HOW TO REGULATE THE FUTURE OF TECHNOLOGY CHALLENGES AND PRINCIPLES

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ABSTRACT

The intention of this paper is to reflect on the future of regulation in order to face the great challenges that new technologies are poposing, especially for regulators. The current regulatory system is forced to make enormous efforts to keep up with technological changes. For this reason, we want to think about whether the current model of slow and deliberate regulation is fully valid, or on the contrary whether we should aim for a more agile form of regulation to reach a balance between allowing innovation and the development of technology, while never forgetting the defence of the rights of the consumers or users of these technologies. The European Union has proposed developing a harmonized legal framework that provides legal security to all citizens of the union as a fundamental piece of this "new regulation" and in turn allowing European companies to compete internationally, and not just in the European context.

1. INTRODUCTION

When we look back and observe the drastic changes that have occurred in such a short time, we are aware that we are leaving one world behind. An "analogue" world that is falling increasingly into oblivion with each day in order to make way for a new world, a "digital world" that is being forged at great speed in front of us. We are going through a no-return frontier in which the weight and influence of technology in our lives is increasing. This change opens before us new horizons; horizons that seem distant, but that arrive quickly thanks to the speed with which we are advancing.

This rapid advance into the future forces us to be more "Darwinian" and adapt to change quickly and effectively. Society is advancing faster than we ourselves can assimilate: blockchain, the Internet of Things (IoT), artificial intelligence, smart contracts or the sharing economy, to mention a few, are concepts that have been appearing in our day to day life; concepts that have come to stay, changing forever the world as we know it. Technological change has come to transform everything, to revolutionise our lives from top to bottom, the way we communicate, the way we learn or the way we transport ourselves. If this is what is already here, what will the future bring us? Robotics? Quantum computers? This is practically unpredictable; what is easier to understand is that a future full of questions awaits us, a future full of challenges to overcome, and a future that will change exponentially.

We have heard on many occasions the assertion that technological change is exponential, but what does this mean? It implies that technologies such as landlines took around 75 years to reach as many as one hundred million users, while mobile phones took 16, the internet, about 7 years to reach that figure, the WhatsApp messaging application surpassed this in 4 and the social network Instagram crossed that border in just 2 years. This means that the penetration of technology into society is increasing, and with it, the changes that take place occur much more quickly, affecting a higher percentage of the world's population.

How should we manage this? Like all disruptive advances, technological change has two sides: on the one hand, it brings with it new solutions, new opportunities, new ways of doing things; but it also brings insecurity, and where there is insecurity, fraudulent or reproachful behaviours proliferate. This is what we, as "jurists of the future", should try to avoid. We must be protagonists of the change, not follow the slipstream of technology. We have been entrusted with the difficult task of regulating what is to be developed, and it is a task that nobody thinks is going to be easy, but it is a challenge that we must face.

The social and economic change that we experienced, and will continue to experience, for our environment is unstoppable. What has been called "the new paradigm" or "industrial revolution 4.0" has come as a high-speed train onto which we must climb without trying to stop it; knowing in advance that the speed will increase. We are faced with the arduous task of regulating technology without stopping its advance, without being the hand brake that derails it; but without forgetting, in turn, the most important thing: the rights of the users or consumers of these new technologies.

The effort of the legislator during these last years has been a titanic effort, managing to resolve in a brilliant way many of the conflicts posed. However, the increasing speed of the technological evolution together with the effect of globalization and the disruption of social and technological changes makes us reflect in this article whether this legislating model will continue to be effective in the future or on the contrary, we should try to adapt our way of working to the requirements of a faster development. We should tend towards a more flexible and more easily adaptable regulation, which gain weight through international collaboration. This is where the role of the European Union can be postulated as decisive. By creating a harmonized regulatory framework, it will allow companies within the Common Market to participate in a wider market with the legal security that would provide a common and coordinated regulation, while ensuring the inviolability of the rights of all European citizens.

Given the challenges that await us in the not too distant future, we cannot begin this work in any other way than analyzing the enormous difficulties we are going to face, trying to shed some light on how we believe the laws should be that in the future will regulate the likely advances in technology.

