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Service Quality, Facilities, and Personnel Competence in Port User Satisfaction: A Qualitative Case Study at Batu Ampar Port, Batam

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Abstract: This study examines how service quality, physical facilities, and personnel competence shape port-service users' satisfaction at Batu Ampar Port, Batam. A qualitative case-study approach was employed through semi-structured interviews, direct observation, and document review. Six purposively selected informants participated, comprising two internal service-unit personnel and four business users with two to twenty years of experience in port operations. Data were analyzed using the interactive model of Miles, Huberman, and Saldaña through data reduction, thematic display, and conclusion verification, supported by source, technique, and time triangulation. The findings indicate that procedural reliability, responsiveness, and information clarity are generally perceived positively, although complaint handling remains partly reactive and interpersonal responsiveness varies among personnel. Basic facilities are available but stacking-yard capacity, wharf conditions, waiting areas, and toilet cleanliness require improvement during busy periods. Technical competence in operational systems and regulations is relatively strong, whereas service-oriented soft skills are less consistent. The study proposes an integrated improvement framework emphasizing end-to-end digitalization, preventive process control, facility readiness, and service-excellence development.

Keyword: Service Quality, Port Facilities, Personnel Competence, User Satisfaction.

INTRODUCTION

Ports are not merely physical nodes for loading and unloading cargo; they are service systems in which operational reliability, information accuracy, infrastructure readiness, and human interaction jointly influence users' evaluation of performance. In port environments, service users interact with administrative personnel, operational systems, terminals, yards, and supporting facilities as one connected experience. A weakness in any one component can create delay, uncertainty, additional transaction costs, or dissatisfaction even when the core cargo-handling activity is ultimately completed. This makes service quality an important managerial issue for ports that seek to maintain operational credibility and long-term user trust.

Service-quality research has long emphasized that users judge services through both expected and experienced performance. Parasuraman, Zeithaml, and Berry (1985, 1988) conceptualized service quality through dimensions that later became widely known as SERVQUAL, while Cronin and Taylor (1992) showed that perceived service performance is closely associated with satisfaction. In the maritime context, Thai (2008) demonstrated that service quality is multidimensional and includes resources, outcomes, processes, management, image, and social responsibility. Port-specific evidence likewise shows that the quality of service processes influences user satisfaction and port competitiveness (Yeo et al., 2015; Le et al., 2020; Roh et al., 2025).

The physical service environment is particularly important in ports because service production depends on space, terminal layout, yards, wharves, waiting areas, sanitation, and supporting equipment. Studies of maritime and terminal services repeatedly identify tangible conditions as a significant component of satisfaction. Pantouvakis et al. (2008) found that physical attributes are important in passenger-port evaluations, while Sayareh et al. (2016) and Hemalatha et al. (2018) showed that tangible elements are central in evaluations of container-terminal service quality. In Indonesia, Fadillah and Haryanti (2021), Maharani and Ariesta (2023), and Satyadharma (2024) similarly indicate that inadequate facilities can weaken satisfaction even when administrative services are available.

Human competence forms a second service layer. Port personnel must understand regulations, information systems, transaction procedures, and operational sequences, but technical knowledge alone does not guarantee a positive service encounter. Competence also includes communication, responsiveness, empathy, and the ability to resolve problems appropriately. Boyatzis (2008) emphasizes that effective performance depends on behavioral and social competencies in addition to cognitive capability, while Spencer and Spencer (2008) identify knowledge, skills, motives, and personal characteristics as foundations of competent performance. For front-line services, this distinction is important because users often evaluate not only whether a problem is eventually solved, but also how clearly, quickly, and professionally the organization responds.

Evidence from Indonesian port and maritime services reinforces this multidimensional perspective. Rachman and Wahid (2023) link service quality with port performance and customer satisfaction at Tanjung Priok. Azizul et al. (2024) show that service quality and accessibility are associated with ferry-passenger satisfaction, while Setiawan and Rumambi (2024) identify reliability, responsiveness, and empathy as important dimensions of passenger satisfaction. Narti et al. (2020), Sadika et al. (2023), and Darangeng and Kamariah (2020) also report that service responsiveness, physical comfort, and service delivery are relevant to user evaluations. Syafri et al. (2023) further demonstrate the importance of port facilities and service performance in shaping satisfaction.

