

Navigating Inclusive Waters: Blockchain-Based Insurance Services for Indonesian Fisherfolk through Multi-Stakeholder Approach

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Abstract

Fishermen often encounter occupational hazards and equipment damage in their pursuit of a marine bounty. To address these risks, the Ministry of Marine Affairs and Fisheries (KKP) collaborated with Jaminan Asuransi Indonesia (Jasindo) to provide Fishermen Insurance Premium Assistance (BPAN). However, the unequal distribution of insurance and fishermen's limited understanding of risk protection have hindered the widespread enrollment in BPAN. Thus, an inclusive program is needed to increase the number of registered fishermen to insurance and manifest an effective insurance service process. This qualitative descriptive study seeks to grasp the phenomenon of inadequate insurance distribution among fishermen in Indonesia. Data is gathered through documentary and literature reviews. The proposed solution is Netfisher, an inclusive blockchain-based insurance service program tailored for fishermen. Blockchain technology can integrate large volumes of data and decentralize it, minimizing the likelihood of fraud occurrences. Under this program, KKP will collaborate with Jasindo to expand insurance coverage, utilize Microsoft Azure for blockchain adoption, and collaborate with relevant stakeholders to deter fraud. Premium payments and claims distribution will be facilitated through mobile banking. As a result, the distribution of fishermen's insurance will be more equitable, safeguarding fishermen's economic well-being and expediting progress towards Sustainable Development Goals 8.

Keywords: Netfisher, fishermen insurance, blockchain, sustainable development goals.

1. Introduction

According to Indonesian Data records, as of December 2022, the number of Indonesian fishermen reached 1.27 million people. This number makes fishermen one of the important actors in managing Indonesia's marine bounty. However, in their efforts to search for marine products, fishermen often face various threats, such as work accidents due to bad weather and damage to fishing facilities due to hitting marine objects.

In the first semester of 2021, 42 incidents of fishing boat accidents resulted in missing, injured, and dead victims (Destructive Fishing Watch Indonesia, 2021). The National Search and Rescue Agency (Basarnas) stated that these accidents typically occur because of bad sea weather, damage to sea transportation, and ship fires. In 2023, Basarnas Bangka Belitung handled eight ship accidents in which most victims did not wear adequate safety equipment (RRI, 2023). Meanwhile, accidents also continued to occur in the first quarter of 2024. There were two deaths and 21 missing victims in South Sulawesi (KOMPAS, 2024). Maritime accidents have also

resulted in four fishermen going missing and two dying in Tongyeong Waters, 10 fishermen missing in the Indian Ocean, and two people missing in Glagah Waters (Detik, 2024).

To protect fishermen from work risks, the Ministry of Maritime Affairs and Fisheries (KKP), together with the Indonesian Insurance Guarantee (Jasindo), issued Fisherman Insurance Premium Assistance (BPAN) in 2016. This assistance aims to protect fishermen from risks that may be experienced in the future, raise awareness of the importance of insurance, aid the offspring, and transfer risks that should be borne by fishermen to the insurance company. The insurance quota is provided for 1 million people.

However, most fishermen still do not receive this assistance and work independently without personal protection. Data from the Central Statistics Agency (BPS) as of the end of 2022 shows that the number of fishermen protected by insurance has only reached 308,000 people (Databoks, 2024). It was caused by various factors such as uneven insurance socialization, which is only implemented in large ports, and the lack of awareness of insurance among fishermen. Based on Destructive Fishing Watch Indonesia's observations in Pati Regency in 2021, many fishermen do not understand the benefits and procedures of insurance. Several other districts experienced similar things. The Pasuruan Regency Government has 1,400 fishermen insurance quotas for the area, but the number of registered fishermen was only 100 (pasuruankab.go.id, 2022). Based on Cilacap Regency Public Relations records (2024), there are only two districts in Central Java that distribute fishermen's insurance, namely Cilacap and Pati. Besides, out of a total of 15,000 fishermen in Bintan Regency, 7,000 were enrolled in insurance as of October 2023 (Kepri Daily, 2023). The Tegal Regency Fisheries Service report stated that of the 10,000 BPAN quotas in Central Java, only 268 had been verified as of March 2024.

Therefore, the idea of Netfisher, an inclusive blockchain-based fishermen's insurance service program, was recommended. This program is a solution to expand insurance coverage for all fishermen in Indonesia and make the insurance transaction process faster, more accurate, and fraud-free. In addition, this program aims to empower young and technology-savvy workers to operate blockchain. This program is in line with Sustainable Development Goals (SDG) point 8, which is decent work and economic growth.

