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

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Specialized in Web and Mobile Application Development

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APPROVAL SHEET

The capstone project entitled **"Lupong Tagapamayapa Incentives Award Database System for DILG Cluster A Province of Laguna"** prepared and submitted by **Jacob Cortes, John Mark Montecillo, and Lester Almadovar** in partial fulfillment requirements for the degree, Bachelor of Science in Information Technology specialized in Web and Mobile Application Development is at this moment recommended for approval and acceptance.

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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 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

‘E Katarunggan Pambarangay’ will launch in Laguna, according to Laguna State Polytechnic University, on February 22. The system was formally introduced during the regular cluster meeting cum cascading of e-KP System at the Sta. Rosa City Auditorium, Laguna. Implementing this technology in the Barangay Justice System will assist the barangay officials in the process of the necessary paperwork in a timely and sufficient manner to facilitate a peaceful resolution of disputes through mediation, conciliation, or arbitration. The Barangay Justice system in selected parts of the Laguna Province will experience a boost by implementing an innovative electronic system. (Laguna State Polytechnic University, 2024) 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)

Sustainable Solid Waste Management System: Los Baños, Laguna's Barangay Bayog This study indicates that Barangay Bayog now has a hierarchy or flow of solid waste. Processing of the waste takes time since it is not separated before it gets to the San Pedro landfill. Waste generators use up their input, which consists of products, clothes, and other materials. Byproducts or solid waste are produced in the system during the process. Solid waste is treated by several procedures. Homes are sorting their solid waste. Separated and sold to junkshop collectors are the recyclable items. Others are giving them away to be used later. Some houses sort their solid

waste that breaks down into compost. Some who keep hogs and other animals feed them biodegradable waste. Others gather everything and either burn, bury, or throw away their solid garbage. Most homes gather up all of their waste and take it outside to be picked up by garbage collectors. The solid waste management system in Barangay Bayog is impacted directly by and interacts with the Municipal Office, where rules about solid waste management are enacted. Other barangays provide particular inputs to the barangay system. Tao. One can import solid trash from one location to another, and certain barangays may dump their solid waste into their canal to move it to Barangay Bayog. The interconnecting canals reach the lake by flowing towards the canals of Barangay Bayog. Another supposedly community-related solid waste management activity is a once-monthly clean-up day. Sadly, the said activity is limited to the barangay officials, who are led by the barangay captain.

(Cynthia V. Almazan and Danilo Vargas, 2016)

In Sta Rosa, one hundred village residents are from San Lorenzo South. A survey was conducted in Rosa City, Laguna, to assess residents' knowledge, attitudes, and practices on solid waste management, preferred information sources, and systems for input. Most respondents were middle-aged female college graduates with nil to low incomes. Most of them were aware of crucial solid waste management ideas and related environmental concepts such as pollution and global warming due to ozone layer damage, aggravated by garbage burning and flooding, all caused by poor solid waste management. (Rosario V. Tatlonghari and Serlie B. Jamias, 2010)

Sampaloc Lake has a complex Governance system. It involves two principal administrative agencies, the Laguna Lake Development Authority

(LLDA) and the City Government of San Pablo; various overlapping laws reflect different opinions and stakeholders with varying expectations on the utilization of the lake. It further claims that the two primary concerns in preventing the development of Sampaloc Lake are a delay in the demolition-relocation program and a lack of formulation of a zoning-management plan. Resolving the former involves scientifically-grounded compromises among the three stakeholders' proposals (namely: the Tourism Council and Environment and Natural Resource Office [TC-ENRO] proposal; the Fisheries and Aquatic Resources Management [FARMC] proposal; and the Seven Crater Lakes and Watershed Management Council [SCLWMC] proposal). To resolve the latter, the demolition-relocation program's funding issue must be addressed. By including Sampaloc Lake on the literature map and increasing the governance and development studies on small lakes in the nation, this study aims to alleviate the dearth of academic works on lakes in the Philippines. (Brillo, 2017)

The Municipality of Bay is a second-class municipality located in the province of Laguna. Historically, they were the first capital town of Laguna, a center for culture, arts, and trade during the Spanish Era. Currently, Bay is a thriving municipality in the Province of Laguna. They receive funds from vital national bodies, and well-known businesses, developers, and investors are establishing themselves here. This is because they see the potential for transforming a once-quaint town into a contemporary and sustainable LGU while maintaining its rural town. Bay Municipality has 67,134 residents and households. The Philippine Statistics Authority's 2020 census reported a population of 62,134. The municipality's household population increased by 8.28%, from 62,143. There are more males (33,696) than females (33.438),

resulting in a gender ratio of 100.77. Although the general sex ratio indicates equal distribution, either gender is predominant in those who come to the Municipality for commercial activity. (Municipality of Bay , 2022)

