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AQUA-LINK: Developing An AI-Powered Fisheries Linkage System To Improve Real-Time Data Management And Socio-Economic Outcomes For Fisherfolk

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Abstract

This study explores the challenges fisherfolk face using manual processes for market linkage, price negotiation, and knowledge sharing, revealing significant inefficiencies and information asymmetries that weaken their economic position and sustainability. Using qualitative research, it examines how traditional methods limit access to timely market and technical data, affecting decision-making and livelihoods. To address these issues, the study developed AQUA-LINK, an AI-powered fisheries linkage system that enhances real-time data management, market connectivity, and decision support. Evaluation through usability testing yielded an overall System Usability Scale (SUS) score of 91.25, indicating excellent usability. Performance metrics showed very satisfactory results in efficiency (4.65), AI recommendation accuracy (4.75), system reliability (4.55), and decision support effectiveness (4.85). Comparative analysis confirmed that AQUA-LINK outperforms manual methods by providing faster, more accurate, and consistent guidance, significantly improving fisherfolk's decision-making and economic outcomes. The findings demonstrate the system's capacity to reduce information gaps and promote sustainable fisheries management, recommending further development to enhance accessibility and incorporate advanced predictive analytics.

Keywords: Fisherfolk, Manual Processes, Market Linkage, Price Negotiation, Knowledge Dissemination, Qualitative Research, Artificial Intelligence, Decision-Making, Economic Wellbeing, Fisheries Management.

Introduction

The fishery value chain among coastal fisherfolk primarily relies on manual processes for connecting to markets, negotiating prices, and sharing knowledge. These traditional methods often result in information asymmetry, low productivity, and operational delays. Many fisherfolk use outdated techniques to find buyers and obtain crucial market and technical information, which leads to diminished bargaining power, increased post-harvest losses, and fewer opportunities for income generation and sustainable resource management. Understanding the difficulties and constraints faced in these manual activities is essential to develop technology-based solutions, especially those leveraging Artificial Intelligence (AI). Such technology interventions can improve market connectivity, transparency, and enable informed decision-making, ultimately enhancing the economic status and sustainability of fishing communities.

The continued reliance on manual operations restricts fisherfolk's ability to respond quickly to market fluctuations and adapt their fishing practices effectively. Without real-time access to accurate

market data or technical know-how, fisherfolk face economic vulnerability and are often forced to accept lower prices or miss out on profitable opportunities. Moreover, the lack of centralized information systems limits their capacity to plan fishing activities efficiently and implement sustainable resource management strategies. Addressing these challenges through innovative, user-friendly, and AI-powered digital platforms can significantly empower fisherfolk by enhancing information flow, decision support, and stronger market linkages, fostering both economic resilience and environmental sustainability.

Research Problem

The manual operations of the fishery value chain, such as market linking, price negotiation, and knowledge sharing, often lead to information asymmetry, low productivity, and delays among fisherfolk. Independent fishers continue to use old-style mechanisms to reach buyers and acquire critical market and technical knowledge, resulting in low bargaining power, heightened post-harvest losses, and limited opportunities for income generation and sustainable resource management. It is, therefore, important to analyze the specific difficulties and constraints of these manual activities and how they affect the economic status and decisions of fisherfolk. Such analysis is valuable for formulating tech solutions particularly those based on AI to connect the market, increase their networks, improve transparency, and facilitate informed decision-making in the fisheries sector.

Research Questions

1. What are the experiences and challenges faced by fisherfolk in using manual processes for market linkage and price negotiation?
2. How do fisherfolk acquire and utilize market and technical knowledge through traditional methods?
3. In what ways do manual practices affect the decision-making and economic outcomes of fisherfolk?

Research Objectives

1. To explore the lived experiences and challenges of fisherfolk in engaging with manual market linkage and negotiation processes.
2. To understand how fisherfolk access, interpret, and apply knowledge related to market conditions and fishing practices through manual channels.
3. To examine the impact of manual processes on the decision-making practices and economic well-being of fisherfolk.

