

PATENT AND TECHNOLOGY TRANSFER AS A TOOL FOR TECHNOLOGICAL DEVELOPMENT IN NIGERIA*

Abstract

Patent right is one of the intellectual property rights. A patent is a legal protection and government granted authority that confers its owners with certain, exclusive rights namely to exclude others from using, interfering and dealing with the patented invention or product without a license or permission of the owner. The aim of this study is to explore how the grant of patent rights to owners over their inventions encourages research and development, enabling inventors to recoup their cost and secure returns on investment. Technology transfer (TT) is a collaborative process that allows scientific findings, knowledge and intellectual property to move from inventors like research institutions to public and private users. Salient questions exist and they are: is the extant legal system still enough to meet the increasing requirement of patent protection? How does patent right facilitate technology transfer? What are the challenges and limitations of patent rights in technology transfer? What are the strategies for enhancing technology transfer? The research methodology employed in this research is doctrinal. This method involves reliance on primary and secondary sources of law. The research found that patent right enables the originators/inventors to transfer their inventions/technology to developing regions, fostering local industry's growth. The researchers recommended inter alia that Nigeria should strengthen her laws with respect to provision and protection of patent right and reduce the high cost of obtaining patent right.

Keywords: Patent, Technology Transfer (TT), Technological Development, Nigeria

1. Introduction

It is not in doubt that increase in technological prowess of any nation facilitates the economic prosperity of that nation which trickles down into engendering economic stability. Technology means the application of scientific knowledge for practical purposes, especially in industry.¹ The rapid involvement of technology has led to the introduction of artificial intelligence which is the ability of a digital computer or computer control robot to perform tasks commonly associated with intelligent beings. Technology has revolutionized human interactions, simplified life processes and increased industrialization. Two things accelerate technological advancement and economic growth in developing countries and they are Patents and Technology transfer.

Patent is essentially a legal protection and government granted-authority that confers its owner with certain, limited exclusive rights namely, to exclude others from using, making and/or dealing with the patented invention/product without a license or permission of the owner, for a specified limited period of time, within the territory it is granted². This entails that strong intellectual property rights in this sense patent, helps strongly to attract foreign direct investment (FDI) and facilitates access to advanced technologies when innovators know that the novelty and integrity of their inventions are protected through strong patent laws, applicable in the developing nations. This will definitely make innovators more willing to make their innovations available to developing nations. This is why strong patent laws in Nigeria will help Nigeria gain access to technology through imports. Patent has also helped foreign companies and innovators like Shell Petroleum Development Company, Unilever, Exxon Mobil, MTN, Guinness through licensing agreements allow local or indigenous firms use their patented technologies. This has helped to establish a relationship that is mutually beneficial between the licensor and the licensee as it grants the licensee the right to use, create and commercialize the patented invention, provided they adhere to the terms and conditions outlined in the agreement.³

Technology transfer on the other hand is the movement of data, designs, inventions, materials, software, and technical knowledge, trade secrets from one organization to another or from one purpose to another⁴. It is to be noted that technology transfer is guided by the policies, conventions and/or practice, values of each organization involved in the process and one cardinal consideration of these organizations is the efficacy of the patent law operational in the country/locality of the recipient organization. Technology transfer can exist between universities, businesses, governments, institutions either formally or informally where skills, knowledge, technologies, manufacturing methods etc are shared.⁵ Technology transfer is important for small and medium sized enterprises (SMEs) as rather than having to pay for internal Research and Development (R&D), SMEs are able to form alliances with fellow companies and research institutes to produce innovations, reduce financial risks or share technologies⁶. Technology transfer gives rise to the following:

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¹Britannica Online Dictionary, 2025 Edition <<https://www.britannica.com/technology/artificial-intelligence>> accessed on 26/11/2024.

²Mike & Uloko, *Modern Approach to Intellectual Property Laws in Nigeria* (2nd Edn, Lagos Princeton & Associates Publishers Co Ltd, 2022) p 146.

