Consultation on Draft GSR-23 Best Practice Guidelines

Regulatory and economic incentives for an inclusive sustainable digital future

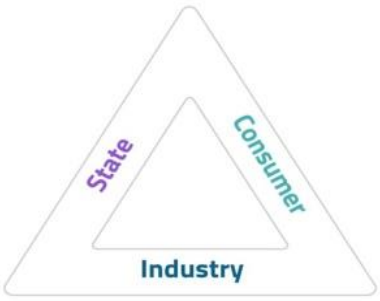
The digital revolution has transformed the world into a global village. It has connected people and businesses across different countries, creating new opportunities and driving economic growth. However, the digital divide remains a significant challenge, especially in rural and isolated areas. The lack of access to digital infrastructure hampers economic development, limits access to essential services, and perpetuates social inequalities.

The National Telecom Regulatory Authority (NTRA) is the national competent authority responsible of regulating and administering the telecommunications sector in Egypt. NTRA has been mandated by law No. 10 of 2003 to guarantee the nationwide provision of telecommunication services across all regions including urban, rural and remote areas. To this end, NTRA is continually using innovative regulatory instruments to develop digital and ICT infrastructure with a focus on rural areas. Pursuant to the Law, NTRA aims to avail telecom services supported by the most advanced technologies, and satisfy consumers' needs at the most appropriate prices, while taking into consideration transparency, open competition, universal service delivery and the consumers' protection rights. NTRA is responsible for creating and maintaining a sustainable regulatory environment for the market in order to ensure healthy competition among telecom operators and service providers, as well as ensuring effectiveness and efficiency of telecommunications services throughout the country.

Our vision is to develop the Egyptian ICT market to become one of the leading markets globally in terms of the quality of ICT services provisioned and availed to the end users, while opening up the investments' prospects in a competitive, safe, and fair environment.

For an inclusive sustainable digital future, the regulatory practice envisioned for the next decade should cope with highly dynamic nature of the ICT market, especially with the proliferation of new and emerging technologies.

Digital services backed up by new and emerging technologies open up unprecedented opportunities to catalyze our transition to the digital future, promising massive gains, higher levels of operational savings, higher efficiencies, and optimized service delivery. However, these developments also bring up new challenges and risks associated with more stringent QoS/QoE service requirements and unknown attack vectors on the ICT infrastructures that could ultimately compromise the services' availability and/or the consumers' rights.



In principle, regulatory instruments should be founded on preserving the intricate balance between three main stakeholder groups, namely, the consumers, market, and state interests.

Adopting innovative regulatory instruments that employ participatory multi-stakeholder evidence-based ex ante impact assessments and ex post evaluations of existing regulatory frameworks provides a solid basis for ensuring an inclusive and sustainable regulatory ecosystem.

Regulatory Instruments in the Digital ICT Era: Infrastructure and Emerging ICT and Business Models

Multi-Dimensional Impact Assessment (MDIA): New dimensions for ex-ante impact assessments and ex-post evaluations are needed. The economic, environmental, social, and health impacts of major new proposed policy and regulatory initiatives especially with the proliferation of new and emerging technologies are needed. Digital ICT services powered with new and emerging technologies facilitate digital transformation and enhance service delivery. Real-time monitoring and data and data analytics can provide timely and effective information for the decision maker. Powered by advanced learning and prediction algorithms, digital solutions and services can simulate and forecast new operation conditions that can be used to improve the effectiveness and efficiencies of service provisioning. However, such technologies could pose risks beyond the tradition economic and environmental impact catered for in Regulatory Impact Assessments (RIAs). Implications on the social systems as well as potential adverse effects on health need to be investigated for a more inclusive treatment of ex-ante impact assessment and ex-post evaluation of existing regulatory frameworks, e.g. attention-grabbing strategies impacts, and the use of artificial intelligence (AI) in mission critical services and use cases with safety and security considerations.

NTRA has adopted a methodological framework for assessing the economic, environmental, social, and health impacts of major new proposed policy and regulatory initiatives in collaboration with the relevant stakeholders. The framework adopted an open and participatory model whereby the views of the relevant subject matter experts, consumers, ICT market players, and relevant governmental bodies are incorporated. This inclusive Multi-Dimensional Impact Assessment (MDIA) approach proves itself as an adequate instrument to assess policy/regulatory impacts as well as streamline stakeholder consultation processes to address emerging challenges in this highly dynamically changing environment. MDIA analyzes and recommends alternative policy/regulatory options for the achievement of targeted policy objectives aiming at realizing NTRA vision and strategy.

Standards Based Regulatory Approach: Complementing regulatory instruments with standards addressing techno-policy, economic, environmental, social, and health domains are necessary for a sustainable digital future. Advancements in data regulations (e.g. regulation of smart contracts) and risks associated with adopting AI in public services entails the adoption of standards that tackle new complementing areas like environmental sustainability, and health.

