What Drives Parking Satisfaction? Evidence from a Shopping Mall in Miri, Malaysia

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ABSTRACT

Parking forms part of the service experience offered by shopping centres, yet it is often treated mainly as a traffic or space-allocation problem. This study examines how users assess parking facility management and how maintenance and service conditions are associated with customer satisfaction at Bintang Megamall, Miri, Sarawak. A quantitative cross-sectional survey was conducted among 250 users of the mall's parking facilities. The questionnaire measured convenience and accessibility, safety and security, payment and system efficiency, comfort and cleanliness, maintenance practices, and overall customer satisfaction using a five-point Likert scale. Analysis included descriptive statistics, Cronbach's alpha, SERVQUAL gap analysis, Pearson correlation and the Relative Importance Index. The constructs showed acceptable to good internal consistency, with alpha coefficients ranging from .77 to .84. Perception scores were moderately favourable, yet each SERVQUAL dimension recorded a negative expectation-perception gap. Safety and security showed the largest gap at −0.20, followed by convenience and accessibility at −0.17. Maintenance practices had the strongest positive relationship with customer satisfaction ($r = .671$, $p < .001$), followed by convenience and accessibility ($r = .612$, $p < .001$). The remaining service dimensions were moderately associated with satisfaction. Relative importance scores were tightly clustered, suggesting that users did not view the major parking service dimensions as sharply separated priorities. The evidence suggests that parking satisfaction is connected with both service conditions and the continued reliability of the facility. For mall management, maintenance, safety, accessibility and payment-system reliability need to be considered as connected parts of parking service performance.

Keywords: parking facility management, customer satisfaction, maintenance practices, shopping mall, SERVQUAL, facility management

INTRODUCTION

Parking is one of the first services encountered by many visitors to a shopping centre. It is experienced before customers reach retail areas and again when they leave. A difficult search for a parking space, confusing circulation, slow payment or unreliable equipment can shape the wider impression of the property. For facility managers, parking is consequently more than the provision of vehicle spaces. It combines physical infrastructure, operational systems, maintenance and customer service. Facility management in shopping centres covers the operation and upkeep of assets that support the use of the property. Hou et al. (2025) place operational performance within the wider management of smart shopping-centre facilities, where service systems and physical assets need to function together. In Sarawak, Yusuf et al. (2022) similarly connect facility management practice with consumer satisfaction in shopping malls. Parking fits naturally within this relationship since users encounter the condition and performance of the facility directly.

The pressure becomes greater where parking demand changes sharply across peak and non-peak periods. Limited availability can lead to additional circulation as drivers search for spaces. Congestion can form around ramps, access points and exits. Ahmadian et al. (2025) found that satisfaction with urban parking is related to the way

parking resources are managed, and Asmael and Turky (2021) discuss parking requirements in shopping-centre settings. In such environments, capacity is only part of the issue. How efficiently existing spaces can be found and accessed matters as well.

Signage and circulation influence this experience. Drivers need sufficient information to locate available areas, understand movement routes and find exits without unnecessary searching. Parmar et al. (2019) describe parking demand and operational characteristics as related parts of urban parking performance. A multi-level facility creates an added need for clear guidance since users move across ramps, junctions and different parking zones.

Payment technology has changed another part of the parking process. Automated payment, QR-based systems, licence plate recognition and related smart-parking applications reduce reliance on manual transactions (Buian et al., 2024; Fahim et al., 2021). These technologies may shorten transactions and improve access to parking information. Their practical value still relies on reliable operation. Henderson et al. (2023) found that self-service technologies can create usability problems of their own. In parking facilities, equipment downtime or a slow transaction can turn a technical feature intended to save time into a source of delay.

Maintenance therefore connects the physical and service aspects of parking management. Lighting, access barriers, road markings, payment machines, CCTV systems and pedestrian areas need continuing attention. Nik-Mat et al. (2011) treated maintenance as an element of facility management performance in Malaysia, and Nicholas et al. (2022) found a relationship between facility management service quality and user satisfaction. These studies suggest that maintenance should not be considered only as a technical activity carried out away from customers. Its outcomes are visible in everyday use.

