

BRIDGING PERFORMANCE AND PREFERENCE: AN EVALUATION OF BERINGHARJO MARKET FACILITIES THROUGH IPA AND CONJOINT METHODS

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Abstract

This study employed a combined Importance Performance Analysis (IPA) and conjoint analysis to assess service attributes at Beringharjo Market. The IPA evaluation identified a strategic roadmap: key strengths, including ample parking, friendly vendors, secure shopping, appropriate quality, pricing, and accessible transportation, fall in Quadrant I, indicating they met visitor expectations and should be diligently maintained. Critical service gaps in Quadrant II, such as cleanliness, toilet and trash bin availability, environmental comfort, signage, and digital payment systems (QRIS), required prioritized improvement to enhance visitor satisfaction. Conjoint analysis further revealed that environmental comfort was the most influential attribute, contributing approximately 31.26% to visitor preferences, while other features like clear signage, adequate toilets, QRIS, and rest areas held secondary importance. The conjoint model demonstrated a high predictive reliability (Pearson's $R = 0.979$; Kendall's $\tau = 0.912$, both $p < 0.01$), validating the findings. These results underscored the need for evidence-based, user-centered facility enhancements, beginning with environmental comfort to bolster market appeal and visitor loyalty.

Keywords: Beringharjo Market; Visitor Perception; Public Facilities; Importance Performance Analysis; Conjoint Analysis

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INTRODUCTION

Traditional markets in Indonesia play a vital role as centers of local economic activity, cultural preservation, and community-based tourism destinations. More than just spaces for transactions, markets like Beringharjo Market in Yogyakarta serve as symbols of urban identity, closely integrated with the royal palace (*keraton*) and the Malioboro area, which are key cultural tourism destinations (Syafii et al., 2025).

The construction and development of traditional market buildings are crucial to economic development and social stability. Traditional market assets include various forms of capital, encompassing tangible, intangible, and social assets. To fully understand the importance of these assets, a comprehensive analysis is needed to examine their contribution to economic empowerment, sustainability, and overall market functioning. Tangible assets, including goods and physical infrastructure, serve as the backbone of traditional markets. These assets provide essential support for trade and commerce, facilitate market transactions, and drive economic interaction. In the context of poverty alleviation, asset development programs have increasingly focused on helping the poor acquire tangible assets that will allow them to participate more fully in markets. This aligns with market-oriented approaches to poverty reduction, which emphasize the importance of effective market participation by low-income communities to leverage market potential for improving livelihoods (Sherraden, 1991).

Infrastructure and facilities in traditional markets are foundational to their sustainability and overall functionality. Investment in physical infrastructure not only enhances the aesthetic and operational quality of these markets but also has a significant impact on economic vitality and consumer experience. This response synthesizes various studies that highlight the multifaceted value of adequate facilities in traditional markets. Most importantly, the presence of well-developed and strategically planned facilities significantly improves the economic performance and sustainability of tradi-

tional markets. Research shows that greater investment in physical infrastructure leads to enhanced economic sustainability and vitality in traditional markets (Yi & Gim, 2018).

Previous research on traditional markets in Seoul found that improved physical conditions were associated with increased economic activity and consumer satisfaction, indicating that revitalization efforts should prioritize facility enhancement as a key strategy for market improvement (Jeong & Ban, 2020). Furthermore, effective infrastructure fosters a dynamic commercial environment that can stimulate the local economy and attract more market customers, particularly in densely populated areas where traditional markets are crucial for food supply and community engagement (Kumalasari & Cahyani, 2023).

In addition, clean, well-organized, and adequate facilities are crucial for attracting consumers and providing a satisfying shopping experience. Various studies have found that consumers increasingly choose markets that provide clean and user-friendly surroundings, including proper sanitation facilities and safety measures such as surveillance systems (Paryatno et al., 2020). Landungsari Traditional Market, as highlighted in a case study, exemplifies this trend; its development initiatives focused on improving market facilities not only supported local economic activities but also met consumer expectations for cleanliness and comfort (Kumalasari & Cahyani, 2023).

The importance of managing buildings and facilities in traditional markets cannot be overstated, as these factors significantly influence the sustainability, functionality, and attractiveness of these economic centers. Effective management practices and appropriate infrastructure are essential for enhancing the overall user experience while also contributing to local economic growth and community well-being. Proper facility management in traditional markets creates a conducive environment for both vendors and consumers. Facilities such as clean toilets, adequate lighting, waste disposal systems, and safety measures contribute to a positive shopping experience. Research has shown

that the presence and quality of such facilities directly affect consumer satisfaction and retention in traditional markets (Ozili, 2024).

Facility management plays a crucial role in ensuring compliance with sanitation standards, which directly impacts market performance and customer loyalty (Paryatno et al., 2020). Infrastructure development has been associated with higher economic activity in Indonesia's traditional markets because amenities that guarantee comfort, convenience, and safety draw more customers (Kumalasari & Cahyani, 2023; Saputra et al., 2024). Building management also involves the strategic planning of space utilization within traditional markets. Effective spatial configurations can optimize vendor visibility while minimizing congestion, thereby enhancing the overall shopping experience for consumers (Sunarto et al., 2020).

Given the importance of market building and facility management, it is essential to measure the performance of traditional market asset management. Asset management performance measurement is vital for organizations to optimize resources, maintain operational efficiency, ensure sustainability, and enhance overall performance. Effective performance measurement provides a framework for organizations to assess the effectiveness of their asset management strategies, make informed decisions, and align operations with strategic goals.

The urgency of evaluating the management of traditional market buildings and facilities is critical not only in terms of public service delivery but also within the broader context of public asset governance. Poorly managed public assets have a direct impact on public perceptions of service quality, regional spending efficiency, and the socioeconomic value that these facilities can generate.

This study focused on a traditional market located in the city of Yogyakarta, specifically Beringharjo Market, the largest and oldest market in Yogyakarta. It is widely recognized as a key tourist destination for souvenirs in the city. The market offers not only fresh produce and food items but also souvenirs such as batik and locally crafted products. According to data from the Yogya-

karta City Market Office, daily visits to Beringharjo Market reach thousands and soar into the tens of thousands on holidays. Therefore, this study aims to measure the performance of building and facility management at Beringharjo Market.

The urgency of this study lies in the increasing challenges faced by traditional markets in maintaining competitiveness, hygiene, comfort, and sustainability amidst modernization and the growth of modern retail sectors. Beringharjo Market, as a heritage site and a center of local economic activity, frequently encounters issues related to building maintenance, waste management, ventilation, and crowd management, which can affect both trader productivity and visitor comfort. A study by Noble and Sastrawan (2021) on Beringharjo Market highlighted that inadequate facility conditions including waste management, ventilation, and sanitation reduce consumer satisfaction and market attractiveness compared to modern shopping centers, while also significantly influencing visitors' perception of safety and comfort.

