Chapter

Intellectual Capital Management and Economic Development in a Quasi-Information Society

Ojinga Gideon Omiunu

Abstract

The study investigates intellectual capital management (ICM) and economic development in a quasi-information society such as Nigeria: a macro perspective. The study adopts the correlational research and secondary data were used. From a macro perspective, data used for the human capital development are literacy level, human development index, and Gini coefficient, among others. Structural capital include telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate. Also, economic development as the dependent variable represents the GDP. Data within the periods of 2005 and 2015 were used, and regression analysis and ANOVA were used to explain the relationships between variables of interest of the study. The findings showed that there was no significant increase in the development of the Nigeria economy in the periods of 2005–2015 and the ICM of the nation does not have significant impetus on the economy. The study recommends that for the level of development to increase in Nigeria, governments and policy makers should concentrate and seek strategies to provide policies that would enhance the IC of the nation such as the level of literacy, innovative research, and development, among others.

Keywords: ICM, macro ICM intervention, economic development, quasi-information society, intellectual capital management

1. Introduction

Economic development is an independent research field and of interest to nations and stakeholders of development at local and global levels. It has a long ancient origin and has been since a major point of attraction in the field of research and also in the practicality in developing economies of nations. Economic development could be said to be a multidimensional process that involves major changes in social structures, attitudes, and national institutions, acceleration of economic growth, reducing inequality, and the eradication of poverty [1, 2]. It has to be more concerned with enhancing the lives lived and the freedoms enjoyed. In the past, economic development of economies was captured from traditional perspectives as accumulation of wealth and includes macro variables such as poverty and per capita income levels, change in real GDP, and change in real GDP per capita, among others.

However, the concept has undergone various dynamics, and in the recent knowledge and information society, economic development has received ample transformation. A major transformation is the inclusion of the human development index which is a comprehensive measure of socioeconomic development into the measure of economic development [3, 4]. The development is no longer approached primarily as a process of capital accumulation but rather as a process of organizational change and transformation [5]. According to Todaro and Smith [2], the three major objectives of development include to increase the availability and widen the distribution of basic life-sustaining goods, to raise the levels and standards of living, and to expand the range of economic and social choices.

Recently, due to the dynamics of information and communication technology (ICT) innovations and the knowledge or information economy, economic development as a concept and practice has received tremendous leap and transformation. Jarboe and Alliance [6] noted that dynamics of ICT innovations and knowledge or information economy are revolutionizing the economies of nations. Also, in recent time of the information economy, productive capability is no longer completely dependent on capital and equipment but also has become a function of workers' skills, knowledge, and expertise—hence the intellectual capital of nations. This economy transformation was what made Stewart [7] to affirm that in the new information and knowledge economy, nations' economy stands on three pillars, and they include knowledge becoming what to buy, sell, and do; knowledge-based assets becoming more important to organizations and nations; and lastly, new technologies, innovations, and strategies are needed to explain the knowledge-based assets.

As information and knowledge become more important to development, organizations and nations have been restructured to better utilize human assets and the intellectual capital. Hamzah and Ismail [8] noted that intellectual capital is a major source of competitive advantage and economic development and there is evidence that success and productivity of nations can be partly explained by its intellectual capital. Intellectual capital includes the intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher-valued asset [9]. In recent modern economic development under globalization and increased competitiveness, intellectual capital is required. It is a major resource on demand, which leads to the generation of new ideas and creative approaches to existing economic processes [4].

Makarov [10] and Lukicheva [11] noted that assessing intellectual capital is a complex process because of its individual, organizational, national and global functioning among economies of nations. Many studies such as Mavridis and Kyrmizoglou [12], Ahmad and Mushraf [13], Fadaei et al. [14], Ogbo et al. [15], Saeed et al. [16], and Rehman et al. [17], among others, have tend to approach intellectual capital from the micro level. However, few studies have given attention to intellectual capital from the macro and economy level. From the micro level which holds the individual and organizational view, intellectual capital management can be grouped into three components; these include human, structural, and customer capital. According to Fadaei et al. [14], human capital is all the abilities that include attitude, skill, knowledge, creativity, existing mental knowledge, and people and managers' experience of an organization. Structural capital includes the events and interactions among people in the organization and what remains in organization when people leave it. Customer capital also known as the relational capital refers to all the formal and informal relations of an organization with external beneficiaries and their understandings about organization and also exchange of information between them and the organization.

At the macro level, human development index which is a major development in intellectual capital measurement has an ultra-integral character. Konovalova et al.

[4] noted that there are three indicators of national population life quality that are summed up in human development index and include welfare level, expressed in figures per capita income; health level, expressed in life expectancy rate; and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions. In summary, measuring human development index cuts across the economic, environmental, and cultural factors of people life.

