
Implementation and Utilization of Smart Fisherman Application in Riau Islands Province

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Abstrak

Aplikasi Nelayan Pintar adalah sebuah aplikasi yang dirancang untuk membantu nelayan dalam memperoleh informasi tentang kondisi laut, perolehan ikan, dan harga pasar ikan. Di Provinsi Kepulauan Riau, aplikasi ini mulai diperkenalkan untuk meningkatkan kesejahteraan nelayan di wilayah tersebut. Namun, pemanfaatan aplikasi ini masih dihadapkan dengan beberapa kendala dan hambatan, seperti keterbatasan akses internet, tingkat literasi digital yang masih rendah, dan adanya resistensi dari beberapa nelayan dalam menggunakan teknologi. Meski demikian, aplikasi Nelayan Pintar dianggap memiliki potensi besar untuk meningkatkan pendapatan nelayan dan membantu dalam pengelolaan sumber daya laut yang lebih berkelanjutan. Oleh karena itu, perlu dilakukan penelitian untuk melihat implementasi dan pemanfaatan aplikasi ini di Provinsi Kepulauan Riau. Pada penelitian ini menggunakan metode penelitian kualitatif, dengan menggunakan teknik wawancara mendalam dan observasi langsung di lapangan.

Kata kunci: Implementasi, Aplikasi Nelayan Pintar, Kebijakan Public, Provinsi Kepulauan Riau

Abstract

The Smart Fisherman Application is an application designed to help fishermen obtain information about sea conditions, fish harvests and fish market prices. In the Riau Islands Province, this application is being introduced to improve the welfare of fishermen in the region. However, the use of this application is still faced with several obstacles and obstacles, such as limited internet access, low levels of digital literacy, and resistance from some fishermen in using the technology. However, the Nelayan Pintar application is considered to have great potential to increase fishermen's income and help in more sustainable management of marine resources. Therefore, research needs to be carried out to see the implementation and use of this application in the Riau Islands Province. This research uses qualitative research methods, using in-depth interview techniques and direct observation in the field.

Keywords: Implementation, Smart Fishing Application, Public Policy, Riau Island Province.

INTRODUCTION

According to the Indonesian Ministry of Maritime Affairs and Fisheries (2020), the fisheries sector is one of the important sectors in the Indonesian economy. The National Long-Term Development Plan 2005–2025 has strengthened one of the missions aimed by the Ministry of Marine Affairs and Fisheries (MMAF) is to realize Indonesia as an archipelagic country that is Independent, Advanced, Strong, and Based on National Interests.(CTF, 2022). Fisheries are still considered as one of the economic sectors that contribute to a nation (Adam et al., 2013).

However, fishermen in Indonesia often experience obstacles in optimizing their catches due to lack of access to information related to weather, fish location, and market prices. To solve this problem, several innovations have been developed, one of which is the smart fisherman application. This application allows fishermen to obtain the necessary information in real-time and makes it easier for them to make informed decisions. Some examples of smart fisherman applications that have been developed in Indonesia include *eFishery*, *Fishermen App*, and *SmartFish*. These apps come with features such as weather predictions, current fish locations, and fish market price information. It is hoped that the smart fisherman application can help improve the welfare of fishermen in Indonesia and support the sustainable growth of the fisheries sector.



Figure 1. Smart Fisherman App Infographic

Source: Kemenkominfo dan KKP, 2018

In addition to providing easier and faster access to information, smart fisherman applications also have the potential to increase efficiency and safety in fishing activities. Some applications are equipped with GPS technology and sensors that can help fishermen in knowing the position and conditions of the surrounding environment, so as to reduce the risk of accidents at sea. Then, some applications can also speed up the fish marketing process by making it easier for fishermen to find the right buyer and provide accurate price information. The use of smart fishermen applications, it is hoped that fishermen can help in increasing competitiveness and obtaining profits towards better in running their fishery business.

The problems faced by the fishing community today are mainly related to economic decline, and the economic decline of the fishing community is unfortunately not only a serious problem that needs to be watched out for (Tanjung, 2016). Furthermore, what about the implementation of this smart fisherman application? Of course, it will also face some challenges that are quite crucial. Key challenges include lack of access to adequate technology and infrastructure in remote areas and coastal areas. In addition, there are still many fishermen who do not understand the use of the application, so it is necessary to do socialization and training so that fishermen can use it optimally. Success in managing fishery resources can be seen from three main interrelated aspects, namely economic, environmental, and social (Adam et al., 2013). Then, supporting policies or regulations are also needed so that the smart fisherman application can run well and provide optimal benefits for fishermen.