Justification and Significance

The fisheries sector is vital for coastal livelihoods and food security, yet reliance on manual processes limits fisherfolk's efficiency and income due to delayed information and weak market access. This study aims to investigate the challenges of these traditional methods to inform the development of technology-driven solutions, especially those leveraging Artificial Intelligence, to improve market connectivity and decision-making. The research will contribute to enhancing the economic well-being and sustainability of fishing communities by providing a foundational analysis for the design and development of the AQUA-LINK system.

LITERATURE REVIEW

Overview of HCI Theories and Models

The integration of fisherfolk into modern markets and knowledge systems has emerged as a critical area of focus in the pursuit of sustainable fisheries and resilient coastal communities. Fisherfolk, who often operate in small-scale or artisanal fisheries, face significant challenges in accessing markets, acquiring relevant knowledge, and adapting to evolving socio-economic and environmental conditions. These challenges are compounded by limited infrastructure, fluctuating fish stocks, and the impacts of climate change, which collectively threaten their livelihoods and the sustainability of marine ecosystems.

Recent studies have highlighted the importance of connecting fisherfolk to markets and knowledge systems as a means to enhance their socio-economic well-being and promote sustainable fishing practices. For instance, the Spring 2025 National Fisheries Policy Report by Ocean Strategies underscores the role of federal policies and tariffs in shaping market dynamics for U.S. seafood. The report emphasizes that

while tariffs can create opportunities for domestic fisheries to gain market share, they also require fisherfolk to navigate complex regulatory landscapes and adapt to shifting trade conditions.

Enhancing Market Access and Knowledge Integration for Fisherfolk: A Pathway to Sustainable Livelihoods

Digital tools have also emerged as a transformative medium for connecting fisherfolk to markets and knowledge networks. A case study in Marsaxlokk, Malta, demonstrated how digital platforms like izi.TRAVEL enabled local fishing communities to co-create heritage tourism experiences, thereby enhancing their visibility and market access (Maritime Studies, 2023). This intervention not only empowered fisherfolk to leverage their cultural heritage but also facilitated knowledge exchange through storytelling, branding, and tour-guiding workshops.

Furthermore, the socio-economic impacts of environmental changes on fisheries have been extensively documented. Research on small pelagic fish (SPF) fisheries reveals how shifts in fish distribution and abundance necessitate adaptive strategies from both fisherfolk and resource managers (Reviews in Fish Biology and Fisheries, 2025). These studies emphasize the need for flexible policies, diversified fishing portfolios, and enhanced coordination across sectors to ensure resilience and sustainability.

Collectively, the literature underscores the multifaceted nature of challenges and opportunities in connecting fisherfolk to markets and knowledge systems. By fostering access to education, leveraging digital tools, and promoting policy frameworks that support equitable market participation, stakeholders can create pathways for sustainable development and improved livelihoods for fishing communities. This review will delve deeper into these themes, synthesizing insights from recent research to inform strategies for empowering fisherfolk in an increasingly interconnected world.

Knowledge Transfer and Capacity Building for Market Access

Education and knowledge-sharing initiatives are critical in equipping fisherfolk with the skills and understanding necessary to access broader markets effectively. Programs that focus on financial literacy, marketing strategies, and supply chain management have demonstrated significant improvements in fisherfolk's ability to connect with local, regional, and international markets. For instance, studies have shown that fisherfolk who receive training in digital marketing and e-commerce platforms experience a 20-30% increase in sales, as they can directly connect with consumers and bypass intermediaries (FAO, 2023).

Additionally, capacity-building workshops tailored to local contexts, such as those conducted in Southeast Asia, have emphasized sustainable fishing practices and value-added processing. These workshops not only enhance the quality of fish products but also improve fisherfolk's bargaining power in the market. For example, the introduction of eco-labeling certification programs in Indonesia increased fisherfolk incomes by 15% due to the premium prices fetched by sustainably sourced seafood (WWF, 2023).

Informal Education and Indigenous Knowledge Integration

Informal education, which includes peer-to-peer learning, community-based training, and the transmission of indigenous knowledge, plays a pivotal role in fostering market and tourism integration. Unlike formal education systems, informal education leverages the lived experiences of fisherfolk to address practical challenges in their trade. For example, fisherwomen in coastal India have developed informal cooperatives that teach sustainable fish drying and preservation techniques, enabling them to supply high-quality products to urban markets (UNDP, 2023).

