



# IMPROVING MONITORING AND CHECKING OF STUDENTS WITH VIOLATIONS IN UNIVERSITY USING A MOBILE VIOLATION APPLICATION

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**Abstract:** The research employed the Unified Modeling Language (UML) to establish a standardized framework for the DO Mobile Violation Application's flow, functions, and structures. Dot net, Microsoft Visual Studio Android, and Xamarin Microsoft SQL Server are all supported by the application, which can be downloaded from the Play Store. As the student population increases annually, the research advises that the implementation of this system would improve data administration and supervision of student violations, which is particularly critical. The principal aim of this study is to design and implement a system that improves monitoring and verification of student violations for implementation by the Discipline Office of St. La Salle Bacolod, Philippines. The objective of this study is to assess the efficacy of the current procedure and proposed mobile application for monitoring in relation to information, efficiency, effectiveness, control, and security. Furthermore, it aims to evaluate the proposed application's non-functional attributes, such as interoperability, dependability, adaptability, installability, defect tolerance, and user interface aesthetics. The study endeavors to establish a comprehensive and streamlined system for monitoring student violations, which are of the utmost importance for preserving order and ensuring the security of the academic establishment.

**Keywords:** mobile application, violation, unified modelling language, data management

## I. INTRODUCTION

In this era of digitalization, mobile phones have become an indispensable component of our everyday routines. They offer a wide range of features and applications that cater to various demands and interests. Mobile phones have emerged as valuable educational tools that enhance the learning process [7] and facilitate communication between students, teachers, and parents [1] [10]. However, they have the potential to serve purposes beyond academic tasks [7]; they can also function as surveillance tools to monitor students and detect any violations of regulations. Utilizing this technology has numerous advantages, including enhanced accurateness, speed, and user-friendliness in monitoring and addressing disciplinary issues. An important advantage of utilizing mobile phones for monitoring student violations is the ability to maintain an accurate and current log of offenses [11]. Android has consistently held the position of being the dominant operating system (OS) for mobile devices for a significant period of time. Android [5] dominated the global mobile market in the second quarter of 2016, accounting for 86.2% of the market share. Android smartphones are extensively utilized and have a user-friendly interface, making them a favored option for educational institutions seeking to implement mobile tracking applications [2]. Conventional methods of monitoring, such as manual note-taking or reliance on paper-based systems, can result in delays, mistakes, and discrepancies. Mobile applications, conversely, offer a centralized platform where instances of rule-breaking and subsequent punitive measures may be conveniently documented and accessed. This ensures that managers, instructors, and parents may readily access precise and comprehensive information.

The main objective of this study is to develop a system that will improve the monitoring and checking of student's violation to be used by the Discipline Office of the University of St. La Salle Bacolod, Philippines. Specifically, it seeks to answer the questions:

1. What is the level of effectiveness of the existing process and the proposed mobile violation application in monitoring and checking?
  - a. Performance
  - b. Information
  - c. Effectiveness



- d. Control
  - e. Efficiency
  - f. Security
2. What is the level of effectiveness of the following non-functional properties of the proposed mobile violation application?
- a. Reliability
  - b. Adaptability
  - c. Installability
  - d. Fault Tolerance
  - e. User Interface Aesthetics
  - f. Interoperability

## II. LITERATURE REVIEW

Discipline Office play a very crucial role in a curriculum institution, wherein it is the one that implement school discipline, school rules that students break are subject to discipline. The aim of discipline is to set limits restricting certain behaviors or attitudes that are seen as harmful or against school policies and educational norms. As violation monitoring systems become user-friendly, rapid, and accurate, they empower and motivate workers [11].

Studies by [3] and [4] highlighted issues related to student violations, including factors influencing non-compliance, manual tracking of offenses, and the need for accurate recording systems. The focus of the research is to develop and implement a comprehensive Students' Violation and Security Monitoring System for STI College Southwoods. The proposed system aims to streamline the identification process, record-keeping, and monitoring of student violations and logs. By creating an efficient and accurate identification system, the study seeks to enhance the management of student behaviors, ensure compliance with school policies, and promote a secure and conducive learning environment at STI College Southwoods.

The study by [4] focuses on Bernardo College's manual monitoring system, emphasizing the need for a more efficient process to track and manage student offenses accurately. Bernardo College uses monitoring sheet and Call slip to monitor, manage, count and evaluate the student's offenses and sanction in manual way. Because of this kind of process, the Prefect of Discipline spends more time and effort on tallying the student's offenses such as late, absences and misconducts. The student violation monitoring system that will benefit the school for consistent monitoring of violations and to accurately record the students' offenses using the modules for Student Information, Violation Monitoring, Audit Trail, Back and Restore, User Account and Report Module. Similarly, the research by [6] presents a web-based ediscipline system for colleges, emphasizing the importance of data processing, reduction of paperwork, and improved data quality. It produces reliable output by keeping track of records with minimum data redundancy, reduction of paper works, Improve data quality, accessibility and responsiveness and elimination of human errors. With the use of Local Area Network (LAN) connection, the proficiency in administrating the Guidance Center will be enhanced and the needed outputs will be more reliable and easy. Every specific feature integrated in the system allows transactions to be done easier such as uploading of file and storing different records in the database.

Moreover, [7] and [8] emphasize the use of SMS technology for notifying students and parents about violations, enhancing communication and transparency. Additionally, [9] introduces a mobile application for Android devices to facilitate access to student violation records, promoting user-friendly interfaces and efficient tracking of offenses. The system helps various users to navigate and receive information for the Office of the Student Affairs (OSA) regarding violations/deviance of the student committed during the current trimester.

As demonstrated by the ideas and works of other authors, a violation system for monitoring, tracking, and inspecting pupils is an effective solution for generating accurate records or data that assist in filling the gap caused by the current issue. The research studies provide evidence of the efficacy of monitoring and managing electronic records of students as a means to alleviate the workload of discipline officers. By utilizing the most recent mobile technology in the form of a mobile application, the system or application will assist the DO officer in verifying student records and assigning violations. Whereby a multitude of boundless applications or purposes can be developed and executed through the utilization of this mobile technology.



III. DESIGN AND METHODOLOGY

The researcher used the Unified Modelling Language (UML) to standardize the flow, functions, and structures of the proposed system. Furthermore, the diagrams aim to present the contextual view of the proposed system before its implementation. The use case model for the current process of the USLS Violation System is shown in Figure 1. In this semi-computerized system, the DO would find the student who had violated the rules, confiscate their ID, give them a ticket, and then order them to go to the DO office to get an office sanction receipt. The student would then go to their assigned area.

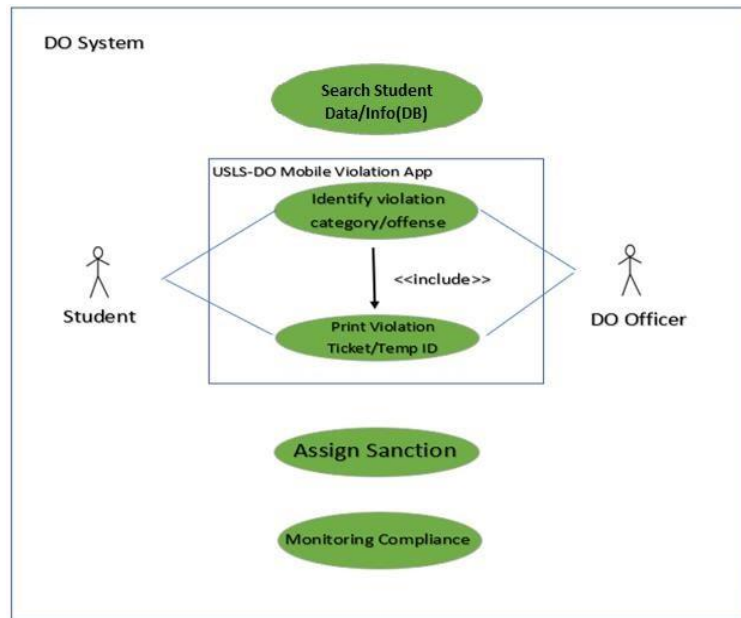


Fig 1 Use Case Model of Existing Process

Table I shows the use case scenario of the existing process.

Table I. Existing Process in Giving Sanction to Student Committed a Violation

Name	DO System. (Existing)
Actor	Students/Discipline Officer
Description	This describes the process used to give sanctions to students who committed violations in the University of St. La Salle.
Pre-Condition	1.The DO Admin must have encoded user accounts, types of violations committed and sanctions to the database server. 2.Violation ticket/temp ID is allowed only for a short period of time, make sure to comply or will endure more sanctions after the expiration date.
Post Condition	1.After compliance of the sanction of the committed violation, the students record will be updated and cleared. 2. Generation of report is given upon the request of DC's, VC's.
Flow of Events	1.Get the attention of the student. Inform about the violation committed and confiscate the ID. Instruct student to proceed to the DO office for explanation and compliance. 2.The DO Officer will login to the system and search the student's data or information. DO then identify the violation committed and offense. 3. DO will assign sanction. Issue temporary pass with community service form. Proceed to assigned offices. 4. The student then will comply the sanction and filled up the form. It will be checked and signed by the head of office. This will be given back to the DO. 5.DO will verify and validate the community service form and update the system for clearing and return the school ID.



Figure 2 shows the Use Case Model of the proposed DO Mobile Violation Application. The mobile application is designed to identify students who have violations. The DO confiscates their ID, issues a ticket using an on-hand ticket printer, instantly sends an email message to the parents' registered email address, and directs the student to their assigned area.

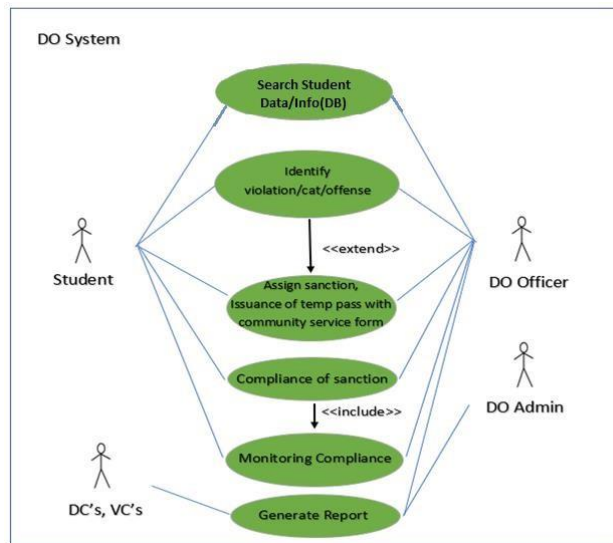


Fig 2 Use Case Model of the propose DO Mobile Violation Application

Table II shows the use case scenario of the proposed DO Mobile Violation Application and how the full system operates online.

Table II Identification of Violation/Category/Offense (Online)

Name	Identify violation/category/offense (Online)	
Actor	Discipline Officer	
Description	This describes the procedures used to give sanctions to students who committed violations in the University of St. La Salle.	
Pre-Condition	1. The mobile app is connected to the network. 2. The DO Admin must have encoded user accounts, types of violations committed and sanctions to the database server.	
Post Condition	1. After compliance of the sanction of the committed violation, the students record will be updated and cleared.	
Flow of Events	1. Get the attention of the student. Inform about the violation committed and confiscate the ID. 2. DO will search the ID # or name of the student on the mobile app. 3. Upon verification of the student's information, the violation will be identified, category, offense and saved.	
Workflow	Student	Discipline Officer
		<pre> graph TD     Start([start]) --&gt; Confiscate[Confiscate ID]     Confiscate --&gt; Search[Search student ID # or Name]     Search --&gt; Identify[Identify violation Cat/offense]     Identify --&gt; Save[Save]     Save --&gt; End([End])                     </pre>



Table III displays the utilization of the proposed DO Mobile Violation Application in an offline mode, illustrating the various scenarios in which it can be used.

Table III Identification of violation/category/offense (Offline)

Name	Identify violation/category/offense (Offline)					
Actor	Students/Discipline Officer					
Description	This describes the procedures used to give sanctions to students who committed violations in the University of St. La Salle.					
Pre-Condition	1.The mobile app is NOT connected to the network. 2.The DO Admin must have encoded user accounts, types of violations committed and sanctions to the database server.					
Post Condition	1. After compliance of the sanction of the committed violation, the students record will be updated and cleared.					
Flow of Events	1. Get the attention of the student. Inform about the violation committed and confiscate the ID. 2.DO will encode the student's information (ID #, Name) on the mobile app. 3.Then identify and encode violation, category, offense and saved.					
Workflow	<table border="1"> <thead> <tr> <th>Student</th> <th>Discipline Officer</th> </tr> </thead> <tbody> <tr> <td></td> <td> <pre> graph TD     start([start]) --&gt; Confiscate[Confiscate ID]     Confiscate --&gt; Encode[Encode student ID # or Name]     Encode --&gt; Identify[Identify violation Cat/offense]     Identify --&gt; save[save]     save --&gt; End([End])                     </pre> </td> </tr> </tbody> </table>	Student	Discipline Officer		<pre> graph TD     start([start]) --&gt; Confiscate[Confiscate ID]     Confiscate --&gt; Encode[Encode student ID # or Name]     Encode --&gt; Identify[Identify violation Cat/offense]     Identify --&gt; save[save]     save --&gt; End([End])                     </pre>	
Student	Discipline Officer					
	<pre> graph TD     start([start]) --&gt; Confiscate[Confiscate ID]     Confiscate --&gt; Encode[Encode student ID # or Name]     Encode --&gt; Identify[Identify violation Cat/offense]     Identify --&gt; save[save]     save --&gt; End([End])                     </pre>					

Table IV shows the use case scenario of the proposed DO Mobile Violation Application when printing the violation ticket while the system operates both in online and offline operation.

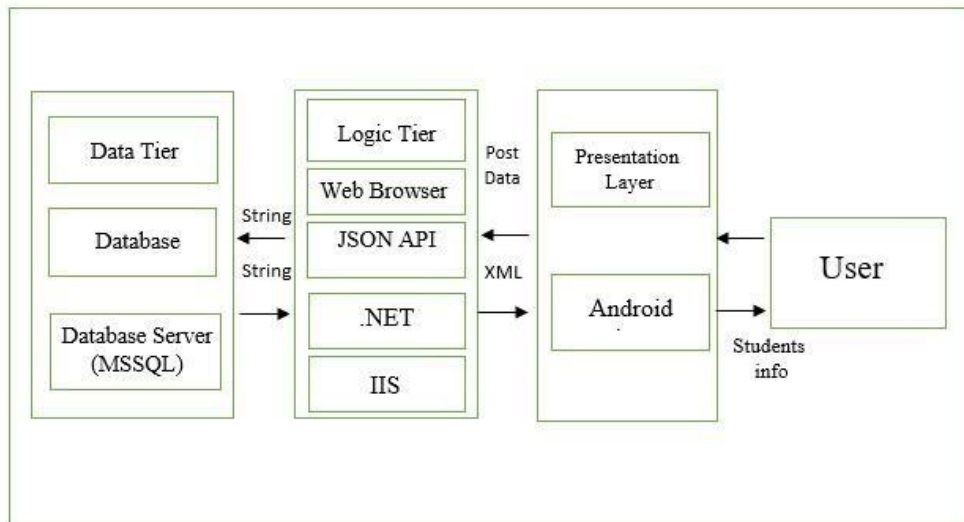
Table IV Printing of Violation Ticket

Name	Print Violation Ticket/Temporary ID					
Actor	Students/Discipline Officer					
Description	This describes the procedures used to give sanctions to students who committed violations in the University of St. La Salle.					
Pre-Condition	1. The mobile app is either online or offline. 2.The DO Admin must have encoded user accounts, types of violations committed and sanctions to the database server.					
Post Condition	1. After compliance of the sanction of the committed violation, the students record will be updated and cleared.					
Flow of Events	1. The violation details are being identified. 2. DO will print a temporary ID/violation ticket and given to the student.					
Workflow	<table border="1"> <thead> <tr> <th>Student</th> <th>Discipline Officer</th> </tr> </thead> <tbody> <tr> <td> <pre> graph TD     Accept[Accept Temp ID violation Ticket] --&gt; End([End])                     </pre> </td> <td> <pre> graph TD     start([start]) --&gt; Identified[Student violation identified]     Identified --&gt; Print[Print violation ticket/Temp ID]     Print --&gt; Student[Accept Temp ID violation Ticket]                     </pre> </td> </tr> </tbody> </table>	Student	Discipline Officer	<pre> graph TD     Accept[Accept Temp ID violation Ticket] --&gt; End([End])                     </pre>	<pre> graph TD     start([start]) --&gt; Identified[Student violation identified]     Identified --&gt; Print[Print violation ticket/Temp ID]     Print --&gt; Student[Accept Temp ID violation Ticket]                     </pre>	
Student	Discipline Officer					
<pre> graph TD     Accept[Accept Temp ID violation Ticket] --&gt; End([End])                     </pre>	<pre> graph TD     start([start]) --&gt; Identified[Student violation identified]     Identified --&gt; Print[Print violation ticket/Temp ID]     Print --&gt; Student[Accept Temp ID violation Ticket]                     </pre>					



Figure 3 displays the System Architecture of the Proposed DO Mobile Violation Application. In the Data Tier, where the student's information is saved, the Logic Tier will convert it into a string format so that it may be easily read by the web browser. The presentation layer will subsequently transform the data into XML format, enabling it to be easily interpreted by the Android device. When the user checks or updates a student's infraction, the presentation layer will send the data to the Logic tier. The data will be translated into a string and then retrieved or updated in the database.

Fig. 3 System Architecture of the Proposed DO Mobile Violation Application



The Figure 4 below displays the class diagram, illustrating the relationships and source code dependencies between the classes. Within this particular framework, a class delineates the procedures and attributes within an object, which is a distinct entity within a program or the code unit that represents such thing.

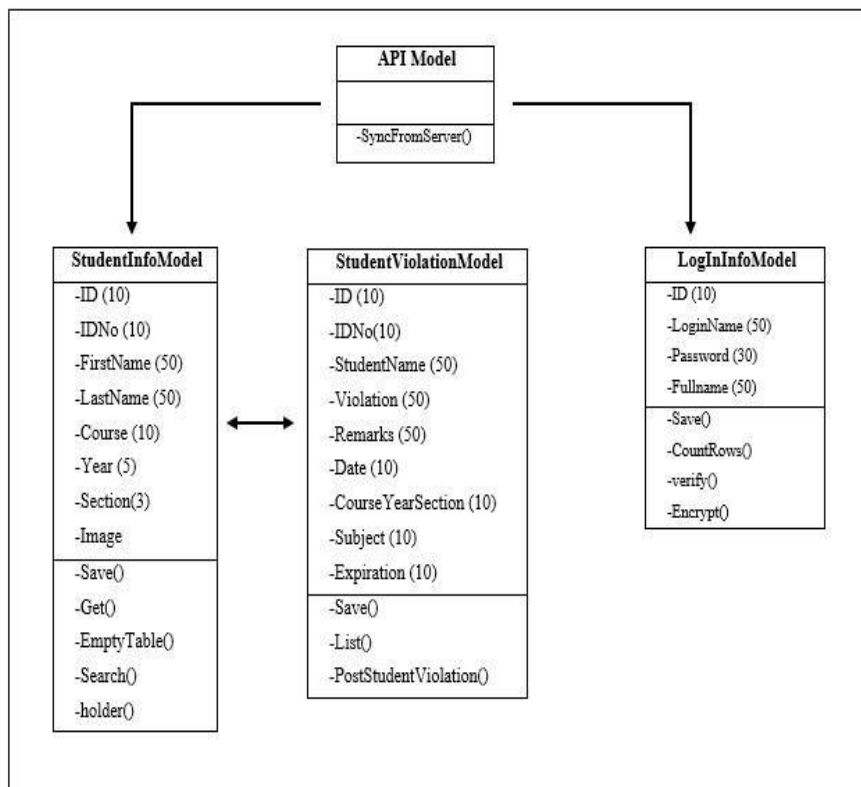


Fig. 4 Class diagram



Figure 5 displays the system interface of the proposed system. The USLS DO mobile violation application gadget is linked to the network over a wireless connection. The student's information or data can be accessed and updated from any location on the school. A portable Bluetooth printer is utilized for producing infraction tickets and temporary IDs due to its compact size and mobility. The officer must carry it at all times while patrolling the school site.

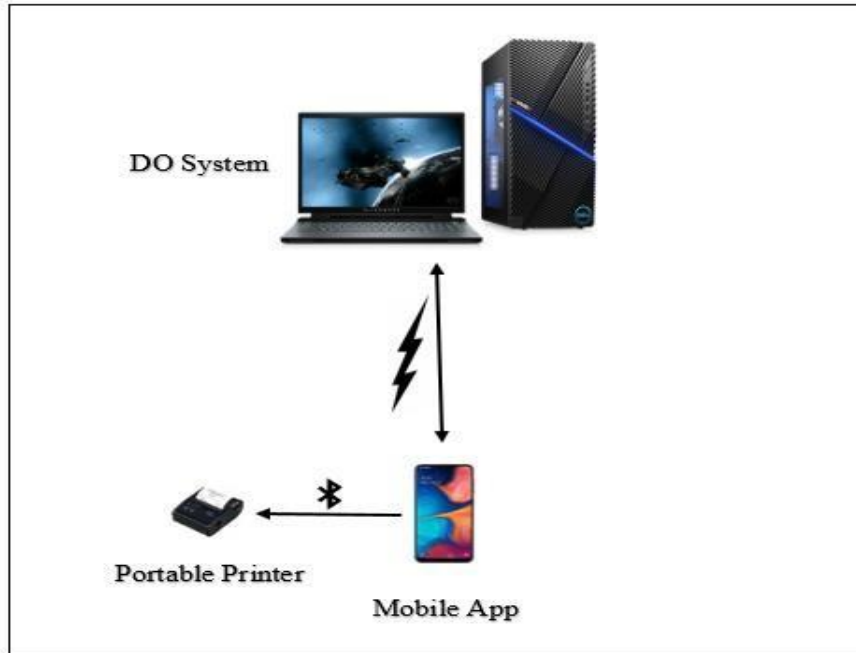


Fig. 5 System Interface of the proposed DO Mobile Violation Application

IV. RESULTS AND DISCUSSIONS

The participants were selectively chosen based on their relevant experiences. The survey questionnaire's content and construct validity have been established through the utilization of the Good and Scates evaluation form. The jury's comments and suggestions have been deemed valuable and instrumental in enhancing the instrument. The validity result was 4.52, which is considered excellent. The instrument's reliability was assessed using the Cronbach Alpha coefficient. The Cronbach Alpha Coefficient, which measures the internal consistency of the questionnaire, was found to be 0.85, indicating a satisfactory level of reliability. The tables below provide data that will be studied in this study to answer the research questions.

Table 5 Summary results of the evaluation of the existing process

Criteria	F	Weighted Mean	INTERPRETATION
<b>FOR STUDENTS</b>	50		
Performance		3.28	GOOD
Information		3.20	GOOD
Effectiveness		3.39	VERY GOOD
Control		3.35	GOOD
Efficiency		3.10	GOOD
Security		3.39	VERY GOOD
<b>Mean</b>		<b>3.29</b>	<b>GOOD</b>
<b>FOR DISCIPLINE OFFICERS</b>	6		
Performance		3.78	VERY GOOD
Information		4.06	VERY GOOD
Effectiveness		3.61	VERY GOOD
Control		3.61	VERY GOOD
Efficiency		3.72	VERY GOOD
Security		3.83	VERY GOOD
<b>Mean</b>		<b>3.77</b>	<b>VERY GOOD</b>
<b>TOTAL</b>	56		
<b>GRAND MEAN</b>		<b>3.53</b>	<b>VERY GOOD</b>

Table 6 Summary result of the evaluation of the use of the propose system



Criteria	F	Weighted Mean	INTERPRETATION
<b>FOR STUDENTS</b>	50		
Performance		4.39	EXCELLENT
Information		4.61	EXCELLENT
Effectiveness		4.72	EXCELLENT
Control		4.40	EXCELLENT
Efficiency		4.50	EXCELLENT
Security		4.65	EXCELLENT
<b>Mean</b>		<b>4.55</b>	<b>EXCELLENT</b>
<b>FOR DISCIPLINE OFFICERS</b>	6		
Performance		4.50	EXCELLENT
Information		4.28	EXCELLENT
Effectiveness		4.50	EXCELLENT
Control		4.56	EXCELLENT
Efficiency		4.61	EXCELLENT
Security		4.50	EXCELLENT
<b>Mean</b>		<b>4.49</b>	<b>EXCELLENT</b>
<b>TOTAL</b>	<b>56</b>		
<b>GRAND MEAN</b>		<b>4.52</b>	<b>EXCELLENT</b>

Table 7 Summary result of the evaluation of the use of the propose system by the IT Experts

Criteria	F	TOTAL	INTERPRETATION
<b>FOR EXPERTS</b>	5		
Reliability		4.53	EXCELLENT
Adaptability		4.40	EXCELLENT
Installability		4.33	EXCELLENT
Fault Tolerance		4.40	EXCELLENT
User Interface Aesthetics		4.53	EXCELLENT
Interoperability		4.33	EXCELLENT
<b>TOTAL</b>	<b>5</b>		
<b>Mean</b>		<b>4.42</b>	<b>EXCELLENT</b>

## V. CONCLUSION

Over-all, the proposed DO Mobile Violation Application is perceived by the participants as excellent. The application can run in Ms Visual Studio Android, Xamarin Microsoft iismssql server and Dot net. The application is downloadable in Play Store.

It is recommended that the system be implemented to improve the data management and monitoring of violations committed by the students as the population of the students are increasing every academic year.

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