

Unveiling the key drivers of effective e-procurement in local government: a mixed-method analysis

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Abstract

Electronic procurement (e-procurement) based on e-procurement quality dimensions. In this unique case, the realisation of electronically conducted procurement has shown a declining trend over the past five years. Adopting a mixed-methods approach that combines qualitative interviews and quantitative surveys with 200 respondents, this research analyses the quality dimensions of e-procurement services and their effects on procurement outcomes. Data processing was carried out using the SPSS Version 29.0 software application, starting from validity, reliability and factor analysis tests. The findings reveal a new variable as a factor influencing the performance and quality of e-procurement, namely the regulatory variable. The results of the factor analysis tests indicate that regulatory factors, with variable indicators, include regulations that support the integration of electronic procurement with the financial system, laws that enable the formulation of price standards relevant to e-catalogues, and regulations that facilitate the development of price standards. Training is also a strategic issue that has been found to have a significant influence on the quality. The implication is that users, in this case, must pay attention to the formation of the first factor, especially to the training and regulation factors.

Keywords:

e-procurement quality; factor analysis; procurement performance; regulatory factors; training.

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Introduction

The declining realisation of e-procurement, along with the lack of prior studies that systematically analyse this issue through the dimensions of service quality in local government, constitutes the main motivation for this research. Procurement of goods and services is a fundamental function for governments to achieve their objectives in service delivery and meet public needs. Governments are required to adopt electronic-based systems, including the digitalisation of procurement processes through e-procurement. In this framework, e-procurement refers to integrated, web-based systems that support purchasing activities such as needs identification, searching, buying, negotiating, ordering, receiving, and post-purchase evaluation (Croom & Brandon-Jones, 2007).

The establishment of an efficient and successful process for the purchase of products and services is one of the goals of putting e-procurement into practice. Reduced unlawful purchases, quicker cycle times, more organised data for reporting, and tighter connectivity between back-office systems and procurement operations are all examples of e-procurement efficiencies. Both the private and public sectors have benefited from the introduction of electronic procurement. Particularly in the public sector, e-procurement's impact is crucial to achieving efficiency and effectiveness in three areas: balanced regional development conditions, healthy competition among businesses, and government administration's transparency and accountability in the efficient use of public resources (Mavidis & Folinas, 2022).

Organisations adopt e-procurement systems because of the many benefits offered by them, including better data management (e.g., spend analysis) and integration with other internal systems, which in turn enables faster cycle times, improved tracking capabilities, improved error elimination, and higher quality purchasing decisions (Ramkumar et al., 2019). This, in turn, enhances user satisfaction and encourages more informed purchasing behaviour, which is directly consistent with sustainable development objectives (Ragin-Skorecka & Hadas, 2024). However, on the other hand, e-procurement, if viewed from the perspective of current business actors, also has the issue of problems in the procurement process, specifically, mistakes in the procurement process are common. For this reason, an effective and reliable procurement system is critical to the organisation's performance. Electronic procurement (e-procurement) promises to help overcome problems and challenges, profit-seeking, and inefficiency (Tiwari et al., 2019).

In the resource-based view, the quality of the e-procurement services played a role in determining buyer satisfaction at the user level. These services are viewed as resources (Ramkumar et al., 2019). In addition, ineffective IT infrastructure can result in extra expenses and lower e-procurement process quality, which affects the user context and, ultimately, internal user happiness (Brandon-Jones, 2017). This study also aims to identify the reasons for the decline in the effectiveness of

e-procurement, despite the relatively small amount of the procurement budget allocated for goods and services. Procurement of Goods and Services is carried out using Electronic Procurement (e-procurement), known as the Electronic Procurement System (SPSE). The Government Goods and Services Procurement Policy Institute created the Electronic Procurement System (SPSE), an electronic system that comprises hardware and software. Its architecture began with the procurement planning system and continued with procurement preparation, provider selection, contract implementation, work handover, provider management, and electronic catalogue ([Government Goods and Services Procurement Policy Institute, 2010](#)).