³Stanzione & Associates, PLLC, 'What is Patent License Agreement' <https://www.stanzioneiplaw.com/what-is-a-patent-license-agreement/#> accessed on 27/11/2024.

⁴TWI, What is Technology? (Definitions and Examples). <<https://www.twi-global.com/technical-knowledge/faqs/what-is-technology-transfer>> accessed on 27/11/2024.

⁵ Ibid

⁶ Ibid

- (a) Economic growth and development by increasing productivity, job creation and also enhanced competitiveness.
- (b) It gives rise to innovation and Research by accelerating innovation, knowledge sharing and innovative discoveries.
- (c) Technology transfer gives rise to social and environmental impact by improving quality of life, sustainable development and social equity and inclusivity.

As we discussed the benefits of technology transfer, it is pertinent to state the various problems technology transfer is fraught with which includes lack of strong intellectual property protection, lack of capacity building and ethical considerations.⁷ In order to boost the technological base of Nigeria, it becomes necessary to strengthen the patent law and practice operational in Nigeria as every right thinking innovator will want to transfer his innovation to a clime or institution where his innovation is protected as a result of strong patent right practice.

2. Legal Framework in the Field of Technology Transfer

Patents and Designs Act⁸

The coming into effect of Patents and Designs Act (PDA), 1970⁹ was in a bid to give Nigeria an autonomous law on patent without first taking recourse to England. The Nigeria's PDA is TRIPS compliant.¹⁰ Section 3 of the PDA recognizes international patent application and it provides that the applicant will have an address in Nigeria.¹¹ This no doubt encourages FDI, licenses, joint venture agreements etc. Also, PDA provides for where the applicant for a patent seeks to avail himself of a foreign priority in respect of an earlier application made in a country outside Nigeria- (a) he shall append to his application under subsection (1) of this section a written declaration showing- (i) The date and number of the earlier application, (ii) The country in which the earlier application was made, and (iii) The name of the person who made the earlier application; and (b) not more than three months after the making of the application under subsection (1) of this section, he shall furnish the Registrar with a copy of the earlier application certified correct by the Industrial Property Office (or its equivalent) in the country where the earlier application was made.¹² Section 6(1)¹³ provides that a patent confers upon the patentee the right to preclude any other person from doing any of the following acts- (a) where the patent has been granted in respect of a product, the act of making, importing, selling or using the product, or stocking it for the purpose of sale or use; and (b) where the patent has been granted in respect of a process, the act of applying the process or doing, in respect of a product obtained directly by means of the process, any of the acts mentioned in paragraph (a) of this subsection. The rights under a patent- (a) shall extend only to acts done for industrial or commercial purposes.¹⁴ The above section provides for rights conferred by patent and thus, goes further to disallow imitation or infringement of an invention/technology duly patented. This guarantees confidence for transfer of technology.

National Office for Technology Acquisition and Promotion Act¹⁵

This is an Act establishing the National Office for Technology Acquisition and Promotion to monitor, on a continuing basis, the transfer of foreign technology to Nigeria and to provide for other related matters. Section 1 of the Act established the National Office for Technology Acquisition and Promotion hereinafter referred to as "NOTAP". NOTAP is a parastatal under the Federal Ministry of Science and Technology. As a corporate body, NOTAP is responsible for implementing the acquisition, promotion, and development of technology while addressing any shortcomings in the acquisition of foreign technology.¹⁶ Technology Transfer Agreements involve the exchange of technology-related assets, knowledge, and skills between entities, often from developed countries to developing ones like Nigeria.¹⁷ The focus of NOTAP is aimed at attracting foreign technologies and investment and the development of indigenous technology. NOTAP was therefore established as one of the main instruments to carry out the National Policy on Technology Development. Part of this policy stipulates encouraging the flow of technology into the country to strengthen industrial development and encourage domestic enterprises to acquire foreign technologies suitable to the local environment.¹⁸ Also part of NOTAP's mandate is to take Nigeria from being a passive player to being an active player in the world's technological market within a very short time.¹⁹

Patent Cooperation Treaty²⁰

⁷ <https://www.emerald.com/insight/content/doi/10.1108/k-12-2019-0828/full/html> accessed on 28/11/2024.