The methodology we will use to develop this article is an analytical methodology based on the study of the problems or difficulties that we must face and the proposal of solutions or principles based on success stories.

2. DIFFICULTIES WE FACE

There are many challenges that we will have to face in order to provide a safe and effective regulatory framework and achieve the correct protection of consumer rights, without thwarting the advancement of technology and development. In this article, we will make a brief analysis of the factors to consider when designing a new technological regulation, such factors as the speed of change, the transversality of the advances, the disruption that these changes produce in traditional markets, the global nature of the technology, and finally, the challenges of an operational or technological point of view.

2.1. The speed of the change

The dizzying pace at which technological innovation advances, along with its rapid penetration in society, is a constant issue for international regulators; they try, without complete success, to keep up with the incorporation of a regulation that resolves current concerns. Simon Beswick, CEO of Osborne Clarke, considers that it is inevitable that there will be a regulatory revolution for countries in order to adapt to the latest technological advances. "The laws go between five to seven years behind technology" he states (Sanz, 2016)[1].

[1] Sanz, S (2016) Interview: Simon Beswick: "*Las leyes van siete años por detrás de la tecnología*". Expansión, online newspaper.

The existing regulatory mechanisms are often slow, or rather, not fast enough, to adapt to the changing economic and social circumstances. "If the volume and pace of the digital transformation remains the way it is, the existing regulatory approach will not work," says Bakul Patel, director for Digital Health at the US Food and Drug Administration (FDA) associate center (Eggers, W. and Turley, M. 2018)[2]. The worst news is that the existing gap between regulatory security and the rate at which technological development is advancing is widening and we should expect that this situation is going to get worse (Marchant, 2011)[3].

Digital products and industries can grow considerably in a very short time, while the current regulatory cycle, depending of the technology, can take between five and twenty years to be effective. There are many examples that we find throughout the world in which regulation has not been quick enough to face the new conditions proposed by technology. Disputes such as those of Airbnb against the French hotel- lobby AhTop, which is ongoing, or the famous examples of mobility companies fighting against the establishment of startups such as Uber or Blablacar in their perceived traditional business territories, are some of the cases in which the regulation has been taking time to provide an environment of legal security, where these new companies can operate and coexist with traditional sectors. The regulator is still trying to adapt to these new conditions, while it is torn between a stricter regulation and a reluctance to change, which allows the current position of the traditional sectors to be maintained in exchange for suffocating the growth of a developing economy such asthe digital economy; or a soft regulation in which situations of unfair competition may arise (Abbot, 2012)[4].

Raymond Kurzweil (awarded in 1999 with the National Medal of Technology and Innovation; the highest honour in technology in the United States) wrote in 2001 "every decade our overall rate of progress was doubling, we won't experience 100 years of progress in the 21st century; it will be more like 20,000 years of progress (at today's rate)[5]."

2.2. Transversality

Transversality is another concept that has recently been strongly linked to technology. If we try to describe what technology is, perhaps it would be easier to start by asking what technology is not, given that, as we know it today, technology affects "everything". It affects each and every aspect of our life: from our education or how we learn and how we interact with others, to the way we do business or travel. Nonetheless, what happens when the big technology companies, such as Google, Facebook, or Amazon, affect these different aspects – they control the way we communicate with others, the way we seek information, the way we advertise ourselves as companies, the way we move using a map, or how we buy or watch movies. That is precisely the power that technology has granted these tech giants: the possibility of operating in numerous business areas that *a priori* have no relationship between them. This raises the following question: How can we, the legislators, set guidelines for companies that today offer their services in the form of a social network and tomorrow could operate in the healthcare sector or space travel, for example.

Transversality is analysed considering the differences and proximity of the networks and in terms of application in the industry, especially based on technology. Using this kind of analysis it can be concluded that the new technology industry is highly transversal and interconnected, that transversality means that it affects many sectors simultaneously[6].

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[2] Eggers, W. and Turley, M. (2018): "*The future of regulation*". Deloitte insights.

