



Indigenous technologies and innovativeness of Africa's industrial organizations: conceptual diagnoses and prescriptions for the African industrial man

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Abstract

African companies, institutions and industries should be significant players in the global marketplace by harnessing indigenous knowledge and technologies in areas of comparative advantages, developing these advantages for global market competitiveness and Africa's economic growth and development. Hence, this study investigated the impact of indigenous technologies on the innovativeness of Africa's industrial organizations. Content analysis with systematic indept literature review was adopted as the study's methodology. Indigenous technologies imply home-grown raw materials, skills, craft and methods employed in the production processes which translate domestically available resources and materials into superior outputs of goods and services in order to satisfy market needs and wants, preferences and perceptions. Innovativeness construct is the ability of a company or an institution to innovate by creatively introducing new products, services, processes and ideas in the marketplace in order to meet the changing needs, preferences and requirements of the markets and industries. Several empirical studies have been done investigating the nexus between indigenous technologies and innovation, domesticated in different nations and environments with varied methodologies. The findings revealed that, indigenous technologies positively and significantly enhance innovativeness and innovations of local firms. The study concludes that leveraging indigenous technologies will improve industrial organizations in the global market and enhance Africa's economic growth and development. We therefore recommend that, African industrial man/entrepreneurs, institutions and industries should adopt indigenous technologies in areas of comparative advantages. This will significantly drive productivity, innovativeness, innovation and competitiveness in the global marketplace and enhance Africa's economic growth and development.

Keywords: Indigenous Technologies, Innovativeness, Africa's Industrial Organizations, Diagnoses and Prescriptions, African Industrial Man

Introduction

Economic growth and development of nations is a function of economies' managers leveraging their unique resources. Knowledge, skills and technologies for the production of goods and services in order to serve existing and potential market demand both in the domestic and global market places and earn above average return in the form of foreign exchange and domestic receipts to improve the economic and social wellbeing of the citizenry (Asaju & Ashepo, 2025). Again, globalization which is the integration of economics and markets through information, communication and transportation technologies has made the world a global village market with competition among companies, industries and nations (Okoro, Nebo & Okoro, 2017).

Companies, industries and nations come to the international or global market with unique offerings; goods, services and ideas to meet the changing needs and preferences of the market or global consumers as well as exploiting values from the market (World Trade Organization, 2024). Hence, globalization drives competition among institutions, industries and nations, resulting into the dominance of some key nations in relative sectors and industries (Espinoza et al., 2021). This dominance or global market hegemony of some industrialized nations is as a result of innovativeness and innovations of their offerings which many be disruptive, incremental, radical or architectural innovations to influence the market share (Espinoza et al., 2021).

African nations and their industries are yet to occupy strong competitive positions and unique advantages in the domestic markets and the global village market (Ifedapo & Mark, 2018). However, Africa represents a continent with vast natural, human and material resources. These unique resources are not well developed through value additions by African nations and their industrial organizations to the advantage of the African community and the citizenry (Moti, 2019). Hence, the lack of competitiveness of African firms and industries is due to their

limitations in creating superior market values through innovativeness and innovations in the marketplace by leveraging their unique resources and home-grown technological advantages.

The African industrial man, the African firms and the industrial sectors are mostly involved in the extraction and sale of primary products without value addition by producing innovative products and services to serve both the African domestic market and the global village market (Lartey, 2024). Thus, the lack of production of superior value driven innovative products and services by the African industrial organizations has negatively affected the competitiveness of Africa and its industries in the global marketplace (Lartey, 2024).

The concept of innovativeness is the ability of an organization to innovate. It is the willingness of the entrepreneur or business organization to introduce something new in the form of new product, new service or new idea in the industry or the market place (Salavou, 2004). It is also the ability of a company to adopt new production technologies, exit existing craft and technologies in order to manufacture new value offerings for the market as well as adapting to emerging opportunities in the market or industry (Salavou, 2004). Thus, innovativeness is the ability of the work organization to innovate by creatively introducing new products, services, processes and ideas in the marketplace in order to meet the changing needs and preferences of the market (Ruvio et al., 2013).

