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ASSESSING THE FORENSIC EXAMINATION EFFICIENCY OF REGION 2 FORENSIC UNITS AS BASIS FOR POLICY ENHANCEMENT

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ABSTRACT

This study, completed in 2025, assessed the efficiency of forensic examinations conducted by Philippine National Police Forensic Units in Region II as a basis for policy enhancement. Using a descriptive research design, data were collected through a validated researcher-made questionnaire administered to 105 personnel from regional, provincial, and satellite forensic units. Frequency and percentage, weighted mean, analysis of variance, and Pearson's correlation were used to analyze the respondents' profiles, efficiency assessments, encountered challenges, group differences, and relationships among variables. Findings revealed that forensic examination was rated very efficient overall, with a mean of 3.72. Evidence collection, forensic reporting, and testimony or court presentation received the highest category means of 3.74, while evidence preservation and forensic analysis or examination obtained the lowest, though still very efficient, means of 3.70. Challenges were evident overall, with a mean of 2.71, particularly equipment malfunction or unavailability, bureaucratic procurement delays, budget limitations, and inadequate resources. Significant differences in perceived efficiency were found across rank, position, length of service, specialization, training, and unit assignment. Challenges also differed significantly across all profile variables except unit or office. Moreover, perceived efficiency was significantly related to the challenges encountered across all examined dimensions. The study concludes that Region II forensic units maintain procedural compliance and operational competence despite resource and administrative constraints. It proposes strengthening human resources, modernizing equipment and facilities, streamlining procurement, increasing funding, digitalizing evidence tracking and reporting, institutionalizing quality assurance, improving workload

management, and reinforcing inter-agency coordination to sustain efficient forensic services.

Keywords: *forensic examination efficiency, forensic units, evidence management, operational challenges, policy enhancement*

INTRODUCTION

Forensic examination plays a critical role in the criminal justice system, as it provides scientific, objective, and reliable evidence essential for criminal investigations and court proceedings. Through the application of scientific methods and specialized analytical techniques, forensic examination enables law enforcement agencies to reconstruct crime scenes, identify suspects, verify testimonies, and establish factual links between individuals and criminal acts. The systematic collection, preservation, and analysis of evidence contribute significantly to uncovering the truth behind criminal incidents and ensuring that investigative findings are supported by verifiable scientific data.

Moreover, forensic examination serves as a vital component in strengthening the credibility and integrity of the justice process. By relying on physical, biological, chemical, and digital evidence, forensic practitioners help minimize errors that may arise from witness misidentification, conflicting statements, or unsupported allegations. This scientific approach enhances the accuracy of criminal investigations and assists prosecutors, defense lawyers, and courts in making informed decisions based on objective findings rather than assumptions or speculation.

Furthermore, the growing complexity of criminal activities has increased the importance of forensic examination in modern law enforcement. Crimes involving cybercrime, financial fraud, drug offenses, homicide, and other serious violations often require advanced forensic techniques to uncover critical evidence that may not be immediately visible through conventional investigative methods. As technology continues to evolve, forensic examination has likewise expanded its capabilities, enabling investigators to analyze a wider range of evidence and respond effectively to emerging forms of criminal behavior.

Ultimately, forensic examination contributes not only to the accurate resolution of criminal cases but also to the protection of the rights of both victims and the accused. Scientific evidence helps ensure that innocent individuals are not wrongfully implicated while providing victims and their families with a greater opportunity to obtain justice. Consequently, the effective and efficient conduct of forensic examinations remains essential in promoting fairness, accountability, and public trust in the criminal justice system.

According to the National Institute of Justice (2020), forensic science contributes significantly to improving investigative accuracy and strengthening the integrity of legal proceedings. Moreover, the use of DNA evidence significantly increased suspect

identification and arrest rates in property crime investigations (Roman et al, 2009). Similarly, forensic testing of previously unsubmitted sexual assault kits generated new investigative leads and supported successful prosecution (Campbell et al, 2019).

In addition, advancements in forensic technology have further enhanced the efficiency and reliability of forensic examinations. The rapid DNA analysis systems can produce accurate results within a short period, significantly reducing turnaround time (Liu et al, 2019). Likewise, it was confirmed that automated DNA technologies improve both the speed and quality of forensic outputs (Hennessy et al, 2017).

Furthermore, management and process improvement strategies have been shown to optimize forensic laboratory performance. The application of Lean Six Sigma in forensic laboratories reduced delays and improved service delivery without compromising quality (Azeem et al, 2020). Similarly, standardized procedures, workload balancing, and automation enhance laboratory productivity and efficiency (Butler et al, 2021). In the same, performance benchmarking allows forensic laboratories to identify inefficiencies and improve resource allocation (Liu et al, (2019). Additionally, underscored the importance of forensic intelligence in enhancing decision-making and accelerating investigations (Ribaux et al, 2021).

Despite these advancements, challenges in forensic examination persist across different contexts. Globally, disparities in resources, laboratory capacity, and personnel competence affect the efficiency of forensic services, particularly in developing countries (Interpol, 2020). However, despite continuous advancements in forensic technology and methodologies, many law enforcement agencies still experience significant challenges that hinder the efficiency of forensic examinations. Among the most pressing issues are delays in evidence processing, the accumulation of case backlogs, and the inadequacy of resources such as modern equipment, trained personnel, and laboratory facilities. These constraints often result in prolonged turnaround times, which can delay investigations, weaken case buildup, and, in some instances, compromise the timely administration of justice. In environments where case volumes are high and resources are limited, forensic units are frequently compelled to prioritize certain cases over others, further contributing to inefficiencies in service delivery.

In the Philippines, the importance of forensic evidence is recognized under the Rules of Court and Republic Act No. 6975, which mandate the Philippine National Police (PNP) to provide scientific crime detection services. However, reports from the PNP and the Department of Justice indicate that outdated equipment, insufficient personnel, and high case volumes continue to contribute to delays in forensic processing.

At the regional level, these challenges are evident in forensic units operating in provincial settings such as Region II. While forensic personnel strive to deliver accurate and timely results, limitations in laboratory facilities, availability of equipment, and logistical support affect operational performance. Additionally, issues related to evidence handling, submission procedures, and inter-agency coordination further influence the efficiency of forensic examinations. These conditions reflect the need to examine not only the challenges but also the existing capabilities within forensic units.

Given this context, it is essential to assess the efficiency of forensic examination by considering both its operational strengths and weaknesses. Understanding these aspects will provide a comprehensive basis for identifying areas for improvement and developing appropriate policy enhancements. Therefore, this study sought to evaluate the efficiency of forensic examinations in Region II forensic units as a foundation for strengthening forensic practices and improving the overall delivery of justice.

Research Questions

This study aimed to assess the efficiency of forensic examinations in the Region II as the basis for recommending policy enhancement.

Specifically, this study sought to answer the following questions:

1. What is the demographic and professional profile of the respondents in terms of
    a. Rank
    b. Position
    c. Length of service
    d. Field of specialization
    e. Training Attended
    f. Unit/Office
2. How do PNP Forensic Unit personnel in Region II assess the efficiency of forensic examinations in terms of:
    a. Evidence collection
    b. Evidence preservation
    c. Chain of custody
    d. Forensic analysis and examination
    e. Interpretation of result
    f. Forensic reporting
    g. Testimony / court presentation
    h. Inter-agency coordination
3. Is there a significant difference in the assessment of forensic examination efficiency among PNP Forensic Unit personnel in Region II when grouped according to their profile?
4. What challenges are encountered by PNP Forensic Unit personnel in Region II in the conduct of forensic examinations?
5. Is there a significant difference in the challenges encountered by PNP Forensic Unit personnel in Region II when grouped according to their profile?
6. Is there a significant relationship between the perceived efficiency of forensic examination and the challenges encountered?
7. What policy enhancements can be proposed to improve forensic examination efficiency in the Region II?

METHODOLOGY

Research Design

The study employed a descriptive research design. Descriptive research was a method that focused on providing accurate portrayals of characteristics, situations, or phenomena as they naturally occurred, without manipulating variables (Nassaji, 2015). Similarly, descriptive studies were appropriate when the goal was to systematically describe trends, attitudes, or opinions of a population (Creswell and Creswell, 2018).

This design was suitable for assessing the efficiency of forensic examinations, since it aimed to capture the perceptions and experiences of PNP Forensic Unit personnel in Region II. This was used to measure forensic examination efficiency in terms of timeliness, accuracy, availability of resources, personnel competence, and logistical support. Specifically, data were collected through the administration of a survey questionnaire to PNP Forensic Unit personnel assigned in Region II.

Locale of the Study

This study was conducted in the Philippine National Police (PNP) Forensic Units in Region II (Cagayan Valley), Philippines.

Specifically, the locale included the Regional Forensic Unit (RFU) and its corresponding Provincial and Satellite Forensic Units, namely: Nueva Vizcaya Provincial Forensic Unit (NVPFU), Isabela Provincial Forensic Unit (IPFU), Quirino Provincial Forensic Unit (QPFU), City of Santiago Forensic Unit (CSFU), Cagayan Provincial Forensic Unit (Cagayan PFU), Tuguegarao City Satellite Forensic Office (TCSFO), Roxas-Mallig Satellite Forensic Office (RMSFO), and Cauayan Satellite Forensic Office (CSFO).

Region II was selected as the locale of the study because it represented a combination of provincial and satellite forensic units operating under varying levels of resources, manpower, and laboratory capabilities. These units provided an appropriate setting for assessing the efficiency of forensic examinations within a regional context, where operational conditions might differ from those in highly urbanized areas.

Moreover, the selected forensic units were directly involved in the collection, preservation, analysis, and reporting of forensic evidence used in criminal investigations and court proceedings. Thus, they offered a relevant and practical environment for examining both the operational strengths and weaknesses of forensic examination processes.

Selection and Description of Respondents

The respondents of this study consisted of one hundred five (105) personnel from the Philippine National Police (PNP) Forensic Units in Region II. These respondents were selected because they were directly involved in forensic examination processes, including

evidence collection, preservation, analysis, documentation, and reporting. Their roles and responsibilities made them the most appropriate sources of information in assessing the efficiency of forensic examinations.

