Journal of Governance and Local Politics (JGLP)
Vol. 8, No. 2, November 2026, pp. 398-411
Received Oct 04, 2026 Revised Oct 31, 2026 Accepted Nov 01, 2026

Quality of E-KTP Services Using the PACEMACE App at the Jayapura City Department of Population and Civil Registration

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Keyword:
Digital Public Services;
e-KTP;
Servqual;
PaceMace

Abstract: Digitalization does not guaranty high quality public services, especially in terms of responsiveness and accessibility. The study analyzed the quality of e-KTP service through the PaceMace application at the Jayapura City Population and Civil Registration Office, Papua, Indonesia. This study used a descriptive quantitative method with a cross-sectional survey approach. Data were collected in 2026 using purposive sampling. Data were collected by means of a 16-item questionnaire based on the five SERVQUAL dimensions and descriptively analyzed using SPSS. Overall service quality was rated as good with a mean score of 3.70 out of 5.00. The highest score was for reliability (3.82) followed by assurance (3.75), tangibles (3.72), responsiveness (3.62) and empathy (3.61). The most highly rated indicator was data accuracy (3.99), and the least rated was accessibility for older adults, persons with disabilities and residents of remote areas (3.47). These results suggest that the users evaluated the technical service results more positively than the support and inclusive access given during the service process. The study recommends improving complaint handling, user assistance, alternative service channels and digital accessibility. The findings offer empirical insight into digital public service quality in eastern Indonesia, but their generalizability is limited due to the use of a non-probability sampling technique.

INTRODUCTION

The reform of public governance has increasingly taken on digitalisation as a significant agenda item, aiming to enhance efficiency, service quality, accessibility, and citizen engagement (Egba et al., 2026; Gorenc et al., 2026; Ma, 2026). But digitalisation is not automatically a recipe for success, since service quality, institutional coordination and public trust are still essential for it (Steinert & Staudt, 2026; Wu et al., 2026; Zamparo et al., 2026). In the Indonesian context, this change can be observed in the Electronic-Based Government System (Sistem Pemerintahan Berbasis Elektronik/SPBE), including in population administration services. The change is also based on Law Number 24 of 2013 concerning the Amendment to Law Number 23 of 2006 concerning Population Administration, which emphasises the need to improve population administration services that are professional, orderly, non-discriminatory and supported by information technology standards (Law Number 24 of 2013).

The Electronic Identity Card (E-KTP) plays a strategic role as an official ID card and as part of the population database that supports various administrative and social services. Therefore, the digitisation of E-KTP services is a must for the reform of bureaucracy and the realisation of citizens' right to fast, accurate and accessible services. The key point therefore is not only the digitisation of services, but also the extent to which such digitisation results in the provision of high quality, reliable, responsive and accessible services to the public (Kaur et al., 2023; Papadomichelaki et al., 2013) . This issue is closely related to policy implementation, which is the process of translating policy objectives into administrative actions and public service outcomes (Rustiyana et al., 2025). It relies on organisational processes, resources, communication and institutional capacity for its success (Allen et al., 2020; Damschroder et al., 2009; Proctor et al., 2010).

So even if there is a digital application, it does not necessarily indicate that a successful transformation will happen if the application cannot provide services that meet citizens' expectations. The link between policy and service outcomes depends on the translation of digital

service design into work procedures, staff readiness, clarity of service processes and institutional capacity to respond to user needs. Thus, service quality evaluation is essential to find the gap between user expectations and the actual experience of services (Rustiyana et al., 2025; Zhang et al., 2022). The SERVQUAL framework is a well-known tool for measuring service quality based on five dimensions: tangibles, reliability, responsiveness, assurance, and empathy (Mathong et al., 2020; Morton et al., 2016; A. Parasuraman et al., 2005; Rahim et al., 2021).

In public services, tangibles are facilities, technology, and infrastructure that facilitate service convenience, efficiency, transparency, and accessibility (Zaenuddin, Anirwan, et al., 2024). Responsiveness is related to the speed of providing information, responding to services, and handling complaints (Zaenuddin, Nurlinah, et al., 2024). Reliability is the consistency and dependability of service performance and is often identified as an important dimension in service quality assessment (Mathong et al., 2020; Matthews & Daigle, 2019). Assurance refers to the users' perception of security, trust and confidence in the competence of service providers (Chakraborty et al., 2026; Morton et al., 2016). Empathy is the ability of service providers to understand users' needs and provide individualised attention (Chakraborty et al., 2026; Matthews & Daigle, 2019).

