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Competency Framework for Enumerator in the Post-Production Non-Tax State Revenue System at Nizam Zachman Port

Anita Febrina Zendrato[1]*, Iin Solihin[2], Retno Muninggar[2]

[1] *Graduate Program of Marine Fisheries Technologies, Department of Fisheries Resource Utilization, Faculty of Fisheries and Marine Science, IPB University, West Java, 16680, Indonesia*
anitafebrina@apps.ipb.ac.id
[2] *Department of Fisheries Resource Utilization, Faculty of Fisheries and Marine Science, IPB University, West Java, 16680, Indonesia*
iin_solihin@apps.ipb.ac.id; muninggar@apps.ipb.ac.id

**Correspondence: anitafebrina@apps.ipb.ac.id*

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ABSTRACT

Issues surrounding the implementation of the Post-Production Non-Tax State Revenue (PNBP) program in Indonesia, particularly at the Nizam Zachman Marine Fisheries Port, center on a lack of accountability in catch reporting, which serves as the primary basis for calculating levies. The accuracy of this data is severely compromised by inconsistencies in the competencies of enumerators; however, the Directorate General has not yet established quantitative and operational standards for these competencies. This study aims to address this gap by developing a robust competency framework for post-production PNBP enumerators using a Design Science Research (DSR) approach. This framework was developed through a systematic content analysis of scientific literature and PNBP regulations, followed by two stages of expert validation. The resulting framework categorizes three fundamental dimensions: knowledge, skills, and attitudes, into 22 specific indicators. This study reveals that the framework consists of knowledge (38%), skills (32%), and attitudes (30%). The dominance of the knowledge dimension underscores that a deep understanding of regulations and technical fish identification is crucial for ensuring data integrity. Ultimately, this framework provides a structured foundation for improving recruitment, training, and performance evaluation to enhance the accountability of the PNBP system.

Keywords: *data accuracy; Design Science Research; expert validation; fishing port; levy calculations*

INTRODUCTION

The fisheries sector occupies a strategic position in national economic development and state revenue, where Non-Tax State Revenues (PNBP) become an important instrument for managing fishery resources. By virtue of Government Regulation Number 85 of 2021, the Indonesian State changed its PNBP obligation on domestic production from pre-production to post-production. This strategy constitutes regulatory reform to improve equity and efficiency in generating state revenue from fisheries (Arkan and Rosdiana 2025).

According to the Decree of the Minister of Marine Affairs and Fisheries No. 187/2023, 296 base fishing ports have implemented post-production. One of the ports is Nizam Zachman Ocean Fishing Port (PPS Nizam Zahman), the largest fishing port in Indonesia and a center for landing high-value commodities such as tuna and skipjack (Alfianto *et al.* 2023). As the first-line

personnel, enumerators are responsible for ensuring that catch data collection is accurate, consistent, and reliable (Darmawan *et al.* 2022). Fish catch data recorded by enumerators are important not only for determining PNBP levies but also for sustainable fisheries resource management and fisheries policy planning (Lubis *et al.* 2021).

The performance and dependability of fisheries data systems depend largely on enumerators' ability to accurately capture and report data (Naz *et al.* 2023). But enumerators cannot be accurate in field recording data. A study by Maulidina *et al*. (2025) reported significant variances between purse seine catch production estimates by enumerators' dockside weighing and weighbridge systems at the PPS Nizam Zahman. These differences denote that the data recorded were not wholly free from error effects. Such differences were ascribed to errors in data recording procedures during fieldwork, including the incorrect use of decimals and visual estimation when counting the number of fish containers. This type of error, however, could result in mismatches in Post-production PNBP disbursements.

Lack of enumerators' competency is one form of poor data quality. This problem is mainly due to the absence of an explicit and objective competency framework that could serve as a guide for enumerator selection, training, and performance appraisal. Enumerators need to be precise, not only in identifying fish species and recording their true weight, but also in understanding changes in levy regulations that are being updated regularly (Wibisono *et al.* 2022). Existing practices among field enumerators, based on observations and review of administrative documents at the study site, rely on general administrative guidelines and terms of reference that do not explicitly define competency dimensions, performance indicators, or objectively measurable standards. Without a shared competency model, the enumerators will lack the requisite competencies needed to gather reliable data, which may result in miscalculations of revenues, informational disparity between fishing fleet owners and port officials, and poor policy analysis.