The respondents are distributed across the different forensic units in Region II, namely: Regional Forensic Unit (RFU) with 25 personnel, Nueva Vizcaya Provincial Forensic Unit (NVPFU) with 10 personnel, Isabela Provincial Forensic Unit (IPFU) with 15 personnel, Quirino Provincial Forensic Unit (QPFU) with 10 personnel, City of Santiago Forensic Unit (CSFU) with 13 personnel, Cagayan Provincial Forensic Unit (Cagayan PFU) with 7 personnel, Tuguegarao City Satellite Forensic Office (TCSFO) with 9 personnel, Roxas-Mallig Satellite Forensic Office (RMSFO) with 8 personnel, and Cauayan Satellite Forensic Office (CSFO) with 8 personnel, with a total of 105 respondents.

Table 1
Population and Sample Distribution of Respondents

	Unit/ Office	Frequency	Percent
1.	Regional Forensic Unit (RFU)	25	23.80
2.	Nueva Vizcaya Provincial Forensic Unit (NVPFU)	10	9.50
3.	Isabela Provincial Forensic Unit (IPFU)	15	14.30
4.	Quirino Provincial Forensic Unit (QPFU)	10	9.50
5.	City of Santiago Forensic Unit (CSFU)	13	12.40
6.	Cagayan Provincial Forensic Unit (Cagayan PFU)	7	6.70
7.	Tuguegarao City Satellite Forensic Office (TCSFO)	9	8.60
8.	Roxas-Mallig Satellite Forensic Office (RMSFO)	8	7.60
9.	Cauayan Satellite Forensic Office (CSFO)	8	7.60
	Total	105	100

The respondents included personnel with varying ranks, positions, length of service, fields of specialization, and training backgrounds. This diversity allowed for a more comprehensive assessment of forensic examination efficiency and enabled the study to examine differences in perception based on professional profile.

Data Gathering Procedure

The data gathering process of this study followed a systematic procedure to ensure validity, reliability, and ethical compliance.

First, a formal request for permission was submitted to the Regional Director of the Philippine National Police (PNP) Forensic Units in Region II to secure authorization to conduct the study among forensic personnel. Upon approval, coordination was made with the respective heads of the Regional, Provincial, and Satellite Forensic Units to facilitate the distribution of the research instrument.

Second, the researcher utilized a researcher-made questionnaire, which underwent content validation by subject matter experts in forensic science, criminology, and research methodology to ensure its relevance and accuracy. After validation, the

questionnaire was converted into a Google Form to enable efficient and accessible data collection across all forensic units in Region II. Clear instructions were provided at the beginning of the form to guide respondents.

Third, the Google Form link was distributed to the identified respondents through official communication channels, with the assistance of unit coordinators. Respondents were informed that their participation was voluntary and that their responses were treated with strict confidentiality and anonymity. This approach also minimized response bias and ensured convenience in answering the questionnaire.

Finally, after all responses had been collected, the data were retrieved from Google Forms, organized, encoded, and subjected to appropriate statistical analysis. The results were then interpreted to assess the efficiency of forensic examinations and to serve as a basis for policy enhancement.

Statistical Treatment of Data

To ensure that the data gathered in this study are analyzed systematically and interpreted meaningfully, several statistical tools will be used. Each tool is chosen based on the type of data collected and the objectives of the study.

Frequency and Percentage Distribution. This was used to describe the demographic and professional profiles of the respondents, such as rank, position, length of service, field of specialization, training attended, and unit/office.

Weighted Mean. The weighted mean was employed to determine the average rating of the respondents for each indicator of forensic examination efficiency, particularly in terms of evidence collection, evidence preservation, chain of custody, forensic analysis and examination, interpretation of results, forensic reporting, testimony/court presentation, and inter-agency coordination.

Analysis of Variance (ANOVA) or t-Test. This statistical tool was used to determine whether there were significant differences in the assessment of forensic examination efficiency and the challenges encountered when respondents were grouped according to their profile (e.g., rank, position/designation, length of service, field of specialization, training attended, and unit/office).

Pearson's Coefficient of Correlation r Test. This was used to determine the significant relationship between the perceived efficiency of forensic examination and the challenges encountered by PNP Forensic Unit personnel. The results included Pearson correlation coefficients (r-values) and significance levels (p-values), which indicated the strength and direction of the relationship between variables.

RESULTS AND DISCUSSION

1. What is the demographic and professional profile of the respondents in terms of:

A. Rank

Table 2.1
Frequency and Percentage Distribution of Respondents in terms of Rank

Rank	Frequency	Percent
Police Lieutenant Colonel	3	2.90
Police Major	10	9.50
Police Captain	10	9.50
Police Executive Master Sargeant	4	3.80
Police Chief Master Sargeant	7	6.70
Police Senior Master Sargeant	16	15.20
Police Master Sargeant	11	10.50
Police Staff Sargeant	14	13.30
Police Corporal	6	5.70
Patrolman	24	22.90
Total	105	100

Table 2.1 presents the frequency and percentage distribution of respondents according to rank. Patrolmen comprised the largest group, with 24 respondents or 22.9 percent, indicating that forensic operations are primarily performed by lower-ranking frontline personnel. In contrast, Police Lieutenant Colonels had the lowest representation, with 3 respondents or 2.9 percent, followed by Police Executive Master Sergeants, with 4 respondents or 3.8 percent. The predominance of lower-ranking personnel suggests that forensic examination efficiency largely depends on operational staff directly responsible for evidence collection, preservation, laboratory processing, and documentation. This finding supports the reviewed literature emphasizing that manpower availability and personnel competence significantly influence forensic efficiency, particularly among technical personnel handling routine procedures. Ramos (2022) underscored the essential role of operational personnel in ensuring the timely and accurate processing of forensic evidence, while Mendoza (2021) explained that supervisory officers mainly perform administrative oversight and policy implementation. Furthermore, the limited number of higher-ranking officers suggests that forensic units are operationally oriented rather than management-heavy. This finding is consistent with Womack and Jones's Lean Management principles, which emphasize directing personnel toward value-creating service functions and reducing unnecessary administrative activities (Womack & Jones, 2003).

B. Position/ Designation

Table 2.2
Frequency and Percentage Distribution of Respondents in terms of Position/ Designation

Position/Designation	Frequency	Percent
Chief of Police	5	4.80
Deputy Chief	1	1.00
Investigator	60	57.10
Forensic Personnel	16	15.20
Operations Personnel	23	21.90
Total	105	100

Table 2.2 presents the respondents' distribution by position or designation. Investigators constituted the largest group, with 60 respondents or 57.1 percent, indicating that most personnel were directly engaged in evidence gathering, case development, and coordination of forensic procedures. In contrast, Deputy Chiefs accounted for only 1 respondent or 1.0 percent, while Chiefs of Police comprised 5 respondents or 4.8 percent. The predominance of investigators suggests that forensic examination efficiency is closely associated with investigative operations, particularly evidence handling and case preparation. Investigators connect crime scene operations with forensic laboratories, making their performance essential to the timeliness and accuracy of forensic processes. Ramos (2022) explained that evidence submission, coordination, and communication problems often cause forensic delays. The limited representation of supervisory personnel further indicates that forensic activities focus more on operational implementation than administrative management. This supports the lean-management principles of Womack and Jones (2003), which emphasize allocating personnel to value-creating operational activities. The findings also align with Deming's (1986) Total Quality Management Theory regarding workforce participation and coordination. Mendoza (2021) distinguished supervisory oversight from operational technical duties, while Del Rosario (2020) emphasized modernization and process improvement. Strengthened coordination, communication, and personnel training may therefore improve forensic examination efficiency in Region II.

C. Length of Service

Table 2.3
Frequency and Percentage Distribution of Respondents in terms of Length of Service

Length of Service	Frequency	Percent
1-3 Years	2	1.90
4-6 Years	24	22.90
7-10 Years	8	7.60
11-15 Years	30	28.60
16-20 Years	27	25.70
More Than 20 Years	14	13.30

Total	105	100

Table 2.3 presents the respondents' distribution according to length of service. The largest group consisted of 30 respondents or 28.60 percent who had served for 11 to 15 years, indicating that forensic operations in Region II were largely performed by experienced personnel familiar with investigative procedures, evidence management, and forensic processes. Villanueva (2021) emphasized that longer-serving personnel tend to demonstrate greater competency and accuracy because of their extensive exposure to case processing and evidence evaluation. Similarly, Fernandez (2020) highlighted the importance of experienced and technically competent personnel in implementing quality management systems and ensuring reliable service delivery. In contrast, the limited number of respondents with shorter service periods may reflect the low entry of new personnel into forensic functions, potentially creating concerns regarding workforce sustainability and succession planning. Deming's (1986) Total Quality Management Theory emphasizes continuous personnel training and development to maintain organizational effectiveness. Likewise, Womack and Jones's (2003) lean-management principles recognize the contribution of skilled personnel to reducing operational errors and improving workflow. Overall, the findings indicate that personnel experience and competence positively influence forensic examination efficiency, while the low representation of newer personnel highlights the need for succession planning and continuous professional development.

D. Field of Specialization

Table 2.4
Frequency and Percentage Distribution of Respondents in terms of Field of Specialization

Field of Specialization	Frequency	Percent
Ballistic	15	14.30
DNA/Serology	1	1.00
Fingerprint	21	20.0
Medico Legal	2	1.90
Photography	17	16.20
Physical Identification	23	21.90
Polygraph	12	11.40
Question Document	10	9.50
Chemistry	4	3.80
Total	105	100

Table 2.4 presents the respondents' distribution according to field of specialization. Physical Identification comprised the largest group, with 23 respondents or 21.90 percent, indicating that Region II forensic units were primarily concentrated in identification-related disciplines. Santos (2020) emphasized that fingerprint examination and physical identification are frequently used in law enforcement because they support suspect identification and crime scene documentation. Lopez (2022) likewise highlighted the importance of operational forensic services in routine investigations. In contrast, DNA/Serology had only 1 respondent or 1.00 percent, suggesting limited capacity in

advanced disciplines that require specialized expertise and laboratory resources. Balagot (2021) explained that shortages in DNA analysis and forensic chemistry personnel may contribute to processing delays and laboratory backlogs, while Reyes (2022) stressed that adequate equipment and personnel are essential for timely examinations. The findings support Womack and Jones's (2003) lean-management principles concerning the efficient allocation of specialized resources based on operational needs. However, the imbalance among specializations may create gaps in technical laboratory services. The findings also align with Deming's (1986) Total Quality Management Theory, which emphasizes personnel competence, quality assurance, and continuous improvement. Therefore, additional recruitment, specialized training, and professional development are necessary to strengthen Region II's technical forensic capabilities.