Acquisition execution is the spine of an organisation's victory since it contributes to competitive buying and securing quality products that put the organisation's products or services within a competitive edge in the market. Be that as it may, on a few occasions, poor procurement execution has caused financial losses in both the private and public sectors due to the conveyance of substandard work materials, loss of value for money, and increased costs. Poor procurement performance has also reduced private-sector profitability ([Waithaka & Kimani, 2023](#)). The components of the electronic procurement strategy have been fulfilled in their entirety. The SPSE cycle is a usage of Presidential Direction Number 12 of 2021 concerning government procurement of goods/services, where each stage of the regulation is integrated into the SPSE, and then, gradually, the procurement process is carried out by each procurement actor within their authority. Procurement actors consist of buyers or users in the cycle called commitment officials, officials who are authorised to carry out the procurement process are called working groups/procurement officials and suppliers. In its usage, e-procurement within the local government is still not running ideally; in fact, in the last 5 years, the realisation of procurement carried out electronically has experienced a downward trend, as seen in Table 1.

Table 1.
Realisation of e-procurement in local government

No	Year	Provider method procurement plan (IDR)	Realisation of e- procurement (IDR)	(%)
1	2019	264,000,000,000	244,000,000,000	92
2	2020	213,000,000,000	197,000,000,000	92
3	2021	307,000,000,000	271,000,000,000	88
4	2022	315,000,000,000	275,000,000,000	87
5	2023	335,000,000,000	263,000,000,000	78

Source: Authors' work (2025)

In the period from 2019 to 2023, the total expenditure budget planned through procurement using the provider selection method has increased, but the realisation of procurement carried out electronically has decreased. Therefore, solutions and steps must be taken immediately so that in the following year, the

process of procuring goods and services mostly be carried out electronically, to be able to find this solution, the step that must be taken is to identify the factors that influence the quality of e-procurement, therefore, the mixed methods design was necessary to capture both the complexity of practice and the generality of patterns (statistical validation of factors). This combination provides a more comprehensive and credible answer to the research question. The selection of objects and novelty in this research is motivated by the absence of research that focuses on improving e-procurement in terms of quality dimensions. While these studies provide valuable insights, they rarely examine the issue from the perspective of quality dimensions of e-procurement services, such as training, content, usability, and regulatory alignment. In particular, studies using the framework of [Brandon-Jones \(2017\)](#) have been applied in private-sector or developed-country contexts, with limited application in local governments in Indonesia, the declining proportion of electronic procurement realisation despite increasing budgets (2019–2023), underscores the urgency of analysing e-procurement through a quality lens. This makes local government not only a relevant but also a unique case where identifying quality dimensions is essential to reverse the declining trend. This study measures e-procurement quality using a dimension-based measurement approach, in which six dimensions and 30 indicators from [Brandon-Jones \(2017\)](#) were then tested using validity, reliability, and factor analysis to identify the underlying factors influencing e-procurement quality. The results of this factor analysis can later be used as a recommendation for improvement in improving the quality of e-procurement of local government.

Literature review

Electronic procurement (e-procurement) has been widely recognised as a tool to enhance efficiency, transparency, and accountability in government procurement ([Aman & Kasimin, 2011](#); [Toktaş-Palut et al., 2014](#)). However, the effectiveness of e-procurement depends not only on system adoption but also on the quality of services provided through the platform. To conceptualise e-procurement quality, this study refers to [Brandon-Jones \(2017\)](#), who proposed six dimensions: specifications, process, functionality, content, training, and professionalism. The government must demonstrate a significant commitment to the development of IT infrastructure to facilitate the seamless adoption of e-procurement in the public sector. Additionally, as e-procurement has its security concerns, the proper rules, procedures, and regulations must be put into place to govern the entire system. Several studies ([Desmond et al., 2019](#); [Hakim et al., 2020](#)) emphasise that the effectiveness of e-procurement depends on adequate IT infrastructure, strong regulatory procedures, and continuous training for procurement practitioners. Electronic procurement, or "e-procurement," is the term for the use of integrated communication systems (usually web-based) to complete all or a portion of the purchasing process. This process can involve many

steps, starting with the users' initial needs assessment and continuing through searching, negotiating, ordering, receiving, and post-purchase reviews (Croom & Brandon-Jones, 2007). E-procurement, to put it simply, is the purchasing process flow that removes the need for paper-based documents like purchase orders and requisition forms.

