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Globalization And Digitization In A Developing Economy: Opportunities, Challenges And Ways Forward

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Abstract. This study examines the influence of Uzbek national traditions on the ethical and aesthetic progress of society. By analyzing cultural practices such as communal cooperation (hashar), hospitality (mehmondo'stlik), and traditional arts, the research highlights their role in shaping moral values, social cohesion, and aesthetic sensibilities. Qualitative methods, including interviews and case studies, reveal that these traditions foster collective responsibility, respect for heritage, and artistic expression. However, globalization and urbanization pose challenges to their preservation. The findings emphasize the need to integrate traditional values into modern frameworks to sustain societal development. This work contributes to understanding cultural mechanisms in ethical-aesthetic education and offers insights for policymakers.
Keywords. Uzbek traditions, ethical development, aesthetic values, cultural heritage, societal norms, moral education, globalization, traditional rituals.

Abstract
This research examined globalization and digitalization in a developing economy: opportunities, challenges and ways forward using Nigeria as the case study. Globalization Index (GI) and Network Readiness Index (NRI) were used as indicators of globalization and digitalization respectively. Human Development Index (HDI) was used to measure development in Nigeria. Society 5.0 theory was the theoretical underpinning. The study employed various econometric methodologies to handle the diagnostic data analysis from 2000 till 2023. Unit Root Test result led to the use of Autoregressive Distributed Lag (ARDL) model. The study determined that the effect of NRI on HDI is in two folds: at current level and at a one-time lag. The lagged impact of NRI on HDI is negative and significant at 5% level and its impact transcends across one lag. This implies that the negative impact of digitalization on human development does not happen immediately but becomes visible after some time. The impact is statistically significant, meaning it is unlikely to be due to chance. On the other hand, the impact of GI on HDI is insignificantly positive at 5% significance level and its effect does not distribute over time lag. This implies that globalization may help improve human development in Nigeria, but the improvement is small and not consistent enough across different time periods. Therefore, the study recommends adequate integrated and coordinated policies (education reforms, digital inclusion programmes, job transition support, equal healthcare accessibility, income equality initiatives) that will drive fourth industrial revolution (4IR) and make Nigeria a Society 5.0.

KEY WORDS: Globalization, Digitalization, HDI, Society 5.0.

1. Introduction

In recent years, the world economy has become increasingly integrated and interconnected through globalization and digitalization. Developing economies and their governments have been making concerted efforts to advance their levels of industrialization, modernization, and human development through the adoption of multifaceted global developmental ideas, policies, programmes, practices, and innovations. Nigeria which is one of the developing economies in Africa is not left out in this drive for economic advancement using globalization and digitalization as the key drivers.

ISSN NO: 2769-996X
March 2025

A developing economy is operationalized in this paper as an economy or country that is yet to achieve a high degree of advancement in modernization, industrialization and human development. In the Human Development Report (HDR) of 2010 of the United Nations Development Programme (UNDP), the country classification system that determines whether a country is developed or not is built around the Human Development Index (HDI). HDI is bound between 0 – 1 (UNDP, 2025). Countries that are in the top quartile (0.75 and above) of the HDI are referred to as advanced economies while others below the top quartile (Below 0.75) are classified as developing countries (Nielsen, 2011).

HDI is an index that emphasizes that people are the greatest measure of the development of a country. It is a composite index that shows a country's achievement in the education, longevity (long life), and income of its citizens (UNDP, 2025). In HDR of 2023/2024, Nigeria's HDI for 2022 was 0.548, ranked 161st out of 193 countries and categorized among countries with Low Human Development (UNDP, 2024a).

The two key drivers of economic development, globalization, and digitalization are coined as the GlobalDigit-Mix in this paper. Globalization is the process by which economies, societies, and cultures around the world become interconnected, interdependent, and integrated through the cross-border flow of capital, people, culture, information, technology, goods, and services. In fact, globalization paints a picture of a world without borders. There are three (3) key forms of globalization which are: economic globalization, social globalization, and political globalization (ETH Zurich, 2025).

For this paper, Nigeria's overall globalization was assessed using a composite index of globalization known as Globalization Index by KOF Swiss Economic Institute, Zurich, abbreviated as KOFGI. It measures economic, social, and political globalization (Haelg, 2019). Nigeria scored 55 points and ranked 116th among 188 countries in Globalization Index in 2020 and in 2021 and 2022 Nigeria scored 55.03 and 55.29 respectively (TheGlobalEconomy.com, 2023).

Digitalization. on the other hand, is the process of increased automation, reliance on digital systems and information and communication technology (ICT) to transform business processes, systems, products, and services. The COVID-19 pandemic fast-tracked the digital transformation process and added urgency for governments to respond (United Nations Conference on Trade and Development (UNCTAD), 2021). Digitatization includes, financial, business, government, social and political digitalization which are also interconnected.

Digitalization in this paper was proxied by a composite index as well called the Network Readiness Index (NRI). NRI is hinged on four key pillars: technology, people, governance, and impact (Portulans Institute, 2023). Nigeria ranked 117th out of the 134 economies in 2020; in 2021, Nigeria ranked 103rd, and in 2022, she ranked 109th (Portulans Institute, 2023).