Batu Ampar Port in Batam provides an important setting for studying these issues because it serves intensive cargo and container activities within a strategic industrial and trade region. The service unit examined in this study handles operational and administrative processes supported by applications such as FBMS, B-SIMS, PJBA, and YOM. Users include companies involved in cargo handling, depot and warehouse administration, and operational checking. In this environment, user satisfaction is not determined by a single transaction. It emerges from the consistency of procedures, availability of physical capacity, accuracy of documentation, responsiveness to problems, and the competence of personnel who connect users with the port system.

Previous studies have largely examined service quality through quantitative surveys and statistical relationships between SERVQUAL dimensions and satisfaction. Such studies provide valuable evidence but offer less detail about how users and internal personnel interpret day-to-day service problems, how technical and interpersonal competence interact, and why digital and physical bottlenecks continue to appear even when basic service standards are in

place. A qualitative case study can therefore complement existing findings by showing how service quality, facilities, and competence converge within one operational setting. This study also separates the tangible dimension analytically into a dedicated facilities theme so that infrastructure concerns can be examined in greater depth while retaining the SERVQUAL logic for reliability, responsiveness, assurance, and empathy.

Accordingly, this study aims to analyze three questions: (1) how service quality is experienced in relation to the satisfaction of Batu Ampar Port service users; (2) how physical facilities support or constrain user satisfaction; and (3) how personnel competence contributes to the consistency of service delivery. The article further identifies cross-cutting improvement priorities that emerge from the interaction of the three themes. The contribution lies in developing an integrated service-improvement framework in which digitalization, preventive process control, facility readiness, and service-oriented competence operate as enabling mechanisms for more consistent port-user satisfaction.

METHOD

This research used a descriptive qualitative case-study design. The case was bounded to the service-unit activities associated with Batu Ampar Port, Batam, and focused on users' and internal personnel's experiences of service quality, facilities, and personnel competence. A qualitative design was selected because the study sought to understand operational meanings, recurring service experiences, and improvement needs rather than to test statistical causal relationships (Creswell & Poth, 2018; Sugiyono, 2019).

Informants were selected purposively based on their direct involvement in port-service processes and their ability to provide relevant information. Six informants participated: two internal service-unit personnel and four service users representing operational, depot and warehouse, and cargo-checking functions. Their experience with Batu Ampar Port ranged from two to twenty years. For publication, individual names are not reproduced; informants are coded I1 to I6 to emphasize their functional perspectives rather than personal identity.

Data were collected through semi-structured interviews, direct observation, and documentation. Interview questions were organized around service facilities, reliability, responsiveness, assurance, empathy, technical competence, interpersonal competence, operational constraints, and improvement priorities. Observation focused on the service environment and operational-administrative process, while documents were used to cross-check procedures and system-related information. Data credibility was strengthened through source triangulation between internal personnel and service users, technique triangulation across interviews, observation, and documentation, and time checks at different data-collection periods.

Analysis followed the interactive approach of Miles, Huberman, and Saldaña (2020). Interview and observation materials were first reduced by selecting statements relevant to the three research questions. The reduced evidence was then grouped into recurring themes and displayed in matrices to compare perspectives across informants. Conclusions were developed iteratively and verified against the original evidence, contrasting internal and external perspectives and noting both convergent and divergent observations.

RESULTS AND DISCUSSION

The case involves a port-service environment in which administrative and operational activities are closely connected. Internal personnel manage service documentation and transaction processes, while external users depend on accurate records, timely approval, sufficient yard and wharf conditions, and clear communication to complete cargo-related activities. This interdependence makes Batu Ampar Port appropriate for analyzing service quality as an operational system rather than as a single front-desk encounter.

