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Comparative Evaluation of Online and Cash Payment Systems in BSPHCL: Case Studies from Patna and Gaya

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Abstract: ***This study provides a data-driven evaluation of electricity bill payment patterns within the Bihar State Power Holding Company Limited (BSPHCL), with a specific focus on the urban and rural divisions of Patna and Gaya during the final quarter of 2024. Utilizing official datasets acquired through the Right to Information (RTI) Act from seven distinct electricity supply divisions—including Dakbunglow, Danapur, Gardanibagh,Patliputra, Barh (Patna), and Sherghati (Gaya)—the research captures monthly trends in digital (website/app) and traditional (cash/cheque) payment modes among domestic consumers. The analysis reveals that although the total number of consumers gradually increased across all divisions from October to December 2024, the adoption of online payment methods either stagnated or declined, particularly in December. Notably, Patna divisions such as Dakbunglow and Barh experienced significant surges in cash counter transactions, reversing the digital gains seen in November. In Gaya's Sherghati division, urban digital payment usage showed a steady decline, while rural users exhibited a brief recovery in December following a prior drop. These fluctuations suggest persistent barriers to sustained digital adoption, including infrastructural gaps, user trust issues, and digital literacy constraints. The findings underscore the urgent need for awareness initiatives, improved digital infrastructure, and targeted policy reforms to encourage online payment adoption, thereby enhancing operational efficiency and transparency within BSPHCL.***

Keywords: Online Payment Adoption,Cash Transactions, RTI Data Analysis, Rural-Urban Digital Divide, Electricity Bill Payment, Bihar Power Sector,Digital Infrastructure

I. INTRODUCTION

The transition to digital payment systems is a central pillar of India's vision for a cashless economy. National initiatives such as *Digital India* and *BharatNet* have sought to expand digital access across both urban and rural areas, with particular emphasis on public utilities like electricity, water, and telecommunications. However, despite these sustained efforts, the actual uptake of online payment systems remains uneven—especially in economically and infrastructurally challenged regions like Bihar.

The Bihar State Power Holding Company Limited (BSPHCL), the state's primary electricity distribution utility, has implemented various digital platforms including websites and mobile applications to facilitate bill payments. Nonetheless, consumer behavior continues to lean heavily toward traditional, cash-based transactions. This pattern is particularly evident in districts such as Patna and Gaya, where monthly transaction data for the last quarter of 2024—obtained through the Right to Information (RTI) Act—indicates a fluctuating and often declining trend in online payment usage across six key electricity supply divisions.

Despite gradual growth in the total number of electricity consumers from October to December 2024, divisions such as Dakbunglow, Gardanibagh,Patliputra and Barh (Patna) witnessed a notable drop in online transactions in December, paired with a rise in cash counter usage. A similar trend was observed in Sherghati (Gaya), where online payment adoption continued to decline among urban consumers, even as rural usage showed a mild recovery. These patterns suggest underlying challenges that digital initiatives alone have not yet resolved.

This study aims to analyze the comparative usage of online versus cash payment methods in the context of BSPHCL's service delivery. It seeks to:

- Examine transaction trends across urban and rural supply divisions.
- Identify infrastructural, behavioral, and systemic barriers to digital payment adoption.
- Recommend targeted policy interventions to increase digital engagement among electricity consumers.

Understanding these dynamics is essential not only for improving operational efficiency within BSPHCL but also for strengthening transparency and inclusivity in public utility governance.

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1) What is Online Payment?

Online payment refers to the process of transferring funds electronically through digital platforms to settle financial transactions. In the context of electricity bill payments, this includes using websites, mobile applications, UPI (Unified Payments Interface), debit or credit cards, net banking, and digital wallets. These systems are designed to offer convenience, speed, and transparency, allowing consumers to pay their bills from anywhere, at any time, without visiting a physical location.

2) What is Offline Payment?

Offline payment, on the other hand, involves traditional, in-person methods of transaction. For utility services like electricity, this typically includes paying bills by cash or cheque at designated counters, customer care centers, or authorized collection points. While this method remains prevalent, especially in semi-urban and rural areas, it often involves longer queues, limited working hours, and greater operational effort on the part of the service provider.

II. LITERATURE REVIEW

The body of research surrounding digital payment systems in India highlights a national shift toward technology-driven financial transactions in both public and private service sectors. Numerous studies affirm the advantages of online payment platforms—including greater transparency, lower operational costs, and enhanced convenience for users (Raghavan & Vasudevan, 2020). However, despite the rise of these systems, particularly in urban centers, their penetration in low-income, semi-urban, and rural regions remains limited.

1) National Trends in Utility Bill Payments

Government reports from the Ministry of Power and institutions such as NITI Aayog show consistent growth in digital utility payments in Tier-1 cities. Yet, a significant lag persists in Tier-2 and Tier-3 areas, often attributed to inadequate digital infrastructure, low levels of digital literacy, and skepticism regarding the reliability of digital platforms (Kumar et al., 2019). These national trends provide useful context for evaluating payment behaviors in states like Bihar.

2) Digital Payment Adoption in Bihar

Empirical research on Bihar's digital payment landscape is relatively sparse. Preliminary insights from regional surveys and pilot projects indicate that initiatives such as mobile wallet promotions and smart meter rollouts have had limited success in transforming consumer behavior. The persistent use of cash-based transactions, as reflected in the official RTI data from Patna and Gaya districts, suggests ongoing challenges such as poor internet connectivity, language barriers, and unfamiliarity with digital tools—particularly in divisions like Barh, Danapur, and Sherghati, where rural and semi-urban populations dominate.

3) Comparative Evaluation of Payment Systems

Drawing from Wright's (2002) framework on evaluating electronic payment systems—which considers factors like accessibility, reliability, affordability, and user trust—it becomes evident that multiple barriers inhibit digital adoption within BSPHCL's operational zones. For example, in divisions such as Dakbunglow, Patliputraand Gardanibagh, while the overall number of urban consumers has increased over time, the number of online transactions has declined or stagnated, reflecting broader systemic and behavioral constraints.