The concept of indigenous technologies connotes home-grown materials, skills, craft and methods employed in the production processes which translate domestically available resources into output of goods and services to serve the market or targeted consumers (Havenga, 2019). Hence, these technologies involve production and operations technologies for the manufacturing of tangible products and services operations' technologies. The major drivers of indigenous technologies are the indigenous knowledge systems and resources employed to manufacture indigenous technologies (Havenga,

2019). Whereas indigenous knowledge system involves local understandings, competences, skills and philosophies originated by local communities with historical connections with their natural space or environment (UNESCO, 2017; Havenga, 2019). Indigenous resources involved the factors of production associated with the local communities or the natural environment (Havenga, 2019).

The dynamic nature of the global market environment and the dominance of most firms from the developed economies are due to relative production and market advantages. Africa and its industrial organizations should look inward to leverage distinctive local knowledge, skills and resources for technological development for innovation and competitiveness in areas of comparative advantages. Therefore, this study aims to conceptually investigate the relationship between indigenous technologies and innovativeness of Africa's industrial organizations which is anchored on the technology acceptance model (TAM).

Literature Review

Theoretical Framework

The Technology Acceptance Model (TAM)

The technology acceptance model (TAM) was developed or propounded by Davis in 1989. The technology acceptance theory or model is employed on how people accept and utilize various technologies in business and administrative endeavours and how TAM can be employed in the development and use of indigenous technologies, craft and innovations (Mugo et al., 2017). Thus, TAM prescribes that, the adoption of technology is a function of the behavioural motives and intentions of users which is largely influenced by the usefulness of the technologies in the performance of the business task or function and the ultimate ease of using the technologies (Greta, Agung & Ida, 2023).

The technology acceptance model represents three dimensional processes where exogenous or external variables influence user cognitive and

affective responses in relationship to using technology or innovation (Davis, 1989). The technology acceptance model (TAM) is associated with the conduct or behavior which is influenced by the perceived ease of using the technology, usefulness of the technology or innovation and the user behavioural intentions (Davis, 1989; Davis, 1993). The implication of TAM to this present study is that indigenous knowledge systems and technologies must be seen to be useful to the African industrial man. Again, the ease of leveraging or using indigenous technologies for production or manufacturing of goods and services is highly laudable which ultimately influenced the behavioural intentions and conducts of African industrial organizations or the African industrial man.

The Concept of Indigenous Technologies

Indigenous technologies is the home-grown or local knowledge, craft and skills that has evolved, developed by traditional businesses and entrepreneurs for the common benefit of the local communities (Averbeke, 2002). Hence, indigenous technologies are technologies developed locally for the manufacturing of goods and services for the common good of the citizenry of the communities. It is the local technologies developed for the local people in order to drive the local industries (Siyanbola et al., 2012). Indigenous technologies is the local technologies which are unique to a given community, culture and society deployed for the production of goods and services in order to meet the needs and demand of the community (Siyanbola et al., 2012; Averbeke, 2002).

According to Ailaiah (2025), indigenous technology could be defined as the application of indigenous science, skills, knowledge and resources for the production of goods and services in order to meet the needs and expectations of the indigenous people or community. It is the process where the society or the community employs domestically manufactured goods and services in contrast to leveraging foreign or imported technologies and merchandise (Ailaiah, 2025). Thus, indigenous technologies involves leveraging indigenous

knowledge, skills, resources and materials for the manufacturing of indigenous machines and crafts which are in-turn employed for the production of goods and services or indigenous value offerings.

Indigenous technology is the process where indigenous people develop machines through home-grown resources for the production of value offerings for the indigenous markets (Ailaiah, 2025). Thus, the major drivers of indigenous technologies are the indigenous human capital, indigenous knowledge systems and the indigenous resources. It is pertinent to note that, indigenous technologies should be developed in areas the community or the nation has comparative advantages (Rabbani, 2014). This is more prominent as the world and markets are being globalized. Competition among nations and organizations take centre stage in globally competitive markets (Siyanbola et al., 2012). Hence, indigenous technology development through innovativeness and innovation is the currency in driving the twenty first century global business competition.

