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Quality Beyond Compliance: Stakeholders' Experiences of Ship Repair Operations in Dar es Salaam

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Abstract: *Quality management in ship repair operations has traditionally focused on compliance with regulatory standards; however, achieving sustainable quality requires broader attention to stakeholder experiences, continuous improvement, and operational effectiveness. This study explored stakeholders' experiences of quality management beyond compliance in ship repair operations in Dar es Salaam. The study employed a qualitative research approach to understand stakeholders' perceptions, experiences, challenges, and opportunities influencing quality practices. Data were collected from 43 participants drawn from different maritime actors involved in ship repair activities through interviews. The findings revealed that stakeholders associated quality with reliable workmanship, safety assurance, timely completion of repairs, customer satisfaction, and improved operational performance. The study further found that quality management practices were affected by challenges related to high operational costs, limited availability of modern equipment, delays in accessing technical materials, communication gaps, and unclear responsibilities among stakeholders. Despite these challenges, participants identified opportunities linked to technological advancement, continuous technical training, and stronger collaboration among shipyards, regulators, and maritime stakeholders. The study concluded that achieving quality beyond compliance required an integrated approach that combined technical capabilities, stakeholder engagement, innovation, and continuous improvement practices. The findings contribute to understanding how quality management practices are experienced within ship repair operations and provide insights into strengthening maritime service delivery in Dar es Salaam.*

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Keywords— Quality management, ship repair operations, stakeholder experiences, quality beyond compliance, maritime industry

1. INTRODUCTION

Quality management has become a fundamental aspect of modern ship repair operations, where success depends not only on meeting regulatory requirements but also on ensuring reliability, efficiency, and continuous improvement. Ship repair activities require effective coordination among different stakeholders, technical expertise, and adherence to safety and quality standards. Therefore, quality in ship repair is increasingly viewed as a broader practice that goes beyond compliance toward achieving operational excellence and stakeholder satisfaction.

The ship repair industry is an essential part of the global maritime sector because it ensures vessels remain safe, seaworthy, and operational. The International Maritime Organization (IMO) and classification societies provide standards that guide ship maintenance and repair activities [1]. While compliance with these standards is mandatory, quality management has expanded to include customer satisfaction, operational efficiency, continuous improvement, environmental responsibility, and stakeholder collaboration [2, 3]. As a result, stakeholders' experiences have become important for understanding how quality can be achieved beyond regulatory compliance.

Maritime transport supports trade and economic development across Africa, prompting many coastal countries to invest in port infrastructure and ship repair facilities [4]. Despite these investments, ship repair operations continue to face challenges such as inadequate infrastructure, limited technical expertise, obsolete equipment, and inconsistent quality management practices [5]. These challenges affect service quality and competitiveness, making stakeholders' experiences valuable for improving ship repair operations.

In Tanzania, the Port of Dar es Salaam is the country's main maritime gateway and plays a key role in supporting national and regional trade. Ship repair operations are important for maintaining commercial and government vessels, with oversight provided by institutions such as the Tanzania Ports Authority (TPA) and the Tanzania Shipping Agencies Corporation (TASAC) [6, 7]. Despite regulatory compliance, challenges including limited technical capacity, equipment shortages, coordination problems, and inconsistent service quality continue to affect repair operations.

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Figure 1: Showing the analysis of ship repair quality management

Figure 1, illustrates the transition pathway for ship repair by identifying current stakeholder perceptions and significant barriers, such as high costs and aging infrastructure, which result in reactive, compliance-driven systems then central analysis shows how these factors influence quality dimensions and performance and finally it proposes strategic opportunities specifically digital technology adoption, stronger partnerships, and continuous training to shift the industry toward a future.

Previous studies have mainly focused on port performance, maritime logistics, and safety compliance, while limited attention has been given to stakeholders' experiences of quality management in ship repair operations beyond compliance. This study addresses this knowledge gap by exploring stakeholders' experiences of ship repair operations in Dar es Salaam

Quality management is essential in ship repair operations to ensure vessel safety, reliability, and effective service delivery. Although ship repair activities in Dar es Salaam follow regulatory and technical requirements, challenges related to technical capacity, resource availability, stakeholder coordination, and consistency in service quality continue to affect operational performance. Existing studies have mainly focused on maritime compliance, safety, and port operations, with limited attention given to stakeholders' experiences of quality management beyond compliance in ship repair operations. Therefore, this study explored stakeholders' experiences, perceptions, challenges, and opportunities related to quality management practices in ship repair operations in Dar es Salaam.

The main objective of the study was to explore stakeholders' experiences of quality management beyond compliance in ship repair operations in Dar es Salaam. Specifically, the study explored stakeholders' perceptions and experiences of quality management practices in ship repair operations in Dar es Salaam and examined the challenges and opportunities influencing quality beyond compliance in ship repair operations in Dar es Salaam.

The study contributed to a deeper understanding of how stakeholders experienced and perceived quality management beyond regulatory compliance in ship repair operations in Dar es Salaam. It provided insights into the role of technical performance, coordination, operational challenges, and improvement opportunities in shaping service quality. The findings added practical knowledge for strengthening quality practices and supporting continuous improvement within the maritime repair sector.

2. RELATED WORKS

2.1 Stakeholders' Perceptions and Experiences of Quality Management Practices

In Europe and North America, quality management in ship repair has evolved from a compliance-based approach to one that emphasizes continuous improvement, customer satisfaction, and stakeholder engagement. Shipyards increasingly recognize that stakeholders' experiences provide valuable insights into service quality and operational performance. Effective communication, employee involvement, and leadership commitment have been identified as key factors influencing successful quality management practices [2]. Organizations that actively involve stakeholders in quality improvement initiatives often achieve higher levels of customer satisfaction and operational efficiency [3, 8].

In Asia, countries such as China, Singapore, South Korea, and Japan have strengthened ship repair quality through lean management, technological innovation, and

customer-focused services. Stakeholders generally associate quality management with timely service delivery, skilled personnel, and effective quality assurance systems [9]. These practices have enhanced competitiveness and strengthened confidence in ship repair services across the region [10-12].

