitude of t (it can be either positive or negative), the greater the evidence against the null hypothesis. Therefore, the closer t is to 0, the more likely there isn’t a significant difference.

in accordance with priority. If a certain service element has ‘must-be’ attribute then it should be fulfilled with higher priority than others because ‘must-be’ as threshold attribute in its nature, if properly fulfilled, does not contribute to increase in user’s satisfaction as they are taken for granted; if not fulfilled, it cause extreme dissatisfaction.

To identify further points empirical results are arranged as shown in Fig. 3(a) thru (c) by the stage of museum service - prior, main, and posterior.

1) Prior Service

Two meaningful points are found in prior service. One is Korea and Austria have the opposite quality attributes in service elements 1(Direction Signs) and 5(Informational Accuracy on Exhibition). The former is classified as ‘must-be’ in Korea whereas ‘attractive’ in Austria, while the latter is classified as ‘attractive’ in Korea and ‘must-be’ in Austria. The other is that t-values in case of Korea is consistently lower than those of Austria except for service element 5. This indicates that Koreans are more sensitive to the basic needs like direction signs, exhibition information, easiness to follow exhibition flow, while the Austrian are supposedly more prone to accuracy of information.

2) Main Service

The main service is the domain ICT can be intensively applied in numerous aspects. The overall patterns in t-values of two sample groups - Korea and Austria are very similar. But t-values of Korean sample are higher all across service elements than Austrian sample. This implies that Koreans are more prone and more sensitive to ICT-based services.

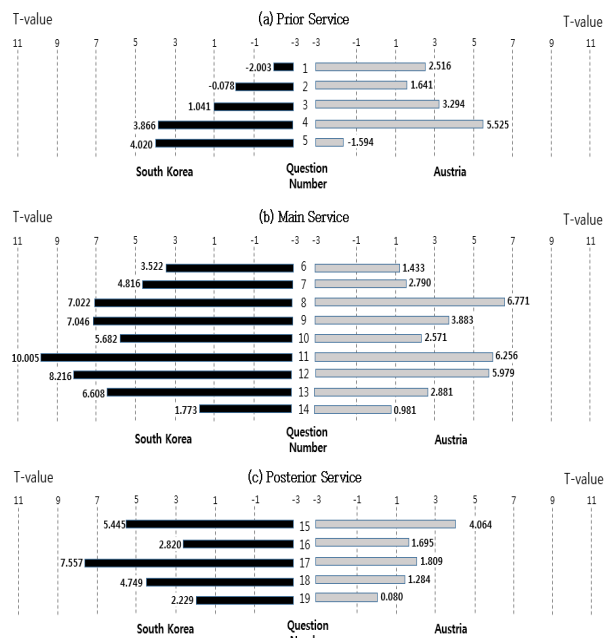


Fig. 3 Difference in t-value of Service Element between Korea and Austria

3) Posterior Service

As in case of main service, t-values of Korean sample are higher across all service elements than Austrian sample. This implies that Koreans are more sensitive to posterior services than the Austrian. Service element 17 (Membership Benefits) in particular retains far higher t-values in Korean sample, whereas element 15 (Informing on Upcoming Programs) is relatively higher than other elements in Austrian sample. Based on the survey results, it would be possible to conclude that Koreans are more interested in fringe benefits. This belief can be further supported by the fact that t-value of service element 18 (Exhibition Artworks for Sale) in Korean sample far exceeds that of Austrian sample.

5.2 Interpretations

The key findings above could be interpreted in cultural context by explaining why two

sample groups (Korean and Austrian) reveal different patterns of propensity to the same service elements. At prior service, the reasons Koreans are more sensitive to the fulfillment of more basic and more tangible needs while the Austrian are more prone to accuracy of information can be found in cultural context. Referring to Fig. 2, Korea has way higher power distance, lower individualism, and lower masculinity than Austria. Koreans, therefore, reveal a strong propensity to be guided by others and to behave collectively where as the Austrian are more likely to determine by self and behave individually. This is why Koreans are more prone to be guided and, in contrast, the Austrian tend to be more sensitive to the information accuracy.