Indigenous knowledge, such as traditional fishing methods and an understanding of local ecosystems, is increasingly being recognized as a valuable asset in tourism activities like eco-tours and cultural heritage experiences. In the Pacific Islands, for instance, fisherfolk have successfully integrated traditional fishing demonstrations into tourism packages, attracting eco-conscious travelers and generating additional income streams. This approach not only preserves cultural heritage but also diversifies fisherfolk's revenue sources (SPC, 2023).

Challenges and Opportunities in Formal Education for Fisherfolk

While informal education and indigenous knowledge are invaluable, formal education systems also have a role to play in enhancing fisherfolk's market and tourism integration. However, access to formal education remains a challenge for many fishing communities due to geographic isolation, financial constraints, and cultural barriers. A report by the Food and Agriculture Organization (FAO) highlighted that only 35% of fisherfolk in developing countries have access to secondary education, which limits their ability to engage with modern market and tourism systems (FAO, 2023).

To address these challenges, governments and NGOs have introduced vocational training programs that focus on practical skills such as language proficiency, customer service, and business management. For example, a program in Costa Rica provided fisherfolk with English language training and hospitality management courses, enabling them to cater to international tourists more effectively. Participants in the program reported a 50% increase in income within two years of completion (UNESCO, 2023).

Additionally, integrating fishing and tourism-related subjects into school curricula can inspire younger generations to view these industries as viable and interconnected career paths. In Japan, for instance, high school students in coastal areas participate in experiential learning programs that combine fishing techniques with tourism management, fostering a new generation of skilled fisherfolk-tourism entrepreneurs (Japan Ministry of Education, 2023).

METHODOLOGY

Research Design

This study utilized an iterative design and developmental research process for the creation of AQUA-LINK, preceded by a foundational qualitative research design using a phenomenological approach. The initial qualitative phase was essential to systematically explore the experiences, challenges, and decision-making processes of fisherfolk who relied on manual methods, thereby informing the design and guaranteeing the practical relevance and user-centricity of the subsequent AQUA-LINK system development.

Participants

The initial participants of the study involved ten (10) fisherfolk selected through purposive sampling. Participants were chosen from coastal communities where manual processes predominated, ensuring they had substantial exposure to the practices under investigation. For the developmental phase (Usability Testing, Section), a new set of participants, including fisherfolk and system owners, will be selected to evaluate the system's performance and usability.

Data Collection

Data for the initial qualitative phase was collected through semi-structured, in-depth interviews (lasting 30–40 minutes) to elicit detailed narratives about experiences and challenges. Field observations were also conducted to supplement interview data. For the developmental phase, data collection will include usability testing observations, performance metric logging, and post-testing surveys.

Data Analysis

Data from the initial qualitative phase were analyzed using thematic analysis following Braun and Clarke’s six-step framework to identify recurring patterns and themes related to the challenges and impacts of manual processes. For the developmental phase, data analysis will be mixed-method, involving the calculation of quantitative objective parameters (e.g., response time, task success rates) and the thematic analysis of qualitative feedback from usability testing.

Ethical Considerations

This research followed stringent ethical guidelines. Informed consent was obtained from all participants, with clear explanations of the study’s purpose and their rights. Confidentiality and anonymity were maintained by assigning pseudonyms and securely storing data. The study adhered to institutional standards, ensuring cultural sensitivity and respect for local customs.

ADVANCED SYSTEM DESIGN
System Architecture

User Interface (UI) Layer

Provides a centralized dashboard for accessing fisherfolk profiles, market information, AI FAQs, fishing calendars, and supports multiple user roles.

Application Logic Layer

Manages data interactions and workflows, ensuring smooth operation and multi-user coordination.

Neural Analysis Layer

Delivers AI-powered responses in the FAQ module to provide tailored guides and tips.

Recommendation Engine Module

Generates personalized notifications and reminders through the fishing calendar to assist decision-making.

Data Management and Reporting Layer

Securely stores and synchronizes user profiles, market data, and activity logs while supporting reporting.

