

**LUPONG TAGAPAMAYAPA INCENTIVES AWARD DATABASE SYSTEM  
FOR DILG CLUSTER A PROVINCE OF LAGUNA**

A Capstone Project presented to the Faculty, College of Computer Studies  
Laguna State Polytechnic University  
Los Baños Campus  
Los Baños, Laguna

In Partial Fulfillment of the Requirement for the Degree  
Bachelor of Science in Information Technology  
*Specialized in Web and Mobile Application  
Development*

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## APPROVAL SHEET

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**The Researchers**

## **DEDICATION**

This Capstone Project, titled "Lupong Tagapamayapa Incentives Award Database System for the DILG Cluster A of the Province of Laguna," is dedicated to the inspiring faculty at the College of Computer Studies, Laguna State Polytechnic University, Los Baños Campus. It is also devoted to the Almighty God, with heartfelt gratitude and love, for bestowing strength, courage, and wisdom. This dedication further extends to the parents of the developers:

**Mr. and Mrs. Cortes**

**Mr. and Mrs. Montecillo**

**Mr. and Mrs. Almadovar**

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**J.B.C.**

**J.M.O.M.**

**D.L.A**

## ABSTRACT

The Lupong Tagapamayapa Incentives Awards Database System was designed to modernize the paper-based Means of Verification handling methods of the DILG and LGUs in Cluster-A of Laguna. This initiative focused on rectifying the flaws in the existing system, such as error-proneness and challenges in case tracking and retrieval. Agile Scrum Methodology was applied to manage the system/software development life cycle with adaptive approaches. The system incorporated JavaScript, PHP, and Bootstrap, chosen for their reliability and broad compatibility across devices and browsers. A MySQL webhost was employed for its robustness in managing relational databases over the internet, a key aspect for scalable and secure database management systems, crucial for the real-time and accurate processing of case reports. Post-development, the system underwent beta testing and evaluation, demonstrating a high level of user satisfaction. It achieved a notable Strongly Acceptable rating of 3.72 based on the Technology Acceptance Model. Additionally, an IT specialist gave a firm approval with a Strongly Acceptable rating of 3.52 according to the ISO 25010 standard.

**Keywords:** *LTIA, Cluster-A, Paper- based handling, Case tracking.*

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## DEFINITION OF TERMS

<b>Attitude Toward Using</b>	The user's overall positive or negative feelings about using the system, influenced by perceptions of usefulness, ease of use, cost, and social influence.
<b>Behavioral Intention to Use</b>	The user's intention or likelihood to use the system in the future based on their attitudes and other factors.
<b>Cluster A</b>	it is a group of 10 Municipalities in the Province of Laguna, namely Municipality of Alaminos, Municipality of Bay, City of Biñan, City of Cabuyao, Municipality of Calauan, City of Calamba, Municipality of Los Baños, City of San Pablo, City of San Pedro, and City of Sta. Rosa.
<b>DILG</b>	is the executive department of the Philippine government responsible for promoting peace and order, ensuring public safety and strengthening local government capability aimed towards the effective delivery of basic services to the citizenry.
<b>Compatibility</b>	the ability of a product, system, or component to effectively communicate and execute its necessary tasks within a shared hardware or software environment.
<b>Functional Suitability</b>	Measures the degree to which a software product fulfills its intended use and conforms to established applicable requirements, ensuring that the system performs as expected for its users.
<b>ISO 25010</b>	A standard that provides guidelines for the development, evaluation, and implementation of software, emphasizing safety and effectiveness. It aims to ensure the quality and reliability of software applications.
<b>Likert Scale</b>	is a unidimensional scale used by researchers to collect respondents' attitudes and opinions



towards a particular subject, such as a brand, product, or target market.

<b>LTIA</b>	Lupon Tagapamayapa Incentives and Award (LTIA) is an annual program that aims to recognize Lurons who have shown outstanding performance in keeping peace and order in their communities.
<b>Maintainability</b>	The level of efficacy and effectiveness. This attribute signifies the extent to which a product or system can be modified effectively and efficiently to rectify, enhance, or accommodate alterations in the environment and demands.
<b>Mean</b>	is the average of a set of values. It is calculated by adding up all the values and dividing by the number of values. The mean represents a central or typical value in the dataset.
<b>Performance Efficiency</b>	It evaluates how well a system uses resources to achieve its objectives, ensuring optimal performance and responsiveness.
<b>Perceived Cost</b>	The cost or perceived financial burden associated with using the system, which can affect the user's attitude toward using it.
<b>Perceived Ease of Use</b>	How easy the user feels it is to use the system, impacts their comfort and willingness to adopt it.
<b>Portability</b>	refers to the characteristic of a system or device that allows it to be easily moved or transported from one device to another.
<b>Reliability</b>	a software quality attribute that refers to the capability of a system to maintain its performance under specified conditions for a specified period.
<b>Security</b>	assessing a system's security using the ISO 25010 standard, which outlines key attributes like integrity, confidentiality, and availability.
<b>Social Influence</b>	The impact that other people's opinions and behaviors have on the user's decision to adopt or use the system.

<b>TAM</b>	is a theory that predicts the likelihood of someone accepting and using a technology based on their intention to use it. This intention is influenced by the user's perception of how useful the technology is for completing a task and their perception of how easy it is to use.
<b>Usability</b>	The level to which specific users can effectively, efficiently, and satisfactorily use a product or method to reach specific goals in a particular setting.
<b>Web-Based</b>	It refers to systems, applications, or services accessed through the internet via a web browser. It signifies online functionalities, eliminating the need for local installation or downloading, enhancing accessibility and usability through web browser

## **CHAPTER I**

### **INTRODUCTION**

The justice system in the Philippines is a complex and multifaceted entity that plays a crucial role in maintaining law and order, upholding the rule of law, and ensuring the protection of citizens' rights and freedoms. As the smallest governmental unit in the Philippines, the barangay is in charge of meeting the needs of its residents and offering essential services. For instance, the barangay might provide health clinics, emergency response services, and community gatherings to foster camaraderie and guarantee the general welfare of its residents. The Philippines barangay system is an excellent illustration of how a government can meet the needs of its people at the local level and offer essential services. The Katarungang Pambarangay System was established to settle conflicts amicably at the barangay level, doing away with traditional court procedures' expensive and time-consuming nature. The Katarungang Pambarangay system, which provides a peaceful means of resolving conflicts at the barangay level, has also contributed to developing an efficient justice system within communities. This legal system, intrinsic to Philippine culture and customs, has helped communities establish efficient justice systems while simultaneously relieving the load on judicial authorities. (Tabucanon et al., 2008).

The primary method of resolving conflicts under the Barangay Justice System is to give the disputing parties a place to look for a compromise. Therefore, the system's primary purpose is to help the parties debate potential amicable resolutions to their issues rather than to adjudicate disputes and force a solution on them. The Punong Barangay and the community conciliators, who

are Lupon members, are facilitators for the conflicting parties to consider potential solutions rather than judges or arbitrators in conflicts. This is why the disputing parties must physically appear and participate in the proceedings; otherwise, there will be appropriate consequences. Conciliation procedures under the Barangay Justice System do not apply to conflicts involving nonnatural persons, such as companies, due to the requirement that the disputing parties personally participate in the proceedings. (Vigo 2004)

An alternative to the expensive and time-consuming method of resolving conflicts in conventional courts is the Barangay Justice System. Instead of going through the extremely formal procedure of submitting official pleadings and presenting evidence in court or Lupon, the parties to a disagreement are allowed to try to engage with one another and discuss their issues amicably. There is no application of the formal procedures and regulations typically used in judicial proceedings. Legal representation would be required to file a court case or defend oneself against one of these actions. However, the parties do not have to hire attorneys in the Barangay Justice System. It is against the law for attorneys to participate in the conciliation process. Cases handled through the Barangay Justice System typically conclude in weeks instead of years when they are tried in court. In short, the Barangay Justice System offers a fast, low-cost, and amicable forum for settling disputes where parties can discuss solutions for settling their differences outside of court. (Manuel 2004). It is also intended for the Barangay Justice System to support the courts in enforcing the law. Before going to court, the parties in matters covered by the Barangay Justice System are required to go through the Barangay Justice System procedures. Should this not be done, the parties' claim or counterclaim will be

dismissed. The parties will only be permitted to file a lawsuit in court if the Barangay Justice System cannot settle the conflict.

Through incentives, the Lupong Tagapamayapa Incentives Award (LTIA) recognizes the Lupong and barangays that are excellent at grassroots conflict resolution and mediation. Additionally, by highlighting the accomplishments of acknowledged barangays, the LTIA fosters public trust and community involvement, ensuring the Barangay Justice System's continued relevance, adaptability, and effectiveness in addressing Filipino communities' evolving needs and challenges. Administered by the Local Government Unit (LGU), the LTIA aligns with the broader objectives of the LGU to promote good governance, transparency, and community empowerment at the local level. By rewarding excellence in barangay governance and mediation, the LTIA strengthens the foundation of the Barangay Justice System, encouraging continuous improvement and innovation in community-based dispute resolution. The local government unit can improve efficiency, transparency, and LGU services by adding the latest technologies. It enhances citizen engagement, satisfaction, and response capabilities, allowing citizens to access various public services online. As technology continues to evolve, it is essential to integrate the transaction and operation of LGU into it. The governance and administration will grow and modernize, making LGU adapt and leverage technological advancement effectively.

The barangay secretary handles the manual generation of documents, including clearances, permits, and records of disputes and crimes. The records maintained in the blotter book are disorganized, making it challenging even for officials to monitor and determine the status of cases, whether they are settled

or require follow-up. The researcher recognizes these inefficiencies and sees a pressing need to develop a web-based crime monitoring system. This system would enable the barangay to keep organized records of various cases by tagging or mapping them on the barangay map. Understanding the significance of the barangay justice system, they believe that implementing an automated system for monitoring blotter cases filed within it would lead to more effective and efficient peace and order management. Such a system would streamline processes, enhance transparency, and ultimately contribute to the betterment of the barangay community. (Lilibeth, 2020).

Developing a Web portal for the Lupong Tagapamayapa Incentives Award system centralized the information resources, allowing authorized users to access them online. This also streamlines communications and reduces the time and effort of attaining or submitting documents in real-time. Web portals for LTIA empower community engagement and participation, allowing authorized users to submit disputes, track the status of cases submitted by citizens, and experience real-time feedback. This also promotes active participation in the Barangay Justice system and strengthens the relationship between barangays and their civilians.

This project aims to develop a particular module for the existing Lupong Tagapamayapa Incentives Award (LTIA) system, which enables Focal Users to upload MOV based on the criteria given by DILG provided in the system. With this module, several benefits are on the line, especially document management, which plays a crucial role for this module considering that this module streamlines the process by centralizing all relevant documents in one accessible location; this is to reduce consumption and a lot of efforts compared

to the manual handling process of the papers that prone for risks and human errors. Adding Data banking to the LTIA System provides systematic storage and retrieval of document data, ensuring that the information is available when needed. Data banking also helps to secure from unauthorized access and possible security breaches. Furthermore, having organized data makes it easy for audits and transparency making the systems reliable and accountable.

### **General Objectives**

The main goal of this capstone project is to develop a particular module intended for the Lupong Tagapamayapa Incentives Award Database System for Cluster a Laguna Province. Specifically, this project aims to:

1. Develop a data banking system that will handle documents related to Lupong Tagapamayapa Incentives Award
2. Design a user-friendly web-based database module interface that supports the needs of the Lupong Tagapamayapa Incentives Award Database System.
3. To test and evaluate the system using ISO 25010 and the Technology Acceptance Model.

### **Project Purpose**

This study aims to develop a system for monitoring Lupong Tagapamayapa's performance and providing transparent access to information on its performance. This system's development intends to improve the manual process of Lupong Tagapamayapa Incentive Awards. This study aims to increase the efficiency of the awarding process by providing a centralized platform to collect, organize, and evaluate data from Lupong Tagapamayapa

Performance and Achievements. It includes data on the number of cases resolved, the effectiveness of mediation efforts, and other relevant metrics.

### **Lupong Tagapamayapa Units**

The primary beneficiaries are the Lupong Tagapamayapa units. The system allows them to monitor their progress, identify areas for improvement, and aim for standards in resolving disputes. Offering incentives as a form of acknowledgment also encourages mediators to persist in their endeavors to foster harmony within their localities.

### **DILG A Cluster Head | City and Municipal**

The DILG Cluster Head can easily access a wide range of data on the performance of Lupong Tagapamayapa units. Due to its accessibility, the cluster can monitor and evaluate operations more effectively, assessing process units' provision of resources and prioritizing support where it is most needed.

### **Barangay Secretaries**

Barangay secretaries gain access to streamlined data administration, improved monitoring and reporting capabilities, more accountability and transparency, recognition and rewards for excellent Lupong Tagapamayapa units, and chances for capacity building and information sharing in conflict resolution.

### **Future Researchers**

Understanding this database system could allow future researchers to offer insights into the effectiveness of community-based conflict resolution



mechanisms, the impact of incentives on the performance of mediation councils, and trends in conflict resolution at the grassroots level. Additionally, it could provide valuable information for policymakers and stakeholders interested in improving the efficiency and outcomes of local dispute-resolution processes.

### **Scope and Limitations of the Study**

The main focus of the study is the Lupong Tagapamayapa Incentives Award Module, a centralized and digital platform created to institutionalize a system of providing financial rewards and other incentives to Lupong Tagapamayapa members who consistently resolve conflicts at the barangay level. It's meant to be used online. It can also operate offline, albeit the drawback is that information entered in offline mode won't sync with the central database until the system is back online. One significant limitation of the system is its incapacity to access previous complaints filed before its installation. Numerous modules, including the nomination and evaluation modules, are part of the web-based system.

### **Nomination Module**

This module serves as a vital resource for uploading supporting documents, such as barangay resolutions and settlement agreements, as well as details on the evaluation standards and selection procedure.

### **Evaluation Module**

The main goal of the Evaluation Module's design was to display the LTIA Criteria and an interface for viewing nominations that have been submitted

together with any supporting documentation. Nominations are only accessible to and submitted by DILG Evaluators. Only the DILG evaluator has access to the entire evaluation module.

The outlined scope and limitations effectively clarify the functionalities and target audience for the LTIA Module. It defines the core features while acknowledging potential limitations that can be addressed in future development phases.

## CHAPTER II

### REVIEW OF RELATED LITERATURE, STUDIES, AND SYSTEMS

#### **Barangay Justice System in The Philippines**

A method used by the community to settle conflicts between its members is the Barangay Justice System. It exists to support the grassroots communities in the mediation process and provide prompt, economical, and excellent justice through a non-adversarial method. The Katarungang Pambarangay Law, also known as Presidential Decree No. 1508, was initially recognized in 1979. Prior studies had been minimal, and the law's presumptions were supported by little evidence. The main goal of the Barangay Justice System (BJS), a community mediation program in the Philippines, is to use non-adversarial procedures to deliver superior justice in a timely and economical manner. The goal of dispute resolution is to resolve disputes as an underlying unit of authority and how the procedure enables both parties to conciliate a dispute resolution and resolve the conflict peacefully out of court by the parties involved, as opposed to using the very technical tactic of filing petitions and presenting evidence in court. (Mohammed & Caingat, 2017)

The state's final legislation grants local control to the Local Government. An extra-governmental organization that supports the timely and efficient local practice of peaceful dispute settlement and suitable and equitable legislation for the community. Former vice president Robredo asserts, "The law not only equalizes but also provides harmony. It reconciles opposing viewpoints by pointing them toward a single, distinct image of the society they seek to create—compassionate, just, and fair—rather than by endorsing one side's interests over another (Gonzales L.A, 2022).

