Effect of First Impressions in Tourism by Using Walk Rally Application

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***Abstract*—In tourism, it is necessary to promote sightseeing areas and tourist amenities as well as to encourage repeat visits by improving the tourists' levels of satisfaction. In this paper, we focus on impressions of sightseeing spots as an important factor in improving tourist satisfaction. Many studies have analyzed the relationship between tourists' impressions of a sightseeing area and their overall evaluation of that area, but few studies have focused on the tourists' first impressions. We analyzed the tourists' first impressions of each sightseeing spot in the area and investigated the relationship between these first impressions and the tourists' overall evaluations of each spot. Our results showed that first impressions contributed to the tourists' satisfaction and increased the tourists' motivation to revisit. We also discovered that first impressions could be significantly changed by altering the way in which tourists navigate between sightseeing spots and the way in which spots are combined.**

I. Introduction

In recent years, tourism has been drawing attention throughout the world and is said to be the third largest industry in the world [1]. According to the World Tourism Organization [2], there were more than 1,184 million international tourists in 2015, and tourism represents one of the main income sources for many developing countries. Thus, it can be said that it is important to market each sightseeing area well in order to further develop the tourism industry, which is regarded as important throughout the world. Meng et al. [3] showed that the satisfaction of tourists is an important index in the marketing of tourism services. In other words, it can be said that improving the satisfaction leads to marketing and the improvement of tourism services' quality. Therefore, the impression of the sightseeing area is important. Chen et al. [4] and Chi et al. [5] suggested that the impression of the sightseeing area is effective in improving the satisfaction of tourists and it can also be an important factor in deciding which sightseeing area to choose.

Many previous studies have analyzed the relationship between the tourists' impressions of a sightseeing area and their overall evaluation of that area in this way. However, few studies have focused on the tourists' first impressions. The first impression of a sightseeing area is a very important factor in deciding whether tourists who visited the area for the first time will visit the area again. Therefore, an analysis of the relationship between the first impression of the sightseeing area and the evaluation is necessary. However, the granularity of the sightseeing areas is different, so the differences in the granularity are summarized below.

- Coarse Grain (Level of cities, such as Kyoto, Rome)
- Medium Grain (Level of towns, such as Gion, Via Labicana)
- Fine Grain (Resource level, such as Yasaka Shrine, Colosseum)

Many previous studies analyzed sightseeing areas at the level of the "Coarse Grain". However, in this study, we focus on a more microscopic viewpoint, the "Fine Grain," and analyze the relationship between the first impression of sightseeing resources and the tourist's evaluation.

In addition, when producing sightseeing areas, it is necessary to match the first impression of the area with the charm and image of the area. Yu et al. [6] stated that tourists' satisfaction is high when the image held in advance to the sightseeing area matches or exceeds the one actually experienced at the area. Since the Coarse Grain consists of several Fine Grains and the first impression of the Coarse Grain can be said to be the collection of first impressions of the Fine Grains, it is necessary to match the first impression of the sightseeing resources, so-called Fine Grains, with the charm and image of the tourism resources. However, there are many sightseeing resources which are not able to give the first impression that they really want to give. Thus, in this study, we investigate and analyze the necessary elements for giving a certain first impression and show the possibility of producing sightseeing areas by giving first impressions freely.

In this research, we conducted a city walk experiment using mobile phones in Kyoto and attempted to collect the first impressions of various sightseeing resources and their evaluations by taking a questionnaire before and after the experiment. The main points of this research are the following three points.

- Carrying out the city walk event and extracting the first impressions of sightseeing resources
- Clarifying the relationship between the first impressions of sightseeing resources and the evaluations of the resources
- Showing the possibility of controlling the first impressions of sightseeing resources for producing sightseeing areas

In this study, we focus on these points and analyze the first impressions of sightseeing resources.

