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# Dividends of professional registration in engineering practice for technological advancement

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**Abstract**
The paper gave a detailed definition of Engineering before it explored the dividends of professional registration in engineering practice in the society. It explained that the synergy of engineering with other societal activities is the root cause of the material prosperity of many societies, and is a key to improving the condition of many developing countries. On Engineering practice, it noted that professional engineering is extending the physical and economic capacity of the society by enhancing the reach of society's components and capabilities of its members, and by creating new methods and instruments for agriculture, the production of goods, communication, defence, offence, exploration of space and the oceans, and of the preservation and utilization of nature's resources from land to energy, water and materials. The paper noted that for success to be achieved in the field of engineering, a professional engineer who stands as the headman to direct and organize activities will work with other technically educated people or team members who include Technologists, Technicians, and Craftsmen. It observed that Professional Registration is an indicator of dedication to integrity, hard work, and creativity, and an assurance that the individual engineering personnel has passed at least a minimum screen of competence, as professionalism in engineering practice enhances technological advancement of any society or country. The paper concluded by explaining that the essence of technological advancement has been to raise the standard of living of man and to make his life more comfortable, as being registered as engineering personnel provides registered members with a competitive advantage as they become more active and informed members of their industries, demonstrating high level of professional knowledge, skills and expertise, hence, enhancing technological advancement.

**Keywords:** engineering, council for the Regulation of Engineering in Nigeria, Nigerian Society of Engineers, engineers, technologists, technicians, craftsmen

## 1. Introduction
Engineering is defined as the application of science, technology, arts, and economics to the definition and solution of real socio-economic and ecological problems. It is a creative process of synthesizing and utilizing the forces of nature, knowledge and experience of humanity to enhance the welfare, health, and safety of all members of the community, with due regard to the environment in which they live and the sustainability of the resources employed.
Sheri *et al*. (2006) [1], sees engineering as problem solving, considering the systematic processes that engineers use to define and resolve problems; as knowledge, considering the specialized knowledge that enables, or fuels the process. Engineering profession is very important in our society in many ways – in manufacturing of goods and services, road construction, building of structures, information and communication technology, transportation system, etc. This explains why Marjoram and Zhong (2010) [2], noted that Engineering is the field or discipline, practice, profession, and art that relates to the development, acquisition and application of technical, scientific, and mathematical knowledge about the understanding, design, development, invention, innovation, and use of materials, machines, structures, systems, and processes for specific purposes.
In order to effectively achieve the goal of technological advancement in our society, being innovative and resourceful is not enough; professional engineering registration is very important. The process of engineering registration is a process whereby engineering personnel is assessed to find out if he possesses the right knowledge and skills and hold the relevant professional experience needed for him to be entrusted with the lives and properties of people in the society. Professional registration demonstrates that engineering personnel have met the standard that gives the public, employers and their clients the confidence to entrust their health and personal safety to products and applications that engineering personnel develop.
Many dividends abound, both at personal, firm level, or beyond that can be enjoyed as a result of professional engineering registration.

## 2. Engineering Practice
### Engineering Regulation
Engineering qualifications and professional registration with regulatory bodies (Council for the Regulation of Engineering in Nigeria [COREN] in the case of Nigeria) may in many countries be categorized as falling into one of the three generic tracks, namely: Engineer, Engineering Technologists, and Engineering Craftsmen (Technicians). Broadly distinguished by Duke University (2005), there are a number of approaches to the regulation of a profession around the world:

**A. Licensing**: in this approach, an area of engineering work is linked to those persons who have demonstrated competence to perform such work. Licensing on a statutory basis prohibits unlicensed persons from performing such work. Non-statutory licensing provides the public with lists of persons competent to perform work within an area of engineering, which may also be undertaken by non-licensed persons.

**B. Registration:** here, those persons who demonstrate their competence against a standard and undertake to abide by a code of conduct, are awarded titles and are admitted to a register. Such registration may be governed by the laws of a country (statutory register) or the regulations or the rules set by the governing body of the profession, which oversees the registration process and maintains the register (non-statutory register). Where governing bodies operate non-statutory registration, they may only use civil action to prevent non-registrants from using the title and are not empowered to restrict any area of work to registrants.

