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Effectiveness of Coordination and Information Sharing System for Law Enforcement Agency

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ABSTRACT
The Coordination and Information Sharing System (CISS) is a vital tool for the Philippine Drug Enforcement Agency Regional Office 12 in providing efficient and reliable coordination and information sharing. This study aims to evaluate the usefulness and ease of use of the developed CISS. Using a quantitative research approach, data was collected through a adapted survey questionnaire administered to PDEA ROC, PDEA RIS, and PNP personnel. The questionnaire assessed user perceptions of the CISS, and data analysis involved calculating means and standard deviations to examine the average ratings and variability. Preliminary findings indicate positive ratings for the CISS in terms of usefulness and ease of use, with mean scores of 1.29 and 1.62, respectively. These findings suggest that the CISS effectively facilitates the coordination and information sharing. Furthermore, the standard deviations of 0.52 and 0.69 indicate relatively consistent perceptions among users. By evaluating the CISS, this research contributes to understanding its performance in coordinating and information sharing. The findings informed further development and improvement, promoting improved coordinating and information sharing practices.

Keywords: Coordination and Information Sharing System, Usefulness, ease of use, cost effectiveness, time constraints

I. INTRODUCTION

Effective coordination and information sharing are critical to the success of any organization, whether a private enterprise, government agency, or non-profit organization. In recent years, advanced digital platforms have significantly reshaped information technology, improving coordination and communication across industries. These technological advancements have transformed various sectors, streamlining operations and enhancing efficiency. The shift toward digital transformation and the adoption of cloud technologies allow organizations to centralize IT operations, eliminate traditional hierarchical structures, increase work speed, integrate departments, and remove redundant steps (Shirpoor et al., 2023). The emphasis on cost-effectiveness and sustainability has further accelerated the integration of IT solutions within government frameworks. Studies indicate that digital coordination platforms can lead to significant reductions in operational expenses, including savings on resource allocation and logistics (Glukhikh et al., 2021). Additionally, these platforms facilitate faster data sharing both within and between organizations, promoting collaborative working environments and enhanced information exchange (Gangneux & Joss, 2022).

However, transitioning to a fully digitalized system presents challenges, particularly for law enforcement agencies. The Philippine Drug Enforcement Agency (PDEA), established in 2002, is a key agency

responsible for enforcing drug laws and combating illegal drug activities in the Philippines. Recognizing the importance of collaboration among government agencies, civil society organizations, and local communities in addressing drug-related issues, PDEA must enhance its training and capacity-building programs to improve overall effectiveness (Rivera et al., 2020).

Despite its crucial role, PDEA continues to rely on manual processes, which create operational delays, increased costs, and inefficiencies in coordination and information sharing. To scale operations effectively, the agency requires a robust, secure, and integrated system that enables seamless collaboration and information exchange. Without such a system, data handling risks and coordination vulnerabilities could hinder the agency's ability to respond efficiently to emerging threats.

The need for a systematized coordination process underscores the urgency of adopting a sophisticated and cost-effective operational framework. Given that information systems in law enforcement are vital for enhancing efficiency, ensuring timely responses, and fostering inter-agency collaboration, PDEA's digital transformation requires a strong infrastructure for information sharing and remote coordination.

Thus, this study aims to develop the PDEA-RO XII Coordination and Information Sharing System (CISS) Manual, designed to streamline operations, improve decision-making, and enable the agency to respond swiftly and effectively to evolving challenges.

II. METHODOLOGY

This chapter presents the requirements required to gather the necessary data for the research. It details the methods used to achieve the objectives of the study, including the development of a life cycle system. Also, it includes research design, determining the software and hardware specifications, selecting the system development methodology, creating context and data flow diagrams, developing a database schema, and constructing an entity relationship diagram.

Research Method

To develop a comprehensive and effectivene coordination and information-sharing system, a quantitative method of research approach will be employed. This approach integrates a deeper understanding of existing challenges, technological gaps, and best practices in inter-agency collaboration.

Research Design

This study utilized the developmental methodology to design, develop, and evaluate a coordination and information-sharing system. According to Sharp (2019), this method includes developing and assessing systems, processes, and systems that are acceptable, consistent, and effective. It is frequently employed in education as a methodical approach to creating, constructing, and assessing educational processes, products, and programs.