Given that Beringharjo is not only a commercial space but also a cultural and tourism icon of Yogyakarta, proper facilities and building management are critical to preserving its function, heritage value, and economic importance. Therefore, this study is relevant to provide empirical insights for policymakers and the Yogyakarta City Market Office to improve management standards, infrastructure planning, and sustainable revitalization strategies for traditional markets. This is necessary to identify which aspects of asset management are underperforming and require improvement to make the market more appealing to visitors. Visitors to Beringharjo Market include not only residents but also domestic and international tourists.

This study presents a pioneering integration of Importance Performance Analysis (IPA) with conjoint analysis of two complementary but traditionally separate methodologies. While IPA identifies facility attributes that users deem important and evaluates their perceived performance (Martilla & James, 1977; Abalo et al., 2007), conjoint analysis goes deeper by uncovering latent

preferences and trade-offs through realistic choice simulations (Green & Srinivasan, 1990; Orme, 2010). Applying conjoint methods in the context of a traditional marketplace like Beringharjo is particularly novel. Previous research has largely confined conjoint analysis to product design, service quality, and e-commerce settings (Louviere, Flynn, & Marley, 2015). Thus, integrating conjoint and IPA in this study offers a new methodological contribution to evaluating facility management performance in traditional markets, a domain where such quantitative preference modeling remains limited.

By integrating IPA and conjoint approaches, the study not only identifies areas where facility performance is inadequate in relation to importance, but it also uses quantified utility values to identify the characteristics that actually influence visitor choice. This dual-method strategy empowers market administrators to prioritize enhancements based on both perceived gaps and actual trade-offs made by different user segments. Consequently, the study offers a robust, evidence-based framework for resource allocation and facility improvement, while also providing a methodological blueprint for evaluating public or traditional service environments using rigorous preference modeling.

By integrating IPA's insight into performance gaps with conjoint analysis's quantification of user trade-offs, market administrators can adopt a strategic, user-centric approach to facility enhancement. This allows them to pinpoint not only which amenities are underperforming relative to their perceived importance, but also which features genuinely drive user choices, enabling targeted improvements (e.g., prioritizing sanitation or signage) that will deliver the greatest satisfaction for specific visitor or vendor segments. As a result, resources can be allocated more efficiently, tailoring upgrades to the attributes that provide maximum perceived value and impact, while also offering a replicable evaluation framework for other traditional or public facility settings.

From a theoretical standpoint, this study is grounded in two main analytical approaches: IPA and conjoint analysis. IPA has traditionally been used in service manage-

ment and marketing studies to identify performance gaps between the importance of service attributes and their perceived execution (Martilla & James, 1977). Meanwhile, conjoint analysis has its theoretical foundation in consumer choice modeling, where preferences are deconstructed into trade-offs among multiple attributes (Green & Srinivasan, 1990). The novelty of this study lies in bridging these two frameworks within the context of traditional market facilities, which are often conceptualized as public assets rather than merely commercial service entities. Existing research often uses IPA to evaluate service industries and conjoint analysis in product design or e-commerce, but there remains limited integration of these methods in the assessment of public service environments such as traditional markets.

The theoretical gap that this study addresses is the underexplored intersection between public asset management theory and consumer-centered evaluation methods. There has not been much empirical research on how users' latent preferences and perceived gaps affect the efficacy of public facility management; instead, the "public" aspect of traditional market facilities has mostly been discussed in terms of policy and governance. Prior studies in public asset management primarily emphasize efficiency, cost optimization, and lifecycle maintenance, often neglecting user perception as a critical dimension of asset performance. By positioning traditional markets as both economic and public service institutions, this study extends asset management theory into the realm of user-centric evaluation, contributing a framework that better captures the dual nature of these facilities: as engines of local economic activity and as publicly governed infrastructures. This integration not only enriches theoretical discourse but also provides a methodological advancement for public facility evaluation that can be replicated in other sectors.

LITERATURE REVIEW

Performance of Public Building and Facility Management

Performance measurement plays a vital role in public building management, particularly in monitoring efficiency and effective-

ness (Teo et al., 2022). Key aspects of performance measurement include lease management, maintenance, building condition, social impact, financial performance, and administrative operations (Teo et al., 2022). In public real estate management, key performance indicators (KPIs) are essential for evaluating organizational performance, with employee satisfaction and customer retention being critical metrics (Riratanaphong & Voordt, 2015). In the context of office buildings, practical performance measurement systems can enhance the delivery of maintenance services (Myeda et al., 2011). For public schools, building performance measurement is crucial for efficient maintenance and educational effectiveness (Victoria Ibo & Wokekoro, 2022), involving infrastructure condition assessments, user satisfaction, and maintenance levels through surveys, interviews, and observations (Victoria Ibo & Wokekoro, 2022). Overall, performance measurement in public building management is essential to improving service delivery and organizational performance across various sectors.

Performance measurement in facilities management (FM) is also critical for organizational effectiveness and competitive advantage. The Balanced Scorecard approach has been proposed as a holistic system that integrates facility management performance indicators with business domains (Amaratunga & Baldry, 2002). Facility management performance measurement should encompass both financial and non-financial criteria, including strategy, resource control, service efficiency, and value for money. This study identified four core performance measurement perspectives for facility management organizations: customer, internal processes, learning and growth, and financial. Organizations should strive to make performance measurement visible using these four perspectives to develop a new performance measurement framework. The organizational performance measurement process depends heavily on the existing knowledge and capabilities within the organization (Amaratunga & Baldry, 2001).

There is a clear need to develop performance measurement techniques to assess facility management in terms of quality,

cost, and effectiveness to advance both organizational and facility management practices. Facility management performance measurement must integrate both the business and facilities domains. This research identifies directions for developing performance measurement systems that align facilities with core business functions (Amaratunga et al., 2005).

A study conducted in a public hospital in Ghana found that the quality of facility management services, financial management, learning and growth, and internal business operations all significantly affected facility management performance, emphasizing the importance of strengthening internal strategic measures (Amos et al., 2020). These findings highlight the crucial role of facility management in supporting organizational objectives and the need for a comprehensive performance measurement framework that aligns facility operations with business strategy.

Performance and Importance of Public Assets

The performance of public assets measures the extent to which government infrastructure meets user expectations. Neely et al. (2002) stated that asset performance can be assessed through three key indicators: effectiveness, efficiency, and relevance. Effectiveness reflects how well public assets achieve their service objectives; efficiency relates to the optimal use of resources to produce maximum outcomes; and relevance denotes the alignment between the asset's function and the evolving needs of society.

