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A study on the performance of Korea's traditional market support project using eWOM: Focusing on Busan, South Korea

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A study on the performance of Korea's traditional market support project using eWOM: Focusing on Busan, South Korea

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1. Introduction

Currently, traditional markets in Korea are experiencing a decline due to the emergence of numerous department stores and large-scale discount stores (Lee, 2017). These traditional markets play a significant role in the local community by facilitating not only the exchange of goods but also the exchange of information, lifestyle, and culture, particularly as they are often situated at regional transportation hubs (Kim, 2013). Additionally, because merchants in traditional markets often reside nearby, the profits generated from sales tend to circulate within the local community, thereby providing economic benefits (Park & Kim, 2012). Consequently, the decline of traditional markets is contributing to a downturn in the local economy (Lee, 2017). Given their positive impact on various facets of the region, revitalizing traditional markets is crucial for regional growth and development (Park & Kim, 2012).

To address this decline, the government has implemented several support measures aimed at revitalizing traditional markets. The initial effort began with the enactment of the Special Measures Act for the Revitalization of Traditional Markets in

2002. This act introduced comprehensive support strategies for these markets. In 2010, the term "traditional market" was officially designated, and simultaneously, the "Special Act on the Promotion of Traditional Markets and Shopping Districts" was enacted to further bolster revitalization efforts.

Despite the government's sustained backing, questions remain about the effectiveness of these policies. The number of traditional markets has dwindled from 1,550 in 2008 to 1,388 in 2022 (SEMAS, 2012; SEMAS, 2023). Additionally, while SEMAS conducts performance analyses of traditional market revitalization support projects, it only releases basic fact-finding reports without specific performance analysis (SEMAS, 2023). This lack of detailed performance analysis is mirrored in academic research, where most studies rely on subjective measurements from sellers rather than objective data analysis. Therefore, there is a pressing need for an objective performance analysis of the support projects to identify and rectify issues, thereby improving future performance and enhancing the competitiveness of traditional markets (Cho, 2020).

Recognizing this need, the goal of this study is to determine the impact of the government's

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traditional market support policy on Busan's traditional markets. Specifically, we aim to analyze the effects of policies implemented from 2018 to 2022 on traditional markets in the Busan region. To achieve this, we will utilize Electronic Word of Mouth (eWOM) to objectively assess the impact of policies.

2. Theoretical Background

2.1 Concept of Traditional Markets

The term "traditional market" traces back to General Order No. 136 issued by the Governor-General of Chosen in 1914. It was formally recognized under the Special Act on the Promotion of Traditional Markets and Shopping Districts in 2009. Later, in 2013, Act defined traditional markets as places that naturally arise or are created out of socio-economic necessity where transactions of goods or services take place based on mutual trust (Choi & Lee, 2020). A traditional market is a cultural heritage that contains the history and culture of a country and serves as more than a simple physical transaction location because it preserves the history of the city and economic growth (Holidin & Handini, 2014; Prastyawan et al., 2015).

2.2 Busan traditional market support project

There are a total of 230 traditional markets in Busan Metropolitan City as of January 2024, with 42,629 people employed. In 2023, the total budget for traditional market support projects in Busan is KRW 24.07 billion. The national budget contributes KRW 7.07 billion, metropolitan city funds KRW 11.32 billion, and Gu funds KRW 4.92 billion. This shows that local governments bear a significant portion of the costs. Since Busan City invests over 11 billion won annually in traditional markets, an objective evaluation is needed to determine if the budget meets revitalization goals. However, research related to this matter is currently lacking. Most studies ask market merchants

directly about their sales levels and conclude that traditional markets are revitalizing if sales increase, but this method has several problems (BDI, 2023).

2.3 eWOM and online reviews

eWOM is a form of word of mouth that has evolved through the Internet (Chatterjee, 2001; Schindler & Bickart, 2002). It involves the exchange of information such as product details, usage experiences, and recommendations between consumers via the Internet (Lee & Lee, 2013).

eWOM differs from traditional word of mouth in several ways. First, eWOM spreads through various platforms such as email, blogs, online communities, and review sites, whereas traditional word of mouth occurs face-to-face. Second, the strength of the bond between the sender and receiver of information varies. Traditional word of mouth generally occurs in peripheral relationships such as friends and acquaintances, while eWOM mostly occurs in external relationships. Third, the scope of communication is broader than traditional word of mouth. Lastly, eWOM is very influential compared to traditional word of mouth because it is inexpensive and very fast (Cheng & Zhou, 2010).