Nigeria, with a population of over 216.7 million people (UNDP - Nigeria, 2025), has experienced significant, and multidimensional influences of globalization and digitalization (GlobalDigit-Mix). These influences are characterized by the good, the bad, and the ugly realities of global economic interconnectivity and a borderless global space.

The GlobalDigit-Mix has created opportunities in Nigeria in terms of better technology, easier and more accessible international trade, and new financial resources.

They have also brought about challenges, such as a rise in inequality, the displacement of conventional work, and the possibility for technology to be abused.

Hence, this study aims to examine the effect of globalization and digitalization on a developing economy using Nigeria as the case study amidst several challenges and opportunities, in addition to suggesting ways forward.

1.1 Motivation of the Study

In recent decades, there have been fundamental global increases in financial, economic, political, and technological integration as a result of globalization and digitalization. However, these increases across the globe appear not to have reflected much in human development in Nigeria considering that Nigeria remains low at 0.548 (UNDP, 2024b), despite being the largest economy in Africa based on its GDP of 2021.

Comparing Nigeria's HDI with other developing economies in Africa from 2000 -2020

	TABLE 1.1	**Country Human Development Index (HDI) Comparisons of Five (5) Developing African Economies from 2000 – 2020**

ISSN NO: 2769-996X
March 2025

	Country	2000	2005	2010	2015	2020
		HDI	HDI	HDI	HDI	HDI
1	**Nigeria**	-	**0.469**	**0.482**	**0.516**	**0.535**
2	South Africa	0.633	0.632	0.675	0.716	0.727
3	Egypt	0.633	0.643	0.675	0.706	0.734
4	Algeria	0.649	0.685	0.721	0.74	0.745
5	Ethiopia	0.287	0.346	0.412	0.46	0.498

Source: UNDP (2022)

The above scenario led to the study aim of determining the influence of globalization and digitalization in a developing economy like Nigeria. The specific objectives include to:

i. determine the effect of globalization on human development in Nigeria;
ii. examine the influence of digitalization on human development in Nigeria; and
iii. ascertain the combined impact of globalization and digitalization (GlobalDigit-Mix) on human development in Nigeria.

In line with the objectives, the paper formulates the following research questions:

a) To what extent does globalization affect human development in Nigeria?
b) Does digitalization impact on human development in Nigeria?
c) What is the combined impact of globalization and digitalization (GlobalDigit-Mix) on human development in Nigeria?

The above research questions yield the following hypotheses:

Ho1: There is no significant effect of globalization on human development in Nigeria.

Ho 2: Digitalization has no significant impact on human development in Nigeria.

Ho 3: The combination of globalization and digitalization (GlobalDigit-Mix) does not have any significant effect on human development in Nigeria.

Thinking forward, what can Nigerians in the various professions, duties, positions, and capacities do to make Nigeria be at the top quartile of the HDI ladder using globalization and digitalization as the drivers of the economy? Can Nigeria catch up with the developed economies by at most the year 2040 using the GlobalDigit-Mix?

For the rest of the paper, the next section comprises of literature review, which discusses the conceptual review, the theoretical underpinning of this study and the empirical review. This is followed by the methodology and the findings. The remaining section is GlobalDigit-Mix opportunities, challenges and ways forward followed immediately with a conclusion.

2. Literature Review

2.1 Conceptual Review

Globalization is the intensification of economic integration that enhances the economic standards of PEOPLE across the globe (Edoumiekumo, 2013). Relatable examples of the three (3) forms of globalization are:

a. Economic globalization: International trade; financial globalization such as foreign direct investments (FDI), international banking, financial technologies (FinTech), external debt flows, etc.
b. Social globalization: Information globalization such as the use of the internet, social media, etc.; cultural globalization e.g.: the spread of cultural practices, values, and beliefs, etc.
c. Political globalization: International governance structures like the United Nations (UN), World Trade Organization (WTO), etc.; Embassies, etc.

These three forms of globalization are interrelated and can reinforce each other. For example, economic globalization can drive social globalization, which in turn can lead to greater political interconnectedness.

2.1.1 **KOF Globalization Index**

Globalization in this study was assessed using KOF Globalization Index (KOFGI). KOFGI is a composite index that measures the degree of globalization of any country. It is on a scale of 1 (least globalized) to 100 (most globalized). KOFGI is an average of the indexes for Economic Globalization, Social Globalization, and Political Globalization (ETH Zurich, 2025). From the databank of TheGlobalEconomy.com (2023),

ISSN NO: 2769-996X
March 2025

Nigeria scored 55 in the KOFGI in 2020 ranking 116th out of 188 Countries, comprising of the Economic Globalization Index (GI) at 41 points, Political GI at 84, and Social GI at 40 points.

2.1.2 Digitalization

Digitalization is the process of transforming analog information into digital form for better storage, processing, analysis, and transmission. Digitalization has birthed technological innovations such as e-Banking and other electronic financial platforms (FinTech), social media, e-Learning, AI, Internet of Things (IoT), Blockchain, Robotic Process Automation (RPA), e-Commerce, Cloud Computing, Advanced Analytics, Ride-Sharing Apps, GPS Systems, etc. Zhang, Dai, and Vasarhelyi (2018) cited in Ojukwu and Chukwudi-Ofoedu (2023) asserted that the rate of technological change has continually disrupted traditional processes in every area of life.

