CHALLENGES OF REGULATING EMERGING TECHNOLOGIES: A CASE STUDY OF COVID-19 AND 5G CONSPIRACY THEORY

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Abstract
Technological emergence and advancement over the decades in information and communication technology, biotechnology, nanotechnology, 3D printing, internet of things and the next generation telecommunication networks such as 5G, big-data analytics and artificial intelligence (AI) has brought about immeasurable global transformation. However, regulating these emerging technologies has been challenging for policy makers, governments and regulatory agencies. The environmental risk presented by these emerging technologies is often misunderstood and unaccepted until the technologies are duly developed and its applications otherwise proved. With the eruption of a novel coronavirus disease (COVID-19), various conspiracies have connected 5G to the spread of COVID-19, stating that the installation 5G facilities will emit radiation waves thereby weakening the immune system. This misinformation among others, poses a major challenge for government, regulatory agencies and policy makers in regulating emerging technology.

Key Words: Regulating, Emerging, Technology, 5G, Conspiracy Theory

1. Introduction
Emerging technologies are technologies whose growth and development are yet to be relatively actualized. These are technologies that are just rising into limelight from an obscure background. They are known for changing existing state of affairs and shaping lives both at national and international levels when implemented (Mifsud, 2018). Educational technology, information technology, artificial intelligence, robotics, 3D printing, biotechnology, nanotechnology, to mention a few are some of these
emerging technologies which when properly implemented, do not only shape a country’s future achievements but also revolutionizes the society at large. However, some advocates and critics of technological change warned against the possibilities of these technologies posing existential risks and other dangers; hence, the need to regulate these technologies as they emerge (Warwick, 2004) (Ford, 2009).

Moreover, the importance of regulating technologies cannot be over emphasized as it is known to greatly mould the welfare of economies and societies asides it’s other benefits. It specifically aims at maintaining fair market, promoting the sustainability of innovations and technologies as they emerge and protecting the citizens (OECD, 2011). However, achieving these aims in a balanced way with limited shortcomings has been challenging for regulatory bodies as discussed in this article.

Regulating technologies can be achieved in different ways with several purposes. Some of these purposes could be to prevent nuclear war, prevent unreasonable human sufferings or to even hinder some actors from accessing certain technologies (Kuhn, 2019). For example, the advent of Mass Destruction and International Humanitarian law came into existence to regulate and control military and technology advancements. In a broader way, regulation of some past technologies can be seen in the regulation and control of Nitrogen oxide (NOx) which was a great threat to the environmental well-being as also envisaged with the emergence of 5G.

2. Related Works

The need for new governance methods and models were addressed in (Marchant, et al., 2013). The paper stated that, no single regulatory agency, or even group of agencies, can regulate any of these emerging technologies effectively and comprehensively. (Nick, et al., 2011) discussed the need to develop a comprehensive understanding of processes of public perception of nanotechnology uncertainties, risks, and benefits, alongside related communication issues. The generic idea of “upstream public engagement” for emerging technologies such as nanotechnology was also discussed, alongside its importance for future work with emerging technologies in the risk communication field.

In (Mandel, 2009), a new governance model that seeks to manage the dynamics of emerging technology promise versus risk by moving the point of first governance earlier in a technology’s development, but enabling the governance structure to evolve after formation was presented. The model aims to turn some of the greatest challenges of managing emerging technologies and the disruption of extant regulatory
systems on their head to create incentives for widespread stakeholder cooperation to produce more proactive, flexible governance.

An overview of the legal implications relevant to the ethical aspects of emerging technologies was provided in (Ivan, et al., 2011). The paper explored the existing situation in the area of legal regulation at EU level, and formulated recommendations for the lawmakers. The paper provided a systemic approach towards transmitting ethical norms to the application of emerging technologies through legal regulation, and formulated detailed recommendations in various areas of such technologies.

In (Gary, et al., 2009), five important lessons from previous attempt to govern emerging technologies were drawn. The paper pointed out public confidence and trust in a technology and its regulatory oversight as probably the most important factor for the commercial success of a technology. Secondly, discriminating against particular technologies should be avoid unless there is a scientifically based rationale for the disparate treatment. Regulatory systems, needed to be flexible and adaptive to rapidly changing technologies. Ethical and social concerns of the public about emerging technologies needs to be expressly acknowledged and addressed in regulatory oversight. International harmonization of regulation may be beneficial in rapidly globalizing world.