Safety carries a related concern, particularly in enclosed parking areas. Lighting affects visibility for both drivers and pedestrians. Fotios and Gibbons (2018) discuss the role of road lighting in visual conditions for drivers and pedestrians, making the condition of lighting infrastructure relevant to user safety. Surveillance, security presence and functioning emergency systems can shape confidence in the parking environment as well.

The present research examines these issues at Bintang Megamall in Miri, Sarawak. The wider project gathered several forms of evidence, but the journal analysis reported here is restricted to quantitative questionnaire data. A total of 250 parking users completed the survey, which measured convenience and accessibility, safety and security, payment and system efficiency, comfort and cleanliness, maintenance practices and customer satisfaction. The paper addresses three questions. What do users report about the principal dimensions of parking service? Which dimensions show the largest difference between user expectations and perceived performance? How strongly are parking service dimensions and maintenance practices associated with customer satisfaction? These questions allow parking performance to be considered from more than one statistical perspective rather than relying on a single satisfaction score.

LITERATURE REVIEW

2.1 Parking Convenience and Accessibility

Convenience starts with the ability to enter the parking facility, locate a suitable space and reach the shopping centre without unnecessary effort. Parking availability is part of this process, but the number of bays alone does not describe the user experience. A facility may have substantial capacity and still be difficult to use if drivers spend too much time searching or encounter poor circulation.

Ahmadian et al. (2025) relate parking satisfaction to the management of parking resources and competing demands for available space. Yang et al. (2021) take a more operational perspective, examining the allocation of parking spaces alongside utilisation efficiency and driver satisfaction. Together, this work suggests that parking satisfaction is partly shaped by how effectively available capacity can be used. The same point applies to traffic circulation. Drivers make repeated decisions after entering a multi-level parking facility. They need to select ramps, interpret zones, respond to directional information and locate suitable bays. Parmar et al. (2019) discuss parking characteristics in relation to urban parking performance, indicating that access, layout and demand should be examined together. Poor circulation can increase searching and create localised congestion.

This matters for shopping malls since traffic demand can rise substantially during weekends, festive periods or special events. From the user's perspective, the distinction between inadequate parking supply and inefficient circulation may be less obvious. Both are experienced as additional time spent before reaching the mall.

2.2 Safety and Security

Safety within a parking facility has both physical and perceptual dimensions. Lighting affects the ability to see other vehicles, pedestrians, changes in direction and potential hazards. Fotios and Gibbons (2018) explain how lighting conditions affect visibility for road users. In basement or enclosed parking facilities, artificial lighting takes on greater importance since natural light is limited. Security extends beyond illumination. Users may assess CCTV coverage, patrol visibility and the broader condition of safety systems. Wattimena et al. (2024) discuss service quality and consumer satisfaction in the parking industry through dimensions that include reliability and assurance. From this perspective, security is not separate from service quality. A user who lacks confidence in surveillance or personal safety may judge the service less favourably even when other parking functions operate adequately.

Maintenance becomes relevant here as well. A lighting installation may be appropriately specified yet provide poor service when lamps fail. CCTV systems offer little reassurance if they are not properly maintained. Au-Yong et al. (2023), in research on maintenance priorities for public facilities, draw attention to the relationship between maintenance conditions and visitors' experiences. This connection is useful for parking management, where the perceived safety of an environment can change as physical systems deteriorate.

2.3 Payment and System Efficiency

Digital parking systems have changed the way users enter, pay and leave parking facilities. Smart-parking research covers automated barriers, sensors, mobile applications and digital payment systems (Fahim et al., 2021; Lin et al., 2017). QR technology provides another route for reducing reliance on conventional ticketing and manual payment (Buian et al., 2024). Adoption alone does not indicate service quality. The system must work when customers use it. Payment equipment that takes too long to process transactions can contribute to exit queues. Users may encounter similar problems when access barriers, sensors or supporting software fail. Henderson et al. (2023) identify usability problems across self-service technologies, showing why system efficiency should be assessed through actual user experience rather than technical availability. This distinction becomes particularly relevant during peak periods. A small delay for one user may appear unimportant, yet repeated delays across many vehicles can create a queue. System reliability therefore has both an individual service dimension and a wider operational effect.