⁸ of 1970 Cap P2 LFN 2004

⁹ Cap P2, LFN 2004

¹⁰ European Commission Africa SME Help Desk: https://intellectualproperty-helpdesk.eceuropa.eu/system/files/2022-02/IP-Country-Fiche_NIGERIA.pdf accessed on 27 December 2024.

¹¹ Section 3 (1)(a)(i) of the PDA, Cap P2, LFN 2004

¹² *Ibid* Section 3 (4)

¹³ *Ibid*

¹⁴ *Ibid*, Section 6(3) of PDA.

¹⁵ Cap N62 LFN 2004

¹⁶ *Ibid*

¹⁷ Banwo & Ighodalo, Regulator Spotlight National Office for Technology Acquisition and Promotion <https://banwo-ighodalo.com/grey-matter/regulator-spotlight-national-office-for-technology-acquisition-and-promotion-notap> <<https://banwo-ighodalo.com/grey-matter/regulator-spotlight-national-office-for-technology-acquisition-and-promotion-notap>>

¹⁸ *Ibid*

¹⁹ *Ibid*

²⁰ (PCT) 2005

The PCT is administered by the World Intellectual Property Organization (WIPO), with 157 Contracting States to the Treaty. This wide coverage simplifies the patent filing process in the sense that rather than filing individual patent applications in each country/jurisdiction where one is seeking for patent protection, one application made by an individual covers the entire gamut of the application process.²¹ Such an application may be filed by anyone who is a national or resident of a PCT member State.²² Each designated contracting state then grants its own national or regional patent if the PCT application meets the conditions for patentability in that country or region.²³ Nigeria is a signatory to the Patent Cooperation Treaty. With Nigeria being a Contracting State to the PCT, it means that inventors can file for PCT national phase entry in Nigeria to seek patent protection for their inventions. Likewise, Nigerian inventors can use the PCT to apply for patent protection for their inventions internationally in other Contracting States.²⁴ The protection offered by this Treaty goes further to facilitate the reception of new technologies.

The Agreement on Trade Related Aspects of Intellectual Property Rights²⁵

TRIPS Agreement made provisions for enhancement of technology transfer. Some of those provisions include: Article 27 (1) TRIPS Agreement provides that subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Article 7 provides that the protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations. Although Nigeria has been a signatory to the TRIPS Agreement since January 1995,²⁶ it has not domesticated same. This makes TRIPS Agreement unenforceable in Nigeria and it will not facilitate an easy transfer of new technology to Nigeria.

African Regional Intellectual Property Organisation (ARIPO) Treaty

African Regional Intellectual Property Organisation (ARIPO) was established by the Lusaka Agreement in the 1976. ARIPO was established via Article 1 of ARIPO Treaty, 1976. The objectives of ARIPO are: (a) to promote the harmonization and development of the intellectual property laws and matters related thereto, appropriate to the needs of its members and of the region as a whole; (b) to foster the establishment of a close relationship between its members in matters relating to intellectual property; (c) to promote the exchange of ideas and experience, research and studies relating to intellectual property matters; (d) to assist its members, as appropriate, in the acquisition and development of technology relating to intellectual property matters; etc.²⁷ With the lofty objectives of ARIPO, unfortunately Nigeria is not a party to the Harare Protocol which entered into force in 1984.²⁸ Nigeria should accede to these Treaties in order to facilitate her transition into being a technological advanced nation.

3. Role of Patents in Innovation and Technology Development

Patent plays an important role in innovation and technology development. The Role of Patents in Innovation and Technological development are as follows:

- (i) It fosters exclusivity which means that no other person should make, use or offer to sell the patented invention without their consent.²⁹ Patent incentivizes research as it is a driving force for firms and individuals to focus upon their Research & Development (R & D).
- (ii) It facilitates investment as companies, organizations and states are likely to fund R & D when they have an assurance that results of research will be patented.³⁰
- (iii) Patent allows inventors and companies to commercialize their inventions by licensing and selling their patented technology to others.³¹

²¹Ani K, How to file a Patent PCT National Phase Entry Application in Nigeria <<https://kabbizlegal.com/how-to-file-a-patent-pct-national-phase-entry-application-in-nigeria/#:~:ext=Patent%20Cooperation%20Treaty%20%E2%80%93%20Nigerian%20Application&text=The%20country%20became%20a%20member%20patent%20protection%20for%20their%20inventions.>> Accessed on the 27 December 2024.