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 Lupons' 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 Lupong Tagapamayapa Incentives Awards were created in 1997 as a way to formalize a program that gives the economy advantages and other incentives to the Lupong Tagapamayapa that shows exceptional achievement in resolving conflicts at the local level. Regional, provincial, and municipal committees assessed the lupons' performance and achievements according to their effectiveness in achieving the katarungang pambarangay goals, their efficiency of operations, and the inventiveness and resourcefulness of their mediators. (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). Undertook a study.

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)

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)

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 Lupong 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 filling 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 Lupong 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
Antonio, L	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 administration	2020

			through better monitoring of infractions and blotter cases.	
Husson University	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
Lacasandile, A. D., & Labanan	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
N. Jamis et.al.	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
Hingorani, Khara, Pomendkar, & Raul,	Police Complaint Management System Using Blockchain Technology	Block-chain for Police Complaint Management System	The Police Complaint Management System employs blockchain technology with consensus mechanisms, smart contracts, and encryption for secure and transparent complaint storage, leading to enhanced security,	2020

			transparency, and automation in law enforcement operations.	
SIMBULAN, MARTIN JOSEPH W.	1KYUSI: A CENTRALIZED WEB-BASED INFORMATION MANAGEMENT SYSTEM FOR THE LOCAL GOVERNMENT OF QUEZON CITY	Methods involve centralized web-based information management, citizen record updating, and Data Privacy Act adherence.	1KYUSI improves record-keeping, accessibility, and disaster preparedness for LGUs in Quezon City while ensuring data privacy compliance and enhancing governance practices.	2022

Conceptual Framework

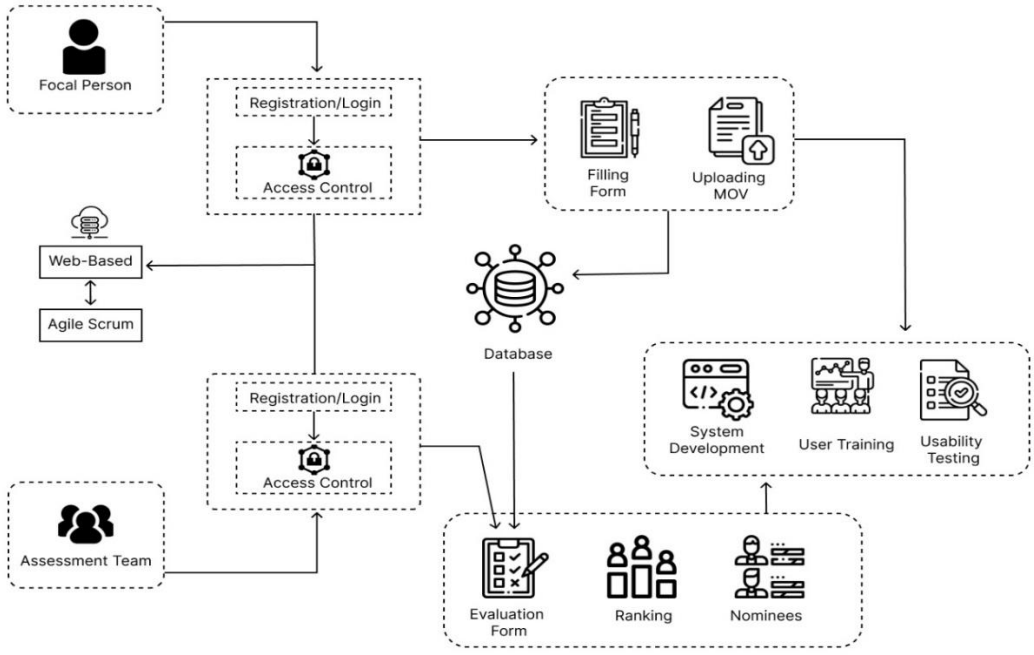

Figure 1: Conceptual Framework

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.