From the studies of Levashov and Rutkevieh [18] and Konovalova et al. [4], the macro level of intellectual capital management was broken down into its micro constituents. The human capital covers the educational and social well-being potential indicators. Structural capital caters for the indicators of scientific potential and the indicators of information and communication components. Consumer capital captures the indicators of relationship capital. Due to lack of data access at the macro level on the relational capital components, only the components of the human and structural capital would be considered for this study. Adapting the work of Konovalova et al. [4], literacy level, human development index, Gini coefficient, unemployment rate, poverty rate, and growth rate would be used to capture the human capital development indices. For the structural capital, telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate would be used. The GDP would stand as the dependent variable of the study which signifies economy development of the nation. These variables used to capture intellectual capital management at the macro level are based on the work of Konovalova et al. [4] that intellectual capital is developed in two ways: education which is the skilled personnel training and involvement of foreign specialists.

The need to focus on quasi-information society is hinged on the fact that development of economy changes with transformation of the society and this differs across nations. According to the Lewis model of development [19], at the lowest level of development, traditional or unskilled labor is surplus while skilled labor is few. According to Rostow's model of development [20], different countries are at different stages of development. The need to close the wide gap and development dividing between developed and developing countries made the General Assembly of the United Nations in September 2015 to adopt the 2030 Agenda for Sustainable Development and developed a 17 Sustainable Development Goals (SDGs) agenda to drive equal development. Built upon the principle of "leaving no nation behind," the SDGs include reducing poverty, reducing hunger, ensuring good health and well-being, quality education, gender equality, providing clean water and sanitation, affordable and clean energy, ensuring a decent work and economic growth, industry, innovation and infrastructure, reduced inequality, providing sustainable cities and communities, responsible consumption and production, climate action, enhancing life below water, life on land, peace and justice strong institutions, and partnerships to achieve the goal. From broader and global perspectives, education is the pivot on which other SDGs' attainment rests. It operates twofold aspects in the development of nation toward attaining SDGs: first, it is seen as a goal in itself, and second, it is also a means for attaining all the other SDGs [21–23]. Thus, it is an integral part of sustainable development of nations as well as a major enabler for the attainment of other SDGs. A better and improved education system could have positive impact on the development and hence on the attainment of SDGs in Africa such as Nigeria. Shettima [24] noted that Africa which includes Nigeria plays important aspect in SDGs' attainment. This is because success in attainment of the SDGs can be achieved if and only if the SDGs succeed in Africa due to the wide gap and development divide that occur between developed and developing countries such as Africa which Nigeria is part.

Meanwhile juxtaposing the Lewis and Rostow models, the reason for the disparities between the developed and developing economies is not farfetched. In the developed economies such as the UK, the USA, Canada, Japan, and China, among others, the development has elastically reached every nook and cranny of their economies, and development activities are controlled by the information economy. However, in developing countries such as Nigeria, there may still be a high level of underdevelopment, and if at all the nation is developed, it is skewed: while some areas experienced the development syndrome, other areas are lagging behind development. This fact is supported by the studies of Blanchfield and Lawson [25], Easterly [26], and Global Monitoring Report by the International Bank for Reconstruction and Development, the World Bank [45], that African countries which include Nigeria experienced setback and failure in the attainment of major development strategies such as the Millennium Development Goals (MDGs).

This is because most developing economies are experiencing a quasi-information society. A quasi-information society refers to a false information society that has the likeliness and the form of information society but does not fully rely on information for their growth and development due to lack of skills and infrastructural challenges. According to Becla [27], quasi-information society occurs because of lack of accessibility, availability and use of ICTs, high transaction costs, low skill and literacy level, and lack of mechanism for quick diffusion and dissemination and use of information. A clear observation of the major problems experienced in Nigeria with respect to the information and knowledge economy shows that Nigeria operates a quasi-information society. In such information society, intellectual capital management could be hampered, thereby affecting the economic activities and development of the nation. In some economies such as the developed economies, where the society is a pure information economy, the intellectual capital management could be high and higher than those of the quasi-information society. This could also create an impetus on the economic activities and development of the nations.

According to Harrod-Domar growth model, output which in this study is economic development is a function of capital. The concept of capital has received a new approach in the information and knowledge economy. In the past and traditional era and in managerial economics, capital was referred to as credit or money and is known to be a factor of production alongside labor and land. However, in recent times, the elasticity of capital has extended beyond this and has included intellectual capital. Therefore, complexity could be noticed with the concept of "capital" especially in the present information and knowledge economy. This made Nitzan [28] to affirm that the concept of capital remains ambiguous and controversial. However Barman [29] noted that a distinction needs to be drawn between the traditional and information- or knowledge-related capital. Hence, going by Harrod-Domar growth model, economic development is a function of nations' intellectual capital management. This is the basis of this study. Hence, the main objective of this study is to investigate the relationship between intellectual capital management and economic development of Nigeria: a quasi-information society.