Online auctions, where contracts and assets are won and dachyed, are one way that e-procurement is demonstrated. Additionally, it makes use of e-catalogues, which display purchase orders, invoices, and delivery confirmations generated electronically (Desmond et al., 2019). Potential customers and suppliers come together on e-procurement platforms to create a two-way networking platform that facilitates the matching of these two things (Hong & Shao, 2021). The practice of methodically enhancing people's knowledge and abilities relevant to their jobs to enhance performance is known as training. Training is provided to improve the skills, knowledge, and attitudes of employees in the organisation. By providing training, development, and education for employees at the right time, the organisation can have a significant impact on increasing their productivity, knowledge, loyalty, and contribution (Mohammed et al., 2020),

Integrity and a sense of purpose are key components of this third component. Along with having the "capacity and disposition to work according to the best standards in the field in a way that serves society at large," it also calls for accountability for the calibre of one's work (Andreassen & Natland, 2022). E-procurement is a public procurement method that makes use of internet-based communication and information technology, Increased efficiency, accountability, and transparency, as well as increased market access, healthy corporate rivalry, and ease of monitoring and auditing procedures, are the goals of e-procurement (Dachyar & Karenina, 2020). Digital information's subject, kind, or unit is called content. Text, pictures, graphics, audio, video, documents, reports, and more can all be considered forms of content (Simarmata, 2010). Using an e-procurement system is crucial to achieving process efficiency in the supply chain. There is a tremendous drive from both the public and private sectors to build electronic procurement systems because they drastically cut costs and improve supply operations. Preparing supply staff to utilise e-procurement is a critical first step in making sure the system works well and is routinely used for the majority of purchase scenarios (Purchase & Dooley, 2010). There are two main categories of critical success elements for e-procurement implementation: technology and human aspects. Technical issues are those that rely on technology and how it is used, whereas human aspects are issues that depend on human behaviour and abilities. Security, authentication, and system integration are examples of technological factors. Aspects of both groups are included in change management, e-procurement deployment techniques, process reengineering, performance measurement, and technology standards (Vaidya et al., 2006). According to the e-procurement vision, society and the business sector will have better and more

equitable access to information as well as improved services and procedures (Kaliannan et al., 2009). The government sector faces several problems in implementing effective e-procurement, including those of software integration, data management. Roll-out plans, legal and administrative procedures, IT infrastructure, outsourcing contracts, and IT skills (Aman & Kasimin, 2011).

Inadequate information technology and supplier/business partner infrastructure availability are considered the most important obstacles in implementing e-procurement (Toktaş-Palut et al., 2014). The government must commit to developing an IT infrastructure to enable seamless e-procurement adoption. Because e-procurement raises security concerns, clear rules and training programs are required to ensure safe implementation (Desmond et al., 2019). The usage of e-procurement is strongly influenced by system requirements, implementation management, changes in organisational characteristics, changes in governance structure, and changes in overall acquisition costs (Hakim et al., 2020).

Research method

Sampling techniques

This research adopts an explanatory sequential mixed-method design that combines qualitative and quantitative approaches, enabling a more comprehensive analysis. A qualitative study helps to identify new factors and contextual issues, while a quantitative study statistically validates these factors and measures their impact. The first study employs a qualitative approach by conducting face-to-face semi-structured interviews with key informants who play a central role in e-procurement. These informants were selected based on their authority and position in the development and management of the e-procurement process within the local government in Indonesia. The participants include six members of the procurement service unit working group team and one structural official serving as the head of the procurement section for goods and services. The second study employs a quantitative approach by distributing questionnaires through the Google Form instrument with a sample size of 200 individuals who procure goods and services as e-users of procurement. Respondents were chosen based on their role in executing the procurement process and were directly involved. The operational concept within the scope of the research provides an explanation of each variable contained in this study. Factors that shape e-procurement quality are measured by six dimensions/variables and 30 (thirty) variable indicators, which are supported by previous works by (Brandon-Jones, 2017) as shown in Appendix 1.

