

Perception Gaps and Awareness Barriers in Mobile Governance Adoption in Kolkata's Suburban Periphery

Mohammed Johaed*

Department of Journalism and Mass Communication, Maheshtala College, University of Calcutta, Kolkata, India.

Kaifia Ancer Laskar

Assistant Professor, Department of Journalism and Mass Communication, Aliah University, Kolkata, West Bengal, India.

Mohammad Reyaz

Assistant Professor/ Head of the Department, Department of Journalism and Mass Communication, Aliah University, Kolkata, West Bengal, India.

*Corresponding Author Email: johaed81@gmail.com

Abstract:

The present study is part of a research program to understand the perception of people towards mobile government services in West Bengal, India. Focusing on the suburban region of Kolkata, chiefly the Maheshtala-Diamond Harbour constituency of the South 24 Parganas district of the state, this study uses a cross-sectional survey method and employs a structured questionnaire to collect data from 240 respondents from randomly selected locations within this region. The analyses of the data reveal that while mobile phone usage is widespread, awareness and informed usage of government mobile applications remain uneven. Age, education, and frequency of using mobile phones significantly influence perception, while awareness proves to be a strong predictor of positive engagement. The findings suggest that apart from infrastructural excellence, upholding trust, awareness, and user support systems are essential for the inclusive adoption of mobile governance in suburban regions of Kolkata.

Keywords: Mobile Governance, Citizen Perception, Kolkata, Public Administration, Digital India.

INTRODUCTION

Mobile governance is deeply connected with development communication, and its integration into public services has transformed the face of communication between the government and its citizens. Mobile governance involves the use of mobile devices and applications to disseminate public services (Srivastava & Singh, 2021). With mobile penetration deepening, its success will not only depend on technological readiness, but also on the perception of people towards its utility, accessibility, and transparency (Misuraca et al., 2013).

The state of West Bengal in India is characterised by regional digital disparity and multifaceted socio-political settings (Parsheera, 2022). The government has launched various mobile service applications (Sivakumar et al., 2022). While Kolkata metropolis, the capital region, has quickly adopted the change, the bordering regions in the neighbourhood reflect a mixed scenario, such as partial access, uneven awareness, and irregular levels of digital literacy. The present study specifically addresses these issues and investigates how citizens in and around Kolkata metropolis perceive and relate with mobile governance services and for this purpose the authors have randomly selected four suburban locations in the region to gather the response patterns across demographic segments which is intended to offer policy recommendation as well as to help in the refinement of tools and variables for future studies.

The need to explore citizens' perceptions is supported by prior research which indicates that even though digital infrastructure is abundant, citizens' acceptance and participation remain critical in the success of e-governance or mobile governance (Dwivedi et al. 2017). Factors such as age, education, digital access, economic status, and trust often shape people's willingness to adopt these services (Venkatesh et al., 2003). However, there is a lack of micro-level studies focusing particularly on semi-urban and suburban areas; zones which are neither 'rural enough' to be considered digitally excluded, nor 'urban enough' to be fully considered into digital ecosystems. The Kolkata suburbs, with their socioeconomic heterogeneity, provide an ideal region for examining this Gray aspect. Hence, this study intends:

- To identify various perceptions of mobile governance.

- To explore preliminary perceptions based on demographic variables such as age, gender, education, and employment.

- To identify barriers and areas of confusion that may hinder meaningful participation in m-governance among suburban citizens.

REVIEW OF LITERATURE

Recently, studies on mobile governance have increased, especially in the wake of the Digital India initiative. Scholars have investigated mobile-based grievance redressal, agricultural advisories, and service delivery apps, such as UMANG and m-Parivahan (Raju and Gupta, 2018). Researchers have also focused on the need for user-friendly interfaces, inclusivity, and language options. Indian studies indicate that lower-income and low-literacy populations often face significant barriers to accessing mobile government services (Bhatnagar, 2014). In West Bengal, some studies have explored digital service delivery at the panchayat level, particularly under e-Panchayat and mobile land record schemes, but most of these studies address rural public administration and rarely focus on mobile service perception or interaction from a citizen's perspective (Chakrabartiet al., 2011; Parsheera, 2022).

Globally, mobile government research has evolved to address user-centric parameters such as trust, accessibility, and digital efficiency. Many Asian and African countries' varying successes and causes have been investigated, particularly citing digital inclusiveness and participation in government processes (Lee and Kwak, 2012; Misuraca et al., 2013). Studies have applied frameworks of the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) to evaluate users' perception, quoting socio-demographic profiles as primary factors affecting levels of adoption (Venkatesh et al., 2003). Although these works provide a healthy theoretical body, their findings are not applicable in the Indian scenario unless they are adapted.