Although still faced with various challenges, smart fishermen applications offer great potential in improving fishermen's welfare and the sustainability of the fisheries sector in Indonesia. In fact, sustainable fisheries management policies need the support of accurate fishing data (Nugroho, H, Sufyan, A, N. Wiadnyana, 2017). Therefore, there are many members of the Indonesian fishing community who are unable to fully utilize Indonesia's coastal potential. Surely, some kind of policy is needed that allows them to access the coast and increase the level of education, technology, cultural awareness, and other resources to maximize the benefits of the coast and coast. (Rumarey Wattimena et al., 2022). Support from various parties, including the government, private sector, and community, is needed to continue to optimize, develop and expand smart fisherman applications throughout Indonesia. One of them is Riau Islands Province. It is hoped that the fisheries sector in Indonesia can further develop and provide benefits for the entire community.

Riau Islands Province has an important fisheries sector in the region's economy (BPS Kepri, 2023). However, fishermen in this area often experience obstacles in optimizing their catches due to the lack of access to information related to weather, fish locations, and market

prices. Climate factors and weather changes can greatly determine the distribution and presence of fish, which can further determine the number of fish caught or fishermen's income (Gustika et al., 2023). In connection with the above, KKP has a commitment to the welfare of the Indonesian people. Through the Marine and Fisheries Research and Human Resources Agency, innovations in research and fisheries results are presented that greatly help the fish processing process. This technology is known as the Smart Fisherman Information System or Nelpin (Finaka, 2018). This application allows fishermen to obtain the necessary information in real-time and makes it easier for them to make informed decisions.

The implementation of the smart fisherman application in Riau Islands Province is expected to help improve the welfare of fishermen and the sustainable growth of the fisheries sector. This application is equipped with various features, such as weather information, fish location maps, and fish price information in nearby markets. The app also comes with social features that allow fishermen to communicate and share information with fellow fishermen. With this application, it is hoped that fishermen can get accurate and *up-to-date* information, so as to optimize their catch and increase their income. By using this application, users can obtain various information such as the location of plankton appearance, wind direction and speed, wave height, general weather, and directions home (Kominfo, 2015).

When viewed on empirical conditions in the Riau Islands, the implementation of smart fishermen applications also faces several challenges, such as lack of internet access and limited infrastructure in remote areas. In addition, there are still some fishermen who do not understand about the use of the application. Therefore, intensive socialization and training are needed to ensure that fishermen can make optimal use of this application. With support from various parties, it is hoped that the implementation of the smart fisherman application can provide optimal benefits for fishermen in Riau Islands Province and support the sustainable growth of the fisheries sector. Therefore, this article will discuss how to implement and utilize the Smart Fisherman Application in Riau Islands Province.

METHODS

In this study, the research method used to see the implementation and utilization of smart fishermen applications in Riau Islands Province is a qualitative research method. This method is suitable for extracting information related to fishermen's experiences, perceptions, and views in using smart fisherman applications. Qualitative methods also allow researchers to understand the social, cultural, and economic context in the archipelago which is an important factor in the utilization of this application (Sugiyono, 2013). Data collection was carried out

using in-depth interview techniques with fishermen who have used the smart fisherman application, as well as direct observation in the field to see how this application is used in fishermen's daily lives. In addition, document analysis can also be carried out, such as data on fish sales transactions carried out through smart fisherman applications.

The research informants were selected using *purposive sampling* techniques (Sugiyono, 2018), namely selecting fishermen who have used the smart fisherman application and are in the archipelago area representing various geographical and social conditions in Riau Islands Province. The collected data can then be analyzed using content analysis techniques to understand the themes that emerge from interviews and observations. In this study, it also considers ethical factors in the study, such as obtaining *informed consent* from participants, maintaining the confidentiality of information, and ensuring there is no risk of harm to participants. Thus, this research can contribute to a deeper understanding of the implementation and utilization of smart fishermen applications in Riau Islands Province.