Measurement

In Study 1 (qualitative research), interview guidelines were developed based on prior literature (Croom & Brandon-Jones, 2007). The interviews were designed

to capture perceptions of e-procurement quality, explore challenges in implementation, and identify potential new factors. In Study 2 (quantitative research), a structured questionnaire was employed. The items were adapted from previously validated studies on e-procurement quality and user satisfaction and complemented by new items identified during Study 1. This approach ensured that the instrument not only reflected established dimensions of e-procurement quality but also incorporated context-specific factors emerging from local government case.

Informed consent

All participants were informed of the research objectives, confidentiality assurances, and the voluntary nature of participation. Written consent was obtained prior to data collection, following ethical research practices.

Data analysis

The qualitative study (study 1) began by conducting face-to-face semi-structured interviews with one head of the procurement department and six members of the procurement working group. These interviews used single case study techniques to identify the best and worst aspects of e-procurement provision, and to explore recommendations for improvement. The interview results show that there is a new variable as a factor that influences the quality of e-procurement in local government. These variables are related to regulations with variable indicators, including regulations that support the integration of e-procurement with the financial system, regulations that must be able to develop price standards that are relevant to e-catalogues, and regulations that can accommodate certification training needs. Overall, the variables along with variable indicators and the results of new variable findings are presented in Appendix 2 and Appendix 3. From the results of the interviews, it was also found that there were factors that became strategic issues and problems that reduced the performance and quality of e-procurement in local government. These factors include training and regulatory dimensions.

Primary data in quantitative research (study 2) was used in this research by distributing questionnaires to procurement actors in local government, namely 200 people. The respondent data consists of 80 commitment making officials (40%), 30 procurement officials (15%), 84 technical activity implementing officials (42%), and 6 operators (3%). Meanwhile, in terms of positions in the organisation, there are 57 heads of divisions (28,5%). Subdistrict heads as many as 3 people (1.50). Heads of villages as many as 17 people (8.50%). Heads of sections as many as 7 people (3.50%). Heads of sub-divisions/heads of sections/functional officials equivalent to echelon IV as many as 110 people (55%), executive staff as many as 6 people (3%). The quantitative results will be

tested quantitatively using the factor analysis method using SPSS Version 29.0 software.

Results

Qualitative findings (study 1)

The qualitative interviews with seven key informants (six members of the procurement service unit working group and one head of procurement section) revealed a new factor influencing e-procurement quality, namely regulation. In addition, training was consistently identified as a strategic issue that significantly affects e-procurement performance. Limited certified procurement personnel were found to hinder the effectiveness and speed of procurement processes. These qualitative insights informed the development of the survey instrument in study 2.

Quantitative findings (study 2)

The results of descriptive statistics by adding one new variable according to the results of the interview. This research identifies regulation as a new variable or additional factor. Regulation encompasses indicators such as regulatory support for integration with financial systems, the ability to formulate relevant price standards in e-catalogues, and the accommodation of certification training requirements. These findings from Study 1 informed the design of the quantitative survey in Study 2 and provided the conceptual foundation for introducing the regulation factor as a novelty in this research.

Based on the respondent's answers to the questionnaire that had been given, we were able to provide the standard deviation. Based on Appendix 4 in the “average” column, it can be seen that all respondents' e-procurement quality indicators are in the high and very high categories, namely having an average of more than 4.08 to 4.44. The indicator with the highest average is the ease of access to training and regulatory information that supports the integration of e-procurement with the financial system, with an average of 4.44. At the same time, the lowest indicator is the speed of making orders and the preparedness of procurement personnel in providing consultation services, namely 4.08. The average of all e-procurement quality indicators is 4.23, which is in the high category.

