Innovations

Electronic and Traditional Payment Systems on Payments in Nigeria A Comparative Analysis of Methods

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Abstract

Traditional payment has been found to have inherent failings or challenges like fraud, errors and corruption that hinders its operational effectiveness. In a bid to figure out how these challenges can be mitigated, reduced or eliminated, the e-payment introduction becomes eminent. Expectations are high on e-payment ability to harness the shortcomings of the traditional payment and turn them up effectively and efficiently for improved payment in the country. However, opinions and views hold suspect the ability of the e-payment to achieve the much desired objectives and this sets the study objectives with the main one being to examine electronic and traditional payment systems on payments in Nigeria a comparative analysis of methods and specific objectives being to determine impact or effects of the two payment systems in Nigeria to establish the more effective; also examine the more effective of their products like: POS and cash payment on spot purchases; IPPIS and bank schedules on effective salary administration and TSA and Multi-Treasury Account (MTA) on effective government financial management and accountability. The questions guiding the study are: how effective is the e-payment and traditional payment systems on payments in the country? how effective is the POS and physical cash convenient in meeting on the spot payment for goods and services? to what degree is IPPIS and Bank Schedules effective on salary administration? and to what extent is TSA and MTA effective in government financial management and accountability? The research hypotheses are: e-payment and traditional payments relatively are not effective as payment systems in Nigeria; IPPIS and Bank Schedules as both payments products are not effective; POS and Cash Payment for on the spot payment are not effective and TSA and MTA are not effective for government's financial management and accountability. The research methodology used is the survey type and data collected were both primary and secondary analyzed with both descriptive and inferential statistics substantially for evaluating responses from questionnaires with paired two sample means and t – test at 0.05 level of significance and p value at 0.00. The theoretical framework is the new growth theory. However, empirical reviews and hypotheses tested showed that e-payment is effective since its introduction in 2015 hence, recommendations were made among which is, all government's MDAs, Corporations and Parastatals should subscribe to it irrespective of its trust deficit by some organizations.

Keywords: *E-Payment, Traditional Payment, System and Tools*

1.1 Introduction

Payment is a crucial concept in exchange processes of goods or services. It bears direct relevance to countries developments (Smith 1776) and therefore, governments world over pay deliberate attention to formulating policies favourable to their economies for growth and development. Akinuli, (2018) and Muraina (2014), both agreed that, standardization of payment systems brought about governments intervention and involvement as means of accentuating their efficiencies. They (payments) are generally referred to as systems because they have components or products that enhance their operational effectiveness.

Payment as an age long economic activity started with the traditional system where goods and services exchanged for equivalent goods and services other words referred to as barter (Oginni, EL-Maude, Mohammed and Michael, 2013). Other abstract representations of payments used were cowries and cattles (9000 BC), Coins (1000 BC), Penny and Pounds in the medieval European era between 410 – 1485 (Davies, 1996).

However, 1485 witnessed the emergence of money in the form of cash, banknotes, cheques and early paper-based credit card payments brought about by the industrial revolution. The expansion of markets and high volume financial transactions necessitated a better means of handling payments hence, the introduction of electronic payment (e-payment) system perceived a better payment option than the traditional method.

While the traditional system made use of products like cash and cheques with the aid of other services such as clearing house(s), cashing facility, multi-treasury for government MDAs as it were, bank deposit(s) among others, the e-payment operates through IPPIS, TSA, ATM, POS, e-banking, Remita (Summers, 2012; Bingilar and Bariweni, 2019) also among others as a model to the old system.

1.2 Objectives of the study

The study objectives are:

1.2.1 To examine the roles of e-payment and traditional payment systems in the country's payments structure.

1.2.2. To evaluate the effect of Point of Sale (POS) and cash payments for on the spot payment for purchases.

1.2.3. To determine the effect of IPPIS and bank schedules of both systems on payments.

1.2.4. To review the effect of TSA and MTA in government' financial management and accountability.

1.3 Research Questions

1.3.1. To what degree is the effect of e-payment and traditional payment systems on the country's payment structure?

1.3.2. How effective is the POS and cash payments on spot payments for purchases?

1.3.3. To what degree is the effect of IPPIS and bank schedules of both systems on payment?

1.3.4. What is the effect of TSA and MTA in government financial management and accountability?

1.4 Hypotheses of the study

1.4.1. E-payment and traditional payment systems are not effective in the country's payment structure.

1.4.2. POS and cash payments are not effective in on spot payments for purchases.

1.4.3. IPPIS and bank schedules of both systems are not effective on payments.
1.4.4. TSA and MTS are not effective in government financial management and accountability.