4) Identified Gaps in Existing Literature

A notable gap exists in current literature concerning the use of digital payments within state-level power utilities like BSPHCL, particularly in a localized context. While many studies focus on metro cities or emphasize technological innovation, there is limited empirical work grounded in primary or official datasets—such as those obtained through the Right to Information Act. This study addresses that void by offering a comparative analysis based on authenticated divisional-level data from both urban and rural consumer segments, providing a more granular understanding of digital payment behaviors in Bihar.

III. RESEARCH METHODOLOGY

This research utilizes a comparative case study approach to examine consumer behaviorconcerning electricity bill payment modes—online versus cash—in two significant districts of Bihar: Patna and Gaya. The study focuses on seven selected divisions across urban and rural areas, with an emphasis on the billing trends observed during the last quarter of 2024 (October, November, and December).

IV. DATA SOURCES AND COLLECTION METHODS

A. Primary Data

The core dataset was procured through formal Right to Information (RTI) applications submitted to Bihar State Power Holding Company Limited (BSPHCL). The data includes:

- The number of electricity consumers in both rural and urban divisions.
- The number of consumers opting for online payment platforms.
- Monthly payment data for October, November, and December 2024, segregated by division.

B. Secondary Data

- Supplementary insights were drawn from:
- Government publications and regulatory reports.
- Academic literature on digital payments and public utility services.
- Previous evaluations of cashless initiatives in India's utility sector.

V. ANALYTICAL TOOLS AND TECHNIQUES

A. Descriptive Statistics

Applied to quantify consumer distribution across divisions and payment modes.

B. Trend Analysis

Used to track the progression or regression in the adoption of online payments over the three-month study period.

C. Comparative Analysis

- Performed to highlight differences between:
- Rural and urban areas.
- Patna and Gaya districts.
- Divisional performance in promoting digital payment usage.

This mixed-methods approach ensures a robust and data-driven interpretation of the digital payment landscape, particularly within the operational framework of BSPHCL. The methodology enables identification of specific bottlenecks while suggesting actionable, evidence-based interventions.

VI. RESEARCH OBJECTIVES

The primary aims of this study are as follows:

1) To compare the proportion of electricity consumers using online versus cash-based payment methods across selected divisions in Patna and Gaya.
2) To identify key behavioral, infrastructural, and socio-economic determinants affecting consumer preference for traditional payment modes.
3) To evaluate the reach and effectiveness of existing digital infrastructure and awareness programs aimed at encouraging online payments.
4) To analyze monthly shifts in digital payment adoption during the October–December 2024 period, based on division-specific RTI data.
5) To propose strategic recommendations for BSPHCL to increase digital payment uptake, especially within rural and semi-urban zones where cash dependency remains high.

VII. SCOPE OF STUDY

This study is geographically confined to the districts of Patna and Gaya in Bihar, providing a focused examination of electricity bill payment behaviors among two distinct consumer categories: urban demand-based consumers and rural general domestic consumers. The analysis spans a defined timeframe—October to December 2024—offering a quarterly perspective on evolving payment preferences and adoption patterns.

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The scope of this research includes:

1) Assessment of Payment Modes: Comparative evaluation of online and cash-based payment methods used by domestic electricity consumers served by BSPHCL.
2) Trend Analysis: Examination of monthly consumer counts to detect shifts in payment preferences and identify emerging behavioral trends.
3) Data Source Limitation: The study exclusively utilizes official RTI data from BSPHCL, and does not incorporate information from other state or private electricity providers.
4) Contextual Constraints: The research is rooted in Bihar's specific socio-economic and infrastructural landscape, particularly focusing on the challenges faced in digital payment adoption across different demographic regions.
5) Consumer Category Limitation: The study intentionally excludes commercial and industrial users, centering solely on household-level (domestic) consumers to derive relevant and actionable insights for broad-based digital payment policy interventions.

This focused scope ensures that the findings remain contextually relevant and policy-relevant, especially for enhancing digital financial inclusion in public utility services across semi-urban and rural Bihar.

VIII. RESEARCH HYPOTHESES

This study formulates and tests a set of hypotheses grounded in the analysis of electricity bill payment behavior across the urban and rural divisions of Patna and Gaya. The hypotheses are designed to evaluate usage trends, behavioral influences, and infrastructural factors affecting the adoption of online payment methods in the BSPHCL framework.

1) H1: The share of consumers utilizing offline (cash-based) payment methods is significantly higher than those using online platforms across both urban and rural areas of Patna and Gaya.
2) H2: There exists a statistically significant difference between urban and rural consumers in terms of their attitudes, trust levels, and comfort with digital payment systems, which affects their likelihood of adopting online payments.
3) H3: Online payment adoption during the period October to December 2024 shows no substantial month-on-month growth, suggesting a stagnation in digital transition among BSPHCL consumers.
4) H4: Behavioral and infrastructural barriers—such as digital illiteracy, low internet penetration, and trust issues—have a significant influence on the continued preference for cash-based transactions.
5) H5: Access to enabling infrastructure, including smart meters, mobile connectivity, and awareness initiatives, has a direct and measurable impact on the adoption rate of online payment systems among domestic electricity users.

IX. DATA ANALYSIS AND INTERPRETATION

Section 1: Urban Electricity Consumers (Household - Demand Based)

Month	Number of Urban Electricity Consumers
October	17,660
November	17,698
December	17,924