Hence, the quality of digital services cannot be evaluated based on the appearance of applications or the speed of response, but all 5 dimensions must be considered holistically. However, applying SERVQUAL to digital services requires contextual adjustments in terms of efficiency, system availability, privacy, information quality, accessibility, and ease of navigation (Papadomichelaki & Mentzas, 2012; A. Parasuraman et al., 2005). Previous studies on E-KTP (electronic identity card) services in Indonesia have reported varied findings. Achmad et al. (2021) found that e-government implementation significantly influenced E-KTP service quality in Takalar, although bureaucratic procedures and communication remained problematic. Rahardjo (2016) identified limitations in human resources, equipment, service distribution, and public understanding in Makassar. Viontita & Mahendrawathi (2024) found that service quality was a key determinant of user satisfaction in Surabaya's population administration system.

While Tunnisa (2025) and Haq (2014) reported negative service gaps, and Putri (2025) and Wati et al. (2024) identified problems related to waiting times, information clarity, responsiveness, and empathy. Conversely, Anggraini (2025) reported relatively high service quality in application-based KTP-el services in Banyuwangi. These findings indicate that E-KTP service quality is shaped not only by digitalisation but also by service models, institutional capacity, technological support, and local context (Li & Shang, 2020), highlighting the need for context-sensitive assessment across regions. This problem is very important in Jayapura City, where in 2023 the population reached 362,994 people (BPS-Statistics of Jayapura City, 2023). Jayapura City Population and Civil Registration Office (Disdukcapil) has launched the PaceMace application to facilitate improved access to population administration services. The application is designed to reduce the need for face-to-face services, but the quality of E-KTP services delivered via PaceMace has not yet been empirically studied from the users' point of view. We have identified three research gaps. First, there is a gap in the context. The study of the quality of digital population administration services in East Indonesia, especially Papua, is still limited (Rahayu & Pribadi, 2023). Secondly, an empirical gap exists.

Most of the previous E-KTP studies using SERVQUAL have concentrated on face-to-face service delivery. Thirdly, there is a methodological gap: the SERVQUAL indicators previously used do not fully describe the characteristics of digital services such as application availability and reliability, real-time data, technical responsiveness, data accuracy, and digital complaint handling. This study aims to measure the quality of the E-KTP service delivered through the PaceMace application at the Population and Civil Registration Office of Jayapura City with the five dimensions of SERVQUAL with indicators contextualised to the delivery of digital services. The study is aimed at finding out empirically the strongest dimensions, the weak ones and how service gaps emerge in users' experiences. This research provides empirical evidence of the quality of digital public services in Eastern Indonesia, contextualisation of SERVQUAL to be used for application-based E-KTP services, and the dimensions of service that need to be maintained and improved.

RESEARCH METHODS

Research Design

This study used a descriptive quantitative design with a cross-sectional survey to assess the perceived e-KTP service quality through the PaceMace application at the Jayapura City Population and Civil Registration Office, Papua, Indonesia. Service quality was measured along the five SERVQUAL dimensions: tangibles, reliability, responsiveness, assurance and empathy (Parasuraman et al., 1988). Like Cronin & Taylor (1992) and Brady et al. (2002), this study only looked at perceived performance and not expectations. Data was collected in 2026. Disdukcapil recorded 235,166 e-KTP users in the first semester of 2025, but the study population was limited to residents who had directly experienced using PaceMace.

Population, Sample, and Sampling Technique

The population in this study were the residents of Jayapura City with the following criteria: (a) Indonesian citizens living in Jayapura City; (b) minimum age of 17 years or are legally married; (c) has ever used the application PaceMace to apply or update their e-KTP; and (d) willing to fill out the questionnaire completely. The analysis was conducted at the user level. The respondents were selected using purposive sampling, which is a non-probability sampling technique whereby participants are selected based on criteria related to the research objectives (Ahmad & Wilkins, 2024). This method was selected because only individuals with direct experience using PaceMace could provide informed evaluations of the quality of its service. Moreover, the e-KTP user data could not be used to identify the specific population of PaceMace users from the aggregate data.

Although purposive sampling is an effective way to reach participants with specific characteristics, it does not allow for statistical generalization to the entire population in the same way as probability sampling (Ahmed, 2024). The findings were interpreted with this limitation in mind. The total sample of respondents was 100, which should be presented as a pragmatic or minimum sample decision rather than as sufficient on the basis of methodological rules alone, because sample adequacy depends on the study design, analysis plan, and intended generalization (Teresi et al., 2022) and also limitations regarding time, cost and access to respondents in Jayapura City. A total of 101 questionnaires were completed in full and all were included in the analysis (n = 101).