2. Literature Review

2.1 Fisherman's insurance

Fisherman's insurance is insurance specifically intended for people who work as fishermen. This program was launched by the KKP together with Jasindo by issuing a program called BPAN in 2016. This program aims to protect the safety and improve the quality of life of fishermen as regulated in the Law of the Republic of Indonesia Number 7 of 2016 on the Protection and Empowerment of Fishermen. Another aim of this program is to provide guarantees for fishermen to protect themselves from accidents and death due to work activities or other activities so that they can work safely. Apart from that, this program is also useful for increasing fishermen's awareness of the importance of having insurance.

KKP has special requirements that every fisherman must fulfill before registering for insurance, namely having a fisherman's card, having a savings account, being a maximum of 65 years old, not using prohibited fishing equipment, having a boat with a maximum size of 10 Gross Tonnage (GT), and being ready to comply with established insurance policies (KKP, 2017). Once all the requirements are met, fishermen can register at the Fisheries Service office, fisheries extension office, or via the Jasindo Health application. Every month, fishermen must pay a premium according to the program they take, with a price range of IDR 75,000 to IDR 175,000. KKP has also classified the value of benefits that can be taken with the following calculations:

Accident insurance claims due to fishing activities:

- Death: IDR 200,000,000
- Disability: IDR 100,000,000
- Medical costs: IDR 20,000,000

Accident insurance claims due to activities other than fishing:

- Death: IDR 160,000,000
- Disability: IDR 100,000,000
- Medical costs: IDR 20,000,000

If an undesirable accident occurs, the fisherman or the insurer's family must fulfill the requirements to withdraw their insurance by reporting the incident no later than 30 days and providing general or special documents as evidence. After that, the insurance company will verify the data and disburse the money no later than seven days, which will be transferred to the insurer's account (Nazula, 2018).

2.2 Sustainable Development Goals 8

Sustainable Development Goals (SDG) 2030 is a sustainable development agenda created by the United Nations (UN), the Economic and Social Council (ECOSOC), and 193 UN member countries in 2015. The SDG are expected to foster peace and prosperity for all people in the world. They have 17 goals, 169 targets, and four pillars of sustainable development that all UN member countries must implement before 2030.

One of the important SDG lies in point 8, namely decent work and economic growth. Point 8 of the SDG is included in the pillars of economic development which aim to increase inclusive and sustainable economic growth, increase employment opportunities for people of productive age throughout the country, and provide all people with decent work as regulated in statutory regulations. With the realization of SDG 8, it is hoped that all citizens can have decent work, have job protection, and experience economic growth.

The Indonesian government itself has committed to realizing SDG 8 by creating decent jobs for the community and ensuring that employment issues meet SDG 8 standards. The Indonesian government plans to integrate SDG into the Medium-Term Development Plan (RPJM) with the

National Development Planning Agency (Bappenas) as the coordinating body for cross-sector SDG implementation.

2.3 Blockchain

First created by Satoshi Nakamoto in 2008, blockchain is a digital ledger consisting of blocks containing transaction data and linked to each other to form a chain. Each block can store thousands of transaction data. All transactions are recorded reliably without any third-party authorization so that each user can verify the information together (Madisetti et al., 2016). In other words, blockchain uses a peer-to-peer network, namely a distributed network that can exchange data directly between two or more computers (peers) without the need for any intermediary (Schollmeier, 2001).

A decentralized data system like this has various advantages, including increasing the frequency of data reconciliation, verifying data accurately, tracking accounting transactions, and reducing the risk of corruption. Meanwhile, Rochmatullah (2022) stated that the goal of blockchain technology is to minimize costs associated with transactions while providing a safe environment for transactions. Blockchain is usually used for various purposes, such as money transfers, digital asset exchange, and data archiving. The use of blockchain is one form of technology utilization in the industrial era 5.0, where the development of production systems is required to be more efficient and accurate.

