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RegTechs: Feedback from the First Experiments

Conference report

Conference organised by the Club of Regulators in cooperation with the OECD Network of Economic Regulators

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CLUB

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Conference of the Club of Regulators
27 November 2018

Digital technologies have great potential to reduce information asymmetries between operators, users and regulators. Moreover, the development of machine learning and artificial intelligence or blockchain technologies makes it possible to automatically enforce regulations and ensure compliance. Nevertheless, exploiting these opportunities and leveraging the true operational potential of RegTech first requires regulators to overcome a number of challenges and explore a range of possible designs and applications.

This conference is a forum for sharing and discussing feedback from the first experiments that have been carried out by regulators in different industries and comparing development perspectives across countries.

Keynote speech

Mounir Mahjoubi
French Secretary of State for Digital Affairs

Rather than being viewed as a tool for regulators, digital technologies are now understood as objects of regulation in their own right. They are creating opportunities to redefine the role of the regulator and give regulation a more central position in our economies.

In France, a national consultative process is underway to gain insight into attitudes to digital technologies and ensure that, when the government launches a new regulatory framework, it will accurately reflect the current reality of both the regulator and the regulated. Thus far, the feedback has shown that while some feel existing rules are sufficient, others feel the time is ripe to reinvent the entire system.

Specific attention is being paid to the regulation of violent online content. There is immense pressure for effective regulatory solutions to be found to this problem, which is easy to understand and elicits strong emotions. The EU is tackling it through a voluntary code of conduct rather than regulations while other countries are adopting different strategies: some are requiring companies to take responsibility for their content, others are regulating 100% of content or even refusing to regulate entirely. France wishes to find a middle ground that responds to legitimate public fears but is not overly restrictive. The aim is for the regulatory framework to foster innovation, encourage cooperation and sanction non-compliance.

Another important challenge is regulating the collection, interpretation and sharing of massive amounts of online data. The giant tech companies that collect this data have immense insight and resources at their disposal and, at times, appear to have a better understanding of the regulatory mission than the regulators do. Regulation must enable these companies to do business effectively and should not seek to hobble them; equally, regulators must ensure that they are not outpaced and outperformed by them. Integrating large, powerful players and smaller start-ups into the regulatory framework is vital. In 2019, important steps will be taken in Europe and across the OECD to develop a shared agenda on digital regulation.

1st roundtable : RegTech, opportunities and challenges

RegTech in the financial sector

Patrick Armstrong
Senior Risk Analysis Officer - Innovation and Products Team, European Securities and Markets Authority (ESMA)

Supply- and demand-based developments are combining to transform the way in which financial institutions comply with regulations and supervisory authorities oversee market participants. The use of technology to supervise and monitor compliance predates the 2007 financial crisis, but changes in the post-crisis regulatory landscape have driven a greater use of technology – notably cloud, APIs and artificial intelligence (AI) / machine learning (ML) – and could radically change compliance and supervision.

On the demand side, market participants have faced increasingly weighty regulatory requirements in the last decade due to market failures and the increasingly complex nature of global financial services. Spending on risk management and compliance has increased as the penalties for non-compliance have intensified. There has been a continued push for efficiency and cost savings, particularly for legacy and back-end systems and labour-intensive processes, and financial services have become increasingly data and tech driven, which in turn requires technology-driven compliance monitoring. Although the volume of information needed to evaluate regulatory compliance is a challenge for enterprise data governance, it is also an opportunity to enhance risk management. In addition, governments have obliged companies to implement technologies such as APIs and effective authentication methods. At ESMA, the shift towards a data-driven, proactive approach to supervision is expected to enhance monitoring in the financial sector and improve outcomes for market participants and customers. If regulators and supervisors fail to adapt, there is a risk that the regulatory framework will be undermined.

On the supply side, significant falls in the cost of data storage and communication coupled with dramatic increases in capacity have encouraged companies to invest in data-intensive AI and ML tools that could not be deployed in a non-digital infrastructure. Improved data architecture that reduces redundancy, facilitates interoperability and improves communication, together with advances in AI and big data, further expand the potential for monitoring and managing compliance and identifying misconduct.

Regulatory pressure and budget limitations are driving organisations to replace front- and back-office staff with automated software that can be used to identify patterns in large, diverse volumes of data in tasks such as credit scoring and capital optimisation. Regulators are increasingly harnessing the benefits of technology to identify risks, non-compliance and collusion, perform network analysis, conduct system-wide stress-testing and automate reporting. Technology also has the potential to reduce the regulatory burden on market participants, for example by making surveillance and supervision more effective.