**C. Specialist lists:** in this approach, a professional or trade body administers a non-statutory voluntary listing of professionals who have met a defined standard of competence in a specific area.

All these forms of regulation are linked to codes of conduct. Serious breaches of a code of conduct can lead to the withdrawal of a license, the loss of title, or the removal of the transgressor's name from a specific list, either on a temporary or permanent basis.

**Engineering and Science**

From the earliest times of human civilization, the activity that has come to be called engineering has impacted on society through the technological artefacts - both tangible and intangible that it creates. According to Bugliarello (2010), products of engineering surround us and affect virtually every aspect of our lives, influencing culture, art, and religion in a tightening circle of reciprocal interactions. Every major engineering innovation, from metal-making to electronics, has brought about changes in the society. The development and practice of engineering is affected, in turn, by significant changes in society's goals, customs, and expectations.

To respond to society's demands, the very education of engineers is becoming interdisciplinary, including courses in the humanities, the social sciences and biology. Societal entities that respond faster and more intelligently to engineering innovations usually have the advantage. The American and French revolutions eventually enhanced technological development by opening up their societies to the opportunities offered by the Industrial Revolution. Likewise, the Russian Revolution greatly accelerated the pace of industrialization in that country.

One of the first sources of confusion, particularly among those who are not engineers or scientists, is the distinction between science and engineering. While Spier (1995) [9], noted that the primary role of science is to develop knowledge and understanding of the physical universe, Davis (1995) [7], observed that an important distinction is that this pursuit of knowledge (science) may occur largely without regard to societal needs. The direction of scientific research has been described by some as curiosity-based research which is not necessarily driven by the values of the society. The Venn diagram of Figure 1 shows that the domain of engineering is the overlap of scientific knowledge with societal need, more specifically, the application of scientific knowledge to the needs of the society.

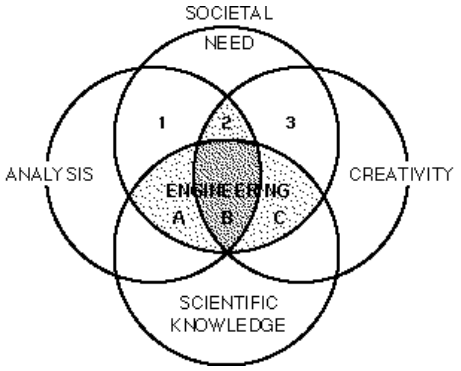


**Fig 1:** Interception of Scientific Knowledge with Social need: Domain of Engineering (Nichols and Weldon, 2004) [8]

Considering the intersection of scientific knowledge with societal need (designated as the domain of engineering), Nichols and Weldon (2004) [8] discussed the three sectors, shown as A, B, and C.

**Sector A:** represents the intersection of purely analytical talents with the engineering domain. This may be used to represent engineering science, an ability to model complex systems and predict their response to various inputs under various conditions. This segment of engineering has, of course, been the subject of intense development over the last half century and has benefitted most directly from the availability of fast digital computers.

**Sector C:** the intersection of the man's creative capacity with the engineering domain, can be viewed as representing those sudden intuitive leaps often responsible for revolutionary advances in technology called "significant novelty" by Spier (1995) [9], as well as those aspects of engineering, not yet fully supported by engineering science, that remain more art than science.

**Sector B:** (the intersection of knowledge and need with both creative and analytical capability) can be used to represent engineering design and much "real world" problem solving. This sector includes activities ranging from developing innovative products and processes, to creating an innovative bridge design, to developing a new control process for petrochemical production. This vision of engineering design as the quadrilateral intersection represented by Section B is consistent with statements expressed by Pahl and Beitz (1988) [10], Dixon (1966) [11], and Penny (1970) [12].

This four-circle representation of human endeavor (Figure 1) also offers a useful perspective for other enterprises. Sector 1, the intersection of analytical skills with societal needs outside the bounds of scientific knowledge might include economics and philosophy while sector 3 may encompass the arts. Sector 2 may be used to represent those societal needs outside the bounds of scientific knowledge that required both analytical and creative skills, perhaps including public policy, business administration, and music.