2.4 Comfort, Cleanliness and The Parking Environment

Comfort and cleanliness are less directly connected with vehicle movement, but they still influence how a facility is assessed. Parking users walk through common areas, use pedestrian routes and spend time within basement environments. Cleanliness, ventilation and the physical condition of surfaces contribute to the impression that the facility is being managed properly. The environmental condition of a parking facility can overlap with safety. Poorly maintained surfaces, wet areas or inadequate lighting can create hazards. Clear road markings and clean circulation areas can make the environment easier to interpret. For users, these characteristics are experienced together rather than as separate facility-management categories.

2.5 Maintenance Practices and Customer Satisfaction

Maintenance provides a link across most parking service dimensions. Access barriers require servicing. Payment equipment needs to remain operational. Lighting and surveillance depend on inspection and repair. Signage and markings deteriorate with use. Preventive attention can reduce the likelihood that these failures become visible to customers. Nik-Mat et al. (2011) approached maintenance through facility management performance measurement in Malaysia. Their work places maintenance within a broader performance framework rather than treating it simply as repair activity. Nicholas et al. (2022) found that facility management service quality is associated with user satisfaction, which offers another reason to examine maintenance through customer responses. Smart-parking infrastructure creates additional maintenance needs. Fahim et al. (2021) describe

parking systems that incorporate digital and automated components. The effectiveness of these systems depends on continued reliability after installation. A well-maintained physical and technological system is likely to experience fewer service interruptions, though a cross-sectional survey cannot establish a causal sequence. The literature therefore suggests several related influences on parking satisfaction. Convenience concerns how readily the facility can be used. Safety involves confidence in the environment. Payment systems shape entry and departure. Comfort reflects physical conditions. Maintenance crosses these categories by affecting whether infrastructure and equipment remain functional. The unresolved question for the present setting is how these dimensions compare when examined in the same group of parking users.

METHODOLOGY

3.1 Research Design and Study Setting

A quantitative cross-sectional survey was used to examine parking facility management and customer satisfaction at Bintang Megamall in Miri, Sarawak, Malaysia. A survey design was appropriate because the study required numerical assessment of users' perceptions across a relatively large group of parking customers. Yavuz (2023) describes survey research as a useful quantitative approach when responses need to be collected systematically and compared across participants. The design allowed several aspects of the parking experience to be measured within the same instrument and analysed statistically.

The study focused on customers and visitors who had direct experience using the shopping complex parking facility. The target population consisted of adult parking users aged 18 years and above who had used the facility within the preceding six months. Defining the population around users with recent experience was intended to make the responses relevant to the actual service conditions being assessed. Population and sampling decisions need to reflect the group to which a study intends to draw conclusions (Noor et al., 2023).

The original sampling plan used a mall-intercept approach at locations where parking users could be approached, including payment areas, pedestrian access points and areas close to vehicle exits. Data collection was intended to cover different periods of parking use rather than a single time window. A total of 250 completed questionnaires were included in the final quantitative analysis. The sample size was consistent with the calculation reported in the original study design for the estimated parking-user population.

3.2 Research instrument and measurement

Data were collected through a structured questionnaire administered using Google Forms. Digital questionnaires provide a practical means of collecting standardised survey responses and preparing them for quantitative analysis (Taherdoost, 2021; Yavuz, 2023). Only closed-ended quantitative items were used in the journal analysis. Open-ended responses, interviews and observational material from the wider project were excluded.

The questionnaire contained a profile of the respondent’s section followed by items covering the main parking service dimensions. Convenience and accessibility measured the ease of finding parking spaces, availability of parking, clarity of directional signage and access between the parking area and the mall. Safety and security covered lighting, security visibility and CCTV or related surveillance measures. Payment and system efficiency assessed payment convenience, equipment functionality and waiting at entry and exit points. Comfort and cleanliness addressed the general condition of the parking environment. Maintenance practices covered the condition and servicing of parking infrastructure, barriers, ticketing equipment, signage, lighting, CCTV and emergency systems.

Customer satisfaction was measured through items concerning overall satisfaction with the parking facilities and services, responsiveness to parking-related enquiries, handling of problems such as payment errors or ticket loss, and the provision of useful information.

Responses were measured using a five-point Likert scale ranging from 1, strongly disagree, to 5, strongly agree. The same structured scaling approach was used across the main constructs so that responses could be aggregated and compared statistically.

