Driven by disruption
Digitized trust and collaboration in the EU

Joël Vanoverschelde
Partner
Advisory & Consulting Leader
Deloitte Luxembourg

Charles Delancray
Director
Advisory & Consulting
Deloitte Digital
Deloitte Luxembourg

Jacques Venter
Consultant
Advisory & Consulting
Deloitte Luxembourg

Gergana Petkova
Analyst
Advisory & Consulting
EU Policy
Deloitte Luxembourg

Dubbed as drivers for the Fourth Industrial Revolution by many,[1] digital technologies lead to transformation in traditional business models, to the way different actors interact with each other, and to new roles for consumers and businesses alike. Digital technologies are indeed creating a revolution, disrupting the market in every dimension, and opening doors full of opportunities. A proactive approach can turn disruption into an opportunity if one is open to the digital change, rather than trying to react against it.[2]

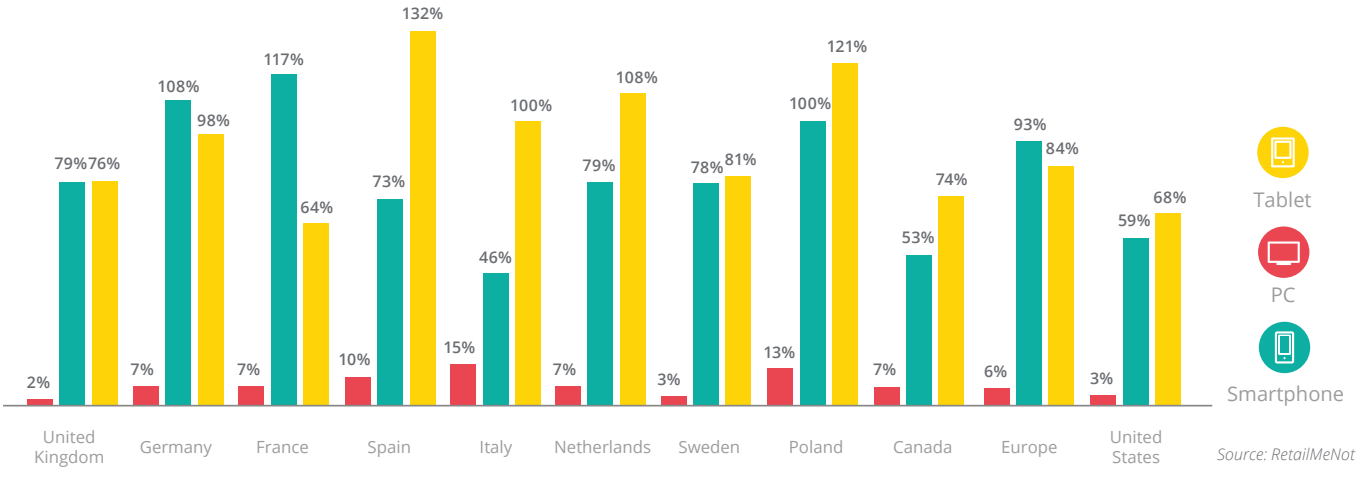
Among the digital technologies, there are certainly some that are standing up as a one-horse race: these are platforms and blockchain, both holding major potential for enhanced and more inclusive collaboration between consumers, businesses, governments, and EU institutions. They can be leveraged to foster stronger relationships and greater interaction between the various stakeholders as well as help address challenges related to transparency and bridge the gap between citizens and national or transnational authorities through different forms of interactive and collaborative platforms. With the right combination of regulatory environment and public awareness about the potential benefits, these technologies can enable new "collaborative" models in the digital economy to arise, based on increased trust and transparency.

Driven by mobile, platforms and blockchain (in combination with digital identity) can be enablers for creating a safe and innovative digital market, based on the "security-by-design" and "privacy-by-design" concept the European Union strives to achieve and enshrines in the European Digital Single Market strategy[3] and the EU Cyber Security Strategy.[4] However, a fast changing environment may cause citizens to feel that they are in less control. Nonetheless, these changes do not necessarily have to induce such a negative psychological effect if they are well-conducted by supportive policy-making, in a way that makes consumers and citizens in this future "collaborative" economy more engaged, more informed, and more empowered.

