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# Digital sovereignty in the context of platform-based ecosystems

*The Digital Sovereignty Focus Group of the Innovative Digitisation of the Economy Platform for the 2019 Digital Summit*

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## Summary

Digital platforms are a fundamental element of the economy, media, government and society. They have developed into complex ecosystems and can transform and disrupt existing markets or create entirely new ones. However, Germany and Europe seem to have fallen far behind global developments in view of the strength of U.S. platforms and Asian companies. The rising significance of digital platforms and their increasing influence on the ability of the state, companies and society to communicate, do business, and be innovative in the broadest sense is creating a growing need to safeguard the digital sovereignty of the platform users (generally individuals, state entities, companies). Also, the fundamental capacity to develop and operate digital platforms of one's own is an expression of digital sovereignty. Without it, Europe is losing the possibility to control data flows and potential value creation in many fields of the digital transformation, with a concomitant risk of fundamental consequences for value creation and prosperity. In view of the radically changing, almost incalculable geopolitical shifts, democratic values and the stability of our political system will potentially be at risk if none of the platforms used for communications, the trading of goods and sharing of information can be controlled in Europe.

However, there is an opportunity for Germany and Europe to determine proactively the societal, scientific and/or commercial fields in which platform-based ecosystems should or must be developed and operated. For these areas in particular, it is necessary to establish market conditions which place the focus on and protect the digital sovereignty of the individual, of companies and research institutions, and of the state. These market conditions must fit in with Europe's humanist and federal tradition, and anchor digital self-determination as a fundamental pillar. They must foster distributed data storage, independent of central instances, and promote the free use of self-generated data. In this way, they lower barriers to market access, safeguard potential for innovation, and mitigate the "winner takes it all" effects prevalent in digital platforms. They are more suited to economic systems dominated by small and medium-sized firms, competition and innovation without limiting the major opportunities related to platforms – e.g. in terms of growth and the creation of new markets and technologies.

Key elements of such market conditions are the direct right of self-determination regarding the use of data generated via interaction with a platform, and the possibility to use such data oneself or to easily provide them to third parties. This in turn necessitates transparency, predictability and verifiability of the processes used to handle the data and which create new data. Data sovereignty is a fundamental aspect of platforms 'Made in Europe'

In principle, a balanced regulatory framework is needed for successful platform-based ecosystems which both fosters the emergence of digital platforms in the EU and prevents abuse of market power. With a view to global competitiveness, companies need to be able to cooperate more easily, especially with their competitors. In the field of platforms for interactions between different companies, there is also a need for participatory processes for the design of platform rules and – as with the internet – a federated structure which permits the operation of parts of platforms under one's own control without being excluded from other parts and thus from the overall benefits of the platform. Such conditions offer the chance to use federated multi-cloud technologies in Europe to establish platforms which in the medium-term at the latest will be able to compete with U.S. and Chinese platforms. With a view to digital sovereignty, it is necessary both to strengthen the European provider community and to build up the *lex loci* principle. In order to achieve these goals, it is vital for European digital sovereignty that the state itself act as a lead client for corresponding solutions.

# 1 Introduction: Digital sovereignty in the context of digital platforms

Within a very short time, digital platforms have become a fundamental element of the economy, media, government and society. They provide a channel to goods, services, content, information and data by bringing supply and demand together more efficiently than traditional business models. Emerging from technical platforms, they have developed into complex ecosystems and can transform and disrupt existing markets or create entirely new ones. Not least, they can put business partners – and people – in contact with one another who would never have met up on highly fragmented markets and they thus offer enormous opportunities.

However, Germany and Europe seem to have fallen far behind global developments in view of the dominance of U.S. platforms, and this is being exacerbated by the rapid growth of platforms based in Asia. In the business-to-consumer (B2C) context in particular, it is difficult to deny the existence of a very great dependency of users on non-European digital platforms. Despite this, the debate about digital sovereignty should not focus solely on social media and B2C platforms. Germany and Europe are highly successful, particularly in the development of industrial platforms.

The rising significance of digital platforms and their increasing influence on the ability of the state, companies and society to communicate with and amongst one another, do business, and be innovative in the broadest sense is creating a growing need to safeguard the digital sovereignty of the platform users (generally individuals, state entities, companies).