II. Related research

Up to now, with research regarding impressions toward cities, regions, and sightseeing resources, there have been analyses based mainly on questionnaire surveys [7], [8], [9] and in some cases, recall-based methods [10], which measure the recollection process of memory and SNS [11] data. These series of survey methods can be positioned as methods for the feasibility study and marketing analysis of sightseeing resources. In this regard, it can be applied towards the goal of promoting first impressions of a tourist spot, which this research is aiming for. However, a questionnaire survey is not something that is necessarily collected at the time of the impression when visiting sightseeing resources and the impression upon visiting may fade compared to the impression immediately after the visit, and may change as time passes from the initial visit. In addition, with the analysis by SNS, guarantee is not assured with each piece of information. In contrast, this research analyzes information obtained immediately after the actual visit of a sightseeing resource using a mobile application to navigate to the sightseeing resource. In other words, the feature of this research is that straight after a visit to a sightseeing resource (on the same day and not more than 6 hours after the visit to a sightseeing resource by the survey subject), the subjects were asked questions about all sightseeing resources the users themselves visited to determine the first impression of a sightseeing resource. In this regard, the differences between the true impressions that the visitors hold are predicted to be small in finding out with certainty the impressions immediately after the visit. This is expected to have the same result as, say, the exit poll, which is said to be extremely useful in predicting an election.

Note that many mobile applications such as the ones used in this research and walk rally applications have been developed and evaluated so far [12], [13], [14]. There are examples of these being used for tourist information and guidance when walking around town [13], for walk rallies [12], and for learning about the history and culture of a region [14]. These mainly evaluate the usefulness of the application in the context of user satisfaction and learning outcomes. In contrast, this research uses applications which offer guidance to tourist spots when walking around town, but the aim is to utilize this for a feasibility study to market sightseeing resources and for marketing, and hence its purpose of use and goal are different.

III. Experiment

A. Outline of experiment

This experiment was conducted in Kyoto City on Thursday, March 2, 2017 and Saturday, March 4, 2017. The test subjects were 33 male and female students in their twenties (11 students studying abroad). Therefore, this experiment cannot be said to be an experiment targeting tourists coming from outside of Kyoto. However, it is confirmed by advance questionnaires that the test subjects have unvisited places in Fine Grains although they are residents of Kyoto who have a certain degree of familiarity. When local people visit unvisited areas, it can be said that they are sightseeing. In this study, we focus on this and analyze it by extracting the first impressions of the Fine Grains. Next, the flow of the experiment is shown below.

1) Gathering at the start point (between 11:15 and 11:45)
2) Answering the advance questionnaire
3) Setting up mobile phone
4) Leaving for walk rally
5) Walking freely around town
6) Arriving at the goal point (between 16:00 and 16:30)
7) Answering the after questionnaire

After taking the advance questionnaire at the start point, we explained the outline of the experiment and the walk rally application used in this experiment. The test subjects were supposed to gather at the start point within the designated time and they started the walk rally experiment from people who are ready for departure. In addition, in the walk rally experiment, we made them walk around Kyoto freely while using the walk rally application, and they were free to take a lunch break and get off the road. They were required to arrive at the goal point within a specified amount of time, and they answered the after questionnaire as soon as they arrived at the goal point.

B. Overview of the application

As mentioned earlier, the test subjects freely walked around Kyoto while using the walk rally application. In this study, we got them to use the "MachiNavi" walk rally application that we developed. Examples of "MachiNavi" screens are shown in Fig. 1 and Fig. 2. As a procedure for using "MachiNavi," the following four steps are repeated.

1) Select a destination
2) Move to the destination using Navi
3) Take a picture at the destination (Check-in)
4) Try a quiz

The biggest feature of "MachiNavi" is the method of navigation. The navigation screen is shown in Fig. 3. Brown et al. [15] clarified that tourists want to travel via a flexible route rather than a designated route when they head for their destination. Also, Kinoshita et al. [16] developed a system that