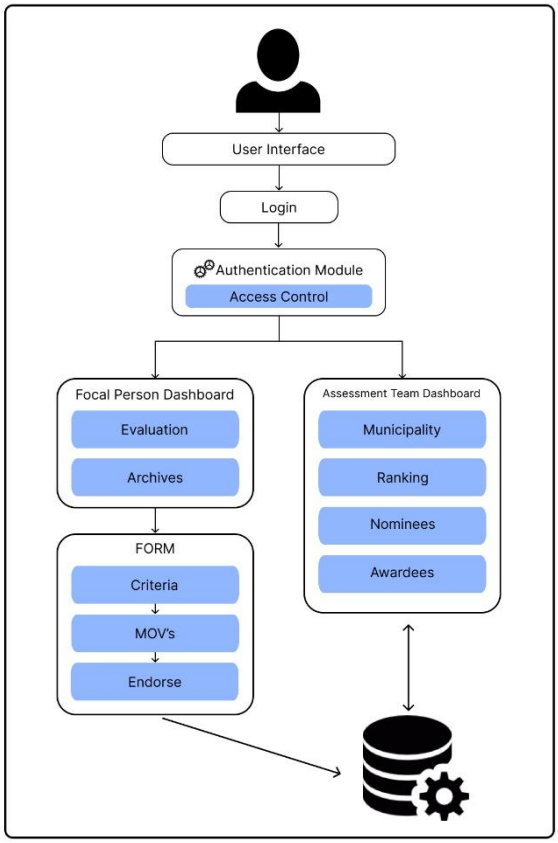

Figure 2. System Architecture

The figure 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 evaluations. 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 focal team interface has an auto-generated ranking feature; the ranking of nominees will be sorted based on their performance and you 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 evaluation, and the Assessment Team focuses more on managing nominees and auto-generating rankings.

SYSTEM FLOWCHART

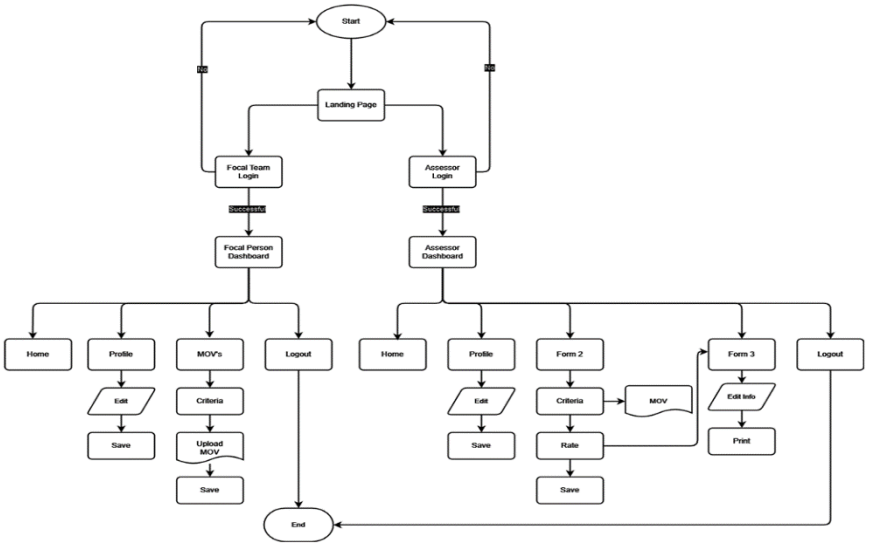

Figure 3. System Flowchart

The Figure 3 flowchart shows the 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.