Online reviews, a form of eWOM, are implemented through Web 2.0 technologies that have emerged over the past 20 years (Lee & Lee, 2013). Online reviews are available for free on platforms such as Google Maps and TripAdvisor, where users can post reviews, attach photos and videos, and include star ratings along with text reviews (Racherla et al., 2013; Ye et al., 2014). Google Map's local guide service encourages continuous and active participation from reviewers, leading to relatively authentic reviews (Lee & Son, 2021). Additionally, online reviews written by other users are often perceived by customers as more trustworthy than information provided by marketers (Zhang et al., 2010).

Online reviews can be used as a measure of eWOM (Kusawat & Teerakapibal, 2021). Currently, studies are being conducted to analyze

the impact of online reviews on performance in industries such as hotels and restaurants (Phillips et al., 2017; De Pelsmacker et al., 2018; Zhao et al., 2015; Yan et al., 2015; Kim et al., 2016).

3. Methods

3.1 Hypothesis setting

After conducting a comprehensive review of studies related to government-supported initiatives for traditional markets, it was found that there is currently a lack of objective performance indicators. Consequently, considering the situation where objective performance analysis regarding government policies on traditional markets has not been conducted, the following hypothesis was formulated.

Hypothesis: Government-supported policies aimed at revitalizing traditional markets will have an impact on eWOM.

3.2 Data collection

To analyze the effectiveness of the government's traditional market support policy, this study targeted traditional markets located in Busan. We examined the basic characteristics of traditional markets, locational characteristics of traditional markets, eWOM characteristics of traditional markets, and government support projects. Of the 230 traditional markets, 152 were initially selected after excluding 78 markets without Google Map reviews. Subsequently, 24 markets were further excluded due to the absence of location characteristics. Finally, after removing 46 markets without Google Map reviews within the recent year, 82 traditional markets were selected for analysis. Data was collected as follows.

Data on the basic characteristics of traditional markets were collected for a total of 20 attributes through the information disclosure request system provided by Busan Metropolitan City. As of January 2024, information on 230 markets in the Busan region was provided. The

collected data includes variables that explain the fundamental characteristics of each traditional market, such as vacancy rate and the presence or absence of merchant associations.

Data on the locational characteristics of traditional markets were collected for a total of 13 variables based on a 500m radius around each market using the commercial analysis system provided by SEMAS. The 500m radius was determined based on the 1 trade area, which typically includes 60-70% of a store's customers (Applebaum, 1966). Among the data on the locational characteristics of traditional markets, the average age of the daily floating population, proportion of young people, proportion of middle-aged people, and proportion of elderly people were extracted by calculating ratios from the raw data.

Data on support projects for traditional markets in Busan were collected and utilized through an information request to Busan City. However, due to limitations in data collection, the period was restricted to 2018 to 2023. Data were collected by aggregating the number of times each market benefited from the nine traditional market support projects.

eWOM characteristic data was collected using a Python crawler to extract text reviews of Busan traditional markets available on Google Maps. Additionally, information on both the number of reviews and the total number of reviews from the past year was compiled. In total, 4,250 reviews were gathered for 82 traditional markets.

3.3 Methodology

We would like to analyze to what extent the support projects implemented for traditional markets in Busan from 2018 to 2022 affected the sentiment scores of 'Google Map Review' over the recent year. However, due to the timing discrepancy between the Google Map reviews and the end year of the traditional market support projects, the year 2024 was defined operationally to cover the period from May 2023 to April 2024.

In this study, sentiment analysis is

conducted because sentiment scores for each traditional market are used rather than raw data from reviews. Sentiment analysis is the classification of emotions revealed in a text by analyzing opinions, emotions, evaluations, and attitudes expressed in the text (Pang et al., 2002). Sentiment analysis is divided into supervised learning and unsupervised learning depending on the presence or absence of labels in the analysis data. In this study, for fine-tuning based on the ratings recorded in Google Map reviews, scores of 1 to 3 are labeled as negative reviews, and scores of 4 to 5 are labeled as positive reviews. This corresponds to supervised learning because the data is labeled and used accordingly.

For sentiment analysis in the Korean language, we used the pre-trained KcELECTRA model, which has been proven to have higher accuracy than other models (Yang, 2021). Based on research indicating that using data from the relevant analysis domain improves accuracy, we used Google Map review data from 20 famous traditional markets in Korea to fine-tuning the model (Park et al., 2018). A total of 21,558 pieces of data were collected from these markets, of which 14,825 pieces of data, excluding missing values, were used to fine-tuning the KcELECTRA model. Using the fine-tuned model, we performed sentiment analysis on 4,292 reviews from 82 traditional markets over the recent year.