Also, the capacity to develop and operate digital platforms of one's own is an expression of digital sovereignty. Without this capability, Europe is losing the possibility to control data flows and potential value creation in many fields of the digital transformation, with a concomitant risk of fundamental consequences for value creation and prosperity. In view of the radically changing, almost incalculable geopolitical shifts, democratic values and the stability of our political system will potentially be at risk if none of the platforms used for communications, the trading of goods and sharing of information can be controlled in Europe.

Accordingly, the "Digital Sovereignty in a Connected Economy" Focus Group considered the key question of what legal framework is required for platform-based ecosystems so that they can boost digital sovereignty in Germany and Europe. This publication concentrates on the policy and business aspects rather than the digital sovereignty of the individual.

There is an opportunity for Germany and Europe to determine, on the basis of a set of principles which still need to be defined, the societal, scientific and/or commercial fields in which we want or even need to develop and operate platform-based ecosystems. For these areas in particular, it is necessary to establish market conditions which place the focus on and protect the digital sovereignty of the individual, of companies and research institutions, and of the state. These market conditions must fit in with Europe's humanist and federal tradition, and anchor digital self-determination as a fundamental pillar. Germany and Europe will need to develop the infrastructure and regulatory framework for this in the coming years and create the preconditions to train people in the skills we need.

# 2 Definition of terms and market definition

## 2.1 Platform-based ecosystems

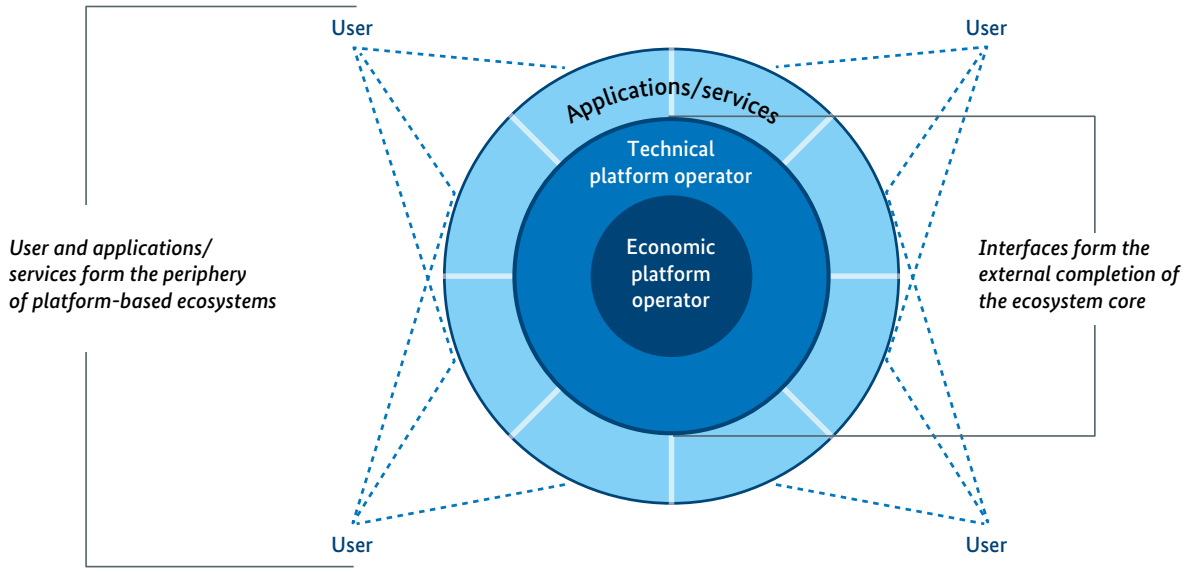
The definition of digital ecosystems which underpins the concept of "platform-based ecosystems" draws on the metaphor of natural ecosystems as a defined habitat for a diversity of organisms and their environment. Working from this, platform-based ecosystems can be "defined as definable value networks based on an existing [technical] network architecture". (Schauf, 2012).

In many cases, platforms are built and operated in order to create new business models. This is particularly true of platforms in the B2C sector: they are created and operated by organisations motivated by the desire to implement the related business model. So the motivation, realisation and operation rest with the same actor.

However, there are also other models, particularly in the B2B sector, where for example the motivation for the establishment of a platform is to be found in the desire for secure communications or secure transfer of data and goods. Such platforms may be initiated by, for example, industrial consortia via associations or cooperatives. One company is then commissioned with the realisation and operation, and acts as the technical platform provider.[1] It therefore makes sense to distinguish between technical and economic platform operators.

