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Phenomenological Insights into Local Government Governance of End-of-Life Vehicles in Malaysia

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Abstract

This study examines the lived experiences of local government officials in managing End-of-Life Vehicles (ELVs) in the Klang Valley, Malaysia. Using a phenomenological approach grounded in Governance Network Theory (GNT), it explores how officers perceive and address the operational, legal, and inter-agency complexities of ELV management. Data from in-depth interviews with key informants across multiple agencies were thematically analyzed, revealing four key challenges: decision-making constraints, group dynamics, communication barriers, and network performance limitations. The findings indicate that weak coordination, unclear deregistration authority, and fragmented communication hinder effective policy execution. Strengthening network collaboration, improving communication systems, and aligning institutional roles are essential to enhance governance capacity. This study contributes to the growing discourse on ELV sustainability by integrating phenomenological insights with network governance principles, offering practical implications for developing coherent, multi-stakeholder frameworks for ELV policy reform in Malaysia.

Keywords: End-of-life Vehicles (ELVs), Abandoned Vehicle, Local Government, Phenomenology, Governance Network, Malaysia

Introduction

End-of-Life Vehicles (ELVs) are harming the environment and therefore require actions focused on sustainability. Though many people use lithium-ion batteries, it is difficult to process and recycle them because they can be so damaging (Golroudbary et al., 2019). Nowadays, recycling ELVs is crucial since disregarding them can harm the environment (Rovinaru et al., 2019). On the other hand, Petronijević et al. (2020) stated that ELVs negatively affect the environment, but their management and recycling are possible using various practices.

If ELVs are recycled, it helps the industry protect the environment while decreasing their negative effects on Earth (Zhou et al., 2019). Recycling ELVs allows us to save useful

resources and reduce the amount of waste produced (Karabelli et al., 2020). Being able to recycle ELVs helps the car industry worldwide achieve environmentally friendly, sustainable, and low-carbon development (Hongliang et al., 2021).

Because more cars are being purchased by people, it is now more important to manage ELVs. Because of this, it is clear that recycling resources and living green are something worth considering (He et al., 2021). Moreover, ELV batteries made of lithium-ion should be recycled to benefit both nature and the economy (Catton et al., 2019). It is necessary to recycle Electric Vehicle (EV) batteries to give the economy a reliable stock of valuable substances that fit within the circular economy model (Gastol et al., 2022).

Disposing of electrical and electronic goods in Malaysia is not done properly. Provided that there are not enough laws, abandoning a car is quite a difficult issue (Ali, Simic, et al., 2023). Insufficient rules lead to vehicles being driven for a long period and, eventually, left abandoned, contributing to the growing problem (Numfor et al., 2021). Lack of proper guidance means that old and discarded cars are abandoned in various areas (Sulaiman et al., 2023).

Research has found that Malaysia has a high number of abandoned vehicles, which explains why the country needs to develop effective plans for managing ELVs (Ali, Simic, et al., 2023). Without suitable methods to manage ELVs, we are experiencing more abandoned cars, and their costly removal is now harming the environment (Abidin, 2024). From what we see in Malaysia today, it is evident that major policies for old cars should be based on those used by developed nations (Abu Kassim et al., 2020).

In addition, researchers show that properly cleaning up old cars and recycling them is crucial (Wyss et al., 2022). Efforts to cope with ELVs in Malaysia must cover legislation, how the public feels about the issue, and how ELVs are handled. This strategy must be applied to help manage the proper handling of ELVs (Numfor et al., 2021).

Here, we see how local government in Klang Valley is dealing with issues caused by abandoned vehicles that are too old to run. The research examines how these situations contribute to managing ELVs, mainly by learning the key challenges ELV management currently faces for local administrations. Evidently, there are some issues, such as problems among different groups, weak communication, and difficulty reaching out to many groups. As a result, making the government more effective, making better planning choices, and creating teamwork with proper departments may lead to better ELV management. Consequently, government policies should be changed to boost the system's efficiency.

ELV Management in Malaysia

Addressing environmental concerns, Malaysia should make necessary laws and encourage people to recycle ELVs more promptly. The paper by Akram Khan et al. (2021) demonstrates how ELVs are handled in Malaysia. The authors discuss the subject based on their personal experience and the things they have seen related to ELVs. This study should make it clear what challenges exist in Malaysia and how the rules influence the management of ELVs.

Ali, Sitinjak, et al. (2023) examined how Malaysians feel and deal with removing vehicles, with the purpose of preparing guidelines for a well-structured law on the issue. The study states that inadequate laws for ELVs in Malaysia have quickly led to more abandoned cars. According to the author, getting rid of ELVs requires strict regulations and policies.

Chong et al. (2022) looked at the progress and new developments concerning cars that have become obsolete in Malaysia. According to the study, securely handling and recycling ELVs should be seen as important, and seeking new methods for ELVs is crucial in the country. The research enhances people's knowledge about managing waste in Malaysia.

To handle ELVs in Malaysia, we have to involve concepts from industries, public opinions, laws, and environmentally safe production. Coordinating ELVs involves setting proper regulations, informing the public, and finding fresh approaches to support sustainability and effective recycling in cars. Still, this paper investigates how local governments respond to ELV management. It is important for Malaysian researchers to understand how local officials in the country deal with the issues and problems connected to managing ELVs, involving other groups, following government rules, and not having everything needed.

ELV Policy and Regulation in Malaysia

ELV regulations are not easily introduced in Malaysia, as people there are not fully prepared. As per Ismail et al. (2023) and Ali, Sitinjak, et al. (2023), there is a major difference between the regulations put in place and the extent to which people know and choose to follow them. If people do not support ELV policies, it becomes challenging to implement ELV laws smoothly. Some research argues that citizens should address both their attitudes and their level of preparedness. In that case, it is likely that ELV laws will not succeed, reducing the success of efforts to stop abandoned vehicles in Japan.

Abu Kassim et al. (2020) believe making ELVs profitable and safe is possible. Since Malaysia does not enforce an ELV policy, more and more unsafe and old cars are appearing on the roads. Solah et al. (2021) determined that when an ELV policy is poorly designed, old vehicles may not be correctly and quickly managed to keep the environment safe. A lack of regulation is dangerous for road users, leading to inefficient use of resources and an increased risk to the environment since older cars use more fuel and often break down easily. Therefore, the ongoing existence of these vehicles presents substantial hazards to the safety of the public and the sustainability of the environment, emphasizing the immediate requirement for a robust and all-encompassing strategy for managing ELVs.

According to Jawi et al. (2016), when information on how ELVs affect nature and society is shared, approval for regulations can increase substantially. Promoting awareness among people about the value of handling ELVs by reducing pollution, boosting road safety, and making society safer can greatly help. It will encourage people to respond favorably to these regulations.

In addition, many people in the public support placing an age limit on passenger vehicles. A majority of people taking part in these discussions want to prevent older, less safe, and eco-friendly vehicles by applying a 5 to 10-year age rule (Jawi et al., 2016).

While developing and following ELV laws in Malaysia, local officials should consider demographics such as age, income, and car ownership status by ensuring polices are seen as fair, likely to achieve results, and effective. After considering a population's needs, strategies can be changed to boost support for ELV policies and make them easier to apply.

Theoretical Framework

To organize the study, the Governance Network model outlined by Ojo and Mellouli (2018) was used (see Figure 1), as it supports teamwork of multi-stakeholders, decentralized decision-making, and emphasizes that our actions are also the actions of others. It is clear that local governments should coordinate well, communicate clearly, and involve different stakeholders, since they need to work alongside the RTD, police, and recycling centers. This explains the difficulties involved when synchronizing these various parties, the negative effects of working independently, and the lack of resources for local governments to handle ELVs. It reveals that reforming governance helps ELV management by improving people's cooperation, making decisions faster, and sharing resources. Its purpose is to simplify examining, analyzing, and merging patterns found in the organizations and practices of Governance Networks. The Governance Network relies on a central element and four additional ones: network design and setup, technology, human resources, and performance integration.

This part of the framework concerns the network's total and individual objectives. The focus is on developing common objectives and working together to reach the goals by coordinating each person's activities. It involves understanding how information and resources, such as human resources, travel in and through a network. Other than that, it outlines the method by which the network is guided, sets out who does what, and shares details on the plans for achieving its objectives. If a network is well-designed, the communication is clear, the resources are well-managed, and it operates efficiently.