NTRA has been leading international efforts of standardization in the domains of smart cities and communities and digital services. For example, NTRA's work on the use of AI and IoT for digital agriculture to explore the potential of emerging technologies including AI and IoT in supporting data acquisition and handling, improving modelling from a growing volume of agricultural and geospatial data, and providing effective communication for interventions related to the optimization of agricultural production processes. The work considers the Ethical, Legal, and regulatory considerations relating to the use of AI for agriculture. Standards of this sort are expected to support regulatory measures developed to tackle associated challenges in digital ICT sectors.

Universal Service Fund (USF): The Universal Service Fund has been effectively used since 2014 to provide mobile coverage to 53 rural areas and 36 strategic roads with total lengths up to 4335 km located in many different governorates, in addition to many other national mega projects such as Decent Life (Hayah

Karima) which aims to extend optical fiber networks and improve mobile broadband coverage to more than 1400 villages at the first phase. USF has been used as well at the national broadband plan (Emisr) that proposes different strategic directives to meet Egypt's broadband service needs. USF has been used to subsidize ISPs running network costs to provide high speed Internet services to more than 1400 governmental entities including (schools, hospitals, etc...).

Tower Infrastructure Companies: NTRA has recently opened up the Egyptian market for tower infrastructure companies to start operating in order to pump fresh investments in the mobile network rollout. This change in the regulatory framework aimed to give more space to the existing mobile network operators to help focus their core business on service delivery and expedite the rollout of mobile networks while improving the economics of service delivery.

Streamlining Infrastructure Development: One of the dampening factors towards achieving the national mobile services policy targets was the lack of collaborative mechanisms and existence of divergent infrastructure deployment procedures. NTRA has stepped in to lead infrastructure development coordination activities in collaboration with other concerned state entities involved in the process, and adopted the necessary mechanisms including the development of the technical guidelines, national infrastructure standards, and unified infrastructure deployment procedures. Those collaborative mechanisms were supported by the necessary regulatory frameworks in order to streamline the infrastructure development process in the Egyptian market. The adopted mechanisms helped to achieve 30% increase in Mobile network densification since 2022, and they include issuing: *the mobile infrastructure development guidelines including acceptance and operational procedures*; *the national standard for Electromagnetic emissions and the mobile site rollout unified procedures*.

Enabling Regulatory Frameworks:

Data centers and Cloud Computing Framework: NTRA issued the regulatory framework for establishing data centers and providing data centers and cloud computing services with the aim of attracting local and international investments by providing a clear and transparent regulatory environment to data centers and cloud providers.

The regulatory framework put forward simplified registration requirements for providing cloud computing services in Egypt and even exempted cloud computing services infrastructure established in Egypt from licensing/registration requirements in case the service is provided exclusively for customers outside Egypt.

Internet of Things Regulatory Framework: With the rapid progress of IoT and the proliferation of various application in the space of smart cities, infrastructure and industrial applications, NTRA issued the regulatory framework for IoT to define the regulatory requirements of every stakeholder in the IoT ecosystem. The framework provided simplified procedures for providing IoT service balancing the need to stimulate investment and ensuring service governance. Furthermore, an IoT Forum has been established in collaboration with all relevant market stakeholders to foster and disseminate IoT services within the Egyptian market, particularly across national projects carried out and the smart ecosystems applied in the governmental developmental sectors.

Digital Payments and Financial Inclusion: Collaborative regulation was a key enabler to unlock the potential of electronic payment services in Egypt and achieve financial inclusion, NTRA cooperated with the Central Bank of Egypt and many telecom and financial stakeholders in order to create a conducive market to digital payment service proliferation.

NTRA worked jointly with all stakeholders to develop services to boost the usage of digital payments such as availing receiving International remittances through mobile wallets and availing utility payments through mobile wallets using NFC technology.
Moreover, NTRA created a hub database that enables Fintech companies to verify customer data and match it with the data registered with the mobile operator. This database will act as a platform for the development of more innovative financial services.

Financial Incentives for Eco-Friendly Practices and Under-Served Areas: regulatory incentives could include subsidies directed to companies that invest in digital infrastructure in underserved areas. This will encourage private sector investment and increase competition, leading to lower prices for consumers. These subsidies can be in the form of reduced fees for accessing government-owned infrastructure (e.g. colocation on public facilities buildings).
However, it is important for these measures to consider the economic sustainability of the telecom market under consideration and whether it is still at early stage of development. In particular, these types of incentives could be more appropriate where the market is stable and competition is at healthy levels. It is important also that governments balance the need for private sector investment with the goal of ensuring that everyone has access to affordable, reliable, and sustainable digital infrastructure. Another economic incentive is to provide financial benefits to companies employ sustainable measures in network operation (e.g. using renewable energy sources to power their digital infrastructure). This will encourage companies to adopt sustainable practices, reducing their carbon footprint and contributing to a more sustainable digital future.