2. Previous studies

Economic development has received great attention from scholars, governments, policy makers, and other stakeholders of the development of nations. According to Robbins [30], the essence of economic development is conceived as

the rupture of existing patterns of economic relationships—which could emanate from the normal circular flow of statistical analysis. Feldman et al. [31] noted that economic development is often confused with the more easily measured economic growth. Kwong [3] defined economic growth as simply a rise in GDP or GDP per capital, while economic development is encompassing and is a broad concept which economic growth is just a part. Other important developmental dimensions or indices are included in the definition of economic development. Schafer [1] defined economic development as a dynamic process over time, and it makes good sense to employ tools of dynamic macroeconomics.

In a more generalized form, Todaro and Smith [2] defined economic development as a multidimensional process which encompassed major transformations in social structure, popular and important attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty. From this, it could be observed that economy can be growing but it is not developing. Other economic development indices are human development index, poverty, and literacy level, among others. To this end, Mackintosh et al. [32] argued that it is very possible for the HDI of nations to decline while the measure of GDP increases. They further noted that this scenario is common among developing economies which Nigeria is a part.

This is because, according to Brown [33], in Keynesian economics, individuals, organizations, and institutions at the micro level cannot increase their productivity but need government interventions. These government interventions may include adopting discretionary economic policy which requires that governments make policy changes on the basis of its judgment of the current and future economic circumstances of the nation. Hence, the government is seen as a major agent for economic development and transformation. Also, such policies should address and be targeted toward the interest of the public at the micro level which could create impetus at the macro level. This is because according to Keynesian economics, the aggregate of the micro level determines the economic development indices at the macro level. However, Jarboe and Alliance [6] stated that economic development strategies and practice must adapt to new economic landscape such as intellectual capital management of the nation.

The importance of intellectual capital (IC) has greatly increased in recent times due to the major shift of economies toward the knowledge- or information-driven society [17]. Previous studies on the relationship between intellectual capital management and performance such as Boedker et al. [34], Subramaniam and Youndt [35], Bramhandkar et al. [36], Asiaei and Jusoh [37], and [17], among others, have approached it from the micro level using the individual and organizational acquired data to explain their relationships. However, in recent information economy and society era, attention needs to be drawn to the macro importance of intellectual capital management to nation's economy. Very few studies have addressed this and such study is lacking in developing nations study.

In recent information and knowledge economy, the value of any country is a function of their knowledge and intellectual capital [38]. Marcin [39] and Rusu-Tanasa [40] noted that intellectual capital is a major key factor of socioeconomic development of regions and countries. Mercier-Laurent [41] in trying to investigate intellectual capital management and the economy revealed that the focus on intellectual capital in any economy is due to the fact that it is the root of all organizations' activities which are directly contributors to the nation's economy or GDP. Pachura [42] noted that it aids structural and economic transformation in any nation. Hence, Makarov [43] has opined that intellectual capital is a major indicator of sustainable development of any country.

However, due to intangible nature, its effect on the economy has not been given much attention in developing countries. Intellectual capital forms the basis of the

success of the development of countries which calls for the right way of managing the intangible wealth and assets such as the intellectual capital in connection with the tangible ones [41]. Earlier scholars such as Schultz [44] and Becker [45] have noted the effect of education, training, and literacy level which are important intellectual capital indices on economic development of any nation. Drucker [46] pointed out that knowledge which is a constituent of intellectual capital is a primary resource and capital for overall economic development having higher value than the traditional land, capital, and labor in the development of economies. Hence, there have been global attention especially among the developed nations on the role of intellectual capital productivity growth and competitiveness and consequently in its contribution to the sustainable long-term economic development of nation [41]. Also, Mercier-Laurent [41] has also noted that communication technology and innovations are also major intellectual capital that could influence economic development of nations.

Despite the significant value of intellectual capital on the development at the macro level, measuring IC could lead to confusion. This is because most of the studies have addressed it as and at a micro level and at the macro level; its measurement becomes a challenge. According to Makarov [43] and Konovalova et al. [4], at the macro level, national population life quality variables such as the human development index which is captured by welfare level, expressed in figures per capita income, health level expressed in life expectancy rate, and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions, among others, are major macro indices for measuring intellectual capital of any nation. Hence, this present study adapts these variables to capture the intellectual capital management at macro level and its effect on the Nigeria economy using the gross domestic product of the nation.