2.1 Literature Review

The concept of e-payment found its way within the country's financial management lexicon in its introduction in 2015 bringing up to two payment concepts: traditional and e-payment systems. The traditional method is the non-electronic paper based payment without the involvement of electronic or automated processing (Gocardless, 2023). According to Shaman (2004), the dormant feature involves writing payment details or transactions without any form of ICT or electronic support. Similarly, Oriahu & Obi (2007:28), described it as being manually inclined in the delivery of financial services either in public or private sector with the inherent challenges of fraud, errors and corruption. However, a brief review of the traditional payment components follows thus:

2.1.1. Traditional Payment System's Components

The operational effectiveness in the traditional system is determined by its products: Multi-Treasury Account (MTA), Bank Schedules and Physical Cash Payment for Transactions:

2.1.2. **Bank Schedule(s)**: The bank schedule presents a snapshot of employees' total emolument and it is displayed for some days prior to payment. It shows salary variations, grade levels, steps and gross pay culminating to net pay and this provides ample opportunity for errors correction before payment, but errors under the IPPIS are noticed only after payment with little hope of corrections in sight and this represents a minus or a challenge that needs urgent attention. This explains the position of Anichebe (2017), that since e-payment introduction in 2006 and implantation in 2015 there is only little achievement which contrasts the view of Paul et al (2019) that, it is for high volume financial management.

2.1.3. **Multi-Treasury Account:** The Multi-Treasury is not a prominent concept, but drawn through inference from the fact that, the adoption of a Treasury Single Account as a government policy in 2015 meant that, what obtained was multi-treasury in the MDAs. The position of Ahmed (2017) that, the movement from a multi-treasury to a single treasury (brought fear of job losses) is sufficient to give credence to the existence of multi-treasury prior to the new policy.

2.1.4. **Physical Cash Transactions:** Cash transactions entail doing business with physical cash in direct exchange process dealings. The cashless economic policy which manifests in some way through e-payment is an attempt to dissuade physical cash involvement in almost all economic activities. The e-payment cost implication serves somewhat a limiting factor to the full implementation with cash payment in businesses flourishing (Kenton, Khartit & Kvilhaug, 2022).

2.2 Electronic Payment System and Components

Relatedly, e-payment system is the automated process of exchanging monetary value among parties in business transactions and transmitting this value over the ICT networks (Amin, Onyeukwu & Osuagwu, 2018). Harelimana (2018), also described electronic payment system as an inter-organizational information system that is for the purpose of monetary exchange that connects several organizations and individual users and this necessitates intricate relationships between stakeholders, technology and the environment.

According to Edet (2019), e-payment system comes in different forms and asserts further that, the tools and channels are numerous some of them are:

2.2.1. **Integrated Personnel and Payroll Information System (IPPIS)**

The IPPIS functions the same way the bank schedule worked under the traditional system, but what is sufficient is its deployment of electronic features particularly, the biometric capturing aids which enables the basic sciences capture peculiar to employees to pooling up a payroll for the government's MDAs devoid of the ghost workers' syndrome prevalent before its introduction.

2.2.2. **Treasury Single Account**

The TSA as an e-payment product, functions in ways similar to the Multi-Treasury in the old system. However, the Remita facility that enables it to sweep government's idle funds to the TSA domiciled in the CBN makes it a great feature. Its (Remita) effect of 31 December, 2015 where all perceived idle balances were swept to the TSA is still fresh in the memory. It ensures the efficient management and control of government's cash resources with effective government's banking arrangements. Such arrangements are designed to minimize the cost of governmental operations, borrowings and maximize the opportunity cost of cash resources (Oguntodu, Alalade, Adekunle & Adegbie, 2016).