To students of the financial innovation, the emergence of RegTech is a predictable response to the post-crisis regulatory agenda: regulatory actions by the public authorities are met by a private sector response designed to ameliorate the impact of the regulations. Rather than trying to sidestep requirements and risk provoking the authorities into further tightening the regulatory regime, participants may choose to become more efficient instead. RegTech supports this positive response by helping firms adapt to regulation in a cost-effective and efficient manner. To further improve the current scenario, regulators and market participants must improve data collection and management and transition towards digital platforms across the board. RegTech has the potential to alter the way in which financial institutions and regulators comply with the rules and supervise markets. In doing so, these technologies have the capacity to reshape the relationship between these parties and facilitate more efficient, transparent practices. As long as they are implemented and monitored correctly, RegTech tools have the potential to improve the ability of financial institutions to meet regulatory demands in a cost-efficient manner.

A broad view of RegTech across industries

J. Scott Marcus
Senior Fellow, Bruegel & Member of the Scientific Committee, Florence School of Regulation Comms and Media (EUI)

RegTech is used in different ways for different regulatory purposes, from the probes and crowd-sourcing used to measure compliance on network neutrality, to the automated techniques (such as big data and AI) that could be used to detect collusive pricing and online fraud or to identify inappropriate content.

Although AI and ML are potentially a practical way to tackle these complex issues, they also give rise to many challenges. For pricing collusion, AI and ML may be both part of the problem and of the solution – pricing algorithms may have a spontaneous tendency to collude, but AI and ML may also provide tools to help regulators to identify collusion, and to distinguish between permissible and impermissible price convergence. Algorithms could help to detect possibly inappropriate content, but humans should verify the tentative determinations made by the algorithms. Dealing with inappropriate content is delicate due to the need to protect freedom of expression, and to ensure reviewability and the right to appeal for any determinations that are made.

AI and ML can sometimes provide incorrect responses. In other instances, they might make legitimate but inappropriate inferences, which might lead for instance to refusing a mortgage on the basis of factors that correlate with ethnic, racial or geographical characteristics. As an example of an algorithm producing unexpected and inappropriate results, consider Microsoft's chatbot 'Tay', which was expected to learn through interactions with Twitter users. Within hours, Tay was tweeting highly offensive material and had to be taken permanently offline.

Regulatory decisions must be subject to review and appeal. For this to be possible for decisions reached by means of AI and ML, the facts and reasoning underpinning decisions be visible. This implies a need for carefully constructed audit trails.

Finally, surveillance for regulatory purposes can create risks concerning the protection of personal privacy.

In the field of Decision Support Systems (DSS), it is common to speak of three kinds of problems. Those that are fully structured, like warehouse inventory control, are amenable to fully automated solutions. Unstructured problems require human judgement. Semi-structured problems have aspects that lend themselves to the use of automated tools, but ultimately require human decision-making. At the current state of the art, most regulatory applications are likely to be in this third category.

In sum, tools such as AI, ML and big data have enormous promise for the regulatory community; however, many of the opportunities also carry risks that must be addressed, including threats to freedom of expression, threats to the protection of personal data, the risk of incorrect or inappropriate decisions, and the need to enable meaningful review and appeal.

Connected vehicles and transport infrastructure

Scott Matthews
Professor, Departments of Civil and Environmental Engineering & Engineering and Public Policy, Carnegie Mellon University

RegTech has the potential to deliver socially beneficial outcomes, especially in transportation. Transport regulation in the developed world often focuses on improving safety and reducing emissions, usually via periodic vehicle inspections to identify non-compliance. The resulting data can be used to perform both high-level analytics and more specific analyses to drive regulatory decision-making.

For example, by analysing historical tyre tread data from millions of vehicles, typical rates of deterioration can be identified. This information can be used to set smarter inspection thresholds that reduce the risk of people driving with bald tyres, a major cause of accidents, and predict which vehicles are likely to become unsafe either due to a lack of basic maintenance or because the tyres only just exceeded the threshold during the inspection. Rather than raising the tread threshold across the board, an algorithm can be used to set targets for individual vehicles based on historical driving cycles and deterioration rates.

In the US and Europe, 'check engine light' tests have started to replace exhaust pipe checks as a means of monitoring vehicle emissions compliance. The driver must visit a test site for this simple visual check, which is currently passed by 95% of cars around the world. In a world of connected vehicles, this information could be communicated remotely and analysed by an algorithm, potentially increasing the utility, frequency and accuracy of the data provided as well as reducing costs and inconvenience for drivers. As the Volkswagen scandal has shown, manufacturers cannot be trusted to act as honest brokers on emissions. Involvement of a third party or intermediary to collect and analyse emissions data would increase confidence in the process and could also leverage data in other ways, for example by replacing flat-rate fuel taxes with intelligent, mileage-based fees.

RegTech has many interesting potential applications in passenger and commercial transportation, many of which would be relatively straightforward from a technical point of view. The main challenges relate to the risk of trying to replace humans with algorithms, as well as the political fallout of mass redundancies. Proponents of RegTech should consider whether the aim is to reduce costs or to achieve socially beneficial outcomes. The continuous monitoring of behaviour also raises issues around privacy and personal choice.