²²[https://www.wipo.int/treaties/en/registration/pct/#:~:text=The%20Patent%20Cooperation%20Treaty%20\(PCT,of%20a%20PCT%20Contracting%20State.](https://www.wipo.int/treaties/en/registration/pct/#:~:text=The%20Patent%20Cooperation%20Treaty%20(PCT,of%20a%20PCT%20Contracting%20State.) Accessed on 27 December 2024

²³[https://uk.practicallaw.thomsonreuters.com/4-507-1542?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/4-507-1542?transitionType=Default&contextData=(sc.Default)&firstPage=true) Accessed on 27 December 2024.

²⁴ *Op Cit (n. 18)*

²⁵ (TRIPS) 1994

²⁶Nigerian National Workshop on TRIPS <<https://www.adams.africa/adams-news/nigerian-national-workshop-on-trips/#:~:text=Although%20Nigeria%20has%20been%20a,the%20provisions%20of%20the%20Agreement.>> Accessed on the 28 December 2024.

²⁷ Article 3 of ARIPO Treaty, 1976.

²⁸ <https://inspire.wipo.int/system/files/juri/ARIPO.pdf>. Accessed on 28 December 2024.

²⁹The Power of Protection: How Patents Shield Innovations.<<https://ttconsultants.com/unlocking-innovation-how-patents-drive-economic-growth-and-benefit-society/#:~:text=Patents%20are%20an%20important%20aspect,as%20well%20of%20international%20trade.>> Accessed on the 4 January 2025

³⁰ *Ibid*

³¹ *Ibid*

- (iv) Patent encourages competition. Competition perpetuates new or better ideas that link the growth process of technology which also drives technological development.³² Healthy competition is needed in a free market economy which encourages R & D as each company wants to outsmart the other.
- (v) Patent creates jobs as companies, organisations, research institutions, leaders of innovation present new products and services which require a workforce with the necessary skills.
- (vi) Patent helps in setting global trade policies as the protection of innovation ensure that firms can move to global market.³³
- (vii) Patents holders have the right to enforce their exclusive rights and inventors can take legal action against infringers.³⁴

4. Types of Technology Transfer

The transfer of knowledge and information about technology can take place in two ways: informal transfer of knowledge and formal technology transfer agreements (contracts).³⁵ Informal transfer of knowledge is more important in the academic environment as it entails the mobility of researchers and students which is greatly contributing to the dissemination of knowledge worldwide. Knowledge can also be transferred through publications, teaching, conferences, courses, presentations, seminar, meetings, informal exchanges and personal contacts between scientists, research institutions, academia and industry.³⁶ The challenge with Nigeria is that the persons privileged to study in the industrialised nations or sponsored to attend these international conferences or courses do not consider it a moral duty to return to Nigeria to impact the knowledge acquired. This has kept Nigeria struggling in her quest to grow her technological base. In addition to the above, Z Farhadikhan and S M Husseini³⁷ listed four types of technology transfer (TT) which according to the authors are as follows:

- (i) International TT: This is a state in which the act of transfer will cut across national borders. E.g. TT from industrialised countries to Nigeria.
- (ii) Regional TT: This is a state in which technology in one single country is transferred from a region to another region, e.g. in United States from Florida to Alaska.
- (iii) Inter-Industry TT: this is where technology is transferred from an industry to other industries. E.g. TT from a space program to military operations.
- (iv) Inter-Corporate TT: this is where technology is transferred from one corporation to another. E.g. TT from Exxon Mobile to Shell BP or to their subsidiaries in Nigeria.