2.1.3 Types of Digitalization

The following are types of digitization and their examples:

a. Financial digitalization e.g. e-Banking, Fintech, etc.
b. Business digitalization e.g. digital marketing, e-Commerce, supply chain digitalization, cloud accounting, etc.
c. Political digitalization e.g. use of digital technologies in political processes, such as election campaigns, voter mobilization, and civic engagement.
d. Government digitalization e.g. e-Taxation, e-Payments, e-Registrations in Ministries, Departments, and Agencies (MDAs) of government.
e. Social digitalization e.g. Social Media platforms like WhatsApp, Facebook, and other online forums, and digital communities.
f. Cultural digitalization e.g. digital technologies to create, distribute, and consume cultural products and experiences, such as music, film, and literature.

2.1.4 Network Readiness Index (NRI)

This study used Network Readiness Index (NRI), another composite index, to proxy digitalization. Nigeria ranked 117th out of the 134 economies included in the NRI 2020 with 30.44 points; in 2021, Nigeria ranked 103rd out of 130 economies with 37.51, and she ranked 109th in 2022 out of 131 economies with 36.67 points (Portulans Institute, 2023).

NRI is an index that measures the application and impact of ICT on economies around the world and it is based on their performances in four different pillars: Technology, People, Governance, and Impact (Portulans Institute, 2023).

2.1.6 - Developing Economy

Developing economy is an economy in the process of industrialization and modernization. Compared to advanced or developed economies, developing economies are typically characterized by low-income levels (low GDP per capita); a high concentration of small businesses or large informal sector; low levels of investment in human capital and infrastructure; high population growth rate, that is, the population is usually growing faster than the economy. Along with having low levels of education, they frequently have high rate of unemployment, poverty. inequality, and gender disparity. Nigeria is the developing economy of focus.

2.1.7 Human Development Index (HDI)

This study used UNDP's measure of a country's development which is HDI to assess Nigeria's development. HDI is a composite index measuring average achievements in three basic dimensions of human development - a long and healthy life, knowledge, and a decent standard of living (UNDP, 2025). It is bound between 0 - 1. HDI is used in this paper to gauge the progress of Nigeria in line with the theoretical underpinning, SOCIETY 5.0.

In Human Development of Report (HDR) of UNDP 2021/2022, Nigeria's HDI for 2021 was 0.535 and she ranks 163rd out of 191 countries (UNDP, 2022). The points and rank were coincidentally the same in the year 2020 (UNDP, 2022). In HDR of 2023/2024, Nigeria's HDI for 2022 was 0.548, ranked 161st and categorized among countries with Low Human Development (UNDP, 2024).

2.1.8 HDI Structure

The following are the components of HDI which is referred to as HDI structure in this paper:

a. **Long and Healthy life**: This is measured by Life Expectancy at Birth (LEB) Nigeria's LEB in 2021 was 52.7 years (UNDP, 2022) and in year 2022 it was 54 years (World Bank, 2025)

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March 2025

b. **Knowledge:** This is measured by Expected Years of Schooling (EYS) and Mean Years of Schooling (MYS). According to UNDP (2022), here is the breakdown of EYS and MYS in Nigeria:
   i. EYS in 2021 = 10.1 years
   ii. MYS in 2021 = 7.2 years
c. **Decent Standard of Living:** A decent standard of living is measured by Gross National Income (GNI) per capita. Nigeria's GNI per Capita result was $4,790 in 2021 according to Nigeria's UNDP 2021/2022 HDR (UNDP, 2022).