[3] Marchant, Gary Elvin, 1958-, (editor.) & Allenby, Braden R., (editor.) & Herkert, Joseph R., (editor.) & French, Peter A., (forewordiser.) (2011). *Growing gap between emerging technologies and legal-ethical oversight: the pacing problem*. Springer, Dordrecht.

[4] Abbot, C. (2012), Bridging the Gap – Non state Actors and the Challenges of Regulating New Technology. Journal of Law and Society, 39: 329-358

[5] Kurzweil R. (2004) The Law of Accelerating Returns. In: Teuscher C. (eds) Alan Turing: Life and Legacy of a Great Thinker. Springer, Berlin, Heidelberg.

[6] Keller, Wolfgang. 2004. "International Technology Diffusion." Journal of Economic Literature, 42(3)

This transversality of technology companies is closely related to their ability to pivot, where startups –normally with lighter structures than the big traditional companies – can change direction very quickly and start developing another activity that, at first, seemed foreign to its purpose (Ries, 2011)[7]. The changing and interconnected nature of their business models is a challenge for the legislator, as they cross the limits of the traditional industry, breaking with the previous one and on many occasions leaving behind traditional operators of different industries without that ability to "turn the boat" with the same agility. This break leads us to another concept, also linked to technology – disruption. Disruption in technological jargon means the rupture or abrupt interruption of something; it is used when the appearance of innovation changes the rules of a market, the way in which people consume, or even how a whole society behaves. It happened with the printing press, the internet or the smartphone and it will continue to happen, and more frequently, in the future. From the point of view of the legislator, we must expect that this will happen, and it is a great challenge that, overnight, technological innovation appears irreversibly changes the rules of a market and forces us to reset or reformulate the rules applicable to it (Downes, 2013)[8].

2.3. Internationality

Globalisation makes the task of the national regulator more complex, since we live in a time when the most important forces that affect all economies are global, not local (Keller, 2004). What happens abroad has a powerful effect on our economy, our markets, and therefore our way of regulating. In many cases, the legislator loses his capacity to avoid, in practice, certain activities. As an example of this, Deng Jiapeng, a professor at the University of Beijing, in respect to the ban on operating cryptocurrency exchange sin China, stated that *"blockchain or digital currencies have a typical global nature, and as a result a simple prohibition does not have much effect in the physical space. The exchange platforms continue working and lending their services in spite of the express prohibition on the part of the legislator, simply changin the place from which they provide the services"* (Smith, 2018)[9].

In addition, new companies no longer develop themselves with a focus on the local market, but with aspirations to conquer the international market, with all the resulting legal formalities. This international quality opens the door to two relevant issues: first, the location of the company in that country where conditions are more favourable for its development, which implies that, depending on the level of regulatory restriction, a country can lose investments. In this sense, countries like Estonia have identified the opportunity to attract technological companies, even allowing a person to become a "virtual resident" of Estonia and very easily registering their company in Estonia.

The second issue is the increase in tax evasion due to the relative simplicity with which multinational companies use their structures in other countries to legally reduce their tax bill, and thus avoid paying their fair share of taxes. These companies transfer the majority of their profits to countries with a more beneficial tax treatment, such as Ireland, the Netherlands or Luxembourg, establishing their European headquarters there and subsidiaries in other countries (Serraller, 2014)[10].

These are just some of the challenges we have in the difficult task of regulating technology in the future. In addition, we will find complications of an operational nature or that the technology uses a typical computer programming language to carry out functions like the management and control of huge amounts of data, and legislators must therefore become familiar with that programming language. In addition, there will be many other issues that technology itself will probably have to solve, such as the algorithmic biases that occur in the use of artificial intelligence, or the resistance to cyber-attacks, and these and other issues will have increasing importance and certainly should not go unnoticed, but the brevity of this study does not allow me to delve into them.

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[7] Ries, E. (2011): "The Lean Startup". Crown Business. USA

[8] Downes, L. and Nunes, P. (2013): *Big Bang Disruption* (March 1, 2013). Harvard Business Review, March, 2013, pp. 44-56.