2.2.3. **Point of Sale (POS):** Point of Sale referred to as a retail shop, a checkout counter in a shop, or the location where a transaction occurs. POS machines are electronic devices deployed at retail outlets to facilitate the exchange of value between a cardholder and a merchant. They are used to perform a variety of basic banking and financial transactions like payment for purchases, balance enquires, mini statement printing etc. It eliminates the numerous issues related to regular cash transactions with the benefits of all the parties involved enjoying improved operational efficiency, ensuring transaction security and integrity, eliminating needs to carry large amounts beyond banking hours, increasing income from transaction fees and float, providing a simple, more efficient and convenient payment system. This is different from carrying cash with the risk involved for payment of goods or services or both.

2.3 **Theoretical Framework**

The theoretical frameworks of this study is the Innovation Diffusion Theory:

2.3.1. **The Innovation Diffusion Theory:** This theory developed by Roger in 1983 explains individuals' intention to adopt a technology as a modality to perform a traditional activity (Isibor, Ojo & Ikpefan, 2018). The critical factors that determine the adoption of an innovation at the general level are the following: relative advantage, compatibility, complexity, and observability. It is interested with the way a new technological thought, technique, or the use of an old technique. From this theory, technological innovation is transmitted through specific channels among the members of a social scheme. The levels of transmission are: knowledge (knowing its existence and understanding its roles); persuasion (showing favourable attitude to the technology); decision (adopting the technology); implementation (using it); and confirmation (benefits based on positive use of it).

2.4. **Empirical Reviews**

Afaha (2019), studied the relationship between electronic payment systems and economic growth using monthly data covering the period of 2012 to 2017. The Autoregressive Distributed Lagged Regression (ADLR) method was used in the analysis. The results indicated a significant positive relationship between electronic payment system and economic growth in terms of real Gross Domestic Product (GDP) growth.

Yusuf (2016), examined cash-less policy and economic growth in Nigeria over the period 2008 to 2015. Making use of the Ordinary Least Square (OLS) technique, the result showed that POS, web and mobile payments have a positive and significant impact on economic growth in Nigeria. The study concluded that the adoption of non-cash payment by customers will contributes to reduced inflation rate, increase in foreign direct investment, increase in government revenue and a fall in unemployment levels, all which contribute to the growth in Nigeria.

Farajimakin & Anichebe (2017), studied Integrated Payroll System (IPPIS) and government expenditure in Nigeria. The study used both qualitative and quantitative methods of research. Data were collected through primary and secondary sources and the secondary mainly from annual report of Bayelsa State Government, Nigeria and survey data were obtained from 30 respondents using research-designed questionnaire validated by experts and shown to have a reliable coefficient of 0.90. Descriptive and OLS regression statistical techniques were used in analyzing the data with the aid of statistical package Social Science (SPSS) version 21. The study found that, there was positive and strong relationship between Integrated Payroll System and personnel cost and overhead.

Effiong et al (2017), studied the effect of TSA, IPPIS and GIFMIS application and implementation effect on fraud management in public sector in Nigeria. The study was conducted using descriptive research design with questionnaires administered on respondents randomly selected from the studied ministries. The linear regression model was employed in establishing the relationship between variables and the study showed that TSA, IPPS and GIFMIS have positive and significant relationship with fraud and fraud management as well as jointly impact the performance of public interest entities.

Methodology

3.1. **Research Design**

The research adopted the survey design to evaluate the effect of e-payment and traditional payment systems on payments in Nigeria. The survey research adoption is premised on its usefulness in describing the characteristics of a large population as it ensures a more accurate sample of gathering results to draw conclusions and make decisions. Also, its anonymity allows respondents to respond to questions candidly.

The study is conducted mainly within Enugu State and the result represents fairly what obtained in the sectors. The population of the study comprises the management and staff of the three selected government parastatals: Enugu State Broadcasting Service (ESBS), Enugu State Waste Management Agency (ESWAMA) and Enugu State Water Corporation (ESWC) and randomly selected residents in the State.

The instrument of data collection used was the questionnaire type, administered, structured and contained 130 closed ended questions carefully designed and analysed with descriptive and inferential statistics for evaluating responses with paired two sample for mean.
A five (5) point Likert Scale: SA–Strongly Agreed, A.–Agreed, U–Undecided, D–Disagreed and SD–Strongly Disagreed is used to address all responses from the questionnaires.