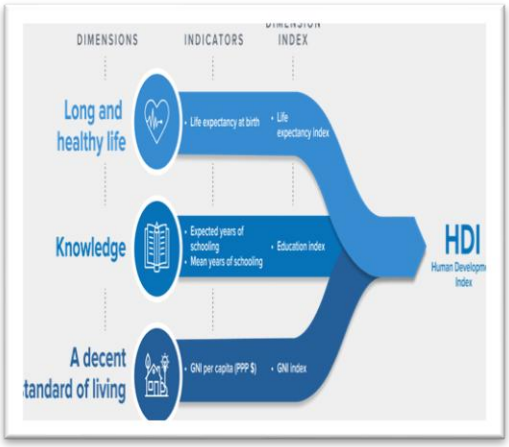

Fig. 2.2 – HDI Structure

Source: UNDP, 2022

Conceptual Framework

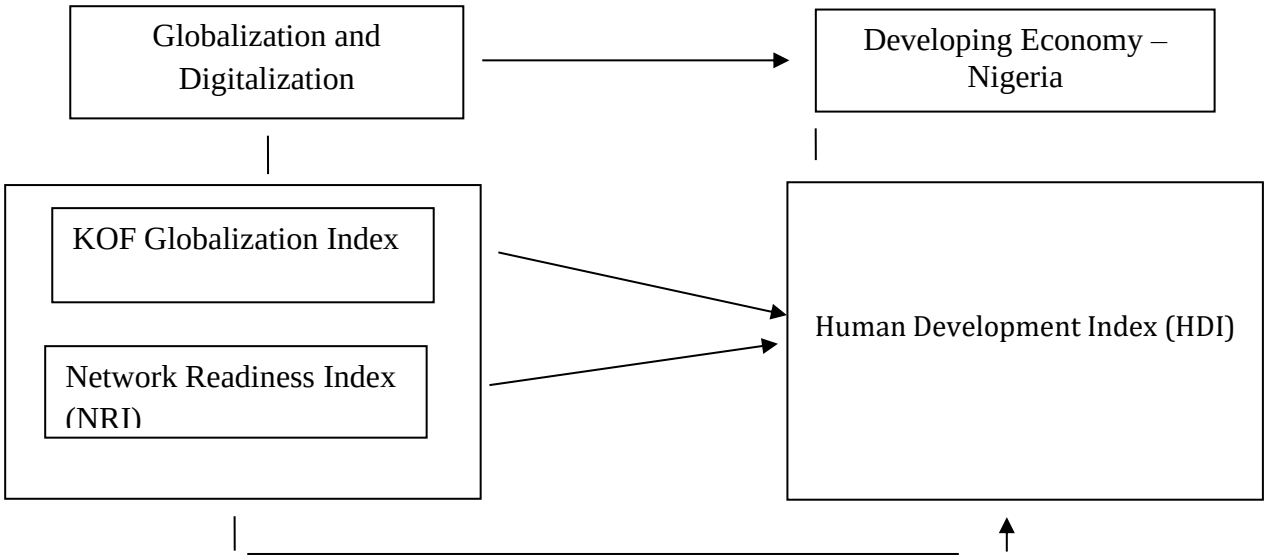

Figure 1.1 - Researchers' Conceptualization of Globalization and Digitalization in a Developing Economy - Nigeria, 2025

2.2 Theoretical Review

Society 5.0 theory is the theoretical framework that this paper is anchored on Society 5.0 concept emerged in Japan in 2016 as a strategic national initiative (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2019), which identified three elements that drive social innovation to be data, information, and knowledge (Deguchi, 2020). Society 5.0 aims at creating a society that can resolve various social challenges by incorporating the innovations of the fourth industrial revolution (4IR) (e.g. artificial intelligence (AI), internet of things (IoT), robot, big data, and sharing economy (online platforms or communities) into every industry and social life (Life, 2023).

ISSN NO: 2769-996X
March 2025

According to Stryzhak (2022), Society 5.0 concept is human-centeredness combined with a high level of digital technology development. Society 5.0 creates a super-smart society (Life, 2023). This theory is considered germane for this paper as it focuses on people - in line with UNDP's key focus of any development, and digital technology.

2.3 Empirical Review

Sinha, Roy, & Tirtosuharto (2025) examined digitalization and economic development: lessons from globalized developing countries using data from top 75 most globalized countries from 2000 to 2019 using KOF Globalization Index. The study found that the relationship between globalization, digitalization, and economic development is firmly supported by long-term equilibrium correlations and bidirectional causalities, which also demonstrate how 75 developing economies are interconnected.

Features of the relationship between human capital development and digital technologies in the context of society 5.0 formation was studied by Stryzhak (2022) for 131 Countries in 2020. Human Capital Index (HCI) and NRI were the variables of measurement used. The study found that there is a direct and strong relationship between HCI and NRI, and HCI in the 131 countries for 2020.

Bon (2021) studied the digitalization–economic growth relationship in developing countries and the role of governance. The study used data of 35 developing countries from 2006 to 2019. Trade openness was a variable of measurement. The findings show that while governance and digitalization work together to promote economic progress, they also work against it.

Oruma & Amah (2021) investigated globalization and technology: Implications in Nigeria. They found that globalization leads to rapid economic growth in Nigeria.

Skarea & Sorianob (2021) studied how globalization is changing digital technology adoption: An international perspective in 183 countries/ from 2014-2016 and 2009−2018. KOFGI, Digital Adoption Index (DAI), Global Competitiveness Index (GDI), and Total Factor Productivity (TFP) were used as the proxies. The study found that Globalization significantly affects technology adoption in all countries.

Tax Compliance and Digitalization of Nigerian Economy: The Empirical Review was examined by Etim, Jeremiah & Dan (2020) in Akwa Ibom State, Nigeria. They found that tax compliance is negatively influenced when economy is digitalized.

Osinubi & Olomola (2020) investigated globalization and Income Inequality in Mexico, Indonesia, Nigeria, and Turkey: A Dynamic GMM Approach from 1980-2018. The dependent variable was income inequality. The independent variables used were economic, social, political, and overall globalization. The study found that overall globalisation increases income inequality in all the MINT countries, except in Indonesia.

Ozigbu & Ezekwe (2020) examined rethinking the distributional effects of economic globalization in Nigeria: A focus on income inequality from 1986- 2017. The measure of the dependent variable was income inequality and the proxies for independent variable were actual flows and restrictions and financial integration.

Shettima & Sharma (2020) investigated impact of Digitalisation on Small and Medium Enterprises in Nigeria. They found that Digitalisation has a great impact on Small and Medium Enterprises of Nigeria.

Isikhuemen, Aigheyisi & Iseghohi (2019) studied comparative analysis of the long run effects of Economic, Political and Social-cultural Globalization on Nigeria's Economic Growth from 1970 – 2014. The endogenous variable was GDP per Capita and the exogenous variables were Social, Economic and political globalization. Economic globalization significantly boosts economic growth, but political globalization hinders it significantly. Social globalization is positive, but insignificant.