Reflecting stakeholders' needs in the digital sector

Jean-Yves Ollier
Member, French Council of State & Coordinator of the Working Group on Regulatory Tools, French Estates General on the Regulation of Digital Economy

France is currently holding a wide-ranging discussions on digital regulation, bringing together working groups of institutional actors, regulators, members of parliament and other stakeholders with a view to delivering substantial reforms in the sector. The discussion covers the substance of economic regulation, labour issues, societal and ethical issues, and the impact of these three areas on the jurisdiction, tools and governance of regulators. Important issues include market power, market failures and risks of discrimination, as well as the possible need for new types of regulation, economic law, competition law and, especially, a new approach to data sharing.

Data sharing can be managed using a purely voluntary approach or through competition-based constraints and sector-specific regulations and authorities. The current view is that addressing these challenges will require both soft law and traditional instruments to ensure access to data and sanction non-compliance, as well as simple mechanisms to empower users, enable them to exercise their rights and protect whistle-blowers. Ideally, this approach should be coordinated at European or international level.

A legal framework to cover the collection and sharing of growing volumes of data by regulators – especially in France where a number of regulators are involved – must address the fact that sensitive and legally protected industrial and commercial data is also covered by privacy laws and regulations. The regulators' toolbox must be optimised by adapting relevant legal instruments and processes, particularly as regards emergency procedures and technical standards.

Regulators and public authorities must develop their capacity to analyse the typology, tools and practices of digital platforms and algorithms to deliver better policy decisions and regulations at national and EU level. This could take the form of a national observatory or think-tank that would feed in to the European observatory on the economy of digital platforms that was established in April 2018. Finally, there is a need to increase and pool the technical capacities and human resources of regulators in this area.

The promise and preconditions of RegTech

Andrea Renda
Member, EU High-Level Expert Group on Artificial Intelligence

Digital technology is an enabler of competition and collusion, of enforcement and infringement. Thus far, it has largely escaped our efforts to capture and control it. Delegating even more regulatory and compliance functions to external infrastructure is not necessarily secure and it is not sufficient unless we are also able to identify and implement effective national and international cyber-security solutions and build trust between the public and private sectors. Successfully leveraging digital technology as a means to re-design and modernise government is also highly dependent upon the successful integration of previous waves of change, such as the liberalisation of the 1970s and 1980s, and the ability to learn from these transitions.

RegTech already shows a lot of promise, including the regulation of algorithms to remove hate speech and copyright violations from the web, the replacement of network sharing and open access regulations with open APIs, and the introduction of PSD2 'open banking' regulations. Algorithmic regulation and enforcement is progressing, although using trust-based mechanisms to monitor private sector algorithms can easily return false positive results. Virtual sandboxes can be used to develop experimental regulation and virtual data spaces test technologies before they are scaled up for full market introduction. Trust-based systems and trustless systems coupled with cryptographic zero-knowledge tools make it possible to verify compliance in the data-analytic and AI spaces. Finally, efforts are being made to reduce administrative burdens through user-centric, 'zero contact' procedures.

Infrastructure is a key precondition of effective RegTech. A significant digital divide in deep mobile broadband connectivity exists between many EU countries and the EU has also experienced significant challenges with spectrum policy over time. This digital divide will be exacerbated if regulatory instruments are only deployed in areas with good infrastructure. There is a need for greater trust between stakeholders and there may be a need for ethical rules and minimum legal standards for AI, blockchain and other disruptive technologies. Compatible procedures and legal and technical interoperability are vital: technology is not a solution for administrative chaos. Open, federated regulatory standards and cross-border platforms can only be delivered with a shared understanding of legal standards and a common technical approach that enables the regulation of each layer and module within the broader architecture. Finally, governments require appropriate skills.

It is worth noting that an analysis of EU institutions shows that most fall far short of the provisions that are required for sound administrative procedures in relation to public bodies and citizens and are essential for the implementation of the Tallinn Declaration of 2017, which is intended to deliver user-centric, interoperable, almost zero-contact administrations. Procedures are heterogeneous, diverse and incomplete and bodies are reluctant to adopt a common set of standards. It will be extremely difficult to achieve full interoperability between these diverse bodies in real-life procedural scenarios.

The EU Parliament has asked the EU Commission to create an in-vehicle data-sharing system; this type of modular system requires a layered architecture and depends upon multiple different technologies, each of which presents different regulatory problems. Unless these components are inter-operable and secure, it will be difficult to implement a suitable regulatory framework and develop a system that is able to cope with the reality of driving conditions across Europe. Successful implementation will require experimentation, interoperability, security and trust in vehicle-to-infrastructure communications, standards for sensors and cameras, and automatic, constant data sharing to enable verification of compliance and the status of both the traffic and the market. Regulators can be sure to encounter plenty of fantastic new challenges in the future as they seek to manage these extremely complex situations.