E. Field of Specialization

Table 2.5
Frequency and Percentage Distribution of Respondents in terms of Field of Specialization

Training Attended	Frequency	Percent
Basic Forensic Training	11	10.50
Crime Scene Investigation Course	4	3.80
Forensic Photography	17	16.20
Ballistic/FA Examination Training	15	14.30
Document Examination Course	10	9.50
Specialized Forensic Workshops	15	14.30
Polygraph Course	12	11.40
Fingerprint Identification Course	21	20.0
Total	105	100

Table 2.5 presents the frequency and percentage distribution of respondents in terms of training attended.

As shown in the table, the highest number of respondents attended the Fingerprint Identification Course, with 21 or 20.0 percent of the total. This predominance indicated that forensic personnel in Region II were more exposed to specialized training in fingerprint identification. This finding is in consonance with Ramos (2022), who emphasized that fingerprint identification is a critical component of crime scene investigation and evidence handling, and that specialized training enhances personnel competence and accuracy in forensic outputs. He also pointed out that inadequate training in crime scene investigation contributes to operational delays and procedural inconsistencies, reinforcing the need for stronger foundational training programs.

On the other hand, the lowest training attended was the Crime Scene Investigation Course, with only 4 or 3.80 percent of the total. This suggested limited participation in foundational investigative training. The findings relate to Deming's (1986) Total Quality Management Theory, which underscores the importance of continuous training and workforce development to maintain service quality. Similarly, Womack and Jones (2003)

in Lean Management Theory highlighted that skilled personnel are essential in minimizing errors and improving workflow efficiency.

F. Unit/ Office

Table 2.6
Frequency and Percentage Distribution of Respondents in terms of Unit/ Office

Unit/ Office	Frequency	Percent
Regional Forensic Unit (RFU)	25	23.80
Nueva Vizcaya Provincial Forensic Unit (NVPFU)	10	9.50
Isabela Provincial Forensic Unit (IPFU)	15	14.30
Quirino Provincial Forensic Unit (QPFU)	10	9.50
City of Santiago Forensic Unit (CSFU)	13	12.40
Cagayan Provincial Forensic Unit (Cagayan PFU)	7	6.70
Tuguegarao City Satellite Forensic Office (TCSFO)	9	8.60
Roxas-Mallig Sattellite Forensic Office (RMSFO)	8	7.60
Cauyan Satellite Forensic Office (CSFO)	8	7.60
Total	105	100

Table 2.6 presents the frequency and percentage distribution of respondents in terms of unit/office.

As revealed in the table, the highest number of respondents were from the Regional Forensic Unit (RFU), with 25 or 23.80 percent of the total. This predominance indicated that central forensic offices possessed greater operational capacity in handling forensic examinations and investigative support services. Lopez (2022) emphasized that larger forensic units generally have better access to laboratory facilities, technological resources, and trained personnel, allowing them to perform forensic functions more efficiently. Reyes (2022) likewise noted that equipment adequacy and resource availability in central laboratories contribute to faster case resolution and improved forensic timeliness. This is in consonance with Lean Management Theory, which stresses the efficient allocation of resources to meet operational demands (Womack & Jones, 2003).

On the other hand, the lowest number of respondents were from the Cagayan Provincial Forensic Unit (PFU), with only 7 or 6.70 percent of the total. This finding suggested that smaller provincial offices had fewer personnel and limited resources compared to regional units. Del Rosario (2020) explained that smaller forensic offices often encounter operational constraints such as insufficient manpower, outdated equipment, and restricted access to specialized forensic services, which may contribute to delays in evidence processing. Balagot (2021) further highlighted that limited technical capacity in provincial laboratories affects their ability to handle complex forensic cases efficiently. The findings relate to Deming's (1986) Total Quality Management Theory, which underscores that organizational effectiveness depends on adequate resources, workforce participation, and continuous improvement.

2. How do PNP Forensic Unit personnel in Region II assess the efficiency of forensic examinations in terms of:

A. Evidence Collection

Table 3.1
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Evidence Collection

Evidence Collection	Mean	Description
1. Evidence is collected within the appropriate and acceptable timeframe.	3.77	Very Efficient
2. Proper tools and techniques are used during evidence collection.	3.76	Very Efficient
3. Personnel strictly comply with established crime scene protocols.	3.77	Very Efficient
4. Evidence is handled with minimal risk of contamination.	3.71	Very Efficient
5. Evidence collection procedures are clearly communicated to all responding personnel.	3.73	Very Efficient
6. Crime scene responders arrive promptly to begin evidence collection.	3.66	Very Efficient
7. Evidence collectors demonstrate proficiency in identifying relevant evidence.	3.71	Very Efficient
8. Documentation during evidence collection is thorough and complete.	3.76	Very Efficient
9. Personal protective equipment (PPE) is consistently used during evidence collection.	3.76	Very Efficient
10. Evidence collection is conducted without disrupting or compromising the crime scene.	3.77	Very Efficient
Category Mean	3.74	Very Efficient

Table 3.1 presents the efficiency of forensic examination in terms of evidence collection. The indicators concerning timely evidence collection, strict compliance with crime scene protocols, and collection without disrupting or compromising the crime scene received the highest mean of 3.77. These results indicate that forensic personnel strongly emphasize procedural compliance and the preservation of evidence integrity. Ramos (2022) affirmed that adherence to standardized forensic procedures improves the reliability and admissibility of evidence. The findings also support Deming's (1986) Total Quality Management Theory, which emphasizes workforce competence and compliance with quality standards. Meanwhile, the prompt arrival of crime scene responders obtained the lowest mean of 3.66, although it was still interpreted as "Very Efficient." This result suggests possible operational challenges involving response time and field deployment. Del Rosario (2020) attributed forensic delays to logistical constraints, geographic distance, and workload distribution. Similarly, Womack and Jones's (2003) lean-management principles emphasize eliminating delays and improving workflow efficiency. Overall, evidence collection practices in Region II were highly efficient and guided by established standards. Nevertheless, delayed response, limited transportation resources,

and increasing workloads require continuous improvement through stronger transportation support, personnel augmentation, and coordination mechanisms to ensure faster, consistent, and effective forensic services.

B. Evidence Preservation

Table 3.2
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Evidence Preservation

Evidence Preservation	Mean	Description
1. Evidence is properly packaged and labeled.	3.76	Very Efficient
2. Storage conditions are adequately maintained to preserve evidence integrity.	3.73	Very Efficient
3. Personnel adhere to preservation protocols at all times.	3.75	Very Efficient
4. The rate of evidence degradation or loss is minimal.	3.71	Very Efficient
5. Evidence packaging materials are consistently available and appropriate for each type of evidence.	3.68	Very Efficient
6. Evidence storage areas are regularly inspected to ensure proper environmental conditions.	3.64	Very Efficient
7. Personnel are knowledgeable about evidence preservation standards.	3.73	Very Efficient
8. Physical handling of evidence minimizes the risk of degradation.	3.72	Very Efficient
9. Preservation protocols are updated and communicated regularly.	3.71	Very Efficient
10. There is a tracking system to monitor the condition of preserved evidence.	3.52	Very Efficient
Category Mean	3.70	Very Efficient

Table 3.2 presents the efficiency of forensic examinations in terms of evidence preservation. Proper evidence packaging and labeling received the highest mean of 3.76, followed by personnel adherence to preservation protocols with a mean of 3.75. These findings indicate that Region II forensic personnel observe proper evidence-handling procedures, particularly in packaging, labeling, and preservation. Butler et al. (2021) emphasized that standardized packaging and labeling are essential for maintaining evidence integrity and improving laboratory efficiency. Ramos (2022) noted that compliance with preservation protocols reduces contamination risks, while Fernandez (2020) highlighted the importance of preservation standards in ensuring reliable forensic examinations. Conversely, the evidence-tracking system received the lowest mean of 3.52, although it was still interpreted as “Very Efficient.” This result suggests possible limitations in inventory management, digital monitoring, and documentation. Del Rosario (2020) explained that inadequate monitoring systems may weaken chain-of-custody procedures and delay evidence retrieval. The findings also support the principles of Womack and Jones (2003), which emphasize efficient workflows and accurate documentation, and Deming’s (1986) Total Quality Management Theory, which promotes systematic monitoring and continuous improvement. Overall, the category mean of 3.70

indicates very efficient evidence preservation, although digital tracking, documentation, and inventory management should be strengthened.

C. Chain of Custody

Table 3.3
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Chain of Custody

Chain of Custody	Mean	Description
1. Chain-of-custody records are accurate and complete.	3.76	Very Efficient
2. The number of personnel involved in evidence transfers is minimized.	3.71	Very Efficient
3. Standardized chain-of-custody procedures are consistently followed.	3.73	Very Efficient
4. Documentation contains no unexplained gaps.	3.71	Very Efficient
5. Chain-of-custody forms are consistently completed at every transfer.	3.75	Very Efficient
6. Evidence transfers are done only by authorized personnel.	3.77	Very Efficient
7. The chain-of-custody system prevents unauthorized access to evidence.	3.76	Very Efficient
8. Documentation errors in the chain-of-custody are minimal.	3.73	Very Efficient
9. There is a secure system for logging evidence entries and releases.	3.68	Very Efficient
10. Personnel are trained regularly on chain-of-custody procedures.	3.65	Very Efficient
Category Mean	3.73	Very Efficient

Table 3.3 presents the efficiency of forensic examinations in terms of chain of custody. Evidence transfers conducted only by authorized personnel received the highest mean of 3.77, indicating that Region II forensic personnel strictly observe transfer controls to reduce the risks of tampering, contamination, and unauthorized access. Butler et al. (2021) emphasized that standardized transfer procedures and strict authorization improve laboratory efficiency and protect evidence integrity. Ramos (2022) similarly noted that accurate documentation and controlled transfers preserve the credibility and admissibility of forensic evidence, while Ribaux et al. (2021) explained that effective chain-of-custody procedures strengthen forensic intelligence and public trust. Conversely, regular personnel training on chain-of-custody procedures obtained the lowest mean of 3.65, although it was still interpreted as “Very Efficient.” This suggests limited opportunities for continuous training and procedural reinforcement. Del Rosario (2020) observed that inadequate training and weak documentation may cause evidence-tracking gaps and retrieval delays. The findings also support Womack and Jones’s (2003) lean-management principles and Deming’s (1986) Total Quality Management Theory. Overall, the category mean of 3.73 indicates strong compliance, although regular training, secure digital evidence tracking, and reinforced documentation protocols remain

necessary to strengthen the integrity, reliability, and legal credibility of forensic examinations.