From the above, it is clear that the type of technology transfer that Nigeria needs and earnestly desires is international TT, inter-industry TT and inter corporate TT. The reason for the above is that the Nigeria is in Africa which is a region comprised of less industrialized countries that are deficient of the technological innovations that are operational in the industrialized nations. Inter-Corporate transfer will also enable industries/corporations in the industrialized nations to establish their subsidiaries in Nigeria and give them license to utilize their technology through the usage of any of the methods of TT. Inter-Industry TT is needed in Nigeria as USA National Aeronautics and Space Administration (NASA) can also transfer Space technology to Nigeria's National Space Research and Development Agency (NASRDA).

5. Types of Technology Transfer Agreements

Basically, Technology Transfer Agreement (TTA) helps in the development of a legal relationship between a licensor (the transferring company) and the licensee (the receiving company). The licensor assigns or licenses their registered industrial or intellectual property rights.³⁸ The objectives or aim sought to be achieved by the parties to the Agreement, determines the type of TTA to be contracted. In Nigeria, the National Office for Technology Acquisition and Promotion (NOTAP) is responsible for registering all agreements for the transfer of technology into Nigeria and also ensuring that TTAs registered in Nigeria are economically and technologically favourable to Nigeria.³⁹ There are different types of technology transfer agreements which can be used to transfer IP rights/technology and some of them are:

- i) **Patent Licensing Agreements (PLA)** grants a licensee exclusive rights to manufacture, sell and use patented invention but subject to certain terms spelled out in an agreement⁴⁰ and in exchange of money or something else of value (e.g cross licensing). A PLA will define the amount of royalties the licensee owes to the licensor. Grant back clause is an arrangement under which a licensee agrees to extend to the IP licensor the right to use the licensee's improvements to the licensed

³²*Ibid*

³³ *Ibid*

³⁴ *Ibid*

³⁵WIPO, 'Technology Transfer Agreements'. <<https://www.wipo.int/en/web/technology-transfer/agreements>> Accessed on the 7 January 2025.

³⁶ *Ibid*

³⁷Z Farhadikhan and S M Husseini, 'Review of Methods and Models of Technology Transfer' (2015) (62) *International Letters of Social and Humanistic Sciences* pp 173-181 on/283753877_A_Review_of_Methods_and_Models_of_Technology_Transfer. Accessed on 6 January 2025.

³⁸LegaMart, 'Technology Transfer Agreements' <<https://legamart.com/articles/technology-transfer-agreements/>> Accessed on the 7 January 2025. (IP rights can be patents, trademarks, copyrights, utility models, technical assistance, know-how etc.) to the other company while allowing the licensor to retain ownership over their intellectual property.

³⁹ Section 4 of the National Office for Technology Acquisition and Promotion Act, Cap N68 LFN, 2004

⁴⁰<https://www.priorilegal.com/legal-forms-and-documents/patent-license-agreement#:~:text=A%20patent%20license%20agreement%20typically,the%20licensee%20owes%20the%20licensor>. Accessed on 6 January 2025.

technology.⁴¹ It is necessary that the licensee guard against 'grant back clause' which would be detrimental to the commercial and development interest of the licensee. The essence of the grant back clause is seemingly plausible which is to ensure that the patent holder's IP is not rendered completely redundant or Otiose by improvements made by the licensee. The grant back clause can be in the form of 'assignment back' or 'license back' clause. Assignment back clause is where the licensor/patentee acquires full rights to the improvements with the licensee having to relinquish all rights in the improvement patent to the licensor/patentee. License back clause is where the Licensee only grants to the Licensor/patentee a right to use the improvement patent without relinquishing his exclusive rights to the subject matter of the patent.⁴² Licensing Back Clauses are a form of cross-licensing. Patent cross licensing is well-recognized and accepted practice in the field of patent law.⁴³ Grant back clause has its own advantage as it encourage TT through the benefit it offers to the Patentee. Without grant back clauses, patentees may be reluctant to license their patented technologies as all the licensees exclusive control over the improvement on the patent may ultimately drive the original patent licensor out of the market.⁴⁴ The implication of the above means that there is need to strike a balance between encouraging TT and encouragement/enhancement of local industries. This is where NOTAP comes in to help Nigerians negotiation skills with a view to ensure the acquirement of the best contractual terms and conditions when entering into any contract or agreement for the transfer of foreign technology.⁴⁵ Exclusive 'assignment back'/grant back clauses in licensing agreement is not supported under Nigerian Law as Section 23 (3) of the PDA abhors such.⁴⁶ The section provides as follows: (3) Any clause in a contract for a license under subsection (1) of this section is null and void in so far as it imposes on the licensee in the industrial or commercial field restrictions which do not derive from the rights conferred by the relevant patent or design or are necessary for the safeguarding of those rights