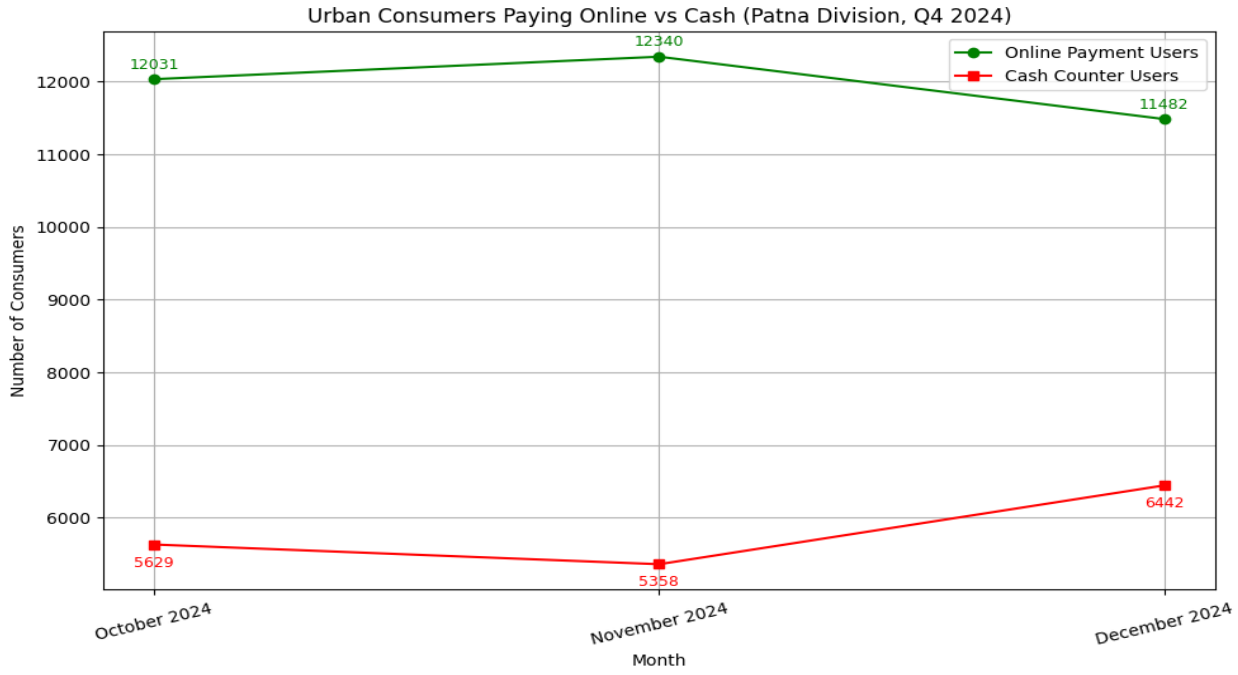
Section 2: Consumers Paying via Online Website/App

Month	Number of Urban Electricity Consumers Who Paid Online
October	12,031
November	12,340
December	11,482

Table 1: Urban Domestic Electricity Consumers – Online vs Cash Counter Payments
(Patna Division)

Month	Total Urban Consumers	Online Payment Users	% Online Users	Cash Counter Users	%Cash Users
October 2024	17,660	12,031	68.12%	5,629	31.88%
November 2024	17,698	12,340	69.72%	5,358	30.28%
December 2024	17,924	11,482	64.07%	6,442	35.93%

The document is signed and stamped by the Assistant Electrical Engineer (Revenue), Electric Supply Division, Dakbunglow, PESW (West), Patna.This table is from the Electric Supply Division,Dakbunglow, Patna, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).
The table clearly shows that while the total consumer base has gradually increased from October to December 2024, the number of users opting for online payments did not keep pace. Most notably, December saw a drop in online users and a spike in cash counter users, reversing the slight digital adoption progress made in November.
Graph Representation



Section 1: Urban Electricity Consumers (Household - Demand Based)

Month	Number of Urban Electricity Consumers
October	358586
November	359462
December	360930

Section 2: Consumers Paying via Online Website/App

Month	Number of Urban Electricity Consumers Who Paid Online
October	201521
November	200199
December	190417

Table 2: Urban Domestic Electricity Consumers – Online vs Cash Counter Payments
(Patna Division)

Month	TotalUrban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	358,586	201,521	56.19%	157,065	43.81%
November 2024	359,462	200,199	55.70%	159,263	44.30%
December 2024	360,930	190,417	52.74%	170,513	47.26%

The document is signed and stamped by the Public Information Officer PESU (East) Zone, Patna.This table is from the Electric Supply Division, Patna, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).
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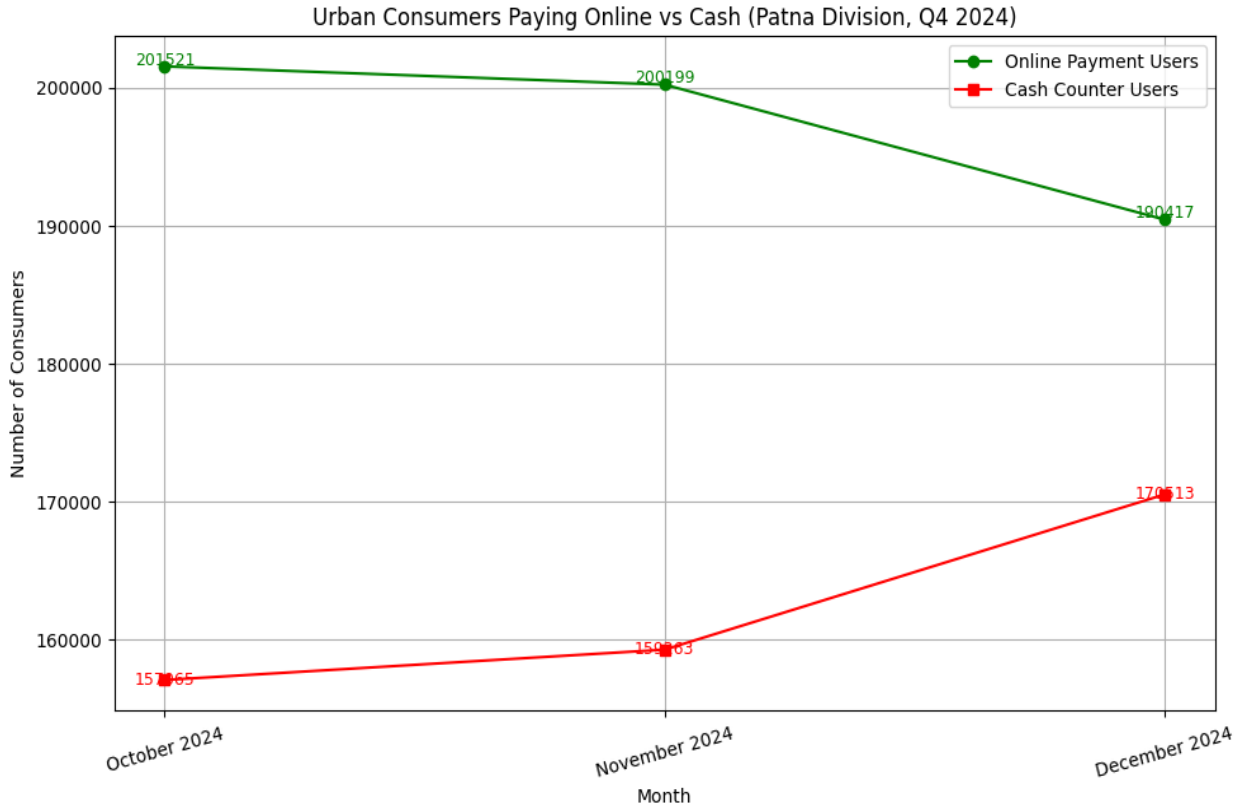