At main service stage, the reasons Koreans are more prone and more sensitive to ICT-based services can be explained by cultural dimensions like uncertainty avoidance, and indulgence. Comparing with the Austrian, Koreans are less masculine (much more feministic), more prone to avoid uncertainty, and less indulgent (more restraint). Koreans are less tolerable for ambiguity and the more ridged in accepting gratification of basic and natural human desires related to enjoying life and having fun; and thus less proactive to social interactions. Collectively Koreans' such cultural propensity perhaps leads to make them more sensitive to ICT-based service.

At posterior service stage, the propensity that Koreans are more interested in gaining tangible fringe benefits like membership and souvenirs for sale than in appreciating artifacts displayed in the museum is perhaps explained by long-term orientation. Korea is a representative country which is strongly oriented in longer term. People in such culture are mostly thrifty and perseverant, which in turn stimulate desire to secure

physical benefits.

6. Conclusion

6.1 Contributions

Unlike previous studies which focused mainly on museum-centered exhibitions, we attempted to figure out critical clues to provide better services from visitors' perspective. To meet this goal, museum service elements were identified by thoroughly reviewing previous literature, from which ICT-applicable services were extracted. With the service elements extracted, we attempted to empirically identify their respective quality attributes with Kano's quality dimension model. We also tried to see if cultural difference influences customers' perception on the quality attributes for the same service elements by applying Hofstede's cultural dimension model. Our research motivation as such lies in the fact that there is a growing concern of visitor-centered services and secondly more foreigners than before are visiting museums. In sum, the contributions of this research are identified in two respects - academic and practical.

In academic wise, application of pair-wise t-test as an alternative to Kano approach is perhaps the most notable contribution. To ameliorate Kano's weaknesses while remaining within its framework, a set of criteria was developed to determine quality attributes. Identification of service elements where ICT can be applied and their quality attributes which influence visitor's satisfaction is also remarkable contributions. Through this study it was revealed that the museum service elements have their own unique quality attributes and that the visitors' perception towards service elements is significantly

influenced by their cultural background.

Practically, it is notable that quality attribute for the identical service element can be variable to the visitors' cultural background. This finding could help museum managers catch initial clues for strategy to improve visitors' satisfaction level in accordance with priority. Taking the following guidelines into account the museum will be able to identify which services to focus, to maintain, and to avoid excessiveness.

'Attractive' service elements disproportionately influence visitors' satisfaction and act as the strongest differentiators in service design. Although visitors do not expect a museum to include these services, they are generally very excited if provided. 'One-dimensional' service elements result in satisfaction when present and dissatisfaction when absent. Their presence increases museum performance - "the more, the better." As service elements of this type improve, visitors' satisfaction proportionally increases. 'Must-be' service elements are taken for granted by visitors. If they are absent, therefore, visitors will be strongly dissatisfied. However, no matter how well they perform, these basic service elements do not have the power to shift visitors' satisfaction beyond a neutral state.

6.2 Limitations and Future Direction

This research has yet its limitations. To secure statistical reliability, questions items for each service element should have been at least more than one. Samples used for the test are so limited that any consistency in quality attributes of the service elements cannot be generalized the services by ICT like experiential program using virtual reality is classified into 'attractive' but they are likely to change over time into 'must-be'. Therefore,

continual monitoring is needed to see if current 'attractive' services turn into 'must-be' and to find new attractive service elements so as to maintain competitive edge over other museums. Additionally, both of the sample groups are skewed to a certain class - i.e. college students at the age of 20's (70% in Korean and 80% in Austrian sample), failing to accommodate demographic diversity.

Besides complementing the limits mentioned above, future studies should be focused on the following two aspects. First, a similar research needs to be conducted by museum type. This study employed an assumption that there is no distinction among the museums, which is not realistic. Second, it would be more meaningful if this study is extended by grafting ICT onto the museum service. That is because museums today are no longer simply a space to exhibit cultural artifacts but more becoming a space that provides various experiential opportunities for visitors.