From the above, it is clear that exclusive 'assignment back' grant-back clauses imposing an obligation to fully assign an improvement patents obtained by the licensee through the exploitation of the patents are restrictions which are unnecessary for the safeguarding of those right and as such not supported under the provisions of Section 23 of PDA.⁴⁷ The reason for the above is because 'assignment back' clause is seeking full and exclusive ownership of a new patent that is independent of the licensed patent. The above is in tandem with the need to encourage R & D in the country going from the known to the unknown, as the improved technology/innovation is the known while the new technology/innovation is the unknown discovered through the known. Some businesses which have established their presence in Nigeria through licensing are Cadbury Nigeria, manufacturers of biscuits, sweets, beverages; General Motors Nigeria which have established vehicle assembling plants in Nigeria and Nigerian Bottling Company, the producers of the globally known Coca Cola drink.⁴⁸

ii) An assignment of IP rights involves the transfer of ownership of a patent, from the owner (assignor) to the assignee (physical or legal entity) with permanent effect. The difference between licensing and assignment of IP is that in licensing relations, the right to use the IP is temporarily transferred to the licensee while assignment of IP rights has a definitive effect, like selling tangible assets, thus the former owner will be permanently divested of the ownership.⁴⁹

iii) Technical know-How Agreements: These are Agreements entered into for the transfer of the technical knowledge associated with a certain technology.⁵⁰

iv) Technical Service Agreements: These are Agreements entered into for the provision of technical services in respect of the technology. One party usually the expatriate, with the necessary technical skills renders such skills as a service to another party.

v) Franchising: This method involves the transfer of IP rights/technology under concretised conditions that stipulates scope, term and territory in exchange for an agreed royalty without losing the ownership.⁵¹

6. How Patent Right Facilitates Technology Transfer to Developing to Nigeria

There is a positive relationship between patent and technology transfer or FDI in that in the absence of protection or weak patent protection, decision making on technology transfer or investment would be difficult or even when decision is made the form and type of technology to be transferred or investment to be made would vary.⁵² One of the key arguments made

⁴¹O Owoeye, 'Patent Licensing Contracts Under Nigerian and US Law: The operation of the Exhaustion Doctrine in Nigerian Patent Licenses' in a Lawal-Arowolo & K Ola (eds), *Nigerian Intellectual Property Law: Reform and Development* (Routledge: 2022)11-25< https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4832206 > accessed on 6 January 2025.

⁴² *Ibid*

⁴³ *Ibid*

⁴⁴ *Ibid*

⁴⁵ Section 4 (1) (b) of NOTAP Act Cap N62 LFN, 2004.

⁴⁶ *Op cit* (n 38)

⁴⁷ *Ibid*

⁴⁸An Overview of Technology Transfer Agreements and its Applications in Nigeria, CANDELP Commercial and Energy Law Practice < https://cdn.prod.website-files.com/60fac140de47190a3a85ad65_/65b2ad640_0c8_e895b96e547f_Technology%20Transfer%20-%20SM.pdf >Accessed on 7 January 2025.

⁴⁹ <https://legamart.com/articles/technology-transfer-agreements/>Accessed on the 7 January 2025.