There are community-based judicial systems in comparable local situations in Western countries, such as the United States of America, where each state follows a different religious system or mediation procedure. Older mediators have been chosen in several Western nations because of their familiarity with the specific conflicts at hand and their history of facilitating internal conflict resolution within societies to optimize outcomes for a group or tribe. The belief that a dispute affects not just the individuals involved but also the entire tribe, organization, or community in which they are engaged is known as "collectivism" in the West. Not only do the mediators apply "group pressure," but they also use their respective positions to influence the parties to settle the dispute.

This jail system is located within the barangay. It displays an official acknowledgment of past conflict settlements. The Philippines' socialization norms mandate that small conflicts and criminal infractions be "amicably settled" by the captain or barangay leader without the involvement of attorneys (Sotto, 2021). The parties benefit from the katarungang pambarangay system because it allows them to settle their differences amicably in the barangay without resorting to legal action (Lim, 2019).

The barangay justice system's improved process for amicable conflict settlement is a significant advancement in the delivery of judicial services in the community (Pagandian & Pasule, 2019). Individuals who have previously handled cases have expressed an interest in not providing the records or paperwork related to the case's handling and outcome. However, after training classes on the barangay justice system, these individuals—barangay officials

in particular—realized the flaws and became aware of their inadequacy (Guia & Mangubat, 2021).

The Barangay Justice System is an essential foundation for grassroots peacekeeping and conflict settlement within the Philippines' legal system. This method, based on the ideas of restorative justice, emphasizes reconciliation, mediation, and peaceful resolutions as practical means of resolving disputes within local communities. The Barangay Justice System makes it easier for people to settle conflicts amicably. It promotes collaboration and solidarity among community members by giving them a quick and convenient forum. Its function goes beyond simple court procedures; it represents a dedication to social harmony, dispute settlement, and the advancement of justice in Philippine society. The Barangay Justice System, a fundamental component of local governance, is essential for maintaining the rule of law, encouraging harmony within the community, and guaranteeing that every person has fair access to the legal system (Project Jurisprudence, 2019)

As stated by Metro O. G. et al. (2021), The Katarungang Pambarangay or barrio Justice System is a community-based conflict settlement process that is run by the country's fundamental political unit, the barrio, as stated in the study that reviewed the relevant laws affecting its implementation. The Punong Barangay and other community members (the Lupon members) serve as intermediaries (mediators, conciliators, and, occasionally, arbitrators) in this community-based method of resolving disputes between members of the same community (typically, the same city or municipality).

As stated by J. Benter. (2020), significant regional differences exist in the institutionalization of extrajudicial conflict resolution. China and Pakistan are

ahead of the US in this regard; the US passed the Dispute Resolution Act very recently. In the Philippines, conflict resolution procedures are handled by *lupong tagapamayapa* and *pangkat ng tagapagkasundo*; in other countries, these organizations may be known as conciliation committees, courts, boards, or community centers. A community-based process called "Shalish" is used in Bangladesh to resolve various civil issues, some of which may have criminal implications. Norway and Russia use mediation extensively; each municipality in Norway has its mediation council. Decreased crime and increased justice are the two main objectives of criminal justice policy in the US, UK, Canada, and Sweden. Like the *Katarungang Pambarangay* in the Philippines, hybrid courts combine traditional dispute resolution methods with Western legal ideas like the Solomon Islands, Papua New Guinea, Nigeria, and South Africa. During the colonial era, these hybrid courts emerged as a means of balancing the increasing authority of central governments with local autonomy.

According to a Nomad Capitalist article, Norway's independent court, which prioritizes impartiality, and its prisoner reform program, which promotes rehabilitation and reintegration, are the main reasons it is ranked first on the World Justice Project's Rule of Law Index. Finland's complex legal system and commitment to judicial independence emphasize the value of diversity and public trust in the legal system. The goals of Sweden's rehabilitative approach to jail align with those of the electronic barangay justice system, which promotes reformation and alternative conflict resolution. The importance of these characteristics in a digital system is modeled after the transparent and effective Dutch legal system. Developing a fair, user-friendly, and highly effective electronic barangay justice system is possible.

**DILG**

Peaceful, safe, self-reliant, and development-dominated communities; improve local governments' performance in governance, administration, social and economic development, and environmental management. Good governance and the protection and promotion of human rights directly contribute to peacebuilding, conflict prevention, and post-conflict recovery. By strengthening community partnerships, the government will foster efficient, inclusive, and accountable LGUs to boost people's confidence in the government and human rights-based security institutions. (DILG, 2022)

Additionally, we will implement appropriate penalties for violators and intensify mainstreaming efforts through improved reward schemes. Maintain peace and order, as well as ensure public safety. In pursuing economic transformation, the manifestation of peace and security is necessary for implementing development activities that could bring in more and better opportunities for the people. If we protect and develop conflict-vulnerable areas, safeguard the quality of life from criminality, and ensure communities are safe from natural hazards and other security threats, we can achieve this. Likewise, an efficient administration of justice is critical to ensuring sustained economic progress. Whether traditional or alternative, a stable and accountable justice system must inspire trust and confidence among stakeholders through integrity, fairness, and accessibility. The Philippine Development Plan (PDP) 2023–2028 assumes that a whole-of-government approach with cross-cutting strategies is required to ensure peace and security. The plan asserts that economic justice serves as a pillar of a robust and vibrant economy, necessitating a sector-based approach based on strong coordination among justice sector institutions,

agencies, and actors to foster public engagement and trust in the justice system. (PDP NEDA, 2023)

The Department of Justice (DOJ) and the Department of Interior and Local Government (DILG) pledged to collaborate to create a criminal justice system that is stronger and more effective. DOJ Secretary Jesus Crispin C. Remulla and DILG Secretary Benjamin C. Abalos, Jr. observed during a joint press conference at Camp Crame that enforcement and prosecution do not now appear to collaborate well. Both authorities concurred that a "drastic" improvement to the current system is required.

Secretary Remulla said that among the areas he and Secretary Abalos have agreed to pursue is the re-training of law enforcement units in both remedial and substantive laws to avoid cases being returned "for further investigation." On the part of the prosecution, he observed that there seems to be confusion on the quasi-judicial functions of the prosecutors. He said prosecutors' quasi-judicial functions should not take precedence over their primary role to prosecute cases such that people guilty of crimes are convicted and punished.

Sec. Remulla reiterated the need for the law enforcers and prosecutors to work well together to achieve a stronger criminal justice system. Further, SOJ said, "Ang gusto sana namin ang piskal at pulis, magkakampi lagi. Nagtutulungan, hindi sila nagtuturuan." (DOJ, 2022)

The justice system's fragmentation is still an issue. Law enforcement, prosecution, courts, corrections, and the community—the five pillars of the justice system—all historically carried out their respective functions



independently but with a restricted focus on their particular areas of jurisdiction. This led to gaps in policy advice and procedural discrepancies. The Department of Justice (DOJ), the Department of the Interior and Local Government (DILG), and the Judiciary, along with any pertinent attached agencies, have formed the Justice Sector Coordinating Council (JSCC). This crucial initiative is now fully operational as a cooperative mechanism for the justice sector agenda. Furthermore, the National Judicial Information System (NJIS) was established to aid in coordinating entities within the judicial sector. Even if the successes above helped to reduce fragmentation, more has to be done to build on and scale up the achievements. The PDP 2017–2022 aims to guarantee the prompt and equitable administration of justice. There will be an overhaul of current systems to solve the system's enduring and widespread problems. A simplified procedure that acknowledges the institutions within the justice sector's distinct mandates and jurisdictions forms the basis of this methodological change. (PDP NEDA , 2018)

### **Barangay Justice System in Laguna and Cluster A**

Implementation of katarungang pambarangay currently, 80 barangays in San Pablo have the resources they need to execute ICT initiatives. Since the Philippine government intends to revolutionize its services, everyone is given and provided with various ICT devices and internet technologies. Despite government help and resources, some formal barangay transactions still require manual processing. The Katarungang Pambarangay, or the Barangay Justice System involves manual transactions. (Joanna E. De Torres and Marco Jr. N. Del Rosario, 2019)

To ensure the continued usefulness of e-services, it is critical to assess the preparedness of the government's in-house and online infrastructure. According to DILG data, all 80 barangays of San Pablo are equipped with essential ICT capabilities. Having stated that it is clear that 100% of the barangay has the essential equipment to facilitate using an information system. Examples of such equipment include desktop PCs, printers, and scanners. However, it is unclear whether all of these barangays have internet access. A survey was performed to determine the availability of internet access in all barangays in San Pablo City. The survey results show that 75% of the barangay is fully equipped with ICT facilities and stable internet connectivity. On the other hand, it shows that 25% of barangay still, unfortunately, lack internet connectivity. Twenty Barangays still do not have a stable internet connection. However, based on interviews with some respondents, the issue was addressed by the barangay purchasing and relying on portable broadband devices owned by barangay secretaries. (Joanna E. De Torres and Marco Jr. N. Del Rosario, 2019). In the Philippines, Lupong Tagapamayapa has been functioning inside the barangay court system for over ten years (Villamor and Dagohoy 2020).

### **Lupong Tagapamayapa Incentives Awards**

Lupong Tagapamayapa Incentives Awards is a web-based application developed by the DILG Information System and Technology Management Services that improves the encoding, evaluation, ranking, and selection of Lupong Tagapamayapa Incentives Awards awardees. (Department of the Interior and Local Government, 2022) It institutionalizes a system of granting economic benefits and other incentives to the Lupong Tagapamayapa that

demonstrates exemplary performance in settling disputes at the grassroots level and it was established in 1997. (Department of the Interior and Local Government, 2023) Lupong Tagapamayapa's assessment will be based on its efficiency and effectiveness in securing the settlement of the interpersonal dispute objective of the Katarungang Pambarangay, the creativity and resourcefulness of Lupong Tagapamayapa, the area of the facility for KP activities, and financial or non-financial support. (Department of the Interior and Local Government, 2022)

The Lupong Tagapamayapa Incentives Awards (LTIA) were established by Section 406 of the LGC of 1991, which requires the DILG to provide economic and other incentives to Lupong Tagapamayapa (LT) for their outstanding contributions to achieving the Katarungang Pambarangay's objectives. (Department of the Interior and Local Government, 2016) It is a joint program of DILG and the Department of Justice (DOJ), Its purpose is to highlight the role of Lupong Tagapamayapa in this resourcefulness in resolving cases under the Barangay Justice System. (Department of the Interior and Local Government, 2022)

Katarungan Pambarangay (KP) is the Philippines' response to the ongoing global search for indigenous mediation systems capable of resolving disputes within and outside formal courts of justice. KP's main feature is the Lupong Tagapamayapa. Years of dispute resolution experience have led to the conclusion that Lupon members' commitment and determination in carrying out their tasks and obligations was substantially responsible for their success. Recognizing the Lurons' substantial contributions to the advancement of the KP aim over the years, the DILG established the Lupong Tagapamayapa

Incentives Awards, both as a function of public policy and as a reward for exceptional Lupon performance. The Lupon Tagapamayapa Incentives Awards were created in 1997 as a way to formalize a program that gives the economy advantages and other incentives to the Lupon Tagapamayapa that shows exceptional achievement in resolving conflicts at the local level. Regional, provincial, and municipal committees assessed the lupon's performance and achievements according to their effectiveness in achieving the katarungang pambarangay goals, their operations efficiency, and their mediators' inventiveness and resourcefulness. (Department of the Interior and Local Government, 2016)

### **Emergence of Technology**

Modern technology has completely changed the criminal justice system, presenting opportunities and difficulties. Law enforcement officers can profit from cutting-edge technology as they investigate criminal behavior and conduct justice, just as sophisticated criminals can use it to commit crimes and avoid discovery. Although forensic science is a well-known and efficient application, it is just getting started. Furthermore, the use of technology in the juvenile justice system, rehabilitation, and incarceration is becoming increasingly important. Professionals in the criminal justice area will be expected to be skilled with state-of-the-art technologies and approaches as their reliance on high-tech solutions develops. This necessitates specialized training and a great deal of experience with various hardware, software, and system kinds. (Husson University, 2023)

For tiny administrative entities like barangays, the rapid population expansion poses serious issues, especially in managing the growing amount of data and information. Without a centralized database system, barangays have historically relied on manual methods to manage the files of their community members, such as Microsoft Word or Excel. This dependence on manual processes exposes the company to data corruption and increased risk of data processing errors. Furthermore, these difficulties have been made worse by the COVID-19 pandemic, making it harder for barangays to serve the community's requirements adequately. In reaction to these problems, scientists—among them M. To create a solution specifically for Barangay 407 in Manila, Philippines, (N. Jamis et.al, 2022). .

Their suggested system, One Barangay, merges web and mobile platforms to provide a methodical and secure approach to managing community files and data. This long-term solution will improve productivity and service delivery inside the Barangay.

In the Philippines, every barangay and its officials must confront the social issues that the community faces and demand that the authorities act. E-government is a critical component of good governance, and profiling community households through information and communication technology can support it. The BIPS (Barangay et al.) uses technology to expedite budget allocation and decision-making procedures within the barangay. BIPS creates visual representations on its dashboard by combining data from home profiling. After that, barangay authorities can use this data as a starting point for budgeting and related paperwork, which will allow them to pinpoint areas in need of repair and launch programs meant to improve the standard of living

and general well-being of the community they serve (Lacasandile, A. D., & Labanan, 2020)

According to a 2021 report by KPMG Philippines, local government units (LGUs) in the Philippines are increasingly focusing on becoming digitally enabled, data-driven, and community-focused. This evolution aims to break down traditional governmental barriers, creating a more connected and responsive local governance structure. LGUs are taking advantage of digital technologies to improve their operations and better fulfill the requirements of their constituents, with a focus on customer-centric service delivery. This report offers KPMG's view of the Philippines' local government's future path.

To improve the efficiency of the barangay justice system in carrying out these duties, the main goal of this research was to create an online Crime Monitoring Module. This module makes it easier for the community to track and maintain records of violations. Technology helps to improve the administration of peace and order by offering a more effective way to keep an eye on infractions and blotter cases, particularly in barangays. (Antonio, L, 2020)

Computer-based information technology is currently quite advanced in the realm of education and is beginning to have influence in the delivery of specific information. However, it turns out that in practice, many businesses are still not using technology for its intended purpose (Herawati, Negara, Febriansyah, & Fatah, 2021). Pasaribu (2021) states that technology's rapid progress in the current era of globalization has offered several benefits in various parts of life.

The internet, mainly Web 2.0, provides access to a range of persons' perspectives and beliefs, creating opportunities for new modes of

communication and knowledge development. Previous methods for browsing and filtering available information will likely be useless in these new circumstances. Connectivism is one of the most popular network learning theories for e-learning environments. Medical educators are identifying it. This study explores connectivity and its potential applications. Connectivism can improve the understanding and management of digital technology-based teaching and learning. However, further development and testing are needed. It is improbable that a single theory can fully explain learning in technology networks. Educators play a crucial role in online network learning. (Goldie, J. G. S., 2016)

### **1kyusi: A Centralized Web-Based Information Management System For The Local Government Of Quezon City**

This system was designed to improve record-keeping efficiency and accessibility for local government units (LGUs) only in Quezon City, Philippines. The system's primary goal is to enhance the delivery of essential social services and bolster the LGU's preparedness for disasters by serving a comprehensive database containing updated records of every citizen of Quezon City's barangays. Despite its extensive data collection, the system also implemented the Data Privacy Act of 2012, making sure to protect every individual's personal information.

Implementing this system in the barangay and managing it under the oversight of the local government will facilitate more efficient access to crucial information, better coordination in different government agencies, and enhanced effectiveness of social service delivery and disaster management

efforts at the grassroots level. This will benefit the community and improve governance practices in Quezon City. (SIMBULAN, 2022)

1Kyusi represents a centralized web-based information management system tailored specifically for the Local Government Units (LGUs) of Quezon City, Philippines. Its main objective is to streamline the record-keeping process, ensuring efficiency and accessibility within the LGU.