The Concept of Innovativeness

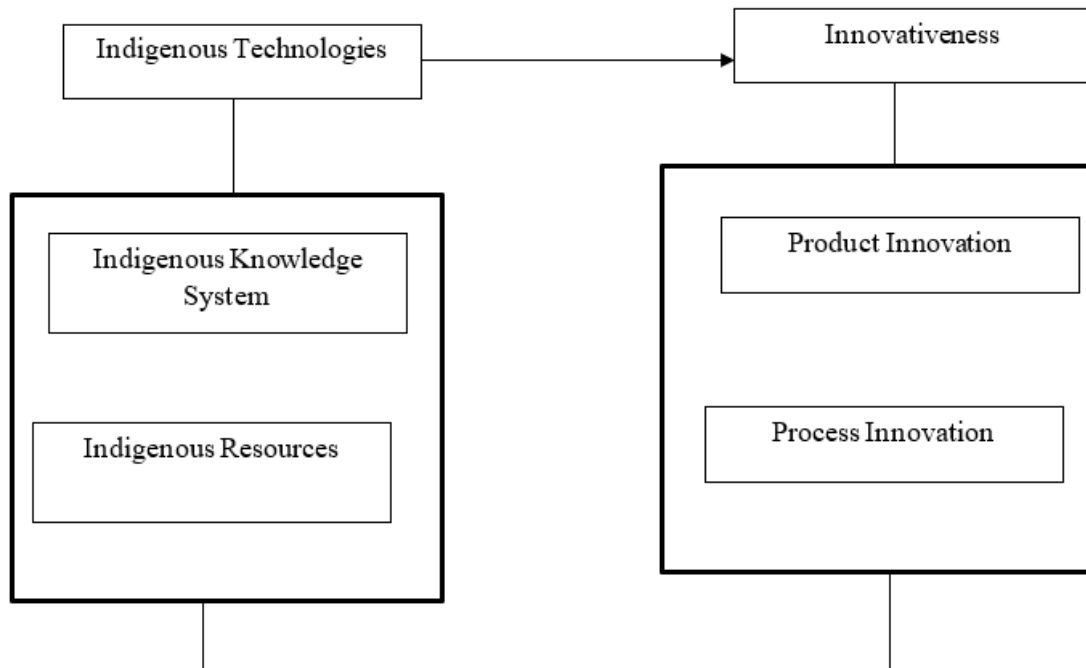
The concept of innovativeness is the ability of the entrepreneur or the business organization to adopt new concepts, technologies, products and services. It involves entrepreneurial or firm's creativity, originality and the receptivity to new ideas which also explain the skills, knowledge and competences of the entrepreneur or the organization to create value adding goods, services and ideas (Salavou, 2004). According to Salavou (2004) innovativeness construct is the workplace or entrepreneurs' productivity to innovate. This encompasses the ability of the work organization to innovate in the form of new business or new ventures, new products, new services, new technologies and inventions.

As markets are evolving, it is imperative for organizations and entrepreneurs to continuously innovate. Firms can innovate by adopting the various kinds of innovativeness or innovations which are disruptive innovation, incremental innovation, radical innovation and architectural

innovation (Akhiwu, 2025; Salavou, 2004). These innovations help firms to acquire reasonable market positions in the industry which may be implemented in the form of product innovation, process innovation, position innovation and paradigm innovation (Tarhan & Sar, 2021). Hence, product, process, position and paradigm innovations can be developed in the form of disruptions, incremental, radical and architectural innovations typology (Tarhan & Sar, 2021). Innovativeness and innovation is the currency of the 21st century business. An organization and entrepreneur that want to remain relevant in the market must be intentional in developing new concepts, new technologies, new products, and services in an evolving marketplace.

Conceptual Framework of Study Variables

The independent or predictor variable of this study is indigenous technologies with sub-variables or dimensions such as indigenous knowledge systems and indigenous resources. The dependent or criterion variable is innovativeness which is divided into two measures; product innovation and process innovation. The conceptual model is depicted thus:

Fig. 1 Conceptual Framework of Study Variables

Source: Researcher's Conceptualization from Literature Review, 2026

Empirical Review

Indigenous technologies adopted by native manufacturers and entrepreneurs improve business performance. This foregoing is validated with empirical studies. Siyanbola et al (2012), studied the relationship between indigenous technologies and innovation in the context of SMEs in Nigeria. The study employed the mixed research methodology, specifically survey research, interview method and focus group discussions. The findings of the study revealed that indigenous technologies improve the innovations of Nigeria's small and medium enterprise. This result is associated with the works of Otarigbo and Ichipi (2016), the scholars investigated the role of indigenous technologies and innovativeness in driving social human and economic development in the context specific of Nigeria. The study made use of qualitative research design with content analysis. The study findings revealed that indigenous technologies and innovations significantly improve human and economic development of Nigeria.

