

Use of New Technologies in Regulatory Delivery

Simon White

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Background: This brief summarises the DCED’s Business Environment working group technical report [Use of New Technologies in Regulatory Delivery](#). The

DCED Business Environment Working Group produces Policy Briefs to provide short, relevant guidance on specific topics related to donor and development agency support for BER in developing economies.

Key Messages for Donors and Development Agencies

- Policymakers and regulators face rapid changes across many industries. New business models are emerging that create opportunities for regulators to improve the administration and delivery of regulations through better access to data and the use of artificial intelligence and machine learning.
- The new ‘Age of AI’ requires regulators to adopt a more anticipatory approach by integrating data and technology in order to improve risk management and service delivery.
- Regulators in both developed and developing economies are exploring and piloting emerging technologies to improve regulation delivery. This technology helps regulators reduce administrative burdens while ensuring public and consumer interests are protected.
- AI and associated applications, such as machine learning and natural language processing, present innovative ways of gathering and analysing data. Regulators are exploring ways of applying AI within these new digital business ecosystems to keep pace with rapid innovations.
- The most feasible and sustainable models of new regulatory delivery involve the active participation of the private sector. This is enhanced through innovation-friendly policies, procurement processes and service delivery schemes, and the use of technology to enrich public-private dialogue.
- Specific regulatory policies and guidelines are required to manage the issues that emerge from these new models and technologies. This includes concerns regarding privacy, the prevention of discrimination and AI algorithmic-bias and various ethical considerations.

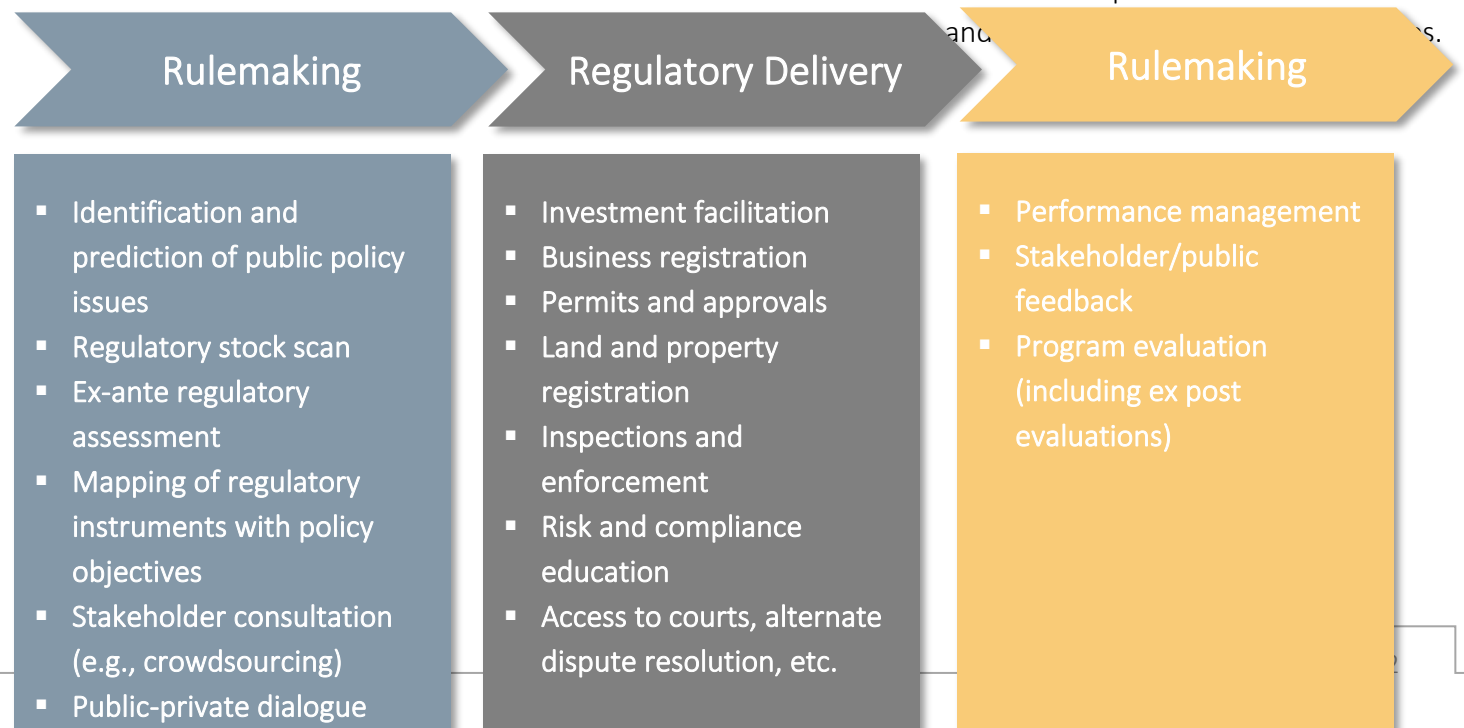
- Donors and development agencies can work with governments and regulators to find ways AI and other emerging technologies can improve administrative efficiencies while mitigating the risk of regulatory non-compliance and the occurrence of adverse impacts on health, safety and the environment.