The questionnaires distributed, returned, not returned and percentages representation for both systems and their analyses areas shown below:

Table 3.3: Distributed and returned questionnaire for e-payment and variables

Entities/individuals	Set of questions Distributed	Set of questions Returned	Set of questions not returned	Percentage (%)
Banks	30	18	12	14%
POS Operators	10	4	6	3%
Enugu State Broadcasting Service (ESBS)	30	24	6	18%
Enugu State Waste Management Agency (ESWMA)	15	13	2	10%
Enugu State Water Corporation (ESWC)	20	16	4	12%
Enugu Residents	25	23	2	18%
Total	130	98	32	75%

Source: Field Survey, 2021

Table 3.3: Distribution and return Questionnaires (traditional payment variables)

The table shows a total of 130 questionnaires distributed to respondents and 32 copies were

not returned while 98 copies were returned relative to e-payment and products.

Table 3.4: Distributed and returned questionnaires for traditional payment and variables

Entities/individuals	Set of questions Distributed	Set of questions Returned	Set of questions not returned	Percentage (%)
Banks	30	20	10	20%
POS Operators	20	10	10	10%
Enugu State Broadcasting Service (ESBS)	30	30	0	30%
Enugu Residents	20	10	10	10%
Total	100	70	30	70%

Source: Field Research, 2021

Table 3.4 shows a total of 100 questionnaires distributed to respondents and 30 copies were not returned while 70 copies were returned relative to traditional payment and products.

3.5. Reliability of the Instrument

The reliability of the instruments is ascertained with the Cronbach alpha's measure of internal consistency that shows how closely related a set of items are in a group with a scale of reliability of at least 0.70% and above. However, the 0.75% scaled test shows the instrument's high reliability.

3.6. Validity of the Instrument

The research validity is attested to by seasoned lecturers, one from the Department of Accountancy and the other from the Department of Banking and Finance. Their modification in the instrument used impacts significantly in rating validity highly.

3.7. Source of Data

The data for the study are obtained from primary sources: questionnaires, observations and personal interview and secondary sources: books, magazines and other social media platforms in Nigeria.

3.8. Method of Data Analysis

The data are analysed using both descriptive: mean, standard deviation and inferential statistics (hypotheses): t-test and the results used in drawing conclusions.

Data Presentation and Analysis

4.1. Data Presentation

Data for the study sourced from the questionnaires distribution are presented as shown below:

Table 4.1: Summary of respondents on the effect of e-payment and products on payments in Nigeria

Variables	SA	A	UD	DA	SD	Total
Ranking	(5)	(4)	(3)	(2)	(1)	-
E-Payment	30	40	5	7	19	98
Integrated Personnel and Payroll Information System (IPPIS)	50	20	10	11	7	98
Point of Sale (POS)	60	15	9	8	6	98
Treasury Single Account (TSA)	71	9	5	4	9	98

Source: Field Research 2021

Table 4.1 shows the responses of e-payment and products scaling from respondents

4.2. Descriptive analyses of responses on e-payment and components

The responses from respondents on the effect of e-payment on payments in Nigeria indicate that:

70 respondents about 71.42% agreed that e-payment as a total package within the Nigerian payments structure is effective, 26 respondents about 27% disagreed on its effectiveness and 5 respondents about 6% remained undecided.

Further analyses of the components show that:

70 respondents about 71.42% agreed that, IPPIS is effective, 18 respondents about 18.37% disagree and 10 about 10.20% undecided.

In the same vein, 75 respondents about 77% agreed that, POS is effective, 14 respondents representing about 14.29% disagree and 9 respondents about 9.2% undecided.

More so, 80 respondents representing about 82% agreed that the TSA is effective while, 13 respondents about 13.27% disagreed and 5 respondents about 6% remained undecided.

For accurate comparison, having analysed e-payment and products or tools, the need arises to do the same for traditional payment hence, the components and traditional payment analyses below:

Table 4.2: Summary of respondents on the effect of traditional payment and products on payments in Nigeria

Variables	SA	A	UD	DA	SD	Total
Ranking	(5)	(4)	(3)	(2)	(1)	-
Traditional Payment	20	30	3	5	12	70
Bank Schedules/IPPIS	30	15	8	10	7	70
Physical Cash Payment/POS	40	10	8	9	3	70
Multi Treasury Account (MTA)/TSA	30	15	9	6	10	70

Source: Field Research 2021

Table 4.2 shows the responses of traditional payment and products scaling from respondents

4.3. **Descriptive analyses of responses on traditional payment and components**

The responses from respondents on the effect of traditional payment on payments in Nigeria indicate that:

50 respondents representing 71.43% agreed that traditional payment as a total package is also effective since e-payment implementation is not completely total, but has relative gaps, 17 respondents about 24.23% disagreed aligning with e-payment and 3 respondents about 4.23% undecided.