(Editorial, 2009) provides a reflexive overview of the nature and purpose of science, technology and innovation (STI) policy research at present, and made a case for a collective and critical reflection on the means and ends of their research. One of the key themes presented is the complex interaction between the past, present and future in the STI policy research field. The authors called for a sustained, critical and extensive ‘conversation’ among researchers about the nature and purpose of STI policy research and the challenges faced.

3. An Overview of Emerging Technology

Emerging technologies are technology whose advancement and applied applications are yet to be actualized, such that they are metaphorically emerging into eminence from a background of nonexistence or obscurity. The term emerging technology (ET) has been recurrently used by IT experts and scholars (Halaweh, 2013). ETs are science-based innovations with the potential to create a new industry or transform an existing one (DAY & Schoemaker, 2000) (Srinivasan, 2008). Emerging technologies include a variety of technologies such as information technology, educational technology, medical field advancement, 3D printing, nanotechnology, biotechnology, cognitive science, psycho technology, robotics, and artificial intelligence, NFC (near field communications), cloud computing,
ambient intelligence, virtual reality, and social network websites (Stahl, 2011) (Chiasson, et al., 2011) and (Siemens & Tittenberger, 2009).

For example, Nitrogen oxide, present in the atmosphere mostly as a result of global emission, has been realized to be rapidly increasing for almost two centuries now. It exists in the form of Nitrous oxide (laughing gas) \( \text{N}_2\text{O} \), NO and NO\(_2\). The \( \text{N}_2\text{O} \) is known as a “Greenhouse Gas” which is similar to carbon dioxide \((\text{CO}_2)\) in that it absorbs long wavelength infrared radiations to refrain heat radiating from the earth which consequently leads to global warming, a great environmental hazard (Ford, 2009). However, strict NOx emission regulations and principles are being implemented in some industrialized countries and these regulations have been driving the development of NOx emission control methods; although not without some challenges as explained below (Clean Air Technology Centre (CATC)., 1999).

The regulation and control technology adopted for the pollution and emission from Nitrogen oxide involved some complex processes which were divided into two; namely: external and internal combustion applications with add-on control technologies. Some of the challenges facing these regulatory techniques include but not limited to significant delays experienced in the acceptance of improved techniques, lack of specific control technology available for all the combustion systems which led to several random selections before settling for a final choice, existing conflicting factors, an imbalance in cost and efficiency parameters suitable for use and many more (Ford, 2009).

Not limited to the biotechnology area of the greenhouse gas that was regulated amidst some specific challenges as mentioned above, information technology is another area of technology that has faced a lot of challenges throughout its different stages of implementation over some decades; specifically the telecommunication sector. For many decades now, there has been notable high increase in technological advancements; ranging from cellular systems to broadband telecommunication in general.

The advent of 1G in the late 1970/early 1980s was mainly characterized with analog systems without data capabilities, strictly for voice communication. This was preceded by the 2G generation which used digital modulation techniques to achieve better voice quality and security was also achieved at this stage via encryption (Abubakar, 2018) (Garg, 2014) (Opeoluwa, et al., 2018). The 3G generation was known for its vast multimedia services amidst others and it was based on the usage of circuit and package switching to achieve its voice/SMS and data services respectively. The advent of 4G brought about higher speed in transmission aside other advantages of mobile broadband higher evolution but not without its numerous short comings which are expected to be mitigated by the advent of 5G.
However, despite the government’s agencies like Federal Trade Commission (FTC) and Health Insurance Portability and Accountability Act (HIPAA) working hard to ensure controlled technology and regulatory standards for these technologies as they emerge, there are still several challenges facing these controlled methods. Some of them include; privacy and security problems, presence of unstructured data which cannot maintain the standard querying approaches, technical skills to control newer collective tools and many others (Amit, et al., 2019).

3.1 The Emergence of 5G Technology and COVID-19 Conspiracy Theory

With the eruption of a novel coronavirus disease (COVID-19), various conspiracies have connected 5G to the spread of COVID-19, stating that the installation of 5G facilities will emit radiation waves thereby weakening the immune system. The crucial claim seems to be that 5G radiofrequency communications have a damaging health impact, and that either these are directly making people sick (i.e. COVID-19 doesn’t exist and people are actually suffering from 5G effects) or the radiation is depressing peoples’ immune systems and therefore making them more likely to suffer from the virus. This misinformation among others, pose a major challenge for government, regulatory agencies and policy makers in regulating the emerging technology.