Technology for regulatory delivery

Artificial intelligence, the use of algorithms and the growing use of open data, including social media, can enable regulators to collect and analyse information, and engage with stakeholders in order to improve policy development and service delivery. Emerging technologies can also replace or complement traditional regulatory mechanisms and support policy evaluation.

The DCED commissioned research that identified more than 60 cases of new technology in regulation delivery spanning the Americas, Asia, Europe, and Australia. These cases covered technology applications across the different stages of the regulatory lifecycle. Figure 1, below, presents the processes associated with the regulatory lifecycle.

Figure 1: Regulatory processes in the regulation lifecycle

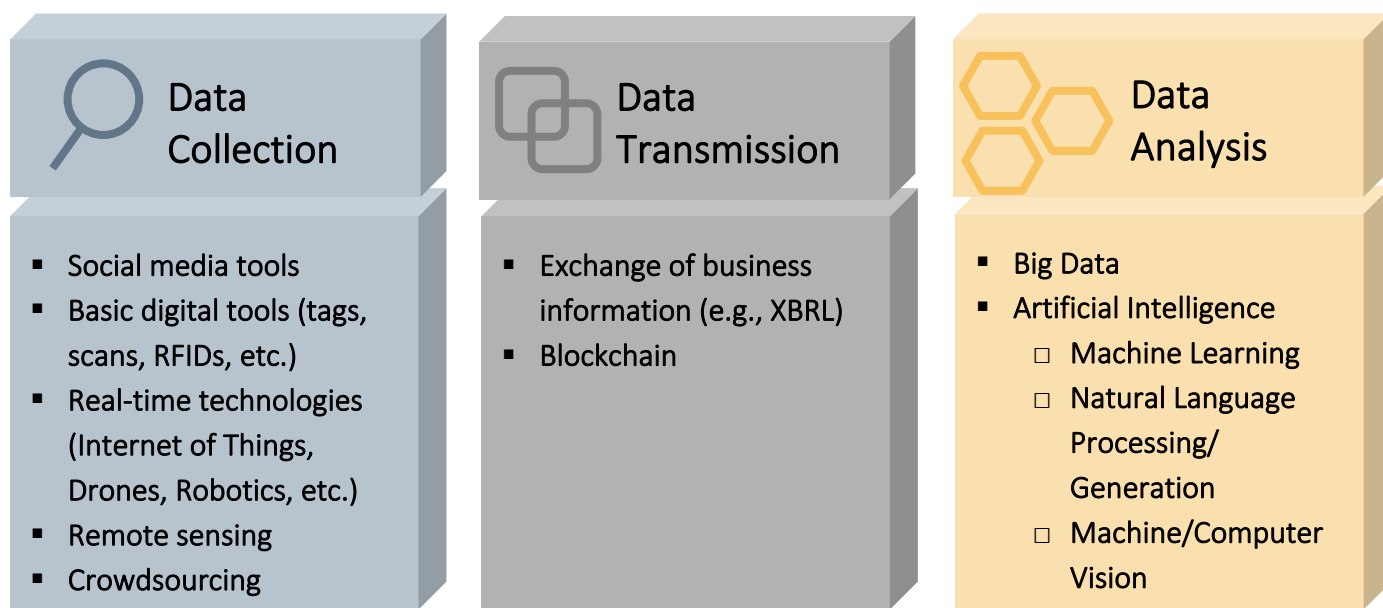


The cases studies largely represented applications that:

- Improve the administration of registration systems (i.e., business registration and licensing, land titles, etc.), access to services and the use of surveillance and inspections;
- Apply artificial intelligence, machine learning and natural language processing; and
- Make use of real-time technology (e.g., Internet of Things, remote sensing), social media and crowdsourcing tools and blockchain technology across the regulatory cycle.