[9] Smith, K. (2018) "China ICO ban proving ineffective". Brave Newcoin. Doi 77-108 The Hague: T.M.C.

[10] Serraller M. (2014): ¿Por qué pagas más impuestos que Apple? Trampas y montajes de las grandes empresas y de los millonarios para no pagar. Editorial Conecta, Madrid, pp 12-55.

3. HOW SHOULD WE REGULATE TECHNOLOGY IN THE FUTURE?

In view of the complications, no one can foretell how to regulate technology in the future, let alone affirm how to achieve effective regulation. However, it is true that technological advances will be increasingly complex. In spite of this, we will try to analyse the principles of the regulation of technology.

3.1. Neutrality

The principle of "technological neutrality" is a principle that has been studied at great depth, since it contains numerous meanings: from the principle of the technological neutrality of Public Administration, to those that identify it as a regulatory criterion of the law. We are going to focus on the latter principle.

As a regulatory principle, it was first used in 1999 in an official document of the European Commission on the revision of the regulatory framework for electronic communications. Subsequently, it has been included in the preamble of the *Framework Directive 2002/21/EC* and later articulated in *Directive 2009/140/CE that incorporates it as a basic principle of the regulation of electronic communications typical of a converging environment, when they use the same technology to carry out activities.* The principle of "technological neutrality" implies that regulatory activity should not focus on the technology, but on the effects that derive from its use. For this reason, the aforementioned legislation states that the legislative technique must be based on a *sustainable, subsidiary and proportionate* regulation that is, at the same time, transparent. In addition, the regulation must be inspired by the *"principle of neutrality",* and therefore it must avoid the effects of discrimination between different technologies, while favouring, at the same time, the development of ICT.

What is then understood by "non-discrimination"? In that specific sense, non- discrimination would also have different implications.

In the first place, the principle of neutrality seeks to guarantee an equitable regulatory treatment between electronic communications, preventing the legal framework from changing according to the technology used to provide a service. That is, its objective is to prevent the application of different regulatory regimes to different competing agents offering the same services but with different technologies.

Another aspect of this "non-discrimination" is found from a more markedly economic point of view. Economic analysis shows that a specific technological regulation can have a really negative effect on market efficiency. To achieve an efficient regulation, it should avoid any course that leads to an excess of regulation, which limits the potential technological development; and, in turn, ensures that one type of technology is not being favoured to the detriment of another.

The final aspect to consider regarding "non-discrimination" is that which exists from the point of view of the consumer and seeks to grant security where, regardless of the technology used for the consumption of services or products, the provision of this service is guaranteed (Écija, 2015)[11].

In conclusion, ITC regulation ought to be value-neutral with respect to technology: it should not favour some specific technologies over other specific technologies (Koops, 2006)[12].

Technological neutrality is also directly associated with the idea of regulatory sustainability, which starts from the basic principle that technology evolves quicker than regulation. The regulation must be sustainable and avoid continuous legal reviews, with the aim of adapting it to the constant technological changes. To ensure this objective, the regulation should not limit its scope to a specific technology; rather, it should focus on the effects emanating from its use, allowing flexible

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[11] Écija, A. (2015): "*Una aproximación jurídica al concepto de neutralidad tecnológica". Ecix Group*.

[12] Koops, B. (2006) *Should ICT Regulation Be Technology-Neutral*?. Starting points for ict regulation. Deconstructing prevalent policy one-liners, it & law series, Bert-Jaap Koops, Miriam Lips, Corien Prins & Maurice Schellekens, eds., Vol. 9, pp.

regulation and being open to change, advances or innovations that occur in its scope, allowing for its continuous application even if new technologies are developed. Regulations should not be static but flexible and dynamic enough to evolve along with technological development, without the need for constant regulatory revisions[13]. This brings us to our next principle – the flexibility of the law.