Economic platform operators (which include public-sector operators) are actors whose motivation is the existence of the platform per se, and who have an economic interest in defining the rules for interaction with the platform and its technical design. In contrast, technical operators are actors who provide the technical structure, the implementation and the smooth operation of the IT infrastructure and its interfaces for the platform. Together, they form the core of platform-based ecosystems. Other typical actor levels (periphery) are the providers of content, goods or applications, and the users. Interactions between and within digital ecosystems are, where desired, made possible by interfaces and standards (cf. Fig. 1).

**Figure 1: Schematic depiction of a platform-based digital ecosystem[2]**




Source: in-house diagram based on Baums (2015), Dobusch et al. (2012), Schauf (2012)

1 Examples of this include the ENX Association, which is organised by the automotive industry, or the Swiss Midata cooperative, which stores and provides medical data.

2 Source: in-house diagram based on Baums (2015), Dobusch et al. (2012), Schauf (2012).

A common feature of all platform-based ecosystems is that their technology is based on digital platforms. These support the secure and trusted completion of transactions to provide, acquire or use goods, services, content, information and data between people and/or technical systems.

### 2.2 Digital sovereignty

Back in 2015, the "Digital Sovereignty in a Connected Economy" Focus Group considered the concept of "digital sovereignty". Then as today, "the concept of sovereignty [should be understood] initially to mean in general terms the capacity for self-determination which finds expression in independence and autonomy. [...] In this sense, digital sovereignty means the capability to determine how one acts and takes decisions in the digital space." (National IT Summit, 2015).

Since then, the concept has been defined in greater depth, and digital sovereignty has been categorised as an aspect of general sovereignty. As a result, the handling of data and the issue of core technological capabilities became even more of a key issue at the 2018 Digital Summit: "The digital sovereignty of a state or an organisation inevitably consists of the complete control over stored and processed data and the autonomous decision on who is allowed to access it." (Digital Summit, 2018) This also includes the "capability of independently developing, altering and controlling technical components and systems, and supplementing them with other components." (Digital Summit, 2018) The aspiration of digital sovereignty is not based on one-zero logic, but allows for graduations. A strata model was developed in line with the criteria identified in 2018 (cf. Annex).

Digital sovereignty is an indispensable precondition for independent action by the state and the commercial sector. It fosters economic viability, competition, agility and the capacity to handle risk. States and organisations that enjoy digital sovereignty can act more freely on the market as they are less dependent on manufacturers or suppliers. At the same time, due to lower market access barriers, digital sovereignty makes it possible for companies/organisations to act more successfully as suppliers in digital ecosystems, and thus to gain scope to innovate and shape developments. Overall, systems, processes and interactions can be adapted, developed and, where necessary, substituted more easily.

## 3 Types of platforms and business models

There is an infinite variety of digital platforms. Some offer only the services of the platform operator, others mix these with services provided by third parties. Pure intermediary platforms only market goods, services, content, information and data of other providers.

Platforms can act as intermediaries between companies (B2B), companies and end-users (B2C) or only between private individuals (C2C). They either collate all the information in a central database or integrate distributed services and data to form a virtual platform. In so doing, they may take on responsibility for transaction services, such as price negotiation, conclusion of contracts, invoicing, shipping or customer service. They stipulate conditions for use and thus provide the framework for interaction with users. Digital products, services and (industrial) production thus come closer together, are linked up via interfaces and made available by intermediaries acting as gatekeepers (technically, via platforms). This means that the platform operator acquires additional information, e.g. about transactions, users and usage patterns. The operators can use this information to develop both platforms and services, thus making them more attractive. The consequence is even faster growth. A network effect is that each additional user (e.g. buyer, seller or communication partner) enhances a platform's benefits and attractiveness.

These effects are mutually reinforcing and can result in dominant positions. Where markets are dominated by individual actors, there is the possibility that very high entry barriers will arise for potential new providers. It is then necessary to carefully examine whether fair competition remains possible and how market entry barriers can be removed.

## 3.1 Walled gardens – one-stop shops

"Walled garden" is a term for a business model which describes a platform curated and designed by a central instance. The concept relates to a business model in which the operator retains control over, for example, the software which can be used via the platform, over mobile terminal equipment (or hardware in general) that can be used and over content, and makes the platform available on a partly exclusive basis, i.e. only to a specific group of clients.