Several studies have investigated the accuracy of data collected, the influence of observers, and the effectiveness of monitoring processes in fishing harbors (Lubis *et al.* 2021; Duarte and Cadrin 2024). Other professions such as medicine and human resource management use competency frameworks developed on the basis of the KSAs framework (Mills *et al.* 2020; Cui *et al.* 2022). There exists limited literature on competency framework development for fisheries enumerators in the post-production PNBP process specifically. No previous research has incorporated aspects of regulatory compliance, accurate species identification, and accountability in revenue collection to develop a competency model for PNBP enumerators. This represents a knowledge gap in the literature concerning the need for competency framework development to improve the quality of data in the PNBP process.

Despite the implementation of e-PIT and other digital systems, the 'human element', specifically enumerator competence, remains a critical bottleneck. The lack of standardized, quantitative indicators leads to high subjectivity in data collection, which directly undermines the financial accountability of the PNBP system. From the challenges stated and the research gap identified, this research endeavors to formulate and validate a coherent competency framework for enumerators participating in the Post-production PNBP system. This study develops its framework based on the competency model by Spencer and Spencer (1993), defined as an integrative unit of knowledge, skills, and attitudes (KSA). In line with this, Rakowska and de Juana-Espinosa (2021) describe competence as the integration of KSA required for efficient adaptation and optimum professional performance. Utilizing the Design Science Research (DSR) methodology (Deng and Ji 2018; Omar et al. 2026), this study converts the KSA of enumerators into observable and measurable indicators, resulting in a research artifact. This framework addresses data inaccuracy through standardized competencies and assessment methods. Theoretically, this study contributes to the literature on competency frameworks within fishery fiscal governance, while practically, it provides a structured basis for recruitment, training, and performance evaluation.

METHODS

This study took place between August and September 2025 in the PPS Nizam Zahman located in Jakarta (Figure 1). The study is being carried out in this area since the PPS Nizam Zahman is the biggest fishing port in Indonesia and the other port that has adopted the Post-production PNBP policy.

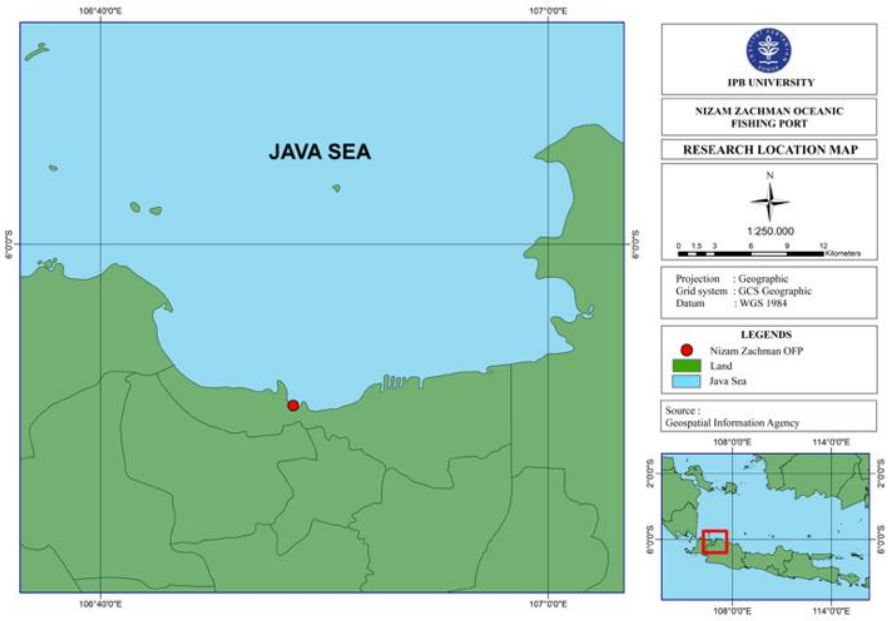

Figure 1 Map of PPS Nizam Zahman in North Jakarta (Indonesia), showing its location along the Java Sea as the study area