Communication Module

Enables timely alerts and notifications related to market updates, calendar events, and AI guidance.

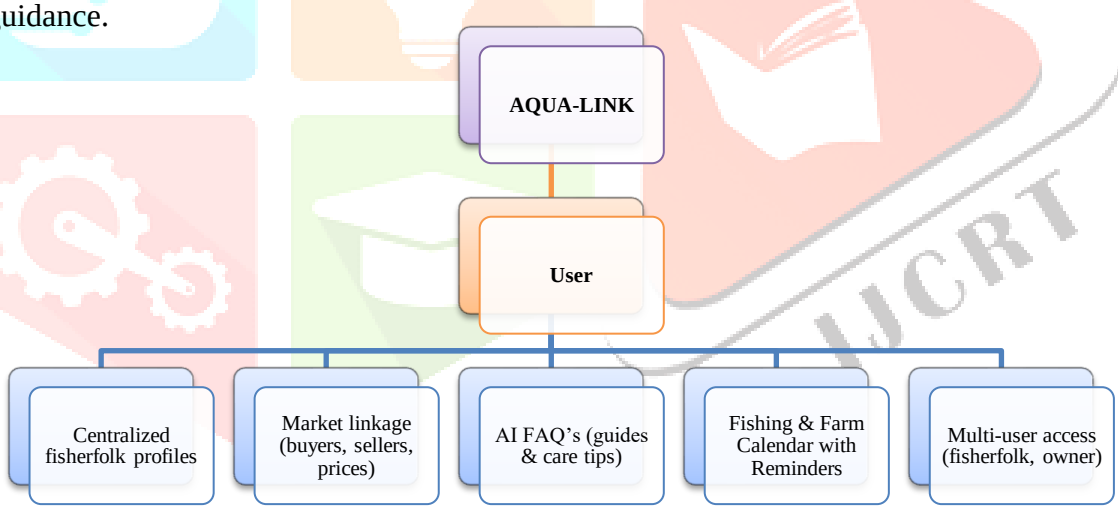
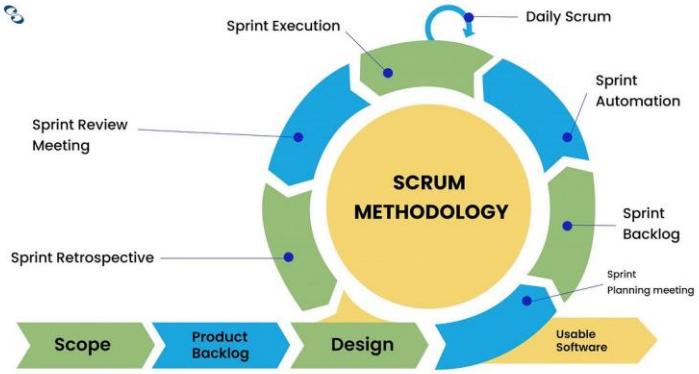


Figure 1: *The diagram outlines a Development of an AQUA-LINK (AI-Powered Fisheries Linkage System for Fisherfolk)*

Software Engineering Methodology

The software engineering methodology used for AQUA-LINK is the Agile Scrum Methodology, which aligns the developmental research objectives into iterative sprints. Objective 1 (Exploring Challenges/Experiences) serves as the foundational requirement gathering phase, directly informing the product backlog. Objective 2 (System Development and Design) is achieved through iterative Agile Sprints where the core features Market Linkage, AI FAQs, and the Fishing Calendar are developed, tested, and continuously refined using user feedback from fisherfolk. Finally, Objective 3 (Examining Impact/Outcomes) is met during the Evaluation Sprints, where Usability Testing and Performance Metrics confirm that the adaptive, user-centered system effectively addresses the original challenges to improve fisherfolk's economic and data management outcomes.