3. Section 1: Urban Electricity Consumers (Household - Demand Based)

Month	Number of Urban Electricity Consumers
October	69032
November	69230
December	69130

Section 2: Consumers Paying via Online Website/App

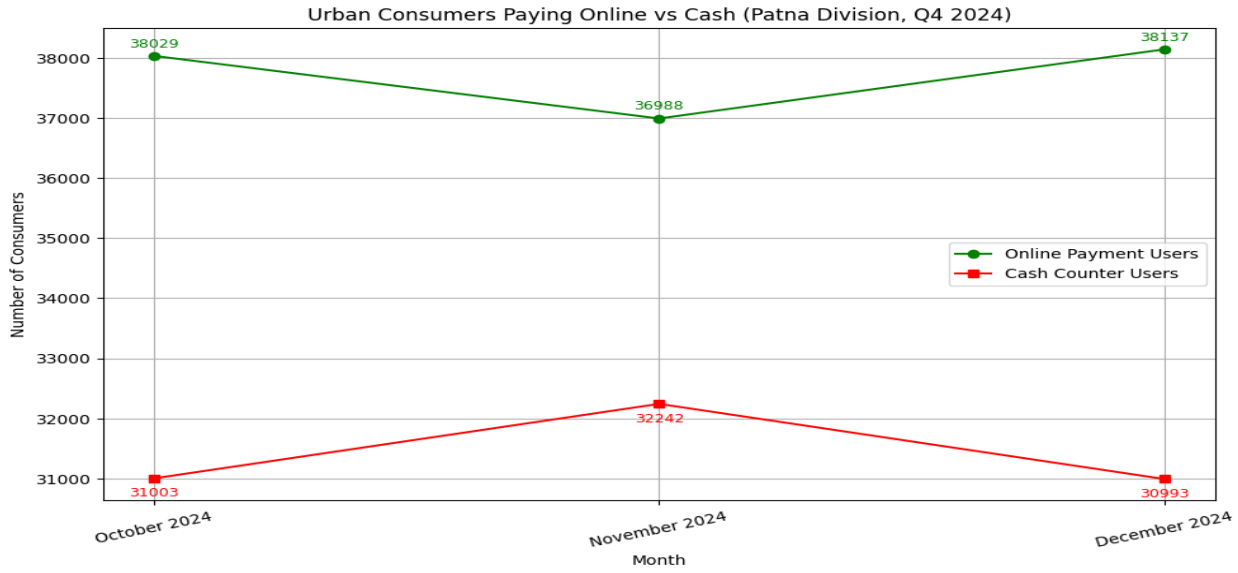
Month	Number of Urban Electricity Consumers Who Paid Online
October	38029
November	36988
December	38137

Table :3 Urban Domestic Electricity Consumers – Online vs Cash Counter Payments
(Patna Division)

Month	TotalUrban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	69,032	38,029	55.09%	31,003	44.91%
November 2024	69,230	36,988	53.42%	32,242	46.58%
December 2024	69,130	38,137	55.18%	30,993	44.82%

The document is signed and stamped by the Assistant Electrical Engineer(Revenue),Electric Supply Division, Danapur.This table is from the Electric Supply Division,Danapur, Patna, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).
The table shows that while the total number of urban electricity consumers remained stable from October to December 2024, online payment usage fluctuated. It dipped in November and rose again in December, while cash payments increased in November and then declined. This indicates that digital payment adoption was inconsistent, with many consumers still relying on cash.

Graph Representation



4. Section 1: Urban Electricity Consumers (Household - Demand Based)

Month	Number of Urban Electricity Consumers
October	50411
November	50438
December	50408

Section 2: Consumers Paying via Online Website/App

Month	Number of Urban Electricity Consumers Who Paid Online
October	36644
November	38471
December	35584

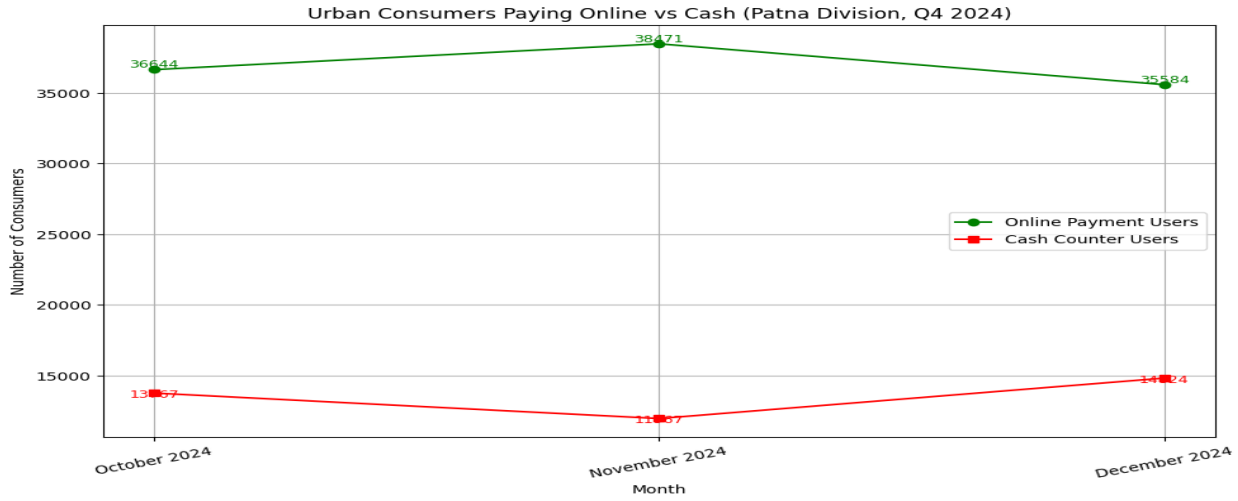
Table :4Urban Domestic Electricity Consumers – Online vs Cash Counter Payments
(Patna Division)