This study adopted a qualitative description approach through the Design Science Research (DSR) method (Deng and Ji 2018; Omar *et al.* 2026). The qualitative descriptive approach was applied to examine enumerator competency requirements based on a literature review and regulatory documents. The DSR methodology designs, evaluates, and refines the research artifact in the form of a competency framework for enumerators involved in the Post-production PNBP system.

Expert selection and data collection

Primary data were collected through expert judgment during the competency framework validation process. Five experts were selected using purposive sampling, which deliberately selects participants who possess characteristics relevant to the research objectives (Campbell *et al.* 2020). This number is considered sufficient for content validation, as a minimum of five experts is commonly recommended in the Content Validity Index (CVI) approach. Criteria for the expert's selection include experience in fisheries port management, fisheries data collection systems, or the implementation of the Post-production PNBP policy; involvement in policy formulation in the fishing port, enumerator supervision, or academic research related to fisheries governance; and familiarity with competency-based human resource development. The expert consisted of two governance practitioners (Head of the Working Group for Measured Fishing Port Operations and Post-production PNBP, and Head of the Operational Working Group of The PPS Nizam Zahman) and three academics. This composition ensured representation of both operational and academic perspectives. Meanwhile, secondary data included a review of relevant literature, terms of reference for the procurement of enumerators in base fishing ports, non-civil servant performance assessment documents, government regulations, and ministerial decrees related to state service fees in the form of Post-production PNBP, a scientific journal on competency framework development, and a data collection system in fisheries.

Design Science Research (DSR) procedure

The research process followed four main stages of the Design Science Research (DSR) framework (Figure 2):

1. Problem Identification

A literature review and regulatory analysis identified inaccuracies in the recording of catch data within the Post-production PNBP system. This stage defined the need for a standardized and measurable competency framework.

2. Artifact Design

The initial competency framework is developed deductively based on the Knowledge, Skills, and Attitudes (KSA) model (Spencer and Spencer 1993; Rakowska and de Juana-Espinosa 2021). Content analysis of government regulations, ministerial decrees,

terms of reference for enumerator procurement, and non-civil servant performance assessment documents generated the competency elements and indicators. Every indicator was developed into a tangible and quantifiable behavioral indicator to facilitate objective evaluation.

3. Artifact Evaluation

The draft model was assessed using a two-step validation of the experts by means of a standardized rating scale.

4. Refinement and Finalization

The indicators were either revised, consolidated, or deleted, depending on their validity, to develop the final competencies framework.

Validation technique

The method of validating the framework employed the Content Validity Index (CVI) technique. The competency framework was validated using structured judgments by the experts on a four-point Likert scale (Strongly Disagree=1, Disagree=2, Agree=3, and Strongly Agree=4). The experts individually rated the degree of relevancy and clarity of the indicators. The use of a four-point Likert scale, which lacks an unlabelled neutral position, is encouraged during content validation to improve rating decisions and minimize biases (Tseli *et al.* 2023). The Item-Content Validity Index (I-CVI) was employed to assess the degree of content validity by determining the percentage of experts rating the indicators with 3 or 4 (Aridi *et al.* 2024).

$$I-CVI = \frac{Number\ of\ experts\ rating\ 3\ or\ 4}{Total\ number\ of\ experts}$$

With five experts involved, an I-CVI threshold of 0.80 is the minimum acceptable level of content validity. The second validation assessed those indicators that scored less than this threshold and modified or eliminated these indicators.