In comparison with the traditional, platform-neutral internet, the development of walled garden strategies is driven primarily by aspects like convenience, security[3] and monetisation. Based on the knowledge about the consumption patterns of the clients, tailored suggestions for, e.g., books, music, films etc. are sent out, and the networking of complementary services also boosts the benefits accruing to the consumers. The related user-friendliness and time-saving also increases the willingness of the users to spend money.

However, in many cases walled gardens stand in contradiction to the interests of the developers and users, who would like to be able themselves to control the hardware and technology they have purchased. This means that walled gardens potentially also contradict the aim of individual digital sovereignty and the commercial freedom of suppliers. After all, services in walled gardens are designed in such a way that switching to another platform can be relatively time-consuming and cost-intensive. Both lock-in effects and the cost of switching play a role here.

Closely related to walled gardens, there is also the one-stop shop principle. This uses a large number of algorithms to create offers that are as tailored as possible, serving the respective customer's needs from a single source (e.g. recommendation algorithms on trading platforms). But this also means that things that are not actively displayed to the platform user may go unnoticed. At the same time, the products and services are networked in such a complementary way that, for example, logistics, payment and after sales processes are set in motion digitally, in parallel and end-to-end – without the customer having to deal with the individual steps. The more automated and convenient the individual steps of the process are on a platform, the less willing the consumer will be to accept that they have to go to their bank (e.g. online banking) for the final step, i.e. the payment. Convenience, security and the "everything from a single source" principle is increasingly becoming accepted as a guarantor of success and a business model. This means that value chains are becoming shorter and, indirectly, supplier diversity is suffering. In terms of digital sovereignty, it means that ongoing market concentration is further restricting the possibilities for the individual to switch platform and provider.

## 3.2 Monetisation and customer retention

The monetisation strategies listed below show what tactics are deployed by successful digital ecosystems in order to tie in what can be billions of customers and to make the platform attractive also for services provided by third parties.

3 Also, the more isolated an ecosystem is from the rest of the internet, the easier it is to block malware and other security risks.

### Transaction and membership fees

The simplest and most common way of monetising platforms is to charge membership and transaction fees. Both are widespread and easily used in the B2C and B2B sector. In the case of membership fees, the platform users have to pay a regular amount which permits them to use the platform; in the case of transaction fees, the platform operator receives a fixed fee or a percentage of the purchase price for each transaction facilitated by the platform. In many cases, there is a combined model in which a membership fee is charged for access to the platform and a fee is then paid for each transaction or for each transaction above a basic volume.

### Advertising-based financing

A common alternative to transaction and membership models in the B2C sector in particular is the advertisement-based financing of platforms, in some cases based on data-driven customisation. The users of the platform (generally, consumers) can use certain services for free, such as internet searches, email or communications via social media. They are then shown advertising, which is used by the operator to finance the platform. In many cases, these models are highly successful because the data generated by the way the consumers use the platform enable advertisers to target specific groups very precisely. The advertisers pay for indirect (in most cases) access to profile and user data of the consumers, and can use this data to target specific groups.

Some platforms also offer a combination of advertising-funded and membership-funded monetisation: consumers are given the possibility to pay for the services they use themselves, cutting out the advertising.

### Interoperability and interface policy (APIs)

Interoperability[4] between heterogeneous technical systems has always been a principle underpinning the development of the World Wide Web. Platforms use application programming interfaces (APIs) to tie third-party providers with complementary (niche) products into their own ecosystem. Many of these are open in terms of their technical specifications. At the same time, however, the platform operator stipulates whether and at what conditions an interface to its platform can be used. Where such APIs are provided by a number of different platform operators, this reduces such dependencies, as is the case with the open internet standards.

The provision of APIs offers two crucial advantages for platform-based ecosystems. Firstly, the external applications create new ways for the users to benefit from the platform, and this makes the platform itself more attractive. At the same time, the platform operators tie the developer community to it and create additional lock-in effects.[5]

Openness and interoperability foster innovation, particularly in the field of information and communication technology (ICT). At the macroeconomic level, they can result in more efficiency, productivity and economic growth. As platform-based ecosystems develop further, it is important to ensure that, in the case of diminishing interoperability, suppliers on the margins of a platform are not displaced by commercial platform operators, so that the self-determination of the users also diminishes.

### Lock-in effect and costs of switching

A lock-in strategy aims to establish a technological connection between the hardware and software on offer and the many different internet services in order to tie the customer even more strongly to a specific

4 Interoperability means the capability of different systems, technologies and organisations to work together. This usually requires compliance with common standards. When two systems can be used together, they are “compatible”.