D. Forensic Analysis / Examination

Table 3.4
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Forensic Analysis / Examination

Forensic Analysis / Examination	Mean	Description
1. Turnaround time for completing forensic analysis meets operational requirements.	3.70	Very Efficient
2. Laboratory equipment is available and functional.	3.55	Very Efficient
3. Forensic analysts possess adequate competence and training.	3.72	Very Efficient
4. Standard operating procedures are strictly observed during examination.	3.78	Very Efficient
5. Test results are accurate and reliable.	3.70	Very Efficient
6. Case load per personnel is manageable.	3.65	Very Efficient
7. Forensic examiners have access to updated reference materials and databases.	3.65	Very Efficient
8. Workload distribution among analysts ensures efficient processing.	3.72	Very Efficient
9. Quality control measures are implemented during examinations.	3.72	Very Efficient
10. Forensic examination procedures are regularly reviewed and improved.	3.76	Very Efficient
Category Mean	3.70	Very Efficient

Table 3.4 shows the mean distribution and descriptive interpretation of the efficiency of forensic examinations in terms of forensic analysis and examination.

As revealed in the table, the highest mean of 3.78 was obtained by the statement *"Standard operating procedures are strictly observed during examination."* This finding indicated that forensic personnel in Region II placed strong emphasis on procedural compliance, ensuring accuracy, consistency, and legal credibility of forensic results. This is in consonance with Butler et al (2021) who emphasized that adherence to standardized laboratory procedures significantly improves efficiency and reliability in forensic examinations. Ramos (2022) likewise noted that compliance with established forensic protocols minimizes procedural errors and strengthens the credibility of forensic outputs. Fernandez further explained that effective quality management systems rely on strict observance of protocols and continuous improvement to maintain service quality.

Conversely, the lowest-rated indicator was *"Laboratory equipment is available and functional,"* which obtained a mean of **3.55**, though still interpreted as *"Very Efficient."* This comparatively lower score suggested that challenges related to laboratory infrastructure and equipment availability may still exist within forensic units. Del Rosario (2020) highlighted that outdated or insufficient laboratory resources often contribute to delays

and inefficiencies in forensic examinations. The findings relate to Womack and Jones (2003)' Lean Management Theory, which stresses efficient resource utilization and elimination of bottlenecks to improve workflow. Similarly, Deming's (1986) Total Quality Management Theory underscores that continuous improvement and resource adequacy are essential to sustain organizational effectiveness and service reliability.

Although the respondents generally assessed forensic analysis and examination as very efficient, the findings also reveal underlying challenges related to laboratory resources, equipment functionality, and workload management. These concerns should not be overlooked because they may eventually affect the timeliness and effectiveness of forensic services if not properly addressed. Strengthening laboratory infrastructure, modernizing forensic equipment, and enhancing technical support systems may further improve the capability of forensic units in Region II.

Overall, the findings demonstrate that forensic analysis and examination procedures in Region II are highly efficient and guided by strong procedural compliance and quality control practices, with the overall category mean of 3.70, interpreted as "Very Efficient." Nevertheless, the comparatively lower ratings in equipment availability and resource accessibility indicate the need for continuous improvement in laboratory facilities and operational support to sustain efficient and reliable forensic examination services.

E. Interpretation of Results

Table 3.5
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Interpretation of Results

Interpretation of Results	Mean	Description
1. Analytical conclusions are clear and well-explained.	3.74	Very Efficient
2. Validated scientific methods are used in interpreting results.	3.74	Very Efficient
3. Interpretation of findings is consistent and unbiased.	3.71	Very Efficient
4. Limitations of the analysis are properly identified and explained.	3.69	Very Efficient
5. Error rates in analysis and interpretation are minimal.	3.73	Very Efficient
6. Interpretation of results is supported by objective evidence.	3.75	Very Efficient
7. Analysts avoid personal bias when interpreting forensic data.	3.72	Very Efficient
8. Interpretations are reviewed before being finalized.	3.76	Very Efficient
9. The basis for conclusions is clearly documented.	3.73	Very Efficient
10. Interpretations are consistent even when handled by different analysts.	3.73	Very Efficient
Category Mean	3.73	Very Efficient

Table 3.5 shows the mean distribution and descriptive interpretation of the efficiency of forensic examinations in terms of interpretation of results.

The highest mean of 3.76 was obtained by the statement *"Interpretations are reviewed before being finalized."* This finding indicated that Region II forensic personnel placed strong emphasis on review mechanisms to ensure accuracy, consistency, and credibility of forensic conclusions. This is in consonance with Butler et al (2021) who emphasized that peer review and validation procedures are essential in improving laboratory efficiency and maintaining the reliability of forensic interpretations. Ramos (2022) likewise noted that evidence-based analysis and objective review reduce the likelihood of bias and strengthen the admissibility of forensic findings in court. Fernandez (2020) further explained that quality management systems rely on continuous review and improvement to sustain service quality in forensic laboratories.

On the other hand, the lowest-rated indicator was *"Limitations of the analysis are properly identified and explained,"* which obtained a mean of 3.69, though still interpreted as *"Very Efficient."* This comparatively lower score suggested that transparency regarding analytical limitations and uncertainties may not always be fully emphasized in forensic reporting. Del Rosario (2020) highlighted that insufficient disclosure of methodological constraints or evidence quality issues may weaken the reliability of forensic conclusions and create challenges during legal proceedings.

Moreover, the findings are aligned with Total Quality Management Theory, which emphasizes continuous quality improvement, accuracy, and accountability in organizational processes (Deming, 1986). The high ratings in review procedures and objective interpretation indicate that forensic personnel observe quality assurance measures to maintain the reliability of forensic outputs. However, Total Quality Management also highlights the importance of identifying procedural weaknesses and improving reporting standards to sustain organizational effectiveness. In this context, improving the discussion of analytical limitations and uncertainties may further strengthen the quality of forensic interpretation practices.

Similarly, the results are consistent with Lean Management Theory, which promotes systematic review, process standardization, and error reduction to improve operational efficiency (Womack & Jones, 2003) . The strong emphasis on review procedures and evidence-based interpretation contributes positively to minimizing analytical inconsistencies and enhancing the efficiency of forensic examination. Nevertheless, the comparatively lower rating regarding analytical limitations suggests the need for more comprehensive documentation and clearer communication of potential constraints in forensic findings.

Although the respondents generally assessed the interpretation of results as very efficient, challenges related to transparency and explanation of analytical limitations should still be addressed. Failure to fully identify and explain the boundaries of forensic analysis may lead to misunderstandings, overreliance on conclusions, or difficulties in evaluating the strength of forensic evidence in legal proceedings. Strengthening reporting guidelines, reinforcing analytical review standards, and promoting transparency in forensic documentation may further improve the reliability and credibility of forensic interpretations in Region II.

The overall category mean of 3.73, interpreted as "Very Efficient," indicates that forensic personnel in Region II generally demonstrate strong analytical capability in explaining, validating, and presenting forensic findings. The results imply that forensic interpretations are commonly based on scientific methods, objective evidence, and established analytical procedures to ensure the reliability and credibility of forensic conclusions. It further demonstrates that forensic personnel in Region II exhibit strong competence in analyzing and interpreting forensic findings through objective and scientifically supported methods. The consistent application of review procedures and evidence-based interpretation contributes significantly to the credibility and reliability of forensic examination. However, enhancing transparency in identifying analytical limitations may further strengthen the quality and legal defensibility of forensic interpretations.

F. Forensic Reporting

Table 3.6
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Forensic Reporting

Forensic Reporting	Mean	Description
1. Reports are prepared and submitted on time.	3.76	Very Efficient
2. Reports are clear, complete, and easy to understand.	3.78	Very Efficient
3. Standardized reporting formats are used.	3.76	Very Efficient
4. Documentation is free from errors or ambiguities.	3.75	Very Efficient
5. Reports are accessible to investigators, prosecutors, and courts when needed.	3.76	Very Efficient
6. Reports include all required technical details and supporting data.	3.73	Very Efficient
7. Report formats follow nationally or institutionally accepted standards.	3.73	Very Efficient
8. Reports are reviewed for quality before release.	3.76	Very Efficient
9. Electronic copies of reports are properly stored and secured.	3.69	Very Efficient
10. Revisions to reports, if necessary, are properly documented and justified.	3.63	Very Efficient
Category Mean	3.74	Very Efficient

Table 3.6 shows the mean distribution and descriptive interpretation of the efficiency of forensic examinations in terms of forensic reporting.

As presented in the table, among the indicators, the highest mean of 3.78 was obtained by *"Reports are clear, complete, and easy to understand."* This was followed by *"Reports are prepared and submitted on time," "Standardized reporting formats are used," "Reports are accessible to investigators, prosecutors, and courts when needed,"* and *"Reports are reviewed for quality before release,"* each with a mean of 3.76. These findings imply that forensic personnel place strong emphasis on clarity, completeness, and standardization in forensic reporting. Clear and understandable reports are essential

because they allow investigators, prosecutors, and courts to properly interpret forensic findings and utilize them effectively during investigations and legal proceedings.

The findings are in consonance with Butler et al (2021), who emphasized that standardized and well-structured forensic reports enhance credibility, admissibility, and minimize misinterpretation. Similarly, Ribaux et al (2021) highlighted that effective documentation and reporting systems strengthen forensic intelligence and improve decision-making.