RESULTS AND DISCUSSION

The implementation and utilization of smart fisherman applications is an interesting innovation in advancing the fisheries sector in Indonesia. In the implementation of this application, there are several concepts that need to be considered. One concept that needs to be considered is the ability of technology to accommodate the needs and capabilities of fishermen. It is important to develop a smart fisherman application that is *user-friendly* and easy for fishermen to use. This is because the nelpin application has an impact on the production process of local fishermen (Wiryati et al., 2021). This application also needs to be designed with due regard to the technological infrastructure available in fishing areas. This is to ensure that fishermen can access this application easily and do not experience technical obstacles.

The implementation and utilization of smart fisherman applications also need to pay attention to social and economic aspects. This application can help improve the welfare of fishermen by facilitating access to information about sea conditions, fish locations, and actual and latest fish prices (Wati & Primyastanto, 2018). However, it should also be noted that the use of this application should not ignore environmental aspects and sustainability of fishery resources. Therefore, there needs to be good coordination and collaboration between fishermen, government, and application developers to ensure that smart fishermen applications can be implemented and utilized effectively and efficiently.

This can be done through socialization and training to fishermen on how to use this application, as well as cooperation between the government and application developers in maintaining the

sustainability of fisheries and marine resources. This is because the Smart Fisherman application (Nelpin) is very useful to help fishermen in fishing activities and easy to operate (Susilowati et al., 2020). The implementation and utilization of smart fishermen applications have concepts that need attention, including technological capabilities, social and economic aspects, as well as coordination and collaboration between stakeholders. Government support and good cooperation between stakeholders can ensure that smart fishermen applications can provide significant benefits to the fisheries sector and fishermen (Cahyandi & Sucahyowati, 2022).

The smart fisherman application is an innovative solution that can help improve the welfare of fishermen in Indonesia. However, in implementing this application, it is necessary to consider several important factors. The successful implementation of smart fishermen applications depends heavily on supportive public policies, adequate human resources, and sufficient government budgets (Kertati et al., 2023). In addition, there are several obstacles that can hinder the use of smart fisherman applications in Indonesia, especially in Riau Islands Province. According to existing research, these obstacles include lack of knowledge and skills in the use of technology, limited access to internet networks, and lack of support from local governments (Poti, 2016). In overcoming these obstacles, efforts need to be made to improve the knowledge and skills of fishermen in the use of technology. Then, the government also needs to pay attention to policy aspects that can facilitate the use of smart fisherman applications. This is in line with research conducted by Pratama & Darmawan (2023), which emphasizes the importance of public policies that support and can accelerate or transform technology adoption (Pratama & Darmawan, 2023).

In addition to those mentioned earlier, there are several other references that can support conceptual discussions about the implementation and utilization of smart fisherman applications. Smart fishermen applications can also help in risk management and food security in coastal areas (Harumy & Amrul, 2018). In this case, the application can help fishermen to access information about weather and waves, so as to reduce the risk of accidents and economic losses caused by natural disasters. In addition, smart fisherman applications can also help in the development of a more efficient and integrated fish market. The use of smart fishermen applications can help increase efficiency and transparency in the fish supply chain, so that it can help increase the selling price of fish and the welfare of fishermen (Hapsari & Fuad, 2017). The fisheries supply chain is an effective measure of whether or not the downstream fisheries process is effective (Darmawan et al., 2021).

However, keep in mind that the implementation of smart fisherman applications also needs to pay attention to aspects of data privacy and security. The use of smart fishermen applications must be regulated with clear rules and pay attention to the privacy rights of fishermen, so that there is no misuse of data by irresponsible parties (Rahmawati et al., 2023). In this condition, it should also be noted that the implementation of smart fishermen applications needs to consider the social and cultural context of the fishing community. The use of technology in the fisheries sector must pay attention to local aspects, so that smart fishermen applications can be well adapted by fishing communities (Ramadian & Muthmainnah, 2023). Thus, the implementation and utilization of smart fisherman applications must consider various aspects, ranging from technological capabilities to social, cultural, and data security aspects. This can be done through good collaboration between stakeholders and paying attention to the experiences and input from fishermen as the main users of the smart fisherman application.

Implementation of Smart Fisherman Application in Riau Islands Province

The implementation of smart fishermen applications in Riau Islands Province can provide many benefits for fishermen and the fisheries sector as a whole. With this application, fishermen can get accurate and fast information about sea conditions, fish locations, and weather forecasts. This can help fishermen in carrying out fishing activities more effectively and efficiently. In addition, smart fisherman applications can also help fishermen in obtaining better prices for their catch. Through this application, fishermen can get information about actual and latest fish prices. That way, fishermen can determine when is the right time to sell their catch at a more favorable price.