Mobile-izing consumers

This is not a new idea, since consumers have already been actively participating in the new collaborative economy through mobile gadgets and are benefiting from the services provided by well-known companies in the private sector (think Uber, Airbnb, Amazon, and BlaBlaCar) that are using digital technologies to fundamentally change the way they engage consumers. This shift in the way that consumers are being engaged is driven by the fact that consumers' connectivity is becoming more mobile, to the extent that for the period of 2014-2015 the share of mobile and tablet page views have finally overtaken those viewed on desktop. (Fig.1)

Figure 1[5]. M-commerce: forecast on the rise/Growth of e-commerce per device 2014-2015



1 https://ec.europa.eu/digital-single-market/en/fourth-industrial-revolution

2 https://dupress.deloitte.com/dup-us-en/focus/disruptive-strategy-patterns-case-studies/approaching-disruption-for-growth-performance.

3 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0192

4 https://eeas.europa.eu/policies/eu-cyber-security/cybsec_comm_en.pdf

5 https://ecommercenews.eu/key-figures-mobile-commerce-europe-revealed/

Figure 2. Three common platform types that facilitate transactions, interactions, and mobilization

1

Aggregation platforms

- Facilitate transactions
- Connect users to resources
- Tend to operate on a hub-and-spoke model

2

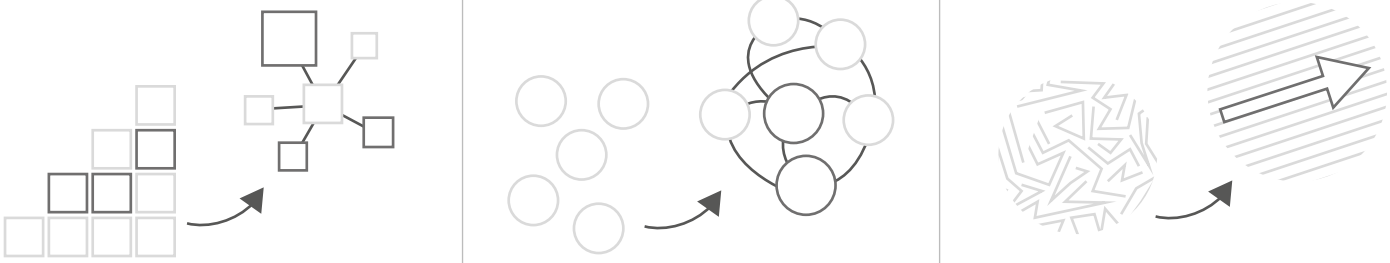
Social platforms

- Facilitate social interactions
- Connect individuals to communities
- Tend to foster mesh relationship networks

3

Mobilization platforms

- Facilitate mobilization
- Move people to act together
- Tend to foster longer-term relationships to achieve shared goals



Source: Deloitte analysis

By 2030, it is estimated that 75 percent of the world's population will have mobile connectivity,[6] while reaching the remaining 25 percent would be possible through offline web apps that rely on service workers to enable apps to function without a network connection.[7] In European context, 54% of consumers use a mobile device to make payments for various goods and services.[8]

An increasing amount of people expect to access information anywhere, at any time, and for this experience to be convenient, seamless, and consistent regardless of the device they use. This is when a platform, driven by the increased need for mobility, in the physical sense (e.g., a platform to facilitate transportation and geographical relocation) and technological sense (e.g., a platform that is "responsively designed" and offers convenient access on different types of devices), comes into play. Moreover, it is vitally important that the sharing of information, be it in the public sector between citizens and national or supranational institutions, or in the private sector, is done in a secure way that leads to further, deeper engagement while also enhancing consumer experience.

The empowering platforms

The acclaimed futurist Paul Saffo talks about the fact that over the past century we have moved from the "producer" to the "consumer" to the "creator" economy and that each economy is characterized by a specific scarcity that needs to be overcome. Whereas in the producer and consumer economies the scarcities were production and desire, the scarcity in the consumer economy is consumer engagement. To overcome the disengagement, according to Saffo, the means to beat this challenge is to offer services through platforms, where the consumer becomes at once a producer and a consumer.