**Engineering, Science, Technology and Skills**

Engineers connect social needs with innovation and commercial applications. The relationship among science, technology and engineering can be roughly described with Figure 2.

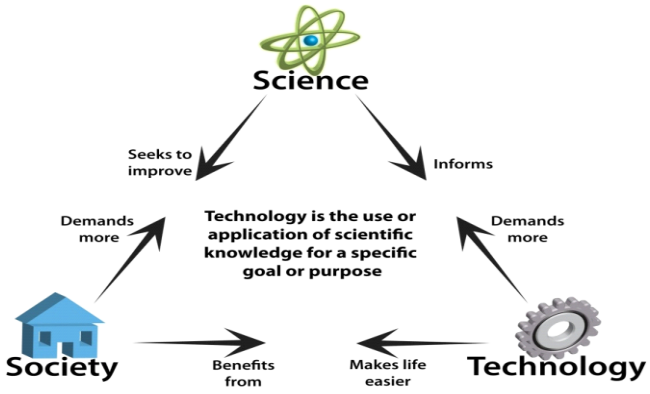


**Fig 2:** The Relationship between Science, Technology, and the Society.

**Engineering Profession and Technological Advancement**

Roads, aqueducts, pumps and canals have made urban life possible, electricity has illuminated and helped to power the world, industries and communications have fostered global affluence and weapons of increasing power are shaping the interactions among nations. Modern music, paintings, and architecture, automobiles and modern bridges embody both art and technique as did the pyramids and the Parthenon. Bugliarello (2000) [5] noted that the fact remains that engineering and technology are processes that require the synergy of individuals, machines (artefacts) and social organizations.

An important facet of that synergy is the ever-closer interaction with science. The synergy of engineering with other societal activities is the root cause of the material prosperity of many societies and is a key to improving the condition of many developing countries. The rapidly developing interaction of engineering with biological and medical system is beginning to dramatically increase the health of vast sectors of the world population, and the synergy of engineering and education through advances in information and telecommunications technology, to improve skills, and job opportunities globally.

At the same time, however, developments in mechanization and automation may tend to diminish both employment opportunities and person-to-person, face-to-face interactions by interposing machines. Also as dependency on technology grows, and as technology becomes less well understood and operated to its maximum capacity – society is placed at increasing risk by technological failures and design faults, whether of logical supply systems for water, food, energy, and vaccine, or of other critical infrastructures and systems. This risk is aggravated by the ever greater inter-dependencies of our engineering world. Sladovich (1991) [4], opined that Engineering in its entirety is in effect, a social enterprise that has made modern society possible, with all its potentials and risks, and is nurtured in turn by the society.

Professional engineering is extending the physical and economic capacity of the society by enhancing the reach of society's components and capabilities of its members, and by creating new methods and instruments for agriculture, the production of goods, communication, defence, offence, exploration of space and the oceans, and of the preservation and utilization of nature's resources from land to energy, water and materials. Engineering's evolving and depending interaction with the other components of the society and its increasing ability to intervene in biological processes has become a key factor in determining the future of our species.

**Further Emphasis on Engineering Technological Breakthrough**

***Biotechnology:*** Exciting breakthroughs in the understanding of human physiology have been among the most captivating topics of public discussion over the past several decades. It is the potential to attack diseases and disorders at the cell and DNA levels that leads some to believe that diseases, as currently known, may be eradicated and that compensations for many of the limitations of the human body (e.g., those related to aging or hormonal changes) will be available.

Advances in biotechnology have already significantly improved the quality of our lives, but even more dramatic breakthroughs are likely. Research in tissue engineering and regenerative medicine may lead to new technology that will allow our bodies to replace injured or diseased parts without invasive surgery, but rather by using the natural growth processes inherent in cells. Already used extensively to help burn victims grow replacement skin, it is possible that related developments will allow spinal cord injury victims to restore full mobility and feeling by reconnecting tissues and nerves.

Linked with new developments in nanotechnology and micro-electronic mechanical systems (MEMS), one may see the use of nanoscale robots, or nanobots, to repair tissue tears or clean clogged arteries. Nanobots might be used to target drugs that can destroy cancers or change cell structures to combat genetically inherited diseases. Bio-informatics will likely take advantage of improved computing capabilities that use the human genome database to allow drugs to be customized for each individual. A drug that might be fatal for one person could be well suited for curing another's disease, depending on their specific genetic makeup.