3.2. Flexibility

The presumption that regulations should be elaborated slowly and deliberately and then remain static for long periods of time is no longer applicable in the current paradigm. Existing regulatory structures are often too slow to adapt to changing economic and social circumstances. This slowness of the regulatory processes, in the face of the constant progression of technology, means that the regulatory projects currently promoted by the European Union, when they are about to be definitively implemented at national or local level, are really difficult to fit within the existing regulatory environment, either because of the rapid evolution of technology or due to the excessive burden of internal regulations. Therefore, we must attend to the need for more flexible and adaptive regulations aimed at adapting effectively to the continuous changes that go along with technological progress. As Aaron Klein, policy director of the Center on Regulation and Markets in the Brookings Institution, stated:

> *"We have a legal regulatory framework built on the basis of mail, paper, words, versus a new world order which is digital, continuous, 24/7, and built on bits and bytes. Somehow we need to square these two worlds."*

Flexible regulation does not mean starting from a blank slate, but starting with a retrospective review of the regulations, which obliges regulators to evaluate whether regulatory alternatives or readjustments in the current rules could adequately address the problem. This exhaustive review should serve in turn to identify those regulations that may be blocking innovation and those regulations that are obsolete or duplicated, and then try to release the regulatory burden. This is precisely one of the objectives of the *Better Regulation* project of the European Union, which emphasises the importance of reducing regulatory burden and simplifying existing regulations in the European Union, in order to create a more agile, flexible and adaptive regulation:

> *Better — and, if possible, less — lawmaking has been an abiding objective of single market policy. It has been consistently supported by the EESC in various opinions, with the aim of f inding the best ways to make the legislative environment more user-friendly and understandable to business, workers, consumers and civil society organisations […].*[14]

One example of this "less" regulation can be found in The Ministry of Environment and Food in Denmark. This ministry is one which is making more aggressive efforts at regulatory modernization. This includes reducing the number of regulations in your portfolio by a third, plans to reduce the number of laws you administer from 90 to 43 and an update of all existing laws to comply with the digital era[15].

In the case of the need for new regulations, we should be oriented not towards slow and overly deliberate models but towards more adaptive and interactive models, based on previous study, trial, error and adaptation, which allow the rapid incorporation of changes or qualifications. One possibility is agile methods, which are characterized by teamwork, sometimes multidisciplinary, and by breaking down large projects into phases, with limited or very limited deadlines. These methods

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[13] Van der Haar, I.M. (2008): "*The principle of technological neutrality: Connecting EC network and content regulat*ion". 5 decemember 2008.

[14] Opinion of the European Economic and Social Committee on Self-regulation and co-regulation in the Community legislative framework (2015/C 291/05).

[15] Danish Ministry of Business, "Disruption task force", accessed July 25, 2019.

make it easier to work in a more flexible and adaptive way, in contrast to the traditional way of working, which is usually more linear and inflexible in introducing new changes during the course of the project. The type of regulatory instrument matters – the government is typically behind the curve of technology, and as regulations take years to promulgate and enforce, the "best technology" mandated by regulation may often be inferior to the best that industry could actually deploy. (Wiener, 2004)[16]

Another possibility is precisely the mechanisms of *soft law* or self-regulation, which have often been cited for the regulation of technology because they allow a rapid response to changes, notwithstanding the European Union statement 2015/C291/05 that *"They should be viewed as important instruments for complementing or supplementing hard law, but not as an alternative to it unless there are fundamental rules providing a sufficient enabling basis" […]*[17].

3.3. Qualification

As we have shown in this article technology is a source of challenges, but it can also be a helpful tool to face them. In this way, it allows for a more direct and fluid communication among those involved, as well as the collection and rapid processing of a large amount of data. We can use the collected data to regulate in a "qualified" manner, which in the context we are dealing with means combining consultation and data-based results.

3.3.1. Consultation

In many cases, regulators can benefit from working directly with companies, innovators and other actors, in order to define the rules to be applied to emerging technologies. That is, representation of the industry in the regulatory process should be allowed, due to the complexity of the subject to be treated and the great difficulty of reaching an understanding of the possibilities for its development. This will help regulators understand the nuances of technology and the possible consequences.