Quantification and weighting procedure

In order to improve the measurable aspect of the competency framework, conceptual definitions were also developed for each validated indicator, operationalized in observable and operational terms. With this definition, it is possible to convert each of the indicators into criteria for scoring purposes when they are used in performance evaluation. Alongside the process of validating the indicators, the experts also assigned 100% weights to the three competency dimensions (knowledge, skill, and attitude). The assignment of weights among the three competency dimensions determines the competencies needed by the enumerators for recording data in Post-production PNBP. Through expert allocations, proportional weights were obtained for each competency dimension after taking the average of their scores. This will form the foundation of the weight-based competency scoring model.

Data analysis

The data analysis process was made up of two related aspects: qualitative content analysis and quantitative validation techniques. The information obtained from the literature review and expert interviews was analyzed using content analysis in a qualitative descriptive research paradigm. Content analysis acted as a qualitative methodology technique for systematically selecting, extracting, and classifying competence-related themes that arise from scientific literature and legislation (Allen and Palermo 2022). Following that, expert evaluation and validation processes ensured indicator importance and operability. The data analysis process involved a number of sequential stages:

1. Initial coding and identification of core themes which were developed from document analysis and then mapping the identified themes on the dimensions of enumerator competencies.
2. Mapping the identified themes into three categories of competencies (knowledge, skills, and attitudes).
3. Development of competency elements and competency indicators based on thematic categorization and relevance.
4. Computing I-CVI value of each competency indicator for relevancy and clarity.
5. Finalizing competency indicators after validation by experts.
6. Weighting each category of competency after validating its proportional weight through experts' opinions.

The combination of qualitative content analysis and quantitative validation methods contributed to the development of the methodology's competency framework being scientifically valid and measurable within the Post-production PNBP model.

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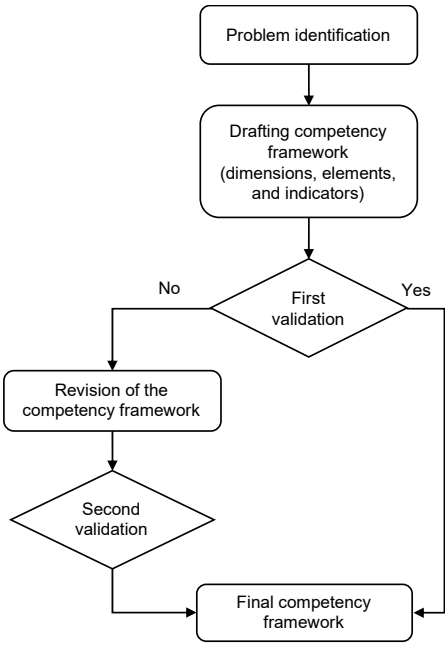

Figure 2 Methodological stages in the development of the competency framework for PNBP enumerators at the PPS Nizam Zahman (Indonesia), conducted through the iterative cycles of the Design Science Research (DSR) approach.
Source: adapted from Deng and Ji (2018); Omar *et al.* (2026)

RESULTS

The first draft of the competency framework consisted of 23 indicators. The number of indicators after the first validation became 24 and later decreased to 22 indicators after the second validation (Figure 3). The criteria determine the skills that the enumerators must possess based on regulations and guidelines related to fishery data collection at ports. Experts carry out the validation process to verify the relevance, clarity, and measurability of the indicators in relation to Post-production PNBP at PPS Nizam Zahman. Indicators have been added, deleted, and revised by the experts during the validation process to avoid overlapping concepts and fit the conditions of the fishing port.

In the first stage of validation, Item-Content Validity Index (I-CVI) scores ranged from 0.20 to 1.00. Those items whose I-CVI scores did not reach 0.80 were either modified or eliminated based on the validation guidelines stated in the methodology section. During the second stage of validation, all selected indicators had I-CVI scores ≥ 0.80, indicating satisfactory content validity (Table 1). This two-step validation strategy confirms that the framework underwent systematic evaluation and improvement via expert judgment and not just theoretical suggestion.

All those indicators that have been included in the final model have passed the test of minimum content validity requirement (I-CVI ≥ 0.80).