A further breakdown of the components showed that:

45 respondents representing 64.23% agreed that bank schedule method of salary administration is effective because it provides a window for correction before payments, 17 respondents about 24.29% disagreed and 8 respondents about 11.43% remained undecided.

Also, 50 respondents about 71.43% agreed on the effectiveness of cash for point of sale payment for purchases, 12 respondents about 17.14% disagreed and 8 respondents about 11.43% undecided.

More so, 45 respondents about 64.29% agreed MTA is effective maybe because of the benefits from corruption, 16 about 23% opposed to corruption disagreed and 9 respondents about 13% undecided.

With the analyses for both payment methods, a strong basis is established for the test of hypotheses to determine the more effective payment in the Nigeria's payments structure as presently constituted and therefore, the research topic which is "The Effect of Electronic and Traditional Payment Systems on Payments in Nigeria, a comparative Analysis of Methods" is re-introduced with payments in Nigeria as independent variable and e-payment, traditional payment and products as dependent variables.

4.4. **Model Specification**

Pryor (1968), while testing the hypothesis of government expenditure on consumption in Germany used the model:

$$C = f(GDP)$$

That is, government's expenditure on consumption is a function of Gross Domestic Product (GDP):

Where: C = Government Expenditure on Consumption.

f = Function

G = Gross

D = Domestic

P= Product

Similarly, the model for this study culled from Pryor model is, payment in Nigeria is a function of electronic and traditional payment systems and products represented as:

$$P = f(\text{e-pmt and t-pmt \& products})$$

Where P = Payment Structure in Nigeria

f = Function

e-pmt = Electronic Payment

t-pmt = Traditional Payment

e-payment products:

(IPPIS, TSA, ATM, POS, Remita, e-banking & Credit Cards)

t-pmt products:

(Bank Schedules, MTA, Cashing Facilities, Cash Payment, Clearing House, Bank Deposit, Loan Forms)

4.5. Test of Hypotheses

The test of hypotheses using t – test statistic helps in drawing inferences that support the more effective of the e-payment and products compared to the traditional payment and tools within the Nigeria's payments structure:

Hypothesis One: E-Payment and traditional payment systems are not effective relatively in the payment structure in Nigeria.

Table 4.3: Paired two sample for mean on impact of e-payment relative to traditional payment method

Details	Mean	Std Deviation (Variance)	Std Error	t-test	Df	Level of Significance	Critical Value	P Value
E-Payment	19.6	909	8.39	0.67	4	0.05	2.132	0.00
Traditional Payment	14	498	-	-	-	-	-	-

Source: Field Research, 2021

Table 4.3. shows e-payment and traditional payment as a total package, but relatively, e-payment with a mean of 19.6 and standard deviation of 909 over traditional payment's 14 and 498 respectively showed a positive position. Furthermore, with a t-test of 0.67 at 4 df at 0.05 with a P Value of 0.00, it shows e-payment's 0.67 > 0.05 level of significance with a critical value of 2.132 is effective and therefore, the null hypothesis **(Ho**) which states that e-payment is ineffective is rejected and the alternate hypothesis **(H1)** which states that, e-payment is effective in Nigeria's payment structure accepted. This position supports Afaha (2019), who studied the effect of e-payment system on economic growth and the result indicated a significant positive relation between e-payment system and economic growth in real GDP in Nigeria.

Hypothesis Two: IPPIS and bank schedules as products of both payment systems are not effective.

Table 4.4: Paired two sample for mean on impact of IPPIS and Bank schedule on effective salary administration.