Figure 2 presents some of the technology applications that can be used to improve the administration of

Figure 2: Technology applications for regulatory delivery



Source: PRISM Institute and World Bank Group (2020)

A basic maturity model was used to categorise, map and review the use of new technologies in these settings (see Figure 3, below). This was used to determine the priority of specific elements of regulatory reform when designing emerging technologies for specific regulatory processes.

Improving data collection and analysis

Regulators need timely and reliable data. The collection and use of data are fundamental elements in the transformation of regulatory processes. Digital technologies, including AI and associated applications such as machine learning and natural language processing, provide innovative ways of gathering and analysing data. Data collection enhancements are achieved through the use of the Internet of Things, remote sensing and data aggregation and transmission technologies, such as blockchain. These technologies are increasingly being used within several regulatory processes.

Figure 3: Maturity model for new technologies and regulation delivery

Model Category	Maturity level 1	Maturity level 2	Maturity level 3	Maturity level 4	Maturity level 5
	Initial (Concept)	Piloted	Partially Scaled, Implemented and Standardized	Fully Scaled, Implemented and Standardized	Optimized with Continuous Improvement
I. Policy Considerations					
II. Institutional Arrangements	The categories and individual elements within each category are described below				
III. Technology Implementation					
IV. Operating Model and Sustainability					

Source: PRISM Institute and World Bank Group (2020)

New digital technologies enhance the scope of regulatory inspections and enforcement by providing data on compliance and risk. This improves the performance of risk-based regulations and regulatory procedures.

Improving data integration and management

Regulation for data collection and business registries helps governments define their data needs. It also provides a mandate for collection, sharing and use of data. Creating unique identifiers for core data elements provides an opportunity to map and link services into an integrated regulatory delivery chain.

Cloud-based solutions built using open source code are the most common, cost-effective and standardised way of applying technologies such as AI and machine learning. They also ensure suppliers and experts in the marketplace are sufficient and that issues such as interoperability are addressed.¹

While most governments are moving towards open data, this may not always be the most appropriate approach, particularly if the data is sourced from external parties such as the private sector or other regulated sectors. Regulators have to assess the risks associated with the misuse of data (e.g., for enforcement purposes) while protecting proprietary information.

Regulating new digital business models

Regulatory sandboxes provide testing grounds for new business models that are not protected by current regulation or supervised by regulatory institutions. Sandbox environments are a useful means to pilot new digitalised regulatory delivery models. They can be used to test various aspects of

regulatory delivery, including new policy precepts and the relevance and feasibility of new technologies and business models. This includes the testing of the interoperability of new technological solutions to ensure new systems interact with other systems, at present or in the future, without any restriction.

Regulatory alternatives, such as self- or co-regulation and regulatory co-operation, can aid the design of timely, technology-based responses to disruptive business models. This promotes better coordination across multiple agencies and departments through improved data sharing and automated responses to regulatory queries. Some examples include the use of regulatory alternatives in global supply chains and online marketplace platforms.

Supporting innovation in regulatory delivery

Strong senior-level leadership is required to drive research, development, coordination, and the implementation of emerging technologies for regulation delivery. An internal team of experts or the use of outsourced expertise can build and maintain capacity and skills within an organisation.

Partnerships with academic or research institutions have benefited agencies on multiple fronts. Such alliances can increase access to the most modern and innovative solutions while improving the continuity of support. These arrangements can also increase the availability of short-term resources such as internships while lowering the costs of expertise compared to obtaining prohibitively expensive resources.

Increasingly, regulatory agencies are recruiting data scientists and analysts to form the backbone for the implementation of new technological delivery systems. Procurement processes are being used to ensure training modules become an essential

¹ Interoperability is a characteristic of a product or system, whose interfaces are completely understood, to work with other products

or systems, at present or in the future, in either implementation or access, without any restrictions.

component of any package provided to regulators from external suppliers.

The most feasible and sustainable models of new regulatory technology involve the active participation of the private sector.

Case studies

Estonian Centre of Registers and Information Systems

The Estonian Centre of Registers and Information Systems (RIK) is using AI to automate business registration-related processes. RIK was established under the Ministry of Justice to integrate business and land registration (i.e., e-Business Register and e-Land Register) with the information systems of courts and other justice systems. Recent pilots involve the use of AI to aid company name selection, the translation of company-related court rulings, chatbots to improve the customer service, and 'Smart Services' for companies. The aim is to use AI to fully automate company and land registration. This goes beyond the capabilities of traditional IT systems.