Validity testing of the research instrument was carried out on 200 respondents. Test analysis is carried out using tests of person correlation as shown in Appendix 4. Validity test column shows that the person correlation results for all variable indicators are greater than the $r_{table} > 0,138$ (for a sample size of 200) and have a significance value below 0.05, so it can be stated that all variables are declared valid.

This study consistency was measured using the reliability instrument test in this study. A figure known as the dependability coefficient value empirically indicates whether a system is reliable or not as in. Reliability test column shows

that the findings test allow for the conclusion that the same object can be measured in this study, and the same consistent data will be obtained with a Cronbach alpha score of more than 0.60, all statement items are considered credible.

Factor analysis using SPSS 29.0 software tools, the data was processed on variables deemed valid and reliable for the factor analysis step. The first step in factor analysis is to determine whether the value is greater than the KMO and Barlett's test values, which are over 0.5, using KMO, Barlett's test, and MSA (Measure of Sampling Adequacy). The KMO test stage and Barlett's test comprise study 1, or what is sometimes referred to as the first step in factor analysis. The purpose of this step is to determine the validity of the study factors; hence, the KMO and Barlette's test numbers which included a value of $0.829 > 0.5$ for the Kaiser-Meyer Olkin (KMO) measure of sampling adequacy and a significance of $0.000 < 0.05$ for the Bartlett's test of sphericity, it can be said that factor analysis is the appropriate method for conducting analysis testing factors.

The MSA (Measure of Sampling Adequacy), based on Appendix 4, in the MSA test column, it can be explained that there are two indicator variables that are reduced because the MSA value is < 0.50 , namely the indicator variables are speed of order creation and personnel are very concentrated and focused on procurement problems, for other indicator variables the value is higher than 0.5 so that testing can be carried out at the next necessary study. The total variance prepared test carried out is the next step in the factor procedure of this research.

The number of factors generated is described by total variance explained, to ascertain the factors that were formed. Thus, it is evident that the eigenvalue needs to be greater than 1. If it is less than one, no factors have developed, when determining the variance of the total number of variables, the eigenvalue indicates the relative significance of each component. From highest to smallest value, the eigenvalue numbers are always organised in this manner. A table with the total variance explained test findings, as shown in Table 2. Variance can be explained in two ways, namely by looking at initial Eigenvalues and extraction sums of Squared Loadings. Initial Eigenvalues indicate the level of importance of the factors formed from the variables being tested. The condition for a factor that is formed to meet the requirements in the test is if the Initial Eigenvalues > 1 . Factors that meet this are indicated by the Extraction Sums of Squared Loadings section. In this test, eight factors were formed that met the requirements. Factor 1 has an eigenvalue of 8.921 and can explain 28.778% of the variance. The second factor has an eigenvalue of 2.827 and can explain 2.827% of the variance, the third factor has an eigenvalue of 2.114 and can explain 6.819% of the variance, the fourth factor has an eigenvalue of 1.681 and can explain 5.424% of the variance, the fifth factor has an eigenvalue of 1.551 and can explain 5.005% of the variance, the sixth factor has an eigenvalue of 1.498 and can explain 4.834%, the seventh factor has an eigenvalue of 1.287 and can explain 4.153% of the variance, the eighth factor

has an eigenvalue of 1.115 and can explain 3.598%. The total variance that can be explained by the eight factors is 67,729%.

Table 2,

Total variance explained test results

Factor	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	8.921	28.778	28.778	8.921	28.778	28.778	4.218	13.605	13.605
2	2.827	9.119	37.897	2.827	9.119	37.897	4.194	13.530	27.135
3	2.114	6.819	44.716	2.114	6.819	44.716	2.410	7.773	34.908
4	1.681	5.424	50.140	1.681	5.424	50.140	2.333	7.525	42.434
5	1.551	5.005	55.145	1.551	5.005	55.145	2.161	6.970	49.403
6	1.498	4.834	59.978	1.498	4.834	59.978	1.937	6.249	55.653
7	1.287	4.153	64.131	1.287	4.153	64.131	1.912	6.167	61.820
8	1.115	3.598	67.729	1.115	3.598	67.729	1.832	5.909	67.729