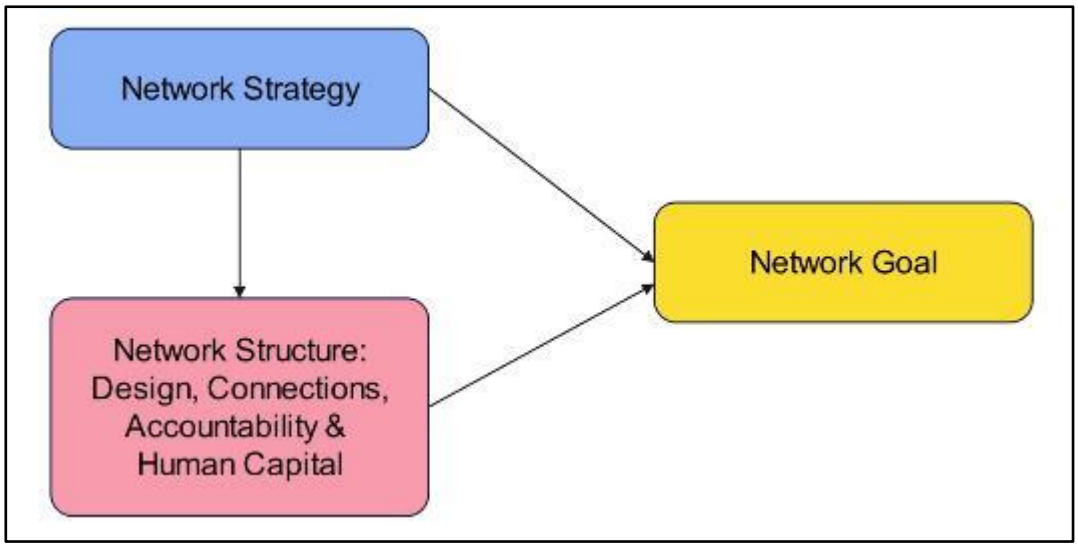

Figure 1: Analytical model relating network strategy, structure, and goals
(Ojo & Mellouli, 2018).

The connecting element is the technology that helps partners to exchange education, business procedures, decisions, client information, and workflows. Through this set of

technologies, individuals involved in the network can easily exchange real-time messages and join efforts to solve difficult problems.

This means that the network ensures that every actor takes responsibility for its successes, failures, or issues. Because of this part, the network becomes more trustworthy and reliable to all its members. It introduces systems for observing, reviewing, and addressing any issues impacting progress and achievements.

For government organizations, accountability and human capital include developing the necessary competencies and skills to operate in the network. They will need to train and build up the expertise of those in the network to help them succeed while working together.

Elements are classified as "Strategy" for the Governance Network or "Structures" to carry out the strategy and achieve the common goals. To achieve the strategy, the network must first set clear goals, while the details of network design, key technology systems, responsibility, and skilled staff ensure its success.

Based on the reliable link between organizational strategy and structure, Ojo and Mellouli (2018) suggest that a network strategy directly changes the network structure. Additionally, the way a network is structured and the strategy used play important roles in achieving its targets. The connections between the elements are nicely laid out in Figure 1.

The Governance Network framework points out that the behavior of local government encourages various stakeholders to join forces and overcome complex problems while increasing democracy (Silva et al., 2023). They are significant in helping make decisions that include many different opinions and knowledge. It becomes crucial when working on hard issues. Moreover, investigations have shown that it is important for the government to be involved in forming local groups to help ensure sustainable development (Aras et al., 2022). Receiving central government help means local groups can use the necessary resources, good policy advice, and supervision to improve and achieve their objectives.

It is also emphasized that local governments should align their policies with the Sustainable Development Goals (SDGs) by cooperating with others through networks. It is important to ensure alignment to improve the impact of official development assistance activities for capacity building (Lim & Jung, 2020). To effectively promote sustainable development, local authorities can use international standards and adopt the most successful approaches.

It is more common for governments at both local and national levels to create networks for tackling tough and complicated problems (Krogh, 2022). Governance networks can effectively respond to wicked problems because they are intricate and hard to solve alone. These networks facilitate the consolidation of resources, knowledge, and expertise from different sectors and levels of government, improving the overall ability to address these challenges comprehensively and sustainably.

The most notable parts of Governance Network Theory for our study are multi-stakeholder interaction, decentralizing power, being involved with others, and coordination.

Based on the study, local governments are experiencing serious challenges in dealing with ELVs due to uncoordinated and weak communication among different agencies. As the framework stresses that companies should cooperate, this highlights why single business unit operations are inefficient. At the same time, the focus on autonomy means that streamlining ELV management helps to improve outcomes. Following the study's recommendations, these problems can be considered by improving management and teamwork among the involved parties.

Method

Research Design

The study focused on learning "What problems do local governments encounter in their handling of ELVs?" We want to understand in detail what the local government officers in Klang Valley, Malaysia, go through. It is necessary to consider the main issues, techniques, and outcomes of these officers' roles by looking at what they have gone through. It is considered vital as the long process for removing this material complicates local storage and costs. Furthermore, since recycling policies for ELVs are not clearly defined, cities have to deal with the problem themselves. People involved in the ELV recycling process should all take responsibility to ensure it protects the environment.

The authors conducted the study with a phenomenological approach to ensure that the insights of officers from local governments, agencies, and ministries were given priority. It wants to understand different people's personal experiences, as every person's reality may differ (Creswell, 2009). Since police encounter various issues with ELVs, the approach of phenomenology is best-suited to such cases. Looking at how individuals create meaning in life helps us understand participants' thoughts, actions, and emotions (Dodgson, 2023). When many individuals and groups are involved, more people become aware of the issues local government officers must handle. Understanding local government policies, the researcher was able to read and explore the information properly and was less likely to be biased (Berger, 2015; Piedra, 2023; Tewolde, 2023).

Thus, the researchers used this method and relevant theories to correctly show and understand what their participants experienced (van Manen, 2017). Additionally, applying both models gave insight into all the main factors affecting ELV management. Following both the case study and framework methods, we were able to see how individual and organizational elements affected ELV management.

Overall, using phenomenology helped the project reveal the experiences of local officers, stakeholders, and workers who deal with ELVs. Thus, the authors made their conclusions based on actual ideas present in society.

Sample

Experts from various educational institutions were asked to assess all sides concerning ELV management. For this study, the subjects included enforcement officers from fourteen local government in the Klang Valley districts, as well as representatives from the Selangor State Government, the Department of Road Transport (RTD), the Department of Environment (DOE), the Ministry of Housing and Local Government (MHLG), the Ministry of International Trade and Industry (MITI), the Malaysia Automotive Robotics & IoT Institute (MARii), and the

vehicle dismantler working in Malaysia. Their main task is to control old and abandoned cars, with ELVs being their main concern.

Interviews were conducted with 27 people using the purposeful sampling method, ensuring they were associated with managing abandoned vehicles, especially ELVs (Sandelowski, 1995). Informants had to fulfill specific criteria to qualify for the study (Marshall, 1996; Pahwa et al., 2023): (1) they needed to be actively engaged in managing abandoned vehicles or ELVs, (2) possess the necessary jurisdiction outlined in the abandoned vehicle management guidelines, and (3) actively contribute to implementing ELV management policies. As a result, the team could choose professionals with the proper knowledge and experience, which made the collected data more comprehensive and accurate. The information that supported the investigation's aims was collected by interviewing a wide variety of informants.

Interviews were conducted with individuals selected to investigate their involvement with abandoned cars, focusing on whether enough informants had been included in the study. Using this method, new ideas and viewpoints were discovered in the field of abandoned vehicles. Therefore, researchers concentrated on comprehending the phenomenon well rather than exploring different sides of it (Cleary et al., 2012; Maxwell, 2013). If criterion-based sampling is applied in qualitative research, 12 interviews are generally enough since saturation will most likely be reached within those 12 interviews (Guest et al., 2006). A sample chosen by criteria should include around six to seven people to explore the key points (Guest et al., 2020). Of the 27 informants, 14 key participants were identified, as no new information or themes emerged from their interviews. The data collected indicated that the informants had covered all the key aspects of the study, so conducting further interviews was unnecessary.