Across Africa, ship repair operations continue to face challenges related to limited infrastructure, inadequate technical capacity, and inconsistent quality management practices. These constraints influence stakeholders' experiences by affecting service reliability, repair efficiency, and customer satisfaction. Strengthening stakeholder participation and improving quality systems have therefore been identified as important strategies for enhancing maritime service delivery across the continent [4, 13].

In Tanzania, ship repair services are concentrated mainly in Dar es Salaam, supporting commercial and government vessels operating within the country and the East African region. Existing studies have focused largely on port operations, maritime transport, and regulatory compliance, with limited attention to stakeholders' experiences of quality management practices during ship repair operations [6]. Understanding these experiences can provide practical insights for improving service quality and promoting continuous improvement within the maritime sector [14].

The reviewed literature shows that studies from Europe and North America have emphasized stakeholder engagement and continuous improvement, while Asian studies have focused on innovation and operational excellence. African research has mainly examined infrastructure and institutional challenges, whereas Tanzanian studies have concentrated on maritime operations and regulatory compliance. However, limited empirical evidence exists on stakeholders' perceptions and experiences of quality management practices in ship repair operations in Dar es Salaam. This gap formed the basis for the present study.

2.2 Challenges and Opportunities Influencing Quality Beyond Compliance

In Europe and North America, ship repair organizations increasingly face challenges related to technological change, environmental regulations, supply chain disruptions, and growing customer expectations. These pressures have encouraged organizations to adopt risk-based quality management, stronger stakeholder engagement, and digital transformation to improve operational performance. Studies suggest that organizations that integrate innovation, knowledge sharing, and employee participation into quality management are better positioned to achieve sustainable competitiveness beyond regulatory compliance [15]. The adoption of quality-oriented organizational cultures has also been associated with improved service reliability and customer confidence [16].

In Asia, the rapid growth of maritime industries has created opportunities for shipyards to improve quality through automation, predictive maintenance, and Industry 4.0 technologies. However, challenges such as increasing operational complexity, workforce shortages, and fluctuating market demand continue to affect quality performance. Maritime organizations have responded by investing in digital shipyard technologies, continuous professional development, and integrated management systems that strengthen quality beyond compliance [17]. These initiatives have contributed to improved operational flexibility and long-term organizational performance [18].

Across Africa, ship repair operations continue to face challenges associated with inadequate infrastructure, limited technological capacity, shortages of skilled personnel, and inconsistent quality management practices. These constraints often reduce operational efficiency and negatively influence stakeholders' perceptions of service quality and competitiveness. Studies on African seaports have shown that poor service quality, operational delays, and inadequate responsiveness remain major barriers to achieving customer satisfaction and sustainable maritime performance [19]. Similarly, comparative studies of ECOWAS seaports indicate that improving service quality through stakeholder engagement, investment in modern infrastructure, and continuous quality improvement presents significant opportunities for strengthening the competitiveness of African maritime industries [20].

In Tanzania, the maritime sector continues to expand alongside increasing trade through the Port of Dar es Salaam, creating greater demand for efficient and high-quality ship repair and maintenance services. However, studies indicate that challenges such as inadequate service quality, inefficient operational processes, limited adoption of modern technologies, and weaknesses in maintenance management continue to affect maritime operations and customer satisfaction [21]. Other scholars have also observed that improving information systems, maintenance practices, and service quality can enhance operational efficiency and strengthen competitiveness within Tanzania's maritime industry [22, 23]. These findings suggest that quality improvement requires greater attention to stakeholders' experiences beyond compliance with technical and regulatory requirements.

Existing studies from Europe and North America have mainly examined innovation, organizational culture, and digital transformation as drivers of quality beyond compliance. Asian research has focused on smart shipyards and Industry 4.0 technologies, while African studies have emphasized institutional capacity, infrastructure, and blue economy development. In Tanzania, available literature has largely examined maritime transport reforms and port development, with limited attention given to stakeholders' experiences of the challenges and opportunities influencing quality beyond compliance in ship repair operations. Consequently, there remains limited qualitative evidence explaining how stakeholders perceive these challenges and opportunities within the context of ship repair operations in Dar es Salaam, a gap that the present study sought to address.

3. METHODOLOGY

This study adopted a qualitative research approach using a descriptive research design to explore stakeholders' experiences of quality management beyond compliance in ship repair operations in Dar es Salaam. The study was conducted at selected ship repair facilities, including Songoro Marine Transport Ltd, Dhow-Licious Ltd, Dar es Salaam Marine Services (DMS), and repair workshops operating within the Port of Dar es Salaam. The target population comprised shipyard managers, marine engineers, quality assurance personnel, technicians, welders, vessel owners, maritime regulators, and other stakeholders directly involved in ship repair operations. A sample of 43 participants was selected through purposive sampling because qualitative studies emphasize information-rich participants rather than large statistical samples. The sample size was considered adequate as it enabled the researcher to obtain diverse stakeholder perspectives and reach data saturation, where no substantially new information emerged [24, 25]. Data were collected through semi-structured interviews and focus group discussions and were analyzed using thematic analysis by organizing participants' responses into codes, categories, and themes aligned with the study objectives.

4. RESULTS AND DISCUSSION

This section presents the findings and discussion based on data collected from 43 participants involved in ship repair operations in Dar es Salaam. The results were analyzed thematically according to the study objectives, focusing on stakeholders' experiences of quality management practices, challenges, and opportunities influencing quality beyond compliance. The findings are discussed in relation to existing literature to provide insights into improving ship repair operations.

4.1 Stakeholders' Perceptions and Experiences of Quality Management Practices

The study explored stakeholders' perceptions and experiences of quality management practices in ship repair operations in Dar es Salaam. The findings focused on stakeholders' views regarding dimensions of quality, including workmanship, timeliness, safety, and reliability, their experiences with existing quality management systems and processes, and their perceptions of how quality practices influenced customer satisfaction and operational performance. The results provided insights into how quality management was implemented and experienced beyond regulatory compliance within ship repair operations.

