

A working model for anticipatory regulation

A working paper

Harry Armstrong and Jen Rae

November 2017

Executive summary

Emerging technology is creating huge opportunities, but present a challenge to existing regulatory systems. In response we are seeing the rise of 'anticipatory regulation' approaches - with methods such as sandboxes, demonstrators, testbeds proliferating across the world.

Our working model suggests three different modes of regulation are appearing - advisory, adaptive and anticipatory. These three modes vary in their goal, approach and who they involve but all demonstrate a more proactive, engaged role for regulators in the innovation process.

For anticipatory approaches, the most future-facing and proactive of all three modes, regulators will need to work closely with others to achieve their goals. They will also need to build new capacities in areas such as horizon scanning and foresight. These new ways of working may require new regulatory institutions that are able to facilitate the need for greater collective action around regulation.

We are suggesting a more active approach to improving regulation in the UK. The Government should incentivise and support UK regulators to test, experiment and adopt new methods for regulating emerging technologies, for example, by setting up an Innovation fund.

Introduction

Emerging, fast changing technologies and new innovative business models are not only disrupting industries and established ways of working, they are also presenting substantial challenges to existing regulatory systems. The cross cutting impact of digital innovation and data have removed old sector boundaries and created new challenges for fields that do not know how to respond. The current regulatory systems originally emerged in the 1970s and 80s as 'deregulation' existing regulations were seen as harmful to businesses and innovation.¹ Little has really changed since in the way regulators operate despite a dramatic shift in the world they need to regulate. Digital technology and data in particular have removed old boundaries, directly challenging these old practices..

In response we are beginning to see the emergence of proactive, future-facing and innovation-enabling approaches to regulation around the world, such as Financial Conduct Authority's (FCA) sandbox or the development of various testbeds for autonomous vehicles. We are beginning to see a radical change in both the theory and practice of regulation with the emergence of a new field- 'Anticipatory Regulation'.

In general, regulation has struggled to be more future-facing, largely unequipped to cope with more fluid, fast moving technological development, preferring to let markets decide the direction of travel and intervening later as issues begin to surface.

Anticipatory regulation helps reframe regulation as a supportive tool for the responsible development and use of new technologies and business models. New and existing methods are helping regulators do this in three important ways:

- Firstly, regulators/regulation can better support innovation as it emerges.
- Secondly, regulators/regulation can drive innovation directly.
- Lastly, regulators/regulation can respond faster or act preemptively to prevent public harm.

There is a chance to position a post-Brexit UK as a country with a world-leading environment to develop new technologies, by putting in place a regulatory system that anticipates the opportunities and drawbacks of innovation, allowing companies to safely test their products and services, and ultimately attracting new industries to invest in the UK. Through recent investment and policy support, the UK is already trying to position itself at the forefront of innovations in areas like AI,² but without the right regulatory systems in place it will lose out.

As technologies create new products and services, and disrupt existing competitive advantage in the global market, creating a dynamic and flexible regulatory environment could secure the industries that will drive growth and create jobs.

However, as Keith Sequeira of the European Commission has commented, there is a 'lack of theory and collective, cross-industry knowledge on new legislative techniques and processes currently being experimented in certain industries that could also be applicable to others'. This shift towards anticipatory regulation also presents issues. We need to revisit what stability means in light of new technology (and new approaches to regulation), moving away from the rigidity and stability we have relied on in the past. This paper is an attempt to provide greater clarity to this emerging area by developing both the theory and practical implications of anticipatory regulation.

This working paper builds on previous work by Geoff Mulgan, which defined ten elements of an emerging regulatory tool kit,³ to describe a working model of anticipatory approaches to regulation and the challenges this presents to current models. This work is based on case study research from examples across the world, interviews and workshops with regulators and other important stakeholders. It sets out our thoughts on a spectrum of anticipatory approaches to regulation, and the ways regulators and relevant stakeholders could reshape the current system.