Adamu (2003) researched on globalization and economic glocalisation in Northern Nigeria and found that Globalisation increases foreign trade, diplomatic relations and intercultural exchanges

2.4 Gaps in Knowledge

Away from what other scholars have studied, this paper sees globalization and digitalization as though two (2) separate drivers of development but are fundamentally interrelated and interdependent to each other because globalization induces digitalization and digitalization aids globalization. Biryuk (2023) added that the simultaneous sign and stimulus of globalization is digitalization. Many scholars in Nigeria over the years have relied on single indicators to measure the variables under discussion such as Edoumiekumo (2013) used trade openness and FDI for globalization, and Voice and Internet Subscriptions for digitalization

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March 2025

(Phillip & Ndirpaya, 2020). However, this study used composite indexes for the three (3) key variables of focus: Globalization, Digitalization, and a Developing economy.

3. Methodology

Ex post factor research design was used in this study. Data were sourced from reputable repositories and institutions from 2000 to 2023. The study adopted econometric methodologies to take care of the time-series data. Unit root test was carried out followed by Autoregressive Distributed Lag (ARDL).

Based on our operational framework, the study's functional model was developed as follows:

HDI = f (KOFGI) (NRI) …… Model 1

Where:

HDI = Human Development Index
KOFGI = KOF Globalization Index
NRI = Network Readiness Index

The above model is transformed into a Mathematical model by introducing a constant term (β0) and slope, thus:

$$\mathbf{HDI} = \beta_0 + \beta_1 \mathbf{KOFGI_t} + \beta_2 \mathbf{NRI_t} \text{ ----------(2)}$$

The equation (2) above is an incomplete equation. Therefore, constant, slope and error term are introduced to realize the Econometrics methodology below:

$$\mathbf{HDI} = \beta_0 + \beta_1 \mathbf{KOFGI_t} + \beta_2 \mathbf{NRI_t} + \mu_t \text{ ----------(3)}$$

β_0 is the constant term, μ_t is the error term, while β_1 and β_2 are the coefficients of each variable.

Decision Rule

Probability Value(P-value) < 0.05(Level of Significance) = Reject H0
Probability Value(P-value) > 0.05(Level of Significance) = Fail to reject H0

This implies that the study rejects the Null Hypothesis where the Probability value (P value) is less than 0.05. Conversely, where the P-value is greater than 0.05, the study will fail to reject the Null Hypothesis.

Theoretical (Apriori) Expectations

The expected signs for the coefficients are: β1, β2 > 0. The a priori expectation following the Society 5.0 theory which pre-supposes that increase in globalization and digitalization has a positive effect on HDI.

4. Results and Discussions

4.1 Pre-estimation Analysis on Data Stationarity

The multivariate analysis begins with an assessment of the data's stationarity for model estimation. Given that the data is in time series format, it is essential for it to be stationary to fulfill its estimation objectives. A unit root test in statistics assesses whether a time series variable is non-stationary and contains a unit root. The null hypothesis is typically characterized by the existence of a unit root, while the alternative hypothesis may indicate stationarity, trend stationarity, or an explosive root, contingent upon the specific test employed. The usual procedures are the Augmented Dickey-Fuller (ADF), Dickey-Fuller (DF), and Phillips-Perron (PP) tests. In light of the aforementioned context, the time series characteristics of the variables were analyzed using the Augmented Dickey-Fuller (ADF) test for unit roots, as presented in Table 4.1:

. Table 4.1: Unit Root Analysis

Variables	Constant (a)	Intercept and trend (b)	None (c)
		At Levels	
HDI	0.114412	-4.356048**	2.879638
GI	-1.726981	-0.575253	1.577259
NRI	-2.856801*	-2.095734	0.798588
		First Difference	
HDI	-4.037577***	-3.951904**	-3.148777***

ISSN NO: 2769-996X
March 2025

GI	-3.251283**	-3.542907*	-3.074256***
NRI	-4.885239***	-6.054503***	-4.694862***

Key:
* Indicates significance at 10% level; ** indicates significance at 5% level
*** indicates significance at 1% level

The findings demonstrate that variable series are stationary at different levels. Consequently, Autoregressive Distributed Lag (ARDL) technique was the most suitable.

Table 4.2: Integrating Order of the Time Series Data of the Study Variables

Variables	Degree of Integration	I(*d*)
HDI	Stationary at level with intercept & trend	$I(0)^{b}$
GI	Stationary at level with trend & intercept	$I(1)^{c}$
NRI	Stationary at level with intercept, trend & intercept or none	$I(1)^{a, b \text{ or } c}$

Source: Authours' Computation 2025

Table 4.2 merely shows the structural dynamic form that is suited for the variables in the proposed co-integration equation.
There is need to select the optimal lag length for the co-integration equation based on the hypothesis that the residuals are serially uncorrelated (see table 3):