Research Instrument and Variable Operationalization

Primary data were collected using a closed-ended questionnaire developed around the five SERVQUAL dimensions and adapted to the context of application-based e-KTP services. The instrument comprised 16 statements (Table 1), together with a respondent identification section and a question concerning respondents' experiences of difficulties when applying for or updating their e-KTP. Each statement was rated on a five-point Likert scale: 1 = very dissatisfied, 2 = dissatisfied, 3 = somewhat dissatisfied, 4 = satisfied, and 5 = very satisfied.

Table 1. SERVQUAL dimensions, item codes, and questionnaire statements

Dimension	Code	Questionnaire statement
Tangibles	Q1	The e-KTP service facilities appear modern and well maintained.
	Q2	The e-KTP service area is clean and comfortable.
	Q3	Service personnel appear neat and professional.
	Q4	The online e-KTP system (application/website) is easily accessible.
Reliability	Q5	The e-KTP recording and printing processes are completed on time.
	Q6	The information printed on the e-KTP matches the information provided.
	Q7	Services are delivered in accordance with clear and consistent procedures.
Responsiveness	Q8	Service personnel respond promptly to complaints or inquiries.
	Q9	Assistance is readily available when users encounter difficulties.
	Q10	Information about e-KTP procedures is easy to obtain.
Assurance	Q11	Users have confidence in the competence of e-KTP service personnel.

	Q12	Users feel that their personal data are adequately protected.
	Q13	Users trust that the e-KTP system operates properly and accurately.
Empathy	Q14	Service personnel understand the needs and complaints of the public.
	Q15	All citizens receive fair service without discrimination.
	Q16	Services are accessible to older adults, persons with disabilities, and residents of remote areas.

Source: Developed by the authors (2026)

Secondary data, including official documents and administrative records from the Jayapura City Population and Civil Registration Office, were used to describe the research context and the population targeted by the service.

Data Collection Procedures

The questionnaire was distributed online to PaceMace users who met the study criteria. Respondents were invited to participate voluntarily after receiving an explanation of the research objectives. The data were analyzed in aggregate form, and individual identities were not disclosed in the reporting of the findings.

Instrument Quality Assessment

Item validity was assessed using the Pearson product-moment correlation between individual item scores and the total score. An item was considered valid if its calculated correlation coefficient (r-calculated) was equal to or greater than the critical correlation value (r-critical) of 0.195 at the 5% significance level. Instrument reliability was assessed using Cronbach's alpha. The instrument was considered reliable when $\alpha \geq 0.60$, while values above 0.70 were generally interpreted as indicating good internal consistency (Mikušová et al., 2023).

Data Analysis Techniques

All data were processed using SPSS and analyzed descriptively in four stages. First, response frequencies and percentages were calculated for each item. Second, item means were calculated using the formula $mean = \Sigma(f \times w) / n$, where f denotes response frequency, w represents the score weight (1–5), and n is the number of respondents. Third, each dimension score was calculated as the mean of its constituent items, while the overall service quality score was calculated as the mean of the five dimensions. Fourth, standard deviation (SD), median, 95% confidence intervals for item means (based on the t-distribution with $n - 1$ degrees of freedom), and the percentages of satisfied (scores 4–5) and dissatisfied respondents (scores 1–2) were reported to describe variability and precision.

Means from multi-item Likert scales can be analyzed as approximately interval-level data, provided that response distributions are also reported. Accordingly, medians and response frequency distributions were included. Mean scores were interpreted using five equally sized intervals, each with a width of $(5 - 1)/5 = 0.80$, as presented in Table 2. Given the descriptive objectives of the study, no inferential hypothesis testing was conducted.

Table 2. Interpretation categories for mean scores

Score range	Interpretation
1.00–1.79	Very poor
1.80–2.59	Poor
2.60–3.39	Fair
3.40–4.19	Good
4.20–5.00	Very good

Source: Primary data analyzed by the authors (2026).

Research Ethics

This study was conducted with permission from the Jayapura City Population and Civil Registration Office (Dukcapil), based on a research authorization letter issued by Universitas Yapis Papua (No. 044/E-026/FISIP/III/2026). The letter confirming the completion of the research, issued by the Jayapura City Dukcapil, was numbered 400.12/238/Dukcapil.