5 However, the ecosystem more or less determines the direction of development, because in many cases it can draw on a loyal base of millions of customers and point to high market shares, whilst third-party providers can benefit from the infrastructure made available and especially from the data of millions of customers.

platform. Within an ecosystem, the lack of interoperability, proprietary interfaces and differing technological standards will make it increasingly difficult for consumers to use services provided by third parties which do not comply with the standards and restrictions of the ecosystem. This means that switching to a different ecosystem can be an expensive business because there are no interfaces or technological standards to link up the various services or the terminal equipment.

#### Cross-subsidisation

Cross-subsidisation is another (monetisation) strategy. Here, individual business fields or product ranges are subsidised by other business fields/products. The providers offer incentives to purchase by cutting prices for specific products, e.g. mobile terminal equipment, in some cases right down to their own costs. In this way, they can undercut competitors and expand their market shares. Most smaller suppliers are unable to afford this (in the long term). In certain cases, the sale of the initial product (e.g. the mobile terminal equipment) primarily serves the downloading of content which has to be paid for, and which is purchased downstream. In this way, the marketing of content becomes the actual business model.

The principle of cross-subsidisation is not new, and can also be found outside the digital sphere. However, there can be antitrust issues if it is deliberately used to force smaller competitors out of the market in order to attain a dominant position.

#### Strategic alliances

Digital ecosystems are increasingly interacting with one another. A likely future development is a growing willingness of the stakeholders to engage in further strategic alliances with one another or with third parties at suitable programming interfaces in the value network. This creates synergies and overlaps in terms of size, range, customers and potential integration. This makes many things much easier for the users. The PC and its operating system become less and less visible, whilst the ecosystem as a whole becomes more prominent, with its large number of internet services. However, the simplicity and the user's desire for convenience lead to an oligopolistic structure of the digital ecosystems.

### 3.3 Digital ecosystems in the international comparison

Studies into the development of the platform markets suggest that Germany and Europe are lagging behind, particularly in comparison with the developments in the United States and Asia.[6] In addition to leading platforms in specific niches,[7] SAP is the only operator of digital platforms from Germany which can be regarded as a global player in terms of its market value. The global distribution shows a much greater concentration of digital platforms in the United States and Asia. This should certainly be regarded as an alarm signal, especially as various effects mean that large platforms tend to grow further and move into different commercial areas.

The primary goal here does not have to be to produce platform operators whose market value withstands comparison with large listed internet companies. Rather, it is more important to enable platforms to emerge which safeguard digitally autonomous action by the state, companies and individuals in Europe on a long-term basis and whose economic added value is at least equivalent to that of platforms under the control of U.S. and Chinese companies. Such platforms foster the innovative capabilities and competitiveness of European companies irrespective of whether they are operated by a single company with a high market value or jointly by several organisations. It is more important that it essentially remains a platform that is open (to interfaces) and should have federated architecture.

6 Cf. e.g. Schmidt (2019), Schössler (2018).

7 For example, the AMADEUS IT Group is the world's leading B2B platform for travel bookings (market capitalisation currently stands at €29-30bn).

The current distribution of the most highly valued platform operators is thus also an opportunity for future developments in Germany and Europe. This is because, whilst far more consideration needs to be given in the United States and Asia to the established business models of the platform operators based there, we in Germany and Europe have the change to shape the market in line with our own principles, and in so doing to utilise the advantages of the platform economy whilst limiting associated risks. The aim should be to establish a European market and development framework in line with European values. These particularly include practicable data protection, innovation processes independent of "central instances", low market entry barriers and thus faster innovation cycles and more competition. If this succeeds, there is a real possibility that platforms emerging in Europe and based on a stable *lex loci* principle can also be successful in other markets because these markets also take over the regulations and European standards since they are highly attractive for everyone involved, offer legal certainty and lend an increasingly European orientation to the development of commercial law.

If, against this background, the overarching goal is to establish more platform-based ecosystems in Europe, two questions arise: what are the principal requirements and policy aspects for the technology and market framework which can enable European platforms to be established, thus boosting digital sovereignty (Section 4) and – building on this – where are there specific areas, not least in view of the existing policy environment, to foster this development (Section 5)?

# 4 Basic requirements for the technology and market framework

## 4.1 Requirements for the technology framework

The business model, interfaces, possibility to access data and transparency are not the only aspects affecting the degree of digital sovereignty permitted by a platform. Technical criteria which are preconditions for digital sovereignty in the context of digital ecosystems can also be defined.