4.1.1 Stakeholders' views on the dimensions of quality in ship repair operations

The findings revealed that stakeholders perceived quality in ship repair operations through different dimensions, including reliable workmanship and technical accuracy, safety compliance and prevention of repair failures, and timely completion of repair activities. According to data presented on table 1, among the 43 participants, 16 (37.2%) associated quality mainly with reliable workmanship and technical accuracy, 15 (34.9%) viewed quality as the ability to complete repair activities within the expected timeframe, while 12 (27.9%) emphasized safety compliance and prevention of repair failures as the most important dimension of quality. These findings indicated that stakeholders did not perceive quality as merely meeting regulatory requirements but as a broader practice involving technical competence, operational reliability, safety assurance, and effective service delivery.

Participants who emphasized workmanship and technical accuracy explained that the quality of ship repair depended heavily on the skills, experience, and attention to detail demonstrated by engineers, technicians, and other repair personnel. They argued that a vessel could only be considered properly repaired when technical procedures were accurately followed, appropriate materials were used, and repaired components performed according to expected standards. One marine engineer explained:

"…quality in ship repair is not only about finishing the work and returning the vessel to the owner. The most important issue is whether the repair has been done correctly and whether the vessel can operate safely after leaving the yard. Sometimes a repair may look good externally, but if technical procedures were not followed properly, the same problem can return and create bigger operational risks. For us, quality means doing the work correctly from the beginning using the right skills, tools, and knowledge…"

This finding suggested that stakeholders considered technical accuracy and workmanship as fundamental elements of quality because they directly influenced vessel reliability and long-term operational performance. Similar findings have been reported in studies emphasizing that effective quality management requires employee competence, technical expertise, and organizational commitment to maintaining consistent service standards. Organizations that invest in skilled personnel and employee involvement are more likely to achieve improved quality outcomes and customer confidence [2, 8]. The finding also corresponded with Asian ship repair practices, where quality improvement has been associated with skilled manpower, systematic quality assurance, and professional management approaches that enhance reliability and competitiveness [10].

The findings further showed that 12 (27.9%) participants considered safety compliance and prevention of repair failures as a critical dimension of quality in ship repair operations. These stakeholders explained that quality could not be separated from maritime safety because repair failures may result in accidents, financial losses, environmental risks, and reduced confidence among vessel owners. A shipyard supervisor stated:

"…In ship repair, safety is part of quality. A repair that does not consider safety requirements cannot be called quality work. We have seen situations where rushing a repair or ignoring safety procedures can create problems after the vessel returns to operation. Therefore, quality means ensuring that every repair meets safety expectations and that the vessel is able to perform its activities without creating risks for people, cargo, or the environment…"

The emphasis on safety reflected stakeholders' understanding that quality extends beyond immediate repair completion to include the prevention of future failures. This finding was consistent with maritime quality management approaches that recognize safety, risk control, and compliance as essential components of operational excellence. Previous studies have indicated that organizations with strong quality cultures tend to integrate safety management, continuous monitoring, and stakeholder involvement to reduce operational risks and improve service reliability [3, 16]. However, the current finding extended existing knowledge by showing that stakeholders in Dar es Salaam viewed safety not only as a regulatory obligation but also as an indicator of professional responsibility and trustworthiness.

Additionally, 15 (34.9%) participants identified timely completion of repair activities as an important indicator of quality. These participants explained that delays in ship repair operations often increase operational costs, affect vessel availability, and reduce customer satisfaction. According to one vessel representative:

"…for ship owners, quality is not only about having a strong repair after completion; it is also about whether the shipyard can deliver the service within the agreed time. A vessel that remains in the yard for too long affects business operations and increases costs. A good ship repair company should balance technical quality with efficiency because both aspects determine whether customers will return..."

This finding demonstrated that stakeholders associated quality with the ability of shipyards to provide reliable services within acceptable timelines. The perception reflects the growing importance of customer-oriented quality management, where service providers are expected to meet both technical and operational expectations. Similar studies have shown that organizations that integrate stakeholder needs, timely service delivery, and continuous improvement practices achieve higher customer satisfaction and stronger operational performance [11]. In African maritime contexts, where delays and service inefficiencies remain significant concerns, improving responsiveness and stakeholder coordination has been identified as an important opportunity for strengthening maritime service competitiveness [19, 20].

The findings therefore demonstrated that stakeholders in Dar es Salaam understood quality in ship repair operations as a multidimensional concept involving technical accuracy, safety assurance, and timely service delivery. While regulatory compliance remained important, participants emphasized that true quality required additional efforts such as skilled workmanship, preventive approaches, effective coordination, and commitment to customer expectations. This perspective supports the argument that quality management in maritime operations should move beyond compliance-based practices toward continuous improvement and stakeholder-centered approaches. Nevertheless, unlike studies from developed maritime economies that have extensively examined digitalization and advanced quality systems, limited attention has been given to how stakeholders in Tanzanian ship repair environments define and experience quality in their daily operations. This finding therefore contributes context-specific insights into the meaning of quality beyond compliance within Dar es Salaam's ship repair sector.

Table 1: Stakeholders' Perceptions and Experiences of Quality Management Practices in Ship Repair Operations

Sub-Indicator	Emerging Themes from Participants' Responses	Frequency (n)	Percentage (%)
Stakeholders' views on the dimensions of quality in ship repair operations	Quality associated with reliable workmanship and technical accuracy	16	37.2
	Quality linked to safety compliance and prevention of repair failures	12	27.9
	Quality reflected through timely completion of repair activities	15	34.9
Experiences with current quality management systems	Quality procedures are available but require stronger implementation	14	32.6
	Existing standards improve consistency and accountability	17	39.5
	Quality systems are mainly applied to meet regulatory requirements	12	27.9

Sub-Indicator	Emerging Themes from Participants' Responses	Frequency (n)	Percentage (%)
Perceptions of how quality practices influence customer satisfaction and operational performance	Effective quality practices increase customer trust and satisfaction	18	41.9
	Quality improvement reduces delays, rework, and operational costs	13	30.2
	Quality practices improve competitiveness and organizational reputation	12	27.9

4.1.2 Experiences with current quality management systems

The findings revealed as per table 1, that stakeholders had varied experiences regarding the effectiveness and implementation of existing quality management systems in ship repair operations. Among the 43 participants, 17 (39.5%) indicated that existing quality standards improved consistency and accountability within repair activities, 14 (32.6%) reported that quality procedures were available but required stronger implementation, while 12 (27.9%) perceived that quality systems were mainly applied to satisfy regulatory requirements. These findings suggested that although quality management systems existed within ship repair operations in Dar es Salaam, their effectiveness depended on the extent to which they were integrated into daily practices rather than being treated as formal requirements.