Participation in this study was voluntary. Although respondents' names were recorded in the questionnaires, their identities were kept confidential and were not disclosed in the published manuscript. The data collected were used solely for research purposes.

RESULTS AND DISCUSSION

Results

This section presents the findings on instrument validity and reliability, respondents' perceptions at the item and SERVQUAL dimension levels, and the overall quality of e-KTP services delivered through the PaceMace application. The results are based on responses from 101 participants and are reported using descriptive statistics. The findings provide an overview of service quality strengths and areas requiring improvement.

Instrument Quality

All 16 items were found to be valid, with calculated *r* values ranging from 0.789 to 0.945, well above the critical *r* value of 0.195 (Table 3). The Cronbach's alpha coefficient for all 16 items was 0.959, indicating that the instrument was reliable, with very high internal consistency.

Table 3. Item Validity and Instrument Reliability by Dimension

Dimension	Items	Calculated *r* Range	Critical *r*	Result
Tangibles	Q1–Q4	0.789–0.863	0.195	Valid
Reliability	Q5–Q7	0.861–0.915	0.195	Valid
Responsiveness	Q8–Q10	0.868–0.899	0.195	Valid
Assurance	Q11–Q13	0.816–0.945	0.195	Valid
Empathy	Q14–Q16	0.895–0.909	0.195	Valid
Entire instrument	16 items	Cronbach's α = 0.959	≥ 0.60	Reliable

Source: Primary data analyzed by the authors (2026).

Respondents' Perceptions at the Item Level

Data from 101 respondents were analyzed, with no missing data. Table 4 presents the descriptive statistics for each item. All items were classified as *Good*, with a median score of 4. Item means ranged from 3.47 to 3.99. The highest-rated item concerned the accuracy of e-KTP data relative to the information provided (Q6; *M* = 3.99; 81.2% satisfied), followed by confidence in the system's proper and accurate operation (Q13; *M* = 3.85) and staff appearance (Q3; *M* = 3.82). The lowest-rated item concerned accessibility for older adults, persons with disabilities, and residents of remote areas (Q16; *M* = 3.47; only 55.4% satisfied), followed by staff responsiveness to complaints (Q8; *M* = 3.50; 56.4% satisfied) and the availability of assistance (Q9; *M* = 3.57).

Table 4. Descriptive Statistics for Each Item

Code	*M*	SD	95% CI	Md	Sat. (4–5), %	Diss. (1–2), %	Category
Q1	3.70	1.05	3.49–3.91	4	69.3	9.9	Good
Q2	3.69	1.09	3.48–3.91	4	69.3	10.9	Good
Q3	3.82	1.07	3.61–4.03	4	74.3	11.9	Good
Q4	3.68	1.09	3.47–3.90	4	68.3	13.9	Good
Q5	3.68	1.08	3.47–3.90	4	68.3	12.9	Good
Q6	3.99	1.14	3.76–4.22	4	81.2	9.9	Good
Q7	3.78	1.05	3.58–3.99	4	69.3	7.9	Good
Q8	3.50	1.07	3.29–3.72	4	56.4	11.9	Good
Q9	3.57	1.09	3.36–3.79	4	62.4	13.9	Good
Q10	3.79	1.03	3.59–4.00	4	72.3	9.9	Good
Q11	3.66	0.96	3.47–3.85	4	67.3	8.9	Good
Q12	3.73	1.21	3.49–3.97	4	71.3	13.9	Good
Q13	3.85	1.06	3.64–4.06	4	73.3	9.9	Good
Q14	3.58	1.12	3.36–3.81	4	61.4	11.9	Good
Q15	3.77	1.12	3.55–3.99	4	74.3	11.9	Good
Q16	3.47	1.12	3.24–3.69	4	55.4	15.8	Good

Note: M = mean; SD = standard deviation; CI = confidence interval; Md = median; Sat. = satisfied; Diss. = dissatisfied. Source: Primary data analyzed by the authors (2026).

The response distributions revealed two patterns. First, the "somewhat dissatisfied" category (score 3) accounted for a substantial proportion of responses to lower-rated items: 31.7% for Q8, 28.7% for Q16, and 26.7% for Q14. This suggests that many respondents expressed ambivalence rather than outright dissatisfaction. Second, across all 16 items, the number of respondents selecting "very dissatisfied" was equal to or greater than the number selecting "dissatisfied." The number selecting "very dissatisfied" was relatively consistent across items, ranging from 6 to 11 respondents (5.9%–10.9%). This lower-end response pattern indicates a small subgroup of respondents who consistently reported very low satisfaction.