To maintain markets' functionality, inclusivity, and ability to offer a pleasurable shopping experience, it is crucial to assess the performance of market services and facilities in the context of maintaining traditional markets as public economic and social spaces. According to Brackertz and Kenley (2002), public asset performance measurement should not only focus on physical aspects such as facility condition, but also include usage levels, social impact, and management sustainability. In the case of Beringharjo Market, this includes how well facilities such as public toilets, market information systems, cashless payment options,

environmental comfort, and visitor resting areas are utilized and valued by the public.

Amaratunga and Baldry (2002) also emphasize that public asset performance evaluation should consider indicators such as infrastructure quality, management efficiency, socio-economic impact, and public satisfaction levels. Therefore, the Importance–Performance Analysis (IPA) method is appropriate for identifying which market service attributes are considered important by visitors but are not yet managed optimally. A study by König et al. (2018) demonstrates that IPA is practically used to set priorities in public service policy, especially in evaluating public facilities based on user perceptions. The approach used is consistent with other research showing that work achievement serves as the primary determinant directly influencing organizational outcomes, while performance allowances and motivation act as important mediating support factors, reflecting a conceptual similarity in understanding what truly impacts both performance evaluation and user preference (Mudhofar and Gumanti, 2021).

As one of Yogyakarta City's primary public assets, Beringharjo Market is assessed in this study based on public perception by determining how effectively market services and facilities meet the needs and expectations of visitors. This evaluation serves as a foundation for prioritizing improvements so that the market functions not only as a trading center but also as a space that provides comfort, accessibility, and a meaningful experience for both local communities and tourists.

Consumer Preferences and Conjoint Analysis

Consumer preferences reflect how individuals evaluate and choose products or services based on various attributes. One of the most widely used methods for analyzing these preferences is Conjoint Analysis (CA). Conjoint Analysis is a statistical technique used to visualize how consumers assess product attributes simultaneously and how they make trade-offs between those attributes. It originates from utility theory in cognitive psychology (Luce & Tukey, 1964) and

was popularized in marketing by Green and Srinivasan in the late 1970s.

CA enables the measurement of part-worth utilities, which represent the relative preference value of each attribute level. By analyzing these utility scores, researchers can determine the relative importance of each attribute and the trade-offs consumers are willing to make. Studies across various sectors, including public services and public transportation, have shown that CA is effective in revealing the attributes most valued by users (Aruan & Crouch, 2018; Cunningham et al., 2010; Rulli, 2019).

In CA, attributes and their levels are arranged into product profiles using an orthogonal design, which reduces the number of combinations while still maintaining representativeness. Respondents then evaluate these profiles through rating, ranking, or choice-based tasks, producing part-worth utility data. This data can be analyzed using regression or estimation methods such as Hierarchical Bayes (Sawtooth Software).

In this study, CA is used to analyze visitor preferences for the priority attributes of Beringharjo Market (as identified through IPA). By understanding these preferences, market managers can design improvement strategies that align with what visitors truly value, for example, improving cleanliness while also expanding the availability of cashless payment systems.

Despite growing attention on performance measurement in facility management, particularly in contexts like healthcare or office buildings, existing frameworks often remain generic, conceptual, or narrowly focused on operational effectiveness, sustainability, or KPI development, with limited attention to stakeholder perception, contextual specificity, or user-driven trade-offs. Moreover, while the literature on public asset performance highlights the importance of aligning performance with perceived importance, it rarely integrates methods that reveal actual

user preferences under trade-offs. In parallel, conjoint analysis has been widely adopted across various consumer decision contexts, from property selections to healthcare interventions and coffee shop ambience, to uncover latent preferences and quantify attribute utilities. Its use in conventional public facility contexts, such as marketplaces, is yet understudied. The current study bridged these gaps by combining a robust, context sensitive performance evaluation of public market facilities (rooted in facility management theory) with a conjoint-based preference modeling approach. This hybrid framework not only identifies underperforming attributes relative to importance (via IPA) but also quantifies the trade-offs and utility values that drive visitor and vendor choices, thus grounding resource allocation in both performance gaps and revealed preferences and extending methodological theory into underutilized public infrastructure domains.

The findings of this study aligned with public administration theories on public building and facility management, which emphasize effectiveness, efficiency, and relevance as key performance indicators (Neely et al., 2002). The IPA results highlighted that attributes such as sanitation, lighting, and waste management are considered highly important yet underperforming. This supports Teo et al.'s (2022) argument that maintenance and building condition are critical factors shaping public perceptions of government performance in managing public assets. In this sense, the performance gaps observed at Beringharjo Market are not merely technical issues but also reflect governance challenges in public asset management that directly affect the legitimacy of public service delivery.

Furthermore, the integration of Conjoint Analysis (CA) extends facility management theory, which has often focused narrowly on financial or operational indicators. The CA findings show that visitors prioritize

combinations of attributes that enhance comfort, safety, and order, consistent with the Balanced Scorecard perspective (Amaratunga & Baldry, 2002) that positions user satisfaction as central to public facility performance. This study thus addresses a theoretical gap, as previous research has concentrated on hospitals, schools, or office buildings, while traditional markets functioning simultaneously as economic, social, and cultural public assets remain underexplored. By combining IPA and CA, this research contributes a methodological innovation to public administration by linking technical performance measurement with user preferences, offering a more strategic and citizen-responsive framework for public facility governance.

METHOD

Sample, Population, Sampling

In this study, the population is defined as all visitors to Beringharjo Market who have engaged in shopping activities over a certain period, specifically within the past year. Since the number of daily visitors is highly fluctuating and not systematically recorded, this population is categorized as an infinite population. This condition is commonly encountered in field research conducted in public areas with no membership boundaries or systematic individual recording. To determine the minimum required sample size, Cochran's formula (1977) is used. This approach is designed to estimate sample size for large or infinite populations in studies involving proportion-based measurements. The formula is expressed as follows:

$$n_0 = \frac{Z^2 \cdot p(1 - p)}{e^2}$$

With the following assumed parameters:

Z: 1.96, Z-score value at a 95% confidence level

p: 0.5, maximum variability proportion (conservative assumption)

e: 0.1, margin of error set at 10%

The calculation is as follows:

$$n_0 = \frac{(1,96)^2 \cdot 0,5 \cdot (1 - 0,5)}{(0,1)^2} = \frac{3,8416 \cdot 0,25}{0,01} = 96,04$$

Thus, the minimum recommended sample size for this study is 96 respondents. This number is considered sufficient to produce a representative estimate of the broader population's perception, with a 95% confidence level and a 10% margin of error. However, during the actual data collection process in the field, the researcher successfully gathered 152 respondents who met the inclusion criteria. This number exceeds the minimum recommended threshold and, statistically, enhances the precision and reliability of the analysis results. With a larger sample size, data variation is better represented, and the population estimates become more accurate, especially in quantitative analyses such as Importance Performance Analysis (IPA) and Conjoint Analysis, which require diverse perception distributions.