3.3 Data Analysis

The analysis was organised around descriptive statistics, reliability testing, SERVQUAL gap analysis, Pearson correlation and the Relative Importance Index. Descriptive statistics were used to summarise respondent characteristics and the distribution of ratings. Kaur et al. (2018) describe descriptive statistics as a means of organising and presenting numerical characteristics of a sample without extending interpretation beyond the observed data.

Internal consistency of the questionnaire constructs was examined using Cronbach's alpha. Reliability testing is relevant when several questionnaire items are intended to measure the same underlying construct, since inconsistent items can weaken subsequent interpretation (Heale & Twycross, 2015). Cronbach's alpha was calculated separately for convenience and accessibility, safety and security, payment and system efficiency, comfort and cleanliness, and maintenance practices. Values of .70 or above were treated as acceptable in line with the criterion adopted in the source study and the reliability guidance used by Nurhafizah et al. (2024).

SERVQUAL gap analysis was used to compare customer expectations with perceived performance. Service-quality research commonly examines gaps between what customers expect and what they report receiving, particularly where several service dimensions are being evaluated (Setiono & Hidayat, 2022). The gap for each dimension was calculated as:

SERVQUAL gap = Perception − Expectation

A negative value indicated that perceived performance was below the corresponding expectation. The analysis covered convenience and accessibility, safety and security, payment and system efficiency, and comfort and cleanliness.

Pearson correlation analysis examined the association between each parking facility factor and overall customer satisfaction. The analysis was interpreted as evidence of association rather than causation. Statistical significance was assessed at $p < .05$.

Relative Importance Index analysis provided a supplementary comparison of the four main parking service dimensions. RII is frequently applied in facility and construction-related studies to convert weighted Likert responses into comparable priority scores (Azman et al., 2019). The index was calculated using:

RII = ΣW / (A × N)

where ΣW represents the total weighted response, A is the highest possible response weight of 5, and N is the number of respondents. Higher values indicate greater relative importance. In this study, the RII values were interpreted together with the SERVQUAL and correlation results rather than being treated as an independent measure of service performance.

RESULTS AND DISCUSSION

4.1 Respondent Profile and Experience with The Parking Facility

Table 1 presents the final quantitative sample, which consisted of 250 respondents. Women represented 52.8% of the sample and men 47.2%. Bachelor's degree holders formed the largest educational group at 36.0%, followed by diploma holders at 22.8% and respondents with secondary education at 22.0%. Most participants were employed, accounting for 62.4% of the sample.

Repeated use of the shopping centre was common. 31.6% reported visiting two to three times per week, and 31.6% visited two to three times per month. A further 23.2% described their visits as frequent, whereas 9.2% visited daily. The high proportion of repeat visitors is useful in a parking study since many participants had more than one opportunity to experience the facility's access, payment systems and physical conditions.

Table 1: Profile of survey respondents (N = 250)

Characteristic	Category	n	%
Gender	Male	118	47.2
	Female	132	52.8
Education	Doctorate	9	3.6
	Master's degree	39	15.6
	Bachelor's degree	90	36.0
	Diploma	57	22.8
	Secondary school	55	22.0
Employment status	Student	34	13.6
	Employed	156	62.4
	Self-employed	32	12.8
	Homemaker	7	2.8
	Unemployed	21	8.4
Visit frequency	Daily	23	9.2
	2–3 times per week	90	36.0
	2–3 times per month	79	31.6
	Often	58	23.2

Age was not retained in the journal table because the frequencies reported in the source document do not reconcile with the stated sample of 250. Rather than reproducing inconsistent values, the demographic description is limited to variables that can be verified from the reported totals.

4.2 Parking Service Ratings and Reliability

Respondents gave moderately positive ratings across the parking service measures. Convenience and accessibility item means ranged from 3.68 to 3.70. Directional signage and road markings received the highest score within this group at 3.70, whereas the ease of finding a parking space recorded 3.68. The narrow range suggests that users did not identify one convenience element as substantially stronger or weaker than the others.

This pattern is broadly consistent with parking research that treats availability and circulation as connected aspects of the parking experience. Ahmadian et al. (2025) found that parking satisfaction is linked to the way parking space is managed, rather than simply to the presence of parking supply. Yang et al. (2021) make a related point by connecting parking-space allocation with utilisation efficiency and driver satisfaction. At Bintang Megamall, respondents appear reasonably satisfied with access and wayfinding, but the mean scores remain below the highest points on the scale.