Source: Authors' work (2025)

With the greatest loading factor value, an indication is said to function as a forming factor. Also shows the results of rotation to clarify the position of a variable in a factor, explaining the distribution of variables more clearly and realistically, as shown in Appendix 4. In the rotated column which shows the result of rotation to clarify the position of a variable on a factor. From the explanation of the factor analysis of the rotation model as seen in Appendix 4 can be obtained that the results of the factor analysis are divided into eight factors with the members of each factor arranged as shown in Table 3.

Discussion

This study shows that most of the factors influencing e-procurement quality, as presented in the 2017 research (Brandon-Jones, 2017), remain valid, with procurement actors in the public sector still critical of most quality dimensions. The findings of factor analysis testing and interviews indicate that there are thirty indicators and six variables that determine the quality of e-procurement (Brandon-Jones, 2017). Two indicator variables are reduced and have less influence on the quality of e-procurement, namely the variable indicator speed of order creation and procurement personnel who are very concerned and focused on procurement problems. Other results show that new variables and their variable indicators have been found that have an influence on the quality of e-procurement based on the results of factor analysis tests, namely regulatory variables with variable indicators including regulations that support the integration of e-procurement with the financial system, regulations must be able to formulate price standards that are relevant to e-catalogs, as well as regulations must be able to develop price standards that are relevant to e-catalogs.

Based on the results of the factor conclusions, factor 1 is the most dominant factor influencing the quality of e-procurement. These factors include ease of access to training information, ease of search system, availability of certification training, availability of suppliers according to user needs, regulations that are can

accommodate certification training needs, and speed of the navigation system. Factors related to ease of access to training information and availability of certification training are variable indicators of the training variable. Training is a strategic issue that currently greatly influences the quality of e-procurement. Certified procurement personnel are the main requirement for procurement actors to be able to carry out e-procurement processes.

Table 3.

Factor conclusion

Factor	Indicator variable
1	Contents supplier availability according to user needs Ease of search system Availability of certification training Ease of access to training information Regulations that are able to accommodate certification training needs
2	Invoice integration with the financial system Ease of reporting system Display and function reliability Suitability/reasonableness of e-catalogue prices Suitability of training materials Regulations must be able to set price standards that are relevant to e-catalogues
3	Procurement personnel have good competence Procurement personnel build good communication with the supplier Procurement staff are able to solve problems quickly Procurement staff can keep secrets well Procurement personnel provide friendly service
4	For integrating e-proc with the financial system Ease of marketplace finding suppliers and goods/services Regulations that support the integration of e-proc with the financial system
5	Ease of authorization system Effective stages from user to supplier Speed of receipt of order letter by supplier System safety
6	Menu / stage transition speed Speed of the navigation system
7	Data processing capability Timeliness of receipt of goods/services Accuracy of orders
8	Preparedness of procurement personnel in providing consultations Ability of procurement personnel in providing consultations Responsive attitude of procurement personnel

Source: Authors' work (2025)

The minimum number of certified procurement personnel will greatly affect the quality of e-procurement by slowing the procurement process. If the number of work packages implemented is not proportional to the number of procurement personnel available, the e-procurement completion target will also take longer, thus affecting the quality of e-procurement. Identification of end-user skills and training in e-procurement is a factor that should be given high priority by

management to achieve the goals and benefits of e-procurement operational functions (Omorodion & Azage, 2024). Developing skilled procurement analysts requires a focus on training management and employees in data technology and analytics, and on developing technical and relational knowledge (AlNuaimi, 2021).