Table 4.3: Optimal Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	12.57911	NA	7.32e-05	-1.008328	-0.859206	-0.983090
1	62.83149	79.34585 *	9.71e-07*	5.350683*	-4.754195*	-5.249733*
2	66.18607	4.237370	1.92e-06	-4.756428	-3.712575	-4.579767
3	80.06268	13.14626	1.47e-06	-5.269756	-3.778536	-5.017382

Source: E-views output 2025

The lag length which minimizes the Akaike Information Criterion (AIC), Schwarz Criterion (SC) and the Hannan-Quinn Criterion (HQC) and at which the model does not have auto-correlation is the optimal lag length. For this analysis, we would make use of the Akaike Information Criterion (AIC) as the choice for the selection of our optimal lag length while we allow the software to automatically choose the optimal lag length. Based on the result in Table 4.3, the lag length which minimizes Akaike Information Criterion (AIC) is lag 1 and thus becomes our optimal lag length in generating the initial regression equation in Table 4.4:

Table 4.4: Initial Regression Equation Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HDI(-1)	0.374552	0.201462	1.859169	0.0815
NRI	0.003843	0.006686	0.574853	0.5734
NRI(-1)	-0.012909	0.006547	-1.971783	0.0662
GI	0.002024	0.001207	1.676859	0.1130
C	0.204040	0.097012	2.103235	0.0516
@TREND	0.002618	0.000930	2.816023	0.0124

R-squared	0.978645	Mean dependent var	0.499091
Adjusted R-squared	0.971971	S.D. dependent var	0.030403
S.E. of regression	0.005090	Akaike info criterion	-7.496050
Sum squared resid	0.000415	Schwarz criterion	-7.198493

ISSN NO: 2769-996X
March 2025

Log likelihood	88.45655	Hannan-Quinn criter.	-7.425955
F-statistic	146.6473	Durbin-Watson stat	1.598289
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: E-views Output 2025

For the purpose of making prediction/forecast and policy formulation, it is crucial for there to be a long-run relationship between the dependent and independent variables. Accordingly, it is imperative to ascertain their long-run relationship by carrying out a bound test.

The bound test involves comparing an F-statistic that characterizes the structure of the estimated model against the upper and lower bounds of the long-run relationship significance. If the F-statistic is greater than the upper bound, then long-run or co-integrating relationship is feasible. If on the other hand, the F-statistic is within the lower and upper bound, then feasibility of co-integrating relationship is inconclusive. Finally, if the F-statistic is lower than the lower bound, then co-integrating relationship is infeasible, hence there would be no need for Error Correction Model. The bound test result is reported in Table 4.5:

Table 4.5: ARDL Long Run Form and Bounds Test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	3.713633	10%	3.38	4.02
K	2	5%	3.88	4.61
		2.5%	4.37	5.16
		1%	4.99	5.85

Source: E-views Output

The result of the bound test for cointegration depicts that the F-statistics value of 3.7136 failed to exceed the upper bound value at 1% level or 5% level or at 10% level. Hence, we fail to reject the null hypothesis that no long-run relationships exist. We therefore settle for a short-run solution for the relationship existing between the dependent and the independent variables.

Table 4.6: Regression Result (Short-Run)

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.204040	0.097012	2.103235	0.0516
@TREND	0.002618	0.000930	2.816023	0.0124
HDI(-1)*	-0.625448	0.201462	-3.104540	0.0068
NRI(-1)	-0.009065	0.006313	-1.436044	0.1703
GI**	0.002024	0.001207	1.676859	0.1130
D(NRI)	0.003843	0.006686	0.574853	0.5734

ISSN NO: 2769-996X
March 2025

Source: E-views output 2025

Table 4.6 confirms the inclusion of trend and intercept as a suitable structural form of modeling HDI as coefficients for both are statistically significant at 5% level. The results show that none of the independent variables is significant at 5% level since none of the p-values is less than 5%.
However, it is usual to ascertain if the standard errors of the coefficients are not bias in their estimation; i.e. if their integrity as 'best linear unbiased estimator' is compromised by any of the militating statistical anomalies that violate the OLS. To begin with, Table 4.7 proves the confirmation of autocorrelation presence. With at least one of the p-values being less than 0.05, we reject the null hypothesis, indicating that there is significant serial correlation in the residuals.

Table 4.7: Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.701902	Prob. F(2,14)	0.1018
Obs*R-squared	6.126824	Prob. Chi-Square(2)	0.0467

Source: E-views output 2025

Also, given the multivariate nature of the model, it is imperative that no two independent variables interact to inflate the variance, thereby undermining the integrity of the coefficients' standard error. Table 4.8 provides evidence on significant detection of multicollinearity. This is because, the centered VIF still contains values that are higher than 10, which the maximum threshold that is established by rule-of-thumb.

Table 4.8: Variance Inflation Factor Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
HDI(-1)	0.040587	8490.674	29.12110
NRI	4.47E-05	432.7081	5.447972
NRI(-1)	4.29E-05	404.0899	7.213915
GI	1.46E-06	3593.915	8.537160
C	0.009411	7991.518	NA
@TREND	8.65E-07	128.1493	30.28376

Source: E-views output 2025

Table 4.9 further adds to the reason for exploring alternative estimation mechanism by confirming the significant presence of heteroskedasticity, given the p-values are less than 0.05.