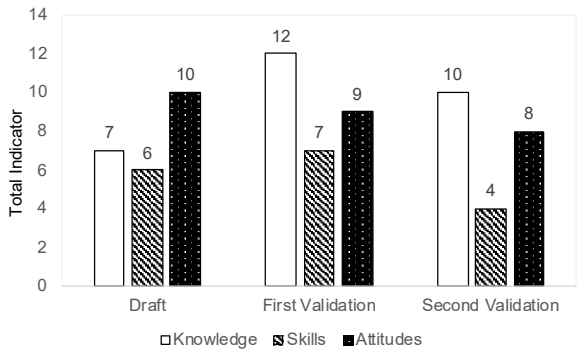

Figure 3 Distribution of competency indicators across knowledge, skills, and attitudes dimensions for PNBP enumerators at the PPS Nizam Zachman (Indonesia), derived from the content analysis and dual-stage expert validation process.

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Table 1 Item-level Content Validity Index (I-CVI) results for the enumerator competency indicators at the PPS Nizam Zahman (Indonesia), calculated from two stages of expert validation involving five port management specialists.

Dimension	Final Indicators	I-CVI Range		Decision
		Validation I	Validation II	
Knowledge	10	0.2 – 1.0	0.8 – 1.0	Valid
Skills	4	0.2 – 1.0	0.8 – 1.0	Valid
Attitudes	8	0.2 – 1.0	0.8 – 1.0	Valid
Total	**22**	**–**	**≥ 0.8**	**Retained**

Knowledge dimension

There was an increase in the number of competence indicators in the knowledge dimension following the first stage of validation by the experts. The introduction of additional competence indicators was mainly concerned with the need for improving the enumerators' knowledge regarding the operational regulations that must be considered for the implementation of the policy on fishing and Post-production PNBP. Following the process of refinement, the knowledge dimension had 10 final competence indicators (Table 2).

Skills dimension

The last stage in the validation process of the skills dimension helped in improving the competency indicators by removing those not linked with the technical competencies of the enumerators. The expert removed the indicators which were not linked with the tasks of the enumerators. The final results indicate that the skills dimension comprises four competency indicators, encompassing data recording and verification, operation of systems/tools, and communication during enumerators' activities (Table 3).

Attitudes dimension

The validation process designs indicators within the attitude dimension to sharpen focus on work-related behaviors that are directly associated with enumerator integrity and responsibility. Several indicators were considered overly general or conceptually overlapping with indicators in other competency dimensions were revised or removed. The results of the second validation stage indicate that the attitude dimension comprises eight final indicators, reflecting competencies related to integrity and honesty, consistency, responsibility and proactiveness, service orientation, adaptability to change, collaboration, and self-development (Table 4).

The expert also weighted across the three competency dimensions: knowledge, skills, and attitudes, with a total weighting of 100% assigned by each expert (Table 5). The weights provided by all experts were then averaged across dimensions to obtain the final percentage distribution of enumerator competencies within the Post-production PNBP system.

Nevertheless, the averaged distribution exhibits a rather balanced competency distribution. The proportional weights also make it possible for the framework to serve as an assessment tool on a quantitative basis. The framework adopted in this research represents a linear (additive) weighted scoring framework where each individual competency makes its proportional contribution towards the final score according to the weights assigned to them by the experts. The use of weights in such a manner is common practice in multicriteria decision making and involves aggregating the various dimensions into a single composite score through summation of the weighted criteria scores (Queiroz *et al.* 2025). In this case, the formula for calculating the overall competency score will be expressed as follows:

$$Total\ Score = (Knowledge\ x\ 0.38) + (Skills\ x\ 0.32) + (Attitude\ x\ 0.30)$$

The scoring system presented above offers a measure for assessing competencies. It can be used in the future as a base for recruiting and training needs assessments.

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Table 2 Competency indicators for the Knowledge dimension and their validation results for PNBP enumerators at the PPS Nizam Zahman (Indonesia), synthesized from regulatory analysis and refined through a dual-stage expert validation process.