Despite the huge volume of work on mobile governance and its process, a clear literature gap exists in comprehending how suburban regions of India perceive and engage with mobile government services. The regions selected are academically interesting as they do not qualify as rural, but still cannot be termed as urban, and consequently face a digital divide. With Kolkata exponentially expanding its urban footprint and the government's growing reliance on digital technology, it becomes pertinent to understand how suburban populations engage with digital mobile services.

CONCEPTUAL FRAMEWORK AND HYPOTHESES

To understand the factors affecting people's adoption, researchers have used the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). As per Venkatesh (2003), scholars have suggested that, one, whether citizens think the technology is useful, and two, whether they find it easy to use. Although these two models have not been extensively adopted, they are definitely inspired to construct the hypotheses. Hence, the researchers have constructed a

simple framework of how demographic profile (age, sex, gender, education, employment status, etc.) affects the frequency of using mobile phones and whether they are aware of such government mobile services.

Construction of Hypotheses

Based on the above framework and a thorough literature review, the following hypotheses are proposed:

H1: Age has a significant impact on how citizens perceive mobile governance.

H2: Education level influences the perception of mobile governance services.

H3: People who use mobile phones more frequently have a more positive perception of mobile governance.

H4: Awareness of specific government mobile services is positively related to positive perceptions.

These hypotheses will be tested in the subsequent parts of this paper to explore any meaningful trend. While the sample is not large enough to come down to some conclusive and concrete conclusions, it will help prepare and refine further studies on the perception of people of West Bengal.

METHODOLOGY

To investigate how suburban residents perceive mobile government services, a structured methodology was employed to assess usage, satisfaction, and awareness in the Maheshtala-Diamond Harbour Loksabha constituency of West Bengal. This transitional zone between urban and rural areas faces inconsistent digital access due to educational and economic barriers (Ray et al., 2023). A quantitative, cross-sectional survey with a 43-question questionnaire, designed in English and Bengali, was used to collect data.

A multi-stage sampling technique was adopted, and four villages, namely Jagannathpur, Shibrampur, Shibugli, Chak Chatta, and four municipal wards (nos. 24, 29, 31, and 33) were selected through simple random sampling. A total of 240 respondents were identified using the systematic intercept method based on availability and consent. Finally, 234 valid responses were analysed, excluding six due to incomplete or uniform answers. Data were collected using both paper-based forms and Kobo Toolbox, a globally recognised open-source application, between May and July 2025. Further, the questionnaire's validity was checked through the Content Validity Index (CVI) with the help of feedback from five experts in different subject domains. The result showed an average I-CVI of 0.9128 and S-CVI of 0.8899 (Table 1), which ensures strong content validity of the questionnaire (Polit and Beck, 2006). Most items in the questionnaire had options to answer on a five-point Likert scale, and the questionnaire included questions on demographics, mobile usage, awareness, accessibility, and trust in these services.

The final data were then exported to Excel for cleaning. The data were then analysed using Jamovi, version 2.3.28.0. The authors analysed descriptive statistics to summarise the responses. Further, inferential analyses, such as correlation, t-tests, regression, and one-way ANOVA, were conducted. The final sample size of 234 ensures

statistical robustness, which was 80% at $p < 0.05$, for relevance in this varied suburban context (Andrade, 2020).

Table 1: Calculation of CVI using MS Excel

Question	Item-Level CVI (I-CVI)	Scale-Level CVI (S-CVI)
1	1	0.913
2	1	0.911
3	1	0.909
4	1	0.906
5	1	0.904
6	1	0.902
7	1	0.899
8	0.75	0.896
9	1	0.9
10	1	0.898
11	1	0.894
12	1	0.891
13	1	0.888
14	1	0.884
15	0.75	0.88
16	1	0.885
17	1	0.881
18	0.75	0.876
19	0.75	0.881
20	1	0.887
21	0.75	0.882
22	1	0.888
23	1	0.882
24	1	0.877
25	1	0.871
26	0.75	0.864
27	1	0.87
28	0.75	0.863
29	1	0.87
30	0.75	0.861
31	1	0.869
32	0.5	0.859
33	0.5	0.889
34	0.75	0.924
35	1	0.941
36	1	0.935
37	1	0.927
38	1	0.916
39	1	0.902
40	1	0.883
41	1	0.853
42	0.5	0.804
43	1	0.956
Average	0.9128	0.8899

Source: Author, based on field Survey 2025

RESULTS AND DISCUSSION

Keeping in view the focus of the study, we ran a series of tests to realise our objectives and analyse the hypotheses. The following sections shall comprehensively discuss the analysis of the data and their interpretations.