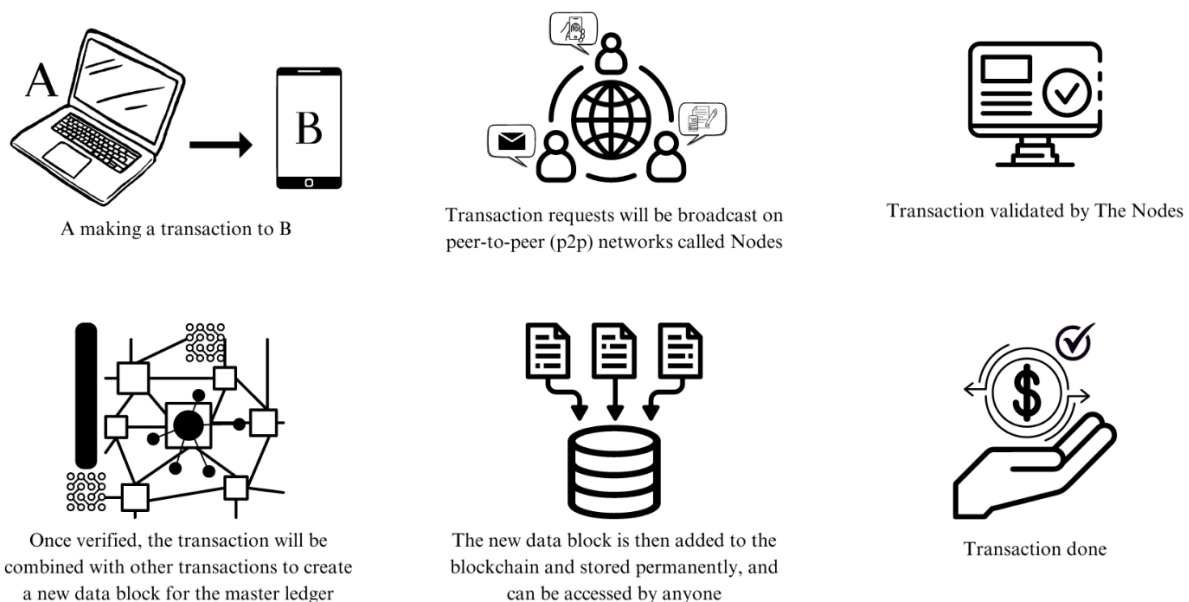


Figure 1. Blockchain Working Mechanism. (references: author)

The image above shows how blockchain works, starting with a transaction request by one of the parties. The transaction will form a new block identified by a hash code. Then, the block is sent to the nodes or networks belonging to all parties who have been given authorization according to mutual consensus. After all parties verify the transaction, the block will be entered

into the ledger on the blockchain. If one party does not approve or validate, the transaction will be canceled and not recorded in the ledger.

2.4 Economic Empowerment Theory

Amartya Sen coined the theory of economic empowerment in 1980. Empowerment means activities that require a change in the condition of an individual or group of people towards a better condition. In substance, empowerment aims to make groups of people who are less capable or powerless become empowered. Economic empowerment itself is an effort to help society's economic condition. Economic empowerment requires support from various parties along with adequate policies, including the fishermen's insurance program.

2.5 Financial Inclusion Theory

Muhammad Yunus coined the theory of financial inclusion in 1970. This theory highlights the importance of developing society's economic capacity. This theory also created a foundation for society's economic independence, which can ultimately improve living standards and reduce economic inequality. This financial inclusion theory has been a pioneer in changing the paradigm regarding the role of finance in fighting poverty and has provided the basis for various financial inclusion initiatives throughout the world.

2.6 State of The Art

Previous research aims to analyze the implementation of fishermen's insurance distribution in Indonesia and understand how blockchain works. These studies enrich the discussion of this paper and differentiate it from current research. Several journals were used as references in compiling this paper.

The first research is "Implementation of the Fishermen's Insurance Premium Assistance Program (BPAN) in the Puger Coastal Community, Jember Regency", which was prepared by Permatasari et al. in 2020. The results of the research show that there are several problems in implementing BPAN, namely that almost 80% of fishermen in Puger still do not record in BPAN, there is a lack of outreach to fishermen and lack of service personnel. The factors that influence this phenomenon are the level of socialization of fishermen, availability of resources, bureaucratic structure, and implementor commitment.

The second research, titled "Potential Use of Blockchain in Intellectual Property Rights Management in Indonesia: Opportunities and Challenges," conducted by Ida A. V. Girindra in 2023, aimed to explore the opportunities and challenges of blockchain technology when applied to intellectual property rights management in Indonesia, particularly in the insurance sector. The findings indicate that integrating blockchain into insurance services streamlines and simplifies transaction processes. Additionally, blockchain enhances security for insurance companies and policyholders. The entire insurance claims process operates automatically, without the need for additional documentation and manual intervention.

The research currently being prepared aims to develop a blockchain-based fishermen's insurance distribution scheme in Indonesia. This scheme needs to be carefully designed so that

the implementation of fishermen's insurance distribution takes place in an accountable, effective, and fraud-free manner.