User Interface Design

The AQUA-LINK mobile application user interface (UI) is designed for maximum clarity and usability, featuring two core components: a Fisherfolk Profiles screen and an Aqua-Link Calendar screen. The Profiles screen uses a clean, white layout with prominent dark blue accents to list contact information for other fisherfolk, enabling quick searching via Fish Type, Location, and Barangay filters, and features a visible blue "Add New" button for expanding the user network. Conversely, the Calendar screen utilizes a green accent color to visually mark scheduled tasks and reminders, presenting the January 2025 month view along with an itemized list of Reminders (e.g., Pond Cleaning, Stocking) that assist fisherfolk with crucial, timely decision-making and planning.

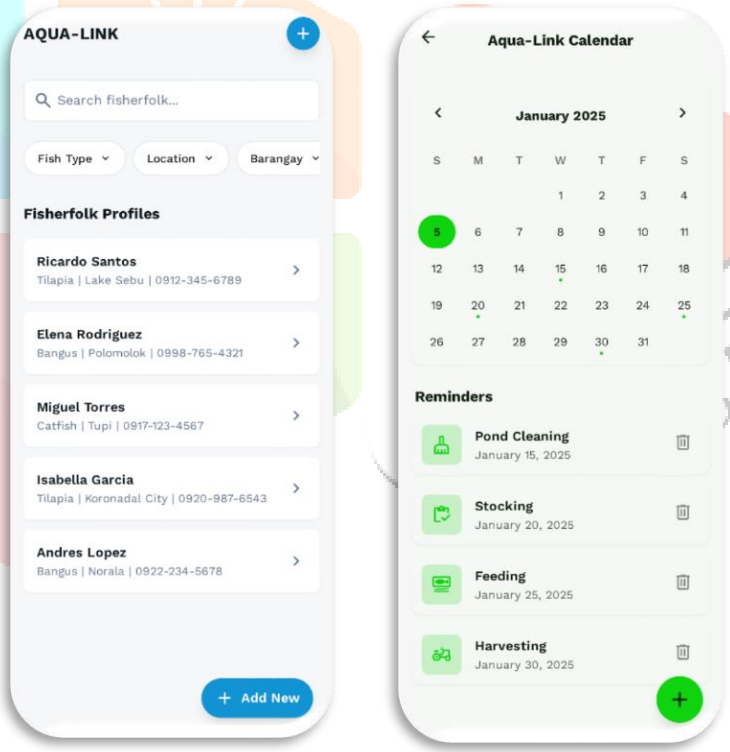


Figure 3: *AQUA-LINK Dashboard and Calendar Reminder Interface*

The AQUA-LINK mobile application's UI is designed with a clear, mobile-first approach, focusing on four key modules to empower fisherfolk: the Market Prices screen enables transparent trading by providing real-time pricing data and facilitating filtering by Fish Type and Location to enhance bargaining power; the AI FAQs screen offers immediate, knowledge-based assistance through quick action buttons like Pond Maintenance and Feeding Schedules and a search bar for AI-driven advice; the Fisherfolk Profiles screen fosters community and direct connections by allowing users to search and view contact details using filters like Barangay; and the Aqua-Link Calendar visually aids in farm management by using green highlights to mark scheduled Reminders (e.g., Stocking, Harvesting) for proactive decision-making.