⁵⁰An Overview of Technology Transfer Agreements and its Applications in Nigeria, CANDELP Commercial and Energy Law Practice <https://cdn.prod.website-files.com/60fac140de47190a3a85ad65_/65b2ad640_0c8_e895b96e547f_Technology%20Transfer%20-%20SM.pdf>Accessed on 7 January 2025

⁵¹Coral Navarro, 'How is Technology Transferred?' <<https://www.clarkemodet.com/en/articles/how-is-technology-transferred/>> accessed on the 6 January 2025.

⁵²THE IMPACT OF THE INTERNATIONAL PATENT SYSTEM ON DEVELOPING COUNTRIES: A STUDY BY GETACHEW MENGISTIE P 22 <https://www.wipo.int/edocs/mdocs/govbody/en/a_39/a_39_13_add_1.doc#:~:text=The%20principal%20way%20in%20which,his%20consent%20by%20third%20parties.> ACCESSED ON 7 January 2025.

(SMEs) in Nigeria, JM Unam⁶⁴ posited that: Small and Medium-Scale Enterprises (SMEs) in most countries are recognized as key drivers of accelerated and sustainable economic development. Small and Medium-Sized Enterprises (SMEs) are prevalent in Nigeria and are often viewed as the backbone of the Nigerian economy. According to the National Bureau of Statistics, SMEs account for 96% of businesses and 84% of employment creation in Nigeria.⁶⁵ With a total number of about 17.4 million, they account for about 50% of industrial jobs and nearly 90% of the manufacturing sector.⁶⁶ For SMEs, embracing technology is not just an option, it is a necessity. It is the difference between clunky processes and streamlined efficiency, between stagnant growth and exponential expansion, between obscurity and global reach.⁶⁷ Therefore, SMEs are expected to partner with multinational companies to execute contracts; which if done with technically competent multinational firms could result in technical expertise, transfer of knowledge and technology⁶⁸ The government should encourage SMEs and the SMEs should also adapt to creating linkages which include encouraging research and development in domestic firms, encouraging partnership between firms, universities and research institutes involved in R&D like the Petroleum Training Institute (PTI), Nigerian Institute of Welders (NIW), technical colleges, etc. Organising and supporting training programmes, providing access to financial and non-financial business services and consultancy will facilitate the development of the technological base of Nigeria. Technology supply depends largely on innovation capabilities of a particular country or the innovation potential.⁶⁹ Therefore, for Nigeria to also keep attracting TT she needs to grow her innovation capabilities having seen that TT is a requisite in her quest to grow her technological base. TT enhances foreign direct investment and FDI is one of most widely used channels of international production co-operation which decide about the location and level of technology transfer complexity.⁷⁰ TT Agreements can also serve as a medium for investment. TT agreements have enabled many businesses to establish their businesses in Nigeria as against establishing their subsidiaries in Nigeria which involves a high cost.⁷¹ This should be encouraged.

8. Challenges in Implementing Patent- Facilitated Technology Transfer to Nigeria

Undoubtedly, Nigeria is a developing country and largely an importer of technology and finished products. Nigeria is faced with myriads of challenges which are a clog in the wheel of her quest for technological growth and they include (a) inadequate public infrastructure; (b) inadequate electric power relevant to drive technological growth in major sectors of the economy; (c) poverty; (d) poor health care infrastructure.⁷²

There are also other challenges hindering TT:

- a. The challenge of conflict of organization's objectives. For example, academic institutions may prioritize research excellence, while businesses may focus on profitability. These differing priorities can create friction during technology transfer process.⁷³
- b. There is another problem of very low number of patented inventions of Nigerian origin.⁷⁴
- c. The cost of developing and transferring technology can be very expensive.⁷⁵
- d. More so, Nigeria's patent law lacks extraterritorial jurisdiction coupled with delay in dispute resolution. This means that Nigerian Courts cannot enforce patent infringements that occur outside Nigeria because Nigeria has not acceded nor domesticated most of these Treaties on Patent and TT.⁷⁶