As shown in Table 2, safety and security produced a similar pattern. Lighting recorded a mean of 3.70, security presence 3.68 and CCTV or related surveillance measures 3.69. These values suggest that customers generally regarded the parking environment as reasonably safe. Parking safety is closely connected with visibility and assurance. Fotios and Gibbons (2018) explain that lighting conditions influence how clearly drivers and pedestrians can see and respond to their surroundings. In a parking facility, this is closely linked with users' sense of safety. Wattimena et al. (2024) further identify reliability and assurance as service-quality dimensions associated with parking satisfaction, suggesting that customers assess safety not only through physical conditions but also through confidence in how the facility is managed.

Payment and system efficiency received mean scores between 3.67 and 3.69. Respondents were moderately positive about the available payment process, equipment functionality and movement through entry or exit points. Digital parking technologies can reduce reliance on manual transactions and make payment and access processes more efficient (Buian et al., 2024; Fahim et al., 2021). Their effectiveness, however, still depends on consistent system performance. Equipment failure, slow processing or unclear procedures can reduce the convenience that these technologies are intended to provide. Henderson et al. (2023) similarly found that self-service technologies may create usability problems when equipment or service processes do not operate smoothly.

Maintenance items were rated between 3.66 and 3.68. The cleanliness of common areas recorded a mean of 3.66, whereas infrastructure and safety-system maintenance were generally around 3.68. These scores suggest a service that users regard as functioning reasonably well without indicating exceptionally strong performance.

The reliability analysis supported the use of construct-level measures. Cronbach's alpha ranged from .77 to .84, with each construct meeting the minimum level adopted for the study. These values indicate satisfactory internal consistency among the items within each construct, suggesting that the measures were sufficiently reliable for further statistical analysis.

Table 2: Internal consistency of the study constructs

Construct	**Cronbach's α**	**Interpretation**
Convenience and accessibility	.82	Good
Safety and security	.79	Acceptable
Payment and system efficiency	.81	Good
Comfort and cleanliness	.84	Good
Maintenance practices	.77	Acceptable

Comfort and cleanliness recorded the highest coefficient at α = .84. Convenience and accessibility and payment and system efficiency followed at .82 and .81, respectively. Safety and security recorded α = .79, with maintenance practices at α = .77. The coefficients indicate satisfactory consistency among the items within each construct. This is relevant before interpreting relationships among the variables, since reliability affects how confidently a multi-item scale can be treated as one measure (Heale & Twycross, 2015; Nurhafizah et al., 2024).

4.3 Expectations and Perceived Parking Performance

The SERVQUAL analysis adds a clearer perspective to the descriptive results. Although respondents generally gave moderately positive ratings to the parking services, the perception scores remained below the corresponding expectation scores across every dimension. This suggests that the current level of service is acceptable to users, but still does not fully meet what they expect from the parking facility.

Table 3: SERVQUAL gaps and relative importance of parking service dimensions

Service dimension	**Expectation**	**Perception**	**Gap (P − E)**	**Gap priority**	**Recalculated RII**
Convenience and accessibility	3.85	3.68	−0.17	2	.738
Safety and security	3.90	3.70	**−0.20**	**1**	.735
Payment and system efficiency	3.80	3.69	−0.11	3	.737
Comfort and cleanliness	3.75	3.66	−0.09	4	.736

Note. RII values were recalculated from the weighted totals reported in the source study using RII = ΣW/(5 × 250).

Safety and security recorded the largest gap at −0.20. Its perception score of 3.70 was actually the highest among the four service dimensions, but customers reported an expectation score of 3.90. The shortfall therefore reflects relatively demanding expectations rather than particularly weak perceived performance.

This distinction is useful. A facility manager examining perception scores alone might conclude that safety is one of the stronger areas. SERVQUAL suggests a different interpretation. Customers regard the current safety provision reasonably positively, yet they expect more from it. Cahyani et al. (2024) similarly used SERVQUAL to identify parking-service dimensions where customer expectations exceeded actual perceptions. The method is useful in cases such as this, where acceptable mean ratings can conceal unresolved service gaps.