Empowering regulators and consumers through RegTech tools

Gwendal Le Grand
Director of Technologies and Innovation, French Data Protection Authority (CNIL)

The introduction of the General Data Protection Regulation (GDPR) in 2018 strengthened the regulatory powers of national data protection authorities and enabled them to impose fines of up to 4% of a company's annual international turnover. Compliance and enforcement tools have been designed to explain GDPR requirements to companies and to collect and analyse data. GDPR adds a governance model at EU level to facilitate information sharing and communication between national data protection authorities.

Data protection authorities at EU level use the IMI system, to securely share information and complaints about regulated entities. Tools are also available at national level to help users and entities to exercise their rights and fulfil their obligations. For example, a new tool enables reporters to notify authorities of any breach involving personal data and self-assess the severity of the breach, which in turns helps regulators to focus their attention on the most serious cases. Complaints can also be filed electronically. The process begins with a series of checks to ensure that the CNIL is competent to handle the complaint and re-direct the user if appropriate.

The CNIL also works to help the general public understand the need for online regulation and legislation, for example by developing software that shows, in real time, how the user's internet activities are tracked and monitored via cookies. It also empowers users to exercise their rights, for example through another browser extension that helps people exercise their '*right to be forgotten*'.

General guidance for controllers and regulators is produced in collaboration with users to ensure that it effectively responds to real-life concerns and questions and is revised following a public consultation process. The CNIL has produced a compliance package that outlines the requirements and tools that will be required for connected vehicles. Similar packages for other sectors are also available.

To help users conduct the data protection impact assessments that are a GDPR obligation for certain types of data processing operations, the CNIL also developed free, open-source software that helps users through the information contained in the 150-page guidance document. The tool has been downloaded 130,000 times and translated into fourteen languages by the community of users. Other tools and software help the CNIL understand how its regulations are being implemented and supports the enforcement work it undertakes both on site and online. It strives to keep pace with innovations and maintain a level of technical expertise that enables it to effectively and intelligently regulate the ecosystem for which it has responsibility.

As digitalisation shifts the frontiers between regulators, it may be necessary for governments to develop a new type of regulatory agency. Data is already pooled but should the scope of agencies also be redefined?

Andrea Renda

The EU Commission's high level expert group on AI discussed the possible need for national ministers for AI or an AI agency. The issue is that AI, while pervasive, will raise data-related and algorithmic issues that are sector-specific. Increased interoperability and data exchange within an administration should go some way to resolving these issues without the need for centralisation. In my view, the real need is for a cyber-security agency with significant computing capacity at EU level and a large, regional 'nervous system' of antennas to cope with the challenges of cyber-security, the application of the subsidiarity principle at EU level, and future issues such as quantum computing and the need for automatic data collection to enable constant market monitoring and orchestrate reactions to emerging threats.

Gwendal Le Grand

The GDPR provides a legal basis for exchanging information and is a regulatory requirement. Any decision that targets data controllers or processors, and has a cross border impact, is made at EU level by the lead supervisory authority, in conjunction with competent national authorities. There is no basis in EU law to exchange detailed case information with regulatory organisations in other sectors. Nevertheless, there is a need to collect and analyse data within the frameworks provided by national laws and, I believe, room to improve the way this is done.

J. Scott Marcus

The sharing of personal data across government agencies raises concerns similar to those about data being shared among private third-party organisations without the consumer's explicit consent. There are opportunities to gain synergies but it needs to be done with enormous care to avoid accelerating the tendency towards a surveillance state.

What are your thoughts about the interaction between legitimacy and commercial confidentiality? The ability of individuals and companies to challenge decisions is central to the legitimacy of public bodies and regulators. Regulators and public bodies are increasingly relying on AI-based solutions to manage problems but they do not know how the algorithms are built or understand the processes that underpin their decisions. Should they acquire the skills and resources to build these solutions in-house? When commissioning tools, should

regulators be explicit that they must have access to the underlying algorithms?

Andrea Renda

The GDPR introduces the 'right to a meaningful explanation', although it is not clear what this means in practice. The private sector is working to develop visual explanations of the algorithmic decision-making process but this is unlikely to overcome the information asymmetry that has existed, for decades, between private companies and consumers, or make it possible to single out the key factors in each process. This is important as algorithms may be delivering discriminatory decisions that run contrary to the values of the EU by allowing biases to creep in at different phases. To help build trust and encourage uptake, algorithms should have checkpoints and standards built in at all phases as well as an end product that can be explained.

J. Scott Marcus

Any technology that is licensed from a third party must be consistent with and support rights of review and appeal. It will often be better to use tools that support human decision makers rather than tools that are designed to do everything independently and that provide little visibility about the path taken.