This working model and discussion paper has two main aims, to provide a framework for describing the different levels of future-facing regulation and to surface some of the methods, implications and challenges of moving towards an anticipatory approach to regulation.

Working Conceptual Framework

Understanding anticipatory regulation

There are a number of elements that distinguish anticipatory approaches from other more reactive forms of regulation, namely they are proactive, forward-facing, flexible, iterative and more inclusive. A central goal of these emerging anticipatory methods has been to enable and support innovation around new technologies or business models in a 'responsible' way.

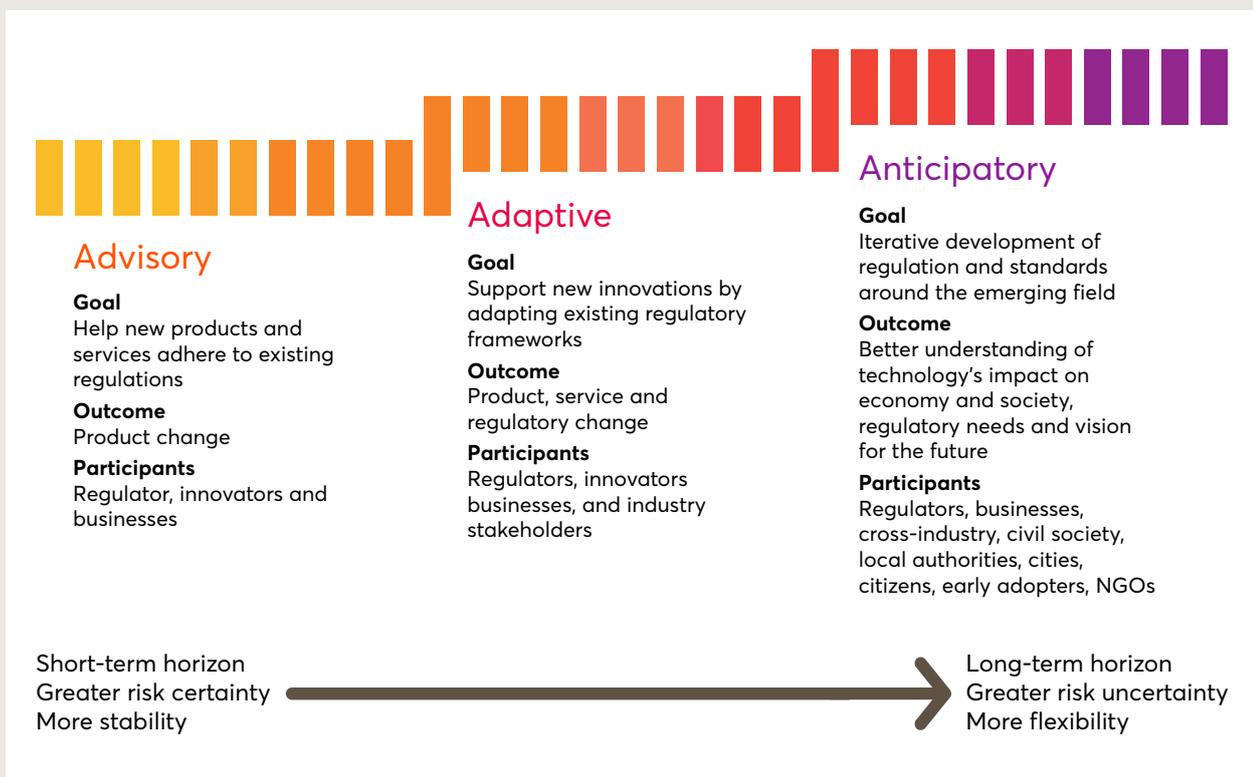
However, while many of these new methods have these goals and attributes in common, in practice they are often trying to achieve very different things and vary in how forward-facing, flexible and inclusive they are. Even projects badged under the same definition are in fact very different in nature. To better understand and build a fuller picture of the anticipatory regulation landscape we characterised these differences. Although there is a lack of consistent language in the use of terms such as sandboxes, testbed, demonstrators and pilots, through looking at examples of these from across the world and talking to regulators, we have identified important distinctions in three areas:

- **Policy goal:** This varies from projects trying to create more effective regulation enforcement, to creating more flexible regulatory environment, and even new, future regulatory frameworks.
- **Desired outcome:** Allowing businesses to bring a product to market more quickly under existing regulatory conditions or by testing out adaptations to existing regulation, through to obtaining a nuanced understanding of a technology's impact to develop an iterative, flexible regulatory system.
- **Level and reach of inclusion:** The stakeholders involved vary considerably between projects; some have a wide reach engaging or working directly with businesses, technology companies, experts, other sectors and even the public.

By focusing on these three variables, a framework emerges that allows us to classify anticipatory regulation into three types of approach - **Advisory**, **Adaptive** and **Anticipatory**.

The working model below describes each of these approaches in turn, their goals, outcomes and attributes. While we describe these three approaches separately they should not be viewed as completely different ways of working. Each mode from Advisory to Anticipatory builds on each other and there are many examples of projects that sit between these approaches or only illustrate one element of what we have described. These different modes of regulation work in sequence and could follow the development of an emerging technology. We plan to continue adapting the model through further research and open conversations. One area currently missing is the extent to which these different approaches can make use of new technologies to regulate in smarter ways.

Figure 1. The AAA model of anticipatory regulation



Advisory approaches

Goal	To help new products and services adhere to existing regulation
Outcome	A change to the product or service
Participants	Regulators, innovators (could be established businesses but more likely to be SMEs or Startups)

Advisory approaches are designed to make it easier for businesses with new products or services to approach regulators and work with them to test and then adapt the product or service under existing regulations. Innovators benefit from temporary relaxations in the full regulatory regime to test the potential impacts of their products or services. The regulator is able to play a more proactive, engaged role in the development and testing of new innovations in that sector. Importantly, they get to see what potential disruptions are on the horizon and how they fit under existing regulations. The goal here is to reduce regulatory frictions and to attract new business by conducting no or very limited amendments to the pre-existing regulation.

Many financial sandboxes fit into this category. For example the Dubai Financial Services Authority's Innovation Testing License will allow qualifying companies to develop and test concepts in a restricted regulated environment- *"We are not proposing to introduce new rules, but rather we set out in Guidance how we can make use of the flexibility inherent in our regime to facilitate the testing of innovative business models."*⁴

Open data initiatives are another form of advisory approach. Open data repositories can help spur open innovation in a way that solves key challenges and engages unusual actors. Both the Open Up Challenge⁵ and Open Data Challenge⁶ have shown the value of these approaches. Some regulators are already making use of open data to support innovation such as Ofcom. While this approach doesn't necessitate a change in regulation it may surface issues that warrant future changes.

Adaptive approaches

Goal	Flexible regulation, support the development of new innovations by adapting existing regulatory frameworks
Outcome	Product, service and regulatory change
Participants	Regulators, policymakers, established businesses, new market entrances and other important industry stakeholders

Adaptive approaches are employed when a regulator wants to help facilitate the development of a new products or services but existing regulatory frameworks may have to be adapted to do so. In this case the objective is to first better understand the value of these new products or services by testing them in a restricted environment, then work to adapt both the innovation and/or existing regulations to bring the product or service to market. As with advisory approaches, participants are given regular advice and granted temporary regulatory relaxations. Unlike the advisory approach, if necessary regulatory barriers are identified, then permanent changes to the existing regulations can be explored - generally on a case-by-case basis.

As the changes may have wider impacts on a particular sector or industry, the process of amending regulations has to be done through wider consultation and engagement with the important industry stakeholders. The key point here is that the regulator is willing to allow some changes to existing regulations to support emerging fields. There are potential limitations to this approach if the regulatory barriers are extensive and complicated to adapt. One of the key blockers to this is the flexibility of existing legislation as regulation is rooted into legislation.