The result also aligns with the nature of parking safety. Lighting, CCTV coverage and security presence are services for which users may have a relatively low tolerance for shortcomings. Wattimena et al. (2024) associate

assurance and reliability with parking satisfaction, supporting the view that customers assess security partly through confidence in the service environment.

Convenience and accessibility produced the second-largest gap at −0.17. Users gave the dimension a perception score of 3.68 against an expectation of 3.85. The gap suggests that reasonable parking access does not remove expectations for easier searching, better circulation and clearer guidance. Parmar et al. (2019) argue that parking demand and facility characteristics need to be considered together, whereas Yang et al. (2021) connect efficient allocation with driver satisfaction. These studies help explain why accessibility remains relevant even where the descriptive scores are positive.

The payment and system efficiency gap was smaller at −0.11. Comfort and cleanliness had the narrowest gap at −0.09. These dimensions were closer to customer expectations, though neither fully met them.

4.4 Relationship Between Parking Facility Factors and Customer Satisfaction

The correlation analysis provides another perspective on parking performance. Table 4 presents the relationships between the parking facility factors and overall customer satisfaction. Each factor was positively associated with overall customer satisfaction, with coefficients ranging from .541 to .671.

Table 4: Relationships between parking facility factors and customer satisfaction

Factor	**Pearson's *r***	***p***	**Interpretation**
Maintenance practices	**.671**	< .001	Strong positive
Convenience and accessibility	**.612**	< .001	Strong positive
Payment and system efficiency	.598	< .001	Moderate positive
Safety and security	.573	< .001	Moderate positive
Comfort and cleanliness	.541	< .001	Moderate positive

Maintenance practices had the strongest relationship with satisfaction at $r = .671$, $p < .001$. The result is important from a facility-management perspective since maintenance is often treated as an internal operational activity. Customers rarely observe inspection schedules or maintenance records directly, yet they experience the condition of the assets those activities support.

Lighting, barriers, payment machines, signage and security equipment provide everyday examples. When these assets remain functional, parking can appear reliable and easy to use. When they fail, the maintenance issue becomes a customer-service problem. Nik-Mat et al. (2011) place maintenance within facility management performance measurement, whereas Nicholas et al. (2022) report an association between facility management service quality and user satisfaction. The present correlation is consistent with this broader relationship.

Causal language would be inappropriate. The survey measured maintenance perceptions and satisfaction at one point in time, so the analysis cannot show that maintenance improvements caused higher satisfaction. Respondents who viewed the parking facility favourably may have rated several related aspects more positively. The coefficient still indicates that maintenance and satisfaction move closely together within this sample.

Convenience and accessibility showed the second-strongest relationship with satisfaction at $r = .612$, $p < .001$. This result complements the SERVQUAL gap of −0.17. Convenience matters not simply as an operational feature but as part of customers' wider assessment of the parking facility. Ahmadian et al. (2025) connect parking satisfaction with effective management of parking resources, and Yang et al. (2021) report a relationship between

parking allocation and driver satisfaction. The current data support a similar interpretation at shopping-mall level.

Payment and system efficiency was moderately associated with satisfaction at r = .598. This reinforces the relevance of reliable digital and automated systems. Smart-parking technologies may support more efficient transactions (Fahim et al., 2021), yet reliability remains central to the user experience. The presence of automated payment offers little advantage when system delays create congestion or inconvenience, an issue that reflects the wider usability concerns identified by Henderson et al. (2023).

Safety and security had a correlation of r = .573. The coefficient is weaker than those for maintenance and convenience, but the SERVQUAL analysis showed safety as the largest expectation gap. These results are not contradictory. Correlation addresses how strongly safety ratings vary with overall satisfaction, whereas SERVQUAL measures the distance between expected and perceived safety. The same dimension can therefore have a moderate association with satisfaction and still represent the largest service shortfall.

Comfort and cleanliness produced the smallest correlation at r = .541, though the relationship remained statistically significant. Its SERVQUAL gap was also the smallest. The combined evidence suggests that respondents were relatively closer to their expected standard in this area, but physical comfort and cleanliness remain part of their wider assessment of parking service.