### Hardware and software sovereignty

One precondition for digital sovereignty is attained when there are **several solutions** offering comparable **performance** by the hardware and software needed for the operation of a platform. They must derive from known, trusted sources and full **documentation** must enable the functions contained and the underlying technologies to be **transparent** and **understood**. The availability of and the possibility to use the source code, along with descriptions of architecture and interfaces in combination with **modularity** and the use and **support of established and open standards** generally boosts the independence of the platform's technical and commercial operator from the platform's developers. The technical platform operator in particular thus gains the possibility to undertake his own changes and additions to the functionality. Open, standardised interfaces to **data portability** can also ensure that the platform can, if necessary, be transferred to another organisation located in a different place.

### Sovereignty in terms of the platform environment

A platform's location and computer centres are an important factor for digital sovereignty. Here, an important role is played both by the physical location of the platform's hardware as well as by how trusted and independent both the infrastructure operator and the platform operator are. They determine the permanent technical availability of the platform and its services and affect the level of protection against cyber attacks, against physical access by criminals, and against (foreign) state actors. Ultimately, Germany and Europe therefore need to aim to have a site within their own borders for the necessary infrastructure of particularly critical platforms or for platforms of special political, economic or geostrategic significance.

Irrespective of the site, there will be no digital sovereignty if the platform operator or the hardware and software providers used by it are able to include legal or illegal backdoors and additional functionalities in the system which are not visible to the users and thus go unnoticed.

### Data sovereignty

Data sovereignty exists when the rights to dispose of and use data, i.e. access, transfer, processing and analysis, ensure self-determined action at each value creation level. This includes, for example, the possibility, on a contractual basis, to include or exclude third parties from access to data, and to permit or prohibit the linkage of different data or and the processing and analysis of data.

Digital sovereignty requires full control over self-generated data on a platform. This not only includes the knowledge of what user-related data are actually available, but also the possibility to transfer all data to a different operator's platform, to grant third parties access to it, or to partially or entirely permanently delete the data.

### Making federated platforms possible

Federated platforms enable users to store data under their own control and to choose the platform operator, and to share the data in a controlled way with other parts of the platform operated by other operators. This type of platform therefore not only offers full data sovereignty, but also innovation and value creation independently from a central operator instance, and more funding should go towards the development of it. This sort of software architecture, which permits the autonomous sharing of data, is the foundation of the internet and is being developed and implemented by, for example, the International Data Spaces Initiative[8]. This architecture makes it possible to safeguard data sovereignty, i.e. the self-determined sharing of data between trusted partners. Géant's Open Cloud Mesh Initiative is another example.

## 4.2 Requirements for the market framework

One important component of digital sovereignty in the context of the platform economy is the capability to initiate or participate in digital platform-based ecosystems, to foster rapid growth, and to steer it in such a way that digital sovereignty is upheld. This particularly means preventing the emergence of impenetrable market entry barriers. This requires a market-based environment which fits with the typical features of platform-based ecosystems.

### Network effects and first-mover advantages

Ecosystem-based platforms rely on the existence of network effects. Every additional user or provider of complementary apps or services boosts the usefulness for the other users and thus the economic value of the platform-based ecosystem. In addition to the quality and attractiveness of the services, rapid attainment of a critical mass is a major factor driving success – in terms of available information and services, and particularly of users. If this is successful, *de facto* standards can be set, e.g. first-mover effects can actually be realised, and the platform-based ecosystem established.

The same is true in the B2B sector of, for example, industrial platforms or data-sharing platforms: the more information available, and the faster it is available, the greater the economic value for the participants. By way of example: An IoT platform collects big data in the factory and machinery environment and evaluates it. The IoT platform or the integration modules are offered not only to the original companies, but potentially to all manufacturing companies or manufacturers of machinery. Each company which provides its data or a suitable software application increases the value of the platform itself.

8 The Industrial Data Spaces Initiative creates a secure data space so that connected companies from any sector can manage their data autonomously. Further information at https://www.internationaldataspaces.org/.

### Cooperation with competitors

In many cases, the stakeholders in an ecosystem are competing horizontally or vertically with one another. At the same time, they are cooperating with one another on the platform in order to share data and tap the potential of the platform economy.[9] As a consequence, cooperation between companies in the field of data sharing and the development of new platforms is becoming increasingly important. In some cases, such cooperation is necessary so that a platform can be established or so that companies can participate in a platform. This implies that cooperation should be permitted, or not impeded, by rules and regulations.