Jean-Yves Ollier

In the energy sector, algorithms are used to filter practices but the enquiry process is undertaken and documented by humans and is consistent with the right of appeal.

The OECD identifies confidentiality, privacy, requirements for physical monitoring inspections and data localisation laws as barriers that prevent data sharing across jurisdictions. Are there other regulatory and legislative barriers facing regulators wishing to use technology?

Andrea Renda

Even if regulators have the skills to perform specific checks, they often lack the necessary tools. Laws and regulations are also often written for an analogue world and testing is required to show if digital solutions are an acceptable alternative. The OECD could support this kind of experimental policy making. Data confidentiality techniques could enable regulators to monitor the market without an inflow of personally identifiable data, but this would be extremely complex and require specific agreements and funding.

Gwendal Le Grand

The French regulator has legally enforceable inspection powers and regulated companies are required to cooperate. Skills and tools are very important, particularly for a horizontal regulator like the CNIL that needs its inspectors to operate effectively across multiple sectors and diverse information systems. It is argued that the CNIL should have more powers to challenge the security of the information systems it is regulating.

Issues such as data sharing and privacy apply to the regulation of everyday activities but also to the allocation of scarce resources such as spectrum. However, these classes of activity pose very different challenges in practice and could be handled at different levels. What are your views?

J. Scott Marcus

The US Federal Communications Commission has discussed leasing spectrum on a more-or-less real-time basis rather than through longer-term contracts. This could be done within a regulated framework. It may be possible to take a political decision about the things that can be performed algorithmically and, thereafter, delegate those tasks to an algorithm on a real-time basis.

2nd roundtable : RegTech, experiments and implementation

Dematerialising regulatory information: the experience of ERSAR

Ana Barreto Albuquerque
Member of the Executive Board of the Water and Waste Services Regulation Authority (ERSAR)

ERSAR, the water and waste services regulation authority of Portugal, regulates more than 400 operators who supply drinking water and manage waste water and solid waste. There are more than 250 operators in each sector using several different management models, which generates a vast amount of data and creates complexity that is difficult to regulate. In response, ERSAR has created a centralised portal to gather and share regulatory information, simplify interactions, enhance decision-making, improve compliance with regulatory procedures, and improve the quality of ERSAR's service to the public.

The portal enables ERSAR to manage information flows from different models and about different subjects. The regulatory process for drinking water is based on an annual cycle, during which ERSAR ensures that water quality complies with national and EU legislation and regulations. The cycle is based on three stages – planning, implementation and reporting – and operators are responsible for reporting information to ERSAR at each stage in the process. Previously, huge amounts of paperwork and manual checking meant the process was slow and non-compliance was not systematically detected, meaning that water-related public health risks were not managed promptly and efficiently. Centralising this information in the portal has made it possible to monitor performance over multiple years and control the quality of water from its source to the tap. Analysis requirements and schedules are calculated automatically for each source, sampling compliance failures are reported to ERSAR within 24 hours, and compliance reports for each operator and supply zone are generated efficiently, enabling ERSAR to assess operators' performance and produce quality and compliance reports for the European Commission.

This system has delivered a number of benefits, including greater operational efficiency and more effective policy implementation and monitoring. The portal harmonises information, pre-validates data prior to submission, provides email notifications, facilitates management for operators and the regulator, simplifies the production and analysis of data, and enhances information portability to support reporting and field inspections. The effective implementation of European directives and regulations, clear policies, and effective use of technology has dramatically improved the quality of Portugal's drinking water: only 50% of the supply was safe in 1993 but this proportion had risen to almost 100% by 2107.

Facilitating innovation on the UK energy market

Andy Burgess
Senior Partner, British Office of Gas and Electricity Markets (Ofgem)

Despite regulators' best efforts, regulatory frameworks can act as obstacles rather than enablers. Ofgem has introduced two initiatives to make it easier for innovators to propose feedback, suggest changes and identify ways to bring new models and products to market.

As monopolies are unlikely to be innovative, regulators have a responsibility to try to replicate the effective of competition in terms of both efficiency and innovation. Ofgem's current phase of price controls is called RIIO: Revenue equals Incentives plus Innovation plus Outputs. An innovation stimulus pushes traditional monopolies to be more innovative in the way they manage and invest in infrastructure. Ofgem also applies totex, a total expenditure model that encourages operators to invest in smarter solutions by providing them with the same return regardless of where they invest, as long as they deliver predetermined outputs. The company retains half of any savings on the allocated budget they are able to achieve while the other half is returned to consumers. The price control period was extended to eight years to provide greater certainty and scope for innovation, but is now being returned to five years.