In addition, a major novelty in this study is its link with the failure in the attainment of the past MDGs and with the likelihood of success or failure of the attainment of the recent SDGs in Nigeria. It has been proven beyond measure that Africa has experienced a perfect elastic setbacks and failures in the attainment of global development strategies, the Millennium Development Goals (MDGs), not excluded ([25, 26, 47]). However, recently, the General Assembly of the United Nations in September 2015 adopted the 2030 Agenda for Sustainable Development and developed a 17 Sustainable Development Goals (SDGs) agenda to drive equal development. From the SDGs, education is the pivot on which sustainable development rests, and it is also the pivot of the ICM of the country. To this end, if Nigeria must have success in the attainment of the SDGs, there is need to draw attention and reposition its ICM system within the center of quality education. Hence, this study focuses and tends to establish the relationship between ICM and economic development toward driving the attainment of SDGs in Nigeria.

3. Methodology

The study adopts the correlational research and secondary data were used. Adapting and juxtaposing the Lewis model of development [19] and Rostow's model of development [20], different countries are at different stages of development, and the lowest level of development is the traditional level where there is a high elasticity of unskilled labor. At the lowest level of development, factors of importance seem to fit into the traditional system, while above the lowest levels, considerations of factors are used as major developmental indices change. According to Harrod-Domar growth model, output which in this study is economic development is a function of capital [48]. The concept "capital has been

said to be subjective especially in recent times of information economy [28, 29]. In the past, emphasis was drawn to agrarian development, population increase, available of credit, agricultural labor, poverty level, etc. However, in recent times, there has been transformation and extension of this variables of interest. Transformation in the sense that some may remain unchanged while others undergo transformation. With regards to extension, other important variables were added to suit the developmental stages of nations. In recent global development, Makarov [43] and Konovalova et al. [4], among others, have argued the place of intellectual capital management on the development and include variables such as human development index which is captured by welfare level, expressed in figures per capita income, and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions, among others. However, there is need to see this in the Nigerian economy, hence, the need for this study.

Due to the lack of access to important data, the data employed in this study include the literacy level, human development index, Gini coefficient, unemployment rate, poverty rate, and growth rate which capture the human capital development indices. For the structural capital, telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate would be used. Also, the GDP stands as the dependent variable of the study which signifies economy development of the nation. Data within the periods of 2005 and 2015 were used so as to obtain an equal number of substantial information to use for the study and were provided in **Table 1**. The study used the regression analysis and ANOVA as its data analysis method to explain the relationships between variables of interest of the study.

The model specification is provided below:

$$Y = \beta_0 + X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_n\beta_n + e_i \quad (1)$$

where X_s are the independent variables of the study which is used to capture intellectual capital management in Nigeria, B_s represents the coefficients of X_s and represents the significant changes of Y (dependent variable) with increase in one unit of X_s, and e_i represents the error term.

4. Results

A keen observation on the information on **Table 1** shows that there is no substantial increase in the human development index (HDI) of Nigeria. There is however an increase in mobile subscription from 13.4 and steadily grows to 83.2% in 2015 in Nigeria economy. The same was applicable in the mobile phone subscription per 100 people data. The result shows that there was no significant growth in the nations' Gini coefficient but there was a stochastic and haphazard movement of the development. Also, there was no substantial growth rate in the Nigeria economy. There was also no significant reduction in the nations' poverty rate, and there was a stochastic and haphazard movement of poverty rate. The increase level of unemployment rate in Nigeria economy is a major concern on **Table 1**; it could be evident that unemployment rate increases drastically from one digit to two digits from 2005 to 2015. Also, literacy level reduced from 2005 to 2015, and this also constitutes a major concern on **Table 1**. Also, there was a substantial increase of Internet use rate in the Nigeria economy from 2005 to 2015. In addition, the rate of telecommunication contribution to the Nigeria economy is very infinitesimal, and no increase is felt in this sector. Furthermore, Nigeria economy also recorded a substantial growth