The resulting solution is to intelligently and strategically interact with citizens by providing them with the necessary and relevant information in a way that captures their attention, and platforms can offer that. There are varying types of platforms that exist, as indicated by John Hagel in "The power of platforms," but essentially what they all have in common is that they connect various types of actors and make resources and participants more accessible to each other on an as-needed basis.[9] Platforms rely on network effects and the active engagement of its users to be successful. For example, if a ride-sharing platform like BlaBlaCar is to be successful, it needs to have both a large base of consumers who want to book rides and drivers willing to offer rides. These network effects ensure the platform's sustainability, since participants rarely leave a vibrant platform once it is established,[10] unless a better platform comes along—as was the case with Myspace when Facebook gained momentum[11]. (Fig.2)

6 http://europa.eu/espas/pdf/espas-report-2015.pdf

7 https://mobiforge.com/news-comment/mobile-technology-trends-2016

8 https://www.visa.co.uk/newsroom/mobile-payments-soar-as-europeans-embrace-new-ways-to-pay-1600684?returnUrl=/newsroom/listing

9 http://dupress.deloitte.com/content/dam/dup-us-en/articles/platform-strategy-new-level-business-trends/DUP_1048-Business-ecosystems-come-of-age_MASTER_FINAL.pdf

An area where platforms are having an additional impact is in the shift from push-based to pull-based interaction. In contrast to the push-based approach, where a batch of goods is produced, placed on the market, and efforts focused on great marketing to sell the product to consumers (the hallmark of Saffo's consumer economy), the pull-based approach is more reactive in that operations do not start until actual demand signals are received from buyers.[12] The implication for information sharing, if we see information as the "product," is to ensure that information can be "pulled," on-demand, by individuals through channels that make it a convenient process.

Properly designed platforms can help create and capture new value and scale the potential for learning across entire ecosystems.[13]

No longer would individuals simply consume, but they are able to create value through their daily activities.[14] This could lead to a fundamental shift in the role that the citizens play in the information-sharing value chain. The power of platforms comes to the forefront when consumers become either producers or contributors, so that their input makes the product better.

Through platforms, consumers adopt "dual roles" across a wide range of services. Precious examples are on the hype, as for instance the current trend of citizens becoming contributors to policy-making design through e-participation platforms or in the case of carpooling platforms in which consumers can be both passengers (consuming the service) or drivers (producing the service). Their more active involvement also means that they actively contribute to improving the product or the service since they are more likely to be aware of the direct benefits or shortcomings, tangible and intangible, for themselves and for all the participants. However, platforms are empowering when they are embedded with sufficient privacy and security features. On this regard, platforms and e-services, from e-government and e-voting to e-commerce, e-health, and even e-taxes, have a lot to gain from making use of blockchain-based technologies in a way that promotes trust and henceforth strengthens the collaboration opportunities between actors and people across Europe. Although most discussions around blockchain have been mainly focused on its impact on the financial sector, the technical architecture of blockchain allows for multiple cross-sector applications.

10 https://hbr.org/2015/04/how-to-launch-your-digital-platform

11 http://thefinanser.com/2016/10/four-banking-business-models-digital-age.html/

12 http://dupress.deloitte.com/content/dam/dup-us-en/articles/platform-strategy-new-level-business-trends/DUP_1048-Business-ecosystems-come-of-age_MASTER_FINAL.pdf

13 http://dupress.deloitte.com/content/dam/dup-us-en/articles/platform-strategy-new-level-business-trends/DUP_1048-Business-ecosystems-come-of-age_MASTER_FINAL.pdf

14 http://www.forbes.com/sites/tedgreenwald/2011/10/19/the-creator-economy-futurist-paul-saffo-on-the-new-business-epoch/#a3a2a2c6e80c

Blockchain (inter)Reaction: toward enhanced trust and collaboration

The blockchain represents a digital, distributed ledger, consisting of a network of trusted "nodes" that allow the transaction of digital assets and transactions in a trusted, secure, cost-efficient, and transparent way and relies on cryptography protocols and algorithms. Each transaction is recorded on a shared ledger, each node keeps a copy of the shared ledger and the transaction and any change to the nodes must be validated by the rest of the members of the network. Therefore, a compromise of any node of the system would be detected. The conditions of the transactions are agreed upon based on pre-defined rules beforehand between the participants and the execution process is automated, therefore leaving out the need for intermediaries, saving time and resources (e.g., smart contracts). (Fig.3)

