Software Design of Sharing Platform based on Fish

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Abstract. In the context of the global digitization process, the demand for intelligent fish service platforms is growing rapidly. Zhida Fish sharing platform stands out in the field of service software. Its intuitive interface, as well as the seamless integration of innovation forums, efficient file sharing capabilities and a second-hand goods trading marketplace, set it apart. Using a feedback mechanism based on Data Enveloping Analysis (DEA), the platform establishes a new benchmark for adaptive fish sharing technology, demonstrating a steadfast dedication to operational efficiency and meeting the needs of diverse populations.

Keywords: Index terms: Service, secondary market, Open fish Resources, Data Envelopment Analysis, software design.

1 Introduction

Globalization and digitalization have profoundly reshaped modern economies by promoting shared values, establishing standardized frameworks, and facilitating enhanced collaboration across various sectors [1][2]. These transformative developments have streamlined service delivery, improved management processes, and effectively addressed diverse social, economic, and environmental needs. Technologies such as cloud computing, mobile applications, virtual environments, and big data analytics play a pivotal role in driving operational efficiency, informed decision-making, and enhanced user experience [3][4].

ASEAN countries—including Vietnam, India, Indonesia, Singapore, and Malaysia—have recognized digital infrastructure as a critical driver of growth, dedicating approximately 14.7% of their national budgets to related projects. For instance, Vietnam has earmarked US$9.92 billion over a 37-year period to establish and expand digital fish-sharing platforms, underscoring their strategic importance in achieving sustainable development goals. These platforms facilitate sustainable resource management by enabling real-time data exchange, equitable resource distribution, and improved transparency in governance. With the increasing demand for sustainable fisheries, digital fish-

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sharing platforms offer a viable, technology-based solution for holistic resource management.

This study investigates the effects of these digital investments on efficiency, sustainability, and user engagement using the Data Envelopment Analysis (DEA) Model. The aim is to develop adaptive, technology-driven systems that not only enhance long-term resilience but also contribute to sustainable growth across the sector.

Traditional software systems are limited in their capacity for real-time sharing, active user engagement, and efficient feedback mechanisms. To overcome these challenges, this paper:

1.Develops a DEA-driven feedback mechanism to improve overall performance and responsiveness.

2.Enhances user engagement through dynamic, interactive digital features that are tailored to user needs.

3.Advances digital fish stock management practices, ensuring optimized resource distribution, sustainability, and comprehensive ecosystem monitoring.

2 Literature Survey

The rapid growth of digital technology and artificial intelligence has accelerated the fish-sharing market, surpassing traditional trading methods [5-7]. This shift to online platforms introduces challenges for suppliers and users [New References], but it also drives market growth, enhances resource-sharing efficiency, and promotes fish resource sustainability.

Digital fish-sharing platforms enable seamless fish distribution across regions, marking a pivotal shift in resource management. The rising demand for shared fish resources necessitates integrated digital solutions that ensure accessibility, transparency, and sustainability.

These platforms democratize fish resource access, reduce operational costs, and foster sustainability. They align with the broader technological momentum in other markets, emphasizing sustainable fishing, waste reduction, and optimized distribution. The platforms also enhance user experiences and adoption rates, while recent studies [New References] emphasize the importance of collaboration among organizations, fishery authorities, and stakeholders to improve digital fish-sharing quality and sustainability [8].

Given the evolving nature of digital fish-sharing, its impact on resource management needs further exploration. The demand for effective resource-sharing tools highlights the need for software that facilitates fish exchanges, ensures compliance with sustainability guidelines, and meets market demands [9].

3 Module Design of The Zhida Sharing Platform

The 'Zhida Sharing Platform' is a significant advancement in digital resource-sharing software, designed to enhance collaboration in the fish-sharing sector. It offers an efficient ecosystem for resource distribution, featuring components like the Fish Exchange

Forum, eco-friendly transactions via the Fish Market module, and optimized information flow through Resource Sharing and User Registration. Its modular design ensures easy maintenance and integration, while Content Supervision and Interface Design provide a user-friendly, device-compatible interface, promoting sustainable access and increased participation. Recognized by users and experts for its adaptability, Zhida effectively meets current demands and anticipates future trends. Comparisons with FishNet and AquaConnect highlight Zhida's strengths in reshaping fish-sharing platforms.The following is the design framework diagram of Zhida service software,as shown in Table 1:

Table 1. Zhida analysis platform module form:

Module	**Description**
Fish forum	Facilitates discussions on Fish -related topics, with features for comments, likes, and post sharing.
Fish Second-Hand Market	A marketplace for selling second-hand items, offering browsing, specific searches, and direct seller contact.
Information Sharing	Supports distribution of educational materials and resources, using data categorization and tagging for easy access.
User Registration and Management	Allows account creation and personalization, including password modification and security features.
Information and Resource Integration	Focuses on combining information and resources, with search and filter tools for efficient retrieval.
Interactive Communication	Encourages messaging and content supervision for community interaction and safety.
Interface Design	Provides a user-friendly interface accessible on multiple platforms, tailored for students, educators, and campus community members.