The six informants provide complementary perspectives. Two internal informants describe service procedures, system use, and institutional responses, whereas four service users describe how those procedures are experienced in practice. The range of experience, from two to twenty years, also provides a combination of relatively recent and long-term observations. The participant profile is summarized in Table 1.

Table 1. Profile of Research Informants

Code	Perspective	Functional Role	Experience
I1	Internal service unit	Billing/FBMS coordination	15 years
I2	Internal service unit	Billing/FBMS administration	2 years
I3	Service user	Operations	2 years
I4	Service user	Depot and warehouse administration	3 years
I5	Service user	Assistant operations	5 years
I6	Service user	Head checker / cargo operations	20 years

Source: Processed by the author from the thesis interview data, 2026.

Service Quality: Reliability, Responsiveness, Assurance, and Empathy

Across informants, the service unit is generally perceived as capable of delivering core administrative services with reasonable reliability. Internal personnel described an emphasis on compliance with the applicable Head Regulation (Peraturan Kepala/Perka) and on avoiding unnecessary delays. Digital systems such as FBMS and B-SIMS are used to support the accuracy of billing and documentation, while PJBA and YOM are embedded in related cargo and yard processes. From a service-quality perspective, these systems reduce dependence on manual memory and create a structured basis for completing transactions.

The external-user perspective broadly confirms this reliability but also reveals that consistency is more important than the mere existence of procedures. Users reported that service is generally understandable and workable, particularly when staff communicate the required documents and process sequence clearly. However, administrative errors are still sometimes corrected only after users raise a complaint. This indicates a gap between procedural compliance and preventive service control. A reliable service system should not only correct errors quickly; it should also detect potential discrepancies before documents or invoices are finalized.

Responsiveness is also evaluated positively in most accounts. Internal personnel stated that users are contacted when delays occur and that complaints can be discussed through briefings or direct communication. Service users generally recognized the willingness of staff to respond, yet the speed and quality of response were not perceived as uniform across all personnel. This variation is important because responsiveness is experienced at the individual interaction level. Even when organizational procedures are sound, inconsistency between staff members can create different service experiences for users handling similar transactions.

Assurance is supported by the use of formal procedures, operational applications, and personnel familiarity with service requirements. Users generally receive explanations about procedures, and the long experience of several personnel and users creates a relatively stable operational knowledge base. Nevertheless, assurance can weaken when information is not synchronized or when users must seek clarification after an error has already occurred. In service settings, confidence is produced not simply by staff knowledge but by the predictability of the whole process, including the accuracy of information provided before a transaction is completed.

Empathy is the most uneven interpersonal dimension. Most users described staff as sufficiently friendly and communicative, but some accounts noted that not every employee demonstrates the same level of attentiveness. The issue is therefore not the absence of positive behavior, but its inconsistency. This distinction is consistent with service-quality theory: users evaluate the service organization through repeated encounters, so variation in interpersonal treatment can influence overall satisfaction even when technical outcomes are acceptable (Parasuraman et al., 1988; Cronin & Taylor, 1992).

These findings extend port-service studies that report positive relationships between service quality and satisfaction. Rachman and Wahid (2023) show that service quality contributes to port performance and customer satisfaction, while Yuen and Thai (2015) identify reliability, speed, responsiveness, and value as important in maritime services. Thai (2008) likewise emphasizes process and management quality rather than treating maritime service as a purely physical product. The Batu Ampar case adds a qualitative explanation: reliability is strengthened by regulation and digital systems, but satisfaction becomes less consistent when error prevention, interpersonal responsiveness, and empathy vary across service encounters.

The findings also align with Darangeng and Kamariah (2020), Setiawan and Rumambi (2024), and Azizul et al. (2024), which associate service dimensions with user or passenger satisfaction in Indonesian maritime settings. However, the present case concerns business users within cargo and container operations rather than only passenger services. This context makes administrative accuracy, operational coordination, and process continuity especially salient because a service problem can affect not only personal comfort but also cargo flow, documentation, and company operations.