> *[…]The institutions intend to promote agreements between stakeholders, defining the bounds of such agreements in legislative acts, verifying that they comply with fundamental legislative texts and with the rules governing their drafting, and monitoring their application.* Legislative framework 2015/C 291/05[18].

Not only is the participation of companies from specific sectors important, but also the assistance from consumers and users. The *Better Regulation*[19] project promoted by the European Commission aims to improve and increase opportunities to contribute throughout the legislative and policy-making cycle, so that citizens and stakeholders can make their views known, while always underlining the importance of transparency in the European legislative process. As per the Inter-institutional Agreement of 13 April 2016 on Better Law-Making: "*Public and stakeholder consultation is integral to well- informed decision-making and to improving the quality of law-making.*[20]"

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[16] Wiener, J. B. (2004) "*The Regulation of Technology, and the Technology of Regulation*", 26 Technology in Society 483-500.

[17] European Commission (2015): *Opinion of the European Economic and Social Committee on Self-regulation and co-regulation in the Community legislative framework* (2015/C 291/05). Pp. 1-7.

[18] European Union (2015): Opinion of the European Economic and Social Committee on Self-regulation and co-regulation in the Community legislative framework (2015/C 291/05).

[19] European Commission Better Regulation project of the European Union

[20] European Commission (2016): *Agreement of 13 April 2016 on Better Law-Making.*

3.3.2. Based on data

We live in the information era, where the recompilation of big data and the exhaustive analysis of data prevails, and we should take advantage of this knowledge also for the regulatory process. With the guidance of data analytics and, in many cases, artificial intelligence, data can be studied to detect new patterns and trends, and to obtain more effective, accurate, safe and personalized information. This knowledge can be used for qualified legal approvals based on data and certainties, but the possibilities do not stop there. This potential of knowledge can be extended to a dynamic regulatory approach in which, based on real-time data flows between companies and their regulators, it is possible to evaluate the effectiveness of the rules applied, and to analyze whether the regulation is complying or not with the goals stated by the legislator, and ultimately to correct ineffective regulations more quickly and safely.

Many regulatory organisations, from the European Commission to the USA Securities and Exchange Commission, have established such data flows with the industry. Once the data flows are integrated, this part of the regulatory process can be automated. The application can become dynamic, and review and monitoring can be integrated as part of the regulatory system.

This has been called "Smart Regulation". This also extends to all those regulatory processes that allow innovating and streamlining the regulatory techniques, placing emphasis on ensuring that these new formulas are rigorous. Smart regulation should be inspired, based on and informed by an accurate knowledge of the factors at play and by a acute awareness of its potential impact on society[21].

With this "preliminary study" and this qualified information compiled by the regulators consulting with users and participants in the industry, we will move to the second step of the adaptive process – prior study, trial and error.

The National Highway Traffic Safety Administration (NHTSA) 2016 Federal Automated Vehicles Policy offers an example. By taking an iterative approach in designing policy for autonomous vehicles, the NHTSA responded to new data and technologies to make significant revisions to its initial policy of 2017[22].

3.4. Experienced: "Sandbox"

The current circumstances have shown that even with all this information and advance study, we cannot predict how the industry will behave, what factors will have an affect and what the scope of its consequences will be. Against this, there are already many countries that have resorted to the application of a new regulation strategy "the regulatory Sandbox".

The Sandbox idea first came from Britain's former chief scientific adviser Sir Mark Walport, who suggested the financial services industry would benefit from having something equivalent to the clinical trials of the health and pharmaceutical sectors.

A Sandbox is a controlled environment that allows innovators to test their products, services or new business models without the need to follow all the standards applied to the sector. The focus of the Sandbox seeks to help regulators better understand new technologies and to work collaboratively with industry in the most appropriate and effective way possible to subsequently develop the rules and regulations that will govern these products, services or emerging business models. It allows innovation to be accelerated while controlling its risks, preventing them from affecting the final consumer. What are the advantages of this model? (Asociación Española de Fintech, 2018)[23]

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[21] Commission Communication on Smart Regulation.COM (2010) 543.