Table 4.9: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	7.857077	Prob. F(5,16)	0.0007
Obs*R-squared	15.63304	Prob. Chi-Square(5)	0.0080
Scaled explained SS	7.321013	Prob. Chi-Square(5)	0.1978

Source: E-views output 2025

Normality Test

ISSN NO: 2769-996X
March 2025

With respect to normality of the error terms however, Figure 4.1 proves a satisfactory confirmation of Normality. This is because the JB-stat of the histogram has a p-value greater than 5%.

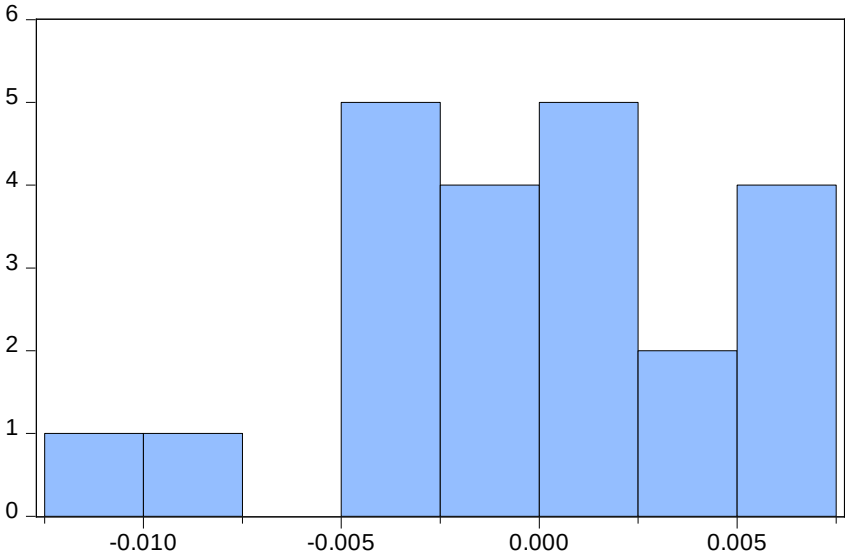

Figure 1: Normality Test

In light of the highlighted shortcomings, it is expedient to explore robust standard error because the OLS-based standard error is biased. Accordingly, the final result after adjusting for the undesirable effects of statistical abnormalities by using Whites's standard error is reported in Table 4.10.

Table 10: Final Regression Result of HDI

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HDI(-1)	0.374552	0.255918	1.463565	0.1627
NRI	0.003843	0.004500	0.854053	0.4057
NRI(-1)	-0.012909	0.005750	-2.244906	0.0393
GI	0.002024	0.001023	1.978039	0.0654
C	0.204040	0.138457	1.473663	0.1600
@TREND	0.002618	0.001202	2.178965	0.0446

R-squared	0.978645	Mean dependent var	0.499091
Adjusted R-squared	0.971971	S.D. dependent var	0.030403
S.E. of regression	0.005090	Akaike info criterion	-7.496050
Sum squared resid	0.000415	Schwarz criterion	-7.198493
Log likelihood	88.45655	Hannan-Quinn criter.	-7.425955
F-statistic	146.6473	Durbin-Watson stat	1.598289
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: E-views output 2025

Interpretation:

The impact of Network Readiness Index (NRI) representing digitalization on the Human Development Index (HDI) representing human development manifests in two ways: at the current level and with a one-time lag. The lagged effect of NRI on HDI is both negative and statistically significant at the 5% level, indicating that its impact persists beyond a single period. This implies that the negative effects of digitalization on HDI do not happen immediately because economies and societies take time to adapt. Once the impact starts, it does not disappear quickly and can last for years. Without proper policies (education reforms, digital inclusion programmes, job transition support), the negative effects can compound over time,

ISSN NO: 2769-996X
March 2025

reducing HDI growth in the long run. For example, job displacement and income inequality, skill gaps and education challenges over time translate to job losses increase, and unemployment rises, leading to higher income inequality and lower living standards, negatively affect HDI. The effects may be small at first, and people may not recognize them. Over years, stress, anxiety, and decreased physical activity contribute to lower life expectancy and lower HDI.

Conversely, the study revealed that the effect of Globalization Index (GI) on HDI is positive but not statistically significant at the 5% level. Moreover, this effect does not extend over time, suggesting that GI's influence on HDI is limited to the current period or on the short run without a sustained impact in subsequent periods. This implies that globalization may help improve human development, but the improvement is small and not consistent enough across time periods. The result does not strongly confirm that globalization is a major driver of HDI improvements, some citizens benefit, while others see little change, making the overall impact weak. Practical examples include: globalization can cause job losses in some sectors (e.g., local manufacturing jobs lost due to cheaper imports); poor and rural areas/communities might not have adequate access to the benefits of globalization. Globalization makes foreign companies to bring advanced technology and skills to developing nations (e.g., multinational companies in Nigeria), however, many local workers do not get access to high-paying jobs, and benefits may remain concentrated among the elite.

The result of the combined effect of globalization and digitalization on human development reveals that human development also depends on other factors such as government policies, education systems, and local infrastructure, which globalization and digitalization alone cannot fix.

The negative effects of digitalization align with the results of Bon (2021) and the limited influence of globalization aligns with findings of Osinubi & Olomola (2020) who found that overall globalisation increases income inequality.