The intersection of medical knowledge and engineering has spawned new biomedical engineering research and curricula that have helped create or refine products such as pacemakers, artificial organs, prosthetic devices, laser eye surgery, an array of sophisticated imaging systems, and fiber-optic-assisted non-invasive surgical techniques. In the future, ongoing developments will expand beyond the application of medical advances toward tighter connections between technology and the human experience.

For example, embedded devices that aid communication or devices that monitor organ functions and provide meaningful information to the user will be available. New-century products will also be exquisitely tailored to match the physical dimensions and capabilities of the user. According to the National Research Council (2001) [16], bio-inspired computer researchers are already investigating virus protection architectures that mimic the human viral defense system, and pattern recognition researchers are developing algorithms that mimic the visioning processes observed in humans and other species.

**3. The Engineering Family**

The successful practice of engineering involves an inter-dependent team effort by a large number of people of diverse degrees of skills and expertise. Individual members of the team perform different aspects of technology or act their vocation/skills. Invariably such people are considered or claim to be practising engineering and consider themselves as 'engineers'.

In the early days, the practice of engineering was more of a craft. At the time, very little was known of the properties of materials and of course the quantities required of their products were limited. Consequently the emphasis was on the

skill of the practitioner and each product was so Skill fully "engineered" that the products were such prideful.

With the advent of the industrial revolution however, the need for mass production had been established and the properties of materials were better known. Thus the practice of engineering became more complex, need for specializations became more prominent and the need to define roles and responsibilities became obvious.

The practice of engineering as a profession requires team efforts and as in team no one member need claim pre-eminence over other members. Each member of the team needs the other members to succeed and the team's success is synonymous with the success of the individuals. However, in assigning roles in a team one member of the team is designated captain, or leader, or head. This is important since no team can function efficiently without direction and leadership.

The team leader provides the motivation for clear direction and effectiveness. So it is with the practice of engineering. There are members of the team and there is a team leader who is the Engineer, other team members are the Technologists, the Technicians, and the Craftsmen. These four cadres with different roles to play in order to ensure the success of the team make up the engineering family. Each one must be trained and prepared for his role in the team. And it is only when such member of the team knows, accepts and plays his role well that the team, or in this case the practice of engineering, can succeed.

For success to be achieved in the field of engineering, a professional engineer will work with other technically educated people (called members of engineering family or engineering team). Among these classifications or divisions, the engineer stands as the headman to direct and organize the activities of the other team members.

**Ethics and Professionalism in Engineering Practice**

Professionalism is about commitment to standards of excellence in the performance of tasks which requires skills and expertise. In practice of any given profession, there are ethical principles and code of conducts that are expected to be observed by the practitioners of such profession. Professionalism in engineering practice is very important since it reduces the activities of quakes, loss of lives and properties, and also enhances technological advancement. There are rules and regulations that must be obeyed; public welfare, safety, well-being and other interests of general public must be taken into cognizance in engineering practice, or during rendering professional services to the general public.

As with many other professions, the professional status and the actual practice of professional engineering is legally defined and protected by law in various countries. In Nigeria, Council for Regulation of Engineering in Nigeria (COREN) is saddled with the responsibility of regulating and controlling the training and practice of engineering profession in all its aspects and ramifications.

Established by decree 55 of 1970 and amended by decree 27 of 1992, now the "Engineers (Registration, etc) Act, CAP E11 of 2004" Law of Federal Republic of Nigeria, COREN performs four key functions, which are (1) registration of five cadres of engineering disciplines namely: Engineering Craftsmen, Engineering Technicians, Engineering Technologists, Engineers and Engineering Consultants that wish to practice in Nigeria (2) Catering for all engineering disciplines many of which are more practiced than other professions (3) Accreditation of engineering courses in universities, polytechnics, colleges of technology and technical colleges in Nigeria and beyond (4) Organization and Supervision of postgraduate practical training of newly graduated engineers.