Year	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Y (in billion naira)
2005	0.466	13.4	13.38	0.4882	6.51	58.2	2.9	67.7	3.5	0.05	22,269.98
2006	0.477	22.7	22.66	0.457	6.03	58.5	5.8	78.6	5.5	0.06	28,662.47
2007	0.481	27.6	27.59	0.429	6.50	59.3	4.9	64.9	6.8	0.07	32,995.38
2008	0.487	41.9	41.90	0.513	6.41	62.4	5.8	51.1	15.9	0.08	39,157.88
2009	0.492	48.3	48.26	0.43	7.0	65.2	11.8	51.1	20.0	0.10	44,285.56
2010	0.500	55.1	55.05	0.447	6.7	69.0	22.0	56.9	24.0	0.11	54,612.26
2011	0.507	58.4	58.43	0.405	6.9	60.0	24.0	51.1	28.4	0.10	62,980.40
2012	0.514	67.4	67.41	0.362	7.2	35.2	27.0	51.1	32.8	0.10	71,713.94
2013	0.521	74.1	74.05	0.41	6.4	33.1	25.0	55.2	38.0	0.10	80,092.56
2014	0.526	78.7	78.75	0.399	6.3	60.0	24.0	59.2	42.7	0.11	89,043.62
2015	0.527	83.2	83.25	0.387	2.8	60.0	29.0	59.6	45.1	0.12	94,144.96

Source: sourced and compiled by the author from various secondary sources such as the CBN, World Bank, National Bureau of Statistics, Internet World Stats, and Internet Live Stats, among others.
Note: X1 represents human development index; X2 represents mobile cellular subscriptions; X3 represents mobile cellular subscriptions per 100 people; X4 represents Gini coefficient; X5 represents growth rate; X6 represents poverty rate; X7 represents unemployment rate; X8 represents literacy level; X9 represents Internet use rate; X10 represents telecom rate to GDP; Y represents the GDP.
Also, some of these data sets at one period or the other were found to be missing, and in order to cater for these missing value, the author used a mean strategy between the lower and upper period to obtain the middle data. At some other time, the author simply used the previous year data where applicable.

Table 1.
Selected macro intellectual capital indices and national GDP of Nigeria.

in its GDP. Despite the growth in the GDP of Nigeria, the information in **Table 1** shows that there was no significant development in major intellectual capital indices of the Nigeria economy in the periods of 2005 to 2015.

The result of the regression analysis was provided in **Table 2**. From the result, the adjusted R square for the regression analysis was 0.99, which shows a better goodness of fit of the model.

From **Table 2**, the results shows that, of all the variables of interest in this study used to represent intellectual capital at the macro level, none was found to be significant ($p > 0.05$). Also, from the beta coefficients of the independent variables, most of the coefficients were negative (mobile subscription per 100 people, Gini coefficient, growth rate, poverty rate, unemployment rate, and literacy rate). Only few had negative coefficients such as human development index (HDI), Internet use rate, and telecom rate to GDP. Also, the model deleted the mobile subscription data because of high level of collinearity between mobile subscription and mobile subscription per 100 people. A keen observation on this result shows the low standard of these indices in Nigeria. Even though Nigeria is developing and recorded substantial increase in some of these indices, its effect on the economy is not felt. Also, the result also shows the quasi-information society level of the nation as the rate of telecom increases and other intellectual capital developments have not create a substantial impetus on the economy. The result of the study depicts that though the nation is big, it has little or no internal economic indices that would create impetus to the nation development. The joint effect of the intellectual capital management on the nation's GDP is provided in **Table 3**.

Coefficients					
Model	**Unstandardized coefficients**		**Standardized coefficients**	**t**	**Sig.**
	B	**Std. error**	**Beta**		
Constant	−460044.760	473238.599		−0.972	0.509
HDI	1075564.924	1023024.189	0.899	1.051	0.484
Mobile subscription per 100 people	−831.564	1616.293	−0.782	−0.514	0.697
Gini coefficient	−8766.881	54633.128	−0.016	−0.160	0.899
Growth rate	−1324.654	1204.995	−0.063	−1.099	0.470
Poverty rate	−33.921	275.659	−0.016	−0.123	0.922
Unemployment rate	−56.848	450.897	−0.023	−0.126	0.920
Literacy rate	−13.369	235.757	−0.005	−0.057	0.964
Internet use rate	1357.304	920.721	0.810	1.474	0.379
Telecom rate to GDP	57605.621	513440.948	0.052	0.112	0.929

Dependent variable: GDP.
Source: Secondary data analysis, 2018.

Table 2.
Regression analysis result.

ANOVA[b]						
Model		**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
1	Regression	6.252E9	9	6.946E8	99.325	0.078[a]
	Residual	6993498.081	1	6993498.081		
	Total	6.259E9	10			

[a]*Predictors: (constant), telecom rate to GDP, poverty rate, growth rate, literacy rate, Gini coefficient, unemployment rate, Internet use rate, HDI, mobile phone subscription per 100 people.*
[b]*Dependent variable: GDP.*

Table 3.
Joint effect of the intellectual capital management on the nation's GDP.

The result in **Table 3** shows that the impetus of intellectual capital management is not felt on the nation's GDP. This provides a challenging situation in the nation which needs to be given attention when development at the global level is put into consideration. In the recent global information economy or society, intellectual capital should have tremendous effect on the economy; however, the case of Nigeria is different.