Physical Facilities: Adequate Basics, Uneven Operational Readiness

The facility theme shows a dual pattern. On one hand, basic supporting facilities such as a prayer room, toilets, canteen, and stacking-yard areas are available and allow daily service activities to continue. Several informants therefore described the physical environment as generally adequate for routine operations. On the other hand, repeated concerns were raised about stacking-yard capacity, damaged or uneven surfaces, wharf conditions, limited waiting-space capacity during busy periods, and toilet cleanliness. These issues indicate that availability and adequacy are different concepts: a facility can exist but still become insufficient when service volume increases.

The stacking yard is particularly important because it functions as operational capacity rather than merely a physical amenity. When space is constrained or the yard surface is deteriorated, the effect can extend to vehicle movement, cargo positioning, waiting time, and perceived orderliness. The same logic applies to waiting rooms and toilets. Their importance may appear secondary to cargo operations, but they shape how users evaluate the organization's attention to comfort and service readiness, especially when activities intensify.

This pattern is consistent with port and maritime research. Pantouvakis et al. (2008) found that physical elements strongly affect passenger-port service evaluations, while Sayareh et al. (2016) identified tangibles as a major dimension in container-terminal service gaps. Hemalatha et al. (2018) similarly used SERVQUAL dimensions to evaluate container-terminal operators, and Le et al. (2020) showed that tangibles and technological advancement support port-logistics service quality and satisfaction. Although these studies use different methods and settings, they converge on the importance of physical and technological service resources.

Indonesian evidence leads to the same managerial implication. Fadillah and Haryanti (2021) identify facilities as a support for comfort and service convenience, while Maharani and Ariesta (2023) link facilities and service quality with user satisfaction at Tanjung Balai Karimun. Satyadharma (2024) found that facilities and infrastructure were among the weakest elements in a ferry-port satisfaction assessment, and Sadika et al. (2023) identified sanitation-related attributes as an improvement priority in Manado Port. These comparisons strengthen

the interpretation that physical limitations at Batu Ampar should not be treated as isolated maintenance issues. They are part of service quality because they influence flow, comfort, and operational confidence.

A practical consequence is that facility evaluation should be volume-sensitive. Routine conditions may produce an impression of adequacy, while busy periods reveal capacity and maintenance weaknesses that are less visible during normal operations. Therefore, the service unit should distinguish between baseline availability and peak-load readiness. Indicators such as yard utilization, damaged-surface reports, waiting-area occupancy, sanitation frequency, and user complaints can provide a more operational assessment than a simple checklist of whether facilities exist.

Personnel Competence: Strong Technical Capability, Inconsistent Service-Oriented Soft Skills

Personnel competence in the case is strongest on the technical side. Internal staff are familiar with operational applications and the regulatory basis of the service process. Users also recognize that personnel are generally able to explain procedures and complete the necessary administrative sequence. This technical competence supports reliability because service delivery depends on accurate input, document handling, billing, and coordination across applications.

The more significant challenge lies in behavioral consistency. Informants described differences in friendliness, attentiveness, and the ability to understand users' needs. These differences do not necessarily indicate poor competence overall; rather, they show that competence has multiple components. Spencer and Spencer (2008) distinguish knowledge and skill from deeper personal and behavioral characteristics, and Boyatzis (2008) emphasizes social and emotional competencies as contributors to effective performance. In a port-service setting, this means that mastery of FBMS, B-SIMS, PJBA, YOM, or regulatory procedures should be complemented by communication, empathy, problem ownership, and professional complaint handling.

This distinction helps explain why technically correct service can still produce uneven satisfaction. A user may receive the correct document but remain dissatisfied if information is delivered ambiguously, if staff appear indifferent, or if the user must repeatedly follow up on an issue. Conversely, responsive and respectful interaction can reduce perceived inconvenience when operational constraints cannot be eliminated immediately. The finding is consistent with the responsiveness and empathy dimensions highlighted in SERVQUAL and with Setiawan and Rumambi (2024), who found these dimensions important in maritime passenger services.