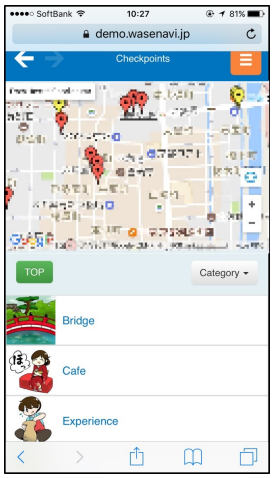

Fig. 1. Checkpoints list screen

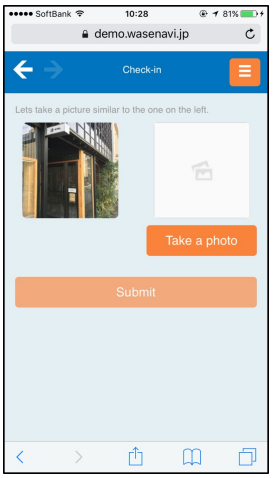

Fig. 2. Check-in screen

can wander around the town using only the compass, and it has been shown that enjoying the atmosphere of the alley is promoted by wandering around the town using this system. From the above research, in order to make the atmosphere of the tourism resources more enjoyable and to enjoy the city walk in Kyoto, we established a navigation system that displays the compass (showing them the direction of the destination) and the remaining distance for guiding them to the destination.

Then, 93 sightseeing resources are installed in "MachiNavi," and the sightseeing resources are classified by category. The categories are "Start" (1 place), "Goal" (1 place), "Hidden Sightseeing Spot" (31 places), "Bridge" (5 places), "Well" (4 places), "Cafeteria" (8 places), "Japanese Sweet" (9 places), "Inn" (4 places), "Japanese Tea" (3 places), "Traditional Vegetable" (4 places), "Japanese Crafts" (2 places), "History" (8 places), "Traditional Industry" (11 places), and "Experience" (2 places); a total of 14 types are set up. In addition, categories other than "Traditional Industry" and "Experience" were displayed on the experiment done on March 2 and categories other than "History" were displayed on the experiment done on March 4. The start point and the goal point, and the position of each sightseeing resource, are shown in Fig. 4. It is about 3 km from the start point to the goal point with the shortest

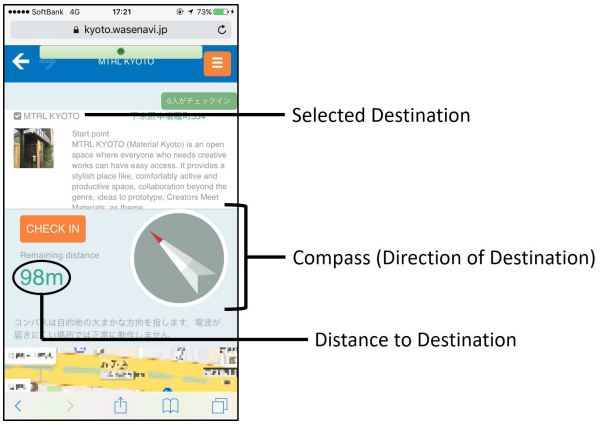

Fig. 3. Navi screen

route, and it is enough distance to walk within the specified time.

C. Extraction of first impressions

In this experiment, we conducted the following three tasks to extract the first impressions.

Survey on the recognition of sightseeing resources

We asked the test subjects about their perceptions of 89 sightseeing resources, excluding the "Well" category out of the "MachiNavi" contents, in the advance questionnaire. We let them preliminarily evaluate tourism resources in the next four choices: "I know this spot and have an experience of visiting it," "I do not know this spot, but have an experience of visiting it," "I know this spot, but do not have an experience of visiting it," "I do not know this spot and do not have an experience of visiting it."

City walk experiment

The test subjects walk in the city freely using "MachiNavi" after completing the advance questionnaire.

Survey on the impressions and their evaluations

After the end of the city walk, we asked the test subjects about the satisfaction ratings for sightseeing resources visited by each subject and the impressions that they felt by visiting sightseeing resources. Regarding the satisfaction evaluation, they evaluated in five levels with 5 as the highest value. Also, regarding the impression, we let them select the impression that they felt when they visited each sightseeing resource, as many as they liked from the next 16 items: "Fun," "Excited," "Impressed," "Beautiful," "Surprised," "Unexpected," "Heuristic ," "Want to go again," "Like Kyoto," "Doubtful," "Mysterious," "Typically Japanese," "Felt history," "Felt tradition," "Everyday life in Kyoto," or "Disappointed."