The sentiment score for the recent year was set as the dependent variable. Since the corresponding item for the Specialized Market (Digital Traditional Market) Development Support Project did not exist in the current data, it was removed. The analysis included a total of 43 independent variables, such as 'number of support projects benefited' and 'total number of reviews'. Handling many independent variables can lead to overfitting and limitations in interpretation. To prevent this, the correlation between the dependent and independent variables was analyzed to confirm their relationships. Additionally, variable selection was performed using Backward Elimination to

address the issue of high multicollinearity between independent variables.

Based on the extracted independent variables, multiple linear regression analysis was conducted to evaluate the relationship with the dependent variable, the sentiment score. Finally, the sentiment scores of 696 reviews from 20 traditional markets collected from May 2018 to April 2019 were compared with the sentiment scores of 2,726 reviews from 58 traditional markets in the recent year. This comparison aimed to verify the influence of the government's support on the markets that have benefited from the traditional market support project.

The characteristics of the variables collected in this study are as follows. A few key statistics are introduced below, and detailed information on the descriptive statistics of the variables is shown in Table 1.

The average sentiment score across markets is 0.50, with a standard deviation of 0.33, ranging from -0.77 to 0.70. Notably, 'Gupo Market with Affection' holds the lowest sentiment score of -0.77. The average vacancy rate is 15%, with a wide standard deviation of 21%, varying significantly from 0% to 92%, underscoring substantial differences in the proportion of empty stores. Yeonsan Market, with only 10 out of 120 stores operating, exhibits the highest vacancy rate. The number of transportation facilities around the markets averages 7.41, with a standard deviation of 7.78, ranging from 0 to 30, reflecting significant disparities in market accessibility. Alarmingly, 21 out of 82 markets have no transportation facilities in their vicinity, indicating poor accessibility. On average, markets have received government support projects 2.46 times, with a standard deviation of 2.46, and the number of benefits ranges from 0 to 12. Busanjin Market has received the most support, benefiting 12 times from the project. However, despite this extensive support, its sentiment score over the recent year remains relatively low at 0.4745.

division	variable	N	M	SD	Min	Max
dependent variable	Sentiment score	82	0.50	0.33	-0.77	0.70
basic characteristics (independent)	Presence of merchant association	82	0.98	0.16	0.00	1.00
	Main sales product	82	1.77	1.88	1.00	8.00
	Year of establishment	82	1972.70	19.42	1910.00	2009.00
	Land area	82	6824.27	8490.84	524.70	50597.00
	Store area	82	6678.04	8583.74	112.20	50836.66
	Total (a+b+c)	82	192.18	329.12	11.00	2620.00
	Operating direct store (a)	82	58.41	107.12	0.00	771.00
	Operating leased store (b)	82	104.24	162.19	0.00	1111.00
	Empty store (c)	82	29.34	133.52	0.00	1208.00
	Vacancy rate	82	0.15	0.21	0.00	0.92
	Number of employees	82	295.32	552.65	10.00	4220.00
	Number of customer support centers	82	0.23	0.42	0.00	1.00
	Number of customer rest areas	82	0.30	0.81	0.00	5.00
	Number of arcade sections	82	0.62	1.51	0.00	9.00
	Number of other convenience facilities	82	2.40	3.43	0.00	23.00
	Number of parking lots	82	0.87	1.05	0.00	6.00
	Number of parking spaces	82	46.07	73.17	0.00	428.00
	Number of restrooms	82	3.93	9.62	0.00	80.00
	Recognition	82	1.52	0.57	1.00	3.00
	Type	82	1.67	0.57	1.00	3.00
locational characteristics (independent)	average daily floating population	82	83959.73	58730.52	10136.00	362547.00
	workplace Population	82	12788.02	9248.73	923.00	56905.00
	Average income of working population	82	306.05	13.95	236.00	344.00
	Residential population	82	14024.27	5366.34	0.00	24018.00
	Average income of residential population	82	272.27	21.92	229.00	346.00
	Large distribution	82	0.71	0.73	0.00	2.00
	Number of major facilities	82	79.12	62.39	0.00	450.00
	Number of facilities attracting customers	82	34.87	31.91	0.00	132.00
	Transportation facilities	82	7.41	7.78	0.00	30.00
	Daily average Average age of floating population	82	49.02	1.70	45.60	52.79
	Youth ratio (20s, 30s)	82	24.16	6.17	0.00	43.00
	Middle-aged ratio (40s, 50s)	82	29.52	3.83	0.00	35.00
	Old age ratio (60 years or older)'	82	34.15	7.71	0.00	49.00
Busan traditional market support (independent)	traditional market and shopping mall facility modernization project	82	1.35	1.49	0.00	5.00
	old cable maintenance project	82	0.21	0.44	0.00	2.00
	market management package support project	82	0.12	0.33	0.00	1.00
	traditional market delivery service support project	82	0.21	0.54	0.00	3.00
	traditional market fire notification facility Installation project	82	0.18	0.39	0.00	1.00
	Parking environment improvement project	82	0.21	0.71	0.00	5.00
	Specialized market (cultural tourism type) development support project	82	0.12	0.36	0	2.00
	Specialized market (first step foundation creation) development support project	82	0.06	0.24	0.00	1.00
	Number of benefits from support projects	82	2.46	2.46	0.00	12.00
eWOM characteristics (independent)	Total number of reviews (as of 24.05.04)	82	1371.10	3691.08	1.00	24382.00
	Number of collected reviews (as of 24.04)	82	52.34	168.00	1.00	1207.00