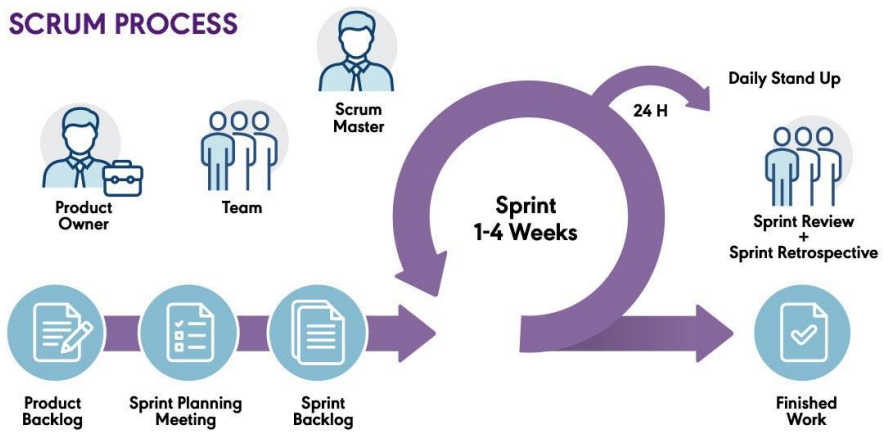

Figure 4. Agile Scrum Methodology

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

PRIORITY	ITEM	ESTIMATED HOURS/DAY
1.	As an assessor, I want to access the dashboard.	2 hrs
2.	As an assessor, I want to grade the form and view uploaded MOVs.	2 hrs
3.	As an assessor, I want to put remarks about certain barangay.	2 hrs
4.	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 accesses the dashboard, grades the form provided and views uploaded MOVs. The assessor can edit info in Form 3 and print the form.

PRIORITY	ITEM	ESTIMATED HOURS/DAY
1	As a User, I want to access the dashboard	2 hours
2.	As a user, I want to upload MOV for the given criteria.	2 hours
3.	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 first gains access by logging in and uploading MOVs. The last step is to save the changes made.

SPRINT PLANNING

PRIORITY	ITEMS	TASK	ESTIMATED HOURS/DAY
1.	As a user, I want to access the dashboard	Develop a dashboard page for Users. Design the dashboard page. Test the dashboard page.	3 hrs
2.	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
3.	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	TASK	ESTIMATED HOURS/DAY
1.	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
2.	As an assessor, I want to grade the form and view uploaded MOVs.	Develop a grading sheet and view the uploaded MOVs page for the Assessor Design the grading sheet and view the uploaded MOVs page. Test the grading sheet and view the uploaded MOVs page.	3 hrs
3.	As an assessor, I want to put some remarks provided in Form 3.	Develop a put remark for the Assessor. Design the remarks page. Test the remarks page.	3 hrs
4.	As an assessor, I want to print the form.	Develop a print page for the Assessor. Design the print file page. Test the print file page.	3 hrs

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

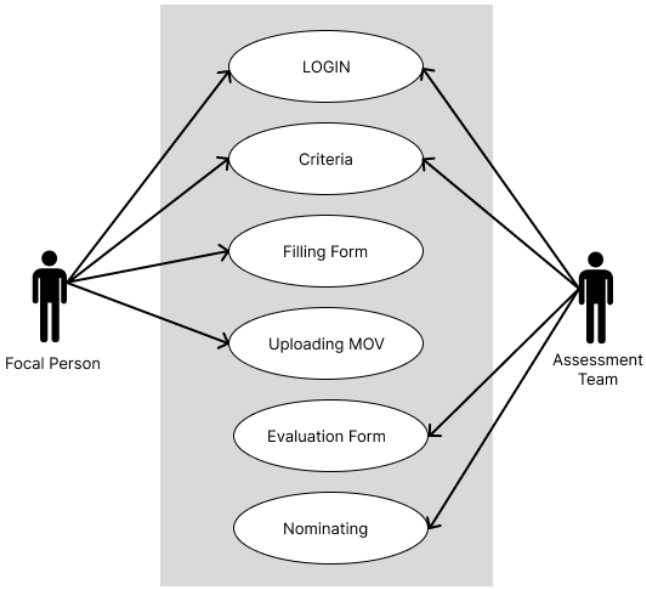

Figure 5. Use Case Diagram of Lupong Tagapamayapa Incentives Award

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

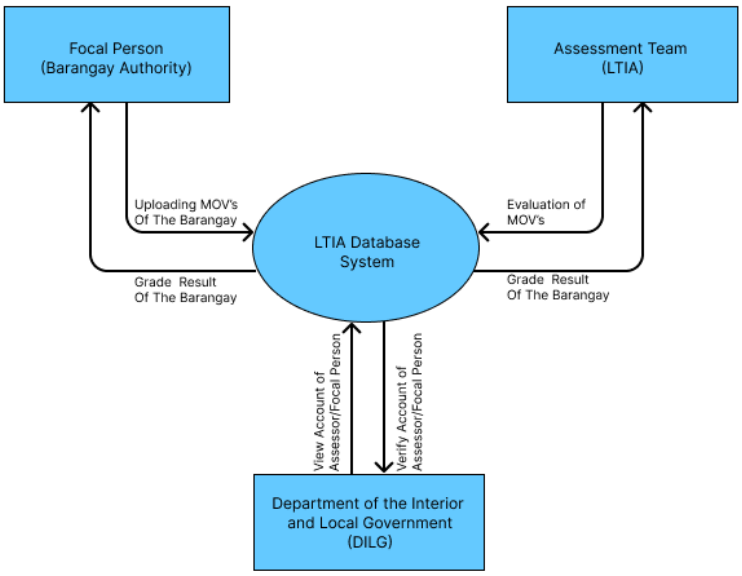

Figure 6. Context Level

This 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.