Blockchain in combination with trust services such as electronic identification and digital identity (already applied in member states such as Estonia) presents a reliable, transparent, and secure solution that could affect not only transactions in the financial sector, but also any sector or service that could benefit from better traceability and identity management (such as e-services). It has already been adopted in several EU Member States (such as Estonia) and the European startup environment is quickly evolving. Ultimately, the results from these technologies could be more transparency, security, inclusiveness, and convenience for individuals and businesses.

Quoting Vitalik Buterin,[15] blockchain platforms and applications such as Etherum[16] (that Buterin is the co-founder of) create better opportunities for improved transparency and trust through "online voting," "distributed governance," and "human collaboration."

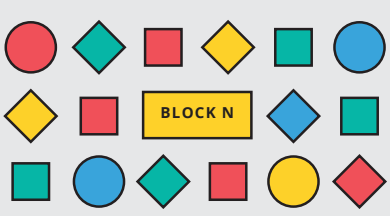
Moreover, they have the potential to enable other technologies and e-services, which can significantly affect the way people interact with governments, businesses, and with each other. For example, e-voting, e-participation, and e-democracy can engage and empower citizens and allow channels for feedback between governments and citizens.[17] In Estonia for example, the impact of internet voting has also demonstrated that it could play a positive role in the turnout on national and local elections with a steady increase since 2005[18] and to bring down barriers to political participation. In other words, blockchain affects different levels of relationships: government-to-citizen (G2C), government-to-government (G2G) and government-to-vendor (G2V).[19]

Figure 3.

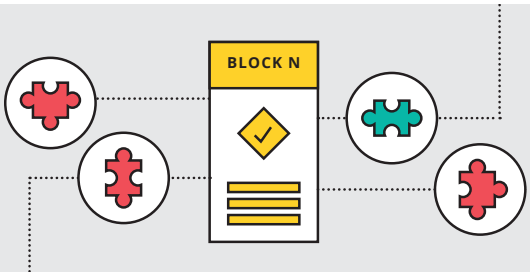
Figure 1. Blockchain: How it works

Blockchain allows for the secure management of a shared ledger, where transactions are verified and stored on a network without a governing central authority. Blockchains can come in different configurations, ranging from public, open-source networks to private blockchains that require explicit permission to read or write. Computer science and advanced mathematics (in the form of cryptographic hash functions) are what make blockchains tick, not just enabling transactions but also protecting a blockchain's integrity and anonymity.

1 TRANSACTION Two parties exchange data; this could represent money, contracts, deeds, medical records, customer details, or any other asset that can be described in digital form.



4 VALIDATION Blocks must first be validated to be added to the blockchain. The most accepted form of validation for open-source blockchains is proof of work—the solution to a mathematical puzzle derived from the block's header.



5 BLOCKCHAIN MINING Miners try to "solve" the block by making incremental changes to one variable until the solution satisfies a network-wide target. This is called "proof of work" because correct answers cannot be falsified; potential solutions must prove the appropriate level of computing power was drained in solving.

The blockchain represents a digital, distributed ledger, consisting of a network of trusted "nodes" that allow the transaction of digital assets and transactions in a trusted, secure, cost-efficient, and transparent way and relies on cryptography protocols and algorithms.

15 Vitalik Buterin explains Ethereum https://www.youtube.com/watch?v=TDGq4aeevgY

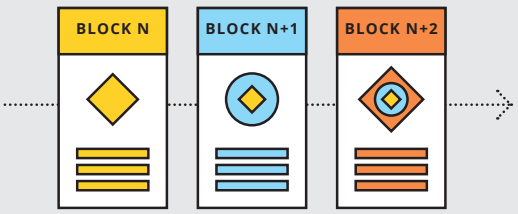
16 https://www.ethereum.org/

17 United Nations, United Nations E-Government Survey 2014 E-Government for the Future We Want, United Nations, 2014. Available at: https://publicadministration.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/EGov_Complete_Survey-2014.pdf