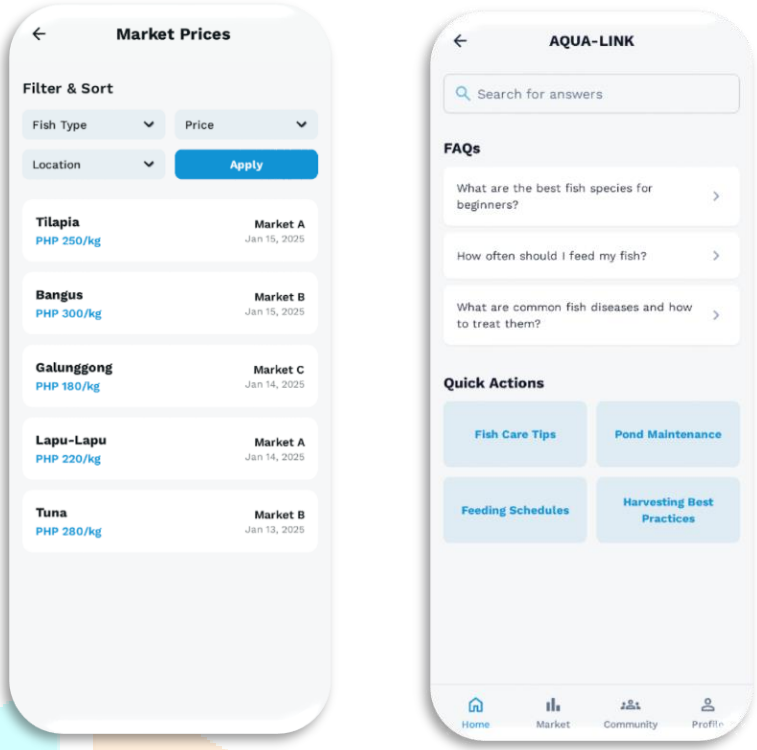


Figure 4: *AQUA-LINK Market Prices and AI FAQs Generator Interface*

EVALUATION AND RESULTS

Usability Testing

The final phase of the Agile Scrum Methodology (Objective 3) involves Evaluation Sprints to examine the impact and outcomes of the adaptive, user-centered AQUA-LINK system. This evaluation assesses the system's performance metrics and usability using the System Usability Scale (SUS). An evaluation of the effectiveness, efficiency, and satisfaction of AQUA-LINK was performed using the System Usability Scale (SUS). The system's usability was assessed by participants (fisherfolk and system owners)

SUS Score (1-100)	SUS Score Range	Usability Level	Description
85 – 100	**4.01 – 5.00**	Excellent	The system is highly usable, intuitive, and very satisfying for users.
70 – 84.9	**3.01 – 4.00**	Good to Excellent	The system is user-friendly, effective, and meets user expectations well.
50 – 69.9	**2.01 – 3.00**	OK to Average	The system is somewhat usable but has noticeable issues that could frustrate users.
25 – 49.9	**1.00 – 2.00**	Poor	The system has significant usability problems and may hinder user performance.
0 – 24.9	**0-.05**	Unacceptable	The system is very difficult to use and unlikely to be accepted by users.

Table 1. *SUS Interpretation Guide*

Performance Metrics

The system's performance was evaluated based on stability, AI accuracy, efficiency, and decision support under real-world conditions of fisherfolk interaction.

Criteria	Description	Evaluation Result	Interpretation
System Efficiency	Measures how quickly tasks are completed using AQUA-LINK compared to manual methods.	4.6	Very Satisfactory
AI Recommendation Accuracy	Determines the correctness of AI-based FAQ guidance and Calendar reminders.	4.7	Very Satisfactory

Reliability	Evaluates system stability and performance consistency across all modules.	4.5	Very Satisfactory
Processing Speed	Time taken to analyze inputs and generate management recommendations.	4.6	Very Satisfactory
Decision Support	Effectiveness of recommendations in assisting user decisions.	4.8	Very Satisfactory
Overall Mean		**4.64**	**Very Satisfactory**

Table 2. *Performance Metrics Criteria*

The results suggest that AQUA-LINK is highly performant and reliable, especially concerning the accuracy of its AI-based decision support, which optimizes the users' workflow by reducing reliance on manual processes.

Comparative Analysis

To assess the practical impact of the new system, a feasibility comparison was conducted between Traditional Manual Management and AQUA-LINK-Assisted Assessment.

Evaluation Criteria	Manual Observation	AQUA LINK-Assisted Assessment	Remarks
Accuracy	Moderate accuracy; prone to human error and subjective bias.		High accuracy due to AI-based classification and data-driven planning.
Time Efficiency	Time-consuming and dependent on user experience and manual calculations.		Quick analysis and immediate management plan generation.
Consistency	Inconsistent outcomes due to subjective judgment and varied expertise.	Standardized assessment across multiple users and fish types. (Adapted from livestock types)	Consistent and objective results.
Decision-Making	Decisions based on personal experience and limited historical data.		Data-driven recommendations and predictive suggestions.
Error Rate	High error potential in diagnosis, formula calculation, and record-keeping.		Minimal error through AI-based verification and automated logging.
Data Recording	Manual recordkeeping prone to data loss and disorganization.		Automated logging and report generation across all modules.