3. Research Method

This study adopts a qualitative descriptive approach, a method aimed at providing in-depth and comprehensive descriptions of specific phenomena (Sukmadinata, 2006). This approach was chosen to explore aspects that are challenging to quantify, such as behaviors, experiences, perceptions, and social interactions. Furthermore, qualitative methodology, as noted by Bogdan and Biklen (1992), facilitates the collection of data through verbal or written means.

The data collection process includes gathering information on BPAN distribution, the underlying reasons for challenges in distributing insurance to fishermen, and an understanding of blockchain technology. Having access to BPAN distribution data will enable the researcher to gauge the extent of insurance distribution among fishermen in Indonesia and identify the obstacles that need to be addressed. By pinpointing these obstacles, the researcher can devise suitable programs to overcome them. Additionally, insights into blockchain technology will aid in the systematic formulation of programs. These data will serve as integral components in the development of the Netfisher program.

The data were obtained through two techniques: documentation study and literature review. Documentation study method involves collecting data from documents created by the research subjects or others in the form of written texts, images, diaries, policies, and monumental works (Herdiansyah, 2010). It was used to gather information related to the policy of distributing insurance to fishermen through the annual reports of the KKP, infographics outlining the stages of BPAN via the KKP website, and the mechanics of blockchain technology through the GIC Indonesia website.

Data collection through a literature review involves searching, collecting, and analyzing information found in written sources such as books, journals, articles, reports, and other documents. Literature is regarded as a reference source used to extract specific information (Suwandi, 2017). This data collection technique will gather several scientific articles from previous researchers related to the implementation of the BPAN program in various districts, as well as explanations of blockchain technology.

The analysis technique utilized is functional analysis. Functional analysis entails the process of analyzing the social function or meaning of a phenomenon within a specific social context (Kleinn, 2016). Once all the data is collected, an assessment is conducted to compare the target distribution of BPAN by the KKP with its actual implementation. Additionally, an examination of the blockchain technology operation is undertaken to adopt it as a potential research concept.

4. Finding and Discussion

4.1 Netfisher Program

The Netfisher program offers an inclusive and integrated solution to address the uneven distribution of insurance among Indonesian fishermen. By adopting blockchain technology that

connects all stakeholders, this program can expand insurance distribution and facilitate swift, accurate, and fraud-free processes. The primary focus of this program is on fishermen as human resources who need protection for their livelihoods and economic conditions. Public outreach and education about the importance of insurance need to be intensified to reach the target of 150,000 BPAN customers among fishermen. KKP agents and Jasindo, as the first parties directly involved with fishermen, will provide education and information regarding the types of insurance available. Education will be conducted both offline and online to widen the insurance coverage.

All fishermen's data and transactions will be recorded in the blockchain system from Microsoft Azure to expedite transactions, reduce fraud occurrences, and securely store data that unauthorized parties cannot alter. The use of blockchain technology in insurance business processes has been implemented by IncubEx Incorporation in the United Kingdom. IncubEx launched Insurwave, which utilizes blockchain systems in its insurance processes, and it has been proven to reduce operational costs by 25% and increase company revenue by £5 million (Insurwave, 2020). Considering Insurwave's success in adopting blockchain in its business processes, it is hoped that the Netfisher program will also enhance insurance distribution among fishermen in Indonesia and streamline the transaction processes.

As outlined in the terms and conditions of BPAN, fishermen can claim insurance through the Netfisher program in situations posing risks to them. This ensures that their families' economic conditions remain stable and that they can continue their livelihood activities. This also aligns with the implementation of SDG 8, where fishermen are assisted in obtaining decent work and improving their economic conditions.

4.2 Actors of Netfisher Program

In the Netsfisher program, there are several actors as illustrated in Figure 1.

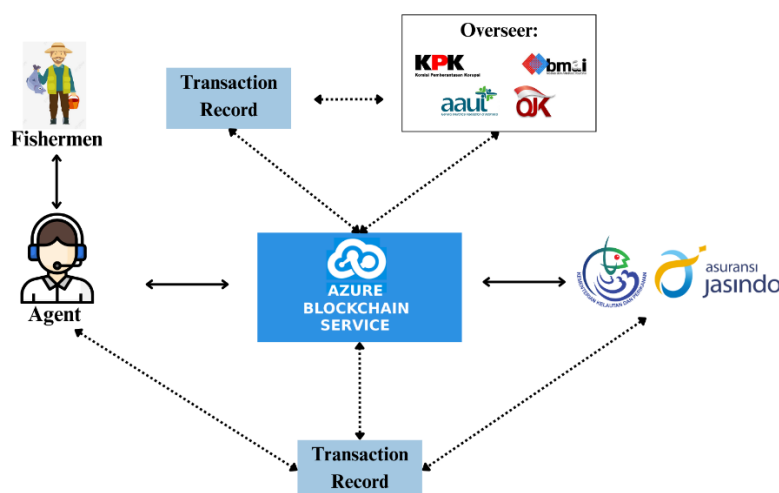


Figure 2. Actors of Netfisher Program. (references: author)