Again, a number of the financial sandboxes fit into this category - the FCA's project Innovate is one of the most well known. The FCA regulatory sandbox has sought to "reduce some of the existing regulatory barriers" but also to "consider changes to the legislation" and "work with industry".⁷ Working closely with the FCA has given businesses the ability to develop their ideas and business models with consumers in mind and in a way that mitigates potential risks through the use of appropriate safeguards to prevent harm.⁸

Anticipatory approaches

Goal	Iterative development of regulation and standards around the emerging field
Outcome	Better understanding of a technology's impact on economy and society, regulatory needs and vision for the future
Participants	Regulators, policymakers, businesses, cross-industry, civil society, local authorities, cities, citizens and citizen groups, early adopters, NGOs

The primary goal of anticipatory approaches is to better understand what the impacts of an emerging technology (which may not be developed enough for use) might be on the economy and society, and therefore what the potential regulatory needs will be. It is more forward-facing than either advisory or adaptive approaches, meaning regulators have to deal with more uncertainty, less evidence and a greater number of possible risks. Here the regulator is not only playing a more active role in supporting innovation but also in building an information and evidence base via direct research activities.

Identifying future potential threats, risks, emerging issues and opportunities around an emerging technology or sector is an important part of this research. A few regulators already regularly perform these horizon scanning functions, such as the Food Standards Agency⁹ and Human Fertilisation and Embryology Authority.¹⁰

Wider inclusion and engagement is the second important element of these anticipatory approaches. This includes a wide variety of stakeholders, many of which are directly involved in the research and evidence building activities. Autonomous vehicle (AV) testbeds involve the coordinated actions of regulators, local authorities (often cities and regional governments), research institutions and technology companies. For example Singapore's Autonomous Vehicle Initiative created a cross-industry committee with public and private sector members to oversee integration of AVs after the Land Transport Authority gave greater flexibility around transport laws to test AVs on public roads. A collaborative research centre was also created to test and improve AV technology in both a live and laboratory environment.

The public also have a key part to play given the societal and ethical implications of many of these technologies. A lack of public acceptance will be a significant barrier to the future use of these emerging technologies. Most engagement around regulation remains fairly narrow and generally only involves specific stakeholders. In particular where there is wider engagement with customers or the public falls short of opening up a two-way dialogue.¹¹ Outside of the regulatory field there are more examples of successful citizen engagement. For example in 2015 online tools for collaborative approaches to governance were used to engage over 21,000 participants in the development of France's Digital Republic Bill.¹²

The last element of anticipatory approaches is the development of a strategic future vision, an understanding of where we want to be in 10-20 years (both in terms of the development of a technology but also at a societal level). This pulls together both the research activities and the wider engagement activities. The role of the wider public is vital as values have to be a core part of this vision- What risks are we comfortable with? What risks need to be managed? Anticipatory regulation requires a more flexible and agile approach to setting rules or standards. This can cause issues as incumbents, businesses, industry and even the public may rely on regulatory stability to function effectively. Building a collective vision around the future can mitigate many of the issues as it helps set a clear direction of travel for everyone to follow.

Regulations are less likely to be created at this stage with other activities such as self-certified standards or guidelines playing a greater role. Others have already begun to map out this interplay between standards, guidelines and regulations and how they fit into different stages of the regulatory process (for example the Framework for proportionate and adaptive governance of innovative technologies).¹³

Developing new forms of regulators, institutions and capability

Integrating all of these functions will require regulators to work in a radically different way. In particular it will require a closer, more dynamic relationship with many different stakeholders and a shift towards a more explicit and open dialogue with innovators, entrepreneurs and even the general public.

It will also require regulators to invest in different types of expertise, skills and capabilities to develop a vision, shape the direction of travel and deliver this iterative approach.