Respondents' Perceptions by SERVQUAL Dimension

Overall, the quality of e-KTP services delivered through PaceMace was rated *Good*, with an overall mean score of 3.70 out of 5 (Table 5). Reliability received the highest score (3.82), followed by assurance (3.75), tangibles (3.72), responsiveness (3.62), and empathy, which received the lowest score (3.61). The difference between the highest- and lowest-rated dimensions was only 0.21 points. The average proportion of satisfied respondents ranged from 63.7% for responsiveness and empathy to 72.9% for reliability, while the proportion of dissatisfied respondents ranged from 10.2% to 13.2%.

Table 5. Mean Scores by SERVQUAL Dimension

Rank	Dimension	Mean Score	Category	Average Satisfied (4–5), %	Average Dissatisfied (1–2), %
1	Reliability	3.82	Good	72.9	10.2
2	Assurance	3.75	Good	70.6	10.9
3	Tangibles	3.72	Good	70.3	11.7
4	Responsiveness	3.62	Good	63.7	11.9
5	Empathy	3.61	Good	63.7	13.2
	Overall mean	3.70	Good	68.4	11.6

Source: Primary data analyzed by the authors (2026).

Within each dimension, the highest- and lowest-rated items were as follows. For tangibles, staff appearance received the highest score (3.82), while access to the online system received the lowest (3.68). For reliability, data accuracy scored highest (3.99), while timeliness scored lowest (3.68). For responsiveness, the ease of obtaining procedural information scored highest (3.79), whereas the speed of responses to complaints scored lowest (3.50). For assurance, confidence in the system scored highest (3.85), while confidence in staff competence scored lowest (3.66). For empathy, fairness of service received the highest score (3.77), while accessibility for vulnerable groups received the lowest (3.47).

Discussion

The PaceMace application was rated by the users as a Good service for e-KTP (overall mean = 3.70 out of 5, n = 101). However, this score is within the lower to middle part of the category (3.40 – 4.19) and no dimensions or single items reached the Very Good category (≥ 4.20). Overall 68.4% of respondents were satisfied compared to 11.6% who were dissatisfied. Roughly one-fifth (20.0%) were in the middle category. These results are consistent with the premise of service quality as a global evaluation of performance as perceived by users (Cronin & Taylor, 1992; Parasuraman et al., 1988). The digital service is working and is widely accepted but is yet to provide a consistently fully satisfactory experience for all users.

The following discussion is based on three findings. The highest is reliability (3.82) and the lowest is empathy (3.61) with only a difference of 0.21 points. Second, the highest rated item was on service outcomes (data accuracy, Q6 = 3.99) and the lowest rated items were on interaction and accessibility for users needing help (Q16 = 3.47; Q8 = 3.50; Q9 = 3.57). Third, the Cronbach's alpha coefficient (0.959) is very high and should be interpreted with caution (Section

4.7). It is a common pattern in newly digitized public services to have 'strong technical outcomes but weak interaction and accessibility' where the capacity for data-processing and procedural maturity tend to develop in advance of the capacity to assist users facing difficulties (Bovens & Zouridis, 2002; Heeks, 2002).

Tangibles: Physical Facilities and Online Access

The tangibles dimension had a mean score of 3.72 and item scores from 3.68 to 3.82. Staff appearance (Q3) scored the highest with 3.82 and 74.3% of respondents were satisfied. In contrast, the online system (Q4) was the most accessible with the lowest score (3.68), with 68.3% satisfied and 13.9% dissatisfied (highest percentage of dissatisfaction in this dimension). The findings suggest that there is a need to pay more attention to access to digital services. Physical facilities, staff appearances, and technological infrastructure are important factors to support the quality of public services and facilitate citizens' access to services (Basyo & Anirwan, 2023; Zaenuddin, Anirwan, et al., 2024).

Tangibles were defined by Sánchez-Hernández et al. (2009) as the physical facilities, equipment, and the appearance of the employees. Their findings support a three-dimensional service quality model, with functional, tangible and relational dimensions with target coefficients of 0.58 for the Spanish sample and 0.65 for the Mexican sample. Meanwhile, Nguyen & Nguyen (2022) found that the mean score of tangibles was 3.6 (SD = 0.7), and respondents appreciated functional equipment and spacious, comfortable waiting areas. Interfaces that are intuitive, digital proficiency and adequate support are important to overcome access barriers for digital public services (Sumardi et al., 2026) The accessibility and efficiency of the system also affect the experiences of citizens with electronic public services (A. Parasuraman et al., 2005).