The difference between 1KYUSI and the Lupon Tagapamayapa Incentives Award (LTIA) lies in their respective focuses and scopes within the Philippine context. 1KYUSI is a centralized web-based information management system designed to enhance record-keeping efficiency and accessibility specifically for Local Government Units (LGUs) in Quezon City. Its primary objective is to improve the delivery of basic social services and bolster LGU preparedness for disasters by maintaining an extensive database of updated records of every citizen in Quezon City's barangays. In contrast, LTIA operates nationally throughout the Philippines, recognizing and incentivizing barangay justice councils (Lupon Tagapamayapa) for their exemplary performance in resolving disputes and maintaining peace within their communities. While 1KYUSI targets LGUs and focuses on governance practices and service delivery at the local level, LTIA emphasizes community-based dispute resolution, restorative justice principles, and social cohesion nationwide.

### **Police Complaint Management System Using Blockchain Technology**

This system aims to solve the challenge of reporting and managing criminal complaints in India using blockchain technology. This Blockchain has



many advantages. It provides a secure and transparent mechanism for storing and accessing complaints records, reducing the risk of unauthorized alteration, and it also serves as verifiable proof of complaints and their timestamp, making it difficult for authorities to deny or manipulate the filing process. Furthermore, by decentralizing the storage and management of complaints the system reduces the risks connected to centralized databases such as single points of failure and possible security breaches. (Hingorani, Khara, Pomendkar, & Raul, 2020)

Lupong Tagapamayapa Incentives Award and the proposed Police Complaint Management System using Blockchain Technology serve as an innovative solution to distinct challenges within the community, as the LTIA aims to recognize and incentivize the barangay's justice councils for their effort in maintaining peace and order at the grassroots level. The Blockchain-based Police Complaint Management System targets improving reporting and managing criminal complaints in India by leveraging blockchain technology to enhance transparency and accountability in law enforcement. While LTIA emphasizes traditional nomination and evaluation processes, the proposed system utilizes decentralized storage and verification mechanisms to provide secure and transparent records of complaints, reducing the risk of unauthorized alteration and manipulation.

### **Land Transportation Management System (LTMS)**

The Land Transportation Management System (LTMS) is an integrated platform that offers a range of services and functionalities to streamline land transportation processes in the Philippines. One notable feature of LTMS is its

provision of E-learning modules on its website, which serve as valuable educational resources for individuals seeking to enhance their knowledge and understanding of land transportation laws, regulations, and safe driving practices. Additionally, LTMS facilitates online transactions, allowing users to conveniently access and complete various tasks related to driver licensing, vehicle registration, and other administrative procedures through digital platforms. This includes the issuance of digital licenses and registration certificates, as well as the management of user transactions and violation documents in a digital format. By leveraging technology and digital tools, LTMS aims to improve the efficiency, accessibility, and transparency of land transportation services, ultimately enhancing the overall experience for both government agencies and the public. (LTMS Portal, n.d.)

The Land Transportation Management System (LTMS) and the Lupon Tagapamayapa Incentives Award (LTIA) represent two distinct initiatives within the Philippine government, each serving specific functions and objectives. The LTMS is a comprehensive platform designed to enhance the efficiency and accessibility of land transportation services nationwide. Through features such as E-learning modules, online transactions, and digital licensing, the LTMS aims to streamline processes related to driver licensing, vehicle registration, and administrative procedures. It leverages technology to improve the overall management of land transportation systems and ensure compliance with relevant regulations. On the other hand, the LTIA focuses on recognizing and incentivizing barangay justice councils (Lupon Tagapamayapa) for their contributions to community-based dispute resolution and social cohesion. The LTIA aims to strengthen governance practices and foster harmonious

relationships at the grassroots level by promoting restorative justice principles and empowering local communities to resolve conflicts peacefully. While both initiatives aim to enhance governance and service delivery within the Philippines, they do so through different mechanisms and target distinct aspects of public administration.

### **Synthesis and Relevance of The Study**

The literature that the researchers studied led to a broader knowledge for creating a system for the Lupong Tagapamayapa Incentives Award, and the literature is community-based for the advancement of governance and service delivery. The Lupong Tagapamayapa Incentives Award recognizes and rewards the efforts and performance of the barangay's justice councils, promoting and promoting restorative justice and social cohesion at the grassroots level involves fostering mechanisms that prioritize reconciliation, mediation, and peaceful resolution of conflicts within local communities. The literature focuses on common objectives, strengthening governance and service delivery of the Philippines, empowering local communities, and leveraging technological advancements. These programs contribute to building a more inclusive, efficient, and responsive society, continuing innovations that are essential for improving the local and even national systems.

## Literature Matrix

Author	Title	Methods/Algorithm	Key Findings	Year
<b>Antonio, L</b>	Enhancing Barangay Justice System Through the Development of a Web-Based Crime Monitoring Module	Modernization of the Old System of keeping blotter cases and using technology for monitoring crime.	The study aims to develop an Online Crime Monitoring Module that improves the efficiency of the barangay justice system. Also, monitor how Technology improves peace and order blotter cases.	2020
<b>Husson University</b>	The Role of Technology in Criminal Justice	Cutting-edge technology for investigating criminal behavior and carrying out justice	Technology is becoming increasingly important in juvenile justice, rehabilitation, and incarceration.	2023
<b>Lacasandile, A. D., &amp; Labanan</b>	Development of an Information-Based Dashboard: Automation of Barangay Information Profiling System (BIPS) for Decision Support towards e-Governance	Information and Communication Technology (ICT) for household profiling	This study aims to develop BIPS data that helps identify priority areas for barangay development programs. Also, it streamlines budget allocation for each household in a barangay.	2020
<b>N. Jamis et.al.</b>	One Barangay: A Mobile And Web Barangay Management System	Web and Mobile Application Platform	The objective of the study is to develop a digitalized system that manages a certain barangay in the Philippines. Its monitories Systematic data management, Secure data storage, Improved productivity, and Enhanced service delivery.	2022
<b>Hingorani, Khara, Pomendkar, &amp; Raul,</b>	Police Complaint Management System Using	Block-chain for Police Complaint Management System	The Police Complaint Management System employs	2020

Blockchain  
Technology

blockchain technology with consensus mechanisms, smart contracts, and encryption for secure and transparent complaint storage, leading to enhanced security, transparency.

## Conceptual Framework

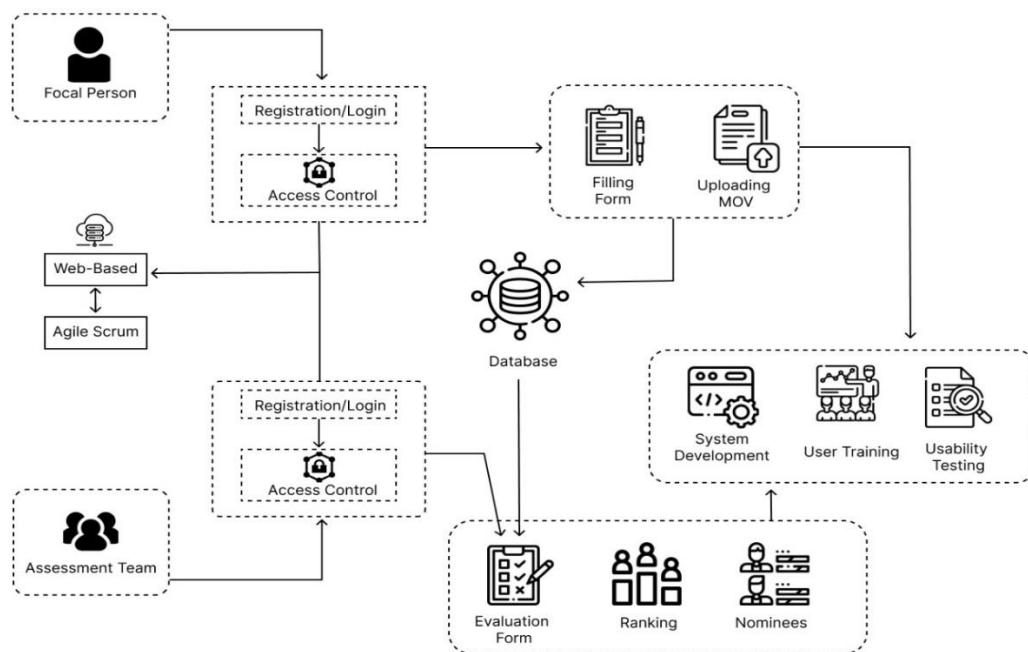


Figure 1: Conceptual Framework

Figure 1 shows the visual representation of the system Lupong Tagapamayapa Incentives Award Database Systems in Laguna's DILG Cluster A, designed to provide a clear and organized approach to evaluating barangays. It promotes efficiency, fairness, and accountability by centralizing evaluation processes, facilitating ranking, and simplifying nomination and awarding procedures. This framework aims to incentivize excellence in

barangay governance, ultimately contributing to community development and empowerment in the province.

## CHAPTER 3

### METHODOLOGY

#### Project Design

The purpose of this section is to outline the system's functionality, which enables the users to manage reports and evaluations of the Lupon proceedings effectively using a structured and secure interface.

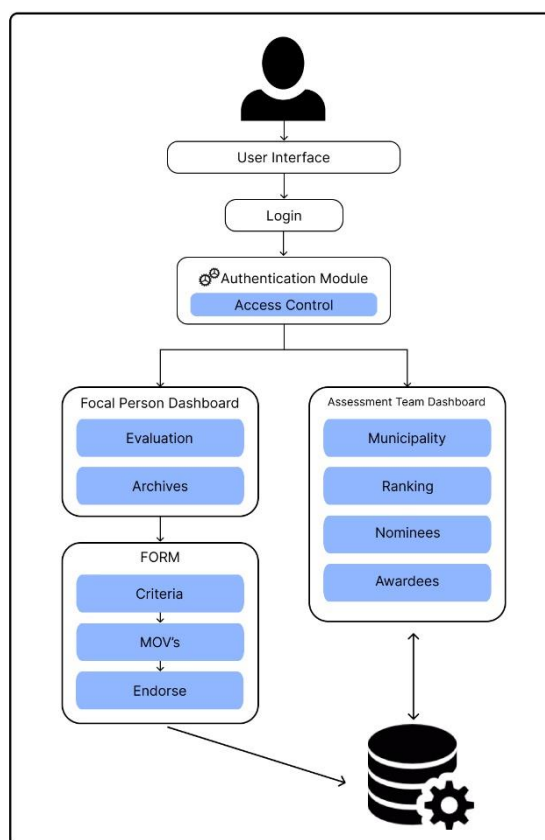


Figure 2. System Architecture

Figure 2 shows that the system has a user interface for the Focal Person and the assessment team. The interface starts with a secure login, one for the focal person and the other for the assessment team. This ensures that the Focal Person will focus more on uploading assessments and MOV's to be evaluated. The Assessment team module focuses on the monitoring of data of the

nominees that have been uploaded, moreover, this interface can quickly find and utilize the nominees per municipality for case management, ranking, and view the evaluation results. The Assessor Team interface has an auto-generated ranking feature; the ranking of nominees will be sorted based on their performance and the user can also view the previous Awardees.

The system's database is the central storage for the design, ensuring data integrity, security, and quick retrieval of information when required. Other roles, such as Focal Person and Assessment Team, suggest hierarchical access and management capabilities within the system. In Summary, the Focal Person focuses on uploading data, and the Assessment Team focuses more on evaluating forms, managing nominees and auto-generating rankings.

## SYSTEM FLOWCHART

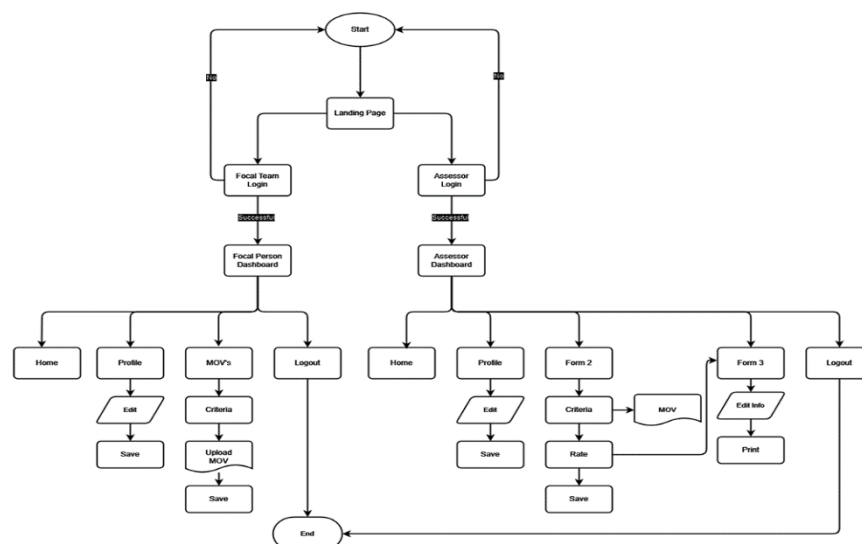


Figure 3. System Flowchart

Figure 3 depicts the flowchart workflow of the Lupong Tagapamayapa Incentives Award Database System, which begins at the "START" and directs



the user to a landing page with options to either "Login as Focal Person or as Assessment Team". If a user doesn't have an account, they must create one. Upon successful login, the user is taken to a "Dashboard" where the available actions differ based on their user role. Focal Person: They can endorse their Lupon from their Barangay. There's also an option to manage their account settings and log out.

The Assessment Team has access to a distinct set of functionalities on their Dashboard. They can comprehensively monitor the data of the nominees, enabling them to view, evaluate, delete, and rank the nominees as necessary. The workflow is structured to ensure that users are presented with options relevant to their role within the system, promoting efficient navigation and task completion. The final action in all scenarios is the ability to log out, which terminates the session and exits the system.

## **Materials**

**Bootstrap.** The LTIA system is built on top of a collection of reusable HTML, CSS, and JavaScript code called Bootstrap. It offers a large number of pre-built components, an adjustable design element set, and a front-end programming framework that makes development easier. Bootstrap expedites development, increases consistency and stability, and guarantees a user-friendly experience. Because of Bootstrap, the web-based LTIA system is visually appealing, cutting edge technologically, and accessible on a range of screens and devices.

**JavaScript.** JavaScript served as the fundamental tool in developing the web-based LTIA system. It played a crucial role in crafting interactive features

essential for user engagement, including animations, pop-up menus, clickable buttons, and multimedia controls. Working alongside HTML and CSS, JavaScript contributed significantly to the system's functionality, providing a dynamic and user-friendly interface for effective navigation and utilization within the electronic justice framework.

**PHP.** PHP is a versatile programming language essential for developing the web-based LTIA system. It is used for server-side scripting, command-line, and desktop applications. PHP enables seamless server-side processes, strong functionality, and dynamic content delivery, enhancing the interactivity and responsiveness of the e-justice platform.

**MySQL.** MySQL is an ideal solution for a web-based LTIA system. It integrates seamlessly with PHP, supporting dynamic web applications within needed frameworks. MySQL plays a crucial role in storing and managing data, ensuring the speed necessary for dynamic web applications.

**HTML.** HTML stands for HyperText Markup Language. It is a standard markup language for web page creation. It allows the creation and structuring of sections, paragraphs, and links using HTML elements (the building blocks of a web page), such as tags and attributes. HTML, specifically the LTIA System, has a lot of use cases.

## Hardware

Table 1. Hardware Specification

Hardware	Specification
RAM	16GB
CPU	Intel Core i5-8265U
OS	Windows 8,10,11
Internet Speed	25 Mbps

Table 1 shows the hardware requirements developers used in developing the LTIA system. It features a robust configuration with 16GB RAM and an Intel Core i5-8265U CPU for quick and accurate legal tasks. The system runs on stable, user-friendly Windows 8, 10, and 11 and requires a 25 Mbps internet speed for prompt and uninterrupted access. The selected hardware specifications ensure that the system can handle multiple concurrent users, reflecting a commitment to efficiency in public service. Additionally, the inclusion of a range of compatible Windows operating systems guarantees accessibility for various users.