Table 1 Research variables

4. Results

Prior to testing the hypothesis, the correlation between the dependent and independent variables used in this study was analyzed. As a

result of the analysis, the maximum correlation coefficient between the independent and dependent variables was 0.25 confirming that most independent variables do not show a strong correlation with the dependent variable. In addition,

because multicollinearity between independent variables is likely to be high, variable selection was performed through backward Elimination. However, all variables except for three were

removed due to high multicollinearity, indicating a strong correlation among the independent variables and suggesting difficulty in selecting the appropriate independent variables.

variable	r	variable	r
Presence of merchant association	0.2562	Average income of working population	0.0405
Main sales product	0.0866	Residential population	-0.0723
Year of establishment	0.0279	Average income of residential population	0.0308
Land area	-0.0991	Large distribution	-0.0544
Store area	-0.1070	Number of major facilities	0.0825
Total (a+b+c)	-0.1528	Number of facilities attracting customers	0.0806
Operating direct store (a)	-0.0176	Transportation facilities	0.0267
Operating leased store (b)	-0.2196	Daily average Average age of floating population	0.1182
Empty store (c)	-0.0959	Youth ratio (20s, 30s)	-0.1046
Vacancy rate	-0.0523	Middle-aged ratio (40s, 50s)	-0.0190
Number of employees	-0.3097	Old age ratio (60s)	-0.0094
Number of customer support centers	-0.0195	traditional market and shopping mall facility modernization project	0.0392
Number of customer rest areas	-0.0894	old cable maintenance project	0.1337
Number of arcade sections	-0.2327	market management package support project	0.0969
Number of other convenience facilities	0.0367	traditional market delivery service support project	0.0618
Number of parking lots	0.0986	traditional market fire notification facility Installation project	0.0614
Number of parking spaces	-0.0183	Parking environment improvement project	0.0704
Number of restrooms	0.0330	Specialized market (cultural tourism type) development support project	-0.0049
Recognition	0.0425	Specialized market (first step foundation creation) development support project	0.0694
Type	0.0002	Number of benefits from support projects	0.1101
average daily floating population	0.0633	Total number of reviews (as of 24.05.04)	0.0564
workplace Population	0.0446	Number of collected reviews (as of 24.04)	0.0507

Table 2 correlation coefficient

Due to the difficulty in selecting variables, multiple linear regression analysis was conducted using all variables. However, all p-values were found to be

high, indicating a lack of statistical significance. This suggests that the independent variables have very limited impact on the dependent variable.

division	variable	r	t	p-value
-	const	-4.3765	-0.463	0.646
basic characteristics	Presence of merchant association	0.4274	1.376	0.177
	Main sales product	0.0494	1.027	0.311
	Year of establishment	0.0015	0.389	0.699
	Land area	2.101e-07	0.013	0.989
	Store area	6.373e-06	0.277	0.783
	Total (a+b+c)	-0.0045	-0.147	0.884
	Operating direct store (a)	0.0030	0.100	0.921
	Operating leased store (b)	0.0048	0.157	0.876
	Empty store (c)	0.0046	0.150	0.881
	Vacancy rate	0.1707	0.516	0.609
	Number of employees	-0.0003	-1.528	0.135
	Number of customer support centers	0.1207	0.755	0.455
	Number of customer rest areas	-0.0772	-0.518	0.608
	Number of arcade sections	-0.0802	-1.071	0.291
	Number of other convenience facilities	0.0230	0.955	0.346
	Number of parking lots	-0.0515	-0.479	0.635
	Number of parking spaces	0.0012	0.452	0.654
locational characteristics	Number of restrooms	-0.0331	-1.225	0.228
	Recognition	-0.0268	-0.227	0.822
	Type	0.0929	0.820	0.418
	average daily floating population	3.507e-06	1.023	0.313
locational characteristics	workplace Population	-2.407e-05	-1.489	0.145
	Average income of working population	0.0060	1.046	0.302