Building on this robust architecture, Zhida integrates DEA-driven feedback with reinforcement learning to continuously optimize natural language processing tasks, including natural language understanding, text classification, and sentiment analysis (Table 2). The DEA mechanism evaluates and enhances input-output efficiency, leading to better resource allocation and information processing. Reinforcement learning refines strategies by adjusting parameters in information sharing and user registration, achieving superior accuracy and stability across tasks. This approach enables Zhida to outperform models like GPT-3, reaching 82.3% accuracy in natural language understanding compared to GPT-3's 78.3%, while also excelling in other tasks.

Table 2. Result and Comparison

Software / **Feature**	**Zhida Sharing Platform**	**BERT (Base)**	**GPT-3**
Natural Language Understanding (NLU) task	82.3%	80.8%	78.3%
AG News	96.3%	94.2%	95.4%
SST-2(Stanford Sentiment Treebank 2)	96.7%	93.5%	94.9%

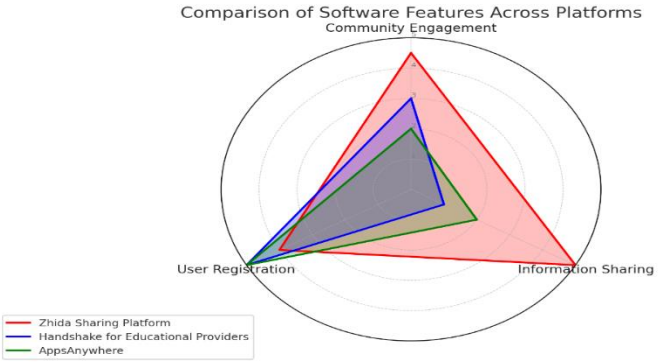

Fig. 1. Radar Chart: Comparing the strength of each feature (like community engagement, information sharing, user registration) among the three platforms.

Digital transformation in fish resource management relies on the performance of fish-sharing software to meet the needs of fishers, traders, and managers. This study uses radar charts to compare three leading platforms: Zhida Sharing Platform, Handshake for Educational Providers, and AppsAnywhere, focusing on areas like community engagement, information dissemination, and user registration (Figure 1).

Zhida excels in community engagement, with discussion forums that foster knowledge exchange and trade opportunities, reinforcing user connections. Its digital fish marketplace supports sustainability by promoting efficient resource distribution and eco-friendly commerce.

Unlike AppsAnywhere, which centers on professional networking, and Handshake for Educational Providers, which focuses on aquaculture management, Zhida offers a comprehensive integration of social interaction and fish resource exchange. Its strengths include:

Community Engagement: Strong user interaction through forums, uniting the fish-sharing community.

Sustainable Practices: Encourages responsible trading and resource use through its digital marketplace.

Personalization and Security: Provides customizable experiences with strict data protection.

Zhida's integrated approach blends social, economic, and environmental factors, continuously improving through user feedback. This study highlights the trend of combining specialized services with community engagement, emphasizing adaptability to evolving needs. As the sector advances, fish-sharing software will likely increase personalization, meeting the complex demands of a global user base.

3.1 Feedback Mechanism Model

The Zhida Sharing Platform uses Data Envelopment Analysis (DEA) to refine its feedback systems, aligning services with user inputs while maintaining high efficiency. DEA, a linear programming technique, evaluates the relative efficiency of decision-

making units (DMUs), ensuring rigorous performance assessment. This approach allows the platform to continuously assess and improve its services.

DEA is effective for analyzing DMU performance by comparing inputs and outputs [10]. It calculates relative efficiency scores through a non-parametric method, with popular models like CCR and BCC addressing different scales of returns. The CCR model assumes constant returns, while the BCC model accounts for variable returns. In this study, CCR DEA, input-output-oriented BCC, and additivity models are applied to evaluate cost-based inputs relative to output targets in supply chain efficiency. The input-oriented model identifies necessary input reductions to maintain outputs, while the output-oriented model seeks output improvements with constant inputs.