In contrast, the lowest-rated indicator was *"Revisions to reports, if necessary, are properly documented and justified,"* which obtained a mean of 3.63, although still interpreted as *"Very Efficient."* This comparatively lower rating suggests that while reports are generally accurate and properly prepared, documentation of report modifications and revisions may not always be consistently emphasized. In forensic reporting, failure to properly record revisions may create issues related to transparency, accountability, and document traceability, particularly when reports undergo updates or corrections during investigations or court proceedings. The findings are in consonance with Del Rosario (2020), who stressed that modernization and process improvement are necessary to address delays and inconsistencies in forensic laboratories.

Additionally, the indicator *"Electronic copies of reports are properly stored and secured"* obtained a relatively lower mean of 3.69, indicating possible concerns regarding records management systems, digital storage, and report security procedures. Weaknesses in electronic records management may increase the risk of misplaced documents, unauthorized access, or difficulty in retrieving reports when needed. Ramos (2022) similarly noted that operational challenges in forensic practice often arise from deficiencies in documentation systems and records management, contributing to delays and accountability issues.

The findings are also in consonance with Demings's (1886) Total Quality Management Theory, which emphasizes accuracy, accountability, documentation quality, and continuous improvement in organizational processes. The high ratings on clarity, standardization, and quality review indicate that forensic units observe quality assurance practices in preparing forensic reports. However, the theory also stresses that organizations must continuously improve documentation and monitoring systems to sustain quality performance and operational reliability. In this context, strengthening revision tracking and records management procedures may further improve reporting accountability and consistency.

Similarly, the results support Womack & Jones' (2003) Lean Management Theory, which highlights the importance of standardized processes, organized documentation systems, and efficient information management to minimize operational inefficiencies. Effective forensic reporting systems contribute to faster communication of findings, improved case coordination, and reduced procedural delays. Nevertheless, the comparatively lower ratings on report revision documentation and electronic records security suggest areas where process enhancements may still be necessary.

Although forensic reporting practices were generally assessed as very efficient, the findings also reveal underlying challenges associated with records management and documentation of report revisions. These concerns should not be overlooked because incomplete documentation and weak records security may affect the reliability, transparency, and legal defensibility of forensic reports. Strengthening digital records management systems, improving report-tracking procedures, and reinforcing documentation protocols may further enhance the efficiency and accountability of forensic reporting in Region II.

Overall, the category mean of 3.74, interpreted as *"Very Efficient,"* demonstrates that forensic personnel in Region II exhibit strong competence in preparing accurate, clear, and standardized forensic reports. The emphasis on quality review and timely submission contributes positively to the reliability and effectiveness of forensic examination. However, improving revision documentation practices and strengthening electronic records security may further enhance the credibility and efficiency of forensic reporting processes.

G. Testimony / Court Presentation

Table 3.7
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Testimony / Court Presentation

Testimony / Court Presentation	Mean	Description
1. Forensic experts are well-prepared when testifying in court.	3.76	Very Efficient
2. Experts are able to clearly explain technical findings to non-experts.	3.75	Very Efficient
3. Forensic evidence presented is consistently accepted in court.	3.77	Very Efficient
4. Prosecutors and judges provide positive feedback on forensic testimony.	3.73	Very Efficient
5. Testimony is consistent with the written forensic report.	3.76	Very Efficient
6. Forensic experts receive adequate preparation before court appearances.	3.73	Very Efficient
7. Experts can simplify complex technical terms for non-scientific audiences.	3.70	Very Efficient
8. Forensic testimony is delivered confidently and professionally.	3.73	Very Efficient
9. Court presentations strictly follow established legal procedures.	3.72	Very Efficient
10. Forensic experts demonstrate impartiality during testimony.	3.70	Very Efficient
Category Mean	3.74	Very Efficient

Table 3.7 presents the mean distribution and descriptive interpretation of the efficiency of forensic examinations in terms of testimony and court presentation.

Among the indicators, the highest mean of 3.77 was obtained by *"Forensic evidence presented is consistently accepted in court."* This was followed by *"Forensic experts are well-prepared when testifying in court"* and *"Testimony is consistent with the written forensic report,"* both with a mean of 3.76. These findings imply that forensic personnel are able to maintain consistency, credibility, and professionalism during court proceedings. The acceptance of forensic evidence in court reflects the reliability of forensic reports, proper evidence handling, and the competence of forensic personnel in presenting scientific findings. The findings are in consonance with Butler et al (2021), who emphasized that standardized and well-prepared testimony strengthens the credibility and admissibility of forensic evidence. Similarly, Ribaux et al (2021), highlighted that effective communication of forensic intelligence enhances judicial confidence and supports fair case resolution.

Conversely, the lowest-rated indicators were *"Experts can simplify complex technical terms for non-scientific audiences"* and *"Forensic experts demonstrate impartiality during testimony,"* both with a mean of 3.70, although still interpreted as *"Very Efficient."* Despite the positive rating, these comparatively lower scores suggest that challenges may still exist in courtroom communication and presentation skills. Explaining highly technical forensic findings in a manner understandable to judges, lawyers, jurors, and other non-expert audiences remains an important aspect of effective forensic testimony. Difficulty in simplifying technical language may affect the clarity and understanding of forensic evidence during legal proceedings. The findings are in consonance with Del Rosario (2020) and Ramos (2022), who noted that communication barriers and perceived bias can weaken the credibility of forensic experts and reduce the effectiveness of forensic evidence in court.

The findings are also in consonance with Deming's (1986) Total Quality Management Theory which emphasizes professionalism, continuous improvement, and adherence to quality standards in organizational performance. The high ratings on preparedness, consistency, and acceptance of evidence indicate that forensic personnel maintain quality standards in courtroom presentation. However, the theory also highlights the importance of ongoing training and development to address weaknesses and improve organizational effectiveness. In this context, strengthening courtroom communication skills and reinforcing ethical practices may further improve the quality of forensic testimony.

Similarly, the results support Womack & Jones' (2003) Lean Management Theory which emphasizes efficiency, clarity of processes, and elimination of communication barriers to improve operational outcomes. Clear and understandable testimony contributes to more efficient court proceedings by reducing confusion and improving comprehension of forensic findings. However, challenges in simplifying technical concepts suggest that communication processes may still require enhancement to ensure that forensic evidence is effectively conveyed to all parties involved in legal proceedings.

Although testimony and court presentation were generally assessed as very efficient, the findings reveal certain concerns related to communication effectiveness and impartiality during testimony. These concerns should not be overlooked because unclear

explanations or perceived bias may affect the interpretation and credibility of forensic evidence in court. Strengthening training programs on courtroom communication, ethical standards, and expert witness preparation may further improve the effectiveness and professionalism of forensic testimony in Region II.

The overall mean of 3.74, interpreted as *"Very Efficient,"* indicates that forensic personnel in Region II generally demonstrate strong capability in presenting, explaining, and defending forensic findings during legal proceedings. The findings suggest that forensic experts are adequately prepared to provide credible testimony while following legal and professional standards in court. Their preparedness, consistency, and adherence to legal procedures contribute positively to the credibility and reliability of forensic examination. Nevertheless, enhancing communication strategies and reinforcing impartiality during testimony may further strengthen the effectiveness and integrity of forensic services in court proceedings.

H. Inter-Agency Coordination

Table 3.8
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Inter-Agency Coordination

Inter-Agency Coordination	Mean	Description
1. Evidence submission by law enforcement agencies is timely.	3.74	Very Efficient
2. Forensic units are responsive to requests for examination.	3.69	Very Efficient
3. Communication between forensic units, investigators, and courts is clear and efficient.	3.75	Very Efficient
4. Feedback mechanisms between agencies are available and functional.	3.70	Very Efficient
5. Coordination protocols with investigators are clearly established.	3.74	Very Efficient
6. There is efficient scheduling of evidence submissions between agencies.	3.69	Very Efficient
7. Regular meetings or dialogues are conducted with partner agencies.	3.69	Very Efficient
8. Communication channels (email, phone, reports) are reliable and functional.	3.62	Very Efficient
9. Collaborative efforts between agencies reduce delays in case processing.	3.74	Very Efficient
10. Roles and responsibilities among agencies are clearly defined.	3.72	Very Efficient
Category Mean	3.71	Very Efficient

Table 3.8 shows the mean distribution and descriptive interpretation of the efficiency of forensic examinations in terms of inter-agency coordination.

As shown in table, the highest mean of 3.75 was obtained by *"Communication between forensic units, investigators, and courts is clear and efficient."* This was followed by *"Evidence submission by law enforcement agencies is timely"* and *"Collaborative*

efforts between agencies reduce delays in case processing," both with a mean of 3.74. These findings suggest that coordination among agencies is generally well established and contributes positively to the efficiency of forensic examination. Effective communication and collaboration help facilitate timely evidence submission, proper case coordination, and faster forensic processing. The findings are in consonance with Butler et al (2021), who emphasized that inter-agency collaboration improves operational efficiency and minimizes procedural delays. Similarly, Ribaux (2021) highlighted that strong communication and forensic intelligence practices enhance case management and justice delivery.

In contrast, the lowest-rated indicator was *"Communication channels (email, phone, reports) are reliable and functional,"* which obtained a mean of 3.62, although still interpreted as *"Very Efficient."* This comparatively lower score suggests that communication infrastructure and information-sharing systems may still experience certain limitations or inconsistencies. Delays in communication, unreliable channels, or inefficient information dissemination may affect the timely coordination of forensic activities and case processing. The findings are in consonance with Del Rosario (2020), who noted that deficiencies in documentation and communication systems contribute to delays and inefficiencies in forensic operations.

Additionally, the indicators *"Forensic units are responsive to requests for examination," "There is efficient scheduling of evidence submissions between agencies,"* and *"Regular meetings or dialogues are conducted with partner agencies"* all obtained relatively lower means of 3.69. These findings may imply that despite the generally high level of coordination, challenges related to scheduling, responsiveness, and regular institutional communication still exist. Previous studies identified communication gaps, delayed coordination, and limited inter-agency collaboration as factors affecting forensic efficiency and case management effectiveness.