On the other hand, the implementation of smart fishermen applications can also help in maintaining the sustainability of fisheries and marine resources in Riau Islands Province. This application can help fishermen in knowing the locations that should be avoided for fishing to avoid excessive damage to the marine environment. In addition, this application can also help fishermen in knowing the minimum size of fish that can be caught so that fish populations are maintained and sustainable. Thus, the implementation of smart fishermen applications in Riau Islands Province can have a positive impact on fishermen and the fisheries sector as a whole. In addition, policy support from the Riau Islands Provincial government in developing smart fishermen applications shows their commitment to improving fishermen's welfare and encouraging sustainable fisheries sector growth.

The Riau Islands Provincial Government has not issued a policy that supports the implementation of smart fishermen applications to improve fishermen's welfare and the growth of the fisheries sector. The Riau Islands Provincial Government should emphasize the importance of developing fisheries and marine information systems as an effort to increase productivity, quality, and competitiveness of the fisheries sector. One concrete form of fisheries and marine information system development is through the implementation of smart fishermen applications.

In addition, the Riau Islands Provincial Government should also collaborate with various parties, such as the Fishermen Association, to support the implementation of smart fishermen applications. This collaboration will certainly show the seriousness of the Riau Islands Provincial Government in strengthening the fisheries sector and supporting the welfare of fishermen in the area (Kurnianingsih et al., 2022). In the long run, the implementation of the smart fisherman application in Riau Islands Province should also be in line with the efforts of the Government of Indonesia in realizing a sustainable *Blue Economy*. *Blue Economy* is a concept of sustainable management of marine and coastal resources, where the fisheries and marine sectors can contribute positively to economic development and community welfare (Akbar et al., 2022). Therefore, the implementation of the smart fisherman application in Riau Islands Province can be one of the concrete efforts in realizing the *Blue Economy* in Indonesia.

Based on the latest report, Riau Islands Province has experienced rapid progress in the use of information technology with the existence of *Kepri Smart Province* (Darmawan, 2018), which is an integrated digital information management. Of course, if this is carried out with one fisheries data in the use of smart fisherman applications, it will certainly have a positive impact on the development of community literacy on marine conditions in the Riau Islands.

The smart fisherman application is one solution to help increase the productivity and efficiency of fishermen's work in the Riau Islands region. One example of the implementation of smart fishermen applications in Riau Islands Province is through the improvement of technology infrastructure on the islands carried out by the Governor of Riau Islands Province in coordination with the Ministry of Communication and Information of the Republic of Indonesia for *Kepri Merdeka Signal* (Kepri Provincial Government, 2021). This program will certainly help integrate smart fishermen applications with geographic information systems (GIS) and fisheries management information systems (FIMS) to monitor fishing activities and map catch areas because all are connected by the internet which has the potential to support fishermen in producing more and quality fish.

In order to support the development of smart fishermen applications in Riau Islands Province, the government has also launched training and mentoring programs for fishermen but has not been specific to aspects of information technology utilization. In fact, one of the implications of marine and fisheries policy is the aspect of human resource development on technological knowledge (Nurjannah & Mokodompit, 2023). This certainly aims to help fishermen understand and operate smart fisherman applications effectively and utilize other information technology to support fishing activities. It can be concluded that Riau Islands Province has taken significant steps in the development of the fisheries sector, especially for fishermen, but has not been optimal in utilizing information technology to increase the productivity and efficiency of fishermen's work through smart fisherman applications.

Constraints and Obstacles to the Utilization of Smart Fisherman Applications in Riau Islands Province

Although the use of smart fishermen applications in Riau Islands Province will provide positive results, there are still several obstacles and obstacles that need to be overcome in its implementation. One of the obstacles faced is the limited access to adequate internet in some coastal areas and islands in the province. This can hinder fishermen's access to smart fisherman applications that require a stable internet connection.

In addition, the lack of understanding and skills of information technology in some fishermen is also an obstacle in the use of smart fisherman applications. Some fishermen still find it difficult to operate the application and take advantage of the features provided. This requires intensive mentoring and training for fishermen to improve their understanding and skills in utilizing smart fisherman applications. Then, another obstacle faced in the use of smart fishermen applications in Riau Islands Province is the lack of support and attention from local governments to the programs that have been launched.