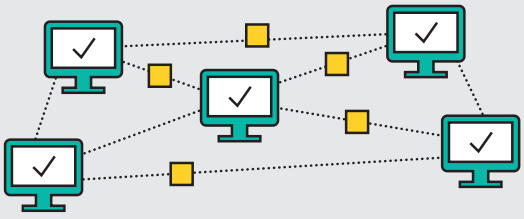
18 http://pubdocs.worldbank.org/en/165711456838073531/WDR16-BP-Estonian-eGov-ecosystem-Vassil.pdf

19 https://techcrunch.com/2016/11/21/blockchain-technologies-could-transform-government-services/?ncid=rss

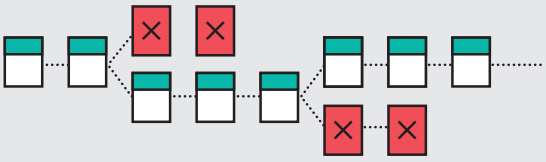
2 VERIFICATION Depending on the network's parameters, the transaction is either verified instantly or transcribed into a secured record and placed in a queue of pending transactions. In this case, nodes—the computers or servers in the network—determine if the transactions are valid based on a set of rules the network has agreed to.



3 STRUCTURE Each block is identified by a hash, a 256-bit number, created using an algorithm agreed upon by the network. A block contains a header, a reference to the previous block's hash, and a group of transactions. The sequence of linked hashes creates a secure, interdependent chain.



6 THE CHAIN When a block is validated, the miners that solved the puzzle are rewarded and the block is distributed through the network. Each node adds the block to the majority chain, the network's immutable and auditable blockchain.



7 BUILT-IN DEFENSE If a malicious miner tries to submit an altered block to the chain, the hash function of that block, and all following blocks, would change. The other nodes would detect these changes and reject the block from the majority chain, preventing corruption.

The digitization game: EU policies as enablers of the digital future?

In order for the EU to take advantage and also counter some of the disruptive challenges of digital technologies, the right regulatory environment is necessary. EU institutions are key players in the digital future and regulatory changes are already underway.

The Digital Single Market is one of the European Commission's ten political priorities[20] which aims to create seamless online experience for EU citizens and businesses. To this end, the European Commission announced the Digital Single Market strategy[21] in May 2015 with the goal to ensure better access to online goods and services for consumers and businesses, create the right conditions and digital infrastructure, and maximize the growth potential of the EU digital economy. The strategy as well as the associated initiatives stemming from it aim to integrate different digital services and technologies into a trusted and transparent EU "digital single" ecosystem. It is based on three pillars:

- Better access to digital goods and services: enable cross-border e-commerce and e-services, better access to digital goods, prevent geoblocking and alleviate obstacles when selling cross-border
- Creating the right conditions and environment for digital services and networks, e.g., platforms and intermediaries, audiovisual media services and telecom rules, and trusted, secure digital services through strong data protection and cybersecurity frameworks
- Economy and society: maximizing growth by a data-driven economy (enabled by technologies such as Big Data and Internet-of-Things), interoperability, and standardization and the benefits of digital services (e.g., e-government, e-health, e-energy)

Through the "Communication on the collaborative economy" as well as the "Communication on online platforms", the EU is raising awareness of emerging trends and digital technologies and its intention of harnessing the potential opportunities arising as a result.

Whereas the Digital Single Market Strategy outlines the European digital vision, the Digitising European Industry[22] initiative has the objective to "establish next-generation digital industrial platforms," which could serve as the backbone of the future European "smart" society and economy by integrating digital technologies such as Big Data, Internet-of-Things, autonomous systems, and artificial intelligence solutions in cross-sector platforms.

An essential aspect for the EU as it engages Member States and citizens is the need to promote and foster trust. There are already key enabling initiatives for building trust, security, and confidence across Europe and among its citizens, e.g., the General Data Protection Regulation.[23]

The EU Cyber Security Strategy calls for "security-by-design" and "privacy-by-design" principles to be embedded in European products and services. Another example is the eIDAS regulation,[24] which will facilitate cross-border access to online services, administrative procedures, and goods through electronic identification for citizens across the European Union. The harmonization of rules across the Member States will ensure that a citizen's eID will be mutually recognizable from one Member State to another.