The results support Womack & Jones' (2003) Lean Management Theory which highlights the importance of streamlined communication, efficient coordination, and elimination of operational delays to improve organizational performance. Effective inter-agency coordination minimizes duplication of efforts, improves information flow, and enhances case processing efficiency. However, communication-related limitations may still create delays and inefficiencies in forensic operations if not properly addressed.

Although inter-agency coordination was generally assessed as very efficient, the findings reveal concerns related to communication reliability, responsiveness, and coordination scheduling. These issues should not be overlooked because ineffective communication systems may affect evidence submission, case monitoring, and overall forensic efficiency. Strengthening communication infrastructure, improving digital coordination systems, and conducting regular inter-agency meetings may further enhance collaboration and operational effectiveness among forensic units and partner agencies.

The overall category mean of 3.71, interpreted as "Very Efficient," indicates that forensic personnel in Region II maintain strong coordination and collaborative

relationships with investigators, courts, and other agencies involved in criminal investigations. Effective communication and cooperation contribute significantly to timely case processing and efficient forensic examination. Nevertheless, enhancing communication systems and strengthening coordination mechanisms may further improve the efficiency and reliability of inter-agency collaboration in Region II forensic operations.

I. Summary

Table 3.9
Mean Distribution and Descriptive Interpretation of Efficiency of Forensic Examinations in terms of Summary

Summary	Mean	Description
A. Evidence Collection	3.74	Very Efficient
B. Evidence Preservation	3.70	Very Efficient
C. Chain of Custody	3.73	Very Efficient
D. Forensic Analysis / Examination	3.70	Very Efficient
E. Interpretation of Results	3.73	Very Efficient
F. Forensic Reporting	3.74	Very Efficient
G. Testimony / Court Presentation	3.74	Very Efficient
H. Inter-Agency Coordination	3.71	Very Efficient
Overall Mean	3.72	Very Efficient

Table 3.9 shows the mean distribution and descriptive interpretation of the efficiency of forensic examinations across all components.

Among the components, the highest mean of 3.74 was obtained by *Evidence Collection*, *Forensic Reporting*, and *Testimony/Court Presentation*. These results indicate that respondents perceived strong performance in operational evidence handling, report preparation, and courtroom presentation of forensic findings. The high rating in evidence collection suggests that personnel are highly compliant with established procedures in handling and collecting evidence at crime scenes. Similarly, the high ratings in forensic reporting and testimony imply that forensic personnel are capable of preparing clear and reliable reports and effectively presenting scientific findings during legal proceedings. The findings are in consonance with Butler et al (2021) who emphasized that efficient evidence handling and standardized reporting practices strengthen the credibility and admissibility of forensic evidence. Likewise, Ribaux (2021) highlighted that effective communication and forensic intelligence practices enhance case management and judicial confidence.

Conversely, the lowest mean scores were obtained by *Evidence Preservation* and *Forensic Analysis/Examination*, both with a mean of 3.70, although still interpreted as *"Very Efficient."* While these findings reflect positive performance, the comparatively lower ratings suggest that challenges may still exist in maintaining evidence integrity, laboratory resource availability, monitoring systems, and analytical processes. The findings are in consonance with Balagot (2021) and Del Rosario (2020), who noted that inadequate

laboratory infrastructure, resource limitations, and increasing workloads often affect forensic efficiency and turnaround time.

Similarly, the results support Womack and Jones' (2003) Lean Management Theory which highlights process efficiency, standardization, and continuous improvement in organizational operations. The generally high efficiency ratings indicate that forensic units are effectively implementing procedures and operational controls. Nevertheless, Lean Theory also recognizes that operational inefficiencies, such as equipment limitations, delays in evidence monitoring, and resource constraints, must be continuously addressed to sustain high performance and minimize procedural bottlenecks.

Furthermore, the findings are aligned with Deming's (1986) Total Quality Management Theory which highlights continuous quality improvement, personnel competence, and systematic monitoring as essential components of organizational effectiveness. Although all components were rated *"Very Efficient,"* the slight variations in mean scores suggest that continuous improvement remains necessary, particularly in areas involving laboratory resources, evidence monitoring systems, and analytical support mechanisms. Continuous training, infrastructure enhancement, and quality assurance initiatives may therefore further improve forensic efficiency.

Although respondents generally assessed all areas of forensic examination as highly efficient, the findings also reveal operational challenges that should not be overlooked. Issues related to evidence preservation systems, laboratory equipment, workload management, and communication mechanisms may still affect certain aspects of forensic operations if left unresolved. Addressing these concerns through improved infrastructure, enhanced monitoring systems, upgraded laboratory facilities, and continuous capability-building programs may further strengthen the effectiveness and reliability of forensic services in Region II.

The overall mean of 3.72, interpreted as *"Very Efficient,"* indicates that forensic personnel in Region II generally demonstrate a consistently high level of efficiency in performing forensic functions. The findings imply that standardized procedures, technical competence, documentation practices, and inter-agency coordination are effectively implemented throughout the forensic process. The consistently high ratings reflect effective implementation of forensic procedures, professional competence, and institutional coordination. However, sustaining and further improving forensic efficiency will require continuous enhancement of laboratory resources, preservation systems, and operational support mechanisms to ensure reliable, timely, and credible forensic services.

3. Is there a significant difference in the assessment of forensic examination efficiency among PNP Forensic Unit personnel in Region II when grouped according to their profile?

Table 4
Results on the Significant Difference in the Assessment of Forensic Examination Efficiency among PNP Forensic Unit Personnel in Region II when grouped according to their Profile

Profile	Significance F	Decision	Remarks
Rank	.000	Reject Ho	Significant
Position/Designation	.000	Reject Ho	Significant
Length of Service	.000	Reject Ho	Significant
Field of Specialization	.000	Reject Ho	Significant
Training Attended	.000	Reject Ho	Significant
Unit/ Office	.006	Reject Ho	Significant

Table 4 reveals the significant difference in the assessment of forensic examination efficiency among PNP Forensic Unit personnel in Region II when grouped according to their profile using Analysis of Variance F -test at .05 level of significance.

The findings indicate that all computed significance values were lower than the 0.05 threshold, resulting in the rejection of the null hypothesis. This means that there are significant differences in the assessment of forensic examination efficiency when respondents are grouped according to rank, position/designation, length of service, field of specialization, training attended, and unit/office.

Among the profile variables, rank, position/designation, length of service, field of specialization, and training attended all obtained the lowest significance value of .000, while unit/office obtained the highest significance value of .006. Although all variables were found to be significant, the results suggest that personnel characteristics such as rank, specialization, training, and professional experience exert stronger influence on the assessment of forensic examination efficiency compared to unit assignment. These findings imply that differences in professional background and operational responsibilities affect how personnel perceive the effectiveness and efficiency of forensic operations.

The results further reveal that respondents holding higher ranks and supervisory positions generally assessed forensic examination efficiency more positively. Similarly, personnel with longer years of service, specialized forensic expertise, and advanced training programs also demonstrated higher assessments of efficiency. This may be attributed to their broader professional exposure, greater familiarity with forensic procedures, and deeper understanding of operational standards. The findings are in consonance with Butler et al (2021) who emphasized that personnel competence and specialized training significantly influence the effectiveness of forensic operations. Likewise, Ramos (2022) and Del Rosario (2020) explained that experienced and well-trained forensic personnel tend to demonstrate higher procedural compliance and operational efficiency compared to less experienced personnel.

The findings also indicate that respondents assigned to larger forensic units, particularly the Regional Forensic Unit (RFU), generally perceived forensic examination

processes as more efficient compared to personnel assigned in smaller satellite or provincial offices. This may be due to better access to laboratory facilities, equipment, personnel support, and operational resources in centralized forensic units. The findings are in consonance with Reyes (2021), who highlighted that regional forensic laboratories often demonstrate higher efficiency because of improved infrastructure, resource availability, and stronger institutional support systems. In contrast, smaller forensic offices may encounter operational challenges related to manpower limitations, inadequate facilities, and resource constraints.

The findings are in consonance with Demings's (1986) Total Quality Management Theory which highlights the importance of continuous training, personnel competence, and organizational support in maintaining service quality and operational effectiveness. Personnel who possess advanced training, extensive experience, and specialized expertise are more likely to recognize and appreciate the effective implementation of forensic procedures and quality assurance measures. At the same time, the significant differences among groups indicate that continuous capability-building and resource improvement remain necessary to ensure more uniform perceptions of efficiency across all forensic units.

The results also support Womack & Jones' (2003) Lean Management Theory, which emphasizes operational efficiency, process improvement, and proper resource utilization in achieving organizational effectiveness. Variations in assessment among personnel groups may reflect differences in workload distribution, access to resources, and operational support systems. Personnel assigned in units with better infrastructure and streamlined processes may naturally perceive forensic operations as more efficient compared to those working under more constrained conditions.

Although all groups generally assessed forensic examination efficiency as *"Very Efficient,"* the presence of significant differences indicates that operational experiences and organizational conditions vary across personnel profiles and unit assignments. These differences suggest that some forensic personnel may experience greater operational challenges related to workload, training opportunities, resource accessibility, and laboratory support systems. Addressing these variations through continuous training, equitable resource allocation, and strengthened institutional support may help improve consistency in forensic operations across Region II.

Overall, the findings are in consonance with existing literature and demonstrate that forensic examination efficiency in Region II is perceived positively by PNP Forensic Unit personnel; however, significant differences exist across profile variables. These differences highlight the importance of personnel competence, specialization, experience, and organizational support in shaping perceptions of forensic efficiency and operational effectiveness.