This study employed the snowball sampling technique, a sampling method in which initial respondents help to identify and recommend subsequent participants. This technique was used to ensure that the selected sample was relevant and had direct experience with the conditions at Beringharjo Market. The sample in this study consisted of individuals who had visited Beringharjo Market within the past year, while the sample represents a subset of that population. The primary instrument in this study is a structured closed-ended questionnaire, systematically designed and divided into two main sections. The first section contains questions related to respondent characteristics, including age, gender, role in the market (visitor or vendor), and frequency of visits to Beringharjo Market over the past year. The second section serves as the core instrument for evaluating respondents' perceptions of public facilities at Beringharjo Market, analyzed using two approaches: IPA and CA.

Data Analysis Technique

This study employed three main analytical approaches tailored to the evaluative and exploratory objectives of the research:

descriptive statistical analysis, Importance-Performance Analysis (IPA), and Conjoint Analysis (CA). Descriptive analysis was used to describe the characteristics of respondents and their initial perceptions of market facilities. Subsequently, IPA was applied to evaluate the performance of public facilities by assessing the alignment between the importance level and the actual performance perceived by visitors. IPA generates a priority map that helps identify which attributes should be improved or maintained.

The attributes identified as priorities for improvement through IPA were further examined using Conjoint Analysis to determine the most preferred combinations of facility services by visitors. Conjoint analysis allows this study to understand not only which aspects are important, but also how ideal combinations of attributes are perceived simultaneously by users. The integration of these three methods provides a comprehensive overview of the actual performance and visitor preferences regarding public facilities at Beringharjo Market, serving as a foundation for formulating more responsive and participatory facility management strategies.

Descriptive analysis was conducted to show the demographic and behavioral characteristics of the respondents, such as gender, age, role in the market (visitor/vendor), and frequency of visits to Beringharjo Market. This analysis provides a foundational understanding of the respondent population and plays a crucial role in linking respondents' perceptions to the market facilities. Data processing was carried out using IBM SPSS Statistics version 26 and Microsoft Excel.

Importance-Performance Analysis (IPA) is an evaluative method used to measure the alignment between the level of importance and the actual performance of a service attribute. Originally introduced by Martilla and James (1977), IPA has been widely applied across various sectors, both commercial and public, including healthcare, transportation, education, and public facilities (Pleger et al., 2020; Jin & Park, 2019). In the context of this study, IPA was employed to assess 23 attributes of services and public facilities available at Ber-

ingharjo Market. The evaluation used a five point Likert scale ranging from 1 (very unimportant/very dissatisfied) to 5 (very important/very satisfied), covering two main dimensions: (1) Importance: Respondents' perception of how important each attribute is, and (2) Performance: Respondents' assessment of how well the facility performs.

The IPA process was carried out in two questionnaire sessions: session 1 – Priority Attribute Exploration Stage (N = 30 respondents). In this initial stage, respondents evaluated 23 attributes identified through field observations and literature review. The aim was to identify attributes with a significant gap between importance and performance, indicating priority areas for improvement.

From this analysis, five key attributes were selected for further investigation using Conjoint Analysis: (a) Waste Bins & Toilets, (b) Information Boards, (c) Cashless Payment (QRIS), (d) Environmental Comfort, and (e) Visitor Rest Areas.

Session 2 – Full Evaluation Stage (N = 152 respondents). In this stage, IPA was fully implemented with the main sample. The objective was to generate a visual IPA quadrant map that categorizes attributes into four strategic priority areas.

This IPA diagram serves as an evaluative tool to identify priority areas for facility improvements at Beringharjo Market. It categorizes attributes into four main quadrants that reflect the relationship between importance and performance levels, providing a strategic foundation for enhancing market management quality: (a) Quadrant I (Keep Up the Good Work). Attributes with high importance and high performance. These factors are functioning well and should be maintained at their current level to ensure continued effectiveness, (b) Quadrant II (Concentrate Here). Attributes that are highly important but have low performance. These should be the primary focus for improvement due to their significant impact on user satisfaction, (c) Quadrant III (Possible Overkill). Attributes with high performance but low importance. Resources allocated to these areas could be reduced or redirected to more critical areas, (d) Quadrant IV (Low Priority). Attributes with low importance and low performance. Improvements in this quadrant are not urgent but may be considered if resources are available.

Over time, IPA has expanded beyond the business sector and is now widely used in the public domain. Various studies have applied IPA to evaluate public services, including e-government services (Pleger et al.,

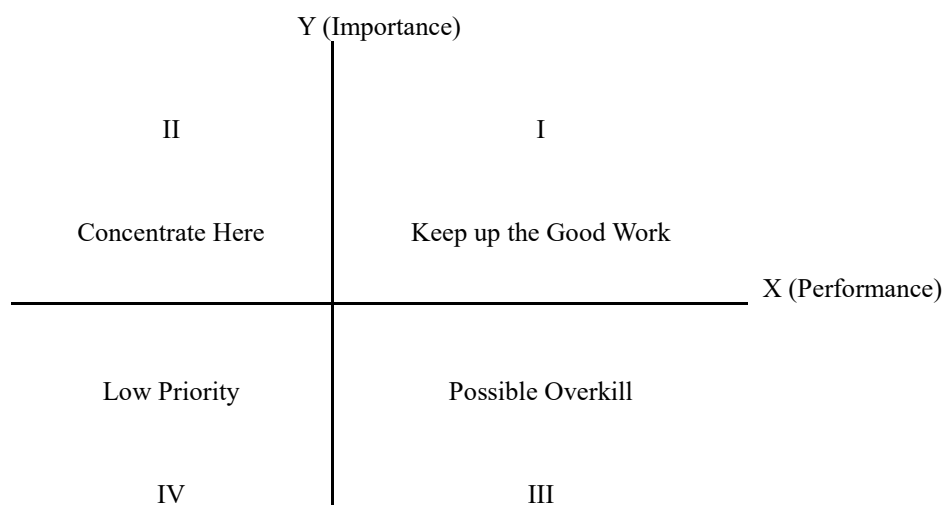


Figure 1: Importance-Performance Analysis (IPA) Diagram

Source: Martilla and James, 1977

2020), public transportation (König et al., 2018), and tourism facilities (Jin & Park, 2019). Its key strength lies in its simplicity in conveying strategic information based on user perceptions. In the context of this research, IPA is particularly relevant as it helps identify public service attributes at Beringharjo Market that are considered important by visitors but are underperforming. This provides a clear basis for market managers to prioritize improvements and enhance public facility quality more efficiently.