Descriptive Statistics

Demographic data (Table 2) provide a snapshot of the sample characteristics. Gender (mean = 1.52, median = 2.00) shows slightly more female respondents (1 = male, 2 = female), with low variation (SD = 0.501). Near-neutral skewness (-0.0839) and low kurtosis (-2.01) indicate a symmetrical, flatter distribution. Age (mean = 2.95, median = 3.00) suggests a mid-range age group with mild positive skewness (0.222) and lighter tails (kurtosis = -0.591).

Table 2: Descriptive Analysis of the Demographic Variable

Statistic	Gender	Age	Employment Status	Edu. Qualification	Monthly Income	Freq. of using Mobile Phones
N	240	240	240	240	240	240
Missing	0	0	0	0	0	0
Mean	1.52	2.95	3.02	2.82	16946	3
Std. error mean	0.0323	0.065	0.061	0.0744	734	0.072
95% CI mean lower bound	1.46	2.82	2.9	2.67	15500	2.85
95% CI mean upper bound	1.58	3.08	3.14	2.97	18392	3.14
Median	2	3	3	3	15000	3
Standard deviation	0.501	1.01	0.948	1.15	11373	1.12
Minimum	1	1	1	0	0	1
Maximum	2	5	4	5	70000	4
Skewness	-0.084	0.222	-0.843	-0.0085	1.21	-0.798
Std. error skewness	0.157	0.157	0.157	0.157	0.157	0.157
Kurtosis	-2.01	-0.591	-0.105	-0.474	2.3	-0.775
Std. error kurtosis	0.313	0.313	0.313	0.313	0.313	0.313

Source: Field Survey, 2025

Employment status (mean = 3.02, median = 3.00) indicates that most respondents are students with a slight left skew (-0.843). Education levels (mean = 2.82, median = 3.00) were moderate, with a nearly symmetric, flat distribution. Household income (mean = 16,946, median = 15,000, SD = 11,373) shows variation, with positive skew (1.21) and heavier tails (kurtosis = 2.30), reflecting some higher-income households. Mobile phone usage (mean = 3.00, median = 3.00) was frequent, with a slight negative skew (-0.798) and flat kurtosis (-0.775).

Reliability

Cronbach's alpha was used to measure the internal consistency of the items (Tavakol and Dennick, 2011). Values above 0.7 are generally considered acceptable, with higher scores indicating stronger reliability, though values over 0.95 may suggest item redundancy (George & Mallery, 2003). For perception analysis, this test ensures that grouped questions fetch accurate ideas about citizen behaviour. Table 3 outlines the interpretation of these values, following Streiner's (2003) guidelines.

Table 3: Cronbach's Alpha and its Consistency (Streiner, 2003)

Cronbach's Alpha (α)	Internal Consistency
$\alpha \geq 0.9$	Excellent (High-Stakes testing)
$0.7 \leq \alpha < 0.9$	Good (Low-Stakes testing)
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Source: Field Survey, 2025

Out of 30 questions, eight were demographic, questions 9 to 27 were to understand people's perception, and 28 to 30 were open-ended to know the awareness about government apps and for comments and feedback. However, this was not suitable for scale-based reliability testing, and thus, Cronbach's alpha was calculated for the 19 perception-based items. The output showed an average value of 0.945 (Table 4), indicating a higher degree of internal consistency of the items and suggesting that the responses were stable and reliable.

Table 4: Reliability Analysis of Questionnaire Items

Item No.	Questionnaire Item (Shortened)	Cronbach's α
1	Convenience and usefulness for official government tasks	0.945
2	Value of services for everyday utilities and routine needs	0.943
3	Availability of native local language options within apps	0.946
4	Contribution to government transparency and accessibility	0.943
5	General user-friendliness and accessibility features	0.943
6	Reduction of time and effort for financial tasks	0.943
7	Improvement in overall efficiency for managing tasks	0.944
8	Ease of participating in community and civic activities	0.944
9	Confidence in personal data and transaction security	0.947
10	Level of concern regarding cyber fraud and phishing risks	0.945
11	General awareness regarding available mobile services	0.944
12	Regular receipt of official cyber-crime safety alerts	0.944
13	Influence of media, internet, and institutional sources	0.946
14	Influence of peers, family, and social circles	0.948
15	Self-confidence in troubleshooting technical app issues	0.947
16	Adequate access to necessary smartphone devices	0.943
17	Availability of active technical helpdesks and support	0.944
18	Access to stable and uninterrupted internet connectivity	0.945
19	Financial affordability of regular mobile data packs	0.948
	Average	0.945

Source: Author, based on Field Survey 2025.

Testing of Hypotheses

H1: Age has a significant impact on how citizens perceive mobile governance (see Table 5).

To test Hypothesis 1, whether age has any effect on people's perception, a one-way Welch's ANOVA (Shieh and January, 2015) was conducted. The results showed $F(4, 49.3) = 2.69$, and $p = 0.042$, thereby suggesting that perception scores differ across age groups. This validates the idea that age plays a crucial role in moulding perceptions and behaviours.