The challenge for the EU and decision makers will be to keep pace with the rate at which digital technologies are advancing, some at an exponential rate,[25] to ensure that these are leveraged to the benefit of society as a whole. It as an exciting time to be part of this discussion and to explore the benefits of digital technologies.

20 https://ec.europa.eu/priorities/index_en

21 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52015DC0192

22 https://ec.europa.eu/digital-single-market/en/industrial-platforms-and-large-scale-pilots

23 http://ec.europa.eu/justice/data-protection/reform/index_en.htm

24 https://ec.europa.eu/futurium/en/content/eidas-regulation-regulation-eu-ndeg9102014

25 https://dupress.deloitte.com/dup-us-en/tags/exponential-technology.html

The challenge for the EU and decision makers will be to keep pace with the rate at which digital technologies are advancing, some at an exponential rate, to ensure that these are leveraged to the benefit of society as a whole. It as an exciting time to be part of this discussion and to explore the benefits of digital technologies.

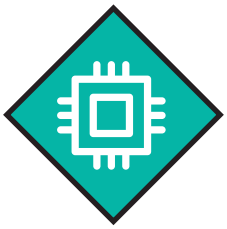
The Mobile Revolution

Mobile-enabled transportation:

The city of Helsinki is aware of this shift in mobile, evidenced by the ambitious goal it has set for the future. By 2025, the city aims to make it unnecessary for any resident to own a car by implementing an on-demand mobility system that enables citizens to find the fastest or cheapest way of getting anywhere at any time, using public or private transport. Everything, from planning to paying, will be done through mobile devices.[26] While 2025 is still a way off, providing such a service to its citizens would require input and interaction between various actors such as transportation providers, payment services, consumers, etc. In order to make this happen, it is likely that this service will be built upon a technology that is already making quite an impact today—the platform.

Amazon GO:

In the retail sector, mobile is a strong driver of Amazon's sales growth. Part of its success can be attributed to how well the online retailer synchronizes consumers' shopping experience between its desktop site and mobile platforms, making it possible to seamlessly switch and transition between channels.[27] The Amazon Go store allows consumers to avoid queues and significantly save time by being able to pick up the product they like, record the choice through a mobile app, and leave the store.[28] Their choice is subsequently billed on their Amazon Prime account. This is an example of the increasing tendency to use mobile devices (through an app) as a personal Point-of-Sale and thus, become "mobile-ized," in a physical and technological sense.



Platforms

Futurium: The platform to enable Policy Making 3.0

It is this kind of effect that the European Commission can leverage through Futurium, the e-participation tool developed to engage stakeholders online and facilitate the joint creation of ideas to help design future policies. As a platform it relies on social networks, open and participatory engagement, and an online toolkit to enable the conducting of new policy-making experiences through scientific evidence and stakeholder participation, ultimately making government processes more transparent, open, and inclusive.[29]

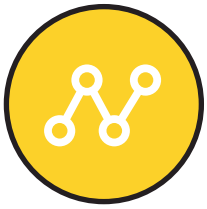
BlaBlaCar: The carpooling platform BlaBlaCar is a prime example of an online platform that has embraced the shift toward the collaborative economy by connecting various stakeholders—drivers with empty seats to passengers looking for a ride—through what it calls a trusted community marketplace.[30] BlaBlaCar is the leading ride-sharing platform in Europe with 35 million members over 22 countries. The value created by the BlaBlaCar community through the online platform equates to an increased efficiency of road transport, saving money on travel for both drivers and passengers and reducing the overall environmental impact of transport.[31]

Online platforms and e-participation:

The Communication on Online Platforms[32] by the European Commission recognizes the importance of online platforms for the European "collaborative" digital economy and society and raises awareness regarding the opportunities for businesses and consumers alike: efficiency gains, increased consumer choice, improved cross-border access to services and information, boost of the data-driven economy, and enhanced citizen participation in democracy. More importantly, the Communication recognizes that a balance needs to be achieved between ensuring compliance with the existing EU rules and core values, especially regarding consumer protection, personal data protection, and competition, while also adapting to the new realities and harmonizing the existing legal framework in such a way that will enable the collaborative economy and boost innovation and growth across sectors.