Therefore, the improvement of PaceMace services should be aimed at maintaining service facilities, simplifying access procedures, improving the navigation of applications and providing assistance to users who have difficulties in accessing digital services. The measures are targeted at bettering the accessibility of population administration services, while maintaining positive ratings of physical facilities and staff appearance.

Reliability: Accuracy and Timeliness

The high score for the reliability dimension supports the classical finding that reliability is one of the key factors in determining perceived service quality (Parasuraman et al., 1991; Zeithaml et al., 1990). The reliability of population administration services is very important, because the electronic Identity Card (e-KTP) is an official identity document of the resident based on national population data (Law No. 24 of 2013). Data accuracy is a major issue for this service as identity errors could affect citizens' access to a number of other services. This is evident in the study results where data accuracy (Q6) was rated the highest, with 81.2% of the respondents were satisfied and only 9.9% were dissatisfied.

However, the results also indicate variation in the ratings across indicators within the reliability dimension. When the data accuracy indicator (Q6) is excluded, the mean score for this dimension is 3.73, which is relatively comparable to assurance (3.75) and tangibles (3.72). Data recording and card printing timeliness received relatively lower rating (Q5; M=3.68) with 12.9% of respondents being dissatisfied. This gap shows that positive assessment of data accuracy does not necessarily lead to equally positive assessment of service timeliness. This finding is in line with findings from studies on public and digital services in Indonesia, where the reliability dimension is generally rated positively, but timeliness and process efficiency are still a source of dissatisfaction for users (Haeruddin et al., 2023; Kurniasih et al., 2023). So, improving service quality with PaceMace means not only ensuring data accuracy, but also providing greater certainty about when services will be completed, to give users a more consistent experience.

Meanwhile, procedural consistency (Q7; M = 3.78) had the lowest dissatisfaction rate of all instrument items (7.9%). This result shows that generally the users perceive the procedures implemented through PaceMace to be reasonably consistent. It provides a platform to maintain the existing process of work and improve the speed of service delivery. Previous research on public services in Indonesia shows that user satisfaction is generally higher when the service process is clear and consistent, but users are sensitive to the time of service processing (Kurniasih

et al., 2023; Susan, 2018). Simultaneously improving these aspects can allow service providers to sustain the reliability of administrative outcomes and enhance the certainty of service processes as perceived by the public.

Responsiveness: Assistance and Complaint Handling

The average score for the responsiveness dimension was 3.62, with 63.7% of respondents satisfied. The comparatively lower ratings were for complaint response time (Q8; M = 3.50), and ease of obtaining assistance (Q9; M = 3.57) as compared to information on service procedures (Q10; M = 3.79). This is in line with AL-Naimat (2024) who reported that the responsiveness and communication dimensions of e-government services in Jordan had a mean score of 3.11, which was lower than ease of use (M = 3.99). The website's response speed was even worse at 2.88. Conversely, Wildhani et al. (2023) reported positive perceptions for ease of use (78.25%), response speed (72.79%) and transparency (71.7%), and the contribution of the system to improve the quality of complaint reporting and the reliability of administrative responses. In the PaceMace case, the delivery of procedural information appears to be more effective than the provision of direct assistance and two-way communication.

This finding is also related to the problems of delayed handling of complaints or complaints that are not sufficiently handled due to weaknesses in monitoring and evaluation (Zaenuddin, Nurlinah, et al., 2024). The theory of administrative burden states that citizen–government interactions involve costs of learning, compliance, and psychological costs (Moynihan et al., 2015). In digital services, self-service systems can transfer administrative tasks to citizens. However, the limited assistance and slow responses can exacerbate user difficulties and frustrations (Lythreatis et al., 2022; van Dijk, 2006). This means that users with technical or procedural issues may need to have support available, not just information. The rating for procedural information (Q10; M = 3.79) was higher than that for direct assistance (Q9; M = 3.57), suggesting that information provision might be working better than direct user support. The findings of Zaenuddin, Nurlinah, et al. (2024) further emphasize the necessity of efficient coordination and monitoring to ensure that the needs and complaints of service users are adequately addressed.

This also corresponds to the New Public Service perspective that emphasizes how government should serve citizens, rather than simply transact with customers (Denhardt & Denhardt, 2000). From this point of view, the quality of e-KTP service cannot be measured only in terms of speed and accuracy in processing, but must also reflect the ability of the government to help citizens who have difficulties when accessing digital services. Therefore, to make PaceMace more responsive, there is a need not only for clear procedural information, but also for timely assistance, accessible complaint channels and systematic follow-up on reported problems.