The challenges, opportunities and way forward in maximizing the benefits of globalization and digitalization termed as **GLOBALDIGIT-MIX** in this paper are summarized in the next section.

5. GLOBAL DIGIT-MIX: Opportunities, Challenges and Ways Forward

	Opportunities	**Challenges**	**Ways Forward**
1	**Improved connectivity:** Gives better access to information, skills, larger markets, people, services, products, etc.	**Increased inequality:** Income Inequality, digital divide and general unequal distribution of benefits.	Equitable and inclusive growth and infrastructural development should be implemented across the country: for better interconnectivity, broadband and internet penetration and e-Government services, especially, in the rural communities

ISSN NO: 2769-996X
March 2025

2	**Borderless economy and a global village**	**Overdependence:** on foreign markets and preference for foreign goods and services like Healthcare, Education, etc. **Cultural homogenization**: Dominance of western culture. **Economic vulnerability**: Increased vulnerability to financial crises, exchange rate fluctuations and other volatility in global financial markets.	There should be policy implementation targeted at protecting domestic industries. As well as, effective monetary and fiscal policies implementation. Local goods and services should be made of high standard. The regulatory and enforcement agencies that ensure quality goods and services should be effective in their responsibilities.

GLOBAL DIGIT-MIX: Opportunities, Challenges and Ways Forward Continued

3	**Creation of new industries, job, business models, global value chains, and financial resources:** Additional funding or investment capital can be acquired from across borders. Sources such as crowd-funding, impact investing, venture capital, or grants etc. Also new opportunities for entrepreneurship and innovation are created in areas like e-commerce, Fintech, and digital media.	**Cybersecurity risks and other malicious activities**: Digital tech brings new cybersecurity risks with significant economic, financial, and social consequences.	Improved cybersecurity network and effective regulatory framework on cybercrime.

ISSN NO: 2769-996X
March 2025

4	**Availability of technology-driven solutions:** Creates more efficient and effective ways of doing business and offering quality service delivery in all sectors of the economy.	**Affordability challenge**: worsened by high level of inflation and multidimensional poverty. **Displacement of conventional work**: leading to job losses.	There should be huge government support to citizens in the provision of ICT through building free, safe and accessible ICT Hubs in all the 774 L.G.As in Nigeria. Improve the funding and investments by government and other institutions in digital research and development (R&D).

GLOBAL DIGIT-MIX: Opportunities, Challenges and Ways Forward Continued

5	**International job opportunities.**	**Brain drain:** This can lead to a shortage of skilled workers in critical sectors, such as healthcare and education	Making Nigeria environment favourable, secured, attractive and lucrative for her skilled labour force not to leave the country.
6	**Economic growth and development opportunities:** From many empirical findings, globalization and digitalization lead to rapid economic growth and development, including human development.	**Corruption:** This leads to embezzlement and misappropriation of funds that is meant for the betterment of the generality of the citizens.	The political, moral, cultural and spiritual will to shun corruption in all its form should be imbibed by EVERYONE. There should be political and institutional will to punish offenders as well.
7	**Realizing Society 5.0: -** A society that is **PPEOPLE-CENTRED** and driven by digital technology so that everyone's life will be more comfortable and sustainable.	Poor commitment on **PEOPLE-CENTRED** policies, targets and goals in general. High illiteracy level generally and low digital education and skills among the populace.	integrating the innovations of the fourth industrial Revolution (4IR) (e.g. IoT, big data, AI, robot, etc.) into every industry and social life in Nigeria by government and individuals. Education and Training: There should be inclusion of digital technology education in our curriculum from primary to tertiary levels.

ISSN NO: 2769-996X
March 2025

Source: Authors' Compilation

6. Conclusion

This study suggests that while digitalization and technological advancements are expected to improve human development, their negative effects—such as job displacement, inequality, and digital divides may appear over time and persist beyond a single period. On the other hand, the study concludes that while globalization may have some benefits for human development, its effect is not strong or consistent enough to be confirmed. Additionally, the impact does not extend over multiple time periods, indicating that globalization's influence on HDI is not sustained over time.

Overall, these findings highlight the potential long-term challenges of digital transformation and the uncertain role of globalization in improving human development. Hence, the study gives an overall conclusion that though GlobalDigit-Mix has some challenges but with the commitment of all stakeholders the challenges can be overcome. Policies should focus on ensuring inclusive digital growth and balanced globalization strategies to maximize their positive impact on HDI. All stakeholders should take action on the ways forward proffered above to tap the great opportunities in the GlobalDigit-Mix to make Nigeria a Society 5.0 and a developed economy by latest the year 2040.

Contributions to Knowledge

Notwithstanding what other researchers have done, this study primarily differs as it is one of the early attempts to examine the dynamic interlinkages among globalization and digitalization (GlobalDigit-Mix) on human development in Nigeria, therefore, adds to the growing body of knowledge with its solution-driven approach.

The variables and models applied in this study are rarely used hence giving readers a different view and new knowledge. Current data on the variables were used from 2000 to 2023 when the latest data on the variables stopped at the time of the research, presenting current realities on human development, globalization and digitalization in Nigeria, hence, contributing to knowledge to drive development in Nigeria.

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ISSN NO: 2769-996X
March 2025

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