Since informants shifted roles in the government at all levels, they learned about different issues facing the policies. In reported cases, officers at the local level usually maintain control of their responsibilities for many years, giving them more time to manage abandoned vehicles and better understand issues surrounding them. Unfortunately, we could not interview people in other departments about abandoned vehicles. Researchers used a diverse research approach to gather in-depth information about the phenomenon, helping to fill the gap (Brewer & Scandlyn, 2022). Interviewing officials from several local agencies and ministries allowed the researcher to draw on different sides of the phenomenon. Note that all participants gave informative responses and shared their perspectives about the phenomenon. Thanks to them, the researcher could better study important topics and understand how the informants responded to the issue's many aspects. The research could explore and report on various viewpoints thanks to the amount of data.

During the analysis process, every participant was assigned a special code to ensure anonymity (Saunders et al., 2015). Because of this coding method, no one knew who the participants were, and the data were analyzed as well as standardized. All their contributions to the study were maintained and preserved (see Table 1).

Table 1
Profile of Key Informants

Profile	
P1	The informant, possessing 20 years of experience in local government, is responsible for managing enforcement related to abandoned vehicles in the Klang Valley. Holding a Bachelor of Laws, the informant plays a crucial role in addressing issues arising from abandoned vehicles, particularly ELVs.
P2	The informant, possessing 16 years of experience in local government, manages enforcement related to abandoned vehicles in the Klang Valley. With a Bachelor of Laws, the informant plays a crucial role in addressing the challenges posed by abandoned vehicles, particularly ELVs.
P3	The informant, possessing 26 years of experience in local government, oversees enforcement related to abandoned vehicles in the Klang Valley. Holding a Bachelor of Laws, the informant is pivotal in addressing the challenges associated with abandoned vehicles, particularly ELVs.
P4	The informant, possessing 27 years of experience in local government, oversees enforcement related to abandoned vehicles in the Klang Valley. Holding a Master's degree in management, the informant plays a pivotal role in addressing the challenges associated with abandoned vehicles, particularly ELVs.
P5	The informant, possessing 22 years of experience in local government, oversees enforcement related to abandoned vehicles in the Klang Valley. Holding a Bachelor's degree in Public Administration, the informant is pivotal in addressing the challenges associated with abandoned vehicles, particularly ELVs.
P6	The informant, possessing 18 years of experience in local government, oversees enforcement related to abandoned vehicles in the Klang Valley. Holding a Master's degree in Business Administration, the informant is crucial in addressing the challenges associated with abandoned vehicles, particularly ELVs.
P7	The informant, possessing 20 years of experience in local government, oversees enforcement related to abandoned vehicles in the Klang Valley. Holding a Bachelor's degree in Public Administration, the informant plays a crucial role in addressing the challenges associated with abandoned vehicles, particularly ELVs.
P8	The informant, possessing 21 years of experience as a government officer and one year in local government management, is responsible for overseeing local government policy from the state government's perspective. Holding a Master's degree in Business Administration, the informant plays a pivotal role in managing local government policies, including addressing the challenges associated with abandoned vehicles, particularly ELVs.
P9	The informant, possessing 11 years of experience in local government, oversees local government policy at the ministry level. Holding a Bachelor's degree in Accounting, the informant plays a crucial role in monitoring the implementation of abandoned vehicle guidelines and facilitating future improvements.
P10	The informant possesses 23 years of experience as a government officer specializing in industry and trade development, and holds a Master's degree in Business Administration. The informant plays a crucial role in developing and overseeing the implementation of the National Automotive Policy and facilitating future improvements.
P11	The informant, possessing 15 years of experience as a Road and Transport Officer and a Diploma in Tourism, plays a crucial role in executing vehicle deregistration processes related to ELVs.
P12	The informant, possessing 25 years of experience as an Environmental Officer and a Master's in Environmental Engineering, plays a crucial role in developing and facilitating the initiation of Authorized Automotive Treatment Centers (AATFs) related to ELV dismantling.
P13	The informant, possessing 11 years of experience as a manager and a Master's in Engineering, is crucial in planning and executing the National Automotive Policy related to ELV recycling.
P14	The informant, possessing 20 years of experience as a workshop operator and six years specifically in ELV dismantling, holds a diploma in engineering. The informant plays a crucial role in the dismantling of ELVs.

Data Collection

During the interviews, researchers asked the informants about their personal experiences (Knott et al., 2022; Patton, 2015). Initially, the researcher will ask open-ended questions to get participants talking about the main subject. Everyone began to feel comfortable after asking and answering the simple questions. Everyone was increasingly paying attention to the

most important aspects of the research question. To encourage participants to provide clearer information, the researcher asked in-depth questions (Knott et al., 2022). To make sure participants provided more informative answers, the experts designed their questions to be broader. The reason for interviewing participants is to let them talk freely, instead of forcing them to pick from predetermined options (Hansen & Świderska, 2023; Patton, 2015). The main objective of this type of interview was to learn more about the people involved and their thoughts. All in all, open-ended questions gave the participants time to reflect, meaning the collected details included a wide variety of opinions.

To ensure the research was successful, researchers invested time in preparing the interview plans (Castillo-Montoya, 2016; Yeong et al., 2018). Experts maintained that the interviews did not interrupt the sessions, so each session ran between 45 and 90 minutes (Knott et al., 2022). The researchers decided to use this period to allow participants to look back on what transpired. They used the additional time to talk in detail about and explain the major points of their area of expertise. To ensure that the discussion would be worthwhile, researchers devised rules that felt natural and encouraged participants to appreciate the questions. After it was peer-reviewed by other researchers, four government officers were interviewed using the enhanced interview process (Malmqvist et al., 2019). The officers provided great advice to boost the questions during the interview. After hearing their recommendations, we completed the final plan for conducting interviews.

The researcher chose to interview the informants in their offices to ensure they felt at ease (Sin, 2003). The researcher decided to practice in this place to prevent external noises or anything else from interrupting the session. Sitting for comfortable interviews in surroundings motivated the participants to let their guards down and contribute more to the topic (Quinney et al., 2016). It was designed so that the environment would help all participants share their personal findings. Before starting the interviews, the researcher received permission from the ethics committee. Ethical approval of a study ensures that everyone involved and the whole community are respected. Hence, once the project is approved, the research team treats each participant with dignity and respect (Gelling, 1999).

Information about all possible participants' backgrounds, purposes, sizes, and significance was sent to them by email. The email comprised a consent form describing participants' options, the rules for privacy and the possible procedures involved, and how crucial their participation was (Caeymaex et al., 2023). They were provided with this information to help them make a wise decision. According to ethics, it is important to ensure that participants understand the research and agree to join it. By performing ethically and putting the participants' rights first, the process made the study more reliable.

To establish how reliable the findings were, researchers organized member checks with research participants after completing their analysis (Birt et al., 2016). Real-time data was validated thanks to the Asking, Record, Confirm (ARC) approach (Zairul, 2021). Following every interview session, researchers looked again at the person's comments and coded them following the established interview guidelines. This way, the data could be checked straight away, mistakes during transcription were kept to a minimum, and the informants did not have to spend too much time on the project.

Data Analysis

The approach used for the analysis helped enhance the link between the problem statement, research questions, initial coding, categories, and developing central themes (Naeem et al., 2023). As a result, the approach ensured better consistency in the research, finally leading to more positive study outcomes (Table 2).

At both the surface and hidden levels of meaning, the thematic structural analysis highlighted the most significant and noticeable themes and patterns in the data. On the semantic level, researchers applied codes to different parts of the data that described people's experiences. Codes are made from everyday language used by regular people to portray the data's explicit features. Researchers grouped and linked the codes, sorting them into categories based on the shared experiences of being a leader in paradoxical situations reported by the informants.

Those studying the field followed Denzin's suggestions and did two rounds of coding on the information gathered. Here, data was coded very briefly to discover and collect key codes for reviewing the data in depth (Denzin & Lincoln, 2019). As a consequence of undertaking this stage, we were able to find words and ideas that are important for our research questions. During the second coding process, we aimed to link the codes and make them more accurate by placing them into wider themes and smaller subthemes. To do this, the researcher analyzed the links between codes and put them into groups that could describe the major points and ideas in the data.

Experts used the steps outlined by Denzin and Lincoln (2019) and organized the data by doing two rounds of coding. With this approach, the researcher could clearly understand the participants' lives and what they thought about the situation. Note that using a systematic analysis helped make the description of the investigated phenomena clear and strong. As the analysis progressed, researchers explored these categories' deeper connotations and implications at the latent level, uncovering underlying significance beyond surface meanings. Throughout the process, researchers iteratively refined the codes and categories, shifting between semantic and latent levels of analysis as new insights emerged.