1. Traditional fishermen are individuals who engage in harvesting marine resources. Typically, they use simple equipment such as canoes and nets to seek resources in water bodies. Given the high-risk nature of their occupation, these individuals deserve education regarding the importance of risk protection and insurance.
2. KKP is the Indonesian government body responsible for marine and fisheries affairs. In 2016, KKP partnered with Jasindo as the initiator of BPAN. As the entity with the authority to utilize state budget funds, KKP also provides technical guidance regarding BPAN to Jasindo for implementation in its branch offices.
3. Jasindo, as an insurance provider, has entered into a contractual agreement with KKP. Jasindo is tasked with providing and distributing insurance coverage to 1 million Indonesian fishermen.
4. Agents, comprising personnel from KKP and PT Jasindo, play a crucial role in socializing and educating Indonesian fishermen.
5. Microsoft Azure is a cloud computing service offered by Microsoft Corporation. It provides a platform as a service (PaaS) that enables customers to run and manage applications as they desire. Azure facilitates a network capable of integrating databases and selected actors chosen by customers. This network is what we refer to as blockchain.
6. Oversight is provided by the Financial Services Authority (OJK), the Corruption Eradication Commission (KPK), the Indonesian General Insurance Association (AAUI), and the Indonesian Insurance Mediation Agency (BMAI). OJK is responsible for safeguarding the contractual rights of insurance policyholders, AAUI is authorized to establish standardization of policies and clauses according to industry needs, KPK investigates corruption offenses, and BMAI is tasked with providing insurance claim dispute resolution services. The presence of these entities is expected to enhance oversight functions over the entire business process and reduce instances of fraud.