To further promote innovation, the RIIO mechanism also includes annual competitions in electricity and gas. Network and system operators and third parties submit practical, pilot-ready projects and the winners receive additional funding based on their project's potential benefit to consumers. Consumers receive a share in the value of any intellectual property that is generated through this scheme and any learning obtained through these pilots must be shared with other operators. Many of the ideas submitted through this process have resulted in network improvements and positive behavioural changes but no genuinely disruptive technologies. The next RIIO phase will encourage more third-party participation.

Innovation Link, an idea borrowed from the financial services regulator, is designed to help innovators quickly understand the regulatory implications of their project and get their idea to the market, without becoming bogged down in bureaucratic procedures. Thus far, 162 proposals been received support through this fast, frank feedback programme. A regulatory sandbox, which is designed to facilitate practical trials of ideas, has received 67 applications but was only able to provide seven trials due to a lack of resources. Many applications relate to local energy networks, such as local generation and storage, and peer-to-peer energy trading. This process is helpful for innovators but also offers Ofgem useful insights.

Blockchain programmes

Nadia Filali
Head of Blockchain Programs, Caisse des Dépôts & Co-founder, LaBChain Consortia

LaBChain, which was launched three years ago with three partners, is now a consortium with 34 partners from banking, insurance, start-ups, charities and research. It was set up to improve understanding of blockchain technologies, their commercial potential and their regulatory implications. The size of the consortium can create challenges but the input from experts from different fields is extremely useful. LaBChain has three streams: an academy that develops models for the banking sector; a think-tank that reflects on blockchain's potential; and a commission on cryptoactivity which is working with the IMF, the French Treasury and others. A research lab conducts practical experiments into potential applications.

The main advantage of blockchain is its ability to enhance transparency while maintaining data privacy. Blockchain-based infrastructure can support very simple regulatory reporting across networks and institutions and provide the regulator with read-only access to specific data without a risk of competitive disclosure. The SFTR project aims to enhance transparency and facilitate a shared governance model. It harnesses the strength of distributed ledger technologies and, following the adoption of security financing transaction regulations, is being tested with French banks and start-ups and has been presented to the IMF and ESMA. Although the system is deliberately designed to be decentralised and innovative, the fact that it is not a traditional model with a central contact is being identified as a challenge by those bodies. There is also the potential to use blockchain to introduce liquidity into small financing markets, for example through the crowd-funding of mini-bonds, and 'green' finance through the certification of green bonds.

LaBChain is also working on 'public chain', which seeks to bring together state entities and local authorities to educate them on blockchain, conduct joint experiments, and drive e-government projects. Although some subjects lend themselves to technology, such as the transparency of supply chains and payments, governance remains a challenge at every turn.

Andrea Renda

Do you only work with permissioned blockchains? Are any of your tests permissionless?

Nadia Filali

Our IT architecture and innovation team is agnostic about technology and works with public and permissioned blockchains. At present, we have the choice of Bitcoin and Ethereum. We will need to develop public blockchain infrastructure to support the EU Commission's plan to build cross-border infrastructure.

Regulating digital technologies in Mexico

Adolfo Cuevas Teja
Commissioner, Mexican Federal Telecommunications Institute (IFT)

New technologies can deliver great benefits but they also generate risks. Mexico is analysing their effects on markets and the social arena but is choosing to apply light touch regulation, self-regulation and zero regulation models that encourage further development of these technologies while reflecting the need to protect minors, freedom of speech, consumer rights and personal privacy. Mexico is similar to the EU in its desire to protect the public interest but emulates the US in its desire to encourage innovation and the penetration of new technologies to promote growth in the digital economy.

There is no national policy in this area so institutions and regulators cooperate on cross-sectoral problems while independently managing issues inherent to their sector. New institutions are being developed to manage these new realities. For example, a new law on the regulation of online financial services recognises virtual assets and opens the way to Bitcoin and other cryptocurrencies. An official technical rule has also established the standards that apply in transactions and databases based on blockchain technologies with a view to protecting the public interest and citizens' rights. Blockchain is already being used by public and private institutions in Mexico, particularly in the banking sector which is hoping to use blockchain to cut the time required to make financial transactions by 90%.

This new digital reality has no borders and effective regulation will require international cooperation and agreements. The recently signed US-Mexico-Canada Agreement (USMCA) contains provisions that limit the ability of national authorities to regulate OTTs. Mexico's aim is to encourage the development and use of new technologies while limiting our regulatory activity to specific challenges.

The Australian RegTech experience

Leif Hanlen
Data and RegTech specialist, Digital Legislation Initiative - Synergy Group

The fundamental problem faced by Australian regulators is that of complexity. Forty-seven percent of the population has an average reading age of less than nine years old, meaning that the population is not empowered to read the laws, far less to understand or use them. Most poor behaviour by small to medium organisations is due to a lack of knowledge and understanding of the rules and regulations.