[22] Marc Scribner, "NHTSA Releases Improved Federal Automated Driving System Guidance," Competitive Enterprise Institute, September, 12, 2017.

[23] Asociación Española de FinTech e Insurtech And Hogan Lovells, (2018): *Decálogo para la implantación de un Sandbox*. 2018.

It develops innovation allowing the creation of a work environment where new business models that allow the use of data and new technologies can be launched in a controlled manner, to obtain innovative and more efficient solutions. In addition, it reduces the time and cost of generating and validating innovative ideas in the market.

It promotes competition by initially reducing the total compliance with all the established rules, and by helping to reduce entry barriers, favouring the increase ofcompetition, and promoting the improvement of products and services made available to the final consumer.

It allows a constant legislative update developing a dynamic environment for the observation and validation of how regulatory frameworks should adapt to the changes that the sector needs in order not to stop innovating.

It minimizes risk as an optimal tool for supervisors to keep abreast of the latest innovations and to develop mutual learning about the risks and opportunities of applying these new technologies to business models.

All this implies **greater safeguards** for the consumer who receives a final product that has been tested under the conditions of legal certainty.

This new form of regulation allows for the development of regulations to be synchronized with rapid technological development, helping to close the gap between innovation and regulation, providing secure conditions for both companies and consumers, conditions that help promote innovation and, at the same time, protect users. It is a novel form of regulation and able to solve the problems caused by the rapid progress of technology.

The Financial Conduct Authority (FCA), the financial authority of the United Kingdom, created the first fintech Sandbox for companies in 2016. The Sandbox has accepted almost 90 companies since its creation and has just finished receiving applications for its fifth cohort.

The FCA says "the Sandbox helps it understand new technologies before products hit the mass market, and that it helps start-ups build in safeguards for consumers at an earlier stage than would otherwise have been the case". It also says it sees innovation playing an important role in driving more effective competition in Britain's financial services market[24].

3.5. Coordinated and collaborative regulation:

The last of the principles is closely linked with the last of the challenges or difficulties we discussed at the beginning of this article. In an increasingly globalised environment in which external forces drastically affect our economy, we must aim for a coordinated and harmonized regulation, where different countries agree to grant a clear security framework, without regulatory mosaics. The European Union has a great opportunity here to become a broad environment where innovation has a place.

A recent global survey conducted by the OECD[25], which involved more than 250 experts and leaders of financial institutions, concluded that regulation incompatible with regulatory divergence in different nations costs financial institutions between 5 and 10 per cent of their income annual totals. The mosaic of international financial regulations costs the world economy approximately $780 billion. Therefore, it concludes that a global ecosystem approach must be encouraged; one in which regulators from different nations coordinate with each other to encourage innovation while protecting consumers more effectively from possible fraudulent practices.

The European Union must seize this opportunity by developing its integrating role, whose objective is effective and competitive regulation. The objective of the policy of research and technological development of the EU has been, as inferred from the Single European Act 1987, to strengthen the scientific and technological bases of European industry and promote

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[24] Global Financial Innovation Network (GFIN), Consulation Document, August 2018

[25] International Federation of Accountants and Business at OECD, "Regulatory divergence: Costs, risks, impacts," February 2018, p. 4.

its international competitiveness. On the other hand, Article 179 of the Treaty on the Functioning of the European Union specifies that "*the Union shall have the objective of strengthening its scientific and technological bases by achieving a European research area in which researchers, scientific knowledge and technology circulate freely, and encouraging it to become more competitive[…]*". Since then, the EU has realised this in programmes such as "Horizon 2020" or "Digital Europe".

However, what is the role that Europe should play in the regulation of these new technologies? "*Our role is to foster a regulatory environment that allows new business models to develop while protecting consumers and ensuring fair employment taxes and conditions"* said Commission Vice President Jyrki Katainen[26], responsible for Jobs, Growth, Investment and Competitiveness. A fragmented method of regulation creates uncertainty among international operators, new service providers and consumers, and can severely undermine innovation, job creation and economic growth within the Union.