Practice of engineering includes any professional service or creative work requiring the application of special knowledge of mathematics, physics and engineering in form of consultation, invention, discovery, valuation, research and teaching in recognized engineering institutions, planning, operation, maintenance, supervision of construction and installation involving investigating, advising, operating, evaluating, measuring, planning, designing, specifying, laying and directing, constructing, commissioning, inspecting or testing in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works or projects (COREN Act, 1992 No. 27).

Any professional involved in any of the above mentioned services require to work according to the ethics of professionalism. Some of the codes of conducts for professional engineering personnel as articulated by the Nigeria Society of Engineers are:

- A member shall make available his professional knowledge and experience in accordance with his code as a consultant or adviser, or a salaried employee, or a teacher of Engineering Science, or in design, or manufacture, or construction as a faithful agent and trustee of his client, employer, or other people connected with the works.
- A member shall not practice in a dual capacity as a consultant and as a contractor for the same project except with the prior written consent of the client.
- A member shall not place orders on his own behalf in respect of a project on which he is engaged but shall only do so explicitly on behalf of his client.
- A member shall not be the medium of payments made on his client's behalf unless specifically so requested in writing by his client, but shall only issue certificate for payments.
- A member shall not take part in competition involving the submission of proposals and designs for engineering work unless an assessor which shall be an Engineer of acknowledged standing has been appointed to whom all such proposals and designs are to be submitted for adjudication.
- A member shall not invite or submit priced proposals under conditions that constitute price competition for professional services.
- A member shall not advertise engineering services in self-laudatory language or in any other manner derogatory to the dignity of the profession.
- A member, on engineering works in a foreign country the members may adapt his conduct according to the professional standards and customs of the country, but shall adhere as closely as practicable to the principles of this code.

**Professional Registration of Engineering Personnel in Nigeria**

Professional Registration is an indicator of dedication to integrity, hard work, and creativity, and an assurance that the individual engineering personnel has passed at least a minimum screen of competence (National Society of

Professional Engineers, NSPE, 2018). Being registered as engineering personnel is the mark of a professional. It is a standard recognized by employers and their clients, by governments and the public as an assurance of dedication, skill, competence and quality. Engineering personnel, according to COREN Act, includes a registered engineer, engineering technologist, engineering technician and engineering craftsman. The registers of engineering personnel consist of four registers, each one for: (a) registered engineers; (b) registered engineering technologists; (c) registered engineering technicians; and (d) registered engineering craftsman.

It is the duty of COREN to secure the establishment and maintenance of register of persons entitled to practice as registered engineers, engineering technologists, engineering technicians and engineering craftsmen and the publication from time to time the lists of those persons. A Registered Engineer, according to the Engineers Code of Conduct of 2015 prepared by COREN is defined as someone who may be engaged in research, production, supervision of engineering activities or as a designer; or he may be retained as a consultant for professional advice, inspection, certification, adjudication, or be engaged in any combination of these.

COREN registers Engineering personnel from four professional Associations in Nigeria as shown in Figure 3. It is important to note that any professional can become COREN Registered through any of the professional associations, depending on the qualifications of the personnel. Each of the professional Associations prepare their members every year for registration as professionals by COREN. Being COREN registered means that COREN has validated the engineering qualification(s), experience and competence of the engineering personnel.

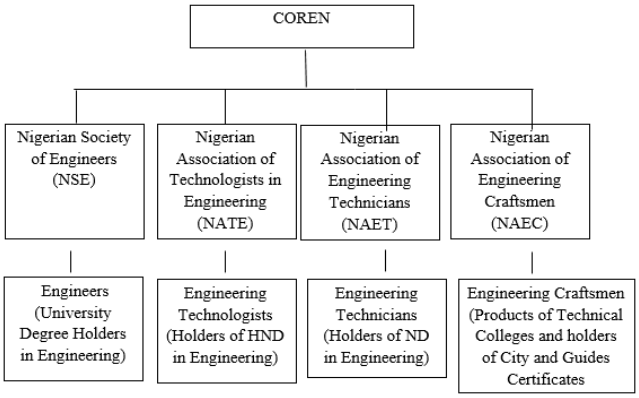


**Fig 3:** Engineering Personnel and their Professional Associations in Nigeria

There are processes involved in professional registration in engineering practice. According to COREN Act, a person shall be entitled to be fully registered if:

1. He has attained a course of training approved by the council under the next following section;
2. The course was conducted at an institution so approved, or partly at one such institution and partly at another or others;
3. He holds qualification so approved; and
4. He holds certificate of experience issued in pursuance of section 9 of COREN Act; and
5. He has completed a minimum of two years' approved post-graduate training and has passed or is exempted from professional interview;
6. In the case of a craftsman, he has completed a minimum of two years' working experience in his trade and submits an acceptable certificate of experience;
7. He has completed his second year of industrial pupilage in an approved establishment.