Month	Total Urban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	50,411	36,644	72.68%	13,767	27.32%
November 2024	50,438	38,471	76.29%	11,967	23.71%
December 2024	50,408	35,584	70.58%	14,824	29.42%

The document is signed and stamped by the Assistant Electrical Engineer(Revenue),Electric Supply Division, Gardanibagh.This table is from the Electric Supply Division,Gardanibagh, Patna, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).

The table clearly shows that while the total consumer base has gradually increased from October to December 2024, the number of users opting for online payments did not keep pace. Most notably, December saw a drop in online users and a spike in cash counter users, reversing the slight digital adoption progress made in November.

Graph Representation



5.Section 1: Urban Electricity Consumers (Household - Demand Based)

Month	Number of Urban Electricity Consumers
October	48990
November	49062
December	49138

Section 2: Consumers Paying via Online Website/App

Month	Number of Urban Electricity Consumers Who Paid Online
October	32379
November	31789
December	30558

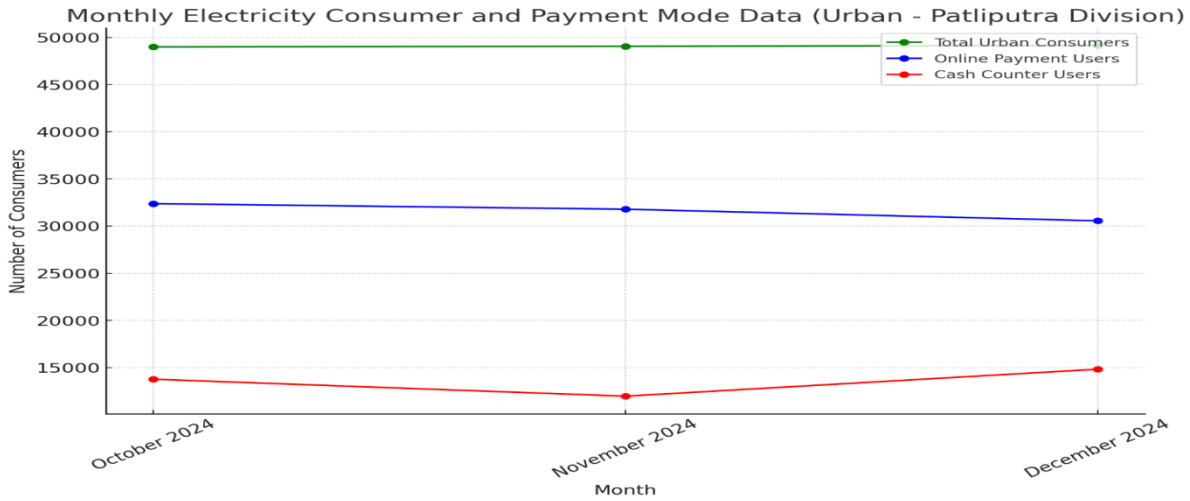
Table :5Urban Domestic Electricity Consumers – Online vs Cash Counter Payments
(Patna Division)

Month	Total Urban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	48,990	32,379	66.10%	13,767	28.10%
November 2024	49,062	31,789	64.80%	11,967	24.39%
December 2024	49,138	30,558	62.20%	14,824	30.17%

The document is signed and stamped by the Assistant Electrical Engineer(Revenue),Electric Supply Division, Patliputra PESU (W).This table is from the **Electric Supply Division,Patliputra,Patna**, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).

The table clearly shows that while the total consumer base has gradually increased from October to December 2024, the number of users opting for online payments did not keep pace. Most notably, December saw a drop in online users and a spike in cash counter users, reversing the slight digital adoption progress made in November.

Graph Representation



6. Section 1: Urban Electricity Consumers (Household - Demand Based)

Sl. No.	Type of Consumer	October 2024	November 2024	December 2024
1.	Rural(Domestic-1) Electricity Consumers	39355	39526	39638
2.	Urban(Domestic-2) Demand-BasedElectricity Consumers	12688	12547	12569

Section 2: Consumers Paying via Online Website/App

Sl. No.	Type of Consumer	October 2024	November 2024	December 2024
1.	Rural (Domestic-1) Electricity Consumers	18007	16689	14502
2.	Urban (Domestic-2) Demand-Based Electricity Consumers	12260	9494	9154

Table :6Urban& Rural Domestic Electricity Consumers – Online vs Cash Counter Payments(Patna Division)

Month	Total Urban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	12,688	12,260	96.63%	428	3.37%
November 2024	12,457	9,494	76.23%	2,963	23.77%
December 2024	12,569	9,154	72.81%	3,415	27.19%

Month	Total Rural Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	39,355	18,007	45.77%	21,348	54.23%
November 2024	39,526	16,689	42.23%	22,837	57.77%
December 2024	39,638	14,502	36.59%	25,136	63.41%

The document is signed and stamped by the Assistant Electrical Engineer(Revenue),Electricity Supply Division, Sub-Division, Barh.This table is from the Electric Supply Division, Barh, Patna and provides monthly data (October, November, December 2024) related to electricity consumers in urban and rural areas (household category) and their method of payment (online via website/app& Cash/Cheque).