References

- [1] Suh, M. A., "An Empirical Study on the Key Factors for Activating Culture and Arts Marketing; Focused on the Museum," *Journal of Museum Studies*, Vol. 12, pp. 281-308, 2008.
- [2] Eilean H. G., *Studying Visitor*, Singapore : John Wiley & Sons, 2006.
- [3] Zhu, Bo, Kim, T. W. and Kim, S. W., "A Study on the Improvement of Smart-Phone Service Quality by Using the KANO Model," *Conference. Proc., Korean Academic Society of Business Administration*, pp. 1-9, 2010.
- [4] Kano, N., Seraku, N. and Takahashi, F., "Attractive Quality and Must-be Quality," *Journal of the Japanese Society for Quality*

- Control, Vol. 14, No. 2, pp. 39-48, 1984.
- [5] Kim, J. W. and Kim, S. W., "A Comparative Study on the Differences in Cultural Attributes of Gamification between Korea and Austria," *Journal of the Korea Industrial Information Systems Research* Vol. 23, No. 1, pp. 109-122, 2018.
- [6] Pratibha, A. Dabholkar, C., Sheperd, D., and Thorpe, D. I., "A Comprehensive Framework for Service Quality: An Investigation of Critical Conceptual and Measurement Issues through Longitudinal Study," *Journal of Retailing*, Vol. 76, No. 2, pp. 139-173, 2000.
- [7] Moor, K., *Museum Management*, Routledge, London. Last reprint 2004.
- [8] Kotler, N. and Kotler, P., *Museum Strategy and Marketing*: Jossey-Bass Publisher, 1997.
- [9] Paulus, O., "Measuring Performance: A Study of Museum in France and United States," *International Journal of Marketing*, Vol. 54, No. 4, pp. 20-35, 2003.
- [10] Yucelt, U., "Marketing Museums: An Empirical Investigation among Museum Visitors," *Journal of Nonprofit & Public Sector Marketing*, Vol. 8, No. 3, pp. 3-13, 2008.
- [11] Nowacki, M. M., "Evaluating a Museum as a Tourist Product Using the Servqual method," *Museum Management & Curatorship*, Vol. 20, No. 3, pp. 225-250, 2005.
- [12] Kim, N., "Impacts of Exhibition Service Quality on Participants' Satisfaction and Intention to Visit Again," *Korea Trade Review*, Vol. 33, No. 3, pp. 123-157, 2008.
- [13] Kim, S. Y and Kim, Y. J. "The Measurement and Consequences of Service Quality for Museum Educational Programs," Vol. 12, No. 1, pp. 109-135, 2009.
- [14] Parasuraman, A., Zeithaml, V. A., and Berry L. L., "A Conceptual Model of Service Quality and Its Implications for Future Research," *Journal of Marketing*, Vol. 29, No. 4, pp. 41-50, 1985.
- [15] Moon, C. H, and Jung, S .M., "A Study on the Tourist Satisfaction with SERVPERF: A Case of Jeonju National Museum and Jeonbuk Province Art Museum," *Journal of Regional Studies*, Vol. 24, No. 3, pp. 2005.
- [16] Cronin, J. and Taylor, S.A., "Measuring Service Quality: A Reexamination and Extension," *Journal of Marketing*, Vol. 56, No. 3, pp. 55-68, 1992.
- [17] Lee, K. D. and Kim, H., "The Effect of Tourism Information Services Factors on the Personal Values," *The e-Business Studies*, Vol. 13, No. 1, pp. 339-359, 2012.
- [18] Kim, H. W., "Effect of Service Quality of Museum on Customer Satisfaction, Loyalty and Quality of Life," Master's Thesis, SookMyung Women's University, 2008.
- [19] So, E. H. and Lee, K. R., "Influence of Service Quality on Visitor's Satisfaction, Behavioral Intention in National Museum of Korea," *Journal of Contents*, Vol. 14, No. 1, pp. 515-527, 2014.
- [20] Yang, G. S., "The Impact on Museum Experience Programs's Service Quality and Experience Factor to Revisit," *Journal of Tourism Research*, Vol. 25, No. 1, pp. 37-51, 2011.
- [21] Lee, H. S., "The IPA on the SERVQUAL of the Museum as a Cultural Tourist Product: The Case of the National Museum Visitors," *Journal of Tourism Research*, Korea Tourism Research Assoc. Vol. 22, No. 1, pp. 55-66, 2008.
- [22] Kwon, H. I., Joo, H. Y, and Lee, J. H., "Service Quality Measurement and Analysis of Consumer Service Condition for Korea Art Exhibition," *Korea Journal of Business Administration*, Vol. 24, No. 4, pp. 2347-2364, 2011.
- [23] Park, S. K., "A Study on Marketing Strategy