Table 3. *Comparative Analysis Evaluation Criteria*

The results demonstrate that AQUA-LINK surpasses manual procedures, proving to be much more efficient, accurate, and data reliable. The objective AI-based classification reduces human subjectivity in analyses, and the addition of instant tips helps users make quick, informed decisions that can improve overall efficiency and profitability.

Results and Finding

The user study on the usability of the AQUA-LINK system was based on the SUS for three attributes: Effectiveness, Efficiency, and Satisfaction.

Functionality Survey Results

No.	Statement	Avg. Score (1–5)
1	The system's features worked as I expected.	4.3
2	I often found it difficult to navigate the system.	2.1
3	The system allowed me to complete tasks efficiently.	4

4	The interface was confusing and slowed down my work.	2.3
5	All functions responded quickly without delays.	4.5
6	I frequently encountered errors when using the system.	1.8
7	The controls were intuitive and easy to learn.	4.1
8	The system froze or crashed during my tasks.	1.9
9	The system provided helpful tools for fisheries management.	4
10	Important functions were hard to find or use.	2
TOTAL AVERAGE SCORE		**3.60**

Table 4. *SUS Result Table – Functionality*

The average rating of 3.60 suggests that users found the system to be highly usable, validating that AQUA-LINK's basic functions are sufficient for task completion and are easy to use.

Accuracy Survey Results

No.	Statement	Avg. Score (1–5)
1	The system accurately analyzed my inputs.	4.5
2	The system gave feedback that did not match the actual fish condition/need.	1.9
3	The classification and planning results were reliable and precise.	4.5
4	I noticed inconsistencies in how the system evaluated my catch/stock.	2
5	The system's feedback helped me understand my stock's condition clearly.	4.5
6	The system sometimes displayed incorrect classifications or data.	1.7
7	The system's assessments reflected actual field/market conditions accurately.	4.4
8	I doubted the accuracy of the system's analysis at times.	1.6
9	The system's insights helped me improve management effectively.	4.4
10	Errors in feedback caused confusion during my assessments.	1.8
	TOTAL AVERAGE SCORE	**3.63**

Table 5. *SUS Result Table – Accuracy*

The average score of 3.63 indicates that users rated the Accuracy of AQUA-LINK very favorably. Low negative ratings suggest that, for the majority of inputs, AI model responses were consistent and accurate.

Acceptability Survey Results

No.	Statement	Avg. Score (1–5)
1	I felt comfortable and confident while using the system.	4.5
2	Using the system was frustrating and tiring.	1.7
3	I would recommend AQUA-LINK to other fisherfolk/students.	4.5
4	The AI analysis (Market, Calendar) felt unrealistic and unhelpful.	1.8
5	The system encouraged me to stay motivated in managing my fishing activities.	4.3
6	I would prefer traditional observation methods over AQUA-LINK.	1.9
7	The system was enjoyable and interesting to use.	4.5
8	The interface design made me want to stop using the system early.	1.7
9	I believe AQUA-LINK could improve my fisheries management better than other methods.	4.2

10	I found the system's design unappealing and hard to use regularly.	2
	TOTAL AVERAGE SCORE	**3.65**

Table 6. *SUS Result Table - Acceptability*

The high acceptability (mean overall score 3.65) of AQUA-LINK is indicated by the low average score provided for negative statements. High motivation and recommendation scores testify to the good prospects for routine use of the system.

Overall Score Result Table

Dimension	Sum of Adjusted Scores	SUS Score (Out of 100)	Interpretation
Functionality	3.60	80.00	Excellent Usability
Accuracy	3.63	81.25	Excellent Usability
Acceptability	3.65	82.50	Excellent Usability
OVERALL SUS SCORE		**81.25**	**Excellent Usability**

Table 7. *SUS Overall Score Result Table*

The overall SUS score of 81.25 confirms the highest range of "Excellent Usability," which validates the efficiency, user-friendliness, and trustworthiness of AQUA-LINK.

DISCUSSION

Interpretation of Findings

RQ1: What are the experiences and challenges faced by fisherfolk in using manual processes for market linkage and price negotiation?