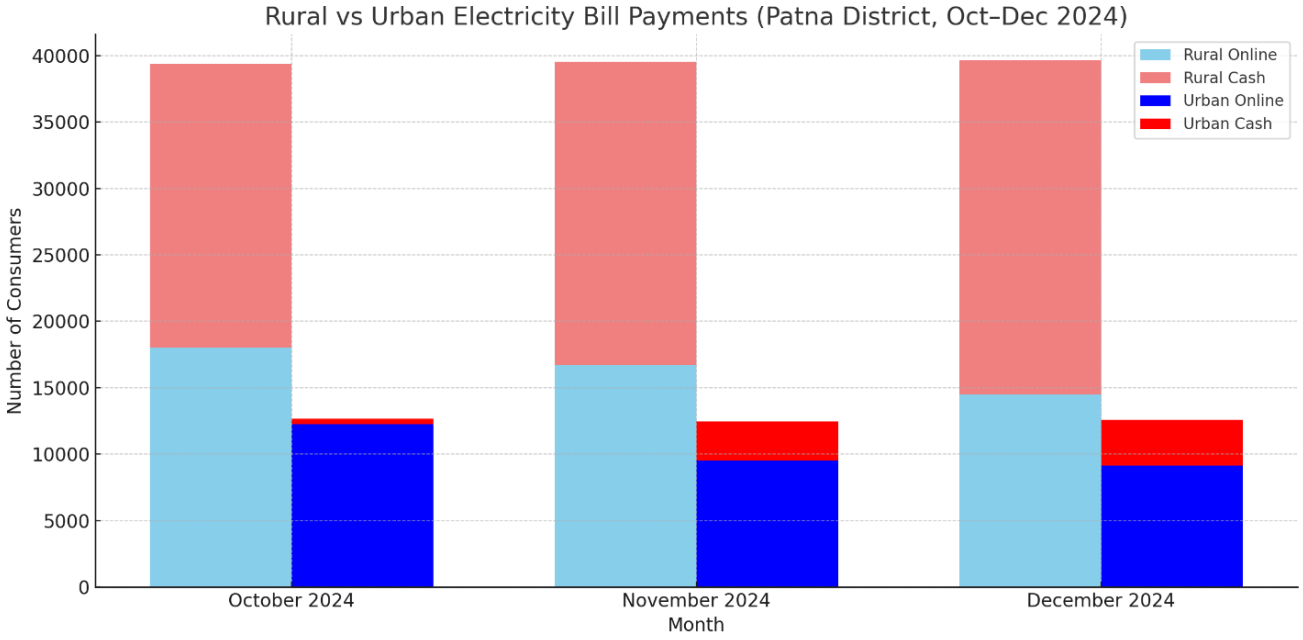
The table clearly shows that while the total consumer base has gradually increased from October to December 2024, the number of users opting for online payments did not keep pace. Most notably, December saw a drop in online users and a spike in cash counter users, reversing the slight digital adoption progress made in November.

For urban consumers, the total number of electricity users remained relatively stable over the three months (from 12,688 in October to 12,569 in December). However, online payment users declined significantly—from 12,260 in October to 9,494 in November and further to 9,154 in December. Consequently, cash counter payments increased markedly from just 428 in October to 2,963 in November and 3,415 in December, indicating a noticeable shift back to traditional payment modes.

For rural consumers, the total number rose steadily from 39,355 in October to 39,638 in December. Online payment users, however, decreased sharply—from 18,007 in October to 16,689 in November and then to 14,502 in December. This decline was mirrored by a growing reliance on cash counter payments, which surged from 21,348 in October to 22,837 in November and peaked at 25,136 in December.

This overall trend highlights a growing preference among both urban and rural users for cash payments over digital methods, suggesting possible issues with digital access, user experience, or trust in the online systems during this period.

Graph Representation



7.Section 1: Urban & Rural Electricity Consumers (Household - Demand Based)

Sl. No.	Type of Consumer	October 2024	November 2024	December 2024
1.	Rural(Domestic-1) Electricity Consumers	115696	116324	116626
2.	Urban(Domestic-2) Demand-BasedElectricity Consumers	12300	12351	12363

Section 2: Consumers Paying via Online Website/App

Sl. No.	Type of Consumer	October 2024	November 2024	December 2024
1.	Rural (Domestic-1) Electricity Consumers	23856	20923	21880
2.	Urban (Domestic-2) Demand-Based Electricity Consumers	6142	5763	5661

Table :7Urban& Rural Domestic Electricity Consumers – Online vs Cash Counter Payments(Gaya Division)

Month	Total Urban Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	12,300	6,142	49.94%	6,158	50.06%
November 2024	12,351	5,763	46.67%	6,588	53.33%
December 2024	12,363	5,661	45.81%	6,702	54.19%

Month	Total Rural Consumers	Online Payment Users	%Online Users	Cash Counter Users	%Cash Users
October 2024	115,696	23,856	20.60%	91,840	79.40%
November 2024	116,324	20,923	18.00%	95,401	82.00%
December 2024	116,626	21,880	18.77%	94,746	81.23%

The document is signed and stamped by the Assistant Electrical Engineer(Revenue),Electricity Supply Division, Sherghati.This table is from the Electric Supply Division, Sherghati ,Gaya, and provides monthly data (October, November, December 2024) related to electricity consumers in urban areas (household category) and their method of payment (online via website/app& Cash/Cheque).