## 4. Dividends of Professional Registration in Engineering Practice for Technological Advancement

Professionalism in engineering practice enhances technological advancement of any society or country. The essence of technological advancement has been to raise the standard of living of man and to make his life more comfortable. Being registered as engineering personnel provides registered members with a competitive advantage as they become more active and informed members of their industries, demonstrating high level of professional knowledge, skills and expertise, hence, enhancing technological advancement. Many dividends are abound to be enjoyed by engineering personnel, firms and the nation as a result of professional registration of engineering practice. With these benefits accruing to the engineering personnel, firms and the society, technological advancement of such society is enhanced.

Some of these dividends of professional registration as shown in Figure 4 are discussed in this section.

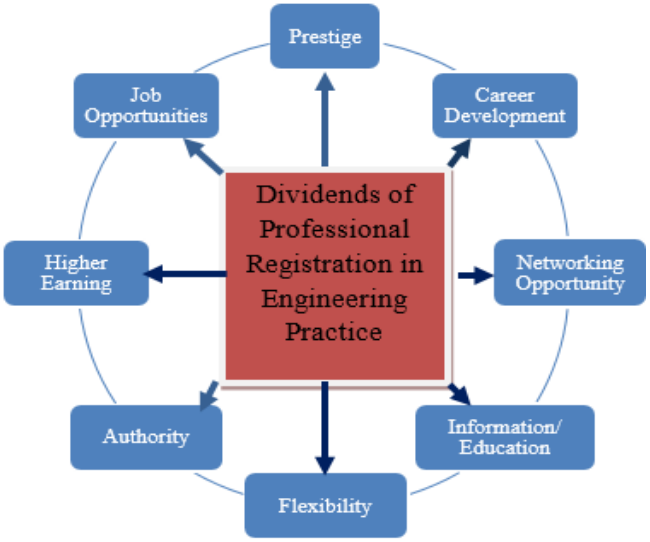


**Fig 4:** Dividends of Professional Registration in Engineering Practice

**Provision of Networking Opportunities**: Various engineering associations such as the Nigerian Society of Engineers (NSE) and Nigerian Association of Engineering Craftsmen (NAEC) provide unparalleled networking opportunities to their members, allowing individuals to connect with their peers, mentors, and other industry leaders. As a member of the NAEC, one is in the unique position to attend conventions, seminars, award dinners and other related events with like-minded professionals in the field. Santiago (2018), noted that these events are attended by the brightest minds and are hotbed of ideas and collaborative efforts

Networking with professionals outside one's place of employment offers one a broader perspective on the trends of engineering practice and technological developments, both within a country and round the globe. An engineering

association's annual meeting represents an incredible opportunity for engineers to meet and network with the largest gathering of their peers during the year, and listening to experiences shared by other practicing engineers can be refreshing and of immense help and source of encouragement.

**Information/Education**: The field of engineering is always in a state of change due to breakthroughs continuously made in science and technology. Engineering professionals can keep up with such new developments during their associations' seminars, journal publications, and other educational opportunities provided to them to disseminate the knowledge and information to their members. Membership of a professional association offers one access to mentors and the opportunity to participate in mentoring others as well. Besides, being a member of an engineering association places one in the unique position of gaining a competitive edge by utilizing all the educational resources available for further research and development in engineering and technology.
Governments deal more with registered trade unions than with a single individual or an unregistered association. Registered professional engineering personnel use such an opportunity to influence government policies and legislations that encourage technological research and development. Virtually all registered trade associations have the names of their members in their databases. Engineering associations are not exempted in this data storage. The NSE has a website which every member should access for information. It also keeps an e-mail database of its members from which it always keeps its members informed about any upcoming workshop/training, lectures, copies of reports, accessible sponsorship programmes, existence of new innovations in engineering and technology, etc. Through interactions during local chapter meetings, members of the associations dialogue with colleagues to obtain strategies on how to deal with each new issue.