4.5 Relative importance and management priorities

The RII results require cautious interpretation. Based on recalculation from the weighted totals reported in the source study, convenience and accessibility recorded the highest index at .738, followed by payment and system efficiency at .737, comfort and cleanliness at .736 and safety and security at .735.

At first glance, this ranking appears to identify convenience as the leading priority. The numerical differences are extremely small. Only .003 separates the first and fourth dimensions. Azman et al. (2019) describe RII as a useful way of ranking factors based on weighted responses, but a numerical rank should not be read as evidence of a large practical difference when the scores themselves are nearly identical.

The more useful interpretation comes from reading the analyses together. Safety and security have the largest unmet expectation. Maintenance shows the strongest association with satisfaction. Convenience records the marginally highest recalculated RII and the second-strongest correlation. Payment and system efficiency remain close to the other dimensions in importance and show a moderate relationship with satisfaction.

This combined pattern suggests that parking improvement should not be organised around one isolated issue. Safety requires attention to lighting, surveillance and visible security. Convenience depends on parking availability, circulation and wayfinding. Payment performance requires reliable equipment. Each of these areas, in turn, depends partly on maintenance.

The connection is particularly clear for automated parking facilities. Fahim et al. (2021) describe smart parking as an integration of technologies rather than a single device. As more parking functions depend on automated equipment, maintenance becomes increasingly connected with service reliability. A malfunctioning payment terminal affects transaction time. A faulty barrier affects traffic movement. Poor lighting becomes a safety problem. Faded markings become an accessibility problem.

For Bintang Megamall, preventive inspection and maintenance can therefore be directed towards assets with an immediate effect on users. Payment equipment, barriers, lighting, CCTV and signage are suitable starting points. Performance monitoring could combine equipment condition with measures such as queue duration, fault response time and periodic customer satisfaction. Such an approach would provide management with a clearer picture than satisfaction scores or maintenance records considered separately.

The results should still be interpreted within the limits of the design. The survey covers one shopping centre, and the relationships are based on customer perceptions rather than objective equipment-performance data. A comparative study involving several malls would provide stronger evidence about whether the same pattern

occurs under different parking layouts and service technologies. Objective indicators such as equipment downtime, search time, occupancy and exit queue length could then be examined alongside customer ratings.

CONCLUSION

Parking users at Bintang Megamall gave moderately favourable ratings to convenience, safety, payment systems, maintenance and customer service. Each SERVQUAL dimension remained below the corresponding expectation score. Safety and security produced the largest shortfall. Acceptable perceived performance does not mean that user expectations have been reached. Maintenance practices had the strongest positive association with customer satisfaction, followed by convenience and accessibility. This places maintenance within the customer-facing side of parking facility management. Users encounter the condition and reliability of the assets that maintenance supports. The Relative Importance Index values indicate that differences among the four principal service dimensions were small. A strict ranking provides less information than the combined analysis. Safety carries the largest unmet expectation, maintenance is most strongly related to satisfaction, and convenience remains prominent across several measures.

Several limitations shape the interpretation of these results. The research examined one shopping centre in Miri. The patterns may not be reproduced in malls with different parking layouts or different demand conditions. The source study identifies the single-site design as a limitation. The analysis is based on 250 self-reported survey responses. Perception data describe how users assess the facility rather than measuring its technical condition directly. Personal expectations may influence individual ratings. Objective operating measures were unavailable for the present journal analysis. Parking occupancy and vehicle search time would provide a comparison with customer ratings. The present dataset contains an extra reporting limitation. The age frequencies in the source document do not sum to the final sample. The simple regression values reported in the wider project do not reconcile with the separately reported maintenance-satisfaction correlation. Those statistics were therefore excluded from the journal analysis.

Future research could compare several shopping malls within Sarawak or across Malaysia. Such a design would allow researchers to examine whether maintenance remains strongly associated with satisfaction under different parking systems. Smart-parking technology provides another line of study, particularly where implementation can be compared before and after system changes. A future submission using the original raw dataset should verify the demographic age analysis and regression modelling outputs.

Parking improvement requires more than adding spaces or installing new technology. Facility performance depends on whether users can move through the parking area conveniently, regard it as safe, complete payment without difficulty and rely on operational infrastructure. These conditions are connected. Treating them as one service system gives facility managers a clearer basis for deciding where attention is needed.

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