Participants who acknowledged the contribution of existing standards explained that quality management procedures helped create uniformity in repair processes, improve documentation, and enhance accountability among workers and supervisors. They indicated that adherence to established procedures reduced errors, improved monitoring of repair activities, and provided confidence among vessel owners and other stakeholders. One quality assurance officer explained:

"…the quality procedures have helped us to organize our work because every stage of repair has to be documented and verified. When there is a clear process, it becomes easier to identify mistakes, know who was responsible, and ensure that the repair meets the required standards. However, the effectiveness of the system depends on whether everyone involved follows the procedures seriously and not just when inspections are approaching..."

This finding demonstrated that stakeholders recognized quality management systems as important mechanisms for improving consistency and accountability in ship repair operations. The perception was consistent with previous studies that identified standardized procedures, documentation, and employee involvement as essential elements of effective quality management systems. Organizations that establish clear quality processes are more likely to improve operational control, reduce inconsistencies, and enhance stakeholder confidence [3]. Similarly, studies have shown that quality systems contribute to improved performance when they are embedded within organizational culture rather than being used only as compliance tools [8].

However, 14 (32.6%) participants indicated that although quality procedures were available, their implementation required improvement. These participants explained that some procedures existed on paper but were not always fully practiced due to workload pressures, limited monitoring, inadequate resources, and differences in employees' commitment to quality standards. A marine technician shared:

"…we have quality procedures that guide our work, but the challenge is making sure they are followed every day. Sometimes workers focus on completing the repair quickly because the vessel owner is waiting, and some steps may not receive enough attention. The system is good, but it needs continuous supervision, training, and commitment from everyone involved so that quality becomes part of our normal work and not just a requirement during inspections..."

The finding indicated a gap between the existence of quality management systems and their practical implementation within ship repair environments. Similar observations have been made in quality management literature, where organizations often experience difficulties in transforming documented procedures into effective daily practices due to weak organizational commitment, insufficient training, and limited employee participation [9]. The finding also reflected challenges observed in African maritime industries, where limited resources and technical capacity may affect the effective application of quality improvement systems despite the presence of regulatory frameworks [4].

Furthermore, 12 (27.9%) participants perceived that quality systems were mainly applied to meet regulatory requirements rather than as tools for continuous improvement. These participants explained that some organizations prioritized passing inspections and fulfilling mandatory requirements instead of using quality systems to identify weaknesses, improve processes, and enhance customer experiences. One ship repair manager stated:

"…sometimes quality systems become something we prepare for when auditors or inspectors are coming. The documents are completed, but the deeper purpose of improving our processes is not always achieved. Quality should not only be about showing compliance; it should help us learn from previous repairs, prevent repeated problems, and improve how we serve customers…"

This experience highlighted the challenge of moving from a compliance-based approach toward a quality culture that emphasizes learning and continuous improvement. The finding supported previous research indicating that organizations achieve greater benefits from quality management systems when they go beyond certification requirements and integrate quality principles into strategic decision-making and operational practices [15]. In Asian ship repair contexts, successful organizations have increasingly combined regulatory compliance with innovation, employee development, and continuous improvement approaches to strengthen competitiveness and customer trust [12].

The findings therefore indicated that stakeholders viewed current quality management systems as valuable but requiring further strengthening to achieve quality beyond compliance. While standards and procedures had improved consistency and accountability, challenges remained regarding implementation, employee commitment, and the tendency to focus on regulatory satisfaction rather than continuous improvement. These findings suggested that improving ship repair quality in Dar es Salaam requires not only maintaining existing standards but also strengthening quality culture, stakeholder involvement, technical capacity, and ongoing improvement initiatives. This perspective contributes to the limited literature on how maritime stakeholders in Tanzania experience the practical implementation of quality management systems beyond formal compliance requirements.

4.1.3 Perceptions of how quality practices influence customer satisfaction and operational performance

Participants' narratives demonstrated that quality practices were considered a critical factor shaping customer satisfaction and operational performance within ship repair operations. Stakeholders explained that quality was not only associated with the technical completion of repair activities but also with the ability of shipyards to build trust, minimize operational disruptions, and maintain positive relationships with vessel owners and other maritime actors. As per table 1, among the 43 participants, 18 (41.9%) perceived that effective quality practices increased customer trust and satisfaction, 13 (30.2%) emphasized that quality improvement reduced delays, rework, and operational costs, while 12 (27.9%) associated quality practices with improved competitiveness and organizational reputation. These perspectives reflected a broader understanding of quality as a strategic element influencing both service delivery and organizational performance.

Stakeholders who emphasized customer trust and satisfaction explained that consistent quality performance created confidence among vessel owners and operators. They noted that customers evaluated shipyards not only based on the final repair outcome but also on communication, transparency, reliability, and the ability to meet agreed expectations. One vessel representative explained:

"…when we bring a vessel for repair, we are not only looking for a company that can fix the technical problem. We need assurance that the work will be done correctly, within the agreed period, and according to the required standards. A shipyard that communicates well, provides updates during the repair process, and delivers quality work builds confidence among customers. In this industry, trust is very important because any mistake can affect vessel operations, increase costs, and create safety concerns. Therefore, quality practices are what make customers believe that they have chosen the right repair facility…"

This experience suggested that stakeholders viewed quality management as an important foundation for developing long-term customer relationships. The emphasis on trust, communication, and reliability corresponded with previous studies that highlighted stakeholder involvement, responsiveness, and consistent service delivery as important determinants of customer satisfaction and organizational performance [8]. In maritime service environments, where customers depend on technical accuracy and operational reliability, quality practices contribute significantly to maintaining confidence and loyalty among service users [11].