4.3 Netfisher Program Working Mechanism

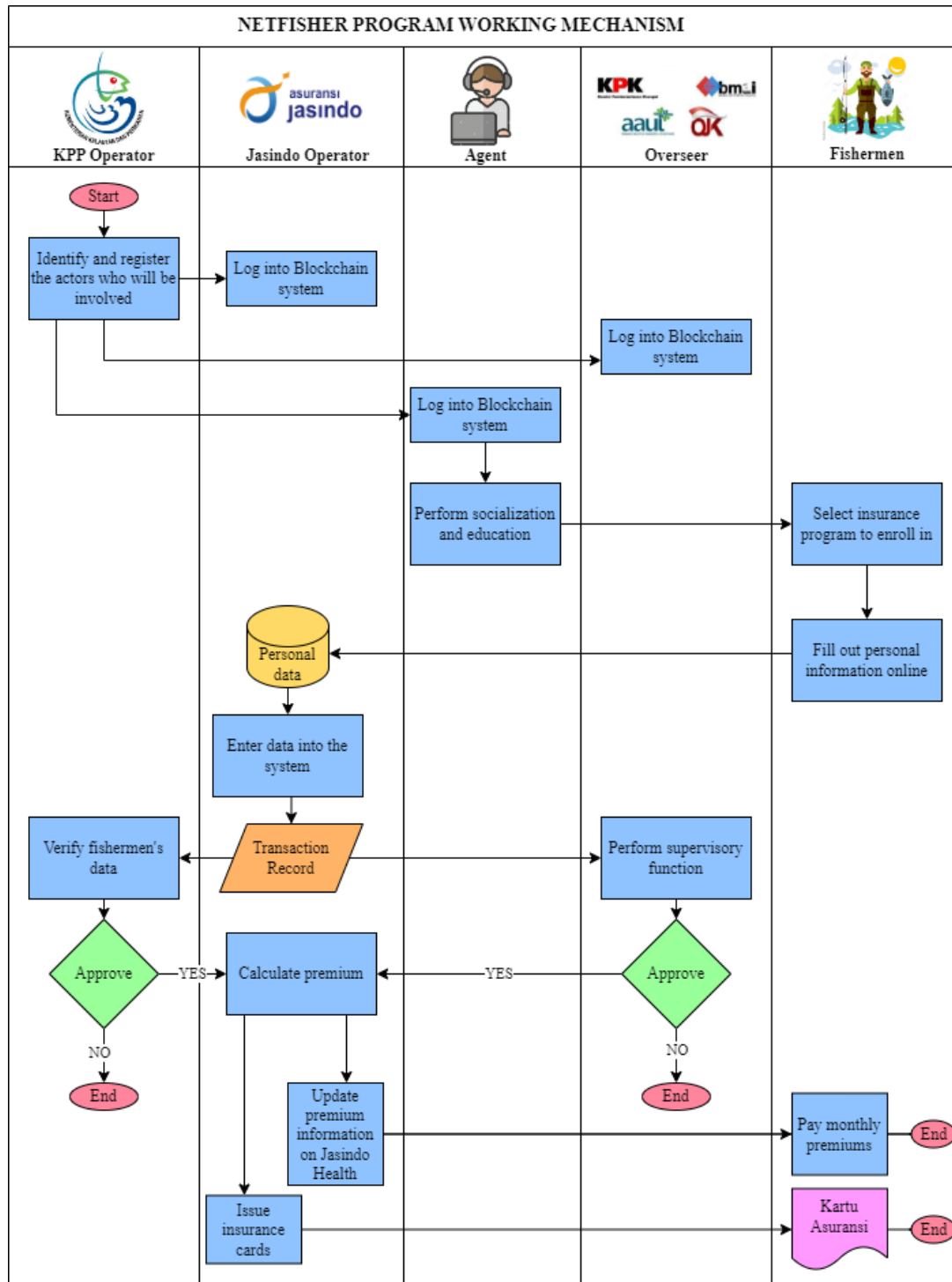


Figure 3. Netfisher Program Working Mechanism. (references: authors)

Based on the diagram above, the working mechanism of the Netfisher program is as follows:

1. KKP, having purchased Azure Blockchain services, will identify the actors or participants involved in the BPAN program. These actors will then be linked within the blockchain system and granted authority to observe and verify data.
2. Agents, who are employees of PT Jasindo and the KKP, will conduct socialization and education sessions regarding the importance of insurance and the types of BPAN available to fishermen. These sessions will be conducted both online and offline across various regions of Indonesia, including small ports outside of Java. Additionally, agents will provide recommendations regarding the most suitable insurance products for each fisherman.
3. Fishermen who have received information about BPAN can register themselves through the Jasindo Health application. They will be required to fill out a fisherman insurance form, provide photocopies of the primary maritime and fisheries practitioner card obtained from the KKP website, photocopies of the candidate BPAN recipient's Identity Card (KTP), photocopies of heirs, and photocopies of the Family Card (KK).
4. Jasindo operator will input data into the BPAN recipient recapitulation and carry out the verification process. All activities will be recorded in a ledger or blockchain technology transaction record. Subsequently, this transaction record will be distributed in real time to all actors involved in the blockchain network. Because all actors receive the same copy of the transaction record, the risk of fraud is expected to decrease.
5. Transaction data will be observed by supervisors including OJK, KPK, AAUI, and BMAI. If any actors do not approve the transaction due to errors or fraud, the transaction will not be recorded in the transaction record or will be canceled.
6. After all actors in the blockchain network approve the data, Jasindo will determine the monthly premium amount that fishermen must pay. Fishermen will receive this information from the Jasindo Health application.
7. Jasindo will issue fishermen's insurance cards, which can be collected at Jasindo branch offices, fisheries distribution offices, and the nearest fisheries service offices.
8. Fishermen can view information regarding the premium rates that must be paid through the Jasindo Health application and then begin paying insurance premiums each month to Jasindo's virtual account via mobile banking.

Netfisher program is also analyzed using Threats, Opportunities, Weaknesses and Strengths (TOWS) tool. First introduced by Heinz Weihrich in 1999, TOWS expands upon the conventional SWOT analysis to facilitate actionable strategies based on the insights gained. In contrast to SWOT, TOWS reverses the sequence of its constituent elements while retaining the same components. By integrating both internal and external factors, TOWS generates innovative approaches for leveraging available information effectively. Its primary objectives are mitigating threats, capitalizing on opportunities, harnessing strengths, and addressing weaknesses.