9. Conclusion and Recommendations

This article is a well thought out effort made to raise awareness on the importance of patent and TT which its adherence by Nigeria will help to revolutionize her technological base of the developing nations and Nigeria in particular. The research therefore concluded that Patent plays an important role in innovation and technology development. The Role of Patents in Innovation and Technological development, Also, Nigeria as developing country and largely an importer of technology and finished products, is faced with myriads of challenges which are act as clogs in the wheel of her quest for technological growth and they include inadequate public infrastructure, inadequate electric power supply necessary to drive technological

⁶⁴J M Unam et al, 'Local Content Policy and Technological Capacity Building of SMEs in the Nigerian Oil & Gas Industry', <https://scholar.oauife.edu.ng/sites/default/files/james4exploits/files/my_paper_local_content_policy_and_technology_capacity_building_of_smes_nacee_full2.pdf> p 352 >Accessed 8 January 2025

⁶⁵M A Otitoju et al, 'Review of the Naira Redesign and its Effect on Micro, Small, and Medium Enterprises (MSMEs)' [2023] 13(9) *Advances in Applied Sociology*, pp 662-673.

⁶⁶J U Ahmed et al, 'Flutterwave-A Digital Payment Solution in Nigeria' [2023] 13(1) *Journal of Information Technology Teaching Cases*, pp 50-57.

⁶⁷ *Op cit* (n 61) p 357

⁶⁸ *Op cit* (n 60) p 559

⁶⁹M G Balarabe and M Lawali, 'Innovation and Technology Transfer on Nigerian Economic Development International', [2022] (3) (4) *Journal of Research Publication and Reviews* p 1309 <<https://ijrpr.com/uploads/V3ISSUE4/IJRPR3476.pdf>> Accessed on 8 January, 2025.

⁷⁰ *Ibid* p 1312.

⁷¹An Overview of Technology Transfer Agreements and its Applications in Nigeria, CANDELP Commercial and Energy Law Practice <https://cdn.prod.website-files.com/60fac140de47190a3a85ad65_65b2ad640_0c8_e895b96e547f_Technology%20Transfer%20-%20SM.pdf>Accessed on 7 January 2025.

⁷² D O Oriakhogba and A I Fenemigho *op cit* (n 145) p 2

⁷³<https://wiseias.com/challenges-solutions-technology-transfer/#:~:text=Absence%20of%20Intermediaries,difficult%20for%20stakeholders%20to%20connect>. Accessed on 10 January 2025.

⁷⁴U B Akpotaire 'Patent Strategies for Companies Doing Business in Nigeria' [2011] 40 <http://www.academia.edu/2539330/Patent_Strategies_for_Companies_Doing_Business_in_Nigeria>Accessed on 9 January 2025

⁷⁵ *Ibid*

⁷⁶<https://www.bloombergneconomy.com/news/nigerias-bid-to-boost-innovation-via-patent-development/#:~:text=Among%20the%20barriers%20are%20a,resulting%20in%20low%20royalty%20rates>. Accessed on 10 January, 2025.

growth in major sectors of the economy. In order to reap the benefits of patents and TT in Nigeria, the following recommendations are made:

- i) Domestication of TRIPS Agreement and other international Treaties.
- ii) Amending the Patent Act to provide how Nigeria Customs Service should deal with unauthorized patented technology at the Nigeria's borders.
- iii) Positioning of NOTAP at the Nigeria's borders in ensuring that international patented technology are not brought into Nigeria without the authorization of the owners of the technology. This will boost the confidence of the international community.
- iv) Making Nigeria's economic, social and political environments conducive for formal and informal transfer of technology.
- v) Facilitating the development and empowerment of local capacities through education, R & D and the development of appropriate institutions to build on the transferred patented inventions and technology.
- vi) Having a strong manufacturing and industrial sector by provision of constant power supply and provision of steel manufacturing companies and its ancillary companies.
- vii) Provision of effective transportation and communication systems.
- viii) Encouragement of locally made goods/products by their patronage.
- ix) Offering of financial benefits/incentives to SMEs in the form of tax subsidies, tax waiver, non-interest and long term loan facilities to enable SMEs acquisition of the new technologies which are capital intensive.
- x) Amendment of the relevant laws establishing various patent institutions conferred with the administration of patent and technology transfer.