Table 2
Example of thematic structural analysis

Semantic Level		**Latent Level**	
Meaning unit	**Codes**	**Category**	**Theme**
Local government must ensure that the surrounding area is in good condition and under control. Therefore, local government must ensure that the administrative area is unaffected. As enforcers, we must ensure that the disturbance is eliminated.	Agency LG: Responsible for urban management; hindered by abandoned vehicles	Individual and group factors	Challenges in the decision-making process
MHLG looks exclusively at the guidelines and is not exhaustive in resolving numerous issues through the initiative of local governments. The authority to deregister is vested in RTD, not the Ministry. Coordinating is challenging for the Ministry because each entity possesses unique capabilities. All ultimately operate in silos.	Decision making: Involve other agencies for vehicle-related records and rights	Decision-making factor	Challenges in the decision-making process
The issue of abandoned vehicles is of utmost importance due to the high rate of vehicle ownership. A new vehicle will be introduced every 5 to 6 years, while the old one will be abandoned.	Issues: Urbanization and housing growth lead to abandoned vehicles due to increased population, car ownership in new developments, and financial factors	Specific understanding of the issue	Challenges in the decision-making process

Researchers transcribed the recorded interviews and analyzed them using Atlas.ti 23 software facilitated the identification of common themes and enabled an objective analysis (Khanal et al., 2023; Rambaree & Nässén, 2020). This stage enables researchers to capture crucial phrases and concepts related to the research questions. Researchers developed the interview protocol using deductive codes derived from Governance Network Theory (Klijn & Koppenjan, 2012), ensuring alignment with the theoretical framework. Researchers analyzed and coded the interview transcripts inductively, using deductive codes as a foundation. These methods allowed for extracting novel perspectives based on the participants' remarks. A total of 15 categories were developed from the initial 112 codes that emerged through the process. The created categories formed the basis for additional thematic analysis, revealing patterns and key themes of the data in relation to the governance network framework.

Researchers regularly held informal interviews with informants throughout the second phase to ensure the categories related to ELV governance were well-defined. Using this approach, the themes were checked and properly analyzed (Richards & Hemphill, 2018).

The researchers increased the believability of the results by considering data from vehicle registration, National Automotive Policy (NAP) reports, the media, statistics on abandoned cars from local governments, experts' opinions, and what similar studies had

reported. Relying on several data sources, they enhanced and confirmed the credibility of what they discovered (Carter et al., 2014).

Individual studies were very detailed and gave clear information so others could review how applicable the findings may be in several settings (Polit & Beck, 2010). Nonetheless, the study's usefulness could be limited because it is designed for the Malaysian context. Scientists described the process of gathering and analyzing data carefully so that the outcome can be repeated and validated (Carcary, 2009; Munafò et al., 2017). As different researchers worked on the project, they kept journals and explained their viewpoints to uncover and address their existing beliefs and preconceptions so that the research findings remained credible (Jasper, 2005). By applying various strategies, the team ensured that the findings provided in the study were solid and a cause for trust.

Findings

Four themes emerged from the analysis: challenges in the decision-making process, challenges encountered in group dynamics, challenges in communication and collaboration, and challenges related to network performance.

Challenges In The Decision-Making Process

This theme examines local government officials' challenges in managing abandoned ELVs, including bureaucratic hurdles, coordinating with multiple stakeholders, and the lack of clear policies. Moreover, law enforcement often struggles to reconcile conflicting interests and priorities, hindering prompt decision-making. The complexities of decision-making in network governance affect service integration and effectiveness, with decision-making power impacting participant commitment and attrition. Local organizations' efficient political leadership and governance rely heavily on these intricate interactions and decision-making processes (Figure 2).

Participants emphasized that local government is accountable for ensuring successful city management and promoting an improved quality of life. The duties exceed those of basic services by covering urban planning, infrastructure, public safety, environmental sustainability, social welfare, and economic growth. It was widely acknowledged that the local government is vital to confronting urban issues and restoring city order.

> *Local government must ensure that the surrounding area is in good condition and under control; therefore, local government must ensure that the administrative area is unaffected. As enforcers, we must ensure that the disturbance is eliminated. (P2)*

The MHLG developed guidelines in 2020 to ensure coordination between the RTD and the Royal Malaysia Police (RMP) concerning the disposal of abandoned vehicles. The guidelines establish uniform practices, promote legality, and boost clear and organized vehicle disposal. Following receiving complaints, MHLG clarified that local governments were not authorized to independently deregister vehicles. Consequently, five local governments served as pilot jurisdictions for implementing the guidelines. Difficult pilot cases highlighted the importance of enhanced coordination and communication between the participating

agencies. MHLG plans to refine the guidelines based on these pilot experiences for consistent implementation across regions.

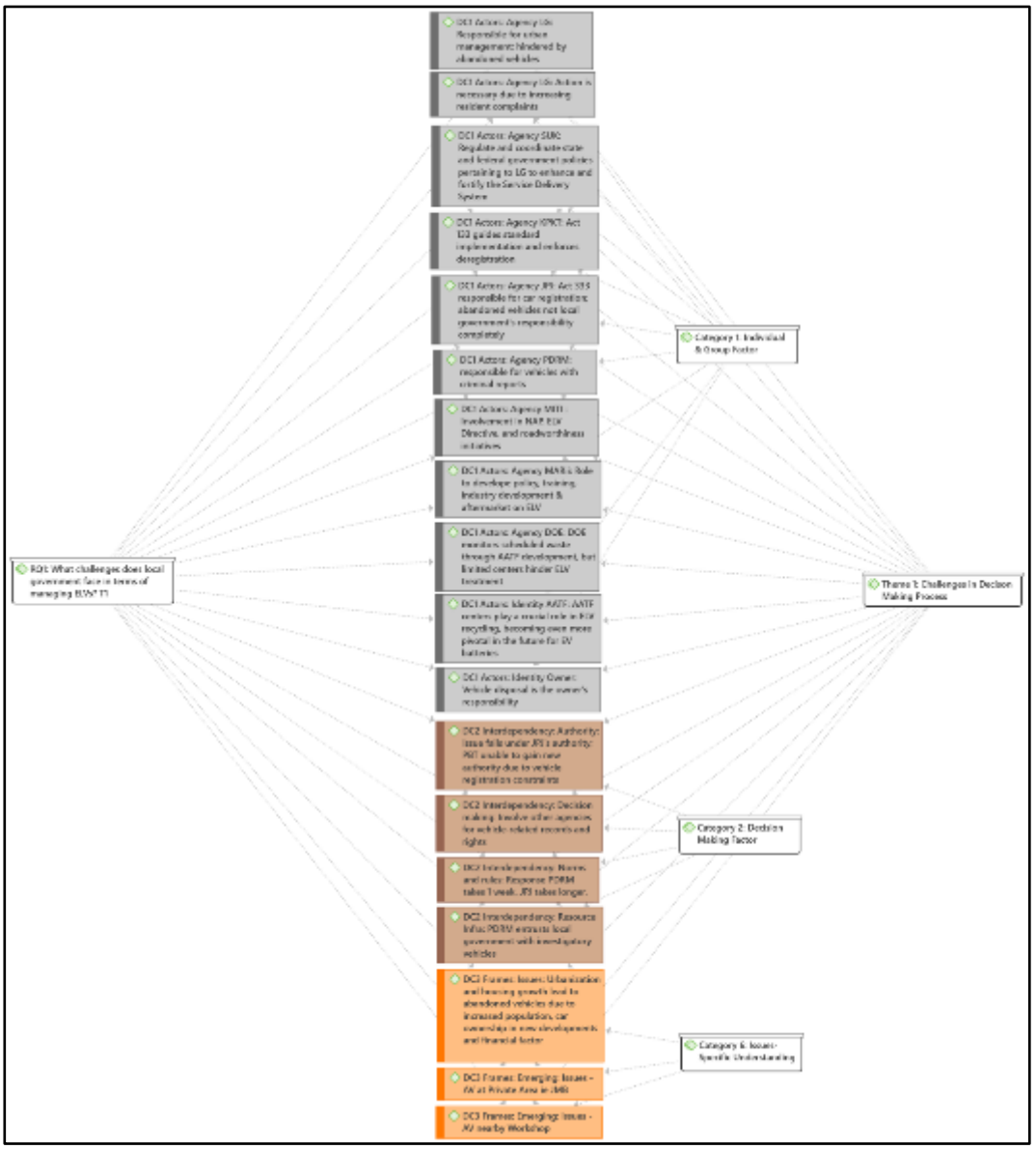

Figure 2: Network view for Theme 1: Decision-Making Factor

> *These guidelines are formulated by the deregistration regulations of the RTD and vehicles under investigation by RMP. These guidelines restructure the disposal process because some local governments dispose of vehicles without deregistration. (P9)*

> *MHLG has brought attention to this matter of deregistration after receiving complaints. The local government lacks the jurisdiction to revoke a vehicle's registration. Five pilot local governments are assisting the Ministry in implementing abandoned vehicle guidelines. One local government successfully executed the deregistration procedure, whereas the remaining four failed. (P11)*

Local government informants highlighted that while the MHLG emphasizes abandoned vehicle guidelines, it does not fully address the broader complexities of the issue. Although the Ministry's supervision is valuable, a more comprehensive approach, including collaboration with local governments, is necessary. Informants also observed that the authority to deregister vehicles lies solely with the RTD, not MHLG. The Ministry faces challenges in coordinating with local governments due to jurisdictional differences, leading to autonomous and disconnected operations, or "silos," which hinder effective abandoned vehicle management. To address the varying capacities of local governments and the Ministry's jurisdictional limitations, a cooperative and strategic approach is needed to improve coordination and optimize the management of abandoned vehicles.

> *MHLG looks exclusively at the guidelines and is not exhaustive in resolving numerous issues through the initiative of local governments. The authority to deregister is vested in RTD, not the Ministry. Coordinating is challenging for the Ministry because each entity possesses unique capabilities. All ultimately operate in silos. (P1)*

The RMP is crucial in managing abandoned vehicles, especially when specific items or counterfeit license plates are involved. Since local governments have limited criminal investigation authority, RMP handles investigations to prevent evidence tampering and legal issues. Note that prompt police notification ensures compliance with legal protocols and leverages their specialized expertise. This collaboration strengthens legal adherence and demonstrates practical cooperation between local governments and law enforcement, ensuring a thorough and lawful approach to handling abandoned vehicles, particularly those tied to criminal activities.

> *When case items are involved, RMP assumes full responsibility. RMP approval is required; failure to do so may result in charges of tampering with evidence. (P1)*

> *When we discover a vehicle with a fake license plate, we immediately notify RMP. Our authority to investigate crimes is limited. (P7)*

The MITI is the critical authority on vehicles over 15 years old and must develop a comprehensive policy to address public interest in vehicle exchange incentives. A clear ELV policy is crucial for guiding industry practices and informing public decisions in line with environmental and economic goals. Although MITI faces challenges in implementing the NAP due to stakeholder and regional policy differences, it remains committed to improving vehicle safety, promoting industrial growth, and fostering sustainability through effective ELV management and component reuse.

> *MITI must establish a policy regarding exchanging vehicles older than fifteen years. Public interest exists regarding the incentives available to them. MITI must publish a policy concerning ELV. (P9)*
> *Although NAP has a strategy for ELV management, implementing it is difficult due to the involvement of people from diverse backgrounds. In addition, surrounding countries have a complete absence of an ELV policy owing to their*

> *respective demographic and economic circumstances. We, however, emphasize roadworthiness. We continue to emphasize safety in NAP 2020. Industrial development is the primary objective of MITI, whereas roadworthiness is a JPJ responsibility. Implementing the ELV directive would foster the growth of the component reuse industry. (P10)*

MITI supports informed decision-making by leveraging the expertise of critical organizations like the MARii, which specializes in automotive technology and collaborates with partners to enhance policy development. Working alongside the RTD, MARii integrates technical and regulatory insights to ensure comprehensive policy formulation, particularly in implementing the NAP 2020. This includes initiatives such as remanufacturing and establishing Automotive Authorized Treatment Facilities (AATF) for ELV management, underscoring MARii's leadership in advancing the automotive sector in line with global standards.

> *The Ministry considers policy matters comprehensively, tasking MARii with examining technical aspects and collaborating with other organizations, including RTD. (P10)*

> *Marii develops the aftermarket industries by collaborating with industry experts and benchmarking with developed countries. This will manifest in NAP 2020, encompassing the entire ecosystem, including remanufacturing, workshop operations, and ELV (presently referred to as AATF). (P13)*

Maintaining product quality through recycling is crucial, and in Malaysia, smelting plants ensure this by sourcing materials from diverse origins and applying heat treatment to produce construction-grade products. In contrast, Japan's smelting processes emphasize precise material separation to meet high industry standards, particularly in the automotive sector. Japan's specialized approach ensures stringent criteria for recycled materials, while Malaysia's broader methods limit the alignment of recycled materials with specific industry standards. The effectiveness of recycling initiatives largely depends on the precision of smelting processes in each country.

> *Recycling is essential for ensuring that the product returned to the manufacturer is of high quality. Malaysia does have smelters, but they extract from industries of all sorts. Following the furnacing of all types of metal, the resulting product is primarily fit for construction purposes. In contrast, supply and demand exist in Japan because the smelter separates the material to meet the quality specifications of a particular industry, such as the automotive sector. That is why it is possible to accomplish the task there but not here. (P13)*

The DOE prioritizes environmental protection but does not explicitly address AATFs in its framework. While DOE grants licenses for managing hazardous waste, it faces challenges with the regulatory classification of discarded vehicles, particularly ELVs, which contain scheduled waste components like used oil and batteries. To navigate these complexities, DOE must assess the evolving waste characteristics of ELVs and develop a regulatory framework that balances environmental protection, efficient waste management, and adaptability to

changing vehicle materials. Additionally, the Ministry of Natural Resources and Environmental Sustainability (MNRES) supports AATFs in effectively managing and recycling EV batteries. This highlights their role in promoting sustainability and fostering a circular economy in the automotive industry.

> *The objective of the DOE is environmental protection. The environmental framework does not include an AATF. The responsibility of the DOE is to issue licenses to facilities that manage scheduled waste. However, abandoned vehicles, the majority of which are ELVs, fall within a grey area. Although ELV does not fall under the category of scheduled waste, specific components like used oil and batteries do. (P12)*

> *AATF can assist us because electric vehicles contain multiple batteries, particularly lithium ones, which various businesses can recycle. (P10)*

The local government sees AATFs as seeking discounted vehicles, requiring careful cost management. To ensure quality taxpayer services, the focus must be on controlling expenses and achieving moderate profits. AATFs' success depends on transparent financial practices, and the local government upholds strict financial integrity, rejecting any compromises. Hence, maintaining service standards requires conducting financial transactions meticulously. Moreover, since the DOE's authority over AATFs does not extend to enforcing local government responsibilities, expanding business diversity is essential to mitigate monopolistic influences.

> *AATF desires to acquire a vehicle at a rebate; therefore, the local government must calculate our expenses. We must cover our expenses and generate a small profit margin if we wish to sell, since we reimburse our taxpayers for excellent service. If AATF wishes to cut corners, the endeavor is not worthwhile. When the DOE acquires monopoly status on AATF, it cannot impose obligations on local governments. They must open it. Increase the number of businesses to reduce monopoly; when we issue tenders, there will be competition to provide the best price for the local government. Silence ensues without action; consequently, the local government provides the best solution. Under no circumstances do we wish to consider it. Therefore, we call for tenders and permit companies with a recycling license to participate, even if they do not have an AATF license from the DOE. (P1)*

AATF operators face infrastructure and cost challenges in hazardous waste management, while scrap metal recyclers fail to implement proper treatment. To enhance competition, the local government introduced an open tender process, selling ELVs to the highest bidder, sometimes at the expense of environmental concerns. Note that inadequate waste management could lead to community dissatisfaction, and AATF operational issues may disrupt cooperation. In response, AATFs have shifted focus from local governments to insurance providers, handling vehicle towing, claims, and disposal authorization. Despite a lack of formal guidelines for total loss vehicles, AATFs collaborate with insurers, demonstrating adaptability and adherence to industry standards.

> *There are only one, two, or at most three operational AATFs. This limited capacity is inadequate to effectively meet the local government's high demands. Although referred to as AATFs, the current company's operational capacity limitations become evident when considering its ability to accommodate only around 100 vehicles. This capability is insufficient when faced with the disposal of a larger fleet of up to 300 vehicles. The crucial question arises: Where will these vehicles be stored, particularly given the local government's directive to clear the depot within a week after disposal? (P1)*

> *We handle a lot of work for insurance companies regarding total loss vehicles (ATL). We will arrange to take the vehicle to our facilities, file the insurance claim, and receive an approval letter for disposal from the financier. This is standard procedure within the insurance sector. Currently, no guidelines or data regarding ATL management exist, particularly concerning insurance claims. (P14)*

Stakeholders agree that vehicle owners are solely responsible for deregistration, as only they or a court can initiate it. Without specific legislation on scrap vehicles, this responsibility appropriately rests with owners rather than local governments. The RTD should address non-compliant owners, while authorities should conduct routine inspections to prevent the abandonment of defective or obsolete vehicles. Vehicle owners should bear disposal costs, like household waste management, emphasizing financial accountability. This approach underscores the importance of proper vehicle disposal, as many owners currently avoid the cost of official deregistration and disposal.

> *Since no scrap law exists, imposing this responsibility on the local government is unjust. RTD ought to take action against the owner. (P6)*

> *There is a lack of owner awareness, and the authorities must conduct inspections to prevent abandoned vehicles that are faulty or outdated. (P7)*

Many vehicle owners are willing to deregister their vehicles but face significant obstacles due to RTD procedures, leading to a shift from willingness to inertia. The situation highlights the need for incentives and guidance to promote responsible disposal. An extensive awareness campaign and streamlined procedures can improve compliance and reduce abandoned vehicles. Note that effective management requires cooperation between local governments, RMP, and RTD, with officials verifying vehicle status, impounding vehicles if necessary, and collaborating to obtain owner information.

> *Many owners are willing to deregister their vehicles; however, they become unmotivated when asked to contact JPJ. (P9)*

> *Regarding collaboration with the RMP, RTD, and other government agencies, there are no issues. However, residents often lack understanding of the legislation, so we request the cooperation of councilors to assist in providing clarification. (P4)*

Identifying vehicle owners using a chassis number is challenging, as the RTD plays a crucial but often delayed role in this process. Misleading license plates further complicate the identification of owners. Although the RTD has granted local governments access to their system, the chassis number information remains inaccessible.

Access to the MySikap system is granted to local governments, but the information available is limited. While we attempt to use the plate number as a guide, the absence of the chassis number is a significant limitation. The chassis number is crucial for our work, but the RTD does not permit us to access this information. (P7)

The RMP stores vehicles involved in criminal activities at local government facilities, but often delays retrieving them, leaving local governments responsible. If a stolen vehicle is found in a different state from where it was reported, the RMP faces the logistical challenge of recovering it.

Many local governments encounter difficulty in managing vehicles linked to criminal incidents, which are, as a result, not recovered by the RMP. For example, when a stolen vehicle is discovered within a local government's jurisdiction but was reported stolen in another state, it becomes necessary for law enforcement officers from that state to travel to retrieve the vehicle. Sadly, upon recovery, these vehicles are frequently in poor condition. Following this, they are deposited at the local government storage depot, which presents a logistical challenge. The local government must seek authorization from the RMP before initiating the process of disposing of these vehicles. (P1)

There may not be sufficient space to construct a storage depot at the RMP depot, which I discovered to be filled with case vehicles. (P3)

The rising number of abandoned vehicle complaints, driven by high vehicle ownership and the typical 5- to 6-year replacement cycle, poses significant challenges for community and infrastructure management. Abandoned vehicles diminish urban aesthetics, reduce parking availability, contribute to congestion, and create public health risks as mosquito breeding grounds. Workshops in light industrial areas are a significant source of this issue, leaving faulty vehicles in public lots. Furthermore, the problem has worsened due to financial constraints from the COVID-19 pandemic, with owners neglecting payments and workshops abandoning vehicles. Comprehensive strategies are urgently needed to address these challenges effectively.

The issue of idle vehicles is of utmost importance due to the high rate of vehicle ownership. A new vehicle will be introduced every 5 to 6 years, while the old one will be abandoned. (P7)

The workshop owner abandoned the vehicle unattended because the owner could not afford the required repairs. The local government must, therefore, tow the property and await the owner's claim. (P5)

The main finding is that effectively managing ELVs depends on cooperation among many parties, with local governments taking the lead. The major obstacles confronting local

governments in handling ELV management are effectively described in the report: governance issues, resource shortage, and collaboration across agencies. The findings underscore the importance of strategic leadership, financial oversight, and collaboration between local and state governments to ensure public safety and urban development. Developing explicit disposal procedures and collaborating closely with JPJ, PDRM, and KPKT significantly simplifies vehicle X categories." MITI should establish specific ELV policies with a view to both protecting the environment and promoting economic growth. Hence, clearing regulatory uncertainties and strengthening the local waste management system are vital. Proper inspections and properly managed disposal costs are necessary to avert more vehicles being left on roadsides. Better cooperation with the PDRM and resource management is essential when dealing with the increasing number of abandoned cars in low-cost neighborhoods.

Challenges Encountered In Group Dynamics

It explores the difficulties local government officials encounter when handling these problems caused by disparate levels of knowledge, clashes with vehicle owners, and the lack of specialized laws covering ELVs, making cooperation among network members challenging, especially with ELV deregistration. Holding organizations within the network accountable and ensuring clarity is complicated since monitoring how various parties interact and making decisions remains a major challenge. Furthermore, disagreements often surface due to the main challenges regarding different objectives and methods employed by the participants (as shown in Figure 3).

The ways people think, perceive, and solve problems are influenced and transformed by education. It offers opportunities to expand one's thinking, develop critical and analytical skills, and broaden one's view of the world. The curriculum, teaching methods, and environment influence how students learn and think. Educational experiences, from primary school to specialized training, expose individuals to diverse intellectual traditions, shaping cognitive patterns that influence problem-solving and understanding. In law enforcement, few leaders hold legal degrees, which is significant as legal education provides specialized knowledge of legal principles and systems, offering a nuanced approach to enforcement. Most enforcement leaders, however, have degrees in business or public administration, reflecting a dominant trend in their education. Some leaders hold degrees in other fields, highlighting diversity in formal education and its impact on enforcement strategies.

Public awareness of abandoned vehicle protocols is low, leading to frequent requests for local government assistance. This lack of awareness may stem from insufficient public education, unclear communication about responsibilities, and unfamiliarity with legal and administrative aspects of vehicle management.

> *There is a prevalent mindset within the community that if a vehicle can no longer be used, it becomes the responsibility of the local government to resolve the issue. This belief often leads individuals to simply abandon their vehicles. (P8)*

Local authorities have implemented an adaptable strategy to manage the growing number of abandoned vehicle complaints. They established a disposal committee to expedite ELV disposal, bypassing MHLG deregistration guidelines due to limited storage capacity. This internal mechanism simplifies ELV elimination, addressing the urgent need for efficient

handling. The lengthy deregistration process results from complex and varied departmental procedures, which delay and complicate the process.

Following the MHLG guideline would require six months; therefore, we will dispose of the confiscated vehicle through the Disposal Committee. Nonetheless, the proprietor is duly notified via notice, and failure to respond results in the local authority being compelled to undertake measures to remove the obstruction. (P2)

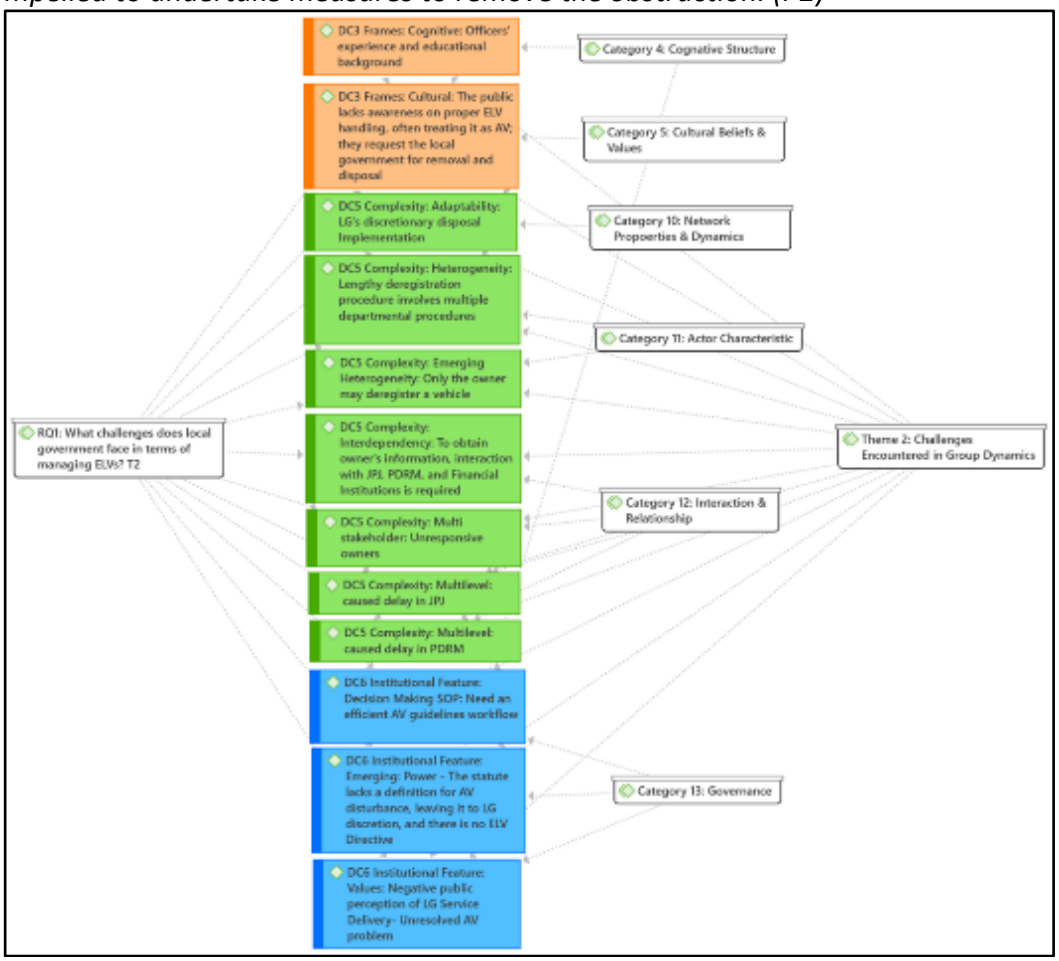

Figure 3: Network view for Theme 2: Challenges encountered in the group dynamic

Some local government entities are deregistering vehicles with complete documentation, while others handle those with incomplete information through a disposal committee. The deregistration process is complex due to diverse departmental requirements, legal compliance, and logistical considerations. Different departments' varied and intricate procedures prolong the process, necessitating a comprehensive approach to streamline and accelerate deregistration while respecting regulatory duties.

The court order requires a lengthy procedure for the local government storage area. By the MHLG guidelines, we can reduce the 6-month duration for acquiring a single vehicle to 3 months by submitting complete documentation. (P1)

Although we do not perform the deregistration procedure, we notify the RTD once the vehicle has been disposed of. We will try to execute the deregistration procedure according to the prescribed guidelines. (P4)

Deregistration is crucial for local governments to maintain an accurate vehicle registration database and ensure administrative compliance. Other than that, it prevents disputes and provides a legal basis for ownership records. Only vehicle owners can deregister, which protects their rights. However, when owners are unavailable, court intervention is required to legally proceed with legal deregistration and protect owners' rights.

> *Certain local governments are dedicated to implementing court orders; therefore, the seized vehicles are accompanied by investigative documents to facilitate the transfer of ownership to the local governments, followed by their deregistration and disposal through vehicle disposal. It is a traditional procedure, but it is safer because the owner's information is obtained before the deregistration, and the vehicle's identity is checked and verified. Our protocol dictates that this review process is superfluous if the owner opts to deregister themselves. We are concerned that the deregistration did not occur at the owner's residence, as in the local government yard. That is not the vehicle of whose it is. No one can verify the accuracy of the chassis number because it cannot be re-registered once it has been deregistered. (P11)*

To ensure accurate vehicle deregistration, the local government must collaborate with RTD, RMP, and financial institutions to obtain and verify detailed owner information. This process is time-consuming due to the need for thorough verification and legal compliance. Practical cooperation with these entities is crucial for accurate and timely deregistration.

> *Determining owner information from relevant agencies is, in my opinion, the most significant challenge we face; the process can take up to six months. Information is the primary function of another agency. The local government is liable for all enforcement actions, from confiscation to disposal. (P6)*

Unresponsive vehicle owners complicate abandoned vehicle management. Although owners are legally responsible, the local government must locate and manage the vehicle if the owner does not respond. This process involves towing, legal compliance, and time-consuming efforts, mainly due to the inefficiencies and delays caused by RTD's hierarchical decision-making and authorization procedures.

> *RTD interaction is straightforward; however, the response time may be prolonged due to the intricate hierarchical structure that spans from the district to the state and potentially the federal level. (P7)*

The RMP's hierarchical structure and lack of central systems cause delays in managing abandoned vehicles. Fragmented information and varying procedures across levels hinder timely data access and coordination, leading to inefficiencies and inconsistencies in vehicle administration.

> *Our collaboration with external organizations, such as RMP, is hampered by our lack of influence over their response time. Checking blacklist vehicles is restricted to Contingent Headquarters. Furthermore, it has come to my attention that RMP lacks a centralized system. As a result, responding requires considerable time. (P3)*

To improve efficiency, the abandoned vehicle SOP requires review. The lengthy, complex guidelines delay issue resolution and lack an environmental impact assessment, highlighting inefficiencies. Unclear legal definitions for "abandoned vehicle disturbance" and the absence of an ELV Directive further complicate enforcement. This regulatory gap forces local governments to navigate unclear disposal and deregistration processes, contributing to negative public perceptions of their services. Thus, effective resolution is essential to maintain public trust and a positive image.

> *In the law, the definition of an abandoned vehicle is unclear. Is it due to its physical appearance or the absence of road tax? A scenario exists in which the vehicle is in good condition, and the road tax is paid, but the grass has grown and remained stationary for an extended period. In some instances, there is no road tax, and the vehicle is in poor condition, but continues to move. (P2)*

This theme demonstrates how members of government, as well as society at large, perceive and act towards abandoned vehicles, especially ELVs, depending on the mentality of government officials, and can be affected by their academic qualifications and professional roles. The study shows that poor awareness of vehicle disposal policies among officials and the public calls for developing effective educational interventions. The study revealed that dealing with abandoned vehicles presents numerous challenges and is often inefficient. Getting ownership information is difficult, and obtaining court orders can take time. The lack of efficient procedures and a distinct ELV Directive negatively impacts how these stakeholders collaborate. As a result of these discoveries, municipalities should improve their internal operations and advance calls for clearer laws and rules to expedite ELV management. Swift and effective action is crucial for preserving public trust, improving service delivery, and ensuring the sustainability of urban environments.

Challenges In Communication and Collaboration

This theme examines local government officials' challenges in addressing issues arising from unclear policies, the absence of an integrated information system, power imbalances, institutional differences, and conflicts with vehicle owners (refer to Figure 4).

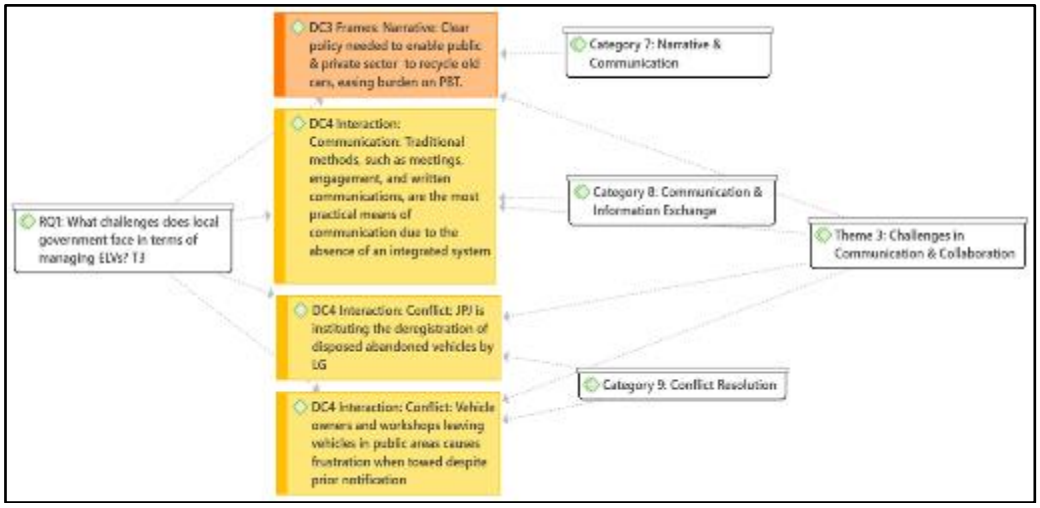

Figure 4: Network view for Theme 3: Challenges in Communication and Collaboration

The narrative highlights the need for a transparent policy enabling public-private cooperation in ELV recycling, which reduces local government workload and promotes environmental sustainability. Therefore, a clear framework with comprehensive guidelines is crucial for efficient recycling, resource allocation, and burden reduction. This ensures fair responsibilities and optimizing procedures for all parties involved.

> *Indeed, it is the responsibility of the owner to dispose of old and outdated vehicles; however, the process is complicated. The potential facilitation of this procedure remains unelucidated. Leaving the vehicle in a public area was an easy way out for the owner. (P3)*

Local governments rely on written communication to meet legal requirements, ensure transparency, and maintain accountability. While this formal approach demonstrates a commitment to organized governance, it can delay response times due to the need for thorough documentation and formal authorization, reducing effectiveness in urgent situations. Local governments notify the RTD about vehicle disposal through formal communication, facilitating deregistration and ensuring responsible disposal. Ministries and state governments also use meetings and written communication for coordination and decision-making, but lack a comprehensive inter-agency information-sharing system. Although the vehicle registration database regulator has an internal system, legal restrictions prevent inter-agency sharing to protect data and privacy. A conflict exists between RTD's desire to standardize vehicle deregistration procedures and local governments' legal framework, which does not require deregistration. This highlights RTD's regulatory authority versus local governments' emphasis on autonomy.

> *After the vehicle has been disposed of, RTD is notified via letter for further action. (P6)*

> *We notify RTD of the list of disposed vehicles with the expectation that it will initiate the deregistration procedure; however, the probability of RTD fulfilling this obligation is uncertain. (P7)*

Without prior notification, owners and workshops often express frustration when local authorities tow vehicles left in public areas. This conflict reflects a clash of values between vehicle owners seeking convenience and local governments enforcing public order by removing abandoned vehicles. While owners may see towing as violating their rights, local governments prioritize safety, order, and regulatory compliance. Local governments conduct towing to protect public spaces and mitigate hazards. The lack of a legal definition for "abandoned vehicle" further complicates enforcement, leading to public disputes and misunderstandings. Note that this ambiguity can raise concerns about arbitrary decisions by local governments, emphasizing the need for clear regulations and efficient law enforcement to ensure community safety and prevent conflicts.

> *The owner inquired as to when we posted the notice. A handheld device containing an image and a copy of the notice is available. Thus, the owner finds it difficult to deny. (P6)*

> *According to the residents' association, the vehicle was abandoned. However, the owner refused to accept it. Local government acts as an intermediary. No legal definition of an abandoned vehicle or statute addresses this issue. The owner and operator of the workshop parked the dysfunctional vehicle in the public lot. If an owner cannot pay, the vehicle is left unattended while the workshop owner does not monitor it. (P2)*

In conclusion, this theme addresses the critical challenges local governments face in managing ELVs, particularly the need for a well-defined policy framework that engages both the public and private sectors in sustainable vehicle recycling. The findings emphasize that local authorities bear an undue burden without clear guidelines, underscoring the necessity for policies that streamline recycling and disposal processes. Other than that, the finding highlights the importance of improving communication between local governments and the RTD to integrate deregistration and disposal procedures more efficiently. It suggests that technology-based solutions could expedite response times while ensuring legal compliance. Enhanced inter-agency collaboration through digital platforms is essential to overcoming current coordination challenges. Moreover, the ongoing disputes between RTD and local governments over regulatory authority indicate a need for more precise role definitions. Finally, the lack of a legal definition for "abandoned vehicles" complicates enforcement, requiring legislative action to establish transparent and fair procedures. These results lead to improvements in governing bodies and enhance the handling of ELV waste.

Challenges Related To Network Performance

This theme examines local government officials' challenges in addressing issues due to complex stakeholder feedback and decisions, making coordination tricky. Communication breakdowns and unclear decision-making processes cause delays and increased costs. Additionally, resource and workforce shortages arise from ineffective abandoned vehicle management guidelines (Figure 5).

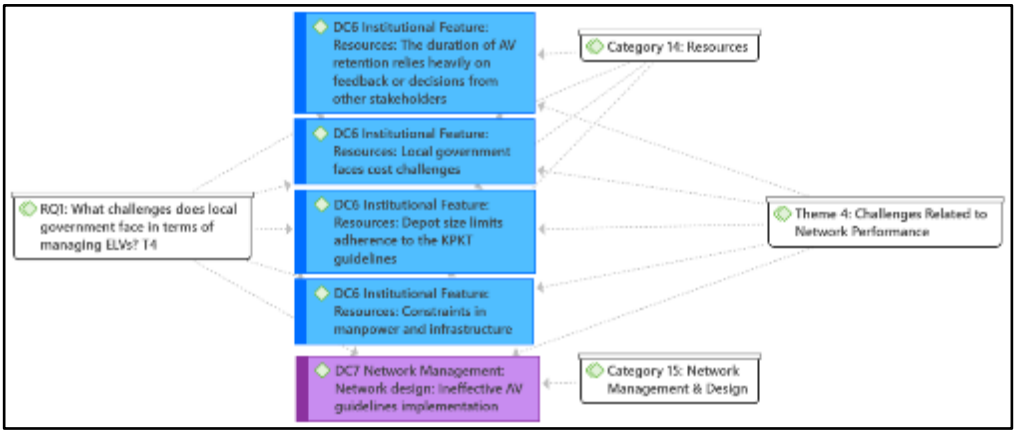

Figure 5: Network View for Challenges Related to Network Performance

Managing abandoned vehicles depends on feedback and decisions from various stakeholders, with local governments bearing the storage costs. Practical cooperation and strategic foresight between local government and external stakeholders are essential. The local government struggles with the costs of managing abandoned vehicles, including storage, workforce, and operations, necessitating careful resource allocation and prioritizing fiscal responsibility and operational efficiency. The MHLG and the State Government acknowledge local governments' financial challenges in handling abandoned vehicles. However, they can only offer limited assistance.

> *As a result of the abandoned vehicle problem, the local government was required to create a budget, and operating expenses increased annually. The proceeds from the disposal of the abandoned vehicles cannot cover operating expenses. (P1)*

Depot size limitations significantly hinder the local government's compliance with MHLG guidelines. Other than that, prolonged procedures and numerous unresolved grievances exacerbate the situation, with human and infrastructure constraints further impeding the management of abandoned vehicles.

> *Storage space is required for automobiles and other confiscated items, making the issue of storage space in the local government extremely critical. How long should the local government retain these abandoned vehicles, assuming their storage is restricted? (P8)*

> *Abandoned automobiles present many complications, and we are presently confronted with logistical and personnel challenges. There are currently six tow trucks, but there are insufficient enforcement personnel. (P6)*

In conclusion, this theme highlights that the financial burden of storage, workforce, and operations falls heavily on local governments, requiring careful resource allocation and a focus on fiscal responsibility. While the MHLG and State Government recognize these difficulties, their support is limited, leaving local governments to manage abandoned vehicles with restricted resources. The findings emphasize the need for enhanced stakeholder cooperation, clear policy frameworks, and efficient processes to address prolonged procedures and unresolved issues. Ultimately, refining governance structures and

improving inter-agency collaboration are crucial to overcoming the operational and financial hurdles in ELV management.

Conclusion

In light of the findings, improving ELV management in Malaysia and similar contexts requires a comprehensive approach that addresses operational and financial challenges. Referring to these findings, it is clear how crucial it is for local ministries, governments, and other relevant parties to team up to deal with abandoned vehicles properly. To maintain effective management of ELVs, everyone involved should have their say and support the well-structured system designed for this purpose. Correct allocation of important resources, tackling infrastructure difficulties, and simplifying procedures are necessary for improving ELV management. It is also important to focus on boosting how the local government manages the disposal of ELVs. If these methods are used, managing ELVs should improve across Malaysia and other relevant countries.

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