Beyond customer satisfaction, 13 (30.2%) participants explained that quality improvement practices helped reduce delays, repeated repairs, and unnecessary operational costs. Participants indicated that poor-quality workmanship often resulted in additional inspections, corrective repairs, extended vessel downtime, and increased expenses. A marine engineer stated:

"…a repair that is not done properly the first time creates problems for everyone involved. The vessel owner loses time because the ship remains unavailable, the company spends more resources correcting mistakes, and workers have to repeat activities that should have been completed earlier. When quality procedures are followed carefully, problems can be identified before the vessel leaves the yard. Good quality management therefore helps us save time, reduce unnecessary costs, and improve the efficiency of the entire repair process…"

The statement illustrated that stakeholders perceived quality improvement as a preventive approach rather than merely a corrective activity. This perspective aligned with quality management literature, which emphasizes that effective quality systems reduce waste, improve process control, and enhance organizational efficiency through continuous improvement practices [9]. Similar experiences

have been reported in Asian maritime industries, where shipyards have improved operational performance through systematic quality control, innovation, and process improvement initiatives [10, 12].

Some participants also linked quality practices with competitiveness and organizational reputation. A total of 12 (27.9%) stakeholders explained that ship repair companies with strong quality performance were more likely to attract customers, maintain industry partnerships, and compete effectively. One shipyard manager explained:

"…the reputation of a shipyard is created by the quality of repairs it provides over many years. Customers remember facilities that deliver reliable services and avoid those where they experience repeated problems. In the maritime sector, one successful repair can create future business opportunities, while poor-quality work can damage the company's image. This is why quality should be treated as part of the organization's identity rather than something done only to satisfy inspectors or regulations…"

This perspective demonstrated that stakeholders considered quality management as a source of strategic advantage within the ship repair industry. Organizations that develop quality-oriented cultures are more likely to strengthen customer loyalty, improve competitiveness, and adapt to changing industry expectations [16]. Furthermore, integrating innovation, stakeholder collaboration, and continuous improvement can enhance the ability of maritime organizations to maintain performance in increasingly competitive environments [17].

The analysis highlighted that quality practices influenced ship repair operations through interconnected outcomes involving customer confidence, operational efficiency, and organizational reputation. Rather than viewing quality as a requirement limited to inspections and certification, stakeholders understood it as a continuous process that shaped relationships, reduced inefficiencies, and strengthened the position of ship repair organizations in the maritime market. This perception supported the need for ship repair facilities in Dar es Salaam to strengthen quality approaches that combine compliance requirements with stakeholder engagement, improvement initiatives, and customer-focused service delivery.

4.2 Challenges and Opportunities Influencing Quality Beyond Compliance

The analysis explored stakeholders' experiences regarding the challenges and opportunities influencing quality beyond compliance in ship repair operations. The findings focused on operational limitations affecting quality improvement, coordination challenges influencing service delivery among stakeholders, and potential opportunities for strengthening quality practices through technological advancement, collaboration, and continuous improvement initiatives within the sector.

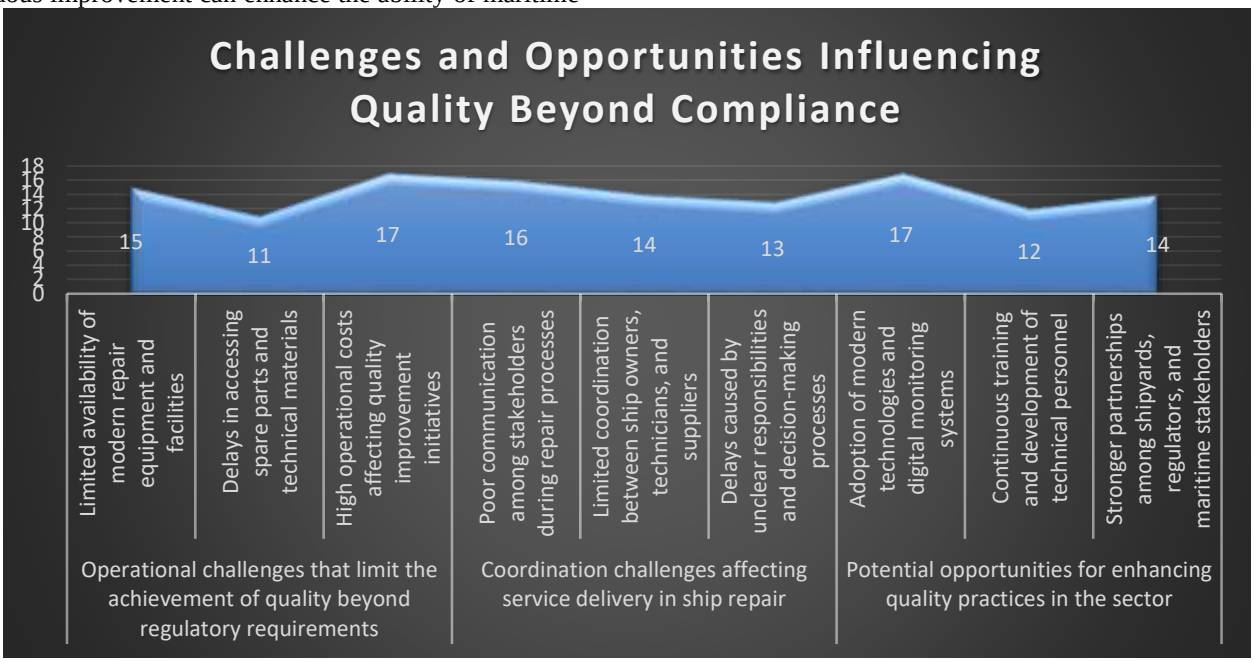

Figure 2: Showing the challenges and opportunities influencing quality beyond compliance

4.2.1 Operational challenges that limit the achievement of quality beyond regulatory requirements

The findings of this study, as illustrated in Figure 2, revealed that stakeholders' experiences regarding operational challenges affecting quality beyond regulatory requirements in ship repair operations were characterized by different levels of concern. Among the 43 stakeholders interviewed, 17

(39.5%) identified high operational costs affecting quality improvement initiatives as the major challenge, 15 (34.9%) reported limited availability of modern repair equipment and facilities, while 11 (25.6%) highlighted delays in accessing spare parts and technical materials. These findings demonstrated that achieving quality beyond compliance required more than adherence to regulatory standards; it depended on the availability of adequate financial resources, modern technological infrastructure, and efficient supply systems. Stakeholders' experiences suggested that although ship repair facilities in Dar es Salaam operated within established maritime requirements, operational limitations continued to influence their ability to achieve continuous improvement, higher efficiency, and customer-oriented quality performance.