Table 5: One-way Anova of Hypothesis 1

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Perception Score	2.69	4	49.3	0.042

Source: Field Survey, 2025

H2: Education level influences the perception of mobile governance services (Table 6).

Hypothesis 2 suggests that education level impacts perception. To test this, a one-way ANOVA was conducted again. The results were remarkable, where $F(5, 33.9) =$

20.5, and $p\text{-value} < .001$. This shows that perception scores vary widely according to different levels of education, which strongly supports our hypothesis.

Table 6: One-way Anova of Hypothesis 2

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Perception Score	20.5	5	33.9	< .001

Source: Field Survey, 2025

H3: People who use mobile phones more frequently have a more positive perception of mobile governance.

The one-way ANOVA test results (Table 7) revealed a statistically significant difference in perception scores for different usage groups ($F(3, 57) = 21.1, p < .001$). However, the omnibus F-test does not specify directionality, so a comparison of the group means indicates that individuals with higher smartphone usage frequencies carry more positive perceptions, confirming that familiarity with digital platforms aligns with higher adoption attitudes.

Table 7: One-way Anova of Hypothesis 3

	<i>F</i>	<i>df1</i>	<i>df2</i>	<i>p</i>
Perception Score	21.1	3	57	< .001

Source: Field Survey, 2025

H4: Awareness of specific government mobile services is positively related to better perceptions. To test the fourth hypothesis, we conducted the following analyses:

Regression Analysis

To test Hypothesis 4, a simple linear regression analysis was conducted to understand whether awareness of mobile government services influences the perception index. This technique effectively calculates the strength of the relationship between two continuous variables (Pandey, 2020).

The analysis indicated a strong connection between awareness and perception. The result indicates $R^1 = 0.799$ and $R^2 = 0.639$, suggesting that awareness influences about 64% of the perception variation (Table 8). In addition, the model is significant, as the results in Table 9 show, $F(1, 238) = 421, p < .001$. This confirms that higher awareness increases positive perceptions of mobile government services (Table 10). Thus, Hypothesis 4 is supported, suggesting that awareness significantly improves perceptions.

Table 8: Model fit Measures of Hypothesis 4

Model	R^1	R^2
1	0.799	0.639

Source: Field Survey, 2025

Table 9: Omnibus Anova Test of Hypothesis 4

	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>
Q19 (Question on Awareness)	154.3	1	154.306	421	< .001
Residuals	87.3	238	0.367		

Source: Field Survey, 2025

All four tested hypotheses showed significant results. Hypotheses 1 to 3, using ANOVA, found that perception scores vary by age, education, and income. For Hypothesis

4, linear regression confirmed a strong positive relationship ($R = 0.799$, $p < .001$) between awareness (Q19) and higher perception scores, indicating that well-informed individuals view mobile government services more positively, supporting all hypotheses.

Table 10: Model Coefficients - Perception Score for Hypothesis 4

Predictor	Estimate	SE	95% CI		t	p	Stand. Estimate	95% CI	
			Lower	Upper				Lower	Upper
Intercept	1.351	0.1084	1.137	1.564	13	<.001			
Q19	0.591	0.0288	0.534	0.648	21	<.001	0.799	0.722	0.876

Source: Field Survey, 2025

CONCLUSION

The outcomes of the present study through different tests and analyses show inconsistent results, as the perception of people is greatly affected by personal, technological, and smartphone usage factors. For example, the higher the frequency of smartphone use, the higher the chances of awareness and exposure to government-related services. Age and educational level also had a deeper impact on perception. The UTAUT model gels well with this study as it helps explain why people use mobile government services, not just because they find them useful and easy, but also because they have access to good Internet and proper infrastructural support. In suburban Kolkata, even though a large number of people now have access to digital government services, there is still a need for more awareness, trust, and competencies to use them. The government must discuss with private mobile operators to try to lessen the data plan costs. Some greater concerns such as online safety, limited language options, and lack of technical support still worry a large number of respondents. This indicates that mobile governance must be made more inclusive, with better design, cost-effectiveness, and accessibility, and the state must try to curb network differences in rural and urban areas.

This study also provides strong recommendations for the West Bengal government. Mere installing digital services will not suffice; the government must initiate awareness campaigns through physical gatherings, digital workshops, and digital campaigns by community workers, who shall provide easy directions in the native language. The government must also set up digital helpdesks in public offices and use local and social media to create awareness of different government services among people. The feedback mechanism should be more transparent and accessible. If the government of West Bengal truly wants to lead in citizen-friendly governance, it must treat mobile governance not just as a technological solution, but as something that grows with people's needs by listening to and constantly improving them.

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