Competence development should therefore move beyond one-time technical instruction. A more complete approach would combine system and regulatory refreshers with service-excellence training, scenario-based complaint handling, communication standards, and supervisory feedback. Training should be linked to observable service behaviors, such as clarity of explanation, ownership of user issues, response time, escalation accuracy, and consistency across shifts. This would convert soft-skill development from a general recommendation into a measurable operational practice.

Cross-Cutting Theme: Digitalization and Preventive Process Control

One of the most consistent themes across internal and external informants is the need to strengthen digitalization, particularly for billing and stacking-related processes that are not yet fully online. This theme is important because it links all three research questions. Digitalization can improve reliability by reducing repeated manual entry, support facilities through better visibility of operational capacity and queue conditions, and assist personnel by providing a common source of information for users and staff.

However, digitalization should not be interpreted as simply moving forms from paper to a screen. The service problem identified in the interviews includes reactive correction, fragmented information, and uneven communication. A digital system creates value only if process rules are clear, data are validated before finalization, status information is visible to relevant users, and exception handling is defined. Le et al. (2020) show that technological advancement can strengthen port-logistics service quality, while Roh et al. (2025) demonstrate that port-service satisfaction emerges from configurations of multiple service-quality factors rather than from one isolated attribute. The Batu Ampar findings support this systems perspective.

A preventive control orientation is therefore necessary. Before a bill, service note, or related document is issued, key data should pass a structured verification step. When an exception appears, responsibility for correction and communication should be clearly assigned. Such an approach reduces dependence on complaints as the trigger for error detection. It also improves assurance because users receive a more predictable process and clearer status information.

Table 2 summarizes the main empirical themes and their implications for user satisfaction. The table shows that the central issue is not a complete absence of service capability, but uneven consistency across processes, facilities, and human interaction. This distinction directs managerial attention toward standardization and integration rather than wholesale replacement of the existing service system.

Table 2. Synthesis of Main Findings and Improvement Priorities

Theme	Observed Strength	Observed Gap	Priority
Service quality	Procedural compliance; clear information in many interactions; generally responsive staff	Reactive error correction; response and empathy vary among personnel	Preventive checking; complaint-handling standard; response-time monitoring
Physical facilities	Basic prayer room, toilets, canteen, yard and service areas are available	Yard capacity and surface condition; wharf condition; waiting-area capacity; toilet cleanliness	Volume-based facility readiness; scheduled maintenance; sanitation control
Personnel competence	Good technical command of systems and operational procedures	Service-oriented soft skills and empathy are not equally consistent	Service-excellence training; coaching; behavioral service indicators
Digitalization	Existing operational applications support transaction accuracy	Billing/stacking processes are not fully integrated online; status information can remain fragmented	End-to-end digital workflow; common data source; exception and escalation tracking

Source: Processed by the author from interview, observation, and documentation findings, 2026.

Triangulation and Evidence Consistency

The credibility check shows meaningful convergence between internal and external perspectives. Internal personnel emphasize regulatory compliance, application use, and response efforts, while users generally acknowledge these strengths but identify inconsistencies that become visible in actual service encounters. Facility limitations are also reported from more than one user perspective, particularly in relation to yard conditions, waiting capacity, and sanitation. The recurrence of the same issues across different informants increases confidence that they are not merely individual complaints.

Technique triangulation produces a similar pattern. Interview findings about the importance of procedures and systems are compatible with the documented service sequence

and the presence of multiple operational applications. Observation and user accounts provide context for physical-facility concerns and service interaction. Time triangulation was used as an additional credibility check by comparing observations and interview information gathered at different periods rather than relying on a single moment. Table 3 summarizes the evidence logic used in the study.