The 17 stakeholders who identified high operational costs as the most significant challenge explained that financial limitations affected investments in modern equipment, employee development, facility improvement, and implementation of advanced quality management initiatives. They emphasized that maintaining quality beyond compliance required continuous investment rather than relying only on existing systems and procedures. One shipyard manager with over ten years of experience in ship repair operations explained:

"…quality improvement requires resources. Sometimes people think that following regulations is enough, but achieving a higher level of quality requires investment in many areas. We need modern tools, proper maintenance of equipment, training for technicians, and better working environments. The challenge is that these improvements require significant financial commitment. When operational costs increase, companies sometimes concentrate on completing immediate repair works and meeting customer deadlines, while long-term quality improvement projects receive less attention. However, without investing in quality, it becomes difficult to compete with other ship repair facilities that are adopting more advanced approaches…"

Another participant, a marine engineer from a ship repair facility in Dar es Salaam, added:

"…the cost of maintaining quality is sometimes underestimated. A good repair does not only depend on the skills of workers; it also depends on whether the company has the right equipment, testing facilities, and materials. When resources are limited, technicians may have to work with available tools even when better technology would provide more accurate results. This affects our ability to move from simply completing repairs to delivering the highest possible standard of service..."

These findings indicated that stakeholders perceived financial capacity as a foundation for achieving quality beyond regulatory compliance. The results were consistent with studies from Europe and North America, which showed that organizations required strategic investment, innovation, and organizational commitment to develop sustainable quality improvement systems beyond minimum requirements [15]. Similarly, quality management approaches emphasized that continuous improvement could only be achieved when organizations allocated sufficient resources toward technology, employee development, and process improvement [16].

The 15 stakeholders who reported limited availability of modern repair equipment and facilities explained that technological limitations affected the accuracy, efficiency, and reliability of ship repair activities. Participants indicated that while technicians possessed valuable experience, outdated machinery and inadequate facilities sometimes restricted their ability to perform repairs according to international expectations. A 46-year-old marine technician explained:

"…the experience of workers is important, but experience alone cannot solve every challenge. Ship repair is changing, and modern vessels require modern approaches. Sometimes we know the correct procedure, but the equipment available does not allow us to achieve the best results. For example, when inspection tools or specialized machines are not available, it becomes difficult to confirm whether the repair has reached the required standard. Improving facilities would help us work more accurately and give customers more confidence in the services provided…"

Another participant, a quality control officer, stated:

"…technology has become part of quality. In the past, some repairs could be completed using traditional methods, but vessels today are more complex. Without modern equipment, there is a risk of depending too much on human judgment. Better facilities would allow us to monitor repairs more effectively, detect problems earlier, and reduce mistakes before the vessel returns to operation…"

These experiences reflected the importance of technological advancement in strengthening quality management practices within ship repair operations. Similar findings were reported in Asian maritime industries, particularly in countries with advanced ship repair sectors, where investment in automation, digital monitoring systems, and modern shipyard technologies improved repair accuracy and operational efficiency [17]. Furthermore, studies indicated that adopting technological innovations enabled maritime organizations to move beyond compliance by supporting predictive maintenance, better resource management, and continuous quality improvement [18].

The 11 stakeholders who identified delays in accessing spare parts and technical materials explained that supply chain limitations affected repair schedules, increased vessel downtime, and sometimes forced technicians to postpone planned activities. Participants noted that ship repair depended heavily on the availability of specialized materials,

some of which had to be sourced externally. A 38-year-old technical supervisor explained:

"…sometimes the problem is not the willingness or ability of the repair team to complete the work. The challenge comes when the required spare parts are not available. A vessel may remain in the yard waiting for one important component, and during that period the customer continues to experience losses. In ship repair, time is very important because every additional day affects the owner's operations. Having a reliable supply system would greatly improve our ability to provide quality services within the expected timeframe…"

Another respondent, a vessel maintenance coordinator, shared:

"…there are situations where the repair plan is ready, the workers are available, and everything has been organized, but the materials delay the process. Customers sometimes think the delay is caused by the shipyard, but some challenges come from outside the organization. Better coordination with suppliers and improved access to technical materials would help reduce these problems…"

These findings aligned with previous research showing that supply chain reliability and access to technical resources significantly influence service quality and operational performance in maritime industries [19]. Across African maritime sectors, inadequate infrastructure, limited resource availability, and inefficient operational systems have continued to affect competitiveness and service delivery, while stronger partnerships and improved resource coordination have been identified as important opportunities for improvement [20].

The findings from Dar es Salaam demonstrated that achieving quality beyond compliance in ship repair operations was influenced by a combination of financial, technological, and supply-related factors. While regulatory standards provided a necessary foundation for safe and reliable repair services, stakeholders emphasized that higher levels of quality required continuous investment, modern infrastructure, and efficient operational support systems. These experiences suggested that strengthening ship repair quality in Tanzania would require a broader approach that moved beyond meeting regulatory expectations toward creating an environment where innovation, resource availability, and continuous improvement became central components of maritime service delivery.

4.2.2 Coordination challenges affecting service delivery in ship repair

Stakeholders' experiences demonstrated that coordination was a central factor influencing the effectiveness and reliability of ship repair service delivery in Dar es Salaam. Since ship repair activities involve interactions among vessel owners, shipyards, suppliers, maritime authorities, inspectors, and technical personnel, the quality of repair outcomes depended not only on technical competence but also on the ability of different actors to exchange information, make timely decisions, and work toward shared objectives. As presented in Figure 2, among the 43 stakeholders interviewed, 16 (37.2%) associated coordination challenges with poor communication among stakeholders during repair processes, 14 (32.6%) identified limited coordination between ship owners, technicians, and suppliers, while 13 (30.2%) reported delays caused by unclear responsibilities and decision-making processes. These findings indicated that weaknesses in coordination affected repair schedules, increased operational uncertainties, and limited the ability of ship repair facilities to achieve quality beyond regulatory compliance.