The study also employed a quantitative evaluation research design in the evaluation of the system in terms of determining the significance of time constraints and the cost-effectiveness of the system. Additionally, the study collected comparative data to compare the effectivity of the wed-based system from manual operation. Additionally, this chapter covered the evaluation methodology utilized during the study process. This involves defining the study's methodology, choosing suitable data collection methods and tools, applying statistical software to evaluate and interpret the data gathered, determining the study's respondents, and selecting a suitable sampling strategy.

Materials: Software and Hardware Requirements

This table describes the specific software and hardware requirements to support the run-through of the application.

Table 1. Software Specification.

Software	Requirement	Notes
Browser	Mozilla Firefox/Google Chrome	Front End of User
PHP	Microsoft Windows 10	Source Code Editor
Localhost Server	XAMPP Server	For development and testing
Jquery	Version 3.5	Javascript to design HTML

Table 1 presents the software requirements, specifying the functional and non-functional aspects of the system, including its intended functions and performance expectations. This information is essential for designing, developing, and testing the software to ensure it meets the needs of users and stakeholders. Additionally, the software requirements help define the project scope, ensuring the inclusion of all necessary features and focusing the development effort on the appropriate areas.

Table 2. Hardware Specification.

Hardware	Requirements	Notes
Computer Headset with Microphone	Any brand with noise-cancelling capacity	Used to communicate via video call.
Web Camera	Any brand with High-Definition capacity	Used to communicate via video call.
Computer	Processor: 9th Gen Intel Core i5-9400 (6-Core, 9MB Cache, up to 4.1GHz with Intel Turbo Boost Technology) RAM: 8GB DDR 4 HDD: 3.5" 1TB 7200RPM SATA Hard Drive OS: Windows 10 Pro 64-bit OEM License Other Software	Will be used by the station.
Internet	Minimum of 30 MBPS	Will be used by the station.
Printer	Inkjet/Laser	The output device for printing document

Table 2 presents the hardware requirements, specifying the physical components and devices necessary to run the software, along with the minimum and recommended specifications for those components. This information helps determine the system's capabilities and limitations while ensuring hardware compatibility with the software. Additionally, the hardware requirements assist in selecting the appropriate components and ensuring they are available and properly configured for the software to function effectively.

System Development Methodology
Agile Methodology

Figure 4. Agile Methodology

This strategy aimed to provide multiple opportunities for assessing the project's progress throughout its development cycle by employing Agile methods. It involved dividing tasks into smaller components, requiring less extensive planning. Iterations, which typically lasted between 10 to 30 days, engaged the entire team in planning, requirement analysis, design, coding, unit testing, and acceptance testing.

At the conclusion of each iteration, stakeholders were presented with a functional prototype, minimizing overall risk and enabling a more adaptable response to changes. While a given iteration might not have been ready for release, the objective was to make it available at the end of each cycle. Multiple iterations might have been required to fully develop the system and its enhancements.

Groups of Related Tasks

Sprint 1: Managing Data Security for Police Stations, ROC Chiefs, and ROC Personnel

During the **planning phase**, the researcher established the data security requirements for police stations, ROC chiefs, and ROC personnel. Potential security risks were identified, and a strategy was formulated to address them. A timeline for the sprint was created, including milestones and deadlines.

During the **design phase**, the researcher developed security features such as data encryption, user authentication, and access controls. User experience and usability were considered to ensure the security features were simple to use and understand. The researcher collaborated with lab experts to collect feedback and refine the designs.

During the **development phase**, the researcher implemented data security measures according to the plan. Access controls and user authentication were integrated to ensure that only authorized individuals could access sensitive data. Data encryption was applied to prevent unauthorized access to confidential information. The code was regularly tested and reviewed to identify and resolve any issues.

During the **testing phase**, the researcher conducted extensive testing to verify that the data security measures met specifications and functioned as intended. Compatibility with different applications and systems was ensured, and the system’s ability to handle large volumes of data and transactions was assessed.