Table 2. Minimum Requirement Used for Smartphone or Tablet

Minimum Requirement	Specification
Android OS	at least Android 9 and above
RAM	8 GB
Processor	quad-core
Internet Speed	at least 2-5 Mbps

Table 2 lists the minimum requirements for smartphones and tablets to access the LTIA System. The system requires an Android OS of version 9 or above with 8GB RAM and a quad-core processor to ensure top-notch performance. The prescribed internet speed is at least 2-5 Mbps, catering to users with varying connectivity. These minimum specifications promote effective usage and inclusivity.

## PROJECT DEVELOPMENT

### Software Development Life Cycle

The researchers worked with the Agile Software Development Lifecycle to effectively design and construct the web-based system.

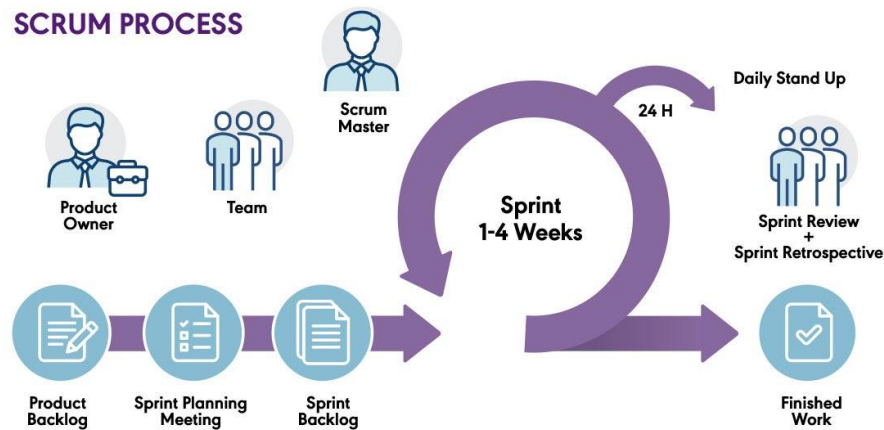


Figure 4. Agile Scrum Methodology

Figure 4 shows Lupong Tagapamayapa Incentives Award Database System has developed more effectively thanks to the Agile Scrum Methodology, which encourages continuous improvement and the ability to adapt to changing requirements. It places a strong emphasis on frequent feedback integration and active user interaction, which speeds up the process of improving the system's functionality and interface. This strategy ensures the system stays current by skillfully integrating new functions and regulatory requirements. Agile Scrum enables a responsive and adaptable database system that meets and frequently surpasses user expectations in the current environment.

**PRODUCT BACKLOG**

<b>PRIORITY</b>	<b>ITEM</b>	<b>ESTIMATED HOURS/DAY</b>
1.	As an assessor, I want to create an account and login.	2 hrs
2.	As an assessor, I want to access the dashboard.	2 hrs
3.	As an assessor, I want to grade the form and view uploaded MOVs.	2 hrs
4.	As an assessor, I want to put remarks about certain barangay.	2 hrs
5.	As an assessor, I want to print the form.	2hrs

Table 3: Product Backlog (Assessor)

Table 3 lists the assessor system capabilities and the associated times that they are used. The assessor creates account and logging in to gain access the dashboard, grades the form provided and views uploaded MOVs. The assessor can edit info in Form 3 and print the form.

<b>PRIORITY</b>	<b>ITEM</b>	<b>ESTIMATED HOURS/DAY</b>
1.	As a User, I want to create an account and log in.	2 hours
2.	As a User, I want to access the dashboard.	2 hours
3.	As a user, I want to upload MOV for the given criteria.	2 hours
4.	As a user, I want to save changes.	2 hours

Table 4: Product Backlog (Focal Person)

Table 4 lists the client's system capabilities and the associated times that they are used. The user creates an account and logging in to gain access to the dashboard and upload MOVs. The last step is to save the changes made.

**SPRINT PLANNING**

<b>PRIORITY</b>	<b>ITEMS</b>	<b>TASK</b>	<b>ESTIMATED HOURS/DAY</b>
1.	As a user, I want to create an account and log in.	Develop login and registration page. Design the login page. Test the login page.	3 hrs
2.	As a user, I want to access the dashboard.	Develop the dashboard page. Design the login page. Test the login page.	3 hrs
3.	As a user, I want to upload MOVs for the given criteria	Develop an upload MOVs page for the User Design the upload MOVs page. Test the upload MOVs page.	3 hrs
4.	As a user, I want to save changes.	Develop a save changes page for the User Design the save changes page. Test the save changes page	3 hrs

Table 5. Sprint Backlog (Focal Person)

Table 5 shows the sprint planning table outlines essential features. The user needs to enhance the system's functionality. Access to a dashboard for user and authentication were foundational elements, followed by document-handling capabilities developed to grade such barangays on their good governance. This involved enabling electronic document submissions and

access to legal databases, which ensured efficient collaboration and information sharing.

PRIORITY	ITEMS	TASKS	ESTIMATED HOURS/DAY
1.	As a user, I want to create an account and log in.	Develop login and registration page. Design the login page. Test the login page.	3 hrs
2.	As an assessor, I want to access the dashboard.	Develop a dashboard page for the Assessor. Design the dashboard page. Test the dashboard page.	3 hrs
3.	As an assessor, I want to grade the form and view uploaded MOVs.	Develop a user interface to grade files and view the uploaded MOVs page for the Assessor Design the user interface to grade Means of Verification and view the uploaded Means of Verification page. Test the user interface to grade Means of Verification and view the uploaded Means Of Verification page.	3 hrs
4.	As an assessor, I want to put some remarks provided in Form 3.	Develop a put remark for the Assessor. Design the remarks page.	3 hrs

5.	As an assessor, I want to print the form.	Test the remarks page. Develop a print page for the Assessor. Design the print file page. Test the print file page.	3 hrs
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Table 6: Sprint Backlog (Assessor)

Table 6 shows the sprint planning table for developing the page for the Assessor. It outlines features like grading such barangay, putting some remarks, and printing the form evaluated.

### Use Case Diagram

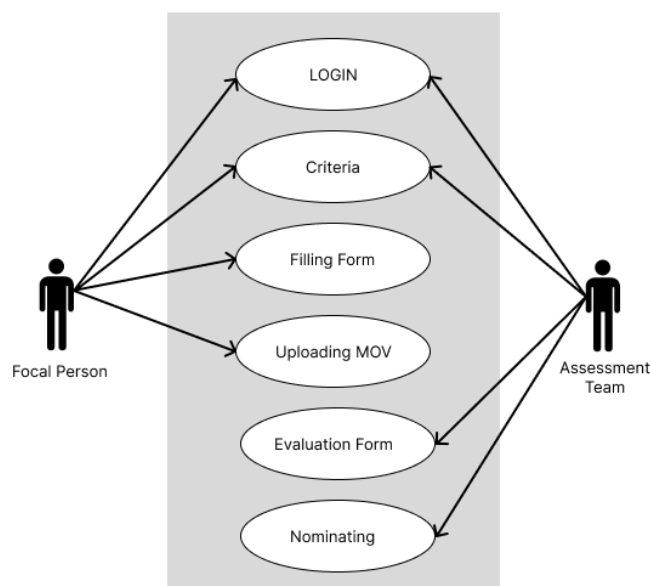


Figure 5. Use Case Diagram of Lupong Tagapamayapa Incentives Award

Figure 5 presents a use case diagram that traces the system's interactions and users' interactions. The primary user is the Focal Person, the



system user responsible for filling out the form and Uploading MOV. The system facilitates a range of functions for the user, such as viewing criteria, filing up forms, uploading mov, evaluation forms, and nominating. The focal person initiates the process by providing criteria to the evaluator, who then engages with the system to carry out the necessary actions. Additional users include the Assessment team (representing the Department of the Interior and Local Government, DILG, level access), who have privileges for broader system functionalities and oversight, respectively. The admin can also view criteria and upload MOV, while the Super Admin has the highest access level, which likely includes system-wide administrative functions and oversight capabilities. Both users can also log in to the system.

**Log In.** Both Focal Person and Assessor need to log in to access all the functions provided by the system.

**Criteria.** The criteria include the points standard by which something may be judged or decided. The DILG Assessment Team follows this criterion to grade a barangay.

**Filling Forms.** The Department of the Interior and Local Government (DILG) Assessor receives this document as authorization or endorsement from the Barangay, the smallest local government unit in the Philippines. Basic Barangay information is gathered on this form, which includes the following: Region, Province, Municipality, Year Nominated, and Barangay. When filled out, this form is the first in a series of steps that culminate in an Evaluation Form. This implies that the DILG Assessor will evaluate the Barangay using the

data supplied, maybe for characteristics related to development, governance, or performance.

**Uploading MOV.** MOVs are used as proof or supplementary materials to substantiate the data submitted throughout the auditing process. Every MOV pertains to a certain facet of the audit, emphasizing several domains such as the regional economy, organizational assistance, readiness for emergencies, and additional areas. MOVs are essentially hard evidence supporting the assertions and data put forward during the DILG evaluation of local government performance.

**Evaluation Form.** These forms likely follow a standardized format established by the DILG, ensuring consistent evaluation across different regions and LGUs. In this kind of evaluation, which is widespread, the DILG evaluates a barangay's overall performance in several areas, including infrastructure development, social services, governance, and preparedness and response for disasters. Evaluation forms may also be used by the DILG to evaluate the performance of service providers or suppliers that collaborate with the department or local government units. This guarantees that they provide services efficiently and under quality requirements.

**Nominating.** These are the people or organizations who have been suggested as suitable candidates for the LTIA Program. "LTIA" stands for "Lupong Tagapamayapa Incentives Awards," although the program's exact details are unknown. This implies that the program has to do with honoring and rewarding exceptional Lupong Tagapamayapa (LTIA), which are quasi-judicial organizations in the Philippines that handle conflicts at the barangay level. A

nomination for the Lupong Tagapamayapa Program signifies that the person or organization is acknowledged for their accomplishments and contributions within the Lupong Tagapamayapa framework.

### Context Diagram

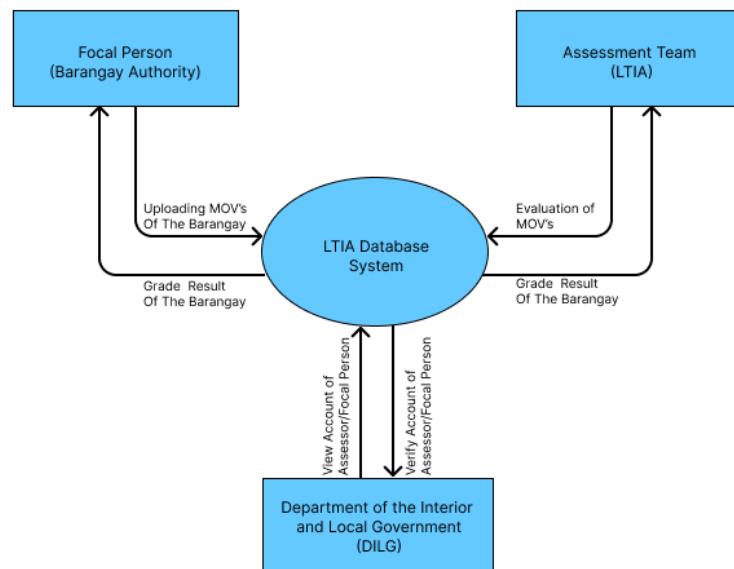


Figure 6. Context Level

Figure 6 illustrates the Lupong Tagapamayapa Incentives Award System as the central system, with two external entities: Focal Person (Barangay) and Assessment Team (DILG), forming a collaborative network. The focal Person uploads an MOV and verifies the grade result under his; the Assessment Team evaluates by filling up the form. The DILG System Admin verifies accounts made and also views accounts used, the primary data flow involves uploading MOV, evaluating a barangay, and highlighting the systematic administration of user roles within the LTIA System, facilitating efficient evaluation.

## Data Flow Diagram

The following shows the flow of processes between the Assessment Team and Focal Person to centralized criteria for evaluation per Barangay.

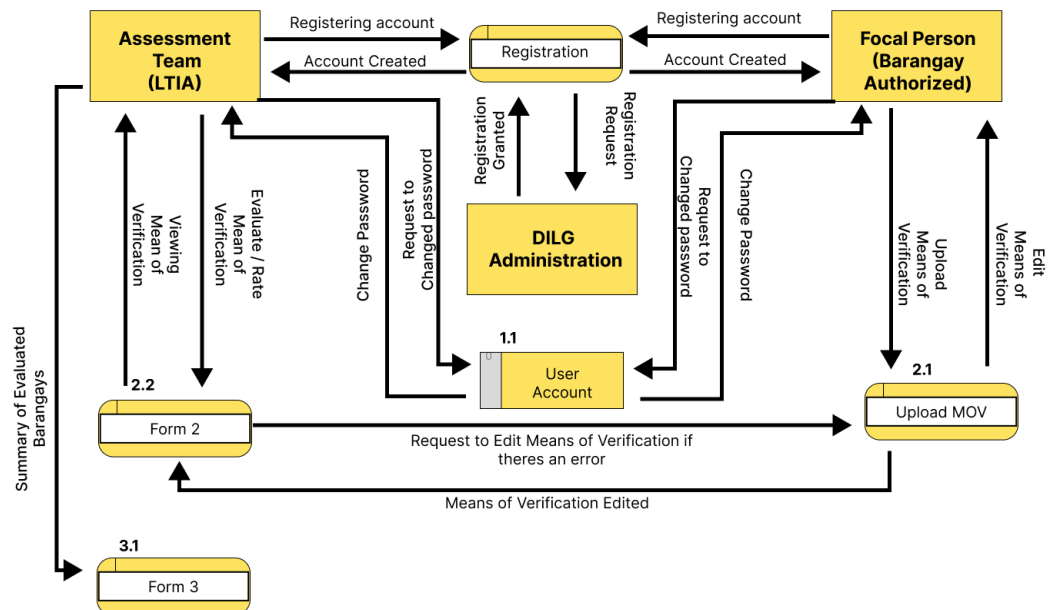


Figure 7. Data Flow Diagram

Figure 7 shows the Data Flow Diagram (DFD) which composed of three levels. At Level 0, the system registers a Focal Person authorized by the Barangay and Assessment Team and is also part of LTIA. Level 1 focuses on verifying and managing passwords for the users since the DILG verifies their accounts. Level 2 is more on the functions for the Focal Person that allow them to check criteria, fill the form according to criteria, and upload Means of Verification (MOV), each criterion has its MOV. And lastly, Level 3 highlights the overall process of evaluating, from 2 to 3 until nomination.

## Project Testing and Evaluation

In Project Testing and Evaluation, the researcher will use different tests to build this project.



Figure 8. Project Testing and Evaluation

Figure 8 is the evaluation that will be conducted by the researchers for different testing, which are Unit Testing, Integration Testing, System Testing, Acceptance Testing, and Evaluation Procedure to ensure the quality and reliability of the project.

## Unit Testing

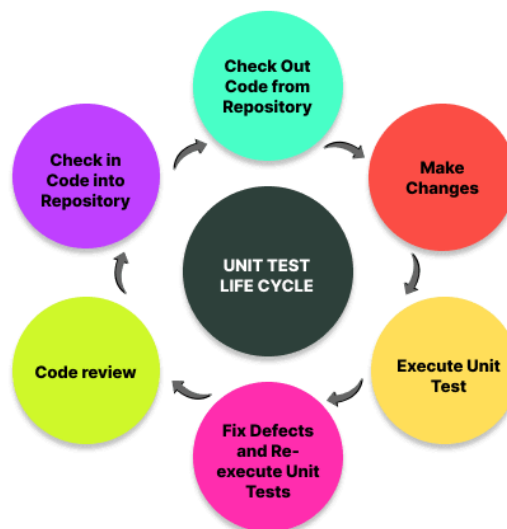


Figure. 9 Unit Testing

Figure 9 shows the Unit testing which is a technique where individual units or components of a software program are tested. This approach helps the researchers to isolate each piece of the system or component being tested, ensuring that it does not impact any other parts of the codebase.