5. Discussions of findings

The findings of this study support the work of Mackintosh et al. [32] that it is very possible for the HDI of nations to decline while the measure of GDP increases, which is a most common phenomenon of developing countries such as Nigeria. Also, if according to Hoff and Stiglitz [5], Jarboe and Alliance [6], Stewart [7],

Hamzah and Ismail [8], and Konovalova et al. [4] that the development of nations has moved from the traditional economic indices such as population growth, GDP, etc. to the intellectual capital and the information economy contribution to GDP, it is evident that Nigeria is not developing. Also, going by the well-known Lewis model of development, if literacy level has not had impetus on the economic growth of Nigeria, it is then a fact that most of the population of Nigeria still operate at the lowest level of development where there is a high unskilled labor and low skilled labor. Hence, going by the work of Becla [27], and the result of this study, Nigeria is a quasi-information society due to the fact that the major intellectual capital indices used in the study have not transformed into economic growth and development. This could also transcend to major sectors of the economy hence affecting their development and economic activities in the nation. This could further lead to threaten the development and sustainable development of the sectors and in extension of the economy in the long run.

Also, going by the work of Edvinsson and Bounfour [38], Nigeria would be said to have a lower value at the global development levels because of the fact that its intellectual capital has not create an impetus on the economic development. Hence, the development in Nigeria is questionable as confirmed by the work of Mercier-Laurent [41], and there may be no structural and economic development as affirmed by Pachura [42], and hence, the sustainability of the economy would be a major problem as attested by Makarov [43]. Consequently, one could say that the future of the nation is questionable and needs urgent attention if it must develop and survive in the recent global information economy and society and transformation.

6. Conclusion and recommendations

In conclusion, in Nigeria economy, intellectual capital management has not created an impetus on the economy of the nation; hence, it is operating in a quasi-information economy (false information economy). In addition, this could constitute a major challenge against the development of the nation and also the development of major sectors of the economy. This could be one of the major reasons for the setbacks and failures in the attainment of major development strategies such as the Millennium Development Goals (MDGs). Also, the practical relevance of this study is to show that, if the ICM of the nation is not given wide recognition and repositioned and developed toward enhancing quality education in Nigeria, there is a high propensity that Nigeria will eventually experience failure and setbacks in the attainment of recent SDGs, hence, lagging behind neighboring developing countries and developed countries who put into recognition and positioned their ICM for development. To this end, the study recommends that:

i. If Nigeria must rise above the present level of development and meet up with global development indices, there is need for the governments and policy makers to concentrate and seek strategies to provide policies that would enhance the intellectual capital of the nation such as the human development index, level of educational development, and level of literacy and unemployment, among others.

ii. Also, attention should be drawn to the need to increase budget allocation to intellectual capital development of the nation and also to its major actors such as skilled workers in the primary, secondary, and tertiary education system, research and development institutes, and other organizations committed to research and education activities in the nation.

iii. The governments and other providers of development programs should deem it fit to see to it that major programs provided to the nation have significant impact on the nation and its development. To this end, there should be need for periodical review and assessments of such major programs to see how effective they are to the economy.

iv. Also, innovative policies addressing users' needs that could create substantial impetus of the telecom industry on the Nigeria economy should be introduced and provided so that the nation could enjoy the benefits of this sector with respect to development.

v. There should also be the need to increase employment in the nation, and the governments should encourage and provide access to business development and a better environment for both local and foreign investors in the Nigeria economy.

vi. To this end, special consideration should be given to the intellectual capital management of nations at macro level and hence should attract future research which could capture more variables of the ICM to observe how it has affected the attainment of SDGs in Nigeria. Also, other African countries can also embark on such research focus; hence, this could help Africa such as Nigeria to reposition their ICM for attainment of development strategies such as future SDGs.

Author details

Ojinga Gideon Omiunu

Africa Regional Centre for Information Science, University of Ibadan, Nigeria

*Address all correspondence to: omiunuojingag@gmail.com

References

[1] Schafer A. Economic Development: Theory and Policy, Course Work; University of Leipzig, Institute of Theoretical Economics. 2013. Available from: https://www.wifa.uni-leipzig.de/fileadmin/user_upload/itvwl-vwl/makro/Lehre/ws/de/DE_T&P_1.pdf

[2] Todaro MP, Smith SC. Economic Development. Harlow: Addison Wesley; 2009. pp. 49-56, 485, 486

[3] Kwong C. Macroeconomics Series (3): Economic Growth and Development, Knowledge Enrichment Seminar for NSS Economics Curriculum. School of Arts and Social Sciences: The Open University of Hong Kong; 2011. Available from: https://www.edb.gov.hk/attachment/tc/curriculum-development/kla/pshe/references-and-resources/economics/Economic%20Growth%20and%20Development(File%205.2).pdf