Table 3. Triangulation Matrix

Theme	Source Triangulation	Technique Triangulation	Evidence Interpretation
Service reliability and responsiveness	Internal personnel compared with four service users	Interviews cross-checked with procedure-related documentation and observation	Core service is generally reliable, but preventive control and response consistency need strengthening
Facilities	Multiple service-user perspectives and internal context	Interviews cross-checked with direct observation of the service environment	Basic facilities exist, but readiness declines under higher operational pressure
Personnel competence	Internal self-description compared with user experience	Interview evidence compared with observed communication and procedural roles	Technical competence is stronger and more consistent than interpersonal service competence
Digitalization	Internal and external informants independently identify system needs	Interview findings compared with the existing application-based process	Further integration is a cross-cutting improvement priority rather than a stand-alone IT issue

Source: Developed by the author based on the study triangulation process, 2026.

Theoretical Interpretation and Research Contribution

The findings support the central proposition of service-quality theory that satisfaction is produced by a combination of process and experience rather than by the technical outcome alone. Parasuraman et al. (1985, 1988) conceptualize service quality as a gap between expected and perceived service, while Cronin and Taylor (1992) emphasize actual service performance. At Batu Ampar, users generally recognize that core services function, yet recurring gaps in facilities, error prevention, and interpersonal consistency shape how that performance is interpreted. This explains why an organization may be operationally functional while still having identifiable satisfaction risks.

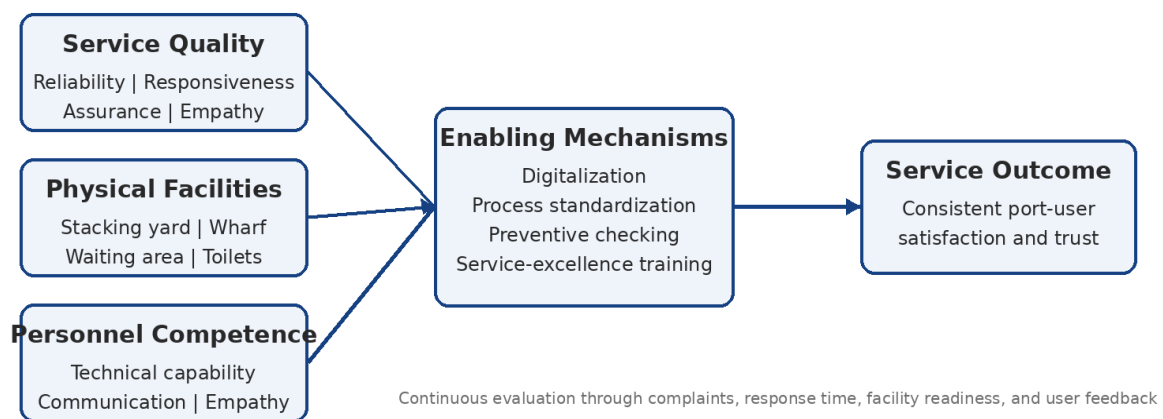
The case also provides evidence that SERVQUAL should be adapted to the operational characteristics of the service context. In the present study, tangibles were separated into a dedicated facilities theme because yard capacity, wharf conditions, and waiting-area readiness have direct operational consequences. Maritime literature supports such contextual adaptation. Thai (2008) proposes a maritime-specific multidimensional model, Yeo et al. (2015) identify management and other port-specific quality factors, and Le et al. (2020) combine conventional service dimensions with technological advancement. Roh et al. (2025) further show that customer satisfaction can result from configurations of service-quality conditions rather than one universal pathway.

The study's main contribution is therefore an integrated interpretation of three domains that are often examined separately: service-process quality, physical facility readiness, and personnel competence. These domains converge through enabling mechanisms. Digitalization strengthens information consistency and transaction visibility; preventive process control reduces reliance on post-complaint correction; facility readiness protects service capacity; and service-excellence development reduces behavioral variation among personnel. The

contribution is not a claim of statistical causality, but an empirically grounded framework for understanding where consistency can be strengthened in a cargo-port service setting.

The framework also helps differentiate technical efficiency from service consistency. A technically capable employee may complete a process correctly, but users still require clear communication and predictable follow-up. A port may possess the required facilities, but those facilities may become inadequate at high operational volumes. A digital application may exist, but it does not automatically eliminate fragmented workflows. Service improvement therefore requires alignment rather than isolated interventions. This aligns with Yuen and Thai (2015), who argue that maritime service quality combines reliability, responsiveness, speed, and value, and with the port-service evidence of Sayareh et al. (2016) and Hemalatha et al. (2018), which demonstrates the importance of balancing multiple service attributes.