To overcome this challenge, regulators are trying to use digital legislation to make it easy, or even trivial, to achieve compliance. The goal is to enable people to be compliant by default so resources can be used to pursue the minority who are deliberately non-compliant. As a result of this drive and various governmental policy decisions, Australia has developed a large RegTech sector. However, effective RegTech is conditional upon effective policy and regulators, and Australia has 1,369 independent regulators in addition to layers of state and local council regulators. In addition, technology cannot overcome poorly thought-out systems and processes or compensate if the regulator is asking the wrong questions or applying antiquated rules. Australia needs to reduce the number of regulators it has and refresh its approach.

In the Australian experience, industry-led solutions designed to solve a business problem have been more successful than solutions developed by vendors seeking to sell a product. The distinction is powerful, because co-design models that involved regulators from the outset add value by increasing trust and assurance in the legislation and technology. Agency-led solutions tend to be driven by a policy-maker seeking to achieve an outcome and generally have the same shelf-life as the policymaker.

Australian employment law is extremely complex and lengthy, legally enforceable contracts are required for even basic, short-term work. The legislation was unreadable and employers often failed to comply despite their best efforts. By working with industry and partners, a co-designed code base that interprets the law and enables companies to test their compliance against their payroll software was developed. This turned audit sampling on its head and enabled the regulators to verify compliance for every single employee and empowered honest employers to rapidly identify and resolve any issues.

While data remains important, the analogue advice that accompanies and underpins it is equally vital when it comes to empowering the population to be compliant by default.

Two case studies from Italy: 'fake news' and broadband mapping

Antonio Nicita and Antonio Manganelli
Commissioner & Board Economic Advisor, Italian Telecoms and Media Regulatory Authority (AGCOM)

RegTech can support the regulators' normal activity by enabling better data collection, enhancing their activity through self-learning algorithms and providing predictive functions to support changes to regulations.

Our agency uses a RegTech approach in a number of areas. For example, since 2013, Italy has used an effective, blockchain-based approach to tackle online copyright enforcement but this must be monitored to ensure automated, self-executed enforcement does not occur. The provision of maintenance and broadband lines for new entrants on incumbent operator networks is monitored using algorithms that deliver prompt alerts and feedback about the reality of provision and network activities. There are plans to manage spectrum frequencies and licensing by introducing a data set and algorithms to understand in real time who is using the spectrum, who has priority and establish relative prices and rights. Furthermore, television outputs can be monitored on a word-by-word basis to support fair representation and parity of airtime, particularly during elections. Real-time data on number portability can used to enable the regulator to identify whether strategies are being deployed that inhibit fair competition.

Two main applications of RegTech tools have been developed. In the field of online pluralism, an algorithm structure has been used to measure the production and consumption of fake news. The initial goal was to understand the fake news phenomenon and its relevance in Italy with a view to informing policy and legislation. From April 2016 until August 2018, over 35 million documents from almost 2,000 sources were reviewed and analysed by two supervised, self-learning, automated algorithms that assessed the frequency and context of the input. At this stage, the aim was not to investigate the origin and content of fake news but simply to understand the relationship between real and fake news, as described by highly reputable fact-checkers, and the way in which it was diffused online. Levels of disinformation grew throughout the study period but the quantity exploded in the months before and after elections. Moreover, fake news life-cycle is quite different from real news. The study also highlighted the existence of self-enforcing echo-chambers and the polarisation between readers of scientific content and readers of conspiracy theories.

Italy also constructed BBmap, a public broadband mapping database that uses algorithms and predictive modelling to provide consumers with highly granular information about the fixed and mobile connections that are available at a given address. All operators provided information about the quality and type of service they supplied to the market on fixed and mobile markets. The resulting map shows how fragmented and variable the quality of service is, even from one side of a street to another, and has enabled the regulator to analyse the levels of investment required to provide more homogeneous coverage and assess whether operators are delivering on service quality promises. Dynamic dashboards show Italy's fixed and mobile networks in terms of connectivity, price and speed, as well as population coverage, average income, and so on. This is important as the database is used for regulation and public policy purposes, for example a geographically-differentiated approach to electronic communications regulation, or to understand the impact of connectivity on social and economic issues.

New technologies in the transport sector

Anne Yvrande-Billon
Vice-President, French Rail and Road Regulatory (ARAFER) & President, Club of Regulators

European passenger transport is undergoing a profound digital transformation that is introducing new business models, transport modes, service offerings and uses of existing modes of transport, as well as new comparative tools for journey planning and pricing and interoperable ticketing systems. Digitalisation has also made it possible for providers to analyse and target demand with tailored offerings that put pressure on less agile mass-transport providers such as monopolistic rail providers.

New technologies also increase the ability of regulators to collect, process and stock data about network capacity and usage. This is true of the upstream market – the heavy infrastructure end of the process where regulators traditionally focus – as well as downstream consumer markets. These data provide regulators with an opportunity to open the black box of monopolies and provide more efficient information to users and policymakers. It is important to note that regulators require the legal power to collect data but also, more importantly, to sanction non-cooperative behaviour.