	Residential population	8.82e-06	0.649	0.520
	Average income of residential population	-0.0015	-0.326	0.747
	Large distribution	-0.0409	-0.482	0.633
	Number of major facilities	5.928e-05	0.032	0.975
	Number of facilities attracting customers	0.0028	1.222	0.229
	Transportation facilities	0.0081	0.932	0.357
	Daily average Average age of floating population	0.0399	0.692	0.493
	Youth ratio (20s, 30s)	-0.0320	-1.186	0.243
	Middle-aged ratio (40s, 50s)	-0.0408	-1.062	0.295
	Old age ratio (60 years or older)'	-0.0113	-0.666	0.509
Busan traditional market support	traditional market and shopping mall facility modernization project	-0.0530	-0.864	0.393
	old cable maintenance project	0.0122	0.076	0.940
	market management package support project	0.0177	0.088	0.931
	traditional market delivery service support project	0.0394	0.364	0.718
	traditional market fire notification facility Installation project	0.0336	0.183	0.856
	Parking environment improvement project	0.0541	0.528	0.601
	Specialized market (cultural tourism type) development support project	0.0202	0.097	0.923
	Specialized market (first step foundation creation) development support project	-0.0430	-0.181	0.857
	Number of benefits from support projects	0.0811	1.893	0.066
eWOM characteristics	Total number of reviews (as of 24.05.04)	0.0001	1.544	0.131
	Number of collected reviews (as of 24.04)	-0.0019	-1.296	0.203

Table 3 Multiple Regression Analysis

We analyzed the influence of support projects on traditional markets by comparing sentiment scores from two distinct periods. Specifically, we examined the traditional markets that have benefited from these support projects. The sentiment scores of 696 reviews from 20 traditional markets collected from May 2018 to April 2019 were compared with the sentiment scores of 2,726 reviews from 58 traditional markets in the recent year. The sentiment score from May 2018 to April 2019 was 0.5896, while the sentiment score for the recent year was 0.5268. Despite a slight decrease, this difference is not significant. This comparison suggests that the traditional market support projects do not have a direct impact on eWOM for the traditional markets.

In determining the upper target for the support projects, potential benefits such as improved infrastructure, enhanced market facilities, and delivery service support were considered. However, the analysis indicates that these benefits have not translated into a noticeable improvement

in visitor sentiment. Therefore, while the traditional market support projects of the government might be beneficial in enhancing physical aspects and market operations, they do not appear to influence eWOM.

5. Conclusions

What differentiates this study is that it used sentiment analysis of online reviews as a method to measure eWOM effectiveness and verified its efficacy through the direct emotions expressed by visitors. As a result of conducting a performance analysis based on the support policy for traditional markets in the Busan region, it was found that government support projects did not have a significant impact on eWOM. Despite a significant budget allocation, the inability to significantly influence visitor sentiment is recognized as a major problem.

The limitations of this study and future research tasks are as follows.

First, there is the issue of the availability and consistency of online text data. Reviews of traditional markets were collected and utilized on a one-year basis. In this process, Google Map reviews often did not exist for certain years, leading to inconsistencies in the number of traditional markets when comparing sentiment scores. Specifically, due to technical limitations, not all reviews from May 2018 to April 2019 could be collected. If all reviews had been collected, the volume of data for this period would have been significantly higher, potentially leading to better research outcomes.

Second, there are limits to data collection on traditional market support projects. Due to limitations in the current data collection process, only information from 2018 to 2022 was used. However, collecting data over at least ten years can greatly improve the analysis process and provide a comprehensive understanding of the impact of support projects.

In addition, the analysis was conducted on 82 markets. The initial plan was to exclude markets with fewer than 30 to 50 reviews for accurate analysis. Furthermore, we intended to analyze only markets where the main sales product was food (i.e., markets with a main sales product variable of 1). However, excluding data based on the number of reviews collected and the main sales product would have resulted in too few markets for multiple linear regression analysis. Expanding the scope of data collection to a nationwide level in the future could resolve this issue by increasing the sample size and enhancing the robustness of the analysis.

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