## Integration Testing

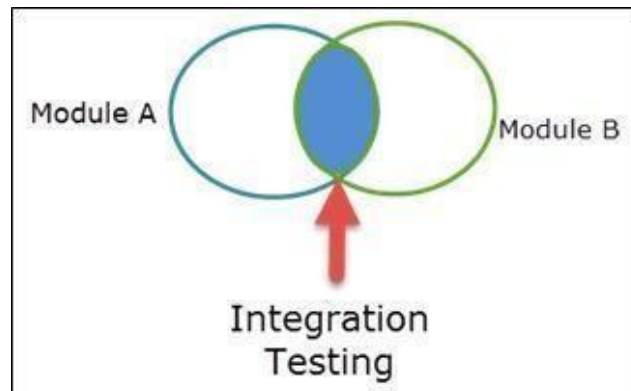


Figure. 10 Integration Testing

As shown in Figure 10, integration testing is a software testing phase involving combining individual software modules and testing them as a group. This type of testing is performed to evaluate whether a system or component meets specific functional requirements. Integration testing takes place after unit testing and before system testing.

## API TESTING

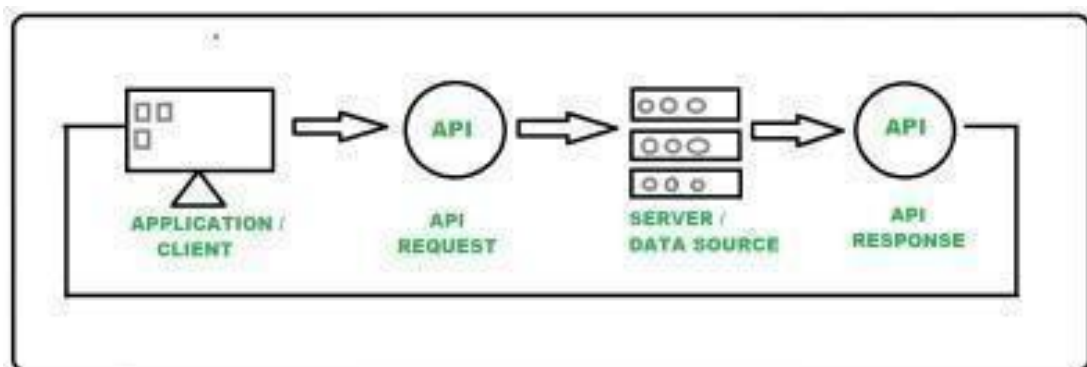


Figure 11. API Testing

Figure 11 depicts the critical process of API testing within the software development lifecycle, focusing on the direct and integration evaluation of application programming interfaces to ensure they fulfill functional, reliability,

performance, and security requirements. Unlike user-interface testing, API testing delves into the business logic layer at the message level, leveraging automated tools and frameworks to meticulously verify the API's responses to varied and complex requests. This testing is essential for pinpointing discrepancies, managing data formats, and maintaining robust error handling, which ensures the API's seamless integration into broader systems and applications. Furthermore, API testing is integral to CI/CD pipelines, providing a safeguard against potential breaks in functionality with each new code update and is instrumental in constructing detailed test scenarios that mirror real-world conditions, thus guaranteeing the API's resilience and effectiveness in live environments.

## Evaluation Procedure

### Technology Acceptance Model

Table 7. Reliability test result for Technology Acceptance Model

Metric	Value
<b>Case Processing Summary</b>	
Valid Cases (N)	16
Valid Cases (%)	100.0%
Excluded Cases (N)	0
Excluded Cases (%)	0.0%
Total Cases (N)	16
Total Cases (%)	100.0%
<b>Reliability Statistics</b>	
Cronbach's Alpha	0.725 (Acceptable)
Number of Items (N)	35

Table 7 presents the reliability analysis for various categories related to a survey or assessment. Cronbach's Alpha values indicate internal consistency, with a score of 0.7 generally considered acceptable. A Cronbach's

Alpha of 0.725 indicates that the survey instrument has an acceptable level of reliability, suitable for preliminary studies or formative assessments. However, if this is part of a more extensive and critical analysis, further improvement in reliability may be necessary, either by refining questions to reduce ambiguity or by increasing sample size to ensure generalizability.

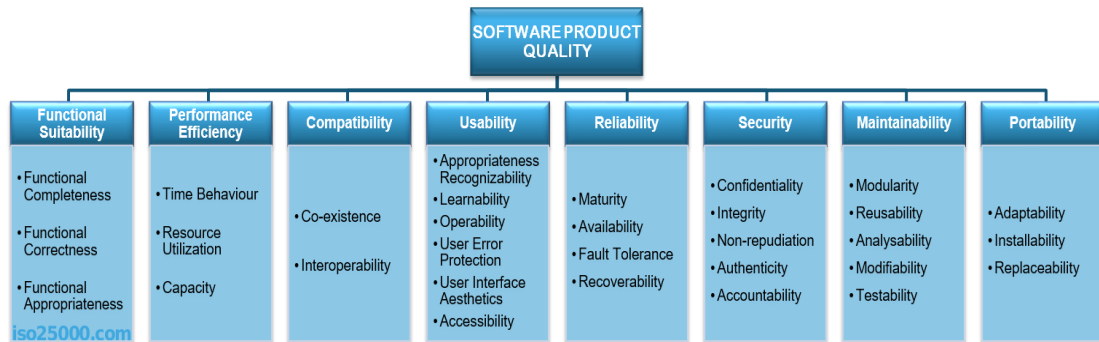
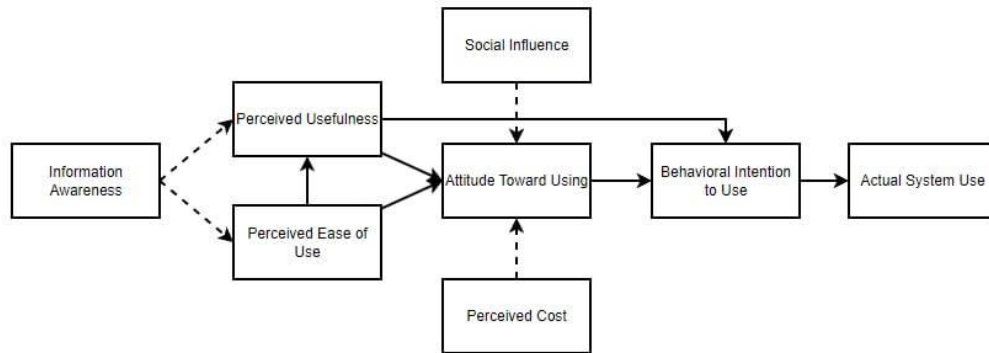


Figure 12. ISO 25010 Software Quality Model Characteristics

Figure 12 presents a structured overview of the ISO 25010 standard that provides a framework for evaluating the attributes that make software reliable, secure, usable, and meet the needs of clients and users. It is also to be used by IT experts to test the technical acceptability of the system. ISO 25010 will be rated using the 4-point Likert Scale with 1 as the Lowest Score and 4 as the highest score. The composite mean will determine if the system is ready for deployment to the intended user.



## Technology Acceptance Model (TAM)



**Figure 13: TAM Model**

Figure 13 shows the Technology Acceptance Model (TAM). This approach facilitates users' understanding and utilization of the implemented system. The researchers used the TAM technique to determine that the system components consistently offer good performance and functionality. In addition, if the system is useful. The goal of the research is to gather data and survey responses

### Sampling Design

The project used purposive sampling to select participants based on specific criteria aligned with study objectives. For the Barangay Employee category, a varied selection of individuals included 3 Barangay employees from 10 different barangays, 2 IT experts, a total of 32 participants. This approach ensures a thorough representation of different roles within the barangay, allowing for a holistic evaluation of the web-based system. This selection aimed to incorporate varied expertise relevant to web-based systems, enabling a thorough assessment of the system's functionality and performance.

This categorizes the respondents into three groups: IT Experts, and Barangay Employees, with a sample size of 2 IT Experts, and 30 Barangay Employees. The evaluation process conducted by these respondents centered on analyzing the feasibility, performance, and features of the proposed web-based system. Specifically, IT Specialists, with their proficiency in web-based systems, provide critical analysis of the system's functionality, contributing to a complete assessment of its technical capabilities.

### **Data Collection Instrument**

Data collection was conducted through questionnaires and in-depth interviews to ensure an understanding of the system's reception by its intended users. IT specialists were provided with questionnaires designed using ISO 25010 standards, recognized for software product quality—which allowed for a targeted assessment of the web-based system's technical attributes and performance. Barangay Employees, on the other hand, were surveyed using the Technology Acceptance Model (TAM) framework to gauge their readiness and willingness to use the system. This model helps understand how users accept and use technology, providing insights into potential adoption rates and usage patterns. These interviews were around 5 prepared questions that explored the design and functionalities of the system. The focus was on evaluating how well the system aligns with the practical needs of the users. Design quality, simplicity of access, portability, security, and the relevance of the presented data were all considered. This dual approach of utilizing questionnaires and interviews enabled a thorough system analysis from both a technical and user-centric perspective. This ensured that the final product would be reliable in aligned with the user's requirements and expectations.

Table 8. Likert Scale Technique

Individual Score	Composite Mean	INTERPRETATION
<b>4</b>	3.25 – 4.00	Very Satisfied
<b>3</b>	2.50 – 3.24	Satisfied
<b>2</b>	1.75 – 2.49	Unsatisfied
<b>1</b>	1.00 – 1.74	Very Unsatisfied

The Likert Scale, as presented in Table 8, is employed by developers as a survey instrument to measure users' satisfaction with the application. This scale quantifies user contentment levels by assigning numerical values to their responses, which fall within defined mean ranges. Ratings from 1 to 4 allow users to express their satisfaction, ranging from 'Strongly Unacceptable' to 'Strongly Acceptable'. By analyzing these ratings, developers can determine the extent of user approval or disapproval regarding the application's features and overall experience.

To complete the mean range,

$$\text{Mean Range} = \frac{\text{Highest score} - \text{Lowest score}}{\text{Number of respondents}} = \frac{4 - 1}{4} = \frac{3}{4} = 0.75$$

### Statistical Treatment

For data analysis, the researchers will calculate the mean of the survey responses to find the central tendency. Each option on the Likert Scale will be assigned a numerical value aggregated for each question. The sum will then be divided by the number of responses to yield the average score. This quantifiable metric offered valuable insights into the participants' attitudes and opinions. The mean, which is determined by dividing the sum of the provided numbers by the total number of numbers, is the average of the given numbers.

The standard deviation, which will be computed as the square root of the variance, is a statistic that expresses how dispersed a dataset is about its mean. Composite scores are calculated from data in multiple variables to form reliable and valid measures of latent, theoretical constructs. The variables which are combined to form a composite score should be related to one another. To calculate the mean and standard deviation, collect final responses from the 30 respondents. And repeat the procedure separately from the 2 IT experts. Compare the means of the general respondents with those of 2 IT experts to identify any differences. For the composite mean, aggregate the category mean to compute the composite mean giving you a single measure of overall performance or satisfaction. In the analysis, it will provide the means, standard deviations, and composite mean. Analyze the data, emphasizing any noteworthy discoveries or differences amongst the various response groups.

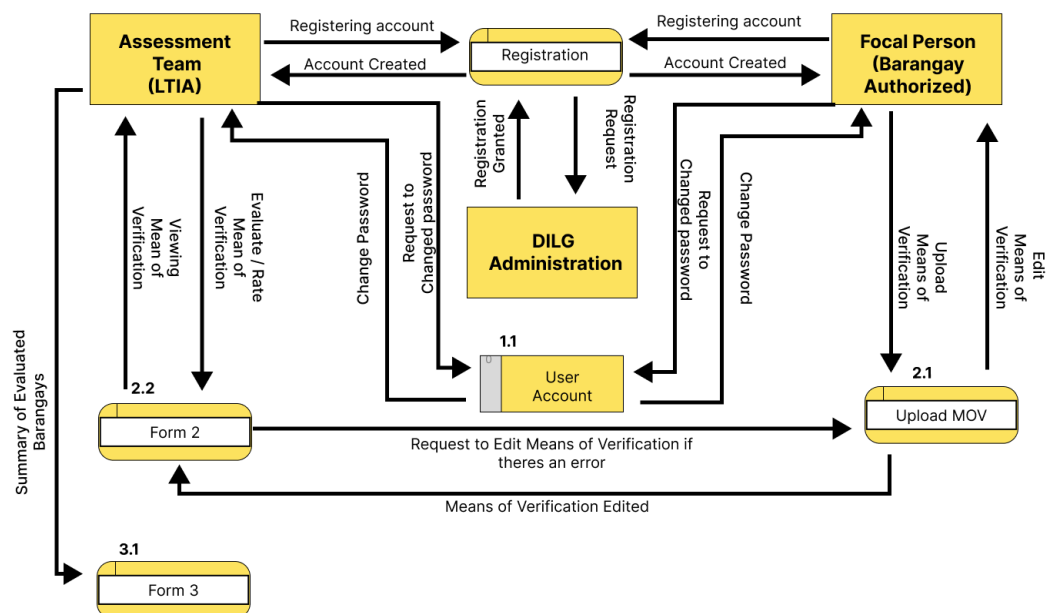
## CHAPTER IV

### RESULTS AND DISCUSSION

This chapter outlines the results and provides a discussion that substantiates the methods used to accomplish the objectives.

#### Results by Objectives of the Study

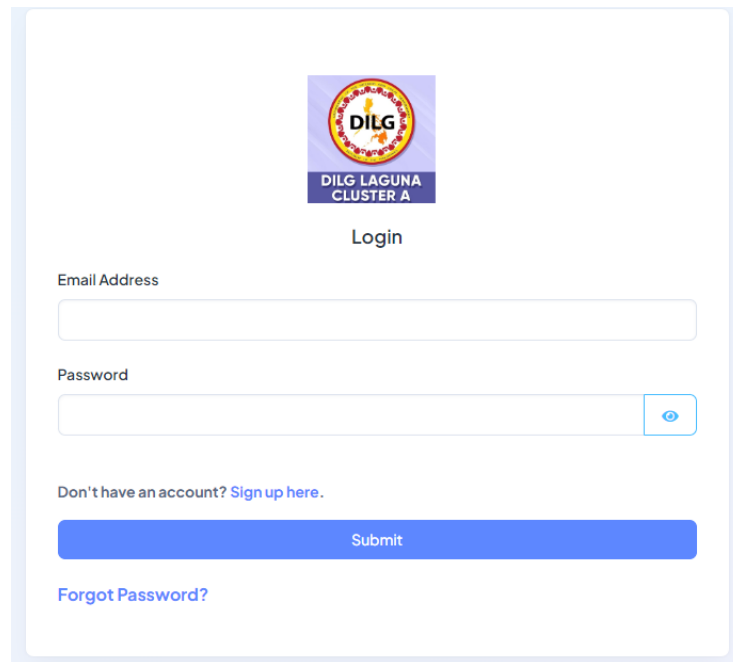
The primary goal of this project is to develop a data banking system that will handle documents related to the Lupong Tagapamayapa Incentives Award in DILG Cluster A Province of Laguna. This system will centralize data, particularly for grading Barangay Performance, enhancing administrative efficiency. The project prioritizes data accessibility and security by utilizing a structured database architecture as illustrated in the diagram.