Since the beginning of December 2019, the coronavirus disease (COVID-19) has spread rapidly around the world, which has led to increased discussions across online platforms. These conversations have also included various conspiracies shared by social media users. Amongst them, a popular theory has linked 5G to the spread of COVID-19, leading to misinformation and the burning of 5G towers in the United Kingdom (Ahmed, et al., 2020). To ensure full acceptability, adaptability, adoption and commercial success of the emerging technology, it is very essential to build public confidence and trust in the technology and its regulatory oversight.

5G is the first generation of mobile networks designed to address the wide range of needs of the vertical industries (Rocsana & Maria, 2018). A quantum leap in wireless capability, offering incredible speeds, low latency, and the ability to connect far more devices than 4G. 5G will enable the most powerful and dynamic wireless communications network deployed to date. Ubiquitous 5G coverage will proliferate new services and will be necessary to accommodate the growing Internet of Things (IoT), which provides constant broadband connections to a variety of new devices and applications. 5G technology, a dynamic, coherent and flexible framework of multiple advanced technologies, supports a variety of applications, offers unlimited mobile broadband experience, providing enormous communication of
everything from hands-held smart devices to sensors and machines with instantaneous connectivity and ultra-high reliability.

The success of 5G deployment according to Wiley 5G Team (2020) is intertwined with several international activities. Interoperability has long been a hallmark of global telecommunications policy. Global technical standards and spectrum harmonization for wireless services are vital for 5G’s success. Regional and national decisions on spectrum band allocations and technical and licensing conditions will affect the ability to fully deploy 5G domestically and abroad. These decisions will also impact the ability of players in the 5G ecosystem to leverage economies of scale (Wiley 5G Team, 2020).

4. The Challenges of Regulating Emerging Technologies

Some of the challenges facing the process of regulating emerging technologies include the following:

- The challenge of balancing the processes of regulations enforcement, maintaining fair market/business models that are unpredictable and protecting citizens without hindering or over regulating the emerging technologies.
- Privacy and security problems, presence of unstructured data and inadequate technical skills and global laws pose a great threat to regulating emerging information technology (IT) technologies.
- Significant delays experienced due to some already existing conflicting factors and imbalances in the cost and efficiency parameters that are suitable for the emerging technologies.
- The problem of coordinating with other regulators far and wide across borders.

Considering the benefits of regulating emerging technologies, the challenges facing the processes of regulating these technologies must be addressed in order to maximize the benefits. Given below are some proffered solutions to the stated challenges.

As stated by Houlin Z., 2018, the problem of coordinating with other regulators regardless of the distance should be addressed by adopting new technologies to connect every regulator all over the globe. The paper expressed the need for fast regulatory responses which implies regulatory bodies can act before a perfect framework or conclusion is reached about a known technology; thereby limiting delays.

Furthermore, it presented a digital regulatory tracker which could serve as a design plan for improving existing regulations to suit emerging technologies with little or no delay.

However, Hardoon & Kundu, 2019 also supported fast regulatory responses but emphasized on allowing the risk associated with a technology to relatively materialize first before implementing regulations.
proportional to the materialized risk. This will consequently ensure a fair market, stable business models and prevent the challenge of over regulation.

In general, Delloite, 2018 suggested that regulators of emerging technologies should carefully reconsider using collaborative and iterative models that involve adequate planning, requirement analysis, design, testing and other important factors. This is to ensure smoother regulation processes with lesser challenges.

5. Conclusion

In this age of rapidly emerging technological innovations, enacting adequate and efficient regulatory policies has become a more difficult task for government agencies and regulatory bodies. However, the emergence of a novel corona virus disease (COVID-19) months ago brought about non-factual conspiracies towards the deployment of 5G globally. This in turn, has posed a great challenge in regulating the emerging 5G technology; despite the numerous advantages of this emerging technology.

In line with solutions proffered for the existing challenges of regulating emerging technologies, 5G technology can also be regulated following similar processes. More so, since technologies involving radiations, greenhouse gas and the earlier versions of 5G technology; 1G, 2G, 3G, and 4G have been successfully regulated and deployed, an IT tracker that can serve as a blueprint for improving those previous regulations can be adopted in the regulation of the newly emerging technologies.

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