### Data access

Access to data is a key factor in the platform economy – irrespective of which actor actually holds the data. Ultimately, it is about the platform generating added value for the clients, from which all the actors on the platform can benefit. This only succeeds if the actors cooperate with one another and are willing to share the data freely or on the basis of fixed criteria and contracts.

All of the actors in these systems thus need legal certainty about the way in which they can use data and the extent to which their business models comply with data protection rules, business confidentiality rules, and transparency requirements, or even offer added value. Here, it should be possible for the users of the platform to decide themselves where the data they provide are stored, and even to control the storage space used.[10] For example, users could give third parties access to the data they generate so that the third parties can create their own services. Market entry barriers would be lowered, and the digital sovereignty of the platform users would be boosted.

### Capitalisation

Access to venture and growth capital is crucial for young platform economy companies in particular. This is because many platforms and their ecosystems only attain commercial viability when they exceed a critical mass, e.g. of market penetration or participants. The capitalisation of platforms must therefore be thought through on a structured, case-by-case basis.

## 5 Specific requirements to be met by a sovereign marketplace in Europe

The Digital Sovereignty Focus Group is particularly thinking of the German EU Council Presidency in the second half of 2020, and has specifically oriented the desire for sovereignty to the further development and completion of the Digital Single Market in the context of the international markets. This is of especial importance, since it is of a comparable size to other markets, such as the United States or growing Asian markets.

Basically, there should be a societal dialogue about the fields in which a high degree of digital sovereignty in Europe is needed. This is not only about critical sectors whose functions affect public services or public security[11], but also about what lead industries and markets need to be covered. In order to foster the development of platform-based ecosystems in the single European market beyond this, various steps and measures are needed to address both the regulatory framework and also funding policy, project development and skills development.

9 In the literature and in business life, the talk is of “coopetition” – a combination of cooperation and competition. Cf. e.g. Brandenburger/Nalebuff (1997).

10 Platform operators could be required to provide APIs via which the data generated by a user are stored in real time. Then, other providers could build storage systems which support these APIs and give the users the possibilities to evaluate the stored data themselves or to make them available to third parties. An example of this in the medical field is Midata (www.midata.coop/).

11 For example, digital sovereignty is needed for communications and data storage by the state, administration and commerce, for systems to control electricity and communications networks, for medical systems and – much more in future – for the storage and use of the data generated by the business sector.

## 5.1 Regulatory framework

In principle, a balanced regulatory framework is needed for successful platform-based ecosystems which both fosters the emergence of digital platforms in the EU and prevents abuse of market power. Here, it is necessary to ensure that specific provisions regulate the same things in the same way and different things in different ways.

### Strengthening of the European provider community – building up the *lex loci* principle

It is necessary to build a European cloud infrastructure in order to retain European knowledge and data sovereignty in the field of digital platforms. The idea is not a rejection of the proprietary standards of international hyperscalers, but rather the definition of further – better – alternatives ("federated multi-cloud solutions") on the basis of our European security standards and values. This is also in line with the European approach to competition. A key first step in this direction can be the establishment of a federal cloud operated by the authorities.

Irrespective of this, the state has an important role to play as a supplier and user. For example, states have a need to use the large quantities of data generated by authorities, health services, the transport sector, etc., and can define requirements which protect European data sovereignty and European security interests. The same goes for school-related data generated, and increasingly held on platforms, by pupils and teachers.

It must be possible in the single European market to ensure fair and equal conditions for all stakeholders and to prevent fragmentation. A regulatory framework is required for this – at the national, European and also international level. This entails the anchoring of governance rules and the development of the innovation system, as well as the reflection of aspects of data autonomy and security, and the interests of employees and individuals in general. However, private-sector investment must not be suppressed by excessive interventionism by the state.

### Data sovereignty: an enabler for platforms "Made in Europe"

The European Commission and the Member States must lead by example in the way they handle and protect the data of citizens, business, and the public administration. This will also require additional rules[12] to protect European data against access by foreign security authorities. The EU countries must help establish European federated multi-cloud and edge-cloud solutions so that digital platforms "Made in Europe" can make use of these. Here, a model might help in which, in addition to the storage necessary for the operation of the platform services by the platform operator at a freely chosen site, the users can prescribe an additional freely chosen site within the EU for storage of data they generate themselves. It is necessary to push hard to encourage corresponding projects – like GAIA-X – which support the establishment of such architectures.