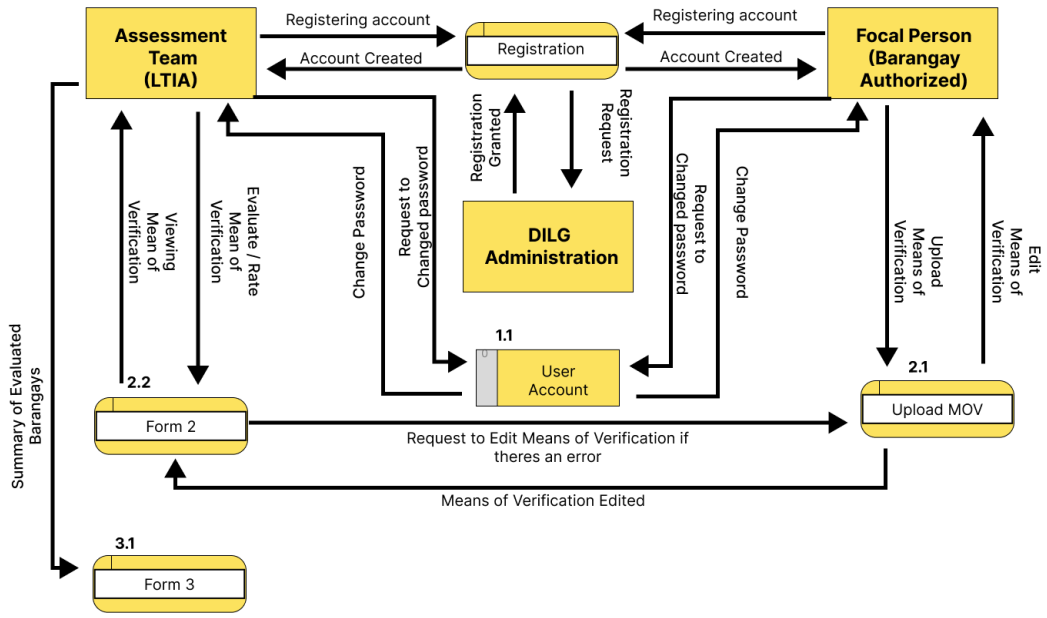

Figure 7. Data Flow Diagram

The Data Flow Diagram (DFD) is 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.

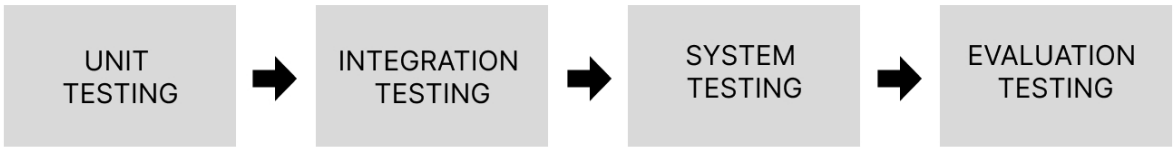

Figure 6. Project Testing and Evaluation

The researcher will conduct evaluation and 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. 7 Unit Testing

Unit testing is a technique where individual units or components of a software program are tested. This approach helps 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