Conjoint Analysis was first introduced by Luce and Tukey (1964) in the field of psychometrics as an approach to measure individual preferences toward combinations of attributes. This method was later further developed by Green and Rao (1971) in the context of marketing and consumer research. The method is designed to measure the utility value assigned by respondents to each level of an attribute. Through this approach, researchers can estimate the part-worth utility of each attribute element and calculate the relative importance among attributes. Conjoint Analysis has evolved beyond marketing and has been applied in various public service domains, such as: (1) evaluating patient preferences in healthcare services (Bridges et al., 2011), (2) designing user-preference based e-government systems (Pleger et al.,

2020), and (3) developing public policies informed by citizen choices (Rulli, 2019).

In the context of this study, Conjoint Analysis is used to evaluate visitor preferences toward combinations of public facility attributes at Beringharjo Market. The five attributes used in this analysis were identified as priority attributes based on the results of the Importance–Performance Analysis (IPA) and are further supported by recent literature on the modernization of traditional markets. Fatimah and Afifuddin (2013) emphasized that aspects such as digital payment systems, public space comfort, and access to information are strategic elements for improving the competitiveness of traditional markets.

Each attribute consists of three levels, resulting in a theoretical total of 243 combinations (3^5) in a full factorial design. However, to avoid respondent cognitive fatigue, a fractional factorial design was employed in IBM SPSS Statistics software using the Orthogonal Design feature. This approach reduces the number of combinations to 16 profiles (stimuli) while still representing the main effects of all attributes. Each respondent was asked to evaluate their level of preference for each attribute combination using a five-point Likert scale, ranging from 1 (strongly dislike) to 5 (strongly like). The

Table 1: Attributes and Levels

NO	ATTRIBUTE	LEVEL 1	LEVEL 2	LEVEL 3
1	Trash Bins & Toilets	Not available / very limited	Available but not clean or adequate	Available in sufficient quantity and clean condition
2	Information Boards	None / confusing	Available but unclear or incomplete	Complete, clear, and easy to find
3	Cashless Payment (QRIS)	Not available	Only available at some vendors	Available at most vendors
4	Environmental Comfort	Hot, stuffy, and smelly	Fairly comfortable but still somewhat hot or crowded	Cool, clean, and well-ventilated
5	Visitor Rest Areas	Not available at all	Available but limited or uncomfortable	Available in sufficient quantity and comfortable to use

Source: Data processed by the researcher, 2025

scores provided were then analyzed to calculate the part-worth utility values and the relative importance of each attribute. This method allows for the development of more targeted strategies based on actual user preferences. The management of Beringharjo Market can create more precise, effective, and inclusive facility improvement policies by knowing the best combinations of facilities.

The findings of this study have a direct bearing on public administration, particularly in the domain of public building and facilities management. Public facilities are viewed in the literature as tools for accountability, efficiency, and public service delivery in addition to being physical infrastructures. The results from IPA in this study show that certain attributes such as sanitation, lighting, and waste management were rated as highly important but underperforming. This resonates with public administration theory, which emphasizes that facility management quality directly affects public perception of government performance and the legitimacy of public service provision (Osborne, 2006). In other words, gaps identified in this study highlight how deficiencies in infrastructure maintenance can undermine the effectiveness of public asset governance.

Moreover, the integration of IPA and Conjoint Analysis contributes to bridging theory and practice. While IPA reflects the performance evaluation perspective commonly applied in public sector management, conjoint analysis advances this by uncovering user preferences and trade-offs, which is aligned with the New Public Management (NPM) paradigm that stresses citizen-centric and demand-driven service delivery (Hood, 1991). The conjoint findings that visitors value combinations of sanitation, safety, and clear signage illustrate how user-centered evaluation can inform strategic facility planning in traditional markets. This aligns with public facility management theory, which stresses the importance of participatory and evidence-based decision-making in optimizing public resources.

Thus, this study contributes to filling a theoretical gap: while existing literature often treats traditional markets as cultural or

economic spaces, this research situates them explicitly within the framework of public facility governance. The results confirm that applying performance measurement tools such as IPA and conjoint analysis not only helps identify service gaps but also operationalizes the principles of public administration efficiency, responsiveness, and accountability into concrete strategies for improving facility management in traditional markets like Beringharjo.

RESULTS

This study involved 152 respondents who had completed the questionnaire completely. They were grouped based on the frequency of their visits to Beringharjo Market over the past year, as well as their age group. This data is important as it helps to understand the respondents' background before analyzing how they assess the market's facilities and services.

In terms of visit frequency, most respondents (48.7%) visited the market 2–3 times a year. Only 5.3% visited just once, while 21.7% visited 4–5 times, and the remaining 23% visited more than five times a year. This indicates that most respondents had firsthand shopping experiences at the market more than once, implying that their assessments of market attributes were based on experience rather than just first impressions. This makes their feedback more relevant and credible as a basis for improving market facilities.

Based on the data, most of the respondents in this study are from the 18–25 age group, accounting for 69.1%, followed by the 26–35 age group at 28.9%, and the remaining 1.3% are under 18 years old. There are no respondents from the 36–45 age group or above 45 years old. This composition shows that the respondents were dominated by young adults. This characteristic has significant implications for the research results, as younger age groups tend to: (1) Visit markets more frequently for shopping, culinary tourism, or social activities; (2) Have higher expectations for service quality, cleanliness, and convenience of facilities such as cashless payment, (3) Provide critical and quick assessments of their shopping experiences, including making

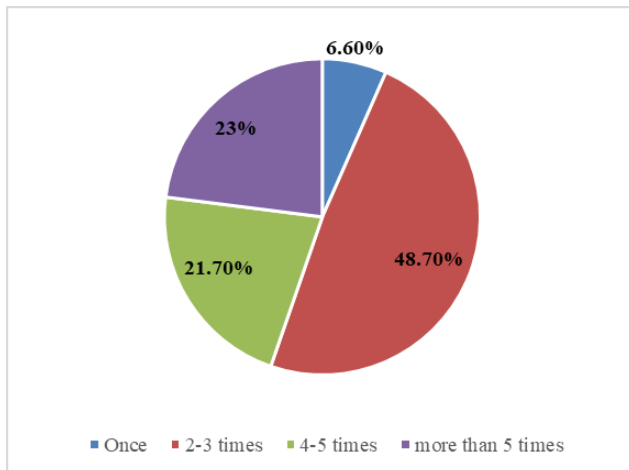


Figure 2: Respondent's Visit Frequency

Source: data processed by the researcher, 2025

comparisons with alternative shopping venues.