Figure 1 translates this interpretation into an integrated service-improvement framework. Service quality, facilities, and personnel competence are treated as three empirical domains. Digitalization, standardization, preventive checking, and service-excellence training function as enabling mechanisms that improve consistency across the domains. The intended outcome is more stable user satisfaction and trust, evaluated through recurring feedback and operational indicators.



Source: Developed by the author from the synthesis of research findings, 2026.

Figure 1. Integrated Service Improvement Framework for Batu Ampar Port

Managerial Implications for Batu Ampar Port

From a managerial perspective, the first priority is to move from reactive correction toward preventive service control. This can be implemented through a verification checkpoint before bills, notes, or service documents are finalized. The checkpoint should define minimum data fields, responsible personnel, and an escalation route when discrepancies are found. A simple log of recurring errors can then be used to identify whether problems originate from data entry, user submissions, system synchronization, or procedural interpretation.

The second priority is end-to-end digitalization of billing and stacking-related processes. Existing applications demonstrate that the organization already possesses a digital foundation. The next step is to reduce fragmented handoffs, clarify transaction status, and ensure that internal personnel and authorized users access consistent information. Digitalization should be evaluated through process outcomes such as fewer repeated entries, shorter clarification time, lower document-error frequency, and improved visibility of transaction status rather than only the number of modules placed online.

The third priority is facility readiness based on operational load. Maintenance and capacity planning should focus on the stacking yard, wharf surfaces, waiting areas, and sanitation. The objective is not merely physical renovation but the protection of service flow.

A facility-readiness checklist can combine yard condition, usable capacity, waiting-space availability, sanitation frequency, and issue closure. This is especially important because port-service quality literature repeatedly connects tangible resources with satisfaction and competitiveness (Yeo et al., 2015; Le et al., 2020; Roh et al., 2025).

The fourth priority is service-oriented competence. Technical training should continue, but it should be complemented by communication standards, empathy, complaint ownership, and escalation skills. Supervisors can use short service scenarios and post-case reviews to discuss how the same operational issue should be handled consistently by different employees. This approach is compatible with Boyatzis's (2008) emphasis on developable social competencies and with the broader service-quality literature that treats responsiveness and empathy as observable components of user experience.

Table 4 provides a practical roadmap. The proposed indicators are deliberately operational so that improvement efforts can be reviewed over time. They are recommendations derived from the research findings, not descriptions of systems already implemented by the port authority.

Table 4. Proposed Service Improvement Roadmap

Priority Area	Recommended Action	Operational Indicator	Expected Benefit
Preventive process control	Introduce pre-finalization verification and an exception log	Document-error frequency; repeated complaint rate; correction lead time	Higher reliability and assurance
Digital integration	Integrate billing/stacking status and reduce repeated manual handoffs	Online completion rate; status-update time; duplicate-entry cases	Faster and more transparent service
Facility readiness	Prioritize yard/wharf maintenance, waiting capacity, and sanitation	Yard readiness; maintenance closure; sanitation checks; facility complaints	Improved flow, comfort, and service capacity
Service-oriented competence	Combine technical refreshers with service-excellence and complaint-handling coaching	Response time; escalation accuracy; user feedback; coaching completion	More consistent responsiveness and empathy

Source: Managerial recommendations developed from the research findings, 2026.

Comparison with Previous Port-Service Research

The Batu Ampar findings are consistent with quantitative studies but add contextual detail about why service-quality dimensions may receive different evaluations. For example, Narti et al. (2020) emphasize responsiveness and staff friendliness in ferry services, while Barasa et al. (2020) identify safety, reliability, comfort, information accessibility, and service equality as satisfaction dimensions. In the present case, responsiveness is generally acknowledged, yet differences among personnel remain visible. This suggests that an average positive evaluation can coexist with specific service encounters that require managerial attention.