Furthermore, employing indigenous crafts, knowledge systems and inventions enhances business performance of local firms and entrepreneurs and bring about community and national developments. Fadipe (2023), evaluated the contributions of indigenous technologies in driving social and economic development of the African continent. The study employed content analysis and it was revealed that the advancement of African indigenous technologies and her industries improves Africa's economic growth and development for the social and economic prosperity of Africa's communities and for global market competitiveness. This corroborates the works of Ailaiah (2025), who discovered that indigenization of technologies through the production of goods and services by employing domestic means of manufacturing is a major driver of India's economic growth and development. India's economy becomes more resilient and self-reliant due to embracing

indigenous technologies and knowledge system (Ailaiah, 2025).

Moreso, indigenous technologies adoption by African communities and nations, producing goods and services through Africa's indigenous firms and entrepreneurs can enhance commercialization of African goods and services in the global market environment (Rabbai, 2014). The scholar investigated the nexus between indigenous technology and commercialization. Employing a qualitative research design, the study discovered that indigenous technology-based industries are the major drivers quality of life of the local citizens, enhance productivity and bring about economic growth and development. This is also supported with Gumus, Bubou and David (2023), the scholars examined the revitalization of indigenous technologies in boosting rural economy. Qualitative research method was employed with interview methods of investigation. It was revealed that indigenous technologies and knowledge systems augmented with replicated western know-how will significantly improve the Nigeria's economy and enhance her global competitiveness. Again, indigenous technology industries development will drive job creation and stem the migration of Nigerian citizens to industrialized nations of the world (Gumus, Bubou & David, 2023). Thus, indigenous technologies drives innovativeness and innovations of local firms, improves economic growth and development.

Methodology

This study employed content analysis with systematic reviews of secondary literature data of both Nigerian and international studies of indigenous technologies, innovativeness and innovations of various research methods.

Discussion of Findings

This study investigated the impact of indigenous technologies and innovativeness of Africa's industrial organizations, diagnoses and prescriptions for the African industrial man. The study findings revealed that indigenous technologies have significant impact on innovativeness of Africa's industrial organizations. This is quite evident from previous empirical studies. The works of Otarigbo and Ichipi (2016) is highly supportive. Indigenous technologies and innovations improve human, social and economic development of Nigeria. Again, Fadipe (2023) discovered that the advancement of African indigenous technologies and her industries enhances Africa's economic growth and development. Pertinent to note that indigenization of technologies through domestic production of goods and services improves economic growth and development (Ailaiah, 2025). The economic transformation and resilience of India and most emerging economies is dependent on leveraging indigenous technologies and knowledge system (Ailaiah, 2025; Rabbani, 2014; Gumus, Bubou & David, 2023). Hence, for Africa's growth and development, indigenous technologies and knowledge system should be augmented with western transferred know-how. This mix of technologies will drive innovations, growth and development of Africa and her industries.

Conclusion

This study investigated the impact of indigenous technologies on innovativeness of Africa's industrial organizations. Empirical literature revealed that, indigenous technologies improve innovativeness and innovations in different content. We therefore conclude that indigenous technologies and industries enhance innovativeness of African industrial workplaces,

improves economic growth and development of Africa.

Recommendations

The following recommendations were made:

- 1) African leadership and its industries should encourage the indigenization of technologies for domestic production of goods and services. This will enhance innovativeness and innovation of the African industrial man, improve competitiveness, growth and development of African economies.
- 2) The African economies managers and its industries should develop indigenous knowledge system and skills for its manufacturing environment. This will significantly improve innovativeness of African industrial production of goods and services.
- 3) African leadership and industrial managers should leverage indigenous resources in areas that Africa has comparative advantages. This will enhance productivity, innovation, growth and development of African economies.

Practical/Managerial Implications

The managerial and practical implications of this study is that this research will be a guide to policy makers, industrialist and entrepreneurs in the African sub-region on how best to look inward in leveraging home-grown technologies, knowledge and skills for the production of goods and services in driving Africa's growth, Competitiveness and prosperity.

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