- of the Animation Museum,” *Journal of Art Management Studies*, Vol. 5, pp. 83-101, 2004.
- [24] Ryu, G., Hong, M, and Kwon, H., “A Study on 3-Dimensional Service Quality Measurement that Influenced Visitors Satisfaction in Museum,” *Journal of Management Education*, Vol. 31, No. 4, pp. 361-380, 2016.
- [25] Byeon, H. S. and Kang, M. R., “Design and Evaluation of Service Quality of Domestic and Foreign Virtual Museums as Tourist Attractions,” *Journal of the Korea Service Management Society*, Vol. 15, No. 5, pp. 277-293, 2014.
- [26] Feredica, P., Gandolfo. D. and Gianpaolo, B., “Designing a Mobile App for Museums According to the Drivers of Visitor Satisfaction,” *Recent Advances in Business Management and Marketing*, pp. 159-166, 2013.
- [27] Rhee B., “A Comparative Study on the Usability Evaluation of Museum Smart Phone Applications in Pre-visit Setting,” *Journal of Korea Society of Computer and Information*, Vol. 18, No. 3, pp. 69-77, 2013.
- [28] Reynolds, P., *Design of the Process and Product Interface*. In *Heritage Visitor Attractions: An Operation Management Perspective*, Cassell, London, pp. 110-126, 1999.
- [29] Taylor, S. A. and Baker, T. L., “An Assessment of the Relationship between Service Quality and Customer Satisfaction in Formation of Consumers’ Purchase Intentions,” *Journal of Retailing*, Vol. 70, pp. 163-178, 1994.
- [30] Kim, B. S. and Bae, M E., “Study on the Influence of e-Service Quality of Internet Open-Market as Perceived Value, Customer Satisfaction and e-Loyalty,” *Journal of the Korea Industrial Information Systems Research* Vol. 15, No. 4, pp. 83-101, 2010.
- [31] Brandt, D. R., “How Service Marketers Can Identify Value-enhancing Service Elements,” *Journal of Services Marketing*, Vol. 2, No. 3, pp. 35-41, 1988.
- [32] Hofstede, G., *Cultures and Organizations: Software of the Mind*. Berkshire, UK: McGraw-Hill, 1991.
- [33] Santoso, H. B., Schrepp, M., Hinderks, A., and Thomaschewski, J., “Cultural Differences in the Perception of User Experience,” *Conference Proc., Human and Computer*, Regensburg, Germany, pp. 267-270, 2017.
- [34] Nunnally, J. C., *Assessment of Reliability*. In: *Psychometric Theory* (2nd ed.), New York: McGraw-Hill, 1978.
- [35] Im, J. H., Min, D, G. and Kim, K. J.. “Fuzzy Kano Model: Fuzzy Set-Based Classification of Customer Requirements,” *Journal of the Korean Society for Quality Management*, Vol. 31, No. 3, pp. 98-113, 2003.
- [36] Won, J. M. and Kim, Y. S., “A Study on Quality Characteristics of 3D Printer Using Kano Model and Timko Customer Satisfaction Factor - Focused on Makers,” *Journal of the Korea Industrial Information Systems Research* Vol. 23 No. 4, pp. 107-121, 2018.



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