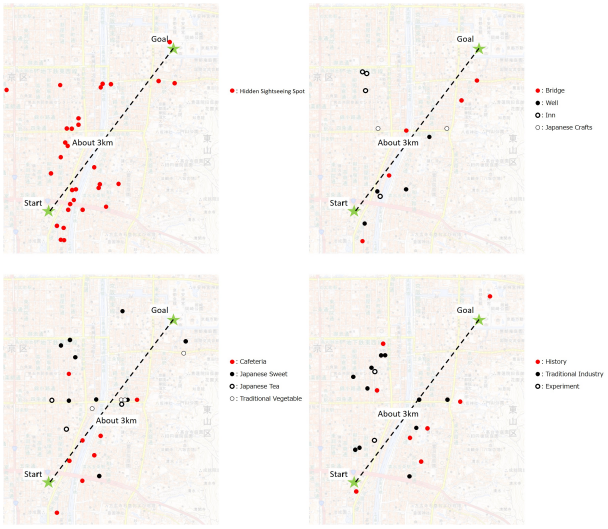

Fig. 4. Positions of the contents

TABLE I
CLASSIFICATION OF SIGHTSEEING RESOURCES

class (points)	Number of points
0-1	76 (82% of the total)
1-2	8 (9% of the total)
2-3	2 (2% of the total)
3-4	2 (2% of the total)
4-5	5 (5% of the total)

We extracted the first impressions by these three levels of work. The impressions that they felt when they first visited the sightseeing resources that they rated as "I do not know this spot and do not have an experience of visiting it" in the advance questionnaire by "MachiNavi" can be said to be the first impressions. In addition, all impressions obtained at the four places included in the "Well" category were taken as the first impressions, assuming that none of the subjects paid attention and never saw the well carefully. Next, we explain how much sightseeing resources we were able to extract from the first impression. Based on the results of the advance questionnaire for 33 subjects, we quantified the sightseeing resources. The method of quantification is: "I know this spot and have an experience of visiting it" is 5 points, "I do not know this spot and do not have any experience of visiting it" is 0 points, and other evaluations are excluded. In this way, the average value of 33 subjects' evaluations for each sightseeing resource was calculated. The result of classifying sightseeing resources based on the average score is the following Table I. In addition, the score of 4 points in the "Well" category is set to 0 points.

Next, we explain how we decided on the options for first impressions. Hosany et al. [18] developed the evaluation index for sightseeing areas, and they showed that the three factors "Joy," "Love," and "Positive Surprise" have a positive effect on satisfaction by conducting a questionnaire survey of 3000. In addition, we added "Otherwise" as the factor like Japan and added "Negative" as the negative factor because the negative factor is the important one [9]. Furthermore, "Satisfaction" was added as the factor indicating the degree of satisfaction. The reasons for choosing the first impressions included in "Otherwise" are as follows.

"Like Kyoto"
: Kyoto is the 6th largest city to visit in the world [19]. So it seems that "Like Kyoto" is an important impression.

"Doubtful" and "Mysterious"
: As told by Tonder et al. [20], Kyoto is considered to have a mysterious aspect as well.

"Typically Japanese," "Felt history," and "Felt tradition"
: Kyoto is an ancient capital of Japan and it is thought that Kyoto has enough Japanese history and tradition.

"Everyday life in Kyoto"
: The landscapes and cityscapes seen in Kyoto are also very important resources, which are also considered to be one of the unique impressions of Kyoto.

Based on the above, it is judged that the important factors as the first impressions of sightseeing resources in Kyoto are "Joy," "Love," "Positive Surprise," "Otherwise," "Negative," and "Satisfaction." In addition, we decided that these impressions were to be included in the factors to ask in the after questionnaire. The relationship between the factors and first impressions in this study is shown in Table II.

IV. RESULTS AND DISCUSSION

A. First impression and evaluation

In the section, we analyze the relationship between first impressions and the evaluations. The relationship is summarized in Table III. From Table III, as in the case of Hosany et al. [18], it is also confirmed that the three factors "Joy," "Love," and "Positive Surprise" are generally effective for the evaluation of sightseeing resources in the first impression. Next, we analyze the first impressions included in the "Otherwise" factor. It turns out that the first impressions such as "Doubtful" or "Mysterious" have a positive effect on the evaluations of sightseeing resources. On the other hand, it becomes clear that the first impression of "Everyday life in Kyoto" cannot be said to have a positive effect on satisfaction.