No.	Dimension	Element	Indicator	Draft	Validation	
					First	Second
1	Knowledge	Regulatory Understanding	Understanding of Government Regulation of the Republic of Indonesia Number 85 of 2021 concerning Types and Tariffs of PNBP Applicable to the Ministry of Marine Affairs and Fisheries	✓	✓	
			Understanding of Ministerial Regulation of Marine Affairs and Fisheries Number 17 of 2024 concerning Procedures and Requirements for the Imposition of PNBP Tariffs Derived from Fisheries Natural Resource Utilization	✓	✓	✓
			Understanding of Ministerial Regulation of Marine Affairs and Fisheries Number 28 of 2023 concerning The Implementation of Government Regulation No. 11 of 2023 on Measured Fishing		✓	✓
			Understanding of Ministerial Decree of Marine Affairs and Fisheries Number 43 of 2023 concerning Work Mechanisms for Bureaucratic Simplification within The Ministry of Marine Affairs and Fisheries		✓	✓
			Understanding of Ministerial Decree of Marine Affairs and Fisheries Number 187 of 2023 concerning Base Fishing Ports within Measured Fishing Zones and Ports eligible for post-production Levy Implementation		✓	✓
		Fish Classification and Identification	Able to classify landed fish species according to established standards	✓	✓	
			Able to identify physical characteristics of high-value fish species (e.g., tuna, skipjack, and frigate tuna)	✓	✓	✓
			Able to identify marine fish species under frozen, fresh, and live conditions	✓	✓	✓
			Able to recognize landed fish species based on vessel type and fishing gear used		✓	✓
		Understanding of Data Collection Workflow	Understanding of catch data collection workflows from landing to reporting stages	✓	✓	✓
			Conducts data recording and weighing of fish landed at base fishing ports	✓	✓	✓
			Able to documentation of fisheries data collection activities		✓	✓
Total				**7**	**12**	**10**

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Table 3 Competency indicators for the Skills dimension and their validation results for PNBP enumerators at the PPS Nizam Zahman (Indonesia), synthesized from professional task analysis and refined through a dual-stage expert validation process.

No.	Dimension	Element	Indicator	Draft	Validation	
					First	Second
2	Skills	Data Recording and Verification	Able to record fish species (local and scientific names) and catch weight accurately and consistently	✓	✓	
			Able to obtain fish price information (at producer and consumer levels) for each landed species	✓	✓	
			Able to conduct sampling-based data collection (weight, length, or otolith for tuna resources landed at base fishing ports when required)	✓	✓	
			Able to record and verify fish species and catch weight using standardized data collection forms		✓	✓
		Use of Systems/ Tools	Inputs catch production data from each fishing vessel into the Fishing Port Information System (PIPP) or the PIPP Mobile application	✓	✓	✓
			Operates weighbridge systems and accurately records fish weight data using transport vehicles (four wheels or more)	✓	✓	✓
			Performs orderly and systematic administrative data management	✓		
		Communication	Communicates clearly and persuasively with fishers and fisheries business operators		✓	✓
			Total	**6**	**7**	**4**

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Table 4 Competency indicators for the Attitudes dimension and their validation results for PNBP enumerators at the PPS Nizam Zachman (Indonesia), synthesized from work behavior analysis and refined through a dual-stage expert validation process.

No.	Dimension	Element	Indicator	Draft	Validation	
					First	Second
3	Attitudes	Integrity and Honesty	Honesty and objectivity in all data recording activities	✓	✓	✓
			Rejects any form of data manipulation or gratification	✓	✓	✓
		Consistency	Records data accurately, carefully, and with attention to detail	✓		
			Consistently applies established data collection procedures and standards	✓	✓	✓
		Responsibility and Proactiveness	Submits monthly work reports containing, daily activities and recorded catch production data based on the number of fishing vessels enumerated	✓	✓	✓
			Takes initiative to verify information or seek clarification when uncertainty arises	✓	✓	✓
		Service Orientation	Demonstrates courteous, responsive, solution-oriented, and reliable behavior	✓	✓	✓
		Adaptability to Change	Quickly adapts to changes in regulations or data collection procedures	✓	✓	✓
		Collaboration	Collaboration with various stakeholders to improve data quality	✓	✓	
		Self-Development	Shows initiative to continuously improve personal competencies	✓	✓	✓
			Total	**10**	**9**	**8**

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Table 5 Percentage weight distribution of the Knowledge, Skills, and Attitudes (KSA) dimensions for PNBP enumerators at the PPS Nizam Zachman (Indonesia), calculated based on expert consensus during the final validation stage.