The 16 stakeholders who reported poor communication among stakeholders explained that inadequate information sharing often affected repair planning, execution, and monitoring. Participants emphasized that ship repair involved several actors with different responsibilities, and failure to communicate technical requirements, repair progress, or changes in vessel conditions could create misunderstandings and unnecessary delays. A vessel owner representative aged 48 years explained:

"…when a vessel enters a repair facility, many decisions have to be made between the owner and the shipyard. The owner needs to understand what work is required, what challenges have been discovered, and how long the repair will take. Sometimes the problem is not the ability of technicians to perform the work, but the lack of clear communication between those requesting the service and those providing it. When information is delayed or incomplete, it affects planning because decisions that should be made early are postponed. In the end, the repair period becomes longer, and the customer may feel that the service provider is not performing well, even when the technical team is capable..."

A marine surveyor further highlighted the importance of timely communication during inspection and approval processes:

"…during ship repair, communication between inspectors, owners, and repair teams is very important because technical findings can change the direction of the work. If inspection results are not communicated properly, the repair team may continue with an approach that later requires modification. Good communication ensures that everyone understands the condition of the vessel, the required standards, and the actions needed before the vessel returns to operation..."

These experiences showed that stakeholders considered communication a foundation for achieving quality beyond compliance. The findings supported previous studies that identified stakeholder engagement, information exchange, and employee involvement as important elements of effective quality management practices [8]. In maritime

operations, where multiple parties are involved in complex technical processes, effective communication has been associated with improved reliability, customer satisfaction, and operational efficiency [11].

The 14 stakeholders who highlighted limited coordination between ship owners, technicians, and suppliers explained that fragmented relationships among these actors affected the smooth flow of repair activities. Participants noted that ship repair performance depended on the interconnected activities of different stakeholders, meaning delays or misunderstandings from one party could influence the entire repair process. A procurement officer working with maritime service providers explained:

"…one of the challenges we experience is that the repair process depends on many external factors. Technicians may be ready to work, but the required spare parts may not have arrived. Suppliers may have the materials, but they may not have received accurate technical information. At the same time, the vessel owner may need more explanation before approving additional work. Without proper coordination between all these groups, even a simple repair activity can take longer than expected. Quality requires cooperation because every stakeholder contributes to the final outcome…"

Similarly, a workshop technician shared:

"...sometimes people focus on their own responsibility without considering how their actions affect others. A technician may complete his part of the work, but if the supplier delays materials or the owner delays approval, the whole project is affected. We need a system where everyone communicates regularly and understands that the quality of the repair is the responsibility of all stakeholders, not only the people working inside the workshop..."

These accounts suggested that quality management in ship repair required collective responsibility rather than isolated efforts by individual organizations. The finding corresponded with literature emphasizing that stakeholder collaboration and supplier relationships contribute to improved quality performance, responsiveness, and competitiveness within service industries [3]. Similar experiences have been observed in Asian maritime sectors, where stronger integration between shipyards, suppliers, and customers has supported improved operational performance and continuous improvement practices [12, 17].

The 13 stakeholders who identified unclear responsibilities and decision-making processes as a challenge explained that uncertainty regarding authority and accountability sometimes delayed repair activities. Participants indicated that when roles were not clearly defined, stakeholders experienced difficulties in approving technical changes, responding to unexpected repair issues, and resolving disagreements. A safety officer aged 40 years explained:

"…in ship repair, some decisions require quick action, especially when safety issues or unexpected technical problems are discovered. However, when it is not clear who has the authority to approve changes or provide final decisions, the process slows down. People become cautious because they do not want to take responsibility for decisions that may belong to another department. Having clear roles and responsibilities would help everyone respond faster and maintain the required quality standards..."

A maintenance planner added:

"…planning is affected when responsibilities overlap. Sometimes a delay occurs because one person is waiting for approval from another person, while the customer expects the work to continue. When responsibilities are clearly assigned, everyone understands what they should do and when they should do it. This improves accountability and helps the repair process move smoothly…"

These viewpoints highlighted that coordination challenges were closely linked to organizational structure, accountability, and decision-making efficiency. Previous research has shown that unclear responsibilities and weak coordination mechanisms can reduce operational performance and limit organizations' ability to implement continuous quality improvement [15]. Furthermore, integrated management approaches that promote collaboration, role clarity, and shared decision-making have been identified as important strategies for improving maritime service delivery [18].

The experiences shared by different stakeholders demonstrated that coordination was a critical requirement for achieving quality beyond compliance in ship repair operations. While technical skills, equipment, and regulatory standards provided the foundation for repair activities, participants emphasized that effective communication, stakeholder collaboration, and clear responsibility structures determined how successfully quality objectives were achieved. Strengthening coordination mechanisms among vessel owners, shipyards, suppliers, and maritime service providers could therefore improve service reliability, reduce avoidable delays, and support the development of a more integrated quality management approach within Dar es Salaam's ship repair sector.

4.2.3 Potential opportunities for enhancing quality practices in the sector

Stakeholders' experiences indicated that improving quality practices in ship repair operations required approaches that moved beyond fulfilling regulatory requirements toward building a culture of continuous improvement. Participants associated future quality enhancement with the ability of shipyards and maritime actors to adopt new technologies, strengthen professional competencies, and establish stronger

working relationships across the sector. As illustrated in Figure 2, among the 43 stakeholders interviewed, 17 (39.5%) identified the adoption of modern technologies and digital monitoring systems as an important opportunity for improving quality practices, 14 (32.6%) emphasized stronger partnerships among shipyards, regulators, and maritime stakeholders, while 12 (27.9%) highlighted continuous training and development of technical personnel. These perspectives suggested that achieving higher levels of quality in ship repair required interconnected improvements in technology, institutional cooperation, and human capacity rather than relying solely on compliance with established standards.