From this result, it is predicted that the evaluation becomes high when tourists feel a first impression which is unusual for sightseeing resources, and on the contrary that the evaluation becomes low when they feel the first impression of familiarity. In addition, it turns out that the first impressions such as "Like Kyoto," "Typically Japanese," "Felt history," and "Felt tradition" had lower evaluations than "Doubtful" and "Mysterious." From this, it is found that the test subjects were more satisfied when they felt a surprising first impression than when they felt the same type of first impression as the preliminary impression predicted for sightseeing resources.

B. First impression and revisiting

In this section, we analyze the relationship between the first impression and whether the test subjects wanted to visit again (revisiting). The relationship between the first impression and revisiting is shown in Table IV. From Table IV, if we could get a first impressions like "Fun," "Surprised," and "Heuristic," we could get a first impression of "Want to go again" more. In addition, the first impressions included in the three factors of "Joy," "Love," and "Positive Surprise" have generally higher

TABLE II
CLASSIFICATION OF FIRST IMPRESSIONS

Factors	First impressions
Joy	"Fun" "Excited"
Love	"Impressed" "Beautiful"
Positive Surprise	"Surprised" "Unexpected" "Heuristic " (Only when evaluation is 3 or more)
Otherwise	"Like Kyoto" "Doubtful" "Mysterious" "Typically Japanese" "Felt history" "Felt tradition" "Everyday life in Kyoto"
Negative	"Surprised" "Unexpected" "Heuristic" (Only when evaluation is less than 3) "Disappointed"
Satisfaction	"Want to go again"

TABLE III
RELATIONSHIP BETWEEN FIRST IMPRESSIONS AND SATISFACTION EVALUATIONS

Factors	First impressions	Number of extracted	Average of satisfaction evaluation value	Median	Mode
Joy	"Fun"	94	4.40	5	5
	"Excited"	91	4.38	5	5
Love	"Impressed"	28	4.60	5	5
	"Beautiful"	98	4.16	4	5
Positive Surprise	"Surprised" (Only when evaluation is 3 or more)	91	4.42	5	5
	"Unexpected" (Only when evaluation is 3 or more)	110	4.20	4	5
	"Heuristic" (Only when evaluation is 3 or more)	134	4.23	4	5
Otherwise	"Like Kyoto"	379	3.84	4	4
	"Doubtful"	28	4.04	4	5
	"Mysterious"	62	4.32	4.5	5
	"Typically Japanese"	145	3.70	4	3
	"Felt history"	244	3.79	4	3
	"Felt tradition"	158	3.88	4	4
	"Everyday life in Kyoto"	139	3.29	3	3
Negative	"Surprised" (Only when evaluation is less than 3)	7	2.00	2	2
	"Unexpected" (Only when evaluation is less than 3)	7	2.00	2	2
	"Heuristic" (Only when evaluation is less than 3)	4	1.75	2	2
	"Disappointed"	35	2.17	2	2

TABLE IV
RELATIONSHIP BETWEEN THE FIRST IMPRESSION AND REVISITING

Factors	First impressions	Number of extracted	Number of first impressions "Want to go again"	Co-occurrence rate(%)
Joy	"Fun"	94	49	52.1
	"Excited"	91	34	37.4
Love	"Impressed"	28	11	39.3
	"Beautiful"	98	30	30.6
Positive Surprise	"Surprised" (Only when evaluation is 3 or more)	91	39	42.9
	"Unexpected" (Only when evaluation is 3 or more)	110	39	35.5
	"Heuristic" (Only when evaluation is 3 or more)	134	55	41.0
Otherwise	"Like Kyoto"	379	89	23.5
	"Doubtful"	28	4	14.3
	"Mysterious"	62	20	32.3
	"Typically Japanese"	145	33	22.8
	"Felt history"	244	44	18.0
	"Felt tradition"	158	35	22.2
	"Everyday life in Kyoto"	139	27	19.4

co-occurrence rates with the first impression of "Want to go again." Furthermore, just like the relationship between the first impression and the satisfaction evaluation, it can be seen that the first impression of "Mysterious" shows a co-occurrence rate with the first impression of "Want to go again" that is high among the factors of "Otherwise."