The output-oriented CCR DEA model is mathematically formulated as follows:

$$min\left(\frac{\sum_{i=1}^{m} v_i x_{ik}}{\sum_{r=1}^{q} u_i y_{rk}}\right) \tag{1}$$

$$\frac{\sum_{i=1}^{m} v_i x_{ik}}{\sum_{r=1}^{q} u_i y_{rk}} \geq 1,\ (j=1,...,n)\ U_r=1,....,q \geqq 0 \quad V_j=1,....,m \geqq 0 \tag{2}$$

In the analytical model, x_{ik} signifies the input vector of DM U_j, accompanied by V_j as its corresponding input weight vector. In parallel, y_{rk} constitutes the output vector of DM U_j, with u_r as the concomitant output weight vector. For visualization, the model is succinctly delineated in Figure 2.

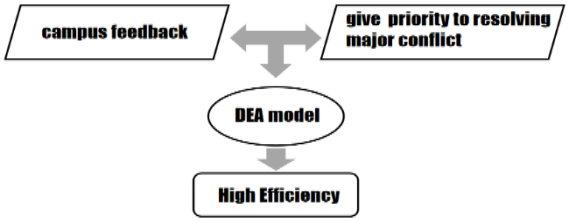

Fig. 2. Zhida Campus Service Software Feedback Mechanism

The following is the pseudocode flow chart of the feedback mechanism of Zhida campus service software:

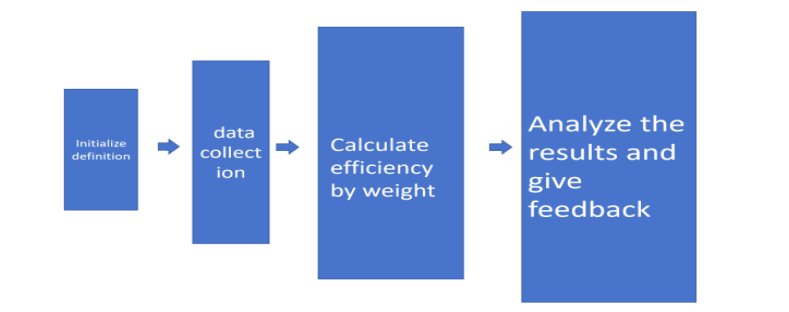

Fig. 3. DEA model feedback mechanism pseudo code flow chart

The pseudocode in Fig 3 illustrates the process used by the Zhida Sharing Platform to assess and improve service efficiency. It begins by initializing feedback variables and collecting data, followed by applying DEA to calculate efficiency based on specific weights, ensuring a data-driven performance evaluation. The results generate actionable feedback, driving the platform's continuous improvement.

The subsequent section explains how this feedback loop refines platform functionality. By processing user feedback and operational data iteratively, the Zhida Sharing Platform adapts to changes in the community, maintaining relevance and effectiveness.

The service feedback mechanism uses DEA to manage and assess feedback systematically. It initializes feedback variables, gathers community feedback, conducts preliminary efficiency analyses, and prioritizes conflicts before reapplying DEA for further refinement. This mechanism enhances service evaluation, personalization, delivery optimization, adaptability, and precision, supported by data visualization.

The Zhida Platform ensures unbiased service evaluation, boosts performance, improves resource distribution, supports data-based decisions, and encourages transparency. The DEA-driven feedback mechanism improves services, fostering a better community environment.

4 Conclusions

In conclusion, the Zhida Sharing Platform demonstrates outstanding performance in the competitive digital fish-sharing sector. Its significant contribution lies in enhancing user experience and promoting engagement within the fish-sharing community. The platform's integration of a user-centric interface, extensive discussion forums, advanced resource-sharing features, and a dynamic digital marketplace for fish trade sets a new standard in adaptive fish resource management. Furthermore, incorporating Data Envelopment Analysis (DEA) into its feedback system underscores the platform's commitment to operational excellence and its ability to offer tailored services to fishers and traders. This study highlights the pivotal role of the Zhida Sharing Platform in setting new benchmarks and driving innovation in digital fish resource management, aligning with modern sustainability trends. Future research should explore the long-term impact of such platforms on resource sustainability and the continued evolution of integrating user feedback for ongoing enhancement.

Acknowledgements

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