## **Artificial Intelligence-based System to Improve Seafood Product Quality**

## Abstract (200-300 words)

Indonesia as a maritime country has a very large potential for marine products that need to be accompanied by infrastructure facilities and infrastructure to optimize these resources. Currently, the Ministry of Maritime Affairs and Fisheries (KKP) continues to make various efforts to increase the export value of fishery products, whether live, fresh, cold, or processed. On the other hand, the stringent stringent export quality standards are a challenge in itself. As is known, marine and fishery products are perishable commodities, so they require special treatment in handling. The official standard of testing to determine the freshness and safety of marine and meat products is the total viable count (TVC). The laboratory test process takes a long time of 24-72 hours and is expensive for one test. Electronic nose (enose) technology has promising potential to be used in various fields. In recent years, e-nose has been developed and tested in the field of food processing for quality assessment. In the medical field, e-nose has also been developed for the diagnosis of diseases such as cancer and diabetes as well as bacterial infections in wounds. For these specific applications, the best sensor gas combination may vary depending on the volatile gas that is the biomarker of a sample. This study aims to develop an e-nose system and artificial intelligence for a fast and inexpensive system for testing the quality of marine products so that later it can be used by many parties to guarantee the quality of marine products. marine products with TKT 4 and HKI. While the additional output is one publication in a reputable international journal. This research also involves partners, namely PT. Anugrah Laut Indonesia (PT Ali Seafood) as a potential user of the products produced and a provider of samples of marine products. This activity also involves students as a forum for direct practice on real case studies in industry. The dataset generated in this study will also be used as material and cases in data science courses.

**Planning** 

Background

The fishing industry is one sector that is expected to increase the country's economic growth. Therefore, in order to realize an advanced, independent, strong and national interest-based Indonesian fishery sector, Presidential Instruction Number 7 of 2016. The purpose of this policy is to improve the welfare of fishermen, cultivators, processing and marketing of fishery products, absorbing labor, and increasing foreign exchange. country [1]. Indonesia as a research summary of no more than 500 words containing the background of the research, the objectives and stages of the research method, the targeted output, and a description of the proposed research TKT. Maximum keywords 5 words Research background no more than 500 words containing background and problems to be researched, specific objectives and feasibility studies. In this section, it is necessary to explain the description of the specification of the relationship between the scheme and the focus area or research strategic plan of PT. Maritime countries have the potential of abundant marine and fishery resources that need to be accompanied by infrastructure facilities and infrastructure to optimize these resources. As is known, marine and fishery products are perishable commodities, so they require special treatment in handling. Therefore, we need a system that aims to increase the capacity and stability of the production and marketing system, strengthen connectivity between upstream production centers, downstream production and marketing efficiently, and improve the efficiency of supply chain management of marine and fishery products, as well as information from upstream to downstream. involving the synergy of various parties. The increase in capture fishery production was contributed by the increase in marine fishery production by 2.23% and inland public waters by 2.71% [2]. The export value of Indonesian fishery products until December 2020 reached USD 5.20 billion. Based on export destination countries, the United States (US) is still the largest market with a contribution of 40.30% or USD 2.1 billion. Currently, the Ministry of Maritime Affairs and Fisheries (KKP) continues to make various efforts to increase the export value of fishery products, whether live, fresh, cold, or processed. Strict export