No.	Expert Validation	Competency (%)		
		Knowledge	Skills	Attitudes
A. Governance				
1	Head of the Working Group for Measured Fishing Port Operations and Post-production Non-Tax State Revenue	30	30	40
2	Head of the Operational Working Group of the PPS Nizam Zahman	40	30	30
B. Academics				
3	Diponegoro University	60	30	10
4	AUP Polytechnic	40	35	25
5	IPB University	20	35	45
	Average (%)	**38**	**32**	**30**

DISCUSSION

The competency model framework created in this research shows that enumeration competence in the PNTSR system involves multiple dimensions that must be considered together when assessing an enumerator's competencies. This competency model based on knowledge, skills, and attitude aligns well with the definition of competency as a construct that includes knowledge, technical skills, and attitudes necessary for effective professional job performance. This supports the idea of Tushar and Sooraksa (2023) that competency is a construct that includes not only knowledge but also technical skills/values orientation and work attitudes that influence performance. Many industries have used such a method to develop competency models, although with a distinction between competency dimensions, competency elements, and performance indicators that assess individual capability (Mills *et al.* 2020).

In this case, it is imperative to note that the KSA model is not conceptual but also operationalized through structured and validated expert judgment in terms of observable and quantifiable indicators. Application of the Content Validity Index (CVI) guaranteed that the selected indicators exceeded threshold levels of relevance. At the same time, assigning proportional weights across dimensions enabled the construction of a composite scoring mechanism. Thus, the use of the KSA model enhances both the theoretical grounding and the quantitative measurability of the competency standard for Post-production PNBP enumerators.

The maximum weight for the competences dimension is for knowledge rather than skills and attitudes. This superiority is due to the enumerator activity in Post-production State Non-Tax Revenues, and it is related to regulatory understanding, fish classification and identification, and data collection workflow at the port. Huang *et al.* (2022) also emphasise knowledge as the major cognitive background mediating professional decision-making, especially in heavily rule-regulated and standardised job environments. Indeed, from this perspective, the added emphasis on the knowledge dimension appears to be a risk management device aimed at addressing misleading data that might lead to uncertainties in Post-production PNBP estimations and compromise accountability in fisheries management.

The expert validation findings further place greater weight on stronger indicators in the knowledge dimension. Knowing the regulations is essential, as ignorance or misunderstanding of the relevant rules can result in collection without a lawful justification. Moreover, expertise in fish classification and knowledge of species directly affect the accuracy of production records and the calculation of levy tariffs for landed catch. Species misidentification and inaccuracies in catch estimation have been identified as significant causes of bias in fisheries production data, especially for multi-species fisheries and at high-volume landing sites (Akinyemi *et al.* 2022). Studies on fisheries monitoring systems with enumerators have demonstrated that capacity building in accurate species identification and catch measurement increases the quality and reliability of length data, as well as species composition, for stock assessment analysis (Wibisono *et al.* 2022). Other studies also show that misspecification of species not only biases the results of fisheries resource management but may also reduce the reliability of economic information and policy

decisions based on fisheries production data (Lewin *et al.* 2021; Duarte and Cadrin 2024).

The decrease in the number of competency indicators in the skills and attitude domains does not minimize the scope of competence. However, it is an outcome of the deliberate effort to exclude those indicators which were redundant, too generic, or unrelated to the main duties of enumerators. Excessively complicated competency measures may be challenging to implement and yield less reliable assessments. Therefore, slimming the indicators contributes to assessment reliability and consistency across experts, as well as practical usability, without diminishing the substantive meaning of what is measured (Cui *et al.* 2022; Jensen *et al.* 2024).