During the **review phase**, the researcher evaluated the data security features by gathering feedback from end users, laboratory experts, and stakeholders regarding their experiences. The results of the testing phase were analyzed, and necessary modifications or improvements were made.

During the **launch phase**, the researcher deployed the data security features for user access. Training and support were provided to ensure end users could effectively utilize the security measures. System performance and user adoption were monitored to identify areas requiring further improvement.

Sprint 2: Coordination Module for Clients

During the planning phase, the researcher defined the scope of the sprint, including the objectives and goals of the coordination module for clients. The required tools and application programming interfaces

were identified, and a timeline for the sprint was established, including deadlines for each phase.

During the designing phase, the researcher developed a detailed design for the coordination module, including the data structure, user interface, and appointment scheduling procedure. Required data inputs, such as client information and appointment details, were identified. A design document outlining the feature's specifications and design details was drafted.

During the development phase, the researcher built the coordination module, allowing clients to initiate coordination requests. The module was integrated with existing data sources and systems to ensure compatibility. Quality assurance procedures were implemented to verify that the program met all requirements.

During the testing phase, the researcher conducted comprehensive testing of the coordination module, including functional and performance testing. Any defects or issues identified during testing were addressed, and necessary adjustments were made to ensure compliance with all requirements and standards.

During the review phase, the researcher assessed the sprint's success by analyzing the testing phase results. Adjustments were made as needed, and feedback was gathered from client industries to ensure that the module met their requirements.

During the launch phase, the researcher deployed the coordination module for client use. Training and support were provided, and the system was monitored for any issues or concerns, which were promptly addressed.

Sprint 3: Information Sharing

During the planning phase, the researcher defined the scope of the sprint, including the objectives and goals of the information-sharing feature. The necessary resources, such as tools, technology, and personnel, were determined, and a timeline for the sprint was established.

During the designing phase, the researcher developed a detailed design for the information-sharing feature, including user flows and interface design. The required data sources and document structures were determined, and a design document was created, detailing the feature's specifications and requirements.

During the development phase, the researcher implemented the information-sharing feature, including user authentication, data uploading, and confirmation processes. Quality assurance measures were put in place to ensure compliance with specified requirements.

During the testing phase, the researcher thoroughly tested the information-sharing feature for functionality and performance. Any identified issues were addressed, and adjustments were made to enhance the system's accuracy and efficiency.

During the review phase, the researcher evaluated the sprint's success and analyzed the testing phase results. Feedback was gathered from clients to ensure that the shared information was relevant and accurate.

During the launch phase, the researcher deployed the information-sharing feature within the system. Training and support were provided to laboratory specialists, and system performance was monitored for any issues or concerns, which were resolved promptly.

Sprint 4: Generating Reports for Coordination and Information Sharing

During the planning phase, the researcher defined the scope of the sprint, including the objectives and goals of the report generation feature. The necessary resources, such as tools, technology, and personnel, were identified, and a timeline with deadlines for each phase was established.

During the designing phase, the researcher developed a detailed design specifying the types of reports to

be generated, their formats, and distribution methods. A design document was created, outlining the feature's specifications, data sources, and data structures required for the reports.

During the development phase, the researcher implemented a report generation function, ensuring that reports contained accurate and up-to-date data. Quality assurance procedures were applied to verify compliance with specified requirements.

During the testing phase, the researcher analyzed the sprint's success and assessed the testing phase results. Consumer feedback was gathered to confirm that the feature met user needs and expectations. Any necessary improvements were made based on this input. During the launch phase, the researcher deployed the report generation feature, making it accessible to stakeholders. Training and support were provided

Evaluation Methodology

Procedure of the study

The initial step in conducting the research study was selecting a research problem relevant to the researcher's field of study. After identifying the problem, the researcher sought approval for the study's title and outline to ensure that the study was carried out responsibly. Moreover, a letter of authorization was provided to the agency where the study was conducted to secure their support and cooperation.

The researcher drafted a study plan outlining the scope, objectives, and timelines for system development. After developing the plan, the system was designed and developed, which involved programming, testing, and integrating various system components. The system was then evaluated to assess its effectiveness and identify areas for improvement. This evaluation included analyzing usage data, conducting usability testing, and gathering user feedback.