**Figure 14: Data Flow Diagram**

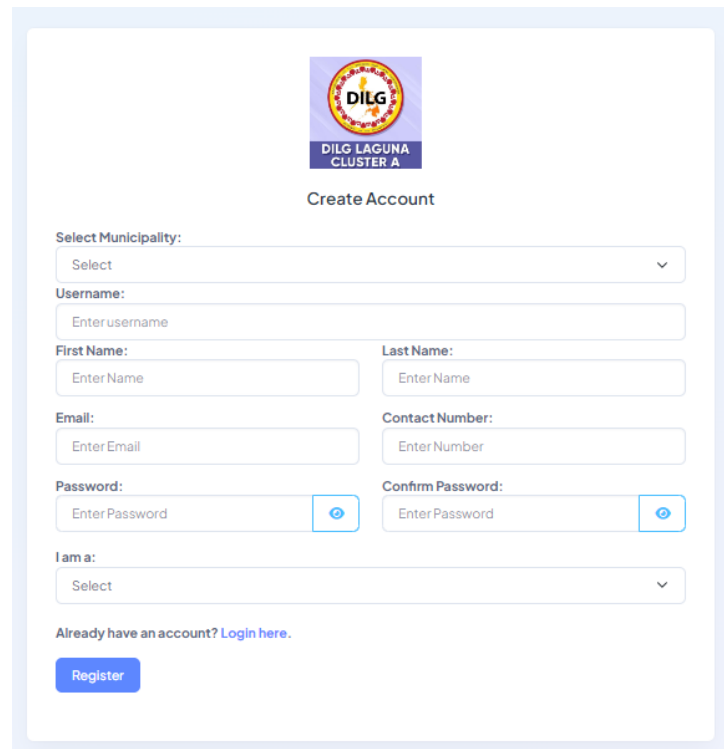
Figure 14 shows the Data Flow Diagram (DFD) which composed of three levels. At Level 0, the system registers a Focal Person authorized by the Barangay and Assessment Team and is also part of LTIA. Level 1 focuses on

verifying and managing passwords for the users since the DILG verifies their accounts. Level 2 is more on the functions for the Focal Person that allow them to check criteria, fill the form according to criteria, and upload Means of Verification (MOV), each criterion has its MOV. And lastly, Level 3 highlights the overall process of evaluating, from 2 to 3 until nomination.

The image shows a login form for 'DILG LAGUNA CLUSTER A'. At the top center is the DILG logo, which is a circular emblem with 'DILG' in the center and 'Department of the Interior' around it. Below the logo, the text 'DILG LAGUNA CLUSTER A' is displayed. Underneath this is the word 'Login'. The form contains two input fields: 'Email Address' and 'Password'. The 'Password' field has a toggle button to the right, represented by an eye icon. Below the password field, there is a link that says 'Don't have an account? Sign up here.' At the bottom of the form is a blue 'Submit' button. Below the button is a link that says 'Forgot Password?'.

**Figure 15. Login Form**

Figure 15 shows that both users of the system will log in. If both users do not have an account yet, clicking on "sign up here" will redirect them to the registration module. The two users have different settings for creating an account. Account for both users is automatically saved in the database. This page enables users to gain authorized entry to the system. The login module functions as the gateway for registered users to access their accounts securely.



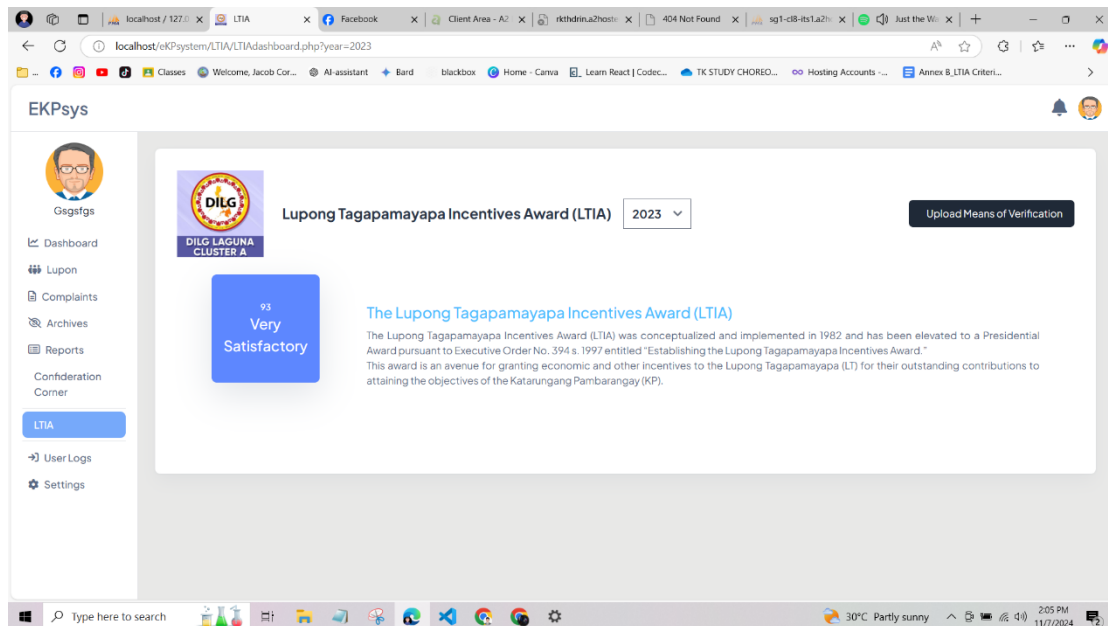
The image shows a web-based registration form for 'DILG LAGUNA CLUSTER A'. At the top center is the DILG logo, which is a circular emblem with 'DILG' in the center and 'LALAYAN NG MAMAMAYAN' around it. Below the logo, the text 'DILG LAGUNA CLUSTER A' is displayed. Underneath this is the heading 'Create Account'.

The form contains the following fields and elements:

- Select Municipality:** A dropdown menu with 'Select' as the placeholder text.
- Username:** A text input field with the placeholder 'Enter username'.
- First Name:** A text input field with the placeholder 'Enter Name'.
- Last Name:** A text input field with the placeholder 'Enter Name'.
- Email:** A text input field with the placeholder 'Enter Email'.
- Contact Number:** A text input field with the placeholder 'Enter Number'.
- Password:** A text input field with the placeholder 'Enter Password' and a blue eye icon to toggle visibility.
- Confirm Password:** A text input field with the placeholder 'Enter Password' and a blue eye icon to toggle visibility.
- I am a:** A dropdown menu with 'Select' as the placeholder text.
- Already have an account?** A link labeled 'Login here' in blue text.
- Register:** A blue button with white text.

**Figure 16. Registration Module**

Figure 16 shows that in this module, any user completes registration via the form, whether an Assessor (e.g., DILG Secretary) or a Focal Person (Barangay Secretary). User must select their affiliated municipality and barangay. If a user takes on the role of a Focal Person, they must further choose their specific barangay from the available municipalities. If a user takes on the role of an Assessor, they must select their particular municipality. Successful registration hinges on the prior registration of their chosen municipality and barangay, requiring administrators to register first.



**Figure 17. Focal Person Module**

In Figure 17, this page is for the Focal Person (Barangay Secretary) for submitting supported files. The user will submit the file to the MOV (Means of Verification) module, which requires complete output per criteria. These functionalities streamline verification, enhance system oversight, and ensure the security and integrity of data submitted by verified secretaries and barangays. It has also a Filtering feature, where in a year user can see uploaded files.



**EKPsys**

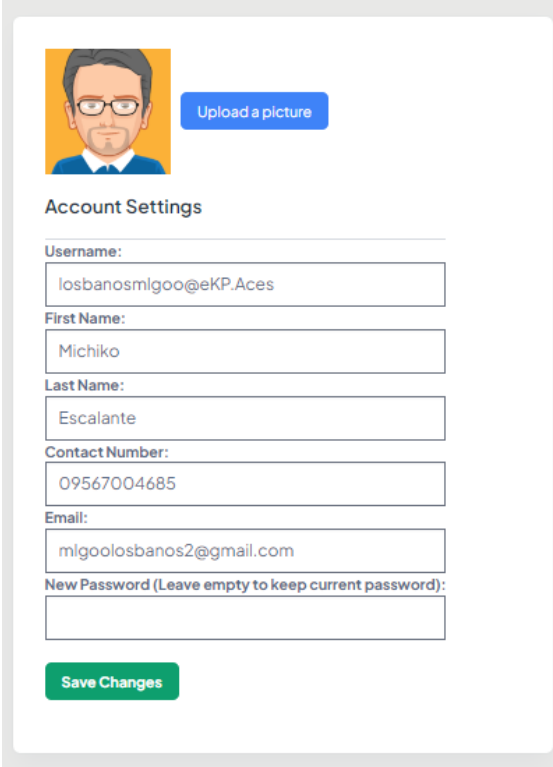
**Lupong Tagapamayapa Incentives Award (LTIA)** 2024

**FORM 1**

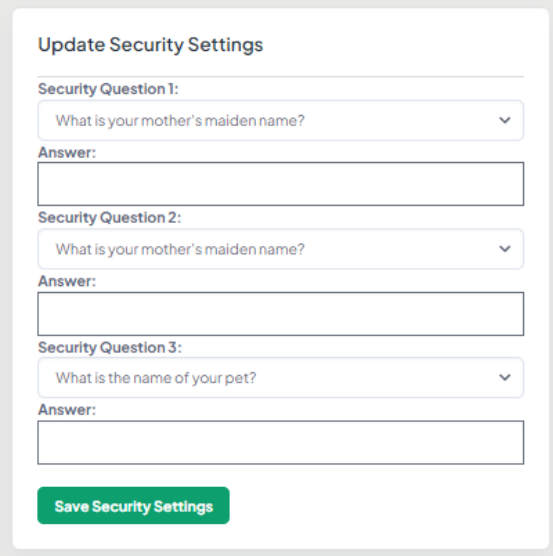
CRITERIA	Means Of Verification	Rate	Remarks
1. a) Proper Recording of every dispute/complaint	No MOV Submitted	Not rated	No remarks
b) Sending of Notices and Summons	No MOV Submitted	Not rated	No remarks
2. Settlement and Award Period (with at least 10 settled cases within the assessment period)			
a) Mediation (within 15 days from initial confrontation with the Lupon Chairman)	No MOV Submitted	Not rated	No remarks
b) Conciliation (15 days from initial confrontation with the Pangkat)	No file uploaded	Not rated	No remarks

**Figure 18. MOV Module**

In Figure 18, the picture shows how the MOV module works, focusing on what the barangay secretary does. The user will submit a file according to the established criteria. When the choose file is pressed, a folder will appear where the document is located. Once everything is completed, the files are submitted by clicking the "Save" button. User can view the uploaded files for further review and put remarks on each criterion. It has also a Filtering feature, where in a year user can see uploaded files.



The top form, titled "Account Settings", features a profile picture placeholder with a blue "Upload a picture" button. Below this, the "Username" field contains "losbanosmlgoo@eKP.Aces". The "First Name" field contains "Michiko", and the "Last Name" field contains "Escalante". The "Contact Number" field contains "09567004685", and the "Email" field contains "mlgoolosbanos2@gmail.com". A "New Password (Leave empty to keep current password):" field is present but empty. A green "Save Changes" button is at the bottom.

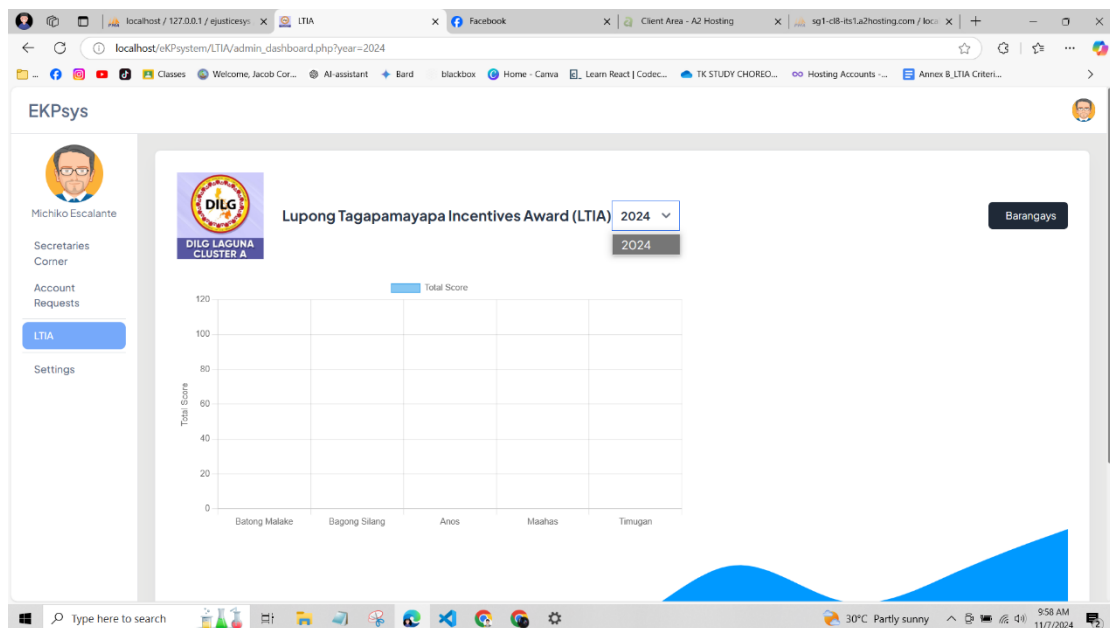


The bottom form, titled "Update Security Settings", contains three security questions. Each question has a dropdown menu and an "Answer:" text field. The first two questions are "What is your mother's maiden name?", and the third is "What is the name of your pet?". A green "Save Security Settings" button is at the bottom.

**Figure 19. User Settings Module**

Figure 19 shows the Account Settings Module that acts as the system's user settings. The user can change their credentials and set their profile picture within this module. Within this module, the user can add an extra layer of protection once they forget their password. Three questions are required to

provide an enhanced security passphrase. These questions will then be prompted for the Forgot Password module.



**Figure 20. Assessor Module**

Figure 20 shows the Assessor (DILG Municipal Assessor) homepage in this module. All the files submitted by the Focal Person are saved through the database. Only saved barangay accounts will be graded and presented in Form 2. The module has one important function: Form 2. These functionalities streamline verification, enhance system oversight, and ensure the security and integrity of data submitted by verified secretaries and barangays. A graph is shown where the user can see the total score of every barangay in a municipality. It has also a Filtering feature, where in a year user can see uploaded files.

**EKPsys**

Michiko Escalante

Secretaries Corner

Account Requests

LTIA

Settings

**DILG**

**Lupong Tagapamayapa Incentives Award (LTIA)**

Municipality of Los Baños

**FORM 1**

Select Barangay

Select Barangay

Select Barangay

Batong Malake

Bagong Silang

Mayondon

A. Observance of Settlement Procedure and Settlement Deadlines

► 1. a) Proper Recording of Every Dispute/Complaint - Evaluation Criteria	5	Select barangay	Ratings	Remarks
---	---	-----------------	---------	---------

Summary Back

**Figure 21. Form 2 Module**

Figure 17 shows that in this module, the Assessor can select a barangay within their jurisdiction that they will grade according to the criteria established by the DILG. The file button, when clicked, will display the files submitted by the Focal Person. This will be the basis for the grade to be given. Only the account holder of the Assessor will be able to access the system and view the files submitted by the Focal Person. The user will input the grade in the Rating field. User can put Remarks for some errors regarding the file sent by the Focal Person. Once everything is completed, the files are submitted by clicking the "Save" button. The final average grade is submitted and compiled in Form 3.