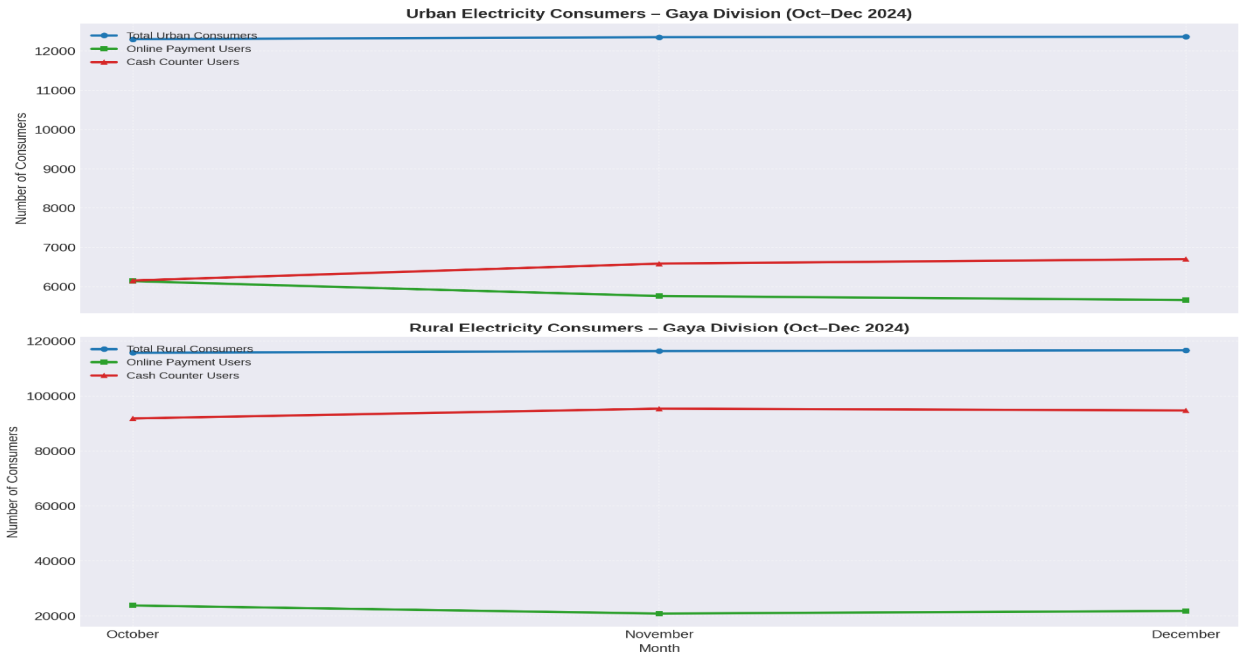
The table clearly shows that while the total consumer base in the Gaya Division has steadily increased from October to December 2024, the trend in online payment adoption has been inconsistent, with only modest improvements in rural areas and a continuing decline in urban digital payments.

For urban consumers, the total number remained nearly constant, rising slightly from 12,300 in October to 12,363 in December. However, online payment users declined over the same period—from 6,142 in October to 5,763 in November, and further down to 5,661 in December. Correspondingly, cash counter usage increased month-on-month, from 6,158 in October to 6,702 in December, indicating a gradual shift away from online platforms.

In contrast, rural consumers displayed a slight recovery in digital payment usage. Although the number of rural online users dropped from 23,856 in October to 20,923 in November, it rebounded to 21,880 in December. Despite this improvement, cash counter users still increased from 91,840 in October to 94,746 in December due to the overall rise in total rural consumers.

This data suggests that while rural areas showed a small uptick in online adoption in December after a dip in November, urban areas continued to experience a decline in digital engagement. The growing reliance on cash counters, especially in urban regions, highlights the need to address barriers to sustained online payment usage.

Graph Representation



X. Data Analysis and Findings

This section presents an in-depth evaluation of electricity bill payment behaviors across urban and rural divisions within Patna and Gaya districts. The insights are based on official data obtained through RTI applications filed with BSPHCL, covering the period from October to December 2024.

1) Digital vs. Cash Payment Preferences

Across all divisions, cash payments remain the preferred method of settling electricity bills, particularly in rural areas. Despite the presence of online payment options—including apps, websites, and digital wallets—digital adoption has yet to gain substantial ground.

- In urban divisions of Patna, digital payments saw a relatively better response, averaging above 50%, with a slight peak observed in November.
- In contrast, rural areas in both Patna and Gaya consistently reported low online transaction rates. For instance, rural Patna recorded online payment usage between 36% to 46%, while rural Gaya showed even lower figures, hovering around 18% to 21%.
- The data highlights that although online facilities are technically accessible, practical usage remains limited—especially outside major city zones.

2) Month-wise Shifts (October–December 2024)

A comparison of the three-month data reveals subtle but meaningful fluctuations:

- October 2024: Online payment usage began moderately in most divisions but showed lower figures in rural zones, suggesting that consumers may have reverted to traditional methods following monsoon disruptions or festive season inactivity.
- November 2024: Marked a modest increase in online payments in most urban divisions—possibly due to post-festival utility management or increased outreach efforts.
- December 2024: Online transactions declined across several divisions, notably in Patliputra and Barh, accompanied by a corresponding rise in cash counter usage. This dip could indicate either reduced confidence in online systems or year-end delays in digital processing.

3) Urban–Rural Divide

There exists a pronounced disparity in digital payment behavior between urban and rural consumers:

- Urban divisions benefit from better infrastructure, smartphone penetration, and higher digital literacy. As a result, divisions like Gardanibagh and Dakbungalow exhibited online usage rates exceeding 70% in some months.
- Rural divisions, on the other hand, lag behind due to challenges such as poor internet connectivity, lack of awareness, preference for face-to-face transactions, and skepticism regarding online platforms. In Gaya's rural division, for example, more than 80% of users continued to pay in cash throughout the quarter.

4) Division-Wise Insights

- Patna's urban divisions (e.g., Gardanibagh, Dakbungalow, and PESU East) showed relatively higher digital participation, particularly in November.
- Patliputra and Danapur reflected an inconsistent trend, where online adoption dropped in December despite stable or rising consumer numbers.
- Sherghati (Gaya) consistently recorded the lowest online engagement among both rural and urban consumers, suggesting that geographic remoteness may compound digital exclusion.

5) Key Observations

- Cash remains dominant: Across both urban and rural divisions, offline payment modes still dominate, highlighting a behavioral and infrastructural gap.
- Urban areas are ahead—but not by much: While cities like Patna demonstrate better digital engagement, there is no steady upward trend in online usage.
- Rural divisions are significantly behind: A combination of digital illiteracy, poor internet coverage, and trust issues contributes to persistently low online adoption.