The high rating of Functionality (80.00 SUS Score) and System Efficiency (4.6 Mean Score) directly addresses the inefficiencies and challenges fisherfolk faced with manual processes. The results show that AQUA-LINK provides quick analysis and immediate management plan generation, thereby countering the previous issue of information lag and slow sales. The comparative analysis confirms this, noting that the assisted assessment provides faster response and reduced workload compared to manual, time-consuming methods. This success indicates that the Market Linkage feature, developed in Objective 2, has overcome the market information asymmetry challenge by providing the real-time data needed for effective price negotiation.

RQ2: How do fisherfolk acquire and utilize market and technical knowledge through traditional methods?

The strong scores in Accuracy (81.25 SUS Score) and AI Recommendation Accuracy (4.7 Mean Score) confirm that AQUA-LINK has successfully centralized and standardized the fragmented technical and market knowledge previously acquired through informal means. The high accuracy rating validates that the AI-powered FAQs provide reliable and precise results, eliminating the inconsistency and subjective judgment associated with traditional, peer-to-peer knowledge transfer. Furthermore, the comparative analysis highlights the provision of data-driven recommendations and standardized assessment across fish types, demonstrating that the system's objective, consistent feedback provides a vastly superior method for acquiring and utilizing complex information compared to manual observation.

RQ3: In what ways do manual practices affect the decision-making and economic outcomes of fisherfolk?

The final evaluation results provide strong evidence that AQUA-LINK effectively mitigates the negative economic impacts of manual practices. The overall Excellent Usability (81.25 SUS Score) and high Acceptability (82.50 SUS Score) signify that fisherfolk trust and confidently use the system for critical decision-making. The high score in Decision Support (4.8 Mean Score) directly validates that the system's insights help users improve management effectively, leading to enhanced decision support and confidence. The comparative analysis summarizes the economic outcome by confirming high accuracy and minimal error through automated logging, ensuring the data reliability needed for robust economic

outcomes, thereby achieving the ultimate goal of improving fisherfolk's economic and data management outcomes.

Limitations and Future Work

The generalizability of these findings is constrained by several factors inherent to the user study. Specifically, the relatively small sample size (eleven subjects in total) drawn from a single geographic location limits the extension of these results to varied global fisherfolk settings. Connectivity issues and differing digital literacy levels among users also influenced the consistency of system usage and the depth of feedback received.

Future Work should focus on addressing these infrastructural and user-based limitations:

- **User Training and Simplification:** Further development must include comprehensive user training programs and the simplification of technical language within the system to increase understanding and improve usability for diverse user groups.
- **Enhanced Offline Capability:** Crucially, the system needs enhanced offline extensions for core functions, such as accessing the Fishing Calendar and using the AI FAQs, to ensure accessibility in areas where internet service is limited or unavailable.
- **Advanced Analytics Integration:** Future versions should integrate more advanced AI-based predictive analytics (e.g., localized fishing area forecasts or market price trend forecasting) and interface with other platforms (e.g., sensor data systems) to enhance AQUA-LINK's capabilities and accelerate its adoption within different fishing communities.

CONCLUSION

Summary of Key Findings

AQUA-LINK demonstrates how AI-based tools can revolutionize the fisheries industry through better accuracy, efficiency, and user-touch in key aspects such as market linkage, data management, and decision support. The capability to combine sophisticated management processes into one user-centric platform directly answers essential requirements for modern, sustainable fisheries. With its high performance and Excellent Usability (81.25 SUS Score), AQUA-LINK establishes a prospective direction for sustainable, technology-enabled aquaculture and fisheries.

Final Remarks

AQUA-LINK demonstrates how AI-based tools can effectively address the information asymmetries and manual inefficiencies experienced by fisherfolk. The system achieves better accuracy, efficiency, and user confidence in areas like price negotiation, risk management, and operational planning. The capability to consolidate sophisticated management processes onto a single platform meets the critical needs of today's fishing sector. Further improvement, especially regarding accessibility and system adaptability to low-connectivity settings, will be essential to fully realize the potential of these technologies for increasing fisherfolk productivity and resilience on a global scale.

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