quality standards are a challenge in itself. As an example of the obstacles faced include [2]:  1. Some Indonesian fishery products are considered not to meet the quality standards of the Japanese market 2. The United States is increasingly dightening the criteria and quality of its imported products, such as guarantees for the safety of fishery and non-IUU products, sustainability and traceability. Some of the efforts made by the KKP include improving the quality of marine and fishery products for export commodities of important economic value through feasibility certifications and Certification. The official standard of resting to determine the freshness and safety of marine and meat products is the total viable count (TVC) [3]. The laboratory test process takes a long time of 24-72 hours and is expensive for one test [4]. For this reason, a fact, inexpensive process takes a long time of 24-72 hours and is expensive for one test [4]. For this reason, a fact, inexpensive of that the frequency of testing becomes easier and more frequent to ensure the quality of fishery product commodities, especially for fishery product commodities, especially for fishery product commodities, especially for fishery products, export and more frequent to ensure the quality of fishery product commodities, including prediction of microbial populations that are first, inexpensive and easy to operate using an electronic nose (c-nose) and artificial intelligence algorithms. The output of the first year of this research is that Application of e-nose interface bases			
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Resources  Financial requirements Technological/other requirements  Strategic options available Their relative importance  Their sequences for execution  The proposed research method can be divided into several steps, including assembling the e-nose hardware, acquiring the e-nose dataset, developing machine learning algorithms, testing the lab environment, and finalizing system integration. Figure 4 shows the proposed research method and flow in detail.  The proposed research method and flow in detail.  This project uses a new method or approach, resulting in better output. In addition, the application of information technology			DIXII
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Strategic options available   Their relative importance	Resources	•	Grant Fund DIKTI
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This project uses a new method or approach, resulting in better output. In addition, the application of information technology	Key points		<u> </u>
<b>Differences from traditional approaches</b> output. In addition, the application of information technology	_		
	Differences for	com traditional approaches	
and ix 4.0 can increase efficiency and productivity.	Differences II	от traditional approaches	
			and in 4.0 can increase efficiency and productivity.

Doing			
Launch date			
Responsible organization	TELKOM UNIVERSITY, PPM, DIKTI		
Progress as of today	-		
Problems in implementation	-		
Approaches to solve the problems	-		
Completion date, if completed	December 15, 2022		
Seeing			
Impacts on students	Become the topic of the student's final project		
	Research results in addition to the Tel-U Nose (T-Nose) product		
Impacts on professors and university	involving lecturers and students have produced several		
	publications in Q1/Q2 journals and presented at international		
	conferences, of course increasing the reputation of the campus		
Responses from industry/market	Respond well to the results of this study		
	The government's response is of course supportive because we		
D C	have successfully passed research grants from the Directorate		
Responses from government	General of Vocational Education, Ministry of Education and		
	Culture and research grants for Research and Innovation for		
	Advanced Indonesia (RIIM) from BRIN-LPDP		
	Develop methods for testing the quality/freshness of product commodities fisheries including microbial population		
Measurable output	commodities fisheries including microbial population prediction that is fast, inexpensive, and easy to operate using		
	electronic nose (e-nose) and artificial intelligence algorithms.		
Cost-benefit analysis for effectiveness	according to the program carried out		
	ture Planning		
I u	Developed an e-nose to detect samples such as meat, seafood		
	and tea. e-nose research for marine products is funded by the		
	Director General of Vocational Studies through a vocational		
	product research (P2V) scheme with partner PT Anugrah Laut		
Where does the project go from here?	Indonesia. Meanwhile, e-nose for tea is funded by BRIN-LPDP		
1 3 2	through the RIIM scheme with partners from the Gambung Tea		
	and Quinine Research Center (PPTK). It is hoped that the		
	system developed can help the quality control department to		
	ensure product quality quickly, cheaply, easily, and accurately.		
N.	liscellaneous		
	Gas sensor array Flushing fan Sample chamber Bread board Arduino+Wifi-		
	Sample chamber shield		
	HICO.		
	(a) (b)		
Exhibits, pictures, diagrams, etc.			
	Wireless network Pausing I		
	E-nose Sensor Box  Sensor Middleware  Raw signals DB		
	Labeled data		
	Labelou data		
	Food Spoilage and Safety Predictor Microbial population Bacterial		
	(FSSP)		
Danarts mimage managraphs haste at			
Reports, mimeos, monographs, books, etc.  Others which may help explain the project			
Outers which may help explain the project			