4. What challenges are encountered by PNP Forensic Unit personnel in Region II in the conduct of forensic examinations?

Table 5
Mean Distribution and Descriptive Interpretation of Challenges Encountered by PNP in Conducting Forensic Examination

Challenges Encountered by PNP in Conducting Forensic Examination	Mean	Description
1. There is a shortage of trained forensic personnel that affects examination efficiency.	2.54	Evident
2. Heavy workload among staff leads to delays in case processing.	2.62	Evident
3. Limited opportunities for specialized training reduce personnel proficiency.	2.69	Evident
4. Stress and fatigue among personnel affect the quality of forensic output.	2.65	Evident
5. Outdated or insufficient laboratory equipment hinders forensic operations.	2.82	Evident
6. Limited laboratory space restricts the ability to process evidence efficiently.	2.75	Evident
7. Equipment malfunction or unavailability delays examinations.	2.90	Evident
8. Lack of modern forensic technology affects accuracy and turnaround time.	2.80	Evident
9. Insufficient funding limits the unit's capacity to upgrade equipment or facilities.	2.82	Evident
10. Budget constraints reduce opportunities for personnel development.	2.89	Evident
11. Lack of resources affects the timely procurement of necessary forensic materials.	2.89	Evident
12. Bureaucratic processes delay the purchase and replenishment of forensic supplies.	2.90	Evident
13. Existing policies do not fully support the needs of forensic operations.	2.70	Evident
14. Administrative procedures increase delays in evidence examination.	2.54	Evident
15. Communication gaps between investigators and forensic examiners contribute to delays.	2.70	Evident
16. Coordination with other agencies (courts, police units, prosecutors) is sometimes inefficient.	2.48	Moderately Evident
17. Delayed submission of evidence by law enforcement affects turnaround time.	2.70	Evident
18. Feedback from partner agencies is limited or inconsistent.	2.46	Moderately Evident
19. Incomplete or inaccurate documentation from submitting agencies complicates examinations.	2.73	Evident
20. Poor packaging or storage of evidence prior to submission causes degradation or contamination.	2.70	Evident
Mean	2.71	Evident

Table 5 presents the mean distribution and descriptive interpretation of the challenges encountered by PNP Forensic Unit personnel in Region II in conducting forensic examinations.

The overall mean of 2.71, interpreted as *"Evident,"* indicates that despite the generally *"Very Efficient"* assessment of forensic examination processes in the previous tables, personnel still experience operational, technical, and administrative difficulties that affect forensic operations. The findings suggest that forensic units are capable of performing their functions effectively; however, several institutional and resource-related concerns continue to hinder optimal efficiency.

Among the identified challenges, the highest mean of 2.90 was obtained by *"Equipment malfunction or unavailability delays examinations"* and *"Bureaucratic processes delay the purchase and replenishment of forensic supplies."* These were followed by *"Budget constraints reduce opportunities for personnel development"* and *"Lack of resources affects the timely procurement of necessary forensic materials,"* both with a mean of 2.89. These findings indicate that the most pressing challenges encountered by forensic personnel are related to laboratory resources, procurement processes, and institutional support systems. Delays in acquiring forensic supplies and equipment may directly affect examination turnaround time, laboratory operations, and evidence processing efficiency. The findings are in consonance with Butler et al (2021)who emphasized that inadequate laboratory equipment and resource limitations significantly affect forensic efficiency. Similarly, Del Rosario (2020) explained that bureaucratic procedures and funding constraints often reduce the effectiveness of forensic services, particularly in regional and provincial units.

In contrast, the lowest-rated challenges were *"Feedback from partner agencies is limited or inconsistent"* with a mean of 2.46 and *"Coordination with other agencies is sometimes inefficient"* with a mean of 2.48, both interpreted as *"Moderately Evident."* These comparatively lower ratings suggest that inter-agency coordination and communication are less problematic compared to resource-related and administrative concerns. This finding supports the earlier results in Table 2.8, where inter-agency coordination was assessed as *"Very Efficient."* The consistency between the findings implies that coordination mechanisms among forensic units, investigators, and partner agencies are generally functioning effectively despite some existing communication limitations.

Additionally, Item 1, *"There is a shortage of trained forensic personnel that affects examination efficiency,"* obtained a mean of 2.54, interpreted as *"Evident."* This finding should be reconciled with the earlier profile results, particularly the data on training attended and length of service. While many respondents were found to possess specialized training and extensive years of service, the results suggest that the issue is not necessarily the lack of competence among existing personnel but rather the insufficient number of trained personnel relative to workload demands and operational requirements. The findings are in consonance with Ramos (2022), who noted that even highly trained forensic personnel may experience operational strain when staffing levels are inadequate and workloads become excessive.

Similarly, the results support Womack & Jones' (2003) Lean Management Theory, which emphasizes the importance of eliminating operational inefficiencies, minimizing delays, and improving resource management to enhance organizational performance.

Bureaucratic procurement procedures, delayed replenishment of supplies, and equipment unavailability represent process inefficiencies that hinder forensic operations and reduce turnaround efficiency. Streamlining procurement systems and improving logistical support may therefore help reduce operational bottlenecks.

The findings are likewise in consonance with Deming's (1986) Total Quality Management Theory, which highlights continuous improvement, resource adequacy, and organizational support as essential factors in maintaining quality performance. Although forensic examination processes were generally rated *"Very Efficient,"* the presence of evident operational challenges suggests that continuous institutional improvement remains necessary. Strengthening laboratory infrastructure, increasing funding support, expanding personnel development programs, and modernizing equipment may further enhance the quality and efficiency of forensic services.

Overall, the findings demonstrate that PNP Forensic Unit personnel in Region II encounter several evident challenges related primarily to equipment availability, procurement delays, budget limitations, and personnel workload. While inter-agency coordination and communication appear to be less problematic, operational and resource-related constraints continue to affect forensic efficiency. Addressing these concerns through improved funding, streamlined administrative systems, upgraded laboratory resources, and strengthened manpower support may significantly improve the effectiveness, reliability, and sustainability of forensic examination services in Region II.

5. Is there a significant difference in the challenges encountered by PNP Forensic Unit personnel in Region II when grouped according to their profile?

Table 6
Results on the Significant Difference in the Challenges Encountered by PNP Forensic Unit Personnel in Region II when grouped according to Their Profile

Profile	Significance F	Decision	Remarks
Rank	.000	Reject Ho	Significant
Position/Designation	.000	Reject Ho	Significant
Length of Service	.000	Reject Ho	Significant
Field of Specialization	.000	Reject Ho	Significant
Training Attended	.000	Reject Ho	Significant
Unit/ Office	.082	Accept Ho	Not Significant

Table 6 reveals the significant difference in the challenges encountered by PNP Forensic Unit personnel in Region II when grouped according to their profile using Analysis of Variance F -test at .05 level of significance.

As presented in the table, the computed F -values for profile variables such as rank, length of service, field of specialization and training attended were all less than .05 which resulted to the rejection of the null hypothesis. There is significant difference in the challenges encountered by PNP Forensic Unit personnel in Region II when grouped

according to their profile rank, length of service, field of specialization, and training attended.

Mostly those who encountered a very serious challenges are with ranked of Police Lt. Col., Major, Captain and Executive Master Sargeant; with position/designation of Chief of Police and Deputy Chief; with length of service more than 20 years; who are specialized in the field of DNA/serology, medico legal and chemistry; those who attended training in Crime scene investigation and ballistic/fa examination training.

For the unit/office of the respondents, the F- value was greater than .05 wherein the Ho is accepted. There is no significant difference in the challenges encountered by PNP Forensic Unit personnel in Region II when grouped according to their profile unit/office.

The personnel as to their unit/office is concerned, they claimed equally that they encountered challenges less and can be tolerated.

6. Is there a significant relationship between the perceived efficiency of forensic examination and the challenges encountered?

Table 7
Results on the Significant Relationship between the Perceived Efficiency of Forensic Examination and the Challenges Encountered

Along…	Significance r	Decision	Remarks
Evidence Collection	.000	Reject Ho	Significant
Evidence Preservation	.000	Reject Ho	Significant
Chain of Custody	.000	Reject Ho	Significant
Forensic Analysis / Examination	.000	Reject Ho	Significant
Interpretation of Results	.000	Reject Ho	Significant
Forensic Reporting	.000	Reject Ho	Significant
Testimony / Court Presentation	.000	Reject Ho	Significant
Inter-Agency Coordination	.000	Reject Ho	Significant
Overall Mean Efficiency	**.000**	**Reject Ho**	**Significant**

Table 7 reveals the significant relationship between the perceived efficiency of forensic examination and the challenges encountered using Pearson's Coefficient of Correlation r -test at .05 level of significance.

The findings show that all areas of forensic examination efficiency obtained significance values of .000, which are lower than the 0.05 threshold. Consequently, the null hypothesis was rejected, indicating that there is a significant relationship between the perceived efficiency of forensic examination and the challenges encountered by the respondents.

The results indicate that the challenges experienced by forensic personnel are significantly associated with the efficiency of evidence collection, evidence preservation, chain of custody, forensic analysis/examination, interpretation of results, forensic

reporting, testimony/court presentation, and inter-agency coordination. This means that operational, administrative, and resource-related difficulties directly influence the effectiveness and performance of forensic examination processes. As challenges increase, certain aspects of forensic efficiency may also be affected, particularly in areas involving laboratory operations, evidence management, reporting systems, and coordination mechanisms.

Notably, the significant relationship across all components suggests that forensic efficiency and operational challenges are closely interconnected. Earlier findings revealed that forensic examination processes were generally assessed as *"Very Efficient,"* while the challenges encountered were considered *"Evident."* This indicates that despite the capability and competence of forensic personnel, operational constraints such as equipment shortages, procurement delays, limited manpower, budget limitations, and administrative inefficiencies continue to influence forensic performance. The findings are in consonance with Butler et al (2021) who emphasized that resource limitations and administrative barriers directly affect forensic efficiency. Similarly, Del Rosario (2020) and Ramos (2022) highlighted that personnel shortages, excessive workloads, and inadequate infrastructure contribute to slower forensic processing and reduced operational effectiveness.

The relationship between perceived efficiency and challenges encountered is particularly evident in areas involving forensic analysis, evidence preservation, and inter-agency coordination. Earlier tables showed that laboratory equipment availability, evidence tracking systems, and communication channels obtained comparatively lower mean ratings despite remaining within the *"Very Efficient"* category. At the same time, the challenges table identified equipment malfunction, procurement delays, and inadequate resources as highly evident operational concerns. These findings are in consonance with Reyes (2022), who noted that resource-related limitations and administrative barriers have direct implications on forensic efficiency and service delivery.

Similarly, the findings support Womack & Jones (2003) Lean Management Theory which emphasizes the importance of minimizing operational inefficiencies, eliminating delays, and improving process flow to enhance organizational performance. The significant relationship between challenges and efficiency indicates that operational barriers such as bureaucratic procedures, resource shortages, and communication delays may reduce process efficiency and create workflow disruptions. Addressing these inefficiencies through streamlined procedures and improved resource management may therefore strengthen forensic operations.