Similarly, Maharani and Ariesta (2023) and Syafri et al. (2023) show statistically significant relationships between facilities, service quality, service performance, and satisfaction. The qualitative evidence from Batu Ampar explains how those relationships may manifest operationally: users do not assess facilities abstractly, but through concrete experiences such as yard availability, surface condition, waiting capacity, cleanliness, and the

ease of completing their work. Facility constraints become service constraints when they create waiting, uncertainty, or repeated coordination.

International port research offers another useful comparison. Yeo et al. (2015) argue that port service quality has management and relational components in addition to operational outcomes. Le et al. (2020) identify five service-quality determinants in port logistics and highlight technology as part of the tangible service environment. Sayareh et al. (2016) and Hemalatha et al. (2018) also demonstrate that SERVQUAL-based evaluation can reveal different gaps across terminal operators. The Batu Ampar case supports these findings but indicates that the most important managerial challenge is not necessarily the lowest-performing single dimension. Instead, the challenge is the interaction between administrative accuracy, physical readiness, and the behavior of personnel when a service exception occurs.

The most recent configurational perspective of Roh et al. (2025) is particularly relevant because it treats port-user satisfaction as an outcome that can emerge from different combinations of service-quality conditions. Although the present research does not apply fsQCA or other configurational statistics, the qualitative findings point in a similar direction. A well-maintained facility cannot compensate indefinitely for unclear service responses, and highly competent personnel cannot fully overcome a fragmented digital process. Satisfaction becomes more stable when multiple conditions reinforce one another.

This interaction is also why the study avoids treating service quality, facilities, and competence as isolated causal variables. The research questions are answered through thematic interpretation rather than statistical coefficients. This qualitative position is important for publication because it preserves the logic of the evidence: six informants provide detailed operational perspectives that are appropriate for explaining process patterns, but not for generalizing effect sizes to the entire population of Batu Ampar Port users. The contribution is analytical depth and an improvement framework, while broader population estimates remain a task for subsequent quantitative or mixed-method research.

CONCLUSION

This study concludes that service quality at Batu Ampar Port is generally supported by procedural compliance, application-based administrative processes, understandable service information, and reasonably responsive personnel. These strengths contribute to positive user experiences, but service consistency remains incomplete because administrative corrections are sometimes triggered only after complaints and the responsiveness and empathy of personnel vary across service encounters. The first research question is therefore answered by showing that satisfaction is supported by a functioning service process but depends on more consistent preventive control and interpersonal service behavior.

Physical facilities contribute to service-user satisfaction because they shape both operational flow and user comfort. Basic facilities are available, yet stacking-yard capacity and surface conditions, wharf conditions, waiting-space capacity, and toilet cleanliness become recurring concerns, particularly when activity is high. The second research question is answered by distinguishing facility availability from facility readiness: the key managerial issue is whether physical resources remain adequate under the actual operational load.

Personnel competence is relatively strong in technical terms, including familiarity with operational applications and regulatory procedures, but service-oriented soft skills are not equally consistent across personnel. The third research question is answered by showing that technical capability must be paired with communication, empathy, problem ownership, and escalation skills to produce a more uniform service experience. Across all three themes, digitalization emerged as a cross-cutting priority because more integrated workflows can reduce repeated manual handling, improve status visibility, and strengthen process consistency.

Theoretical implications arise from combining SERVQUAL-oriented service quality with facility readiness and personnel competence in one qualitative port-service framework.

Practically, the study recommends end-to-end digitalization, preventive document checking, volume-sensitive facility maintenance, and service-excellence development supported by operational indicators. The study is limited by its single-site design, six informants, and data collected within a defined period; the findings should therefore be interpreted contextually rather than statistically generalized. Future studies should expand the number and diversity of port users, combine qualitative interviews with user-satisfaction surveys or Customer Satisfaction Index measures, compare different ports, and examine additional factors such as port tariffs, digital process speed, safety, and operational performance.

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