Details	Mean	Std Deviation (Variance)	Std Error	t-test	Df	Level of Significance	Critical Value	P Value
IPPIS	19.6	1249.2	15	0.34	4	0.05	2.132	0.00
Bank Schedule	14	358	-	-	-	-	-	-

Source: Field Research, 2021

Table 4.4 shows IPPIS' t-test (0.35) at 4 df at 0.05 (0.35 > 0.05) level of significance with a critical value of 2.132. This shows positive effect of IPPIS and therefore, the null hypothesis **(Ho)** which states that, IPPIS is not effective in salary administration rejected and the alternate hypothesis **(H2)** which states that IPPIS is effective in salary administration in Nigeria as an e-payment component accepted. This position is in tandem with Farajimakin & Anichebe (2017) on IPPIS and therefore, IPPIS as presently constituted is good for the country. This is attested to by government MDAs, Corporations and Parastatal like: ESWAMA, ESBS and ESWC in Enugu State. With this result, IPPIS could be extended to other MDAs, Corporations and Parastatals yet to be captured.

Hypothesis Three: The POS and cash payment for on the spot payment for purchases are ineffective.

Table 4.5: Paired two sample for mean on impact of POS and Cash Payment on effective payment for purchases.

Details	Mean	Std Deviation (Variance)	Std Error	t-test	Df	Level of Significance	Critical Value	P Value
POS	19.6	2085.2	17	0.31	4	0.05	2.132	0.00
Cash Payment	14	874	-	-	-	-	-	-

source: Field Research, 2021

Table 4.5 shows POS t-test (0.35) at 4 df at 0.05 (0.35 > 0.05) level of significance with a critical value of 2.132. This shows positive effect of POS and therefore, the null hypothesis **(Ho)** which states that, POS is not effective on immediate payment for purchases in Nigeria is rejected and the alternate hypothesis **(H3)** which states that POS is effective as an e-payment component accepted. This study is in line with the findings of Yusuf (2016).

Hypothesis Four: The TSA and MTA in government's financial management and accountability are not effective.

Table 4.6: Paired two sample for mean on impact of TSA and MTA in government's financial accountability.

Details	Mean	Std Deviation (Variance)	Std Error	t-test	df	Level of Significance	Critical Value	P Value
TSA	19.6	3323.3	18.15	0.31	4	0.05	2.132	0.00
MTA	14	362	-	-	-	-	-	-

Source: Field Research 2021

Table 4.6 shows e-banking t-test (0.31) at 4 df at 0.05 (0.29 > 0.05) level of significance with a critical value of 2.132. This shows positive effect of the TSA and therefore, the null hypothesis **(Ho)** which states that, TSA is not effective is rejected and the alternate hypothesis **(H4)** which states that the TSA is effective in government's financial accountability as an e-payment component accepted. This finding also aligns with Effiong (2017), Enakirerhi & Temile 2017 and Kaojo (2020).

4.6. Comparative Analysis of Methods

From the analyses of electronic and traditional payment systems and components or products above, it has been found that, e-payment system with its tools: IPPIS, TSA, and POS is more effective in Nigeria's payment structure relative to the traditional payment method and components: Bank Schedules, MTA and Cash Payment. in every facet of financial delivery services.

Summary of Findings, Conclusion and Recommendations

5.1 Summary of Findings

The research combined descriptive analyses converted into percentages and hypotheses testing of the research questions. The findings of the study are as follows:

The null hypotheses (Ho) that stated the ineffectiveness of the e-payment and products such as the: IPPIS, TSA and POS over the tradition payment tools like: bank schedules, Multi-Treasury (MTA)and cash payment were all rejected using t-test 0.05 level of significance findings as bases and the alternate hypotheses (H1 – H4) stating that, e-payment and all its tools are effective accepted.

5.2 Conclusion

Based on the findings and empirical reviews, e-payment and components has proven to be effective relative to traditional payment and tools within the country's payment structure. It is instructive to note that, some

aspects of traditional payments like cash payment for transactions are still relevant and they in a way cover up the gaps created by e-payment since it is not yet end to end.

5.3 **Recommendations**

It is recommended that:

5.31. E-Payment and product should be sustained in the Nigerian payment structure while traditional payment and products particularly cash continues to fill up payment gaps of the e-payment.

5.3.2. The POS remains a better way of remitting payments for on the spot purchases with minimal risk compared to holding cash and therefore, should be sustained while improving on its facilities for effective service delivery.

5.3.3. IPPIS as an effective e-payment product for salary administration and management for government should be sustained.

5.3.4. The TSA having proven to be effective in government's financial accountability and fraud prevention, should also be sustained.

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