Data Gathering Procedure

The data collection process for this study followed standard operating procedures, which were approved by the Graduate School Dean before the study was conducted. A letter of consent was prepared for the participants to ensure compliance with ethical guidelines.

Before beginning the data collection process, the researcher gained an understanding of the existing processes or flowcharts related to the system's objectives. This step helped identify potential areas for improvement and ensured the accuracy and relevance of the data collected. To achieve this understanding, the researcher reviewed relevant documentation, such as previous studies or reports, and consulted subject matter experts as needed.

The researcher started by defining the system's objectives and identifying the specific data requirements based on these objectives. Several methods, including interviews, surveys, and observations, were used to collect the required data. After gathering the data, the researcher validated its accuracy and completeness. Additionally, the researcher documented the data, including its sources, collection methods, and key insights or findings. This documentation ensured that the data was easily understandable and could be used for future analysis.

Furthermore, the researcher obtained and used the organizational chart of the agency to ensure that the proposed system was designed with appropriate access controls. The organizational chart provided a visual representation of the organization's hierarchy, including its departments, roles, and reporting structures.

By utilizing the organizational chart, the researcher ensured that the proposed system incorporated the necessary access control levels, taking into account the different roles and responsibilities within the organization. This approach helped maintain the security and confidentiality of sensitive information while

ensuring that authorized individuals had access to the data they needed to perform their duties.

Data Gathering Instruments

To evaluate the developed system, an adapted and modified survey questionnaire was used. The questionnaire was distributed to three groups of participants: Coordinating Law Enforcers, PDEA Regional Office Command personnel, and PDEA Regional Intelligence Section personnel. The survey instrument was adapted from the study by Smith & Johnson (2021) and focused on respondents' perceptions of the system's performance.

The survey questionnaire included five (5) indicators for functionality, acceptability, and accuracy. Each indicator was evaluated by participants using a 5-point Likert scale. The scale ranged from 1 to 5, with 1 indicating "strongly disagree" and 5 denoting "strongly agree," to measure the system's usefulness as shown in Table 3. A similar evaluation was applied to measure ease of use but with a different scale as presented in Table 4. The researcher used a scale ranging from 1 to 5, with 1 indicating "Very Easy" and 5 indicating "Very Difficult."

The survey questionnaire aimed to collect truthful observations from participants and assess the system's performance across various dimensions. Utilizing a Likert scale provided a standardized and systematic method for data collection, promoting reliability and consistency in the gathered data.

Overall, the adapted survey questionnaire offered a comprehensive and efficient method for assessing the developed system. The use of the Likert scale enabled a quantitative analysis of the collected data, enhancing the depth of the evaluation.

Table 7. Five-Point Likert Scale to Evaluate the Usefulness of the System.

Numerical Rating	Mean Range	Verbal Interpretation
5	4.21-5.00	Strongly Disagree
4	3.31-4.20	Disagree
3	2.61-3.30	Neutral
2	1.81-2.60	Agree
1	1.00-1.80	Strongly Agree

Table 8. Five-Point Likert Scale to Evaluate the Ease of Use of the System.

Numerical Rating	Mean Range	Verbal Interpretation
5	4.21-5.00	Very difficult
4	3.31-4.20	Difficult
3	2.61-3.30	Neutral
2	1.81-2.60	Easy

1	1.00-1.80	Very easy

Statistical Tools and Data Treatment

The process of analyzing data involves several stages. One of the initial steps was organizing and tabulating the data to make sense of it and prepare it for further analysis.

The mean was employed to assess the usefulness and ease of use of the developed system in terms of its performance. To examine differences in assessment among Coordinating Law Enforcers, PDEA Regional Office Command personnel, and PDEA Regional Intelligence Section personnel regarding the system's usefulness and ease of use, a One-Way ANOVA test was conducted.

Respondents of the Study

The respondents of this study were classified into three (3) groups: Coordinating Law Enforcers, PDEA Regional Office Command personnel, and PDEA Regional Intelligence Section personnel. These groups included ten (10) Coordinating Law Enforcers within the Region XII area, four (4) PDEA Regional Office Command personnel, and four (4) PDEA Regional Intelligence Section personnel.