- Month-wise inconsistency: The data shows fluctuations in digital payment behavior, indicating a lack of sustained consumer trust or convenience.
- Need for long-term policy interventions: One-off awareness drives are insufficient. Targeted digital literacy programs, infrastructure upgrades, and streamlined userexperiences are necessary to promote consistent online bill payment adoption across Bihar.

XI. CONCLUSION

1) The analysis of electricity bill payment behaviors across urban and rural divisions in Patna and Gaya during the last quarter of 2024—grounded in RTI-acquired data—demonstrates a pronounced and persistent reliance on offline cash-based methods. Despite the steady growth in the number of consumers across all six divisions, digital payment channels have not seen proportional adoption. In fact, most divisions reported either stagnation or a decline in online transactions, with December marking the lowest point in digital engagement during the quarter.

2) Urban divisions such as Dakbunglow, Gardanibagh, and PESU (East) experienced a marked increase in cash counter payments, reversing earlier trends that hinted at growing online adoption. Similarly, rural divisions—Barh and Sherghati—continued to rely heavily on physical payment methods, with Barh Rural showing a gradual decline in online payments and Sherghati consistently reporting low digital usage throughout the period. Even in divisions like Danapur, where some digital activity was recorded, it was not sustained and did not keep pace with the overall consumer growth.

3) These findings suggest that structural and behavioral barriers—such as inadequate digital literacy, patchy internet access, lack of confidence in digital systems, and minimal consumer incentives—continue to hinder the shift toward online platforms. The temporary uptick in online payments in November, followed by a sharp drop in December across most regions, further underscores the volatility and fragility of digital engagement in this context.

4) To foster a meaningful shift toward digital payments, BSPHCL must prioritize localized and consumer-centric interventions. These should include improving digital infrastructure in semi-urban and rural regions, ensuring the reliability of online payment systems, simplifying interfaces for user-friendly access, and actively addressing consumer apprehensions through awareness campaigns. Moreover, consistent digital literacy initiatives—particularly those rooted in community engagement—and small, recurring incentives can help build trust and habitual usage.

5) The evidence strongly indicates that without such targeted and sustained efforts, the vision of a digitally empowered electricity payment ecosystem will remain out of reach. BSPHCL's path forward must be informed by on-ground realities, as highlighted by this RTI-backed data, and focused on bridging the digital divide through inclusive and practical strategies.

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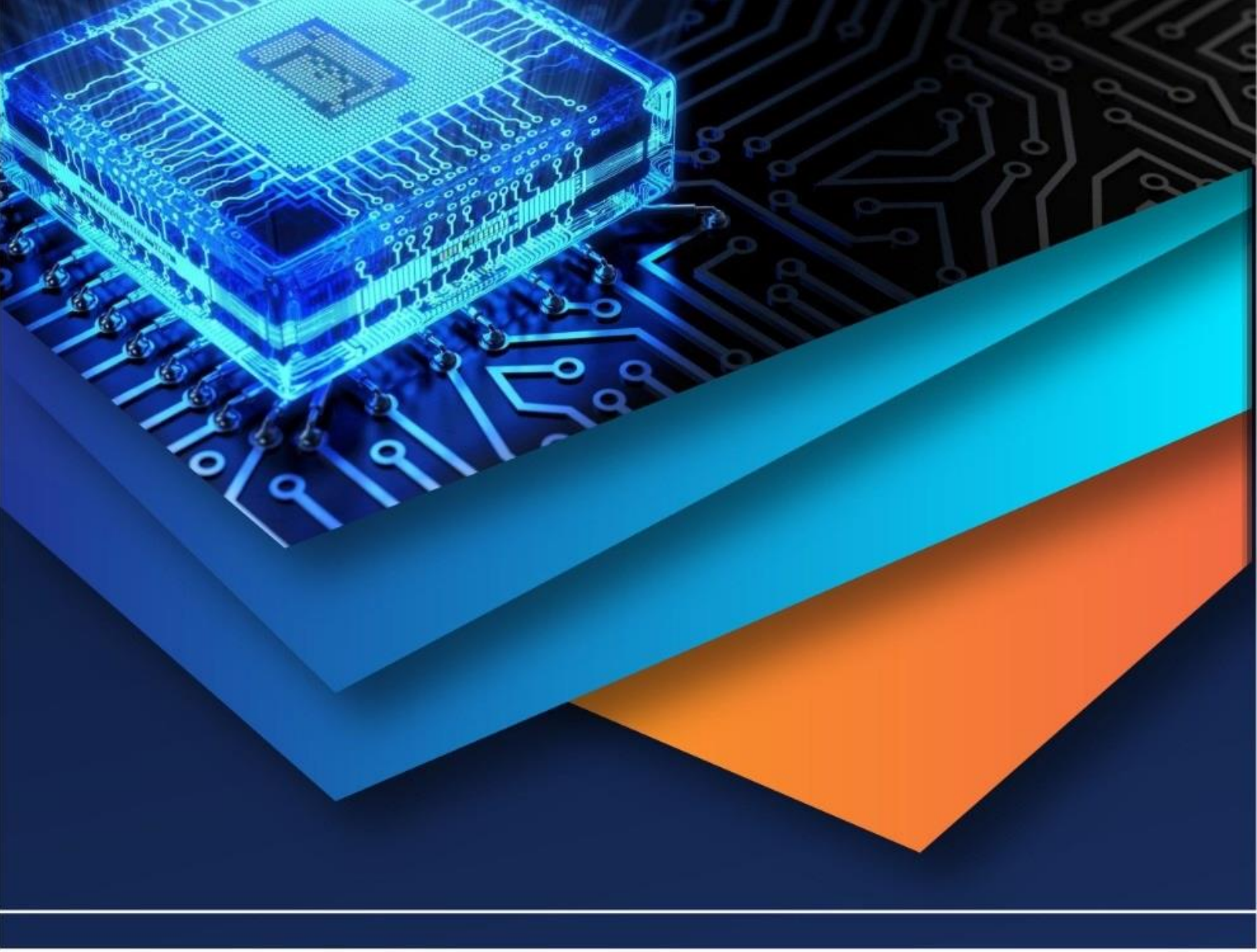

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