The absence of respondents over the age of 35 may also signal that this market is less appealing to older age groups or that such groups are rarely active visitors. This opens opportunities for market managers to develop strategies to attract more senior segments, for example, by improving comfort, physical facilities, and promotional programs tailored to their preferences.

Importance Performance Analysis of Beringharjo Market Building and Facility Management

A reliability test was conducted on 23 question items using Cronbach's Alpha analysis. The results showed a value of 0.945, which falls into the "very reliable" category (generally, values > 0.90 are con-

sidered very high). This suggests that if all questionnaire items are utilized repeatedly under the same conditions, the findings will be consistent.

According to the Corrected Item-Total Correlation results, all question items had values greater than 0.30, meaning each item had a strong relationship with the total score and contributed positively to the overall reliability of the instrument.

In addition, Cronbach's Alpha if Item Deleted results showed that removing any single item did not significantly improve the reliability score. Therefore, all items were retained in the instrument, ensuring that each question remained relevant and supported the quality of measuring the studied variables. Overall, this reliability test confirmed that the questionnaire used had excellent quality for measuring respondents' perceptions and preferences, making the subsequent analysis results trustworthy.

Once the data were deemed reliable, an Importance-Performance Analysis (IPA) was conducted to evaluate visitors' perceptions of the importance and performance levels of various service attributes at Beringharjo Market. Based on the processed data from 152 respondents, the following averages were obtained: (a) Average importance level: 4.47, and (b) Average performance level: 2.97.

These two values were used as the vertical axis (importance) and horizontal axis (performance) thresholds in the Cartesian

Table 2: Reliability Test Results

<i>Reliability Statistics</i>	
<i>Cronbach's Alpha</i>	<i>N of Items</i>
.945	23

Source: data processed by the researcher, 2025

diagram, which maps 23 service attributes into four quadrants: (1) Quadrant I (High Importance & High Performance) – Maintain Performance, (2) Quadrant II (High Importance & Low Performance) – Improvement Priority, (3) Quadrant III (Low Importance & Low Performance) – Low Priori-

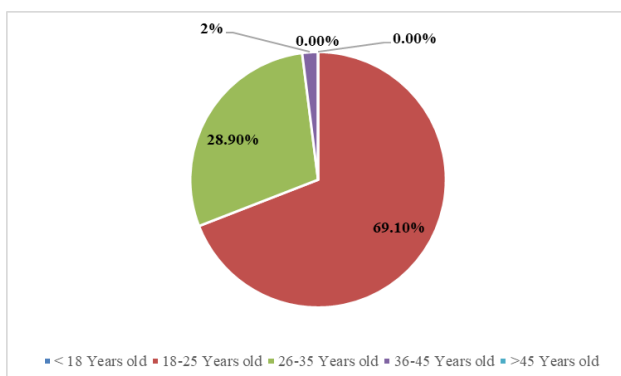


Figure 3: Respondent's Age

Source: data processed by the researcher, 2025

ty, (4) Quadrant IV (Low Importance & High Performance) – Overdone.

The main focus of this study lies in Quadrant II, which contains attributes that visitors consider highly important but with low performance levels. These attributes become the top priority for improvement by market management, as they directly affect visitor satisfaction. The six attributes in Quadrant II are: (1) Cleanliness of the market area; (2) Availability of trash bins & toilet cleanliness; (3) Comfort of the market environment; (4) Availability of proper public toilets; (5) Availability of cashless payment systems (QRIS); and (6) Information boards & directional signage.

Cleanliness and comfort of the environment emerge as central issues, as both are directly linked to the market's image and the shopping experience. Basic facilities such as toilets and trash bins still require improvements in both quantity and quality. Modern supporting facilities, such as QRIS and information boards, have significant potential to enhance convenience and efficiency in the shopping experience but are currently underutilized. These findings form the basis for the subsequent conjoint analysis, aimed at determining the combination of service improvements that best align with visitors' preferences.

The IPA analysis results reveal the distribution of Beringharjo Market's service attributes into four quadrants, illustrating the relationship between importance and performance levels. This mapping provides strategic insights into market management in determining priority areas for facility and service improvements.

Quadrant I – Maintain Performance (High Importance, High Performance). Attributes in this quadrant score above average in both importance and performance, indicating that market management has met visitor expectations in these areas. Examples include adequate parking space, vendor friendliness, shopping security, appropriate product quality and pricing, and ease of transportation access. The implication is that performance in these attributes should be maintained, as a decline in quality could

negatively affect established visitor satisfaction.

Quadrant II – Priority for Improvement (High Importance, Low Performance). This quadrant contains attributes that are highly important to visitors but currently underperform. The gap between expectations and reality is evident in aspects such as market cleanliness, availability of toilets and trash bins, environmental comfort, signage, and cashless payment services (QRIS). These attributes should be the top priority for improvement, as they directly influence visitor satisfaction. Enhancing these areas could significantly impact the market's image and visitor loyalty.

Quadrant III – Medium Priority (Low Importance, Low Performance). Attributes here are considered less important by visitors and perform poorly, such as ventilation, lighting, prayer facilities, pedestrian pathways, vendor orderliness, market uniqueness, and architectural appeal. Improvements can be made gradually or selectively, depending on resource availability, since upgrades in these areas are unlikely to have an immediate, significant effect on visitor satisfaction.

Quadrant IV – Resource Efficiency (Low Importance, High Performance). Attributes in this quadrant perform well but are considered less important by visitors, including seating areas, disability access, and elevators/ escalators. The implication is that management can maintain these services at an optimal level without allocating excessive resources, allowing the budget to be redirected to higherpriority areas (Quadrant II).