**EKPsys**

Michiko Escalante

Secretaries  
Comer  
Account  
Requests  
LTIA  
Settings

**DILG**

**CY Lupong Tagapamayapa Incentives Award (LTIA)  
LTIA FORM 3 (C/M) - COMPARATIVE EVALUATION FORM**

**A. IDENTIFYING INFORMATION**  
City/Municipality : CITY OF LOS BAÑOS  
Region : IVA  
Province : LAGUNA  
Category : CITY

**B. COMPARATIVE EVALUATION RESULTS**

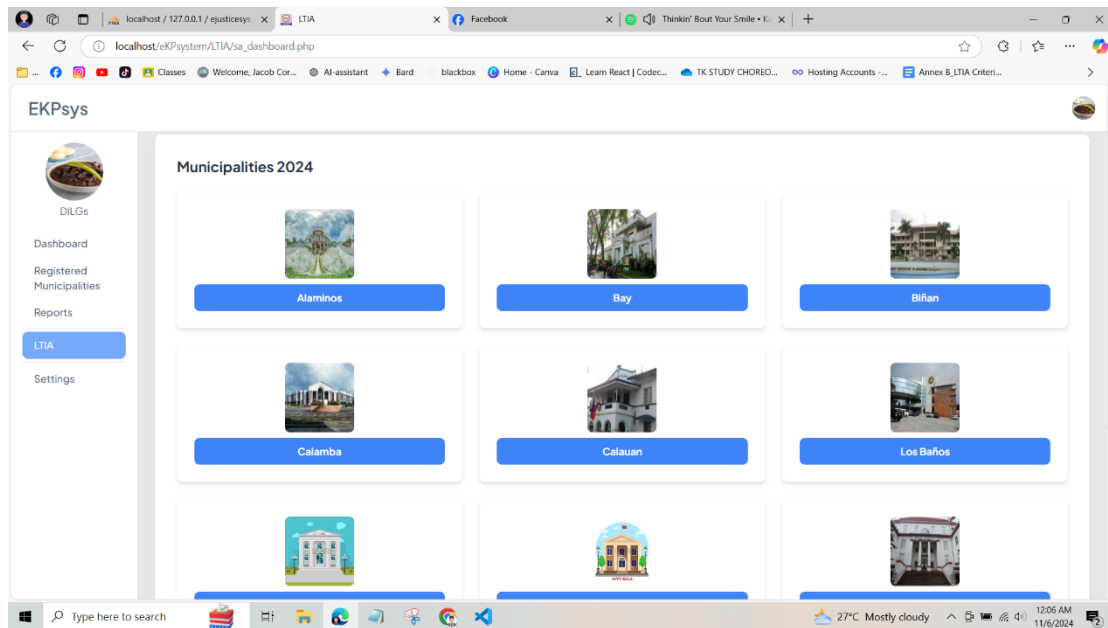
LUPONG TAGAPAMAYAPA (LT)	OVERALL PERFORMANCE RATING	ADJECTIVAL RATING	RANK
1. Bagong Silang	94	Very Satisfactory	1
2. Mayondon	75	Poor	2

**C. WE CERTIFY TO THE CORRECTNESS OF THE ABOVE INFORMATION**

Enter Name  
Chairperson - LOS BAÑOS City Awards Committee

**Figure 22. Form 3 Module**

Figure 18 shows that this module presents the grades given by the assessor to each barangay under their jurisdiction. It is recorded here who has the highest and lowest grades based on the files submitted by the barangay focal person and the grade given by the Assessor. The awarding committees will sign this. This can be used as a reference when the inauguration of whichever municipality with good performance in their governance takes place. Once everything is completed, the file can be printed by clicking the Print button.



**Figure 23. Super Admin Module**

Figure 23 shows the Super Admin Module where every municipality/city in Cluster A is shown, once the user clicks any present municipality, final grades of each barangay will be shown as a basis for the award. It can be use as a reference for a municipality/city that a barangay under their jurisdiction joined the awarding event.

### **Test and Evaluate the Software using ISO 25010**

Table 9: Results of Beta Testing answered by the IT Specialists

<b>Characteristics</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Functional Suitability	5.00	0.00	EXCELLENT
Reliability	4.50	0.71	EXCELLENT
Performance efficiency	4.00	0.00	EXCELLENT
Usability	4.50	0.71	EXCELLENT
Security	4.00	0.00	EXCELLENT
Compatibility	5.00	0.00	EXCELLENT
Maintainability	4.00	0.00	EXCELLENT
Portability	5.00	0.00	EXCELLENT
<b>Composite Mean</b>	<b>4.500</b>	<b>0.516</b>	<b>EXCELLENT</b>

---

$N_r = 2$  IT Experts

Table 9 shows the ISO 25010-based testing results, as evaluated by IT specialists, demonstrate that the software performs robustly across multiple criteria. Ratings in the three range signify that the software is effective but has yet to achieve maximum scores, indicating that the software meets the users' needs effectively, though not indisputable perfection. Specific areas such as Performance Efficiency and Security, rated at 4.00, directly point to opportunities for the software to be further developed to meet all user requirements and improve error handling. The overall weighted mean score of 4.50 solidifies the software's status as a reliable and competent tool, with the results emphasizing the need for continuous improvement to elevate the software's performance from strongly acceptable to outstanding.

### Results of Survey Answered by the Respondents using TAM

Table 10: Evaluation of Perceived Usefulness by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
The system effectively improves the accuracy of tracking awards and promotions within DILG Cluster A.	3.96	0.20	Very Satisfied
Using the system speeds up the process of evaluating and awarding incentives.	3.92	0.28	Very Satisfied
The system reduces the administrative burden of handling awards and promotions manually.	3.92	0.28	Very Satisfied
It enhances the transparency of the awards process for Lupong Tagapamayapa members	3.68	0.56	Very Satisfied
The system provides valuable insights into award performance metrics and eligibility criteria.	3.84	0.37	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.86</b>		<b>Very Satisfied</b>

*Nr= 25 Respondents*

Table 10 shows the results indicate a solid approval of the LTIA system's capabilities, with no areas falling into the "Unacceptable" categories. Scores in the three (3) range represent areas where users are satisfied but have identified specific improvements that could enhance their experience. These may relate to the system's intuitiveness, the efficiency of navigating through information, or the speed of operation. The item scoring in the two (2) ranges, relating to receiving timely updates, clearly indicates a deficiency that affects the system's effectiveness. These scores collectively demonstrate that users perceive the system as a functional and valuable tool for their work, with certain aspects



needing refinement to elevate the system from being strongly acceptable to exemplary in its user experience and efficiency.

Table 11: Evaluation of Perceived Ease of Use by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
The system is easy to navigate, even for first time users.	3.92	0.28	Very Satisfied
Tasks within the system such as entering or reviewing data can be done efficiently.	3.64	0.57	Very Satisfied
The user interface design allows for a smooth and straightforward experience.	3.60	0.58	Very Satisfied
Learning to use the system requires minimal training and instruction.	3.76	0.44	Very Satisfied
The system provides helpful prompts and guidance for completing award-related processes.	3.48	0.71	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.68</b>		<b>Very Satisfied</b>

*Nr= 25 Respondents*

Table 11 shows the results indicate that the web-based system is favorably received by barangay workers, with an overall weighted mean classified as "Highly Acceptable." Notably, all aspects assessed have achieved this level of acceptance with no dimension falling below the threshold for solid acceptability. The scores in the three range, although still reflecting satisfaction, signal areas for potential enhancement. The analysis suggests a requirement for a more intuitive and efficient system, as even the lowest scores indicate a solid base of approval. This feedback is a formative guide, highlighting the most pressing areas for user experience improvements to address barangay secretaries' specific needs.

Table 12: Evaluation of Attitude Toward Using by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
I am enthusiastic about using this system to improve our awards process.	3.88	0.33	Very Satisfied
The system makes me feel confident in the accuracy of our award and promotion records.	3.72	0.46	Very Satisfied
I believe the system will have a positive impact on DILG Cluster A operations.	3.56	0.71	Very Satisfied
I find the system satisfying to use for handling awards and promotions.	3.84	0.37	Very Satisfied
Overall, I feel positive about adopting this system in our work processes.	3.84	0.37	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.76</b>		<b>Very Satisfied</b>

*Nr= 25 Respondents*

Table 12 shows the results indicate a solid approval of the LTIA system's capabilities, with no areas falling into the "Unacceptable" categories. Scores in the three (3) range represent areas where users are satisfied but have identified specific improvements that could enhance their experience. These may relate to the system's intuitiveness, the efficiency of using the system, or the speed of operation. The item scoring in the two (2) ranges, relating to receiving timely updates, clearly indicates a deficiency that affects the system's effectiveness.

Table 13: Evaluation of Behavioral Intention to Use by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
I intend to use the system for processing award nominations and promotions.	3.56	0.58	Very Satisfied
I am likely to recommend this system to other staff members within DILG.	3.52	0.65	Very Satisfied
I plan to rely on the system as the primary tool for awards and promotion data management.	3.56	0.51	Very Satisfied
I am committed to use the system in future awards cycle.	3.36	0.64	Very Satisfied
I intend to use the system to improve the overall efficiency of our award processes.	3.68	0.56	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.53</b>		<b>Very Satisfied</b>
<i>Nr= 25 Respondents</i>			

Table 13 shows the results indicate a solid approval of the LTIA system's capabilities. Scores in the three (3) range represent areas where users are satisfied. These may relate to the system's intuitiveness, the behavior of using the system.

Table 14: Evaluation of Perceived Cost by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
The cost of implementing this system is reasonable, given the benefits.	3.52	0.51	Very Satisfied
I believe the cost of maintaining the system is justified by its functionality	3.44	0.58	Very Satisfied
The system helps reduce other costs associated with the manual processing of awards.	3.40	0.50	Very Satisfied

Training and setup costs for the system are acceptable and manageable	3.60	0.50	Very Satisfied
The affordability of the system makes it a viable solution for our needs.	3.44	0.58	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.48</b>		<b>Very Satisfied</b>
<i>Nr= 25 Respondents</i>			

Table 14 shows the results indicate a solid approval of the LTIA system's capabilities. Scores in the three (3) range represent areas where users are satisfied. These may relate to the system's intuitiveness, the behavior of using the system.

Table 15: Evaluation of Social Influence by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
My colleagues support the use of this system for awards management.	3.64	0.57	Very Satisfied
People in my team believe this system is beneficial for our work.	3.68	0.56	Very Satisfied
I feel encouraged by superiors to adopt this system in our processes.	3.68	0.48	Very Satisfied
The system has the backing of DILG Cluster A, making it more acceptable to use.	3.76	0.44	Very Satisfied
I am influenced by others who have positively embraced the system for their needs.	3.68	0.69	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.68</b>		<b>Very Satisfied</b>
<i>Nr= 25 Respondents</i>			

Table 15 shows the results indicate a solid approval of the LTIA system's capabilities. Scores in the three (3) range represent areas where users are

satisfied. These may relate to the system's intuitiveness, the social influence of using the system.

Table 16: Evaluation of Information Awareness by Barangay Workers

ITEM	MEAN	STANDARD DEVIATION	INTERPRETATION
I am well-informed about the system's features and benefits for awards management.	3.76	0.44	Very Satisfied
The system's functionalities for aiding in promotion decisions are clear to me.	3.84	0.37	Very Satisfied
I receive regular updates on improvements and updates within the system.	3.68	0.48	Very Satisfied
The system provides sufficient resources for understanding its capabilities and usage.	3.84	0.37	Very Satisfied
I am aware of the data security measures within the system to protect sensitive information.	3.76	0.44	Very Satisfied
<b>Overall Weighted Mean</b>	<b>3.77</b>		<b>Very Satisfied</b>

*Nr= 25 Respondents*

Table 16 shows the results indicate a solid approval of the LTIA system's capabilities. Scores in the three (3) range represent areas where users are satisfied. These may relate to the system's intuitiveness, the awareness of using the system.

### Results of Unit Testing

Testing on the system's units, which are the functions of each module, yielded the following findings. The developers employed testing methodologies to evaluate each unit's functionality and interactivity. The developers verified all modules to ensure the connecting modules met standards and resolved issues immediately to maintain system integrity and

performance. This process not only ensured that each module functioned as intended but also that they worked seamlessly together, enhancing the overall effectiveness of the system.

Table 17. Unit Testing for Admin Module

<b>Tested Case</b>	<b>Expected Output</b>	<b>Actual Output</b>	<b>Response Time</b>	<b>Remarks</b>
Evaluating Files	The system can grade submitted Means of Verification (MOV) files from different barangays depending on the municipalities designated.	The system can view all the files and grade submitted files from different barangays.		Passed
User Management	The system shows all the control of user access within a system or administrator. It has the role to securely give access and permission to use accounts.	The system successfully manages every account that runs in specific municipalitie s.	2 seconds	Passed
Account Request	The system will have an admin account so that they prevent the unknown user from using the system and also to know what activity they've done.	The system will assign one (1) admin to every municipality/ city to monitor the capacity of users.	1.0 second	Passed

Account Setting	The system will have an account setting to know the privileges and permissions compared to regular user accounts.	The system successfully restricts the user account to configure the other account only the admin can do.	1.0 second	Passed
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Table 10 shows the first test evaluates the system's ability to grade and view submitted MOV from various barangays, based on the municipality assigned, with the test passing as the actual system behavior matched expectations. The table demonstrates the system's efficiency in handling data segregation. The second test confirms the system's capability to manage user accounts, ensuring each account operates within its specific municipality. The third test checks for an admin account to oversee system use and user activities, which was successful as the system assigns one admin per municipality or city. Finally, the system's ability to set account privileges and permissions was tested, with the system restricting the configuration of other accounts only to the admin, leading to a pass result. In General, the system demonstrated expected performance in all tested areas.

## Integration Testing Results

Integration testing demands the integration of all modules that contribute to the system's functionality. Connecting the navigation and data analytic modules boosts the working system's overall performance.

Table 18. Integration Testing Result of the System

Tested Case	Expected Output	Actual Output	Response Time	Remarks
Navigation Module	All the admin navigation menu works properly.	All the navigation buttons that the admin can use to manage the system work properly 1 second.	1.0 second	Passed
Submission of MOV (Means of Verification) File Module	The system displays criterion where user can submit Means of Verification's.	The system successfully processed the data and submitted the file based on its intended functions.	1.0 second	Passed

Table 18 shows that integration testing runs unit tests on modules to verify whether the integrated modules work as designed. Before conducting integration testing, the developers ensure that each module has undergone functional testing. Every module is tested depending on the situation or scenario the admin provides. Developers carefully select input data when executing test cases for reliable integration testing.



## Acceptance Testing Results

Acceptance testing plays a crucial role in the system, validating the end-to-end functionality and user experience. This phase involves testing the system in real-world scenarios to meet user expectations. By engaging actual users, the acceptance testing phase provides valuable insights into the system's practical usability and effectiveness in real-life scenarios.

Table 19. Acceptance Testing Result of the System

ITEM	MEAN	INTERPRETATION
Functional Suitability	5.00	Excellent
Performance Efficiency	4.00	Good
Compatibility	5.00	Excellent
Usability	4.50	Excellent
Reliability	4.50	Excellent
Security	4.00	Good
Maintainability	4.00	Good
Portability	5.00	Excellent
<b>Overall Weighted Mean</b>	<b>4.50</b>	<b>Strongly Acceptable</b>

Table 19 shows that the web-based system exhibits strong performance and acceptable overall characteristics. While functional suitability received an excellent 5.00, indicating an exceptional level of performance, there might be areas where additional features or optimizations could enhance user experience. The security characteristic, rated at 4.00, indicates a good level below other attributes, suggesting potential areas for improvement in security measures to attain a perfect score. Despite these considerations, the system's high scores in performance efficiency, compatibility, usability, reliability, maintainability, and portability highlight its effectiveness and user-friendliness. These findings suggest that, while the system performs well across various

aspects, there's room for refinement, particularly in augmenting functionality and bolstering security measures to achieve perfection in every characteristic.

Table 20. Windows Versions Compatibility Test

Windows Version	Process	Expected Result	Actual Result	Remarks
Windows 11	Installation	Compatible	Compatible	Passed
Windows 10	Installation	Compatible	Compatible	Passed
Windows 8	Installation	Compatible	Compatible	Passed
Windows 7	Installation	Compatible	Compatible	Passed

Table 20 provides a quick overview of the compatibility status during the installation process for different Windows versions. It indicates that Windows 11, Windows 10, Windows 8, and Windows 7 all exhibit compatibility, meeting the expected results successfully. The "Passed" remarks confirm that the installation process for each version proceeded without any issues.