Internal External	Strengths • KKP involvement can improve • Jasindo's involvement • Community involvement • Blockchain technology	Weaknesses • Fisherman card limitations • Savings account limitations • Age restrictions • Fishing gear limitations • Fishing boat limitations
Opportunities • Economic development opportunities • Technology development opportunities • Technology-savvy young human resources in Indonesia	SO Strategies • Enhance community awareness • Strategic partnerships • Capacity building • Monitoring and evaluation • Resource allocation	WO Strategies • Conduct streamline documentation • Conduct financial assistance • Age and experience-based incentives • Gear and boat upgrades • Capacity building and training • Conduct monitoring and evaluation
Threats • Threat of death • Threat corruption • Threat of lack of technological understanding • Cyber crime • Data manipulation	ST Strategies • Enhance risk management • Improve good corporate governance • Raises education and awareness • Resource allocation and manpower planning	WT Strategies • Address fisherman card limitations • Expand savings account options • Review age restrictions • Fishing gear and boat compliance

Table 1. TOWS Analysis of Netfisher Program (reference: authors)

The table above shows the TOWS analysis of Netfisher program. The strengths include KKP involvement which can enhance the program's regulatory compliance, data access for risk assessment, and credibility among fishermen. Jasindo's involvement will also contribute expertise in risk management, distribution channels, and tailored insurance products to ensure the program's success. Community involvement will enable local fishing communities to foster trust, ownership, and awareness. Besides, the backbone of the program, blockchain will ensure secure, transparent, and efficient insurance transactions, reducing fraud, administrative burdens, and enabling faster claims processing.

The weaknesses of Netfisher program include restrictions on eligibility criteria or benefits tied to the possession of a fisherman card, such as access to certain subsidies or services. There might be limitations based on age, potentially affecting eligibility for certain benefits, participation in programs, or legal requirements for specific activities related to fishing. Besides, there might be limitations on the types, quantities, or sizes of fishing gear that fishermen are permitted to use, often implemented to promote sustainable fishing practices. Fishing boat limitation might include restrictions on the size, capacity, or specifications of fishing vessels, often imposed for safety, environmental, or regulatory compliance reasons.

There are several opportunities for Netfisher program. Economic development opportunities give chances for growth and prosperity in various sectors of the economy, often arising from investments, innovation, or favorable market conditions. Technology development opportunities refer to prospects for advancements and improvements in technology, which can lead to enhanced products, services, efficiency, and competitiveness in industries. Technology-savvy human resources in Indonesia denote the presence of skilled individuals proficient in technology-related fields, capable of contributing to the development and implementation of technological solutions across different sectors. The technology development era signifies a period characterized by rapid advancements and adoption of technology, leading to transformative changes in society, economy, and culture fueled by innovations in various technological fields.

There are several possible threats for Netfisher program. There are possible threats to Netfisher program. Threat of death refers to the risk or danger of loss of life, often associated with hazardous conditions, violence, or other life-threatening situations. The threat of corruption represents the risk of unethical or illegal behavior, such as bribery or embezzlement, which undermines transparency, fairness, and integrity in institutions and society. The threat of lack of technological understanding is the risk posed by a widespread lack of knowledge or understanding of technology, which can impede technological progress, innovation, and effective utilization of technological solutions. Cybercrime encompasses criminal activities carried out through digital means, such as hacking, phishing, or malware attacks, which pose threats to individuals, organizations, and society by compromising data security and privacy. Data manipulation involves unauthorized or fraudulent alteration of data, often with malicious intent, which can lead to misinformation, loss of trust, and disruption of operations in various sectors.

The strength-opportunity (SO) strategies include enhancing community awareness such as utilizing the community involvement to raise awareness about the importance of insurance and the benefits of the BPAN program. Conducting targeted education and awareness campaigns are meant to increase fishermen's understanding of risk protection and the benefits of the BPAN program. Strategic partnerships includes collaboration with other organizations, such as healthcare providers and local government agencies, to promote the BPAN program. There should be partnerships establishment with financial institutions to provide banking services or alternative financial solutions to fishermen without access to traditional savings accounts and work with local businesses to provide support for fishermen. Capacity building can be done by

training and capacity-building programs for fishermen to enhance their skills and knowledge in risk management and insurance. After that, monitoring and evaluation should be conducted to track the effectiveness of the BPAN program and identify areas for improvement. Regular assessments also should be conducted to ensure the program meet its objectives and making a positive impact on the fishing community. Resource allocation and manpower planning can be implemented by ensuring sufficient funding and support for the BPAN program.

The weakness-opportunity (WO) strategies include streamline documentation in which implement digital documentation systems to simplify the process of obtaining fisherman cards and savings accounts. Incentives should be offered for fishermen to transition to digital documentation, such as reduced costs or increased access to insurance benefits. Financial assistance can be implemented by providing financial assistance to fishermen who need help in obtaining savings accounts or upgrading their fishing gear. Age and experience-based incentives can be done by offering incentives for younger fishermen to participate in the BPAN program, such as reduced insurance premiums or increased access to training and mentorship programs. Capacity building and training can be implemented by providing training and capacity-building programs for fishermen to enhance their skills and knowledge in risk management and insurance. Lastly, performing monitoring and evaluation conduct regular assessments can ensure the program is meeting its objectives and making a positive impact on the fishing community. Data and insights from monitoring and evaluation can be utilized to inform policy decisions and adjust the program as needed.