Survey questionnaires were distributed to all respondents to gather the necessary data. The respondents accessed the developed system through the ciss-app-project.web.app domain to evaluate its functionality, accuracy, and speed.

Sampling Technique

The study utilized a random sampling technique to ensure that each user group was sufficiently represented in the sample. The population was divided into three (3) strata based on the three groups of users: Coordinating Law Enforcers, PDEA Regional Office Command personnel, and PDEA Regional Intelligence Section personnel.

To select the sample, a total of 28 Coordinating Law Enforcers, four (4) PDEA Regional Office Command personnel, and four (4) PDEA Regional Intelligence Section personnel were randomly chosen from their respective populations.

This sampling technique ensured that the findings were applied to the broader user population, with each group being sufficiently represented in the sample. It also facilitated comparisons among the three (3) user groups regarding their perceptions of the coordination and information-sharing system’s functionality, accuracy, and speed.

III. RESULTS AND DISCUSSION

This chapter presents the study's findings, showcasing the collected data through a combination of tabular and textual formats. Each variable was meticulously analyzed and interpreted, with a thorough exploration of its implications. The presentation of results follows a logical sequence aligned with the stated research problem.

The survey involved a total of 17 participants, including 15 Coordinating Law Enforcers, one (1) Regional Office Command personnel, and one (1) Regional Intelligence Service personnel.

4.1 Developed System Based on Usefulness

To assess the developed system’s usefulness, respondents evaluated its performance based on a set of predefined indicators. These indicators covered key aspects such as user satisfaction and system reliability.

The evaluation results were compiled and presented in Table 5, providing a clear overview of the system's effectiveness. This data offers valuable insights into the system's practical utility and highlights areas for potential improvement.

According to Davis, F. D. (1989), the usefulness methodology emphasizes the importance of aligning system development with user needs and organizational objectives, thereby enhancing the perceived effectiveness, value, and suitability of the developed system.

Table 9. Performance Rating of the Developed System Based on Usefulness.

No.	Items	Mean	Interpretation
1	I am familiar with the computerized system I am using.	1.29	Strongly Agree
2	The computerized system is useful for improving the coordination processes.	1.24	Strongly Agree
3	The computerized system is useful for improving information sharing	1.41	Strongly Agree
4	The computerized system is a cost savings through automation.	1.41	Strongly Agree
5	Does a computerized system improve your real-time data access	1.29	Strongly Agree
6	The computerized system significantly cuts the budget for coordination.	1.29	Strongly Agree
7	Automated workflows and task management are applied	1.35	Strongly Agree
8	Scalability can be applied to the system.	1.24	Strongly Agree
9	The Computerized System can increase efficiency and productivity	1.06	Strongly Agree
10	Time constraints are highly affected by the computerized system	1.29	Strongly Agree
MEAN		**1.29**	**Strongly Agree**

Table 9 presents the performance rating of the developed system, revealing that it received an excellent rating based on user feedback. With an overall mean of 1.29, respondents expressed a high level of satisfaction with the system's usefulness.

Several key factors contributed to the system's outstanding performance. First, it facilitates easy data retrieval, allowing users to access the required information effortlessly. Second, the system demonstrates data flexibility, accommodating various data types and adapting effectively to changes in data structure. Third, automated data backups ensure data integrity and minimize the risk of data loss or corruption.

Additionally, the system supports a large data capacity, enabling the storage and management of extensive datasets. Finally, its ability to generate useful reports further enhances its effectiveness by providing valuable insights and summaries based on stored data, thereby facilitating informed decision-making.
The developed system's excellent rating is a testament to its user-friendly design, adaptability, data security measures, scalability, and robust report-generation capabilities.
These findings align with the study by Venkatesh et al (2012), which highlights the critical role of usefulness in systems effectiveness. To maintain up-to-date collections of structures and models based on the latest information, a system must exhibit optimal performance and seamlessly integrate current data.

