

QUALITY TEST OF THE NARCOTICS EVIDENCE DETECTION SYSTEM AT THE PROSECUTOR'S OFFICE OF THE REPUBLIC OF INDONESIA WITH ISO 25010

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Abstract

This study aims to test the quality by implementing ISO 25010 on the Narcotics Detection System of the Republic of Indonesia Prosecutor's Office. This research method uses a descriptive quantitative method. The population of this study consisted of 100 employees spread throughout the High Prosecutor's Office in Indonesia. The sampling technique used was overall sampling. The research data was conducted by providing an online questionnaire. Supporting data was also obtained from the results of blackbox testing. The analysis method was carried out by finding the percentage of data against the classification of data that had been created. The results of the study can show: 1) Users are satisfied with the Narcotics Detection System that has been tested, 2) The quality of the Narcotics Evidence Detection System is in accordance with ISO 25010 Functional Suitability which contains sub-characteristics of Functional Completeness, Functional Correctness, and Functional Appropriateness. The contribution of this research is expected so that the development of this Narcotics Evidence Detection System can be better in its implementation, so that employees who use it can be better assisted and also the data obtained from the system becomes more accurate

Keywords: *Blackbox, Functional Appropriateness, Functional Completeness, Functional Suitability, Quality Test, ISO 25010.*

Introduction

Operational management is an important aspect in an organization that coordinates and manages daily activities, including the Attorney General's Office of the Republic of Indonesia. In this context, efficient operational management is essential to support the accountability and effectiveness of the institution in carrying out its duties, especially in the digital era marked by advances in information technology. The Attorney General's Office of the Republic of Indonesia, as a pillar of the justice system, utilizes systems and applications to manage data and carry out operations, including in testing the authenticity of narcotics evidence. The Indonesian Attorney General's Office has implemented tools and systems to detect the authenticity of narcotics submitted by the police. This process involves testing evidence at stage two of the case, where the prosecutor is responsible for ensuring the authenticity of the evidence.

Although information technology provides convenience, it is important to maintain the quality of the application to meet operational needs. Periodic system evaluation is needed to prevent malfunctions that can disrupt the law enforcement process. In system development, there is often pressure to complete projects quickly, which can sacrifice quality control. Therefore, the implementation of a Quality Control (QC) system is essential to ensure that software products meet the established quality standards. Previous studies have shown that system

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quality testing based on the ISO/IEC 25010 standard can provide satisfactory results, with all features functioning without error. This study aims to conduct a quality test of the Narcotics Evidence Detection system at the Indonesian Attorney General's Office using the ISO 25010 method, which will include recording functions in the system module to assess its suitability and operational effectiveness.

Literature Study Systems and Applications

A system can be defined as a series of interconnected and interdependent subsystems, collaborating to achieve a predetermined goal. Each system consists of elements such as input, process, output, and feedback. Real examples of these systems include computer information systems and organizations. According to Jogianto (2005:2), the concept of a system includes a group of elements that interact with a specific purpose, including events and physical entities such as places, objects, and individuals that exist. Murdick, R. G (1991:27) describes a system as a group of elements that form a collection, procedure, or processing diagram that aims to achieve a certain goal. The system operates by manipulating data and/or goods at a certain time to produce the information, energy, and/or goods needed. From these definitions, it can be concluded that a system is a group of interrelated components that work together to achieve a certain goal.

In the context of information technology, an application is a subclass of computer software that utilizes the capabilities of a computer to perform specific tasks according to user needs. Application comes from the word "application," which means processor. Common examples of application software include word processing programs, spreadsheets, and media players. According to Jogiyanto (1999:12), an application is the use of instructions or statements that are arranged in such a way in a computer so that the computer can process input into output. The Great Dictionary of the Indonesian Language (1998:52) defines an application as the application of system design to process data using the rules or provisions of a particular programming language. Rachmad Hakim S added that an application is software used for a specific purpose, such as processing documents, managing Windows, or games. Harip Santoso also explained that an application is a collection of files (forms, classes, reports) that aim to carry out certain interrelated activities, such as payroll applications and fixed asset applications. Thus, an application can be understood as software designed to meet the needs of users in carrying out certain tasks.

Application Quality Test

Software quality testing is a complex and multifaceted process, which can be understood from different perspectives depending on the context (AMITY UNIVERSITY, 2015). This activity involves a series of activities carried out by researchers or research teams to evaluate and test software applications. The purpose of this quality testing is to measure the extent to which the application meets the established quality standards, as well as to identify problems and potential improvements. The quality testing process includes testing various aspects of the software, including functionality, performance, security, reliability, and other relevant aspects.

Management Quality

Quality Management in language it can be said that quality management is an activity in a company or organization that has the aim of maintaining a quality of the company or organization. This quality can be macro or even very micro, depending on the needs of the company or organization. In short, in quality management there are several competencies that can be measured according to Jason Martin. With competencies with the idea of quality management that emerges, there will be a need for more integrative quality management and will be oriented towards excellence in business.(Martin et al., 2021)

Operating System

In operations management, it is how organizations or companies produce goods and services.(Nigel Slack et al., 2010).In the Operational System, this is an activity carried out to monitor or record in order to be more accountable and precise. IT Operational System Derivatives in monitoring and recording an activity that exists in operational management involving computerized systems or information technology. Operational IT systems can

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be part of operational technology that describes a series of systems used to manage, monitor, and control industrial operations that focus on physical devices and the processes they use.(Salfati & Pease, 2022). Making operations management more accountable and more flexible to work on.

DMAIC (Define, Measure, Analyze, Improve, & Control)

Methods for making process improvements taken from a derivative of a methodology commonly called Six Sigma. This method aims to improve quality by identifying problems found. By doing (Define, Measure, Analyze, Improve & Control), to determine the problems found and then measure the level of the problem, then analyze it, and make the necessary improvements.(Chrishardiyan & Shilul Imaroh, 2023)

Quality Test

Quality is the most important and the single most important factor affecting organizational performance.(Drozd & Wolniak, 2021)In maintaining the quality, a test or assessment is needed that can show and maintain the quality. There are various ways to assess a product, goods, services, and also a system. Quality testing is an important thing in the derivative of a function of quality control.

The International Organization for Standardization

International standards ensure that the products and services we use every day are safe, reliable and of high quality. They also guide businesses in adopting sustainable and ethical practices, helping to create a future where the products we buy not only perform exceptionally well, but also protect us. At their core, they combine quality with conscience, enhancing everyday experiences and choices.(ISO, nd)

ISO 25010

ISO/IEC 25010 is a standard issued by The International Organization for Standardization. ISO/IEC 25010 focuses on the quality of a system and application. The aspects considered are the characteristics of the Quality Model in an application.(ISO, 2012) The quality model is the foundation of a product quality evaluation system. The quality model specifies which quality characteristics will be taken into account when evaluating the properties of a software product. Where the quality of a system can be measured by the extent to which it meets the stated and implied needs of various stakeholders, and thereby provides value. From the ISO/IEC 25010 Quality Model, this research will focus more on the characteristics of Functional Suitability with sub-characteristic derivatives such as Functional Completeness, Functional Correctness, and Functional Appropriateness which will later explain each function of the feature must be in accordance with the user, then can provide the correct results from what is expected from each function created, until the function of the feature is appropriate and appropriate for use by users who will later use the system. The following is a table image of the ISO/IEC 25010 Quality Model.

User Acceptance Testing

User Acceptance Testing also known as testing conducted by the User. Testing is done by interacting directly with the application or system that has been created. User Acceptance Testing testing that has been conducted by the user (User) can be used as evidence by the user that the system used or the system that has been accepted can be said to be appropriate. During this activity, the user must be able to ensure that the application and system are in accordance(Wahyudi & Alameka, 2023).

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Black Box Testing

One of the tests that can be done to help evaluate and test an application or system is also called Black Box Testing. Black Box testing can be done by testing the suitability of features and functions. (Yap_ronal & Arijanto, 2023).

Quality Assurance

Quality assurance It is very necessary to get the system to be fully usable. Quality assurance is also needed to get software certification that is in accordance with the needs and also from an activity. (Zulfa et al., 2020).

Research methods

Research Design

This study uses a descriptive quantitative approach. This design allows researchers to analyze phenomena that occur on a logical and empirical basis, utilizing statistical methods to interpret data.

Population and Sample

The study population involved 100 employees of the Prosecutor's Office who were directly responsible for detecting narcotics. The overall sampling technique was applied to ensure that the data obtained were authentic and reflected actual conditions.

Data collection

The research data consists of primary data and secondary data:

- **Primary Data:** A Likert scale (1-5) based questionnaire was used to measure the level of satisfaction and relevance of the narcotics detection system.
- **Secondary Data:** The results of blackbox and UAT testing conducted by the development team are used to support the analysis.

Research Procedures

The research procedure follows the DMAIC approach:

1. *Define:* Identifying key problems in the narcotics detection system.
2. *Measure:* Measuring system performance based on primary and secondary data.
3. *Analyze:* Analyze the root causes of problems and identify areas that need improvement.
4. *Improve:* Design and implement solutions to improve system quality.
5. *Control:* Ensure sustainability of improvement results through regular evaluation.

Data analysis

Data were analyzed using descriptive statistics to describe the research variables, such as mean, standard deviation, maximum, and minimum values. System quality evaluation was conducted based on the Functional Suitability characteristics of ISO 25010.

Results

Data Analysis Results

This research analysis was conducted using Google Colab, Google Colab is an IDE for processing data with the programming language used is python. The following is a table of calculation results to find the minimum, maximum, mean, and standard deviation values:

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No	Question	Total	Minimum	Maximum	Mean	Standard Deviation
1	How complete is the system's functionality in detecting various types of narcotics?	100	2	5	3.42	0.955368
2	How complete is the system's functionality in providing reports on narcotics detection results?	100	3	5	3.93	0.768772
3	How complete is the system functionality in supporting integration with spectrometer instruments?	100	2	4	2.99	0.822598
4	How complete is the system's functionality in providing guidance or assistance to users?	100	4	5	4.34	0.476095
5	How complete is the system's functionality in storing and managing detection data?	100	3	5	4.14	0.804281
6	How comprehensive is the system's functionality in handling complex narcotics detection cases?	100	3	5	3.86	0.804281

Data analysis from respondents regarding the functionality of the drug detection system was conducted by measuring three main aspects: Functional Completeness, Functional Correctness, and Functional Appropriateness.

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Each aspect was evaluated through a series of questions covering minimum, maximum, average (mean), and standard deviation (SD) values to provide a clearer picture of user perceptions.

Functional Completeness (CP)

This aspect assesses how complete the system's functionality is in detecting and reporting narcotics detection results.

- **CP1:** Questions about the completeness of functionality in detecting various types of narcotics showed a minimum value of 2 and a maximum of 5, with a mean of 3.42 and SD of 0.96. These results indicate a significant variation in user perceptions, with some feeling the system is incomplete, while others feel it is very complete.
- **CP2:** For the completeness of the detection result report, the minimum value is 3 and the maximum is 5, with a mean of 3.93 and SD of 0.77. Most users feel that the system is quite complete in providing reports, although some feel dissatisfied.
- **CP3:** Questions about integration support with spectrometer tools showed a minimum value of 2 and a maximum of 4, with a mean of 2.99 and SD of 0.82. This indicates dissatisfaction in this area, with a clear need for improvement.
- **CP4:** Regarding guidance or assistance to users, the minimum value of 4 and maximum of 5, mean of 4.34, and SD of 0.48 indicate that most users feel that the system provides complete guidance, with high consistency in perception.
- **CP5:** For the system's ability to store and manage detection data, the minimum value of 3 and maximum of 5, mean 4.14, and SD 0.80 indicate general satisfaction, although there are some users who feel less satisfied.
- **CP6:** Questions about the system's ability to handle complex drug detection cases showed a minimum value of 3 and a maximum of 5, a mean of 3.86, and an SD of 0.80. This indicates variation in perception, with some users feeling less satisfied.

Functional Correction (CR)

This aspect assesses the accuracy and consistency of the detection results provided by the system.

- **CR1:** Questions regarding the accuracy of narcotics detection results showed a minimum value of 3 and a maximum of 5, with a mean of 4.41 and SD of 0.62. Users generally felt that the detection results were quite accurate, with good consistency.
- **CR2:** For accuracy in identifying types of narcotics, the minimum value of 4 and maximum of 5, mean 4.45, and SD 0.50 indicate a very positive and consistent perception.
- **CR3:** The question about the suitability of the detection results with user expectations showed a minimum value of 2 and a maximum of 4, a mean of 2.80, and an SD of 0.67. This indicates significant variation and higher dissatisfaction among users.
- **CR4:** Regarding the timeliness of detection result reports, the minimum value of 4 and maximum of 5, mean of 4.34, and SD of 0.48 indicate that users feel that the system provides reports in a timely manner.
- **CR5:** The question about the consistency of detection results for the same sample shows a minimum value of 4 and a maximum of 5, a mean of 4.47, and an SD of 0.50. This indicates that the system is considered very consistent by users.
- **CR6:** For the frequency of errors or failures in detecting narcotics, the minimum value of 3 and maximum of 4, mean 3.34, and SD 0.48 indicate concerns about the reliability of the system.

Functional Appropriateness (AP)

This aspect assesses the suitability of system functionality to user needs in the field.

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- **AP1:** Questions regarding the suitability of system functionality to the needs of narcotics detection in the field showed a minimum value of 3 and a maximum of 5, a mean of 4.60, and an SD of 0.62. Users felt that the system functionality was very suitable for their needs.
- **AP2:** For ease of use of the system without additional training, the minimum value of 3 and maximum of 5, mean of 4.07, and SD of 0.67 indicate that the system is quite easy to use, although some users felt the need for additional training.
- **AP3:** Questions about the relevance of the system's functionality to the tasks performed by prosecutors and field officers showed a minimum value of 2 and a maximum of 4, a mean of 2.99, and an SD of 0.82. This indicates variation in user perceptions, with some feeling that the system is less relevant to their tasks, thus providing room for improvement.
- **AP4:** Regarding the efficiency of the system in processing and analyzing narcotics detection samples, the minimum value of 4 and maximum of 5, mean of 4.34, and SD of 0.48 indicate that users feel the system is quite efficient, with high consistency in perception.
- **AP5:** Questions about the suitability of the system with existing infrastructure and policies in the Prosecutor's Office showed a minimum value of 3 and a maximum of 5, a mean of 4.14, and an SD of 0.80. This indicates that the system is considered quite suitable, although there is variation in user perceptions.
- **AP6:** For the suitability of the system with the intended use set by the Prosecutor's Office, the minimum value of 3 and the maximum of 5, mean 3.86, and SD 0.80 indicate that users feel the system is quite suitable, but there is room to improve this suitability.

Overall, the analysis shows that there is variation in user perceptions of the functionality of the drug detection system. Some areas, such as integration with spectrometers and relevance of functionality, show a need for improvement. However, on the other hand, many users are satisfied with the accuracy, consistency, and efficiency of the system. These results provide valuable insights for further development of the system to better meet the needs of users in the field.

DMAIC Results (Define, Measure, Analyze, Improve, and Control)

The purpose of improving the functionality of the narcotics detection system is to overcome technical constraints that often hinder the detection process, such as processing failures and incompatibility between the process in the field and the technical limitations of the system. In addition, the appearance and understanding of the application are often difficult for field officers to understand even after training, and unclear guidance makes it difficult to understand the technical use of tools and applications. The measurement results from the questionnaire showed variations in user perceptions regarding the completeness of functionality, accuracy of detection results, and relevance of the system to operational tasks. For example, low mean scores on questions regarding the completeness of functionality in detecting various types of narcotics and support for integration with spectrometers indicate the need for improvements in detection coverage and technical integration.

Dissatisfaction with the conformity of detection results to user expectations and reports of errors in detection also indicate problems with system reliability. The proposed improvements include improving the detection algorithm, optimizing the data analysis process, and adjusting system features to be more relevant to operational needs in the field. Control measures needed to maintain and improve improvements include periodic evaluation, reporting and feedback mechanisms from users, and documentation and standardization of the detection process. Thus, technical improvements and adjustments to functionality are expected to increase the efficiency and relevance of the system in supporting the work of field officers.

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Results Based on ISO 25010 Functional Suitability

The assessment of the narcotics detection system includes three main aspects: Functional Completeness, Functional Correctness, and Functional Appropriateness.

1. **Functional Completeness (CP):** This assessment covers how complete the system is in detecting various types of narcotics, providing reports, supporting integration with tools, providing guidance, managing data, and handling complex cases. If the mean from CP1 to CP6 is high and the standard deviation is low, it indicates that users feel the system is complete.
2. **Functional Correction (CR):** This aspect assesses the accuracy and consistency of the system in detecting narcotics as well as the frequency of errors. If the mean from CR1 to CR6 is high and the standard deviation is low, it indicates that users feel the system provides correct and consistent results, although there may be challenges in the timeliness of the results report.
3. **Functional Appropriateness (AP):** This assessment covers how well the system meets the needs of drug detection in the field, ease of use, relevance to the task, efficiency, compatibility with the infrastructure, and the purpose of use. If the mean from AP1 to AP6 is high and the standard deviation is low, it indicates that users feel the system is appropriate for their needs.

Discussion

Based on the DMAIC analysis applied to the narcotics detection system, the conclusion shows that this system has not fully met the Functional Suitability criteria according to the ISO 25010 standard. Several aspects, especially those related to the completeness of functionality (Functional Completeness) and suitability to operational needs (Functional Appropriateness), obtained results below expectations. This indicates that the system still has limitations in detecting various types of narcotics and less than optimal integration with external tools such as spectrometers. In terms of Functional Correctness, although some users were satisfied with the accuracy of drug detection, there was significant dissatisfaction regarding the consistency of results and the error rate in the detection process. This indicates that the reliability aspect of the system needs to be improved to better meet user expectations. In addition, the relevance of the system to operational tasks in the field is also considered inadequate, which requires feature adjustments to better support the practical needs of users.

Factors that are obstacles in this system include limited detection coverage, suboptimal integration, inconsistent detection results, and unclear usage guidelines. To overcome these obstacles, several strategies are proposed. First, to increase detection coverage, it is necessary to expand the database to include more types and samples of narcotics, as well as update detection technology with more sophisticated devices. Cooperation with research centers and laboratories is also needed to obtain the latest and valid data on the types of narcotics that may be found in the field. Second, optimizing integration between the system and external devices, such as spectrometers, requires the development of more efficient interfaces to ensure smooth integration. Improving interoperability through the implementation of better communication protocol standards will also ensure that various external devices can function with the system without problems. Routine testing and validation of all devices used is also needed to ensure optimal integration.

Third, to address inconsistencies in detection results, it is necessary to improve the accuracy of the narcotics detection algorithm used by the system to be more accurate and consistent in providing results. Periodic calibration must also be carried out to ensure that all system components function according to standards. Regular collection and analysis of user feedback can help identify and fix problems that cause inconsistencies. Fourth, to reduce the error rate or failure of the system in detecting narcotics, regular maintenance and system updates are essential to fix bugs and technical issues. Integrating more sophisticated and reliable detection technology will also help minimize the failure rate. In addition, developing a fast and effective error handling protocol is essential to mitigate the impact of detection failures.

Fifth, increasing the relevance of system features to operational tasks in the field requires an in-depth study of the operational needs of officers. Based on the results of the study, additional features can be developed or adjusted to be more effective in supporting field tasks, such as faster reporting and better device integration.

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Direct trials in the field also need to be carried out to ensure that the features developed are in accordance with operational needs. Sixth, clarifying the system usage guide or documentation for field officers can be done by creating a more detailed guide, including visual guides and video tutorials to facilitate understanding. The guide should be provided in digital format that can be accessed at any time by field officers through their devices. Periodic training and review sessions need to be held to ensure all users understand how to use the system effectively.

Seventh, improving training and socialization related to system usage requires the provision of more frequent and in-depth training sessions, which include not only theory but also hands-on practice. Interactive learning methods, such as simulations and case studies, can be used to enhance user understanding. Field mentor programs that can help users overcome technical obstacles encountered when using the system also need to be considered. Eighth, to improve the reliability of the system in handling complex cases, it is necessary to integrate more sophisticated technology, such as machine learning, which can improve the system's ability to process and analyze narcotics samples. Trials in various field conditions must also be carried out to ensure that the system is able to function properly in various situations. Backup and recovery protocols

Conclusion

Based on the research results, the Narcotics Evidence Detection System of the Republic of Indonesia Attorney General's Office has not fully met the characteristics of Functional Suitability as stipulated in the ISO 25010 standard. This is caused by several factors, including limited system coverage, lack of integration between components, and the low level of relevance of features to operational needs. These obstacles are the main obstacles that need to be overcome immediately through various development and improvement efforts. Strategies that can be taken to overcome this problem include system optimization, increasing integration between components, and improving the user interface to make it easier for employees in the field to use. With these steps, it is hoped that the system can support the implementation of tasks more effectively, efficiently, and in accordance with the established quality standards.

Thank You (optional)

Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a galley of type and scrambled it to make a type specimen book. It has survived not only five centuries, but also the leap into electronic typesetting, remaining essentially unchanged.

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