New hires become digital natives who are more at ease picking up new skills and are not as familiar with the specific work environment of an organisation. As a result, they need training to be ready to use digital technologies to boost supply chain efficiency (Foroughi, 2020). Factors related to the ease of the search system and the availability of suppliers according to usage requirements are variable indicators of the content variable. The convenience and availability of suppliers with various references to the types of goods and services required by users will certainly greatly influence the quality of e-procurement in finding suppliers that suit their needs. With the supplier variants available in e-procurement, healthy competition between suppliers can be increased by providing quality goods/services and competitive prices. Most procurement actors in the public sector consider e-procurement functionality to be sufficient for their contracting authority (Špaček & Špačková, 2023). Suppliers need to work with digitalisation to develop resilience, flexibility, and social (Sharma & Joshi, 2023).

Factors related to navigation system speed are variable indicators of usage function variables. The usage function is the main component in the operationalisation of e-procurement. An effective navigation system plays a major role in the data processing of the procurement process in the e-procurement system. Users continue to criticise the system's performance speed, stability, and convenience of use (because of the processes and information it uses), all of which have the potential to greatly impact how efficiently work is done in the system (Špaček & Špačková, 2023). Factors related to regulations that can accommodate certification training needs are variable indicators of the regulation variable. In e-procurement, regulations are also a very important factor in influencing the quality of e-procurement. E-procurement regulations must be able to accommodate all obstacles and challenges, as well as effective business processes implemented in the e-procurement system. Adaptive and visionary regulations must be able to respond to the needs of developments in globalisation and digitalisation so that the continuity of the e-procurement process can run smoothly and be stable and consistent. The most important factors that describe the organisational context are top management support, followed by organisational readiness (Marei, 2022). Regulations related to e-procurement cannot currently be implemented optimally. Appropriate policies, laws, and regulations must also be implemented to guide the entire e-procurement system (Mavidis & Folinas, 2022). Legislation and public sector capacity determine procurement outcomes (Bosio et al., 2022). Furthermore, the public sector should set enough budget to support the purchasing of materials required for running the e-procurement system since the usage of the

e-procurement system requires financial resources for its effective operation (Igogo, 2023).

The factor analysis results indicate that indicators from different initial dimensions, such as training, regulation, and content, clustered together into a dominant factor. This suggests that in the local government case, these dimensions are not perceived as independent, but rather as interconnected components of e-procurement quality. Thus, the dominant factor identified in this study should not be interpreted merely as training or regulation in isolation. Instead, it represents a broader institutional capacity factor, which integrates human resource development, regulatory alignment, and content management. This deeper interpretation provides richer insight into the systemic nature of e-procurement quality in local government.

Conclusion, limitation, and future research

Six previously established dimensions (specifications, process, functionality, content, training, and professionalism) continue to significantly influence e-procurement quality. Among these, training—especially certification training and access to updated knowledge—emerged as the most critical dimension affecting performance. Importantly, the qualitative findings revealed an additional factor: regulation, which encompasses regulatory support for financial system integration, the formulation of relevant price standards in e-catalogues, and the accommodation of certification training needs. The novelty of the research lies in introducing regulation as a new factor within the framework of e-procurement quality. While previous studies primarily examined organisational, technical, and human resource aspects, this study demonstrates that regulatory alignment plays a decisive role in shaping the effectiveness of e-procurement in local governments.

This research has theoretical implications, specifically broadening the e-procurement quality model by including regulatory factors, which have historically received little attention in the literature. Practical implications include the need for local government to enhance regular certification training and develop adaptive regulations to align with the financial system and e-catalogue dynamics. This research is limited to a local government and cannot be generalised to all regions. The qualitative study involved only seven informants, and the quantitative data relied on perceptions rather than performance outcomes. Future research should undertake comparative case studies across multiple regions and incorporate performance-based measures of procurement quality.

Author contribution

Deddy Prasetyo: Conceptualisation and Research Design, Data Collection, Writing Entire Paper, Conceptualisation, Data Collection and Analysis, Editing and

Layout. **Rita Ambarwati:** Conceptualisation, Methodology, Supervision, Writing - Review and Editing.

Declaration of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Appendix 1.