The strength-threat (ST) strategies include enhancing risk management by identifying potential risks and threats then developing a comprehensive risk management plan. Improving good corporate governance can be done by recruiting people whose diverse range of skills and expertise. Education and awareness can be raised by conducting campaigns and community engagement. Resource allocation and manpower planning should be implemented by ensuring the efficiency and effectiveness of the allocation and manpower planning framework outline the skill and knowledge.

The weakness-threat (WT) strategies include utilizing blockchain technology to create a secure and transparent system for managing fisherman cards and savings accounts. Saving account options should be expanded by offering low-interest loans or grants to support fishermen in purchasing new equipment or upgrading their boats. There should be age restrictions review by provide additional support and resources for fishermen who have been in the industry for a longer period, such as increased access to insurance benefits or preferential treatment in the allocation of fishing rights. There should be fishing gear and boat compliance by encouraging the fisherman to equip and provide them with fishing gear or vessels that comply with regulations.

The potential risks in implementing the Netfisher program are as follows:

1. High costs of Blockchain technology

The adoption of blockchain technology may escalate the budgetary requirements of the KKP.

2. Lack of human resources

KKP might face challenges due to insufficient human resources for the development of the Netfisher program. The program's development necessitates additional personnel such as a blockchain project manager responsible for coordinating the project with all involved actors and a blockchain quality engineer to ensure smooth technology operation.

Mitigations to address these risks include:

1. Utilizing affordable local Blockchain services

Consideration can be given to employing more cost-effective local blockchain services. However, scrutiny is essential to ascertain whether these services are suitable for integration into insurance business processes.

2. Creating new job opportunities

This strategy involves creating new employment opportunities for Indonesian citizens. It aids in boosting employment rates in the IT sector and harnesses the technological literacy of the younger generation. Consequently, it accelerates the achievement of SDG 8.

5. Conclusion

Traditional fishermen, as owners of high-risk jobs, should protect themselves with insurance. However, BPAN from KKP and Jasindo has not been evenly distributed due to fishermen's lack of understanding of the importance of insurance, outreach only being held at large ports, and the closure of several Jasindo branch offices. Netfisher, an inclusive blockchain-based fishermen's insurance service program, is expected to increase insurance distribution accurately and avoid fraud. To implement this program, synergy is needed between the KKP as the originator of BPAN and the power of budget users, Jasindo as the insurance distribution company, as well as the KKP and Jasindo agents who will intensify insurance socialization. The OJK, KPK, AAUI and BMAI will carry out supervisory functions to create fraud-free business processes. All parties will be connected in one blockchain system. The program begins with the KKP identifying all actors; purchasing Microsoft Azure blockchain services; and connecting them to the system. Agents will carry out outreach and education so that fishermen are encouraged to register via the Jasindo Health application. Jasindo operators enter fishermen's data into the system and calculate premiums. All data will be validated by the KKP and supervisors and then recorded in the blockchain ledger. Jasindo will print insurance cards for fishermen and fishermen can pay monthly premiums via mobile banking. Implementing this program involves risks, such as expensive blockchain services and a lack of human resources. The KKP can overcome these risks by purchasing local blockchain services, which are relatively more affordable, and opening new job opportunities to hire blockchain specialists from Indonesia. This is in line with SDG 8, which aims to realize decent work and a sustainable economy.

There also several recommendations for KKP so that they can overcome the current phenomenon: (1) KKP should synergize with Jasindo to re-intensify BPAN distribution which

was hampered and not yet optimal. This can be started by expanding the reach of socialization and education related to BPAN in small ports and areas outside Java. KKP and Jasindo agents need to explain the types of insurance that are suitable for each fisherman, the access procedures and payment methods. (2) KKP should carry out regular evaluations and asks for full disclosure of Jasindo's performance so that the branch office continues to be active in serving fishermen. Jasindo branch offices that are not actively operating also need to be reopened. (3) KKP should use the Azure Blockchain service to be able to integrate all related parties, namely KKP, OJK, KPK, AAUI, and BMAI. In this way, recording transaction data can take place more quickly, accurately, and avoid fraud. (4) KKP should open new job opportunities to look for blockchain project managers and blockchain quality engineers from Indonesia. This is useful for increasing labor absorption in the IT sector and empowering the younger generation who are technologically literate. In this way, it is hoped that the achievement of SDG 8 can be accelerated.

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