Competency indicators in the skills domain were intentionally related to fundamental technical tasks such as recording and verifying catch data, using digital data collection systems, and operating weighing facilities. This operationalisation aligns with the development of competences, which has its roots in the notion that competence indicators are behaviours and that specific work-based activities can facilitate them, with direct performance implications (Mills *et al.* 2020; Lopes *et al.* 2025). These results are consistent with previous studies in fisheries, which have shown that manual recording systems have limited memory and may result in incomplete or incorrect data when field staff lack the necessary technical expertise (Grantham *et al.* 2022). These results demonstrate the critical role of enumerator technical and operational quality in maintaining reporting data continuity and timely reporting.

Attitude is concerned about the need for honesty and faithfulness to commitments. The importance of honesty and ethical behavior of public officials in efficient public financial management is supported by Khamzina *et al*. (2025). Being the biggest fishing port in Indonesia and one of the major sources of high-value fishing catch, the PPS Nizam Zahman may encounter some problems associated with the integrity issues of the information collected and reported. The issues can be associated with inconsistencies in reporting and collecting data that can occur in any other fishery database. The risks will arise because of inadequate integrity or operational controls, causing issues related to lost revenues, poor operating efficiency, and lack of stakeholder trust (Suherman *et al.* 2025). Lack of integrity and insufficient operational controls cause revenue loss, reduce operating efficiency, and erode stakeholder trust. Notteboom and Haralambides (2020) further explain that quality of governance in the port is essential for its sustainable development and that includes integrity of employees and effective supervision. Therefore, attitude is a type of non-technical control that increases the impact of technical controls on data validation and Post-production PNBP implementation.

Since the three competencies have a relatively balanced weight distribution, it must be recognized that none of the three competencies can take the entire responsibility for performance by the enumerators. It is possible that enumerators who are very knowledgeable and have good intentions but have limited technical capabilities will not be able to capture the data effectively in the data capture system. Conversely, enumerators who have a wealth of knowledge and the technical capacity to perform the task but have poor intentions can abuse the opportunity in capturing the data. In essence, synergy between knowledge, skills, and attitudes is a crucial prerequisite for efficient enumeration performance in the fishing port.

It is important to note that the more even weightage distribution between knowledge (38%), skills (32%), and attitudes (30%) (Table 5) suggests that the competency dimensions contribute to the overall performance in an equally important way. The composite score calculation model created in this research will allow organizations to calculate overall competency score and analyze gaps in particular dimensions quantitatively. The proposed approach can serve as a basis for evaluating the performance of enumerators by means of using validated indicators with the required weightage. Although the application of the framework for calculating gaps between performance and expectations is outside the scope of this research, the proposed design proves its feasibility as a diagnostic tool in terms of performance–expectation gap analysis.

Finally, the competency framework generated by this study serves as an organized foundation for the development of human resources within a fishing port, covering aspects such as recruitment requirements, training programs, and regular performance evaluations. The framework establishes a competency-based system with established criteria and proportional

weightings among the three dimensions of knowledge, skills, and attitude, which is not explicitly mentioned in any existing enumerator manuals. With its application to competency-based frameworks, the current study provides a viable method to help facilitate competency assessment within post-production PNBP governance.

CONCLUSION

The competency-based framework for the PNBP system in the post-production phase at PPS Nizam Zahman has been developed based on Design Science Research (DSR). The systematic process included reviewing literature, regulatory documents, and expert validation leading to the development of a total of 22 competency indicators divided into knowledge, skills, and attitudes dimensions, emphasizing the need for a multidimensional framework where knowledge is the most emphasized dimension. This framework can serve as a foundation for competency-based human resources management in fisheries port by facilitating the development of requirements, training programs, and performance evaluations. The proposed competency framework will facilitate measuring competency levels through the scoring model. However, further studies are required to explore how the framework can be used in practice.

SUGGESTION

The competence framework should be utilized by the Directorate General of Capture Fisheries to make choices about, design, evaluate, and decide on the enumeration of fisherfolk at the fishing port.

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