[4] Konovalova M, Kuzmina O, Mikhailov A, Hansevyarov R, Persteneva N. Intellectual capital as a key factor in the economic development of the region. Global Media Journal. 2016;**14**:27. Available from: http://www.globalmediajournal.com/open-access/intellectual-capital-as-a-key-factor-in-the-economic-development-of-the-region.php?aid=82614

[5] Hoff K. Stiglitz JE. Modern Economic Theory and Development, The World Bank. 2000. Available from: http://www8.gsb.columbia.edu/faculty/jstiglitz/sites/jstiglitz/files/2000_Modern_Economic_Theory_and_Development.pdf

[6] Jarboe KP, Alliance A. Knowledge Management As an Economic Development Strategy, Reviews of Economic Development Literature and Practice: No. 7, U.S. Economic Development Administration. 2001. Available from: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.460.3136&rep=rep1&type=pdf

[7] Stewart T. The Wealth of Knowledge: Intellectual Capital and Twenty-First Century Organization. London: Nicholas Brealey Publishing Limited; 2002

[8] Hamzah N, Ismail MN. The importance of intellectual capital management in the knowledge-based economy. Contemporary Management Research. 2008;**4**(3):237-262

[9] Stewart TA. Intellectual Capital: The New Wealth of Organizations. New York: Bantam Doubleday Dell Publishing Group; 1997

[10] Makarov AM. Assessment of Intellectual Capital. Management. Theory and Practice. Izhevsk: Bravado Print; 2003

[11] Lukicheva LA. Management of Intellectual Capital (Tutorial). Moscow: Omega-L; 2007

[12] Mavridis D, Kyrmizoglou GP. Intellectual capital performance drivers in the Greek banking sector. Management Research News. 2005;**28**(5):43-62

[13] Ahmad S, Mushraf AM. The Relationship Between Intellectual Capital and Business Performance: An Empirical Study in Iraqi Industry, International Conference on Management and Artificial Intelligence IPEDR. Vol. 6. Bali, Indonesia: IACSIT Press; 2011. Available from: http://www.ipedr.com/vol6/20-A10012.pdf

[14] Fadaei M, Taleghani M, Noghlebari ES. The effect of intellectual capital on organization's financial performance. Interdisciplinary Journal of Contemporary Research in Business. 2013;**5**(6):275-286

[15] Ogbo A, Ezeobi J, Ituma A. Impact of intellectual capital on organisational performance: Evidence from Nigeria banking sector. Journal of Research in National Development. 2013;**11**(2):249-254. Available from: www.ajol.info/journals/jorind

[16] Saeed R, Sami A, Lodhi RN, Iqbal A. Intellectual capital and organizational performance: An empirical study in telecom sector of Pakistan. Middle-East Journal of Scientific Research. 2013;**18**(4):517-523. DOI: 10.5829/idosi.mejsr.2013.18.4.11716

[17] Rehman W, Rehman CA, Ilyas M. Linking intellectual capital and knowledge management with organizational performance: A meta-review analysis. Arabian Journal of Business and Management Review. 2015;**5**(2):63-73. Available from: http://www.arabianjbmr.com/pdfs/KD_VOL_5_2/6.pdf

[18] Levashov VK, Rutkevich MS. About the concept of intellectual capacity and its assessment methods. Science Studies. 2000;**1**:49-65

[19] Lewis WA. Economic development with unlimited supplies of labour. The Manchester School. 1954;**22**(2):139-191

[20] Rostow WW. The Stages of Economic Growth: A Non-communist Manifesto. Cambridge: Cambridge University Press; 1960

[21] Bokova I. Why Education is the Key to Sustainable Development, Project Syndicate, World Economic Forum. 2015. Available from: https://www.weforum.org/agenda/2015/05/why-education-is-the-key-to-sustainable-development/

[22] United Nations Educational, Scientific and Cultural Organization (UNESCO). Education for Sustainable Development Goals: Learning Objectives. 2017. Available from: http://unesdoc.unesco.org/images/0024/002474/247444e.pdf

[23] United Nations Educational, Scientific and Cultural Organization (UNESCO). Education for Sustainable Development. 2018. Available from: https://en.unesco.org/themes/education-sustainable-development

[24] Shettima K. Achieving the sustainable development goals in Africa: Call for a paradigm shift. African Journal of Reproductive Health. 2016;**20**(3):19. Available from: http://www.bioline.org.br/pdf?rh16030