From the above two sections, in addition to the first impressions included in the three factors of "Joy," "Love" and "Positive Surprise," it is revealed that the element which can be said to represent the cultural aspect of Kyoto in Japan called "Mysterious" is important for the first impressions of Kyoto.

C. Control of the first impression

In this section, we analyze sightseeing resources that could give their own first impression unlike other sightseeing resources, despite being in the same category. This time, we analyze the four wells that were included in the "Well" category. The first impressions extracted for the wells are summarized in Table V. None of these four wells is currently used and the shapes of the wells were all standard, so we predicted that the first impressions that can be extracted from these four wells would not be significantly different.

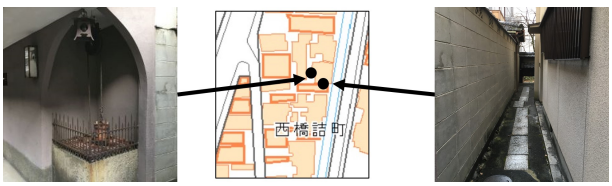

Fig. 5. "Well D" and "An alternative way" [17]

However, from Table V, "Well D" shows that it is able to give an important first impression in Kyoto called "Mysterious" compared to the other wells. Therefore, it is thought that the reason why "Well D" was able to give the first impression of "Mysterious" is the difference in location conditions, because the only difference between the four wells contained in the "Well" category is their locations. Thus, we analyze the location conditions that can give that "Mysterious" impression. There is "An alternative way" as another sightseeing resource near "Well D." Table V says that even "An alternative way," like "Well D," gave the first impression of "Mysterious" in particular. Therefore, it is found that first impression has a linkage effect and the first impression of a sightseeing resource is influenced by the first impressions of surrounding resources. Additionally, it turns out that the first impression is closely related to the atmosphere of the spot and location conditions. Furthermore, it becomes clear that it is sufficient to place resources that give a similar first impression nearby when it is desired to give a specific first impression to sightseeing resources.

V. SUMMARY AND FUTURE CHALLENGES

In this research, we focused on the relationship between the first impression and satisfaction evaluation. The results of the

TABLE V
FIRST IMPRESSION OF WELL AND LINKAGE

	Well A (people)	Well B (people)	Well C (people)	Well D (people)	An alternative way (people)
Number of times visited	13	11	15	17	22
"Fun"	0	1	1	0	9
"Excited"	2	2	0	2	9
"Impressed"	0	0	0	1	4
"Beautiful"	1	0	1	3	4
"Surprised" (Only when evaluation is 3 or more)	1	2	0	1	9
"Unexpected" (Only when evaluation is 3 or more)	1	2	2	4	9
"Heuristic" (Only when evaluation is 3 or more)	3	2	3	5	10
"Like Kyoto"	7	4	4	9	8
"Doubtful"	1	0	1	0	2
"Mysterious"	1	1	1	5	10
"Typically Japanese"	1	1	2	4	3
"Felt history"	9	6	5	9	5
"Felt tradition"	3	2	4	5	0
"Everyday life in Kyoto"	2	4	3	5	2
"Disappointed"	0	0	1	0	1

experiment revealed that the three factors, "Joy," "Love," and "Positive Surprise," which are known as factors that affect the evaluation of satisfaction, also have an effective influence on the satisfaction evaluation of the first impression. In addition, it became clear that a unique impression of the sightseeing site has a positive effect on the satisfaction evaluation from among these three factors. Furthermore, we found that it often makes people think that they want to go to the sightseeing area again when they felt a first impression that has a positive effect on the satisfaction evaluation. As a result, it was shown that an improvement in satisfaction leads to an increase in the repeat rate of tourists. It also became clear that, when it is desired to give a certain first impression, it is sufficient to arrange resources that give a similar first impression nearby. As a result, the possibility of controlling the first impression of sightseeing resources for producing sightseeing areas was shown.

As a future challenge, experiments will be needed to determine whether it is possible to impart the required first impression to the sightseeing area by using the method that controls the first impression of sightseeing resources developed here for sightseeing resources not giving the first impression required.

ACKNOWLEDGMENT

This research was supported by the foundation for the Fusion Of Science and Technology (FOST) in Japan and Waseda University Grant for Special Research Projects.

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