These findings confirmed that Quadrant II should be the focus for follow-up actions, as its attributes reflect high expectations that are not yet met. Improvements in this area are expected to significantly enhance the shopping experience. Furthermore, these priority attributes will serve as the basis for service scenario development in the conjoint analysis, aimed at identifying the optimal combination of public facility improvements aligned with visitor preferences. This approach aligns with the principles of evidence-based planning, in which market management policies are formulated

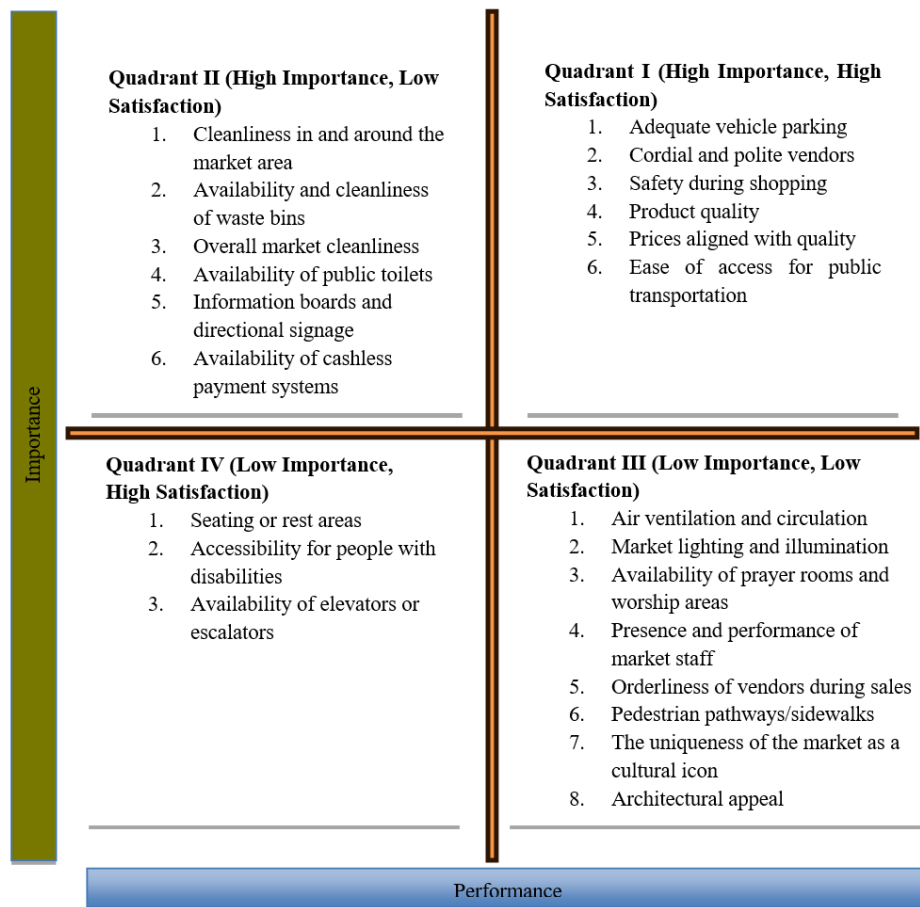


Figure 4: Results of the Importance-Performance Analysis

Source: data processed by the researcher, 2025

based on data-driven evaluations, ensuring more targeted interventions with a greater potential for measurable positive impact.

Conjoint Analysis of Building and Facility Management at Beringharjo Market

The estimated part-worth utilities from this study provide a clear picture of visitors' priorities and preferences regarding the service attributes analyzed. This model assumes that preferences for a combination of attributes are additive, which means that the total preference value equals the sum of the contributions from each attribute level.

Based on the calculations, the combination of attributes most favored by visitors is: (1) Clean and well-equipped toilets (utility = 0.186), (2) Clear information (utility = 0.253), (3) Cashless payment system available in all stores (utility = 0.093), (4) Comfortable and tidy market environment (utility = 0.468), and (5) Rest areas available, although limited (utility = 0.121).

This combination produces a total utility value of 1.121, the highest compared to other combinations, and can therefore be regarded as the most ideal market service configuration from the visitors' perspective. In particular, the environmental comfort attribute shows the most dominant influence in shaping preferences, as evidenced by the highest positive utility value at the "Comfortable and Tidy" level (+0.468) and the largest negative utility value at the "Noisy and Dirty" level (−0.638).

This means that the market's physical condition and atmosphere are key factors in attracting visitors. Other attributes, such as information boards and toilets, also make a significant contribution to enhancing comfort and convenience for visitors, although their contribution is relatively smaller compared to environmental factors. The availability of a cashless payment system (QRIS) and rest areas provides a positive but moderate impact, indicating that these factors serve more as value-added services rather than as primary determi-

Table 3: Part-Worth Estimation Results

UTILITIES		Utility Estimate	Std. Error
Toilet	Not available	-0.156	0.067
	Available and Not Clean	-0.030	0.077
	Clean and Complete	0.186	0.077
Information	Not available	-0.171	0.067
	Unclear	-0.083	0.077
	Clear	0.253	0.077
QRIS	Not available	-0.173	0.068
	Some Stores	0.080	0.074
	All stores	0.093	0.077
Comfortable	Noisy and Dirty	-0.638	0.067
	Crowded and Clean	0.169	0.077
	Comfortable and Neat	0.468	0.077
Rest Area	Not available	-0.171	0.068
	Few	0.121	0.077
	Comfortable and many	0.050	0.074
(Constant)		2.925	0.062

Source: data processed by the researcher, 2025

nants. Meanwhile, attribute levels with negative utility values, such as “None” for information boards or toilets, and “Noisy and Dirty” for environmental comfort, reflect a strong rejection from visitors toward such conditions. This underscores that improving basic facilities and creating a comfortable environment are top priorities for increasing market attractiveness.

The practical implication of these findings is that market managers should prioritize efforts in increasing environmental comfort, facility cleanliness, and the provision of clear information, while still complementing these with modern services such as cashless payments and rest areas. This part-worth analysis provides a quantitative basis for market managers to prioritize service improvement interventions. In other words, enhancing environmental comfort and providing proper toilets and information facilities should be the top priorities in market facility management policies. In the conjoint analysis, the calculation of relative importance is carried out to determine the magnitude of each attribute’s contribution to the total preference decision of respondents. This value is calculated based on the range of

part-worth utility for each attribute, which is the difference between the highest and lowest utility values for each attribute.

The findings indicate that environmental comfort is the most dominant attribute in shaping visitor preferences, contributing 31.26% to the overall preference decision. This underscores that physical aspects, market atmosphere, and environmental comfort are key factors determining visitor satisfaction. Although other attributes such as adequate toilets, clear information boards, a cashless payment system (QRIS), and resting areas still make a

Table 4: Relative Importance Value

Attributes	Range	Relative
	Part-Worth	Importance
Toilet	0,342	16,93%
Information	0,424	17,16%
QRIS	0,266	16,05%
Comfortable	1,106	31,26%
Rest Area	0,292	18,60%
Total	—	100%

Source: data processed by the researcher, 2025

positive contribution, their influence is relatively lower compared to environmental comfort. Therefore, market facility improvement priorities should first focus on enhancing the quality of the physical environment and market atmosphere before strengthening other supporting attributes. Conceptually, these findings are consistent with the user-centered public service design approach proposed by Bridges et al. (2011), which emphasizes that public service design should focus on the direct experiences of users. Public services designed with consideration for user comfort and actual needs will have a greater impact on satisfaction, participation, and the sustainability of facility use.