**Intrinsic Value and Career Development**: Associations are always in need of new blood to help organize their annual meetings, workshops, professional exams, and legislative committees. Members helping their organization work to improve their profession as well as to help improve the overall state of engineering and technology can be very rewarding. Benefits reaped by members depend to a large extent on their level of commitment/engagement with the association.
A professional association can attract industry leaders and bring them to a lecture. When engineering associations have their seminars/workshops/conferences, international and/or local experts in various areas of engineering and technology are invited to deliver lectures and provide new knowledge and methods of dealing with engineering problems to the participants who later use such knowledge and methods in developing new technologies or in advancing the existing ones.

**Jobs Opportunities and Advocacy:** Viable engineering associations are great places to find the latest jobs in the related fields. Members can connect with prospective employers at annual meetings and make contacts with other members of the association and by such interactions secure jobs that offer them the opportunity of exhibiting their talents and contributions to the advancement of engineering and technology. The associations act as advocates for their members, effectively bringing the professional interests of the members to the knowledge of allied engineering professionals, government, insurance industry, media and other organizations in various sectors of the economy. In doing this, these associations also actively market its members to the general public, relate well with engineering service providers on a regular and consistent basis regarding the scope and benefits of the profession's services, and countering any negative press that may harm the profession.
Professional associations give their members the leverage and resources to meet their business needs of information, advocacy, public relations, expanding opportunities and professional development, and shore their defenses against those who would exploit or manipulate the profession and the source of the member's livelihood.

**Prestige:** Registered engineering personnel are respected by the public and are seen in the same light as licensed professionals in other fields. Professional registration enhances the status as the professionally registered engineering personnel. Professional registration is achieved through peer recognition of competence and commitment to society, the profession and the environment. This brings a great sense of achievement, credibility with colleagues and students, respect from the wider industry and, for many individuals, boosts self-esteem and confidence.

**Higher Earning Opportunities:** Being registered engineering personnel gives one the leverage to earn more than the unregistered peers. The Engineering Council's 2013 survey of professionally registered Engineers, Technologists, Technicians, and Craftsmen indicated that those holding the titles continued to enjoy pay increases above the national average. As a professionally registered engineer or technician, one is likely going to enjoy higher earnings across his working life. This is because employing registered personnel brings benefits to the employer, such as increased customer confidence. This could help them to win more contracts, in turn improving their bottom line.

**Flexibility**: Being registered, opens up one's career options. The registered engineer can become a specialist, or can establish his own business. It also allows one to go as far as his initiative and talent can take him.

**Benefits to Firms or Businesses:** Firms or organizations employing professionally registered engineering personnel can enjoy the following benefits:

- They meet the required standards of technical credibility and competence
- Ability to tender for contracts or attract investment, where professionally registered engineering professionals are critical
- Legal credibility and significance
- Competitive advantage for consultants, technical start-ups and micro-businesses.
- High professional and ethical standards
- Updated skills and knowledge, through a long term commitment to staff continuous professional development
- A structured mechanism and best practice examples to develop, attract and retain top technical talent, via a professional engineering institution

- Access to a wide network of experts and technical knowledge
- Greater kudos when professionally registered company staff present at industry or sector events, from exhibitions to conferences
- Answering audit questions and requirements about professional competence and training

## 5. Conclusion

Technological advancement in any society is very necessary in improving the standard of living of man and to make his life more comfortable. To achieve this purpose effectively and efficiently in our society, professionalism in engineering practice, being a standard recognized by employers and their clients, by governments and the general public as an assurance of dedication, skill, competence and quality, is the solution.

Numerous dividends for individuals and for businesses abound to be enjoyed as a result of professional engineering registration. To unlock these benefits which will help to enhance technological advancement in our society, professional engineering registration is a distinction or goldmine which all engineering personnel must strive for, and do everything necessary to be registered.

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