Assurance: System Confidence and Data Protection

The assurance dimension is about the users' trust in the competence of the staff, the protection of personal data, and the reliability and accuracy of the e-KTP service through the PaceMace application (Aljukhadar et al., 2022; Kaur et al., 2023). The results show that this dimension attained a mean score of 3.75 which signifies a good level of performance. The questions with the highest scores were confidence in the system's reliable and accurate operation (Q13, M = 3.85), personal data protection (Q12, M = 3.73), and confidence in staff competence (Q11, M = 3.66). The pattern shows that the respondents have confidence in the system performance than the staff competencies and demonstrates the need to enhance the staff's capacity to improve the quality assurance of the service. Regular training of staff and availability of communication will further enhance users' trust by providing clear explanations and consistent execution of service processes.

Despite the good rating for the protection of personal data, 13.9% of respondents stated their dissatisfaction or strong dissatisfaction with this aspect. Moreover, Q12 (SD = 1.21) had the highest standard deviation of the three assurance indicators, suggesting a substantial difference in responses. This demonstrates that users do not have altogether the same perceptions regarding the protection of personal data. Privacy is regarded as an essential dimension of

electronic service quality and a factor to build user trust in e-service research (Dehghanpouri et al., 2020; Martínez-Navalón et al., 2023). Therefore, improvements in PaceMace service quality should be supported by better staff competence and stronger personal data protection measures to increase users' confidence, besides system reliability.

Empathy: Accessibility for Vulnerable Groups

The empathy dimension had the lowest mean score (3.61). 63.7% of the respondents were satisfied and 13.2% were dissatisfied, which is the highest rate of dissatisfaction amongst all the five SERVQUAL dimensions. The item concerning ease of access for older adults, people with disabilities and residents of remote areas (Q16; M = 3.47) was scored lowest of all the items on the instrument. This aspect was satisfied by only 55.4% of respondents, while 15.8% were not. These results suggest that the main weakness of PaceMace is not only related to the accuracy of service outcomes, but also to its ability to accommodate users with different needs and levels of access to digital services. One possible explanation is the digital divide, which encompasses disparities in access to technology, digital skills, and the ability to derive socioeconomic benefits from digital services, with older adults, persons with disabilities, and residents of remote areas potentially facing overlapping barriers to accessing digital public services (Kruhlov & Dvorak, 2025).

This concern is supported by the low Q16 score, although the current study does not identify the specific barriers faced by each group. Furthermore, the limited capacity of staff, lack of proper public awareness, and lack of user assistance have been found to hamper the effectiveness of digital tax services (Sujendra & Zaenuddin, 2025). Although the cited study was in a different service context, these findings emphasize the necessity of providing support that is responsive to the needs of citizens. The New Public Service perspective further argues that public administration should be citizen-centered rather than mere transaction processing (Denhardt & Denhardt, 2000). Thus, the quality of e-KTP services should not only be measured by speed and accuracy but also the extent to which citizens who have greater barriers can get effective assistance. A service may be a good option for users who are capable of using an application without help, but it may not be as accessible for citizens who need extra support.

There is an important difference in the results on fairness. The respondents rated non-discriminatory service delivery relatively favorably (Q15; M = 3.77) with 74.3% reporting satisfaction. Accessibility for vulnerable groups scored the lowest (Q16). Such contrast may suggest that the respondents perceive formal treatment as relatively equal, but do not necessarily believe that the service is equally accessible for all. Thus, equal treatment does not guaranty equal access. Another methodological consideration is that the respondents were PaceMace users who filled in an online questionnaire. This sampling method is more prone to include those citizens who already have access to digital technology. Therefore, the groups most affected by digital barriers may be least represented. So, the Q16 score and the dimension empathy may provide a somewhat more positive picture than the accessibility experienced by vulnerable groups. Thus, the limitations described in this study should be considered as potential underestimates of the accessibility challenges of the population in general.

Implications for Public Service Providers

The findings above indicate five improvement priorities, ranked according to the most evident weaknesses. The example targets are proposed benchmarks and should be adjusted to the capacity of the Department of Population and Civil Registration (Disdukcapil). These recommendations are consistent with the mandate of Law No. 25 of 2009 on Public Services, which requires service providers to deliver services that are accessible and free from discrimination.