[25] Blanchfield L, Lawson ML. The Millennium Development Goals: The September 2010 U.N. High-level Meeting, Congressional Research Service, Prepared for Members and Committees of Congress. 2010. Available from: https://fas.org/sgp/crs/row/R41410.pdf

[26] Easterly W. Was Africa set up to fail on the Millennium Development Goals? 2010. Available from: http://www.nyudri.org/aidwatcharchive/2010/06/was-africa-set-up-to-fail-on-the-millennium-development-goals

[27] Becla A. Information society and knowledge-based economy—Development level and the main barriers—Some remarks. Economics & Sociology. 2012;**5**(1):125-132

[28] Nitzan J. Differential accumulation: Toward a new political economy of capital. Review of International Political Economy. 1998;**5**(2):169-217

[29] Barman S. The micro and macroeconomics of information. In: Annual Review of Information Sciences and Technology. USA: Information Today, Inc; 2006. p. 40

[30] Robbins L. The Theory of Economic Development in the History of Economic Thought Being the

Chichele Lectures for 1966, Revised and Extended. 1966. Available from: https://mises.org/sites/default/files/The%20Theory%20of%20Economic%20Development_2.pdf

[31] Feldman M, Hadjimichael T, Kemeny T, Lanahan L. Economic Development: A Definition and Model for Investment. 2014. Available from: https://www.eda.gov/files/tools/research-reports/investment-definition-model.pdf

[32] Mackintosh M, Brown V, Cortello N, Dawson G, Thompson G, Trgg A. Economics of Changing Economies. Milton Keynes: International Thompson Business Press, The Open University; 1996

[33] Brown V. Chapter 16: Changing economies and economic theory. In: Mackintosh M, Brown V, Cortello N, Dawson G, Thompson G, Trgg A, editors. Economics of Changing Economies. Milton Keynes: International Thompson Business Press, The Open University; 1996

[34] Boedker C, Guthrie J, Cuganesan S. The strategic significance of human capital information in annual reporting. Journal of Human Resource Costing and Accounting. 2005;**8**(2):722

[35] Subramaniam M, Youndt MA. The influence of intellectual capital on the types of innovative capabilities. Academy of Management Journal. 2005;**48**(3):450-463

[36] Bramhandkar A, Erickson S, Applebee I. Intellectual capital and organizational performance: An empirical study of the pharmaceutical industry. Electronic Journal of Knowledge Management. 2007;**5**(4):357-362

[37] Asiaei K, Jusoh R. A multidimensional view of intellectual capital: The impact on organizational performance. Management Decision. 2015;**53**(3):668-697. DOI: 10.1108/MD-05-2014-0300

[38] Edvinsson L, Bounfour A. Assessing national and regional value creation. Measuring Business Excellence. 2004;**8**(1):55-61. DOI: 10.1108/13683040410524748

[39] Marcin K. Intellectual capital as a key factor of socio-economic development of regions and countries, international economic conference of Sibiu 2013 post crisis economy: Challenges and opportunities, IECS 2013. Procedia Economics and Finance. 2013;**6**:288-295

[40] Rusu-Tanasa M. Intellectual capital a strategic factor of socio-economic development of regions and countries, 22nd International Economic Conference-IECS 2015 "Economic Prospects in the Context of Growing Global and Regional Interdependencies", IECS 2015. Procedia Economics and Finance. 2015;**27**:369-374

[41] Mercier-Laurent E. Managing Intellectual Capital in Knowledge Economy, Position Papers of the 2014 Federated Conference on Computer Science and Information Systems. Vol. 3. ACSIS; 2014. pp. 253-257. DOI: 10.15439/2014F476

[42] Pachura P. Regional Cohesion. Effectiveness of Network Structures. Berlin, Heidelberg: Physica-Verlag Springer Company; 2010

[43] Makarov P. Intellectual capital as an indicator of a sustainable development. Journal of Sustainable Development. 2010;**3**(3):85-90. Available from: https://pdfs.semanticscholar.org/6cfa/b57b70b94ec3587866b749dfdc94ab91dbb1.pdf

[44] Schultz T. Investment in Human Capital. The American Economic Review. 1961;**51**(1):1-17

[45] Becker GS. Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education. Chicago: University of Chicago Press; 1964

[46] Drucker P. The New Society of Organization, Harvard Business Review; September-October 1992; 1992

[47] The International Bank for Reconstruction and Development. The MDGs after the Crisis, The World Bank. 2010. Available from: http://siteresources.worldbank.org/INTGLOMONREP2010/Resources/6911301-1271698910928/GMR2010WEB.pdf

[48] Harrod RF. Towards a Dynamic Economics, Some Recent Developments of Economic Theory and their Application to Policy. London: Macmillan; 1948