Looking at some cases, these programs do not run optimally due to the lack of support and attention from local governments in terms of budgeting and managing these programs. It can be concluded that the use of smart fishermen applications in Riau Islands Province still faces several obstacles and obstacles, such as limited internet access, lack of understanding and information technology skills in some fishermen, and lack of support and attention from local governments. Therefore, further efforts are needed to overcome these obstacles and obstacles so that smart fishermen applications can be utilized optimally in increasing the productivity and efficiency of fishermen's work in the region.

Then, the human resources (HR) of fishermen in Riau Islands Province is one of the important factors that play a role in the successful use of smart fisherman applications. However, there are still obstacles in the management and development of fishermen's human resources in the region. This can be seen from the low participation rate of fishermen in training and skill development programs organized by local governments so that the productivity of fishery products will also have an impact (Center for Data, Statistics and Information, 2022).

Furthermore, there are still a number of fishermen who have difficulty in meeting their basic needs, such as food, housing, and health. This can hinder the ability of fishermen to utilize information technology, including smart fisherman applications, in increasing their productivity and work efficiency, especially in predicting mileage and so on (Rahmasari, 2017).

Therefore, further efforts are needed in the development of fishermen's human resources in Riau Islands Province, including increasing fishermen's participation in training and skill development programs, as well as improving fishermen's overall welfare. This is expected to improve the ability of fishermen to utilize information technology, including smart fisherman applications, in increasing their work efficiency and productivity.

Furthermore, in facing the obstacles and obstacles faced by fishermen in the use of smart fishermen applications, synergy between local governments and all relevant *stakeholders* is needed. Local governments can certainly take strategic steps in improving the quality of fishermen's human resources, by expanding access to relevant training and skill development programs, and providing support in terms of meeting the basic needs of fishermen, such as food, housing, and health. In addition, efforts are also needed to strengthen cooperation between fishermen and local technology companies or *start-ups*, in order to support the development of better smart fishermen applications and meet the needs and expectations of fishermen. Increased participation of fishermen in the development of these applications can increase their understanding of information technology and technological skills, which in turn can increase their productivity and work efficiency.

On the other hand, the community also needs to be involved in the development of smart fishermen applications. Through community empowerment in order to encourage their participation in application development, there can be synergy between the community and the government in responding to the challenges faced by fishermen. This community empowerment can be done through training and mentoring programs, as well as providing easy access to the necessary information technology (Ginting, 2018). This also applies equally especially to utilizing smart fisherman applications. Overall, the development of smart

fishermen applications in Riau Islands Province is a very important effort in improving the welfare of fishermen, but still faced with a number of obstacles and obstacles.

Therefore, integrated strategic efforts are needed, involving various parties, ranging from local governments, fishermen, technology companies, to the general public, in order to increase the effectiveness and impact of smart fishermen applications. Based on sources collected from several fishermen who have been interviewed, not all fishermen in Riau Islands Province use smart fisherman applications. There are still a number of obstacles and obstacles faced by fishermen in utilizing the application, such as limited access to information technology and limited understanding of technology. There needs to be more active efforts in increasing fishermen's participation in the use of smart fishermen applications, through training programs and providing easier and more affordable access to information technology.

Then, the budget that should be allocated to fishermen is still limited and not optimal (Malik & Saribulan, 2018). There needs to be a more active effort from the government in increasing budget allocations for the development of smart fishermen applications and overall empowerment of fishermen. This needs to be done considering the important role of fishermen in managing marine resources and improving the welfare of communities in coastal areas and small islands.

CONCLUSION

In the discussion that has been carried out, it can be concluded that the smart fisherman application has great potential in improving the welfare of fishermen in Riau Islands Province. This application makes it easy for fishermen to obtain information related to sea conditions, weather, fish locations, and fish prices. In addition, this application can also help in more sustainable management of marine resources. However, there are several obstacles and obstacles that need to be overcome in the utilization of smart fishermen applications, such as limited telecommunication infrastructure and internet access in the archipelago, lack of understanding of fishermen about information technology, and lack of support from the government in application development and overall fishermen empowerment.

Therefore, there needs to be more active support and commitment from the government in developing smart fishermen applications, improving telecommunications infrastructure and internet access in the archipelago, as well as increasing fishermen's understanding and skills in the use of information technology. Not to forget, the government's commitment in supporting budget allocations also plays an important role. Thus, the smart fisherman application can be utilized optimally to improve the welfare of fishermen and more sustainable management of

marine resources, especially in Riau Islands Province as a province that has fairly good marine resources.

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