Table 6. Recommended Improvement Priorities and Monitoring Indicators for Public Service Providers

Priority	Findings	Recommended Actions	Monitoring Indicators

1	Q16 = 3.47; 55.4% satisfied; *empathy* received the lowest score.	Provide alternative service channels for older adults, persons with disabilities, and residents in remote areas, including assistance at village or district offices, mobile services, and in-person service options.	Percentage of respondents satisfied with Q16 (illustrative target: ≥ 70%).
2	Q8 = 3.50; Q9 = 3.57; 31.7% of respondents gave a neutral response to Q8.	Establish a single official support channel with a defined response-time standard and frequently asked questions integrated into the application.	Median response time; percentage of respondents satisfied with Q8–Q9.
3	Q4 = 3.68 (13.9% dissatisfied); Q5 = 3.68.	Audit system availability, simplify the application submission process, and provide transparent tracking of application status.	Actual processing time; percentage of respondents dissatisfied with Q4 and Q5.
4	Q12: SD = 1.21 (the highest); 13.9% dissatisfied.	Improve transparency and communication regarding the management of personal data in accordance with Law No. 27 of 2022 on Personal Data Protection.	Percentage of respondents dissatisfied with Q12; standard deviation of Q12.
5	Q6 = 3.99; 81.2% satisfied.	Maintain the existing data verification procedures, which have received positive assessments from respondents.	Percentage of respondents satisfied with Q6.

Source: Developed by the authors based on primary data analysis (2026).

These priorities offer a practical framework to convert the study's findings into concrete service improvements, while maintaining existing strengths in data accuracy. Monitoring of the proposed indicators regularly can help Disdukcapil to know the progress and to make sure digital public services to be more accessible, responsive, reliable and inclusive.

CONCLUSSION

The results of this study indicate that the quality of e-KTP services through the PaceMace application at the Jayapura City Department of Population and Civil Registration is generally in the good category with an overall mean score of 3.70 on a scale of 5.00. However, none of the five SERVQUAL dimensions reached the very good category, indicating that there is room for improvement in the quality of digital population administration services. Reliability had the highest mean score (3.82), followed by assurance (3.75) and tangibles (3.72). Meanwhile, responsiveness (3.62) and empathy (3.61) had the lowest ratings. These results indicate that the users rated the accuracy and consistency of service outcomes higher than the support and accessibility during the service process.

The highest rated indicator was data accuracy (Q6; M = 3.99) with 81.2% of the respondents reporting satisfaction. Conversely, accessibility to the elderly, persons with disabilities and inhabitants of remote areas was rated the lowest (Q16; M=3.47) with a satisfaction rate of 55.4%. Areas needing improvement were also observed in complaint handling (Q8; M = 3.50) and the availability of user assistance (Q9; M = 3.57). The findings suggest that the biggest challenges are not solely the technical performance of digital services, but also responsive support and equitable access for users with different needs. Therefore, the Department of Population and Civil Registration needs to pay attention to inclusive service channels, more responsive complaint-handling mechanisms, better application accessibility, transparent information about service procedures and straightforward communication about personal data protection.

This study presents empirical evidence on the quality of digital public services in Jayapura City, a context that warrants more scholarly attention concerning electronic population administration services in eastern Indonesia. It also confirms the use of the five SERVQUAL dimensions as a useful practical measure of user perceptions of e-KTP services delivered through

the application. This research also demonstrates the urgent need to address the issue of digital accessibility and user support, as well as technical performance. However, the results should be interpreted in light of the purposive sampling technique, descriptive cross-sectional design and sample size of 101 respondents. Future research might consider larger and more diverse samples including citizens facing barriers to digital access, and include objective indicators of service performance and further assessment of the measurement structure. These approaches can provide a more holistic assessment of digital service quality, and help to identify improvements that are both operationally effective and inclusive.

This study provides an overview of the quality of e-KTP services delivered through the PaceMace application in Jayapura City. The findings should be interpreted within the scope of the study, which employed purposive sampling of 101 respondents and online data collection. Measurements were based on users' perceptions at a single point in time. Future research could expand the respondent pool, combine perceptions with actual performance indicators, and examine variations in assessments across user characteristics. Further testing of the measurement dimensions and items could also strengthen the validity of the instrument.

AI Use Declaration: ChatGPT, Scopus AI, Leapspace, and QuillBot were used to assist with literature searches, synthesis development, and language refinement. The authors reviewed the use of these tools and take full responsibility for the accuracy, interpretation, and final content of the manuscript.

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