A key problem with many emerging technologies, particularly digital systems, is their ability to have broad cross sectoral impacts. Existing regulatory systems are more focused on bounded sectoral impacts creating a difficult tension. There is currently a lack of coordination and coherence between regulators to deal with these emerging issues. Collaboration through knowledge sharing seems to be key. But there are questions around how to make this happen and where incentives might be needed to encourage greater collaboration. Projects like Adelaide 5000+ have used these collective strategic plans to do just this, stimulate innovation towards the larger goals while successfully bringing together people involved in design and planning, local and State Government, business, industry and the community.¹⁴

One of the key questions forming from our research is whether delivering anticipatory regulation will need a new type of institution. Several suggestions have been made for smaller tweaks to the regulatory field including new cross sector organising bodies to be set up, but it is questionable whether this would solve the issue or only increase the current complexity. There is scope for using the data that regulators already have more experimentally to share intelligence across sectors.

A key element of anticipatory regulation is the need for coordinated collective action. Rather than thinking of individual institutions that function in one defined way, we should be moving towards a flexible system where regulators work together and in partnership with policymakers, research institutions, civil society and the public to understand what kind of world we want to create and use regulation to help get us there.

Conclusion

Here we have presented a working model with three emerging approaches to anticipatory regulation. These three modes vary in their goal, approach and who they involve but all demonstrate a more proactive, engaged role for regulators in the innovation process. While there are many examples of these approaches being developed and used across the world, there is little evidence that any regulators are currently working across these different modes. Even at the level of specific methods many regulators are yet to adopt or test out these new approaches, let alone develop new methods.

To ensure we make most of the opportunities anticipatory regulation offers we suggest the UK Government should play a more active role in incentivising and supporting innovation in this area. This could be done through the creation of toolkits or other supportive materials to help regulators try existing methods in new areas, better forums to bring regulators together to share best practice or an innovation fund. An innovation fund in particular would help support UK regulators to test, experiment and adopt new methods for regulating emerging technologies.

Acknowledgements

With thanks to the regulators and relevant stakeholders who offered their experience and expertise, particularly at our September workshop, where their suggestions shaped this model. **Charlotte Goujon** and **Jack Pillkington**, interns at Nesta, who did much of the background research for this paper. Nesta staff for their input.

Endnotes

1. OECD (2010) 'Regulatory Policy and the Road to Sustainable Growth.'
2. <https://www.gov.uk/government/news/industry-led-review-details-plans-to-supercharge-uk-artificial-intelligence-ai-industry>
3. Mulgan, G. (2017) 'Anticipatory Regulation: 10 ways governments can better keep up with fast-changing industries.' Blog, Nesta.
4. [https://www.dfsa.ae/MediaRelease/News/NOTICE-OF-CONSULTATION-PAPER-RELEASE-\(3\)](https://www.dfsa.ae/MediaRelease/News/NOTICE-OF-CONSULTATION-PAPER-RELEASE-(3))
5. <https://www.nesta.org.uk/project/open-challenge>
6. <https://www.nesta.org.uk/open-data-challenge-series>
7. <https://www.fca.org.uk/firms/regulatory-sandbox>
8. FCA (2017) 'Regulatory sandbox lessons learned report.' London: FCA.
9. <https://www.food.gov.uk/sites/default/files/fsa170606.pdf>
10. <http://hfeaarchive.uksouth.cloudapp.azure.com/www.hfea.gov.uk/Horizon-Scanning-Panel.html>
11. Bussu, S. (2015) The public's voice on regulation. London: Sciencewise.
12. Simon, J., Bass, T., Boelman, V. and Mulgan, G. (2017) 'Digital Democracy: The Tools Transforming Political Engagement.' London: Nesta.
13. Tait, J. and Banda, G. (2017) 'Proportionate and adaptive governance of innovative technologies: The role of regulations, guidelines and standards.' BSI, BIES and Innogen.
14. http://saplan.org.au/our_plan/our_actions/designing-the-city-we-all-want



nesta

58 Victoria Embankment
London EC4Y 0DS

+44 (0)20 7438 2500

information@nesta.org.uk

 @nesta_uk

 www.facebook.com/nesta.uk

www.nesta.org.uk