Adapting to the future of the collaborative economy:

The Communication on the collaborative economy[33] by the European Commission addresses the role of the consumers and different actors in the collaborative economy in more detail as well as provides guidance for policy makers in Member States on how to achieve a balance between maximizing the potential of the new collaborative business models and ensuring compliance with fair and responsible practices online. The Communication also aims to clarify regulatory "gray zones" regarding market access requirements, liability regimes, user protection, self-employed and workers, and taxation. It raises awareness regarding the potential need to adapt a national legal framework in order to reap the benefits as well as counter the risks related to platforms. The consumer protection framework needs to be adapted in the view of online platforms. Last but not least, the Communication recognizes a new role for consumers in the context of the collaborative economy—a consumer and a producer at the same time.



Blockchain

Blockchain technology for Member States' national governments and citizens:

In Estonia, a country renowned for its proactive adoption of innovative digital policies and blooming ICT sector, NASDAQ (which runs Tallinn's Stock Exchange) provides blockchain solutions for Estonia's e-Residency platform[34] —a service, based on "transnational digital identity", that allows non-Estonians to obtain an e-residency card and digitally sign and encrypt documents, verify their authenticity, and administer and conduct business online.

The combination of blockchain and electronic identification (eID) are the same technologies that enable Estonian e-services across sectors such as e-government, e-voting, e-tax, and e-healthcare. The Estonian blockchain company Guardtime[35] recently signed an agreement with the Estonian e-Health Authority to ensure the data security of the country's healthcare records.[36] The Keyless Signature Infrastructure (KSI),[37] based on digital signature authentication and blockchain, ensures transparency, reliability, and data security for citizens and institutions alike. It is used to verify and authenticate all e-government processes and e-services. These services are enabled by the advanced digital ecosystem X-Road (a decentralized and distributed secure data exchange layer), which serves as the country's digital "backbone."

Slock.it[38] is a blockchain company based in Germany that provides solutions combining the Internet-of-Things and blockchain. The Ethereum Computer,[39] which comes preconfigured to run Ehtereum and decentralized applications, has the objective to "build the future infrastructure of the sharing economy by enabling anyone to rent, sell, or share anything—without middlemen." This would not only make peer-to-peer payments and sharing between different parties trusted and secure, but would also make use of objects in the physical reality, e.g., rent office space, smart objects (smart locks, smart homes), etc. To this end and due to the cross-sector potential of their solutions, the company has built varied partnerships in the energy, ICT, and automotive sector, with smart home and object manufacturers, cryptocurrency businesses, hotels, and startups.

Other applications such as BlockPay[40] can change the way consumers interact with services and pay. The German blockchain startup offers a free and secure mobile point-of-sale (POS) based on blockchain through an Android app. It provides a "platform" for mobile payments in multiple digital and cryptocurrencies with a combination of blockchain and QR codes. This offers a convenient, traceable solution with embedded privacy-by-design features for consumers who can use the application for services across sectors, e.g., e-commerce, hotels, groceries, retail etc.

26 https://www.google.com/search?q=smart+mobility&sourceid=ie7&rls=com.microsoft:en-GB:IE-Address&ie=&oe=&gws_rd=ssl

27 https://econsultancy.com/blog/10852-12-reasons-behind-amazon-s-massive-mobile-success/

28 https://www.theguardian.com/business/2016/dec/05/amazon-go-store-seattle-checkouts-account

29 http://www.europarl.europa.eu/RegData/etudes/STUD/2016/556949/IPOL_STU(2016)556949_EN.pdf

30 https://www.blablacar.co.uk/faq/question/what-is-blablacar

31 https://www.blablacar.co.uk/about-us

32 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016DC0288

33 http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0031:en:HTML

34 https://e-estonia.com/e-residents/about/

35 https://guardtime.com/about

36 http://www.businessinsider.com/guardtime-estonian-health-records-industrial-blockchain-bitcoin-2016-3?r=UK&IR=T

37 https://guardtime.com/technology/ksi-technology

38 https://slock.it/faq.md#a1

39 https://slock.it/ethereum_computer.html

40 https://blockpay.ch/