Research design

Study	Method	Respondents /informants	Position/role	Purpose
Study 1	Qualitative (semi-structured interviews)	7 informants	6 members of the procurement service unit working group, 1 head of procurement section	Explore contextual issues and identify new factors influencing e-procurement quality

Study	Method	Respondents /informants	Position/role	Purpose
Study 2	Quantitative (structured questionnaire)	200 respondents	Procurement actors: commitment making officials (40%), procurement officials (15%), technical activity implementing officials (42%), operators (3%)	Validate factors statistically and measure their impact on e- procurement quality

Source: Authors' work (2025)

Appendix 2.

Characteristics of respondents by procurement role

Category	Position	Number	Percentage (%)
Procurement actors	Commitment making officials	80	40.0
	Procurement officials	30	15.0
	Technical activity implementing officials	84	42.0
	Operators	6	3.0
Total		200	100.0

Source: Authors' work (2025)

Appendix 3.

Characteristics of respondents by organisational position

Position	Number	Percentage (%)
Head of divisions	57	28.5
Subdistrict heads	3	1.5
Village heads	17	8.5
Heads of sections	6	3.5
Heads of subdivisions/sections/functional	7	55.0
Executive staff	110	3.0
Total	200	100.0

Source: Authors' work (2025)

Appendix 4.

Average, validity, reliability and factor analysis

Dimensions and variable indicators	Average	Validity test	Reliability test	MSA test	Rotated comp. matrix
<i>Specifications</i>			0.654		
For integrating e-proc with the financial system	4.16	0.580		0.722	4
Invoice integration with the financial system	4.15	0.517		0.849	2
Ease of marketplace finding suppliers and goods/services	4.31	0.686		0.854	4
Ease of the reporting system	4.28	0.730		0.922	2
<i>E-procurement process</i>			0.687		
Speed of order creation	4.08	0.354		0.488 (reducti on)	Reducti on
Ease of the authorisation system	4.21	0.561		0.596	5
Effective stages from user to supplier	4.19	0.536		0.876	5

Dimensions and variable indicators	Average	Validity test	Reliability test	MSA test	Rotated comp. matrix
Speed of receipt of the order letter by the supplier	4.12	0.562	0.648	0.849	5
Data processing capability	4.11	0.314		0.854	7
Timeliness of receipt of goods/services	4.21	0.447		0.794	7
Accuracy of orders	4.14	0.272		0.734	7
System safety	4.17	0.596		0.841	5
<i>Function usage</i>			0.660		
Menu/stage transition speed	4.2	0.670		0.911	6
Speed of the navigation system	4.33	0.731		0.855	6
Display and function reliability	4.2	0.631	0.878	0.934	2
<i>Content</i>					
Contents supplier availability according to user needs	4.27	0.622		0.752	1
Suitability/reasonableness of e-catalogue prices	4.31	0.660	0.661	0.827	2
Ease of the search system	4.33	0.683		0.766	1
<i>Training</i>					
Availability of certification training	4.42	0.801	0.661	0.833	1
Suitability of training materials	4.41	0.850		0.948	2
Ease of access to training information	4.44	0.813		0.813	1
<i>Service professionalism e - procurement</i>					
Preparedness of procurement personnel in providing consultations	4.08	0.331	0.816	0.602	8
Ability of procurement personnel in providing consultations	4.21	0.542		0.567	8
Responsive attitude of procurement personnel	4.19	0.545		0.661	8
Procurement personnel have good competence	4.12	0.547		0.535	3
Procurement personnel build good communication with the supplier	4.11	0.309		0.699	3
Procurement staff are able to solve problems quickly	4.21	0.439		0.783	3
Procurement staff can keep secrets well	4.14	0.261		0.572	3
Procurement personnel provide friendly service	4.17	0.600		0.755	3
Personnel are very concentrated and focused on procurement problems	4.32	0.241		0.499 (reduction)	Reduction
<i>Regulations</i>					
Regulations that support the integration of e-proc with the financial system	4.44	0.819	0.816	0.868	4
Regulations must be able to set price standards that are relevant to e-catalogues	4.33	0.741		0.821	2
Regulations that are able to accommodate certification training needs	4.41	0.828		0.925	1

Source: Authors' work (2025)