4.2 Developed System Based on Ease of Use

To assess the developed system's simplicity, respondents were asked to evaluate its performance based on a set of predefined indicators. These indicators focused on the ease of use. The evaluation results were then compiled and presented in Table 10, providing a clear overview of the system's effectiveness. This data shows valuable insights into the system's practical utility and highlights areas for potential improvement.
According to Davis (1989), determining user requirements and generating alternative system solutions to meet these requirements are two critical steps in the requirement analysis phase of the system development life cycle.

Table 10. Performance Rating of the Developed System Based on Ease of Use.

No.	Items	Mean	Interpretation
1	Overall, how would you rate the ease of use of the system?	1.82	Easy
2	How easy is it to navigate through different sections or	1.82	Easy
3	How quickly can you perform your tasks using the system?	1.65	Very easy
4	How would you rate the responsiveness of the system to your actions?	1.53	Very easy
5	How do you think the system's usability?	1.71	Very easy
6	Functions of the system usability	1.53	Very easy
7	How is your experience using the system?	1.59	Very easy
8	Is the information sharing easy to use?	1.53	Very easy
9	How is the interface of the system?	1.53	Very easy
10	How do you complete the task using the computerized system	1.47	Very easy
MEAN		**1.62**	**Very easy**

Table 10 presents the performance rating of the developed system, revealing that it received an excellent rating for its ease of use. Respondents rated its accuracy highly, with an overall mean of 1.62. This rating indicates that the system excels in several key aspects related to ease of use.
First, it ensures accurate data storage, guaranteeing that the data stored within the system remains reliable and error-free. Second, the system incorporates error prevention measures, minimizing the occurrence of mistakes or inconsistencies in data handling processes. Additionally, it demonstrates precise data handling, accurately processing and manipulating data without introducing errors or distortions. The system also employs data validation checks to maintain the accuracy and integrity of input data.

Furthermore, the system incorporates automated data verification mechanisms to ensure the accuracy of entered information. The rating in Table 10 demonstrates the system's effectiveness in terms of ease of use.

These results are consistent with the research by Sa et al. (2016), which highlights the importance of ease of use of the system. Such precision plays a vital role in the advancement of autonomous information systems, especially in improving the users friendlynes of the system. This indicates that prioritizing ease of use in system development is essential to maximizing benefits for end users.

4.3 Overall Performance of the Developed System

The developed system was evaluated by respondents based on its usefulness and ease of use to determine whether this online-based solution demonstrates improvements and effectively addresses issues associated with conventional methods. The results below summarize the overall performance of the developed system.

Table 11. Overall Performance Rating of the Developed System.

No.	Items	Mean	SD	Interpretation
1	Usefulness	1.29	0.52	**Strongly Agree**
2	Ease of use	1.62	0.69	**Very easy**
MEAN		**1.45**	**0.60**	

Table 11 presents the performance evaluation of the developed system. The respondents strongly agreed with its overall performance, as reflected in the mean rating of 1.45. This indicates that the system’s usefulness, with a mean rating of 1.29 and a standard deviation of 0.52, enables aspect-based sentiment analysis of textual feedback and recommendations gathered from the respondents. Furthermore, it highlights the system's versatility and effectiveness compared to traditional approaches. Additionally, the system’s ease of use received a mean rating of 1.62, with a standard deviation of 0.69, demonstrating its capability to meet standard requirements.

These conclusions are supported by the research of DeLone & McLean (2016), which emphasizes the crucial role of online information systems in the success of individuals, communities, companies, sectors, and nations—particularly in the domain of information data banking. This suggests that aligning system development with end-user expectations for both usefulness and ease of use plays a significant role in ensuring its effectiveness.

Table 12. Comparison between Manual and Web-based.

MANUAL / MONTH			WEB BASED
PROVINCE	TOTAL	TOTAL TIME / MINUTES	
	FUEL and MEALS	TRAVEL and PROCESSING	PROCESSING in MINUTES
Sarangani/GenSan	68,000	240	5
South Cotabato	66,000	63	5
Sultan Kudarat	59,600	240	5

North Cotabato	102,400	480	5

Table 12 compares manual and web-based processes across four (4) provinces in terms of total fuel allocation, meal expenses, and processing time.

In the manual process, fuel and meal allocations vary across provinces: Sarangani and General Santos: Approximately ₱68,000 with a 240 minutes processing time; South Cotabato: Approximately ₱66,000 with a 63 minutes processing time; Sultan Kudarat: Approximately ₱66,000 with a 240 minutes processing time; and North Cotabato: Approximately ₱102,400 with and 480 minutes processing time.

In contrast, the web-based process significantly reduces processing time to just five (5) minutes for all provinces. This highlights the efficiency and potential cost savings of adopting a web-based approach over the manual method.

DeLone & McLean (2003) emphasized that comparing traditional manual methods with modern web-based systems demonstrates the effectiveness and efficiency of web-based solutions. Their study suggests that web-based systems are advantageous as they reduce the high costs associated with coordination and information-sharing activities.

Table 13. T-test, P Value, and Interpretation of the Variables.

Variables	Process	Mean	SD	t-statistic	df	p-value (2-tailed)	critical value	Decision
Time Traveled	Manual	255.775	1.072	-9.95	70	0	1.994	Reject the null hypothesis.
	Web-based	5	0					
Travel Expense	Manual	74,000	16687.7	17.983	70	0	1.994	Reject the null hypothesis.
	Web-based	0	0					

Table 13 compares manual and web-based methods in terms of travel time and expenses. The results show that the web-based method has a fixed duration of 5.00 minutes, while the manual method takes an average of 255.775 minutes, with some variation.

In terms of expenses, the manual method incurs an average cost of ₱74,000, whereas the web-based method has no associated cost. Statistical analysis indicates a significant difference in both time and expenses, leading to the rejection of the null hypothesis. This confirms that the observed differences are not due to chance.

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CITATIONS

The shift toward digital transformation and the adoption of cloud technologies allow organizations to centralize IT operations, eliminate traditional hierarchical structures, increase work speed, integrate departments, and remove redundant steps (Shirpoor et al., 2023).

The emphasis on cost-effectiveness and sustainability has further accelerated the integration of IT solutions within government frameworks. Studies indicate that digital coordination platforms can lead to significant reductions in operational expenses, including savings on resource allocation and logistics (Glukhikh et al., 2021).

Additionally, these platforms facilitate faster data sharing both within and between organizations, promoting collaborative working environments and enhanced information exchange (Gangneux & Joss, 2022).

The Philippine Drug Enforcement Agency (PDEA), established in 2002, is a key agency responsible for enforcing drug laws and combating illegal drug activities in the Philippines. Recognizing the importance of collaboration among government agencies, civil society organizations, and local communities in addressing drug-related issues, PDEA must enhance its training and capacity-building programs to improve overall effectiveness (Rivera et al., 2020).

A well-coordinated system, guided by Lean principles, significantly enhances efficiency by optimizing communication and minimizing operational bottlenecks. According to Womack and Jones (1996),

Continuous Flow further enhances coordination by enabling seamless and uninterrupted information exchange, reducing the need for batch processing and ensuring that critical updates reach relevant personnel in real time. This is complemented by Just-in-Time (JIT) Communication, which prevents information overload by ensuring that data is transmitted precisely when needed, improving decision-making and response efficiency (Ohno, 1988).

the Elimination of Waste (Muda, Mura, Muri)—a core Lean concept—focuses on reducing inefficiencies, inconsistencies, and overburdening of resources by removing redundant tasks, standardizing workflows, and optimizing workload distribution (Liker, 2004).

In addition, Kamau et al. (2021) examine how challenging it is for law enforcement agencies to provide one another with criminal information and how it impacts crime control.

Meanwhile, Aden (2018) averred that using centralized databases and networks that enable cooperation has made information sharing amongst security agencies—especially within the European Union—extremely important. Law enforcement agencies and intelligence services frequently struggle to balance sharing information and safeguarding the confidentiality of their operations.

In law enforcement, removing these obstacles is essential to creating efficient coordination and information-sharing systems (Mao, 2021).

In developing a coordination and information-sharing system, these concerns must be addressed to ensure operational secrecy does not compromise these fundamental rights. When necessary to accomplish security goals, sharing cyber-threat intelligence—specifically, IP addresses—between multinational corporations can be justified in the public interest even without data subject consent (Sullivan & Burger, 2017).

Hence, inter-agency coordination is an important notion in dealing with anti-illegal drug operations in law enforcement. Ovsianiuk, D. (2024) emphasize that coordinated action between diverse agencies and public or private stakeholders is essential in countering drug crime; however, selecting an effective coordinating body remains a persistent issue in domestic contexts.

For instance, a study by Lopez (2024) evaluating the Barangay Anti-Drug Abuse Council (BADAC)'s drug-clearing operations emphasizes collaboration's significance in improving public safety and security through a structured intervention paradigm. His study further claimed that Barangay Labangal, in General Santos City, Philippines, performed well in the sequential explanatory mixed-method study to refine the drug-clearing functioning model.

On the other hand, Baldino (2018) argued that comprehensive intelligence and marine domain awareness are needed to combat drug smuggling and cyber-sabotage, highlighting how intelligence sharing and coordinated defense enable maritime and transnational threat combat.

Faced with rising drug distribution and use, anti-drug operations need better coordination and a systematic revamp of preventive measures. Aleksandr and Renat (2021) suggest more interdepartmental coordination to combat illegal drug trafficking and use; they analyze interdepartmental drug control dynamics and recommend actionable improvements based on successful regional cooperation in anti-drug projects.

It increases officer safety as well as productivity and efficiency in the police profession (Dwyer, 2023).

However, data security and privacy concerns must be addressed to ensure successful implementation (Dawes et al., 2009). Knowledge networking and public sector knowledge networks can help create a systemic capacity to share knowledge and information within law enforcement domains across multiple jurisdictions and sectors (Savelyev, 2018).

This has led to an increase in the collection of personal data (Arumugam & Sulekha, 2016).

To understand the essence, content, levels, and essential links of the law enforcement system, Dzhorobekova et al. (2019) emphasize the necessity of using a systematic approach (as a tool—theoretical and methodological knowledge) at first.

Chiancone (2023a) emphasizes that these systems use sophisticated algorithms and machine learning to comb through large amounts of data, including audio, video, and social media posts, to identify suspicious activity and send out alerts to law enforcement in real-time This technological advance has supported public safety and crime prevention initiatives, proving the enormous advantages of information-sharing mechanisms in law enforcement.

As such, the successful governance of AI-driven monitoring in law enforcement depends on the development of strict guidelines and moral principles that balance the competing interests of privacy protection and crime prevention (Chiancone, 2023b).

Access to data must be strictly controlled to preserve privacy and prevent unauthorized use. Managing data security and access control becomes more difficult when handling data from different technology platforms (Odess, 2023).

This proactive approach demonstrates an insightful understanding of the dynamic security landscape, a trait emphasized in Dzhorobekova et al. (2019).

The exploration of data analytics and AI-driven capabilities, in which the information sharing is anchored to the conceptual framework, parallels the increasing adoption of these technologies, as seen in studies by Chiancone (2023a) and Mitzias et al. (2019), bolstering the relevance and potential impact of your project. The literature emphasizes the need for robust data security protocols and a clear legal framework that aligns with the Philippine Data Privacy Act of 2012. The studies by Sullivan & Burger (2017) and Lee (2023) highlight the complexities of ensuring data protection in the context of evolving technology. Success and social responsibility depend on navigating this ethical dimension and building a system that inspires public trust.

The questionnaire was distributed to three groups of participants: Coordinating Law Enforcers, PDEA Regional Office Command personnel, and PDEA Regional Intelligence Section personnel. The survey instrument was adapted from the study by Smith & Johnson (2021) and focused on respondents' perceptions of the system's performance.

According to Davis, F. D. (1989), the usefulness methodology emphasizes the importance of aligning system development with user needs and organizational objectives, thereby enhancing the perceived effectiveness, value, and suitability of the developed system.

These findings align with the study by Venkatesh et al (2012), which highlights the critical role of usefulness in systems effectiveness.

These results are consistent with the research by Sa et al. (2016), which highlights the importance of ease of use of the system. Such precision plays a vital role in the advancement of autonomous information systems, especially in improving the users friendlynes of the system.