Table 21. Android Versions Compatibility Test

Android Version	Process	Expected Result	Actual Result	Remarks
Android 9	Viewing	Compatible	Compatible	Passed
Android 8	Viewing	Compatible	Compatible	Passed
Android 7	Viewing	Compatible	Compatible	Passed

Table 21 shows if you can view things easily on different Android versions. It checks Android 10, Android 9, and Android 8. The results say viewing works well on all three versions, just as expected. The "Passed" remarks mean everything is good and there are no problems. It tells that viewing is smooth and works fine on these Android versions, making it a good user experience.

Table 22. Windows Versions Runtime

<b>Windows Version</b>	<b>Expected Runtime</b>	<b>Actual Runtime</b>	<b>Remarks</b>
Windows 11	3-5 seconds	5 seconds	Fast
Windows 10	3-5 seconds	5 seconds	Fast
Windows 8	3-5 seconds	5 seconds	Passed
Windows 7	Compatible	Compatible	Passed

Table 22 compares how quickly different Windows versions can run the system. Windows 11 and 10 finished within the expected time, showing they worked fast. Windows 8 takes a bit longer but still passes, and Windows 7, although slower than expected, also passes. It gives a simple but formal view of how well these versions handle the response time within set timeframes.

Table 23. Android Versions Runtime

<b>Android Version</b>	<b>Expected Result</b>	<b>Actual Result</b>	<b>Remarks</b>
Android 9	3-5 seconds	5 seconds	Passed
Android 8	3-5 seconds	5 seconds	Passed
Android 7	3-5 seconds	5 seconds	Failed

Table 23 compares how fast different Android versions can view the system. Android 9 and Android 8 performed well, finishing within the expected time range of 5-10 seconds. Android 9 took 8 seconds, and Android 8 took 10 seconds. However, Android 7 did not meet expectations, as it was supposed to finish in 5-10 seconds but took a whole minute.

## Runtime Testing Results

Table 24. Browser Testing Runtime Results

Browser	Expected Runtime	Actual Runtime	Remarks
Microsoft Edge	3-5 seconds	2 seconds	Passed
Google Chrome	1-3 seconds	1 seconds	Fast
Mozilla Firefox	1-3 seconds	0.6 seconds	Fast
Opera	1-3 seconds	0.6 seconds	Fast

Table 24 shows this comparative analysis assesses the runtime performance of various web browsers, specifically Microsoft Edge, Google Chrome, Mozilla Firefox, and Opera. The focus is on each browser's expected and actual runtimes, providing insights into their relative speed and efficiency. While Microsoft Edge successfully passed the evaluation despite slightly exceeding the anticipated range, Google Chrome demonstrated swift performance within the specified timeframe. Mozilla Firefox and Opera distinguished themselves by exhibiting exceptional speed and completing tasks in a notably brief period. This test contributes valuable information on the efficiency of these browsers in executing the system, with each browser showcasing performance ranging from satisfactory to excellent.

## CHAPTER 5

### SUMMARY, CONCLUSION, AND RECOMMENDATION

#### Summary

Lupong Tagapamayapa Incentives Award Database System is a new way of grading and nominating barangay in every municipality in Laguna's DILG and LGUs of Cluster-A, developed using Agile Scrum principles. Stakeholders were continuously involved throughout the project lifecycle to meet their evolving needs. Initially, implemented an Agile Scrum information management module. This empowered barangay secretaries to store Means Of Verification's digitally, addressing inefficiencies and errors in manual handling of Means Of Verification tracking. Regular feedback cycles allowed for swift adjustments to meet end-user requirements. DFDs were used in the system design phase to visually represent information and processes, aiding in understanding, analyzing, and refining the grading workflow and identifying bottlenecks for a streamlined and efficient digital process. Agile Scrum enabled the collaborative development of a unified reporting protocol to standardize processes across barangays. The methodology allowed for adaptive planning, evolutionary development, and early delivery of a solution that addressed the need for uniformity in data recording. The system was built using JavaScript, PHP, HTML, CSS, and Bootstrap, chosen for their flexibility, reliability, and compatibility. MySQL was used for real-time and accurate handling of case reports. These technologies align with Agile principles, prioritizing individuals, working solutions, and responsiveness to change. The results show how the DILG Cluster-A Province of Laguna's Digital Information and Municipal Grading

System improves barangay document handling efficiency and promotes organizational effectiveness. Form 3 module shows the compiled grade of each barangay in every municipality contributing to efficient barangay MOV management and informed decision-making. The system has positive feedback from IT specialists and Barangay employees, with a "Strongly Acceptable" performance score of 3.68. However, the results show room for improvement in certain areas, such as updating cases promptly, achieving completeness in functionality, and addressing issues related to system maturity. Ongoing development is necessary to enhance the user experience and system performance.

## **Conclusion**

In conclusion, the LTIA system is a web system for evaluating and nominating barangay performance, it is developed through the following objectives:

- 1. Develop a data banking system that will handle documents related to Lupong Tagapamayapa Incentives Award**

In this study, a data banking system for municipalities and barangay secretaries is developed using reliable programming languages and tools like JavaScript, PHP, HTML, CSS, Bootstrap, and MySQL, and a user-friendly and dependable system is built. It works well on various devices and browsers. As shown in the Information Module (Figure 5), it provides a straightforward way for secretaries to submit files. They can easily select, and submit. With options to save as drafts, secretaries can keep information current and accessible. This approach

transforms how Means of Verification is processed, allowing for quicker updates and interactions and significantly improving the efficiency of barangay secretaries' work.

**2. Design a user-friendly web-based database module interface that supports the needs of the Lupong Tagapamayapa Incentives Award Database System.**

In this study, a user-friendly web-based database module interface is designed to efficiently analyze data that holds significant value for each user in barangays. This tool not only enhances data accessibility but also facilitates informed decision-making by providing concise and timely insights into various activities, contributing to the overall effectiveness and efficiency of barangay operations.

**3. Conduct beta testing across various barangays in the DILG Cluster-A using the ISO 25010 questionnaire to evaluate the usability, reliability, and effectiveness of the information management and report generation modules.**

The proposed beta testing initiative involving various barangays within the DILG Cluster A, assessed against the ISO 25010 standard, aims to ensure the system's functionality, reliability, and overall quality. This comprehensive testing approach is essential for identifying potential issues, refining user experience, and ultimately guaranteeing the successful implementation of a robust and effective solution tailored to the diverse needs of barangays.

## **Recommendation**

Exploring the following proposals for improving the web-based system based on results and insights is recommended.

1. For optimal performance and efficiency, running the system on the Mozilla Firefox and Opera browser is highly recommended. This approach is likely to produce the swiftest and most reliable user experience.
2. The project proponents recommend training and seminars for DILG barangay secretaries and staff utilizing the developed system.
3. The project proponents will have the DILG barangay secretaries and employees use the system to improve their filing of complaints and reports.
4. For security, specific rules should be in place before uploading to the cloud, such as securing all data, sensitive information, and transactions, especially when submitting reports to the Department of the Interior and Local Government (DILG).
5. The project proponents recommend that the students/future researchers/software developers incorporate features that will let the developed system accept old complaints to store them digitally.



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# APPENDICES

# **APPENDIX**

## **A**

**PLANNING & REQUIREMENT ANALYSIS PHASE**

**Project Title: Lupong Tagapamayapa Incentives Award Database System for DILG Cluster A Province of Laguna.**

**The Researchers:** Jacob B. Cortes, John Mark Montecillo, Dawn Lester Almadovar

Good Day! We are 4<sup>th</sup> year students, currently pursuing a Bachelor of Science in Information Technology specializing in Web and Mobile App Development. As part of our academic endeavors, we have developed a comprehensive web-based system adhering to the ISO 25010 standard.

To assess the effectiveness and user satisfaction of our system, we have devised a set of questions. Your responses, rated on a scale from 1 to 4, will help us evaluate various aspects of the system, from usability, functionality, security, and overall user experience.

1 = Poor 2= Needs Improvement      3 = Fair 4 = Good 5 = Excellent

RUBRIC FOR 5-Point Likert Scale to evaluate product/system quality using ISO 25010

<b>Characteristics</b>	<b>Excellent (5)</b>	<b>Good (4)</b>	<b>Fair (3)</b>	<b>Needs Improvement (2)</b>	<b>Poor (1)</b>
<b>Functional Suitability</b>	Fully meets all functional requirements; consistently performs all tasks accurately and reliably across use cases.	Meets most functional requirements; minor issues that do not affect core functionality.	Meets core functional requirements; some limitations on accuracy or scope of functions.	Partially meets functional requirements; notable limitations in scope or accuracy of functions.	Fails to meet key functional requirements; significant issues with task accuracy and performance.
<b>Reliability</b>	Consistently stable with no unexpected crashes; maintains stability under heavy load.	Generally stable; rare crashes that do not impede performance.	Some stability issues under moderate load; occasional, non-critical crashes or downtimes.	Noticeable stability problems; frequent minor crashes or issues under normal load.	Very unstable; frequent critical failures or crashes under any load.
<b>Performance efficiency</b>	Very high performance; consistently fast response times and resource-efficient under all conditions.	Good performance; quick response times with minor lag under heavy load.	Average performance; acceptable response times, but noticeable delays in some situations.	Below average performance; frequent delays, noticeable lag, or inefficient resource usage.	Poor performance; consistently slow response times, excessive resource usage, or major lags.
<b>Usability</b>	Highly intuitive; very user-friendly with a seamless user experience and excellent accessibility features.	User-friendly with minor usability issues that do not hinder functionality.	Some usability challenges; requires user adjustment but overall manageable.	Noticeable usability issues; difficult for users to navigate or operate without support.	Very difficult to use; poor user interface design, confusing navigation, and major accessibility barriers.
<b>Security</b>	Strong security measures in place; fully	Strong security measures in place; fully	Strong security measures in place; fully	Strong security measures in place; fully	Strong security measures in place; fully



	protects data and user privacy with minimal vulnerabilities.	protects data and user privacy with minimal vulnerabilities.	protects data and user privacy with minimal vulnerabilities.	protects data and user privacy with minimal vulnerabilities.	protects data and user privacy with minimal vulnerabilities.
<b>Compatibility</b>	Seamlessly integrates with all intended systems and platforms; fully interoperable.	Mostly compatible; minor integration issues that do not affect core functions.	Compatible with main systems; some issues with certain platforms or configurations.	Limited compatibility; significant challenges integrating with certain systems or platforms.	Incompatible; fails to work with most systems or causes conflicts with other software.
<b>Maintainability</b>	Codebase is highly readable, modular, and easy to update; supports seamless debugging and modification.	Codebase is mostly readable and maintainable, with minor areas needing improvement.	Codebase is maintainable but has some complex areas that slow down updates or debugging.	Difficult to maintain; significant portions of the codebase are hard to debug, modify, or update.	Very poor maintainability ; codebase is nearly impossible to debug or update without extensive rewriting.
<b>Portability</b>	Easily transferable across environments with full functionality; minimal or no setup required.	Mostly portable; minor configuration needed for full functionality across environments.	Moderately portable; requires some configuration changes to function across different environments.	Limited portability; significant adjustments needed for functionality in new environments.	Not portable; fails to function in different environments without extensive reconfiguration or adaptation.

Signature of Respondent

**Survey Questionnaire based on ISO 25010 (IT Expert)**

## TECHNOLOGY ACCEPTANCE MODEL QUESTIONNAIRE

Project Title: **Lupong Tagapamayapa Incentives Awards Database System for DILG Cluster A of Laguna**

**The Researchers:** Jacob B. Cortes, John Mark Montecillo, Dawn Lester Almadovar

Good day! We are 4<sup>th</sup> year students, currently pursuing Bachelor of Science in Information Technology specializing in Web and Mobile Application Development. As part of our academic endeavors, we have developed a comprehensive web-based system adhering to the ISO 25010 standard.

To assess the effectiveness and user satisfaction of our system, we have devised a set of questions. Your responses, rated on a scale of 1 to 4, will help us evaluate various aspects of the system, from usability, functionality, security, and overall user experience.

**Respondent's Name:** \_\_\_\_\_ **(Optional)**  
**Position in Barangay:** \_\_\_\_\_

1= Very Unsatisfied

2= Unsatisfied

3= Satisfied

4= Very Satisfied

<b>PERCEIVED USEFULNESS</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. The system effectively improves the accuracy of tracking awards and promotions within DILG Cluster A.				
2. Using the system speeds up the process of evaluating and awarding incentives.				
3. The system reduces the administrative burden of handling awards and promotions manually.				
4. It enhances the transparency of the awards process for Lupong Tagapamayapa members				
5. The system provides valuable insights into award performance metrics and eligibility criteria.				
<b>PERCEIVED EASE OF USE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. The system is easy to navigate, even for first time users.				
2. Tasks within the system such as entering or reviewing data can be done efficiently.				
3. The user interface design allows for a smooth and straightforward experience.				
4. Learning to use the system requires minimal training and instruction.				
5. The system provides helpful prompts and guidance for completing award-related processes.				
<b>ATTITUDE</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. I am enthusiastic about using this system to improve our awards process.				
2. The system makes me feel confident in the accuracy of our award and promotion records.				
3. I believe the system will have a positive impact on DILG Cluster A operations.				
4. I find the system satisfying to use for handling awards and promotions.				
5. Overall, I feel positive about adopting this system in our work processes.				
<b>BEHAVIOR</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1. I intend to use the system for processing award nominations and promotions.				
2. I am likely to recommend this system to other staff members within DILG.				
3. I plan to rely on the system as the primary tool for awards and promotion data management.				
4. I am committed to use the system in future awards cycle.				

5. The affordability of the system makes it a viable solution for our needs.				
<b>PERCEIVED COST</b>	1	2	3	4
1. The cost of implementing this system is reasonable, given the benefits.				
2. I believe the cost of maintaining the system is justified by its functionality				
3. The system helps reduce other costs associated with the manual processing of awards.				
4. Training and setup costs for the system are acceptable and manageable				
5. The affordability of the system makes it a viable solution for our needs.				
<b>SOCIAL INFLUENCE</b>	1	2	3	4
1. My colleagues support the use of this system for awards management.				
2. People in my team believe this system is beneficial for our work.				
3. I feel encouraged by superiors to adopt this system in our processes.				
4. The system has the backing of DILG Cluster A, making it more acceptable to use.				
5. I am influenced by others who have positively embraced the system for their needs.				
<b>INFORMATION AWARENESS</b>	1	2	3	4
1. I am well-informed about the system's features and benefits for awards management.				
2. The system's functionalities for aiding in promotion decisions are clear to me.				
3. I receive regular updates on improvements and updates within the system.				
4. The system provides sufficient resources for understanding its capabilities and usage.				
5. I am aware of the data security measures within the system to protect sensitive information.				

### Survey Questionnaire based on TAM

# **APPENDIX**

## **B**

**Communication Letter and Approvals**

Warm Greetings of Peace and Prosperity!

The researchers are in process of writing and developing their capstone project titled “**Lupong Tagapamayapa Incentives Awards Database System for DILG Cluster A of Laguna**”. This is in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology at Laguna State Polytechnic University – Los Banos Campus.

The researchers are in the process of gathering data that will be used to their capstone project. The researchers would like to ask permission to your good office to gather data that will be a great help to develop their capstone project. The data that will be gathered from your good office will be solely used for this capstone project undertaking only. Rest assured that the data to be collected for the capstone project will be treated with utmost confidentiality.

The researchers would greatly appreciate your consent to their request.

Thank you very much and God bless!

Respectfully yours,

**Jacob Cortes**

**John Mark Montecillo**

**Lester Almadovar**

Noted by:

**Loyd S. Echalar**

Capstone Project Adviser