This integrating role of the European Union has resulted in one of the most ambitious projects promoted in recent years, the "Digital Single Market".

> *"Internet and digital technologies are changing the world. But the obstacles on the internet mean that citizens lose goods and services because internet companies and emerging companies have limited horizons, and companies and administrations cannot fully benefit from digital tools. The time has come to achieve the adaptation of the EU's single market to the digital era by tearing down the walls of different legislations and moving from 28 national markets to a single one".* Andrus Ansip, Vice President for the Digital Single Market.

The European Union aims to move towards the digitization of the freedoms of the EU's single market, with the adoption of Europe-wide standards for telecommunications services, copyright and data protection. The digital single market strategy has delivered the main legislative proposals that have been previously established as a priority, focusing on electronic commerce, copyright, audiovisual and media, privacy, harmonization of digital rights, delivery of affordable packages and harmonized VAT rules. Its objective is to guarantee a fair, open and secure digital environment. To this end, the Commission has identified three main emerging challenges: ensuring that online platforms can continue to benefit our economy and society, developing the European data economy to its full potential, and protecting Europe's assets by addressing the challenges of Cybersecurity. Just between 2015 and 2017, the European Commission has presented 35 legislative proposals and political initiatives within the scope of its strategy for the effective achievement of a digital single market.

With this project, the European Union is clearly taking the reins of technological regulation with a vision for coordinated and collaborative work between the different countries of the EU, tending towards the creation of a broad harmonized space and a framework of full legal security. For example, the EU emphasises this need in one of its last projects, based on the incorporation of 5G technology. *"The interconnected and transnational nature of the infrastructures underpinning the digital ecosystem, and the cross-border nature of those involved, mean that any significant vulnerabilities and/or cybersecurity incidents concerning 5G networks happening in one Member State would affect the Union as a whole"* Recommendation (EU) 2019/534 Cybersecurity of 5G networks[27].

The digital politics of the EU must be adequate for the digital transformation and data economy. The European Union, since its founding act, has always looked to the future, and the future is to understand and regulate technology. The European Commission aims to create an inclusive digital society that benefits from the digital single market, seeks to build smarter cities, improve access to e-government, eHealth services and digital skills, which will allow a truly digital European society. It is taking concrete actions for the development of cross-border digital public services, and apportioning them major significance in the future of the European Union. Intelligent digital technologies, such as the development of autonomous automobiles or Smart Cities, are being strongly supported by the Commission.

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[26] A European Agenda for the collaborative economy. Daily News 02/06/16.

[27] European Commission (2019): Recommendation (EU) 2019/534 Cybersecurity of 5G networks.

Technology involves everything and is eminently global in nature; therefore, it is increasingly difficult to regulate everything that concerns, so we must join forces and regulate in a coordinated and collaborative manner to allow their development without losing sight of the rights of all citizens.

However, this is not only a European task, but the whole world should also tend to this kind of coordination and cooperation to create a harmonization of regulation for the technology industry, helping to build an effective framework to protect consumers, to improve transparency and increase the cross-national comparability of corporate information.

In a digital world without borders and where everything is connected, global regulation should also be connected and coordinated to avoid the lack of protection of consumers.

4. CONCLUSION

> "*We can only see a short distance ahead, but we can see there is a need for that*". Alan Turing, Computing machinery and intelligence.

This phrase by Alan Turing, a character very much linked to technology, perfectly serves to describe what lies ahead, the challenges we have to face, knowing that our work as regulators can tremendously mark the future of technology. It can serve as a catalyst, encouraging development, or be an obstacle, a break that derails the process, since the advance of technology will not stop.

Therefore, we must find a way to adjust the balance and promote the development of technology, while we adequately protect the rights of the consumers and users of these new products and services. We have to avoid fraudulent actions arising in this new global ecosystem and provide a framework of broad legal security that benefits every participant in the industry. After the study, we believe that the best way to approach these objectives is through regulation: neutral, flexible, qualified, experienced, and coordinated among the different countries.