### Fostering interoperability and strengthening the *lex loci* principle

The flexible networking of different stakeholders to form agile value networks within and between platform-based ecosystems is one of the core building blocks of digital business processes. A high level of interoperability is required to ensure the direct networking of operations and processes across companies and sectors, and permits unrestricted participation in digital value networks and thus also the development of new business models.

However, even in cases where a platform operator controls the interface and thus *de facto* controls market access, competition can work as long as third parties enjoy non-discriminatory access. In order to ensure

12 There is a need for, for example, clear rules on the handling of backdoors or the misuses of screen readers.

fair and equal conditions for all stakeholders, a regulatory framework[13] is required – at the national, European and also international level. This entails the anchoring of governance rules and the development of the innovation system, as well as the reflection of aspects of data autonomy and security, and the interests of employees and individuals in general. However, private-sector investment must not be suppressed by excessive interventionism by the state. Once again, there is a need here to ensure fair and equal conditions for all the active stakeholders in the single European market.

### Facilitation of models enabling cooperation with competitors

If platforms are to be (rapidly) developed, there is a need for competing companies to work together. The aim has to be that companies are able to devote reasonable resources to a variety of forms of cooperation. This requires legal certainty, because lack of legal certainty creates a barrier both for efforts to cooperate and for innovation in general. Specifically, there are two main approaches here. Firstly, consideration of the work currently being done by the European Commission on competition law to promote cooperation on the development of platforms.[14] In addition to this, there should be a targeted information initiative about the existing possibilities for the Bundeskartellamt or the European Commission to scrutinise individual cases of cooperation. It also seems worthwhile taking recourse to existing successful examples here.

### Countering abuse and promoting data portability and interoperability

Increased tendencies towards concentration on digital platform markets are creating a need for speedier proceedings to tackle abuse of dominant positions, with a clearer focus on conglomerate effects.[15] In this context, it is worth mentioning the example of leveraging, i.e. the transfer of market power from a dominated market to another market, or targeted mergers and acquisitions.[16]

There is a need for further developments in the oversight of abuse of market power in order to establish a stable and modern basis for improved and expedited decisions. In cases of abuse of dominant positions or market failure, in addition to existing competition rules, it is necessary to give consideration to whether and to what extent regulation is required to ensure further-reaching data portability in order to offer an opportunity not least for smaller, innovative providers to compete.[17] From the perspective of competition law, it would seem useful to update antitrust law specifically for platforms which are important gatekeepers and which dominate the respective market. In line with the report by the Commission 'Competition Law 4.0', it is worth considering the imposition of particular conduct obligations for these cases.[18] Further to this, the flexible networking of different stakeholders to form agile value networks within and between platform-based ecosystems is one of the core building blocks of digital business processes. A high level of interoperability is required to ensure the direct networking of operations and processes across companies and sectors, and permits unrestricted participation in digital value networks and thus also the development of new business models. In network and platform industries, the lack of interoperability of products is in many cases the reason why lock-in effects emerge, and these can present a high barrier to switching to competitors.

### Improved data access

In overall terms, the EU has developed a positive example of lex loci-oriented policy in the General Data Protection Regulation. Nevertheless, the distribution of market power, particularly in the B2C sectors, has shifted further towards providers, mainly from outside the EU.

13 In principle, a market framework needs to ensure that the same things are regulated in the same way, and different things are regulated differently. The regulation of messenger services illustrates this. Whilst SMS services, for example, are covered by the Telecommunications Act, other messenger applications are not subject to such regulation.

14 The report by the Commission 'Competition Law 4.0' (cf. BMWi (2019), pp. 59ff.) contains detailed ways to avoid lack of legal certainty and to foster cooperation between companies.

15 Conglomerate effects particularly result from business practices like the strategic purchase of small platforms, leveraging, or discrimination against other market players, and make it possible to extend or transfer market power from one market to another.

16 Cf. BMWi (2019), p. 19.

17 Cf. BMWi (2019), pp. 34ff.

18 Cf. BMWi (2019), pp. 52ff.

In order to promote the establishment of platform-based ecosystems from within the EU, data protection rules must be developed, and data access and availability must be enhanced, taking risk-based approaches and giving consideration to the individual's need to be protected. One way forward would be the granting of permissions which facilitate the targeted processