

The Effectiveness of Using Inaproc in the Procurement Process for Goods and Services

Setyo Yuwono

Kementerian Pendidikan Tinggi, Sains, dan Teknologi, Indonesia

Email: yuwono.21@mail.unnes.ac.id

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Abstract

The transformation of government procurement of goods and services in Indonesia increasingly relies on integrated digital platforms such as INAPROC to improve efficiency, transparency, accountability, and the quality of public services. This study aims to analyze the effectiveness of INAPROC in the procurement process by evaluating dimensions of process performance, including time and cost efficiency, information accuracy, and operational ease; governance, including transparency and accountability; and user experience, including ease of use and satisfaction. Employing a mixed-methods approach, this study surveys INAPROC users, including procurement officials, Commitment-Making Officials (Pejabat Pembuat Komitmen/PPK), system operators, and vendors, and complements the survey with targeted interviews to obtain deeper insights into user experiences. The analytical framework integrates the DeLone and McLean Information Systems Success Model and the Technology Acceptance Model (TAM) to provide a comprehensive evaluation. The findings indicate that INAPROC is highly effective in strengthening transparency and accountability in procurement governance; however, its practical efficiency remains constrained by limitations in system quality and support services. The study is expected to identify the key factors determining INAPROC's effectiveness and provide evidence-based recommendations for improving the quality of digital procurement services.

INTRODUCTION

Government procurement of goods and services is a strategic area that influences the quality of public spending and directly affects the quality of services delivered to the public. In many contexts, public procurement is also considered vulnerable to irregularities because it involves substantial budgets, power dynamics, and potential conflicts of interest (Boehm & Olaya, 2006). The e-government literature emphasizes that the use of information technology can foster openness and strengthen accountability mechanisms, particularly through the provision of information that is traceable and readily auditable (Bertot et al., 2010). Consequently, the digitalization of procurement through e-procurement has been promoted as an important instrument for improving efficiency while simultaneously reducing opportunities for corruption.

Numerous international studies indicate that e-procurement has the potential to reduce corruption risks and enhance process integrity by limiting monopolies of power and information asymmetry while strengthening transparency and accountability (Neupane et al., 2014). Operationally, the implementation of e-procurement in the public sector can accelerate procurement cycles, reduce administrative costs, and expand market access for suppliers, provided that system quality and business-process readiness are adequate (Croom & Brandon-Jones, 2007). However, these benefits are not automatically realized because user perceptions

of trust, service quality, and regulatory conditions influence both system success and perceived transparency (Aminah et al., 2018). Therefore, the effectiveness of e-procurement should be assessed not merely in terms of system availability but also in terms of how the system is used and the outcomes it generates.

In the Indonesian context, previous research on government e-procurement, including the implementation of the Electronic Procurement System (Sistem Pengadaan Secara Elektronik/SPSE), Electronic Procurement Services (Layanan Pengadaan Secara Elektronik/LPSE), and electronic catalogs, has revealed a relatively consistent pattern: effectiveness tends to improve when procedures are transparent and accessible, but it is often constrained by limitations in human resource capacity, infrastructure, and organizational support. A study of the Malang City Government indicated that e-procurement implementation was considered effective and more transparent despite challenges related to human resources, infrastructure, and centralized technical support (Habibi & Untari, 2018). Similar findings were reported in Surabaya, where goal achievement, integration, and adaptation were emphasized as indicators of e-procurement effectiveness (Dharmawan & Widiyarta, 2025). From a governance perspective, policy reviews have shown that differences in regulatory interpretation and leadership dynamics may lead to variations in implementation practices (Khairina & Dompok, 2022). Meanwhile, the transformation of electronic catalog systems, including feature enhancement, category management, notifications, and monitoring, requires stakeholder readiness and user training to ensure that efficiency and service-quality objectives are achieved (Ridwan et al., 2025).

The importance of the user perspective is also evident in studies of electronic catalogs and e-purchasing systems. Users may encounter navigation difficulties, interface complexity, and insufficient training, all of which may reduce procurement effectiveness (Putra, 2024). From the provider perspective, electronic catalog implementation influences both effectiveness and satisfaction, indicating that platform success is closely related to external user experience (Arifin et al., 2023). In the context of micro, small, and medium enterprises (MSMEs), the use of electronic catalogs in procurement may also affect business opportunities, suggesting that effectiveness can be assessed in terms of expanded economic access (Iqbal, 2020; Diani & Lubis, 2022). From a technical perspective, limitations in human resources and network or server capacity have frequently been identified as barriers to electronic procurement implementation (Juniawan et al., 2021). These findings reinforce the argument that the effectiveness of digital procurement platforms should be evaluated systematically by integrating process-performance indicators with user-experience indicators.

Theoretically, the effectiveness of a system such as INAPROC can be evaluated using information systems success and technology acceptance frameworks. The DeLone and McLean Information Systems Success Model identifies system quality, information quality, and service quality as key determinants of system use and user satisfaction, which ultimately contribute to net benefits (DeLone & McLean, 2003). The Technology Acceptance Model (TAM) explains technology adoption through perceived usefulness and perceived ease of use, which influence behavioral intention and actual system use (Davis, 1989). The Unified Theory of Acceptance and Use of Technology (UTAUT) further incorporates performance expectancy, effort expectancy, social influence, and facilitating conditions as determinants of technology acceptance and use (Aminah et al., 2018). Studies of e-procurement in Indonesia have also

applied information systems success frameworks to examine relationships among system quality, system use, and user satisfaction (Harjito et al., 2016) and have recommended the DeLone–McLean dimensions for evaluating e-government success (Saputro, 2015). Furthermore, research on e-procurement adoption intentions has reaffirmed the importance of transparency and accountability in encouraging adoption, particularly within public institutions (Habiburrochman & Fatimah, 2020).

The novelty of this research lies in its specific and integrated evaluation of INAPROC as a centralized e-procurement platform that consolidates multiple procurement mechanisms within a single digital ecosystem. While previous studies have examined e-procurement in Indonesia, they have predominantly focused on regional implementations, such as SPSE/LPSE in particular cities, or on specific features such as electronic catalogs. This study addresses that gap by integrating the DeLone and McLean Information Systems Success Model and TAM to evaluate INAPROC's operational performance, governance dimensions, and user experience from a multistakeholder perspective. Through this approach, the study seeks to identify the factors that enhance or constrain INAPROC's effectiveness.

Against this background, this study aims to evaluate the effectiveness of INAPROC in the procurement of goods and services from the user perspective. Specifically, it examines process effectiveness, including efficiency, operational ease, and information quality; evaluates governance dimensions, including perceived transparency and accountability; and identifies determinants of effectiveness based on information systems success and technology acceptance frameworks. The findings are expected to provide empirical evidence for strengthening procurement policy and supporting the continuous improvement of the INAPROC platform, particularly in relation to system quality, service support, and user training, so that the benefits of procurement digitalization can be more fully realized.

METHOD

This study employed a mixed-methods approach by combining quantitative survey data and qualitative interview data to evaluate the effectiveness of INAPROC utilization. An explanatory sequential design was used, in which quantitative data were collected and analyzed first, followed by in-depth interviews to provide contextual explanations of the findings (Venkatesh et al., 2013; Fetter et al., 2013). The study was conducted from November 3 to 15, 2025, and involved 11 INAPROC users selected through purposive sampling based on their experience using INAPROC in procurement processes and their willingness to participate (Palinkas et al., 2015).

Data were collected using an online questionnaire and semi-structured interviews. The questionnaire was distributed through Google Forms and used a five-point Likert scale to assess respondents' perceptions of INAPROC effectiveness (Jamieson, 2004) (see Table 1). Semi-structured interviews were conducted to explore users' experiences, challenges, and recommendations for system improvement. The integration of quantitative and qualitative data provided methodological triangulation and strengthened the credibility of the findings (Carter et al., 2014). Quantitative data were analyzed using descriptive statistics, including means and percentages, to summarize response patterns for each indicator (Norman, 2010).

Table 1. Indicators and Google Form Questionnaire Items (Likert Scale 1–5)
Scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

No.	Question
A. Ease of Use (Usability)	
1.	INAPROC is easy to learn when first used.
2.	INAPROC's menus and navigation are easy to understand.
3.	I can complete key tasks in INAPROC without assistance from others.
4.	INAPROC's interface/display makes it easy for me to find the features I need.
B. System Quality	
5.	INAPROC runs stably (rarely experiences errors/interruptions).
6.	INAPROC's access speed is adequate when I use it.
7.	INAPROC's features function according to the needs of the procurement process.
8.	INAPROC supports my work consistently (does not change unpredictably without clarity).
C. Information Quality	
9.	The information displayed by INAPROC is accurate and reliable.
10.	Procurement information in INAPROC is presented clearly and is easy to understand.
11.	The information I need is fully available for making decisions/taking action.
12.	Information/activity history is easy to trace back when needed.
D. Service/Support Quality	
13.	Guidance/help for using INAPROC is easily accessible (FAQ/instructions).
14.	Technical support/customer service/helpdesk is responsive when problems occur.
15.	Problem resolution (troubleshooting) in INAPROC is carried out well.
E. Process Efficiency	
16.	INAPROC helps speed up the stages of the procurement process I work on.
17.	Using INAPROC reduces manual administrative work.
18.	INAPROC helps reduce process errors (e.g., input/upload/completeness).
F. Transparency & Accountability (Governance Outcomes)	
19.	INAPROC makes the procurement process more transparent for stakeholders.
20.	The process trail (log/history) in INAPROC facilitates auditing and tracing.
21.	INAPROC helps ensure process compliance with rules/procedures.
G. Overall Satisfaction & Effectiveness	
22.	Overall, I am satisfied using INAPROC.
23.	INAPROC effectively helps me complete procurement work.
24.	I am willing to continue using INAPROC for future procurement processes.
25.	In general, the benefits of INAPROC outweigh the obstacles I have experienced.

Qualitative data from the interviews were analyzed using thematic analysis, following the stages of data familiarization, coding, theme searching, theme reviewing, theme naming, and report writing (Braun & Clarke, 2006). The integration of survey and interview results was conducted during the interpretation phase to explain the reasons behind high or low survey scores in specific aspects (Fetters et al., 2013).

RESULTS AND DISCUSSION

The results of the user-perception survey show that all 25 questionnaire items (I1-I25) obtained a mean score of at least 3 on a 1-5 Likert scale. This means that, for every measured

aspect, user responses did not fall into the “disagree” or “strongly disagree” categories, but rather ranged from neutral toward agree. This pattern provides an initial indication that, from the user's perspective, the utilization of INAPROC is perceived as reasonably effective in supporting the goods and services procurement process, with no single aspect showing a critical, systemic problem. However, because a score of “ ≥ 3 ” can still include neutral ratings, the interpretation of effectiveness needs to go further by identifying which variables are strongest and which remain weak points, so that the conclusion does not stop at “fairly good” without diagnosis.

When the survey items were grouped into seven evaluation variables, differences in strength across dimensions became apparent, as summarized in Table 1 below.

Table 2. Mean Score per Evaluation Variable

Evaluation Variable	Items	Mean Score
Ease of Use	I1-I4	3.85
System Quality	I5-I8	3.60
Information Quality	I9-I12	3.80
Service/Support Quality	I13-I15	3.50
Process Efficiency	I16-I18	3.80
Transparency & Accountability	I19-I21	4.00
Overall Satisfaction & Effectiveness	I22-I25	4.00

The two highest-scoring variables were Transparency & Accountability and Overall Satisfaction & Effectiveness (4.00 each). By contrast, the lowest scores - though still above 3 - were found in Service/Support Quality (3.50) and System Quality (3.60). The survey results thus tell a fairly clear story: INAPROC's value is felt most strongly in governance impact and end outcomes, while the main constraints appear at the daily operational layer, namely system performance and service support.

Transparency, Accountability, and Traceability

Interview results clarify why this score pattern emerged. Respondents tended to rate INAPROC as effective when discussing process traceability, document organization, and activity trails, as illustrated in the following excerpts.

1. "If asked about progress, you just check the history. It's clearer and easier to account for." (R3)
2. "The process trail helps whenever there is an inspection or clarification needed." (R7)

However, respondent narratives also consistently explained why system and service quality did not rank as high as the governance dimension.

3. "Access is sometimes slow, especially during peak hours." (R2)
4. "When there's an issue, the response is sometimes not quick, or it doesn't resolve things right away." (R9)

The interviews therefore serve not merely to “echo” the survey results, but to provide causal context: users acknowledge INAPROC's substantial benefits, yet that experience can be diminished when the system is unstable or support is less responsive. The survey places Transparency & Accountability among the highest-scoring dimensions (mean 4.00), showing that users perceive INAPROC as effective primarily as a governance tool - processes become easier to trace, stages are clearer, and process evidence is better organized. In procurement,

“effective” often does not stop at whether a process is fast, but whether it is defensible and traceable, which explains why respondents tend to rate the system positively despite lingering technical friction.

Interviewees described the audit trail/activity history as a source of administrative security. When clarification, inspection, or proof is needed, users do not need to rely on separate documents or informal communication - they can simply refer to the system's history. Analytically, INAPROC functions as an “institutional mechanism” that narrows room for interpretation, because user activity is documented. This means the increase in transparency and accountability is not solely a result of individual behavior, but a consequence of a system that enforces procedural regularity - an important finding, as it shows INAPROC's effectiveness has reached a fundamental aspect of procurement: procedural compliance and process openness. This implies that strengthening traceability-related features (logs, stage status, document archives, activity chronology) is a core asset that should be maintained and enhanced, and that policymakers should judge INAPROC's success not solely by “speed” indicators but also by the “process-provability” perceived by users.

Functional Satisfaction and Its Risks

The Overall Satisfaction & Effectiveness dimension likewise obtained the highest score (mean 4.00), indicating that most users rate INAPROC as effective in aggregate. A closer reading, however, shows that this high satisfaction is functional in nature: users are satisfied because the system's broader objectives - orderly processes, traceability, strengthened governance - are achieved, not because the usage experience is free of obstacles.

Interviews reveal a form of “rational tolerance” among users: they accept certain friction (such as slowness during peak hours or the need to adapt to particular steps) as long as the system continues to deliver its core, irreplaceable benefits - orderly processes and clear evidence. Analytically, this is important because it confirms that satisfaction in the context of a procurement system is not equivalent to satisfaction with a consumer application. INAPROC users judge the system based on whether it helps them stay “procedurally safe” and “get administrative matters done,” rather than on interface comfort alone.

Nevertheless, this functional satisfaction also carries risk: if operational friction increases (e.g., more frequent disruptions, slower support), satisfaction could decline quickly, as users would judge the system as no longer consistently supporting the completion of their work. In other words, the currently high satisfaction score can be understood as a window of opportunity: the system is already trusted, and what remains is ensuring operational quality so that trust is not eroded. Practically, this finding confirms that effectiveness-improvement strategies should focus on what most disrupts users' work, rather than merely adding new features.

System Quality and Support: The Critical Bottleneck

The two lowest-scoring dimensions - though still ≥ 3 - are System Quality (3.60) and Service/Support Quality (3.50). Analytically, this is the most crucial finding, as these two dimensions act as a lever for all other dimensions: a transparent and informative system can still be considered ineffective if users are frequently hindered by slow performance, errors, or unresponsive support.

Interviews clarify this bottleneck mechanism. When the system is slow or unstable, users experience not only annoyance but operational consequences: repeated data entry,

delayed document uploads, waiting for the system to return to normal, or switching temporarily to manual coordination. In the procurement process, such disruptions carry hidden costs: wasted working time, increased potential for error, and disrupted stage timelines - meaning performance issues are not merely a technical matter, but a matter of process effectiveness. Inconsistent support quality further reinforces the bottleneck: procurement-system users often face specific cases (failed submissions, document validation, data mismatches) that require specific and fast assistance; when the helpdesk is slow or guidance lacks context, users spend time on trial and error or seek informal solutions, reducing efficiency and undermining the procedural certainty that is the primary reason users rate INAPROC as effective.

In conclusion, this third finding shows that INAPROC's effectiveness is already “good by design intent,” but part of its benefit remains “locked” behind operational quality. The most impactful improvement priorities are therefore not new modules, but rather: (1) performance stabilization, particularly during peak hours; (2) reliability improvement at critical steps (upload/submit/validation); and (3) strengthened case-based support (clear troubleshooting SOPs plus consistent response). Resolving this bottleneck has strong potential to raise the efficiency, ease-of-use, and satisfaction dimensions, as the main obstacles eroding the daily user experience would be reduced.

CONCLUSION

This study evaluated the effectiveness of INAPROC in the procurement of goods and services based on the perceptions of 11 users who completed an online questionnaire and participated in interviews conducted between November 3 and 15, 2025. The quantitative findings showed that all assessment items (I1–I25) achieved an average score of at least 3.00, indicating that users generally perceived INAPROC as moderately effective to effective in supporting procurement activities. At the variable level, Transparency and Accountability (mean = 4.00) and Overall Satisfaction and Effectiveness (mean = 4.00) emerged as the strongest dimensions. These findings indicate that INAPROC was perceived as effective in strengthening process traceability, facilitating status tracking, and documenting procurement stages, all of which are important elements of procurement governance. The qualitative findings supported these results, as respondents emphasized that INAPROC helped clarify process status, organize documentation, and provide an activity trail that facilitated clarification and audit processes. However, day-to-day operational effectiveness remained suboptimal, particularly in relation to System Quality (mean = 3.60) and Service and Support Quality (mean = 3.50). Respondents reported issues such as slow system access during certain periods, technical errors that required repeated procedures, and support services that were not always timely or sufficiently tailored to specific problems. Overall, the findings suggest that INAPROC was effective in strengthening procurement governance; however, improvements in system stability and user support are necessary to enhance operational efficiency, reduce user difficulties, and increase overall satisfaction.

This study has several limitations that should be considered when interpreting the findings. First, the relatively small number of participants (11 users) limits the generalizability of the results to the broader population of INAPROC users across agencies, regions, and occupational roles. Accordingly, the findings should be interpreted as an exploratory assessment of INAPROC effectiveness from the user perspective. Second, the study relied

primarily on self-reported perceptions collected through questionnaires and interviews, which may have been influenced by subjective experiences, recent interactions with the system, and differences in users' digital proficiency. Third, the relatively short data-collection period, from November 3 to 15, 2025, may not have captured variations in INAPROC performance across different procurement phases, particularly during peak procurement periods such as the end of the fiscal year. Fourth, the study did not incorporate objective system-performance indicators, such as response time, transaction or upload success rates, system downtime, or helpdesk ticket records. Consequently, assessments of technical performance and support quality were based primarily on user experience rather than verified operational data.

Future research should involve a larger and more diverse sample representing different user roles, such as procurement officials, Commitment-Making Officials (Pejabat Pembuat Komitmen/PPK), system operators, and vendors, as well as users from different agencies and geographic regions. This broader coverage would enable comparisons across user groups and improve the robustness of the findings. Future studies should also integrate survey and interview data with objective system-performance indicators, including performance logs, procurement-stage completion times, transaction-failure rates, system downtime, and helpdesk resolution records. In addition, inferential statistical analysis could be employed to examine relationships among system quality, service quality, transparency, user satisfaction, and overall effectiveness. Further usability and service-quality evaluations are also recommended to identify specific system processes that create operational bottlenecks and determine the types of technical support most needed by INAPROC users.

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