From a methodological standpoint, the conjoint model validation shows highly satisfactory results. Pearson's R value of 0.979 and Kendall's Tau value of 0.912, both significant at $p < 0.01$, suggest a substantial correlation between the model's estimated values and respondents' actual ratings. In other words, the constructed conjoint model has a very high predictive accuracy, making its results reliable and suitable as a reference for formulating market management policies. The practical implication of these findings is that market quali-

for formulating and implementing policies that are more responsive and well-targeted.

DISCUSSIONS

This study yielded significant findings regarding visitor perceptions and preferences toward public facilities at Beringharjo Market. Using an Importance Performance Analysis (IPA), six service attributes were identified in Quadrant II, meaning they are deemed important by visitors but currently underperforming. This highlights a service quality gap that may negatively impact public satisfaction and trust in traditional markets as providers of public services.

Attributes such as cleanliness, environmental comfort, and availability of information or directional signage are foundational for creating a positive user experience. Prior studies by König et al. (2018) and Sunahwati et al. (2019), corroborate that such elements in public service environments substantially influence public perceptions of service quality.

Conjoint analysis offered insights into visitors' ideal preference combinations, specifically facilities that are clean, clear (legible), comfortable, and digitally enabled. These findings are consistent with Pleger et al., (2020), who found that both the physical environment and ease of digital transactions are pivotal in shaping perceptions of modern public services. The highest part-worth utilities were obtained for environmental comfort and clear information, reinforcing the importance of ambience and visual clarity in the context of traditional markets.

The attribute of environmental comfort also recorded the highest relative importance (31.26%), indicating it is a critical area for optimization. Other high-priority attributes include rest areas, toilet cleanliness, and the QRIS (digital payment) system. These results support the user-centered public service design approach proposed by Bridges et al. (2011), which suggests that centering public service design on user experience significantly enhances satisfaction and engagement.

The Kendall's Tau validity test yielded a coefficient of 0.912, indicating that the conjoint model used has strong predictive power. This lends confidence that strategies derived from visitor preferences can be practically im-

Table 5: Conjoint Validation Value

	Correlations	
	Value	Sig.
Pearson's R	0.979	0.000
Kendall's tau	0.912	0.000

Source: data processed by the researcher, 2025

ty improvement strategies should place environmental comfort as the focus, accompanied by upgrades to basic facilities (toilets, information boards), modernization of the payment system, and provision of supporting facilities such as rest areas. This approach is believed to enhance the overall attractiveness of the market while also strengthening visitor loyalty. The findings affirm that the market facility improvement strategy developed through the conjoint model results truly reflects the real preferences of visitors. Conceptually, this supports the evidence-based policy-making approach, as explained by Sunahwati et al. (2019), where public perception data serves as the foundation

plemented. Moreover, this approach aligns with the principles of evidence-based policy-making, where public perception data serve as the foundation for policy formulation (Sunahwati et al., 2019). Conceptually, this approach also reflects a co-design service model (Jin & Park, 2019), in which the public not only acts as service users but also serves as a primary source of inspiration in the innovation process of public services.

This study provides a significant contribution by integrating Importance Performance Analysis (IPA) with conjoint analysis to generate actionable insights for traditional market management, a method that is still uncommon in hospitality and traditional public sector contexts. A novel finding is how environmental comfort overwhelmingly shapes visitor preferences, accounting for 31.26% of the decision weight. This emphasis on physical atmosphere and market ambiance shifts the discourse from typical infrastructure or service features to intangible experience factors, offering fresh nuance to user-centered service design theory often explored in digital service contexts. Additionally, the high predictive validity of the conjoint model (Kendall's Tau = 0.912) demonstrates its efficacy in capturing real-world visitor attitudes, reinforcing the value of blending user feedback with quantitative modeling in policy planning.

Moving forward, the research recommends adopting a phased, co-design approach that involves visitors and local vendors in formulating and iteratively testing facility improvements, particularly in underperforming Quadrant II attributes like cleanliness, signage, comfort, and digital payment systems. Such a participatory strategy aligns with coproduction paradigms where users help drive public service design, enhancing ownership and long-term sustainability. From a governance perspective, embedding these methods within an evidence-based policy-making framework ensures continuous feedback loops for evaluating impact and adapting interventions as service contexts evolve. Ultimately, transitioning from "design-for-users" to a collaborative "design-with-users" approach will reinforce visitor satisfaction, community trust, and the vitality of public markets like Beringharjo into the future.

CONCLUSION

In summary, the evaluation of Beringharjo Market's facility attributes through IPA and conjoint analysis delivers a clear, evidence-based roadmap: attributes such as ample parking, friendly vendors, product quality and pricing, security, and transit access identified in IPA's Quadrant I are meeting visitors' expectations and thus should be vigilantly preserved. In contrast, critical gaps exist in areas like cleanliness, restrooms, signage, environmental comfort, trash facilities, and digital payments (QRIS) (IPA Quadrant II) and demand prioritized attention. Conjoint analysis further confirms that environmental comfort overwhelmingly influences visitor choice ($\approx 31.26\%$), followed by amenities such as toilets, signage, QRIS, and rest areas. The synergy between these methods enables targeted resource allocation: urgent focus on high-importance but underperforming features; moderate maintenance of strong yet less valued amenities; and gradual improvement of low-priority areas, all grounded in real user preferences and supported by robust model fit (Pearson's $R = 0.979$; Kendall's Tau = 0.912, $p < 0.01$).

Theoretically, this study advances facility management research by demonstrating how integrating IPA with preference modeling via conjoint analysis deepens understanding of user-centered facility evaluation in traditional public settings. Practically, it equips market administrators with a prioritized, user-driven strategy to enhance visitor satisfaction and operational effectiveness. For example, boosting environmental comfort through improved ventilation, lighting, or ambiance should be the first investment, followed by addressing cleanliness, signage, and digital payment enhancements.

However, the study has limitations. It centers on a single market context, limiting generalizability; its design captures stated and simulated preferences but may not fully reflect actual behavior under varied real-world conditions. Future research should replicate this hybrid framework across different market types or public facilities to test external validity, explore additional user segments (e.g., vendors vs. different visitor demographics), and possibly incorporate longitudinal tracking of behavioral changes following interventions.

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