The findings are likewise in consonance with Deming's (1986) Total Quality Management Theory, which highlights continuous improvement, quality assurance, and institutional support as essential elements in maintaining effective organizational performance. Although forensic personnel demonstrated high efficiency ratings, the existence of evident operational challenges suggests that continuous enhancement of laboratory systems, personnel support, and organizational processes remains necessary. Improving equipment availability, strengthening manpower support, and modernizing forensic infrastructure may further enhance both efficiency and service reliability.

Overall, the findings demonstrate that the perceived efficiency of forensic examination is significantly related to the challenges encountered by PNP Forensic Unit personnel in Region II. The results indicate that operational and institutional challenges directly influence the effectiveness of forensic processes, even when personnel demonstrate high competence and procedural compliance. Addressing these challenges through improved resource allocation, enhanced laboratory facilities, streamlined administrative systems, and strengthened institutional support may further improve the efficiency, reliability, and sustainability of forensic examination services in Region II.

8. **What policy enhancements can be proposed to improve forensic examination efficiency in the Region II?**

Policy Enhancements to Improve Forensic Examination Efficiency in Region II

7.1. Strengthening Human Resource Capacity. There is a need to recruit additional qualified forensic personnel and provide continuous specialized training programs. The results revealed challenges related to workload, limited training opportunities, and personnel fatigue. Thus, regular capacity-building initiatives, certifications, and advanced forensic training should be institutionalized to enhance competence and reduce workload imbalance.

7.2. Upgrading Forensic Equipment and Technology. The study identified issues such as outdated equipment, lack of modern forensic technology, and equipment malfunction. Therefore, policies should prioritize the procurement and maintenance of modern forensic tools, laboratory equipment, and digital forensic technologies to improve accuracy, speed, and reliability of forensic examinations.

7.3. Improving Laboratory Facilities and Infrastructure. Limited laboratory space and inadequate storage facilities were also evident challenges. It is recommended that forensic laboratories be expanded and upgraded to meet standard requirements, including proper evidence storage systems, environmental controls, and secure facilities to maintain evidence integrity.

7.4. Streamlining Procurement and Administrative Processes. Bureaucratic delays in procurement and supply acquisition significantly affect forensic operations. Thus, policies should be revised to simplify and expedite procurement procedures, ensuring timely availability of forensic materials, equipment, and supplies.

7.5. Enhancing Funding Allocation for Forensic Services. Insufficient funding was identified as a key constraint. Increasing budget allocation specifically for forensic operations, equipment upgrading, personnel training, and research development will help improve overall efficiency and service delivery.

7.6. Strengthening Chain of Custody and Documentation Systems. Although efficiency in chain of custody was rated high, improvements can still be made through the implementation of digital tracking systems for evidence handling. Automated and

centralized documentation systems can reduce errors, improve transparency, and ensure accountability.

7.7. Institutionalizing Quality Assurance and Standard Operating Procedures (SOPs). To maintain consistency and reliability, policies should enforce strict adherence to standardized forensic procedures and regular quality audits. Continuous review and updating of SOPs will ensure alignment with national and international forensic standards.

7.8. Enhancing Inter-Agency Coordination Mechanisms. While coordination was generally efficient, communication gaps and delays still exist. Establishing formal coordination protocols, regular inter-agency meetings, and integrated communication platforms will improve collaboration between forensic units, investigators, prosecutors, and courts.

7.9. Implementing Workload Management and Case Prioritization Systems. To address heavy workload and delays, policies should introduce case management systems, including prioritization mechanisms and equitable workload distribution among personnel to improve turnaround time.

7.10. Promoting Digitalization and Information Systems Integration. The adoption of digital forensic management systems, electronic reporting, and centralized databases will enhance efficiency, reduce manual errors, and improve accessibility of forensic data across units.

Conclusions

Based on the indicated findings of the study, he following conclusions are drawn:

The findings of the study conclude that forensic examination processes in Region II Forensic Units are generally functioning at a very efficient level across all major components, including evidence collection, evidence preservation, chain of custody, forensic analysis and examination, interpretation of results, forensic reporting, testimony/court presentation, and inter-agency coordination. This indicates that PNP Forensic Unit personnel possess the necessary competence, procedural compliance, and operational capability to effectively perform forensic functions that support criminal investigations and the administration of justice.

However, despite the high level of perceived efficiency, the study also concludes that several operational and institutional challenges remain evident within the forensic units. The most prominent challenges involve equipment malfunction or unavailability, delays in procurement caused by bureaucratic processes, insufficient funding, lack of modern forensic technology, and limited resources for personnel development. These constraints demonstrate that while forensic personnel are capable of maintaining efficient operations, resource limitations and administrative inefficiencies continue to affect the overall effectiveness and sustainability of forensic examination services.

The study further concludes that the efficiency of forensic examinations is significantly influenced by the challenges encountered by forensic personnel. Operational constraints related to laboratory resources, manpower, procurement systems, and administrative procedures directly affect forensic processes, particularly in evidence preservation, forensic analysis, and laboratory operations. This confirms that forensic efficiency is closely associated with the availability of institutional support, technological resources, and effective organizational systems.

Moreover, the findings establish that significant differences exist in the assessment of forensic examination efficiency when respondents are grouped according to profile variables such as rank, position/designation, length of service, field of specialization, training attended, and unit/office. This suggests that perceptions of forensic efficiency vary depending on professional experience, operational responsibilities, and access to resources and training opportunities.

Overall, the study concludes that although Region II Forensic Units demonstrate strong operational efficiency, continuous improvement remains necessary to address the challenges affecting forensic operations. Strengthening laboratory facilities, modernizing forensic equipment, improving procurement systems, enhancing personnel development programs, and increasing institutional support are essential measures to further improve the effectiveness, reliability, and sustainability of forensic examination services in Region II.

Recommendations

Based on the results of this study, the researcher recommends the following:

1. PNP Forensic Unit personnel may continuously enhance their professional competence through specialized training, seminars, workshops, and capability-building programs relevant to their respective fields of specialization. They are also encouraged to strictly observe standardized procedures in evidence collection, preservation, chain of custody, forensic analysis, reporting, and court presentation to sustain the efficiency and reliability of forensic examination services.

2. The Philippine National Police (PNP) may prioritize the modernization, repair, and regular maintenance of forensic laboratory equipment and technological resources. It may also strengthen manpower support, provide additional specialized training opportunities, improve laboratory and evidence-storage facilities, and adopt digital systems for evidence tracking, chain-of-custody documentation, and forensic reporting. Furthermore, adequate budget allocation and streamlined procurement procedures may be considered to address delays in acquiring essential forensic supplies, equipment, and other operational resources.

3. Judiciary and Legal Practitioners may strengthen coordination with PNP Forensic Units regarding the submission, presentation, interpretation, and use of forensic evidence in legal proceedings. Regular coordination and appropriate information-sharing

mechanisms may help minimize procedural delays and promote the proper appreciation and utilization of scientific evidence in the administration of justice.

4. Local Government of Quirino Province may strengthen its support for forensic services through appropriate resource assistance, logistical support, and partnerships with the PNP and other concerned agencies. Where legally and administratively appropriate, assistance may be directed toward improving facilities, equipment, communication systems, and other operational needs that can contribute to more efficient forensic services.

5. Educational Institutions. Higher education institutions offering criminology, forensic science, and related programs may continuously review and strengthen their curricula and practical training to reflect the actual operational requirements of forensic practice. Partnerships with PNP Forensic Units may also be strengthened through training, research, seminars, and other academic activities that expose students to current forensic procedures, technologies, and professional standards.

6. The General Public. Community members may be provided with appropriate information and awareness programs concerning the importance of forensic evidence, crime-scene preservation, and proper cooperation with law enforcement authorities. Increased public understanding may help prevent unnecessary contamination or disturbance of evidence and support more effective criminal investigations.

7. The Family of the Victim. Families of victims may be provided with appropriate information regarding forensic processes and the role of scientific examination in criminal investigations. Concerned agencies may also strengthen communication mechanisms with families, within legal and confidentiality limitations, to help them understand necessary procedures and possible causes of delays in forensic examination and case processing.

8. The Victim of crime should continue to be afforded appropriate access to efficient, reliable, and scientifically sound forensic services. PNP Forensic Units and concerned criminal justice agencies may strengthen coordination and evidence-processing procedures to minimize avoidable delays and maintain the integrity of forensic evidence relevant to the resolution of their cases.

9. Faculty, Instructors, and Professors in Forensic Science may incorporate current forensic practices, operational challenges, technological developments, and evidence-management procedures into their instructional materials and classroom activities. Greater collaboration with forensic practitioners may also help ensure that instruction remains responsive to actual field conditions.

10. The researcher may utilize the findings of the study as a basis for further professional development and for advocating evidence-based improvements in forensic examination practices. The results may also serve as a foundation for future academic or professional work related to forensic efficiency, resource management, personnel development, and policy enhancement.

11. Future researchers may conduct similar studies in other regions or forensic units to determine whether the findings are consistent across different operational settings. They may also include other stakeholders, such as investigators, prosecutors, legal practitioners, and other criminal justice personnel, and consider the use of actual case-processing records, laboratory turnaround times, workload statistics, and other objective performance indicators to complement personnel assessments.

Compliance with Ethical Standards

This study observed established ethical standards throughout the research process. Prior authorization was obtained from the appropriate authorities of the Philippine National Police Forensic Units in Region II before data collection. The respondents were informed of the purpose of the study, the voluntary nature of their participation, and their right to decline or withdraw without penalty. Informed consent was secured before the administration of the questionnaire. Confidentiality and anonymity were maintained by excluding personally identifiable information from the collected data and research report. All responses were used exclusively for academic purposes, stored securely, and presented in aggregated form to protect the identities of the respondents and their respective offices. The researchers also ensured that participation involved no foreseeable harm, coercion, deception, or undue influence. The results were analyzed and reported objectively, accurately, and transparently, without fabrication, falsification, misrepresentation, or manipulation of data. Proper acknowledgment and citation of all sources were likewise observed to uphold academic integrity and avoid plagiarism.

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