The RIK chatbot improves customer service because most of the questions are similar and can be answered automatically. AI-based court ruling translations provide foreigners with the ability to understand the content of decisions related to their companies. This involves the use of neural machine translation, which is the next generation of machine translation technology and produces more fluent translations.

The Smart Service for Companies initiative helps businesses to understand and navigate through a company lifecycle by suggesting different actions, supporting grants and information from the government. This means that the AI machine learning algorithm constantly 'learns' the behaviour patterns of business users and presents helpful information at the right time.

The next stage is to use AI to provide advice to businesses on how they can lessen bureaucracy, such as filing annual reports, sending e-invoices, statistics reports, and renewal applications. The platform should allow private companies to develop and add commercial applications, while allowing AI to choose the services relevant to them. In the future, the platform could also use economic indicators to predict the probability of a recession in some areas of activity (i.e., AI company life expectancy) and suggest what entrepreneurs could do to prevent a decrease in a profit.

Geotagging for Property Assessment and Compliance (State of Andhra Pradesh, India)

The Andhra Pradesh Municipal Development Project for India helps improve urban services in the state and build the capacity of urban local bodies (ULBs) to sustain and expand urban services. The project supports state policy and institutional development to improve the policy and institutional framework for service delivery and capacity building.

The project builds the capacity of municipalities to improve the management of all ULBs and invests in urban infrastructure in ULBs to improve urban services or operational efficiency.

New state policies were introduced to an inclusive regulatory and policy framework, robust, accountable, and transparent institutions that provide quality service delivery, the creation of sustainable partnerships, and the creation of a vibrant civil society based on the effective and smart use of data. This included the introduction of a biometric attendance system for all ULB functionaries, an e-Office system with fully digitised file management for increased transparency and quicker response, and other e-governance elements. The state government introduced an enterprise resource planning (ERP) model to revolutionise urban governance. The World Bank provided support for the development of this ERP model, rolling out e-governance activities across 110 urban local bodies and integrating a centralised system involving a total of 18 service modules. These applications were rolled out on a centralised cloud-based server and made available to the urban bodies.

GIS mapping of entire landmass across ULBs was carried out with the use of drones that fed data into AI algorithms and calculated SFI for all properties in the ULBs. This helped to fill the gaps in property tax, which increased four- to five-fold and reduced corruption by lowering costs and reducing falsified property areas. A combination of drone data, GIS platform and AI helped measure the floor space and number of floors and calculate the property tax and review backlogs. In addition, the drone data provided valuable information on the condition of the roads, potholes, encroachments, levels, and sources of pollution. GIS maps have 100 layers that could be switched on and off based on needs and modular applications. Each ULB could be covered over a period of two weeks using multiple drones.

The ULB e-governance is based on an integrated core service platform. This creates a single point of entry to government services. It establishes a technological foundation for the digital transformation of G2C, G2B, G2G services, by enabling government agencies to streamline operations, deliver consistent service and modernise operations without interruption.

Governments can enable this by establishing innovation-friendly policies, procurement processes, and service delivery schemes. Incentives and subsidies should be created to encourage the private sector to participate in and share the burden.

Good practices for donors and development agencies

Donor and development agencies can work with government and regulatory authorities to find ways digital technologies can be used to improve administrative efficiencies and enhance data collection and integration while mitigating the risk of regulatory non-compliance. This includes:

- Support better sharing of best practices and case studies on how government and regulatory authorities are using digital technologies and AI for regulatory delivery, especially in developing and emerging economies.
- Commission evaluations and impact assessments on the use of new digital technology regulatory delivery models.
- Share state-of-the-art information on the policy and regulatory frameworks that foster innovation in information management and regulatory delivery.
- Support capacity building and improve the understanding of development partners around new technology and AI applications.
- Integrate the design and management of technology-based regulatory delivery models into business environment reform programmes.
- Support dialogue with the private sector to improve the relevance and applicability of new technologies and delivery models.
- Work with governments and regulators to support the interoperability of regulatory administration and delivery systems.
- Foster partnerships and exchanges between government, academia and regulatory authorities.



Acknowledgements

This Policy Brief was written by Simon White based on the technical [PRISM Institute and World Bank Group \(2020\) report](#).

The Business Environment Working Group (BEWG) serves as a platform to share information and knowledge on donor-supported business environment reform in developing countries and to identify and support good practices and new approaches in this field. For more publications by the BEWG, visit <https://www.enterprise-development.org/organisational-structure/working-groups/overview-of-the-business-environment-working-group>

Feedback is welcome and should be sent to the DCED at admin@Enterprise-Development.org

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