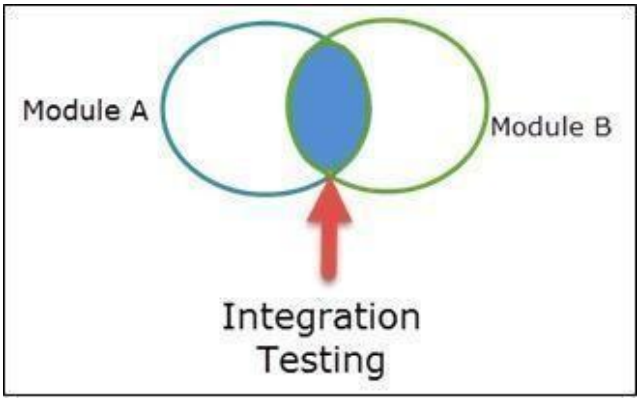

Figure. 8 Integration Testing

As shown in Figure 8, 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

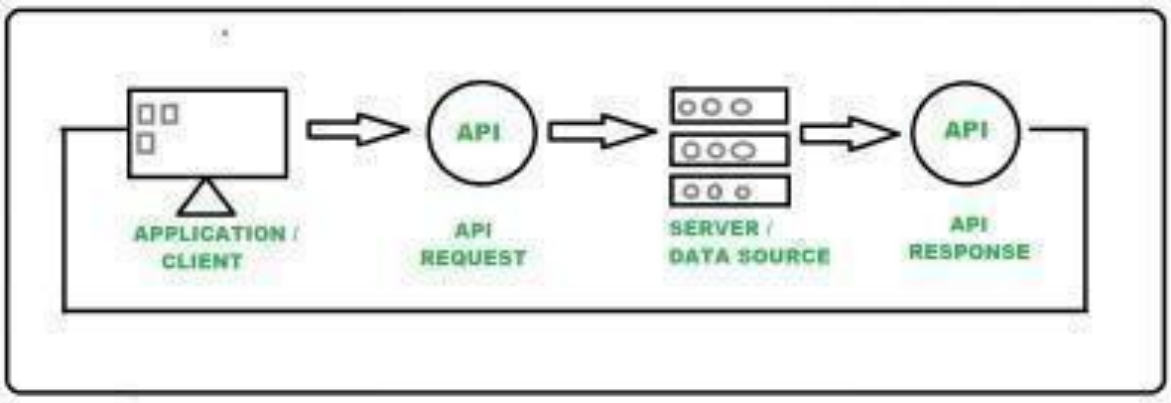

Figure 9. API Testing

Figure 9 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

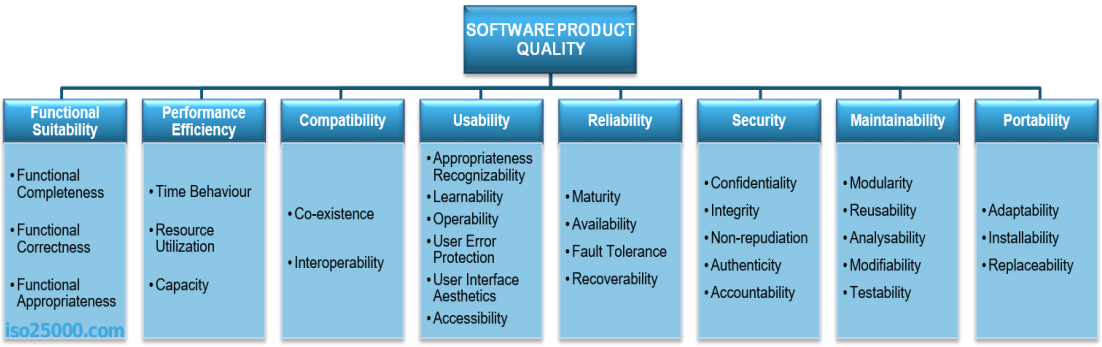

Figure 10. ISO 25010 Software Quality Model Characteristics

Figure 10 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.

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 50 Secretaries from 10 Municipalities and different barangays, 3 IT experts, and 1 DILG Assessor, a total of 54 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, DILG Admins, and Barangay Secretaries, with a sample size of 3 IT Experts, 1 DILG Admin, and 50 Barangay Secretaries, totaling 54 participants. 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 6. Likert Scale Technique

Individual Score	Composite Mean	INTERPRETATION
4	3.25 – 4.00	Strongly Acceptable
3	2.50 – 3.24	Acceptable
2	1.75 – 2.49	Unacceptable
1	1.00 – 1.74	Strongly Unacceptable

The Likert Scale, as presented in Table 6, 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,

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

Statistical Treatment

For data analysis, the developers calculated the mean of the survey responses to find the central tendency. Each option on the Likert Scale was assigned a numerical value aggregated for each question. The sum was then 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 can 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 50 respondents. And repeat the procedure separately from the 3 IT experts. Compare the means of the general respondents with those of 3 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 your analysis, provide the means, standard deviations, and composite mean. Analyze the data, emphasizing any noteworthy discoveries or differences amongst the various response groups.

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