Public-Private Partnerships: Another regulatory incentive is to promote public-private partnerships that leverage the strengths of both sectors to deploy sustainable digital infrastructure. Governments can partner with private companies to provide digital infrastructure services in remote areas. This approach can ensure that the infrastructure is sustainable, reliable, and affordable, as the public sector can provide funding and oversight while the private sector can bring technical expertise and innovation. Economic incentives should aim to make the deployment of digital infrastructure in underserved areas financially viable for private companies. For example, governments can provide grants or low-interest loans to companies that invest in digital infrastructure in rural areas. This will reduce the financial risk for private companies and encourage investment in underserved areas.

Emerging Technologies and Research: Emerging ICT technologies and business models are critical to driving innovation and ensuring a sustainable digital future. However, the high cost of developing and deploying these technologies can be a barrier to entry for many companies. Therefore, governments should identify the right incentives required to ensure the introduction of these technologies and business models. One possible incentive is to provide research and development funding to companies working on emerging ICT technologies. This funding can help companies develop new technologies and bring them to market, making them more affordable for consumers. Moreover, regulators can foster innovation and competition in the telecom sector by providing incentives for new entrants and startups that bring new ideas and technologies to the market. This can include offering regulatory and economic incentives to startups that focus on developing technologies that serve underserved areas or that are sustainable.
Backed up by a strategic vision for the telecom market, whereby research, and analysis of complex, novel, and non-traditional technological and techno-regulatory communications and digital issues are conducted, NTRA has established a roadmap for investing into techno-regulatory and standardization Research and Development Programs (RDPs) in multiple techno-regulatory domains covering Industry 4.0 segments covering, for example, advanced ICT infrastructure, telecom networks, security, quantum computing,

advanced sensing, AI and robotics, IoT, smart cities use cases, and mixed/augmented reality solutions and use cases.

Regulatory Sandboxes: Regulatory sandboxes are an important emerging concept that allow companies to test new technologies and business models in a controlled environment. This can help companies identify potential challenges and opportunities, reducing the risk of failure when they are deployed at scale. Regulatory sandboxes promote innovation and experimentation while ensuring that new products and services comply with regulatory requirements. They allow businesses to test new technologies and business models in a controlled environment, where they can receive feedback and guidance from regulators before launching them in the market. Egypt is considering establishing such sandbox to encourage innovation in the ICT market.

Skills Development: All these regulatory instruments require extensive skill set development for the regulatory practice. For instance, NTRA inaugurated EG-ATRC in July 2021 as the first of its kind in Africa to provide foundational and advanced telecom/regulatory practical masterclasses. The center acts as an international platform for exchanging expertise and provides top notch regulatory programs tackling real life market scenarios. Furthermore, it provides the foundation for the ICT regulatory art necessary for achieving regulatory excellence in a very dynamic ICT marketplace, with emerging technologies and services being developed and delivered in our markets constantly and at a very high pace. EG-ATRC also provides hand on practical regulatory master classes delivering top notch regulatory case studies as well lessons learned from existing regulatory cases. The participants of EG-ATRC include regulators, policy makers, academic community and operators as part of the philosophy adopted by NTRA to enable an inclusive sustainable digital future.

Building Blocks of a Sustainable Inclusive Digital and ICT Market Development Agenda

Regulatory instruments in the digital era must be coupled with progress on the legislative front (promulgation of data protection law, anti-cyber and information technology crime law) for a comprehensive treatment of all inter-related issues that tackle technology, economic, environmental, social, and health aspects of digital and ICT services. It is important to highlight that effective and efficient regulatory interventions to develop sustainable positive market impact relies on the adoption of an inclusive regulatory model that brings all stakeholders in the decision making process and addresses the market readiness and impact of the regulatory actions on the different stakeholders: government, consumers, and business/market segments.

Regulatory and economic incentives are essential to ensure the effective deployment of sustainable digital infrastructure and services and to allow for the proper adoption of new and emerging ICT technologies and sustainable business models. Environmental, social, and health impacts as well as economic and techno-policy aspects are all needed to be accounted for. A comprehensive set of regulatory tools/instruments backed by collaborative regulatory approaches ensure that people in rural and isolated areas have access to affordable, reliable, and sustainable digital infrastructure. Additionally, research and development funding and regulatory sandboxes can help companies develop and deploy emerging ICT technologies and business models, driving innovation and contributing to a sustainable digital future.