ARAFER has conducted data collection campaigns and field surveys in a number of sectors and publishes the data on its website. The data have been used to update various regulatory hypotheses that underpin its work. For example, induction rates have been updated on the basis of more accurate information about passenger numbers and the pricing of track access charges in the freight sector now reflects the weight transported per kilometre rather than the distance only. The data has also been leveraged to deliver sunshine regulation and yardstick competition in monopolistic sectors. A hackathon will be held in spring 2019 with a view to developing tools that support upstream regulation and assist end users.

European regulations on multi-modality and open data in transport and a draft French act on mobility are both intended to facilitate multi-modal journeys and help people transition away from cars. By end 2021, all mobility data should be available for all transport modes, including regular and on-demand modes, so end-users can easily understand the opportunities for seamless door-to-door journeys and seamless ticketing. The regulator will be responsible for controlling the compliance of the data produced by public and private service providers and monitoring the neutrality of public-facing algorithms. In the future, transport regulators will shift from the regulation of tangible infrastructure and assets to the regulation of transport data, an intangible asset.

Will the fake news platform you have built be shared as an open-source resource? Is it time-limited?

Antonio Nicita

All of the data that we publish are openly available. Universities and researchers will be able to use the platform but as it is primarily a machine-learning process, there is no single data set that can be shared. The data from the sample will be made available.

Can network operators form part of a third-party entity? In Italy, there is discussion around whether storage units should be classed as a type of generation plant or a proxy for new capacity. Currently, the transmission system operator organises a tender for the acquisition of the services and the storage unit is kept entirely separate from the rest of the grid under a long-term contract. Is a similar approach taken in the UK?

Andy Burgess

In theory, a network company can form a consortium with a third party as long as they do not cross the dividing line that should exist between the monopoly and the market. The consortium could propose a solution that falls outside the usual regulated space but not one that relates to something like storage. The regulator requires companies to consider flexibility, such as storage, as an alternative to infrastructure investment and does not allow them to own or operate storage to avoid conflicts of interest. Grey areas about where a monopoly stops and the market starts are considered on a case-by-case basis. We would allow companies to partner with third-parties to develop solutions but long-term ownership would only be acceptable if the regulator was convinced that it would not lead to an anti-competitive effect.

The broadband maps are very interesting and effectively empower consumers. How do you incentivise operators to provide enough information to create a complete map while also managing issues around privacy and the security of network infrastructure? Do the maps cover fixed and mobile infrastructure?

Antonio Nicita

The operators are required to give us the information. We are working to obtain the right to publish specific information about their offer. The map covers all fixed and mobile

technologies. Certain technologies are highlighted for transparency and because they form part of the regulated offer.

One issue with evidence-based regulation is the quality of data that is available about the quality of service. Are operators the right people to provide this information? They have an incentive to manipulate it or even withhold it. New technologies mean chips can be used to monitor the quality of service on fibre and could be used for electricity and transport. How do regulators manage to access and validate this information?

Antonio Nicita

In Italy, operators report speed and capacity data but the regulator also conducts random tests. It would be easier if the regulator could collect that data automatically. The real challenge is net neutrality. Since this measure is relative rather than absolute, it is extremely complicated to measure it effectively.

Adolfo Cuevas Teja

In Mexico, mobile operators are required to provide maps with guaranteed coverage for 2G, 3G and 4G voice, SMS and data services. The regulator performs random tests and sanctions non-compliance. Data is also measured randomly and the results are published to ensure consumers have access to accurate information.

Why does ARAFER consider it more important to have information for monopolistic providers? As the automotive industry has shown, it is very easy for companies to manipulate the information they provide.

Anne Yvrande-Billon

Assessing the credibility and quality of data is easier when there is a point of comparison. Some regions are trying to develop applications that would enable trained users to submit accurate punctuality data via flash code. This kind of system would provide a complete and exhaustive dataset and could also be used to weight punctuality data by the number of passengers affected. Even in monopolistic situations, benchmarks can be used and the infrastructure manager's reports can be compared to those of the operators.

Is there a risk of self-selection bias when consumer measurements are used for quality of service? Might the consumers who choose to participate be those who are the quickest to complain?

Anne Yvrande-Billon

Yes, there is a bias: the people who answer surveys are usually those who wish to complain. Crowd-sourced data is weighted and complemented by real-time data from the network. Although there is a risk of bias, crowd-sourced data is a novel and potentially interesting source of information in transport.

Adolfo Cuevas Teja

We conduct an independent consumer survey but it is viewed as an indicator rather than a dataset. The idea is to obtain an overall sense of how consumers perceive services. Customer satisfaction is related to a broad range of factors that go far beyond the performance of the network or the quality of service. We never use it for sanctions but simply to get a sense of how customer satisfaction is evolving over time.

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