Stakeholders increasingly associated technological transformation with the future improvement of ship repair quality. Participants explained that modern technologies and digital monitoring systems had the potential to improve repair accuracy, strengthen accountability, and provide better control over complex repair activities. Rather than viewing technology only as an operational tool, stakeholders perceived it as a mechanism for improving decision-making, communication, and transparency throughout the repair process. This perspective was reflected by 17 (39.5%) participants who identified technological adoption as a major opportunity for enhancing quality practices. A marine surveyor aged 51 years explained:

"…ship repair is becoming more complex because vessels are changing and customers expect higher standards than before. Technology can help us understand problems better and monitor whether repair activities are being completed correctly. When information is recorded digitally, it becomes easier to follow the progress of work, identify areas that require attention, and provide evidence to customers that the repair has been performed properly. It also reduces dependence on assumptions because decisions can be based on accurate information…"

A vessel maintenance officer further shared:

"…In the past, many activities depended on manual communication and physical records, but this can create challenges when many people are involved in one repair project. Digital systems can allow ship owners, technicians, and managers to access updated information about the vessel. This improves coordination because everyone understands what has been completed and what remains to be done. Technology can therefore help create more reliable and efficient repair services…"

These experiences reflected a growing recognition among stakeholders that digital transformation could support quality improvement beyond minimum compliance requirements. The findings corresponded with studies showing that maritime organizations have increasingly adopted technological innovation, improved information systems, and digital solutions to enhance operational efficiency and service performance [17]. Similarly, the integration of advanced technologies and improved management systems has provided maritime organizations with opportunities to strengthen flexibility, reliability, and continuous improvement practices [18]. In Asian maritime industries, technological advancement and operational innovation have contributed to stronger competitiveness and improved confidence among maritime service users [10].

Beyond technological advancement, participants emphasized that sustainable quality improvement depended on the relationships developed among different maritime stakeholders. The experiences of 14 (32.6%) participants indicated that stronger partnerships between shipyards, regulators, suppliers, and vessel owners were viewed as an important opportunity for improving coordination, knowledge sharing, and problem-solving. Stakeholders explained that ship repair quality was influenced by multiple actors, meaning that improvements could not be achieved through the efforts of shipyards alone. A maritime consultant stated:

"…the quality of ship repair is affected by many people, not only those working inside the shipyard. The vessel owner provides important information, suppliers provide materials, regulators guide standards, and technicians perform the actual work. When these groups cooperate, challenges can be addressed faster because everyone understands their responsibility. However, when each stakeholder works separately, small problems can become bigger and affect the quality of the final service..."

A regulatory officer added:

"…quality improvement requires a relationship between regulators and industry players. Regulation should not only be about identifying mistakes after they happen; it should also encourage organizations to improve their systems. When regulators, shipyards, and other maritime stakeholders communicate regularly, it creates an opportunity to identify challenges early and develop better solutions for the sector…"

These accounts demonstrated that stakeholders viewed collaboration as an important foundation for developing a stronger quality management environment. The findings supported previous research emphasizing that stakeholder involvement and cooperation contribute to improved organizational performance, customer satisfaction, and continuous improvement initiatives [3]. Within African maritime sectors, limited resources and operational challenges have increased the importance of partnerships, knowledge sharing, and coordinated strategies for improving service quality and competitiveness [19].

Human capacity development also emerged as an important opportunity for strengthening quality practices within ship repair operations. Participants explained that technological improvements and improved systems would

have limited impact without competent personnel capable of applying them effectively. The views of 12 (27.9%) stakeholders highlighted the importance of continuous training and professional development in maintaining technical accuracy, improving safety practices, and adapting to changing maritime requirements. A technical training coordinator explained:

"…the quality of repair depends on the ability of workers to understand and apply the correct procedures. Equipment can support the work, but skilled people are still needed to make decisions and solve technical problems. Continuous training is important because the maritime sector does not remain the same. New vessels, new technologies, and new safety expectations require workers to continue developing their skills…"

A workshop technician further explained:

"…training gives workers confidence because they understand better what is expected from them. When technicians are not updated, they may continue using old approaches even when the industry has changed. Regular training helps workers improve their performance, reduce mistakes, and provide services that meet customer expectations. Developing employees is therefore directly connected to improving the reputation of the shipyard…"

These experiences highlighted that stakeholders considered human resource development as a long-term investment in quality improvement. The findings were consistent with studies that emphasized employee involvement, organizational learning, and continuous improvement as important elements of effective quality management practices [16]. In Tanzania, improving maintenance practices, information systems, and technical capabilities has been identified as necessary for strengthening operational efficiency and competitiveness within maritime services [22, 23].

Taken together, stakeholders' experiences positioned quality improvement in ship repair as a broader transformation process involving technology, collaboration, and human capability. The perspectives gathered suggested that regulatory compliance provided only the foundation for quality performance, while sustainable improvement depended on the sector's ability to embrace innovation, strengthen partnerships, and continuously develop technical expertise. These opportunities represented important pathways for enhancing service reliability, customer confidence, and the long-term competitiveness of ship repair operations in Dar es Salaam.

5. CONCLUSION AND RECOMMENDATIONS

The study explored stakeholders' experiences of quality management beyond compliance in ship repair operations in Dar es Salaam. The findings showed that quality extended beyond regulatory requirements to include reliable workmanship, safety, timely repairs, and customer satisfaction. Although existing quality systems supported consistency and accountability, their effectiveness depended on proper implementation within daily repair activities. The findings further indicated that operational and coordination challenges, including high costs, limited equipment, material delays, communication gaps, and unclear responsibilities, affected service efficiency and quality delivery. However, stakeholders identified technological advancement, workforce development, and stronger collaboration among maritime actors as important opportunities for improving quality practices. The study established that quality management in ship repair operations was shaped by the interaction between technical capacity, stakeholder relationships, and continuous improvement efforts. Moving beyond compliance required an integrated approach where standards, innovation, skilled personnel, and effective coordination contributed to improved service outcomes within the maritime environment.

Based on the findings, the study proposed the following recommendations aimed at strengthening quality management practices and supporting improved service delivery in ship repair operations:

- Ship repair facilities should strengthen investment in modern equipment, digital monitoring systems, and maintenance technologies to improve repair accuracy, efficiency, and quality beyond regulatory compliance.
- Shipyards should enhance continuous training and professional development of technical personnel to ensure that workers possess updated skills required for modern repair practices and changing maritime demands.
- Maritime stakeholders should improve coordination and communication mechanisms among shipyards, vessel owners, suppliers, and regulatory authorities to reduce delays, clarify responsibilities, and enhance service reliability.
- Industry actors should promote stronger partnerships and knowledge-sharing initiatives to encourage innovation, collaboration, and continuous improvement within the ship repair sector.

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