

Research Article

Analysis of Effectiveness and Compliance Implementation of E-Tickets in Jakarta Using the Framework Cobit-2019

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Abstract: The Electronic Traffic Law Enforcement (E-Tilang) system has been implemented in Jakarta as an innovative solution to address the increasingly complex traffic law enforcement problems. This study aims to evaluate the effectiveness of the implementation of the E-Tilang system through an analysis of the level of community compliance and measurement of system maturity using the COBIT 2019 framework. The research method uses a quantitative approach with a survey of 113 respondents from Jakarta residents who have experience with the E-Tilang system. Data were collected through a structured questionnaire mapped to five COBIT 2019 domains: Evaluate, Direct and Monitor (EDM), Align Plan and Organize (APO), Build Acquire and Implement (BAI), Deliver Service and Support (DSS), and Monitor Evaluate and Assess (MEA).

Keywords: COBIT 2019; Community Compliance; E-Tilang; Electronic Traffic Law Enforcement; Traffic Law Enforcement.

1. Introduction

1.1 Background

The development of information and communication technology has brought significant transformation in various aspects of people's lives, including in the field of traffic law enforcement. Along with the increasing number of motorized vehicles and the complexity of traffic in Indonesia, especially in urban areas such as Jakarta, a more effective and efficient approach is needed in handling traffic violations. The conventional ticketing system that has been implemented so far is considered to have various weaknesses, ranging from the potential for officer subjectivity, inconsistency of enforcement, to the risk of corrupt practices that can reduce the effectiveness of law enforcement.

Responding to these challenges, the Indonesian National Police has implemented the Electronic Traffic Law Enforcement (E-Tilang) system as an innovative solution in traffic law enforcement. The E-Tilang system utilizes CCTV technology integrated with an automatic identification system to detect, record, and process traffic violations digitally. The implementation of this technology is expected to increase objectivity, transparency, and efficiency in the traffic law enforcement process.

Jakarta as the nation's capital and the center of national economic activity has a very high level of traffic density, with the number of motorized vehicles continuing to increase every year. Data from the DKI Jakarta Transportation Agency shows that the level of traffic violations in Jakarta is still relatively high, including traffic sign violations, speed limit violations, and special lane violations. This condition makes Jakarta a strategic location for the implementation and evaluation of the effectiveness of the E-Tilang system. (Lisdayanti and Ihsan 2024).

However, the success of implementing the E-Tilang system does not only depend on the technological aspect, but also on the level of acceptance, understanding and compliance of the community as road users. (Electronic Traffic Law Enforcement). The basis for implementing Electronic Traffic Law. The era of Electronic Traffic Law Enforcement is called Electronic Traffic Law Enforcement Electronic Traffic Law Enforcement 2024). Various initial surveys show that there is still public doubt about the accuracy of the system,

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the security of personal data, and transparency in the law enforcement process.(Tabaika and Friday 2024). In addition, the level of socialization and education regarding the working mechanism of the E-Tilang system to the public still needs to be improved.

The importance of a comprehensive evaluation of the implementation of the E-Tilang system is becoming increasingly urgent, considering the significant investment that the government has made in developing this technological infrastructure. This evaluation needs to be carried out not only from the technical operational aspect, but also from the perspective of effectiveness in achieving law enforcement objectives and the level of public compliance as the main stakeholder.(Samsiah et al. 2024).

1.2 Problem Formulation

Based on the background that has been described, this study focuses on several main problems that need to be answered to provide a comprehensive picture of the implementation of the E-Tilang system in Jakarta:

- To what extent is the level of compliance of road users with the implementation of the Electronic Traffic Law Enforcement (E-Tilang) system in Jakarta?
- Has regular monitoring and evaluation been carried out on the effectiveness of the performance of the E-Tilang system in Jakarta?
- How well does the public understand the mechanisms and operational procedures of the E-Tilang system implemented in Jakarta?
- What is the maturity level of the E-Tilang system implementation based on the COBIT 2019 framework?

1.3 Research Objectives

This study aims to conduct a comprehensive evaluation audit of the effectiveness and compliance of the implementation of the E-Tilang system in Jakarta. Specifically, the objectives of this study are: Identifying and analyzing the level of road user compliance with the Electronic Traffic Law Enforcement (E-Tilang) system in Jakarta, as well as the factors that influence the level of compliance. Evaluating the monitoring mechanism and implementation of periodic evaluations of the performance of the E-Tilang system, including the role of related institutions in maintaining effectiveness and Assessing the level of public understanding of the E-Tilang system, including technical, procedural aspects, and accessibility of information for various community groups. Analyzing public perceptions regarding the fairness, transparency, and accountability of the implementation of E-Tilang, as well as its implications for public trust in law enforcement officers.

Measuring the maturity level of E-Tilang system implementation using the COBIT 2019 framework to provide structured and international standards-based improvement recommendations.

1.4 Benefits of Research

This research is expected to provide significant contributions to:
Theoretical Benefits:

- Increasing the knowledge base in the field of information systems, especially regarding the evaluation of electronic traffic law enforcement systems.
- Contributing to the development of an E-Tilang system evaluation framework using COBIT 2019
- Practical Benefits:
- Providing input to the Republic of Indonesia National Police for improvements to the E-Ticket system
- Providing policy recommendations to the DKI Jakarta Regional Government in increasing the effectiveness of traffic law enforcement.
- Providing information to the public about the E-Ticket system to increase compliance levels.

2. Literature Review

2.1 Electronic Traffic Law Enforcement (E-Tilang)

Electronic Traffic Law Enforcement (E-Tilang) is a traffic law enforcement system that uses electronic technology to automatically detect, record and process traffic violations.(Airlangga and Suryokencono 2024). This system aims to improve effectiveness, efficiency, and objectivity in traffic law enforcement.

According to the Regulation of the Chief of the Republic of Indonesia National Police Number 5 of 2021, ETilang is defined as "an integrated information technology system to support the process of electronically enforcing traffic and road transportation laws, starting from detecting violations, issuing electronic tickets, to the trial process."

2.2 COBIT 2019 Framework

COBIT 2019 (Control Objectives for Information and Related Technologies) is a framework developed by ISACA for enterprise information technology governance and management (ISACA, 2019). This framework provides comprehensive guidance to help organizations achieve their objectives through effective information technology governance and management.(Bagja et al. 2024).

COBIT 2019 consists of five main domains:

- Evaluate, Direct and Monitor (EDM)- Governance domain that focuses on evaluation, direction, and monitoring
- Align, Plan and Organize (APO)- Management domain that focuses on planning and organizing
- Build, Acquire and Implement (BAI)- Management domain focused on development, acquisition and implementation
- Deliver, Service and Support (DSS)- Management domain focused on service delivery and support
- Monitor, Evaluate and Assess (MEA)- Management domain that focuses on monitoring, evaluation, and assessment.

2.3 Capability Maturity Model (CMM)

Table 1. CMM

Average Score	Maturity Level	Information
1.00 – 1.49	1 – Initial	There is no process
1.50 – 2.49	2 – Repeatable	Ad-hoc, iterative process
2.50 – 3.49	3 – Established	Documented & consistent
3.50 – 4.49	4 – Predictable	Measurable and controlled
4.50 – 5.00	5 – Optimized	Optimal, sustainable

2.4 Previous Research

Several studies related to E-Tilang and information system evaluation have been conducted previously:

(Candra, Sudiro, and Gunadi 2025)conducted a study on public perception of the E-Tilang system in Surabaya. The results showed that 62% of respondents had a positive perception of the E-Tilang system, but there were still concerns regarding system accuracy and data security.

3. Research Methodology

3.1 Research Design

This study uses a quantitative approach with a survey method. The research design is descriptive-evaluative which aims to describe and evaluate the effectiveness of the implementation of the E-Tilang system in Jakarta using the COBIT 2019 framework.

3.2 Population and Sample

The population in this study were people who live in the DKI Jakarta area, have private vehicles (motorcycles or cars), and are aware of the implementation of the Electronic Traffic Law Enforcement (E-Tilang) system.

This population was chosen because they are the parties most likely to be directly involved in the implementation of the E-Ticket system, as road users who are under the supervision of automatic ticketing cameras.

The sampling method used is purposive sampling technique, namely determining the sample based on certain criteria that have been determined by the researcher. The three respondent criteria in this study are:

- Residing or domiciled in DKI Jakarta.
- Have a private vehicle (motorcycle or car).
- Knowing the existence of the E-Ticket system, whether from the media, personal experience, or other people's experiences.

Table 2. sampling method

COBIT 2019 Domains	Objective	Number of Questions
EDM (Evaluate, Direct and Monitor)	EDM01, EDM05	2
APO (Align, Plan and Organize)	APO01, APO08	2
BAI (Build, Acquire and Implement)	BAI04, BAI06, BAI10	3
DSS (Delivery, Service and Support)	DSS06	1
MEA (Monitor, Evaluate and Assess)	MEA01	1

3.3 Data Analysis Techniques.

The data obtained from the questionnaire will be analyzed quantitatively using a descriptive statistical approach. The purpose of this analysis is to determine the public's response to the effectiveness and compliance in implementing the E-Tilang system in Jakarta, based on indicators from the COBIT 2019 framework. The steps of the data analysis technique used in this study are as follows:

Initial Data Processing

Data collected through Google Forms will be downloaded in spreadsheet format (.xlsx or .csv), then cleaned (data cleaning) to ensure there is no duplicate or empty data that could affect the analysis results.

Scoring and Data Tabulation

Each answer on the Likert scale (1–5) is weighted according to the level of agreement. The results of each question are then added up and averaged to see the respondents' tendencies towards each indicator.

Descriptive Statistics

This analysis includes:

- The average value (mean) to see the general tendency of respondents' answers.
- Percentage frequency of answers for each option (Strongly Agree – Strongly Disagree).
- Data distribution per COBIT 2019 domain (DSS, APO, BAI, MEA) to evaluate each aspect separately.

Interpretation of Results

The results of descriptive statistics will be used to answer the problem formulation and see how effective and compliant the implementation of E-Tilang is based on public perception. An average value of ≥ 4.00 indicates a positive tendency towards the assessed indicators, while a value < 3.00 indicates a negative tendency or problem in that aspect.3.1.

4. Results and Discussion

4.1 Respondent Overview

This study involved 123 respondents who were Jakarta residents and residents who had experience passing through areas with ETLE (Electronic Traffic Law Enforcement) cameras. Respondents provided an assessment of the implementation of the e-Tilang system through a questionnaire consisting of 11 statements, which were then grouped into four main domains based on the COBIT 2019 framework, namely BAI (Build, Acquire, and Implement), DSS

(Deliver, Service, and Support), APO (Align, Plan and Organize), and MEA (Monitor, Evaluate and Assess).

Summary of Likert Scale and COBIT 5 Levels:

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4.2 Respondent Demographic Data

Table 4. Respondent Demographic Data

Kategori	Jumlah	Persentase
Total Responden	100	100%
Lokasi	Jakarta	100%
Pekerjaan:		
- Pelajar/Mahasiswa	58	58%
- Karyawan Swasta	42	42%
Pengalaman E-Tilang:		
- Pernah Terkena	38	38%
- Tidak Pernah	62	62%

4.3 Mapping Questionnaire Questions to COBIT 2019 Domains:

Table 5. Mapping Questionnaire Questions to COBIT 2019 Domains

No	Questionnaire Questions	Domain COBIT 2019	COBIT Objectives	Average Score	Interpretation
Q1	Is the implementation of E-Tilang in accordance with the government's goal of regulating traffic?	Govern (EDM)	EDM01 - Ensure Governance Framework Settings and Maintenance	3.0	Currently- There are still doubts about the suitability with strategic objectives
Q2	Is there a regular evaluation of the results of the ETilang implementation?	Govern (EDM)	EDM05 - Ensure Stakeholder Engagement	3.1	Currently- Routine evaluation is not optimal
Q3	What are system performance indicators?	Monitor, Evaluate &	MEA01 - Monitor, Evaluate and Assess	3.0	Currently- KPI Monitoring
	monitored regularly?	Assess (MEA)	Performance and Conformance		still need to be improved

Q4	Is information about E-Tilang easy for the public to find and understand?	Align, Plan & Organize (APO)	APO08 - Manage Relationships	2.8	MediumLow-Public communication needs to be improved
Q5	Is this system well planned and executed?	Align, Plan & Organize (APO)	APO01 - Manage the IT Management Framework	3.1	Currently-Planning and execution can still be improved
Q6	Is the E'Tilang camera installed in the right and clear place?	Build, Acquire & Implement (BAI)	BAI04 - Management Availability and Capacity	3.0	Currently-Placement infrastructure needs evaluation
Q7	Is your personal data safe when using this system?	Build, Acquire & Implement (BAI)	BAI06 - Management Changes BAI10 - Manage Configuration	3.2	Medium-High-Security relatively good data
Q8	Is the public given the opportunity to provide input?	Govern (EDM)	EDM05 - Ensure Stakeholder Engagement	3.1	Currently-Stakeholder involvement is still limited
Q9	Overall, are you satisfied with the implementation of E-Tilang?	Deliver, Service & Support (DSS)	DSS06 - Management Business Process Controls	3.0	Currently-Satisfaction users can still be improved

4.4 COBIT 2019 Domain Analysis

Table 6. Domain Management - Align, Plan & Organize (APO)

Objective	Question Related	Average Score	Status	Recommendation
APO01- IT Management Framework	Q5	3.1	⚠ Need Attention	Improve planning and implementation processes
APO08 - Relationship Management	Q4	2.8	✗ Not enough	Improve communication and outreach to the community

This domain shows the most significant weaknesses, especially in:

APO08 (Relationship Management): The lowest score (2.8) indicates less effective public communication.

APO01 (IT Management Framework): The planning and implementation process still needs improvement

Table 7. Domain Management - Build, Acquire & Implement (BAI)

Objective	Question Related	Average Score	Status	Recommendation
BAI04- Availability & Capacity	Q6	3.0	⚠ Need Attention	Evaluation reset location And camera visibility
BAI06/BAI10 - Security & Configuration	Q7	3.2	☑ Enough Good	Maintain existing security standards

This domain shows relatively good performance:

BAI06/BAI10 (Security & Configuration): The highest score (3.2) indicates adequate data security.

BAI04 (Availability & Capacity): Placement of camera infrastructure still needs evaluation

Table 8. Domain Management - Deliver, Service & Support (DSS)

Objective	Question Related	Average Score	Status	Recommendation
DSS06- Business Process Controls	Q9	3.0	⚠ Need Attention	Improve the quality of service overall

Table 9. Domain Management - Monitor, Evaluate & Assess (MEA)

Objective	Question Related	Average Score	Status	Recommendation
MEA01- Performance Monitoring	Q3	3.0	⚠ Need Attention	Implement the dashboard monitoring comprehensive

The performance monitoring and evaluation system still needs to be improved with the implementation of a more comprehensive monitoring dashboard.

5. Conclusions

The Jakarta E-Tilang system shows a fairly good level of maturity by being at the "Established" level based on analysis using the COBIT 2019 framework on 123 respondents, with an average score ranging from 2.8 to 3.2. The data security aspect is the main strength with the highest score of 3.2, indicating that the system has met adequate standards in information protection. However, significant weaknesses were identified in the public communication management aspect which only scored 2.8, indicating the need for improvement in terms of community involvement and information delivery. Although the system already has a good technological foundation and process documentation, to achieve optimal effectiveness, a more holistic strategy is needed. This includes strengthening the socialization program, developing a comprehensive monitoring dashboard, and improving feedback mechanisms from stakeholders. The implementation of these improvements is expected to not only increase public compliance with traffic regulations, but also create a safer, more orderly, and more sustainable transportation ecosystem, and make Jakarta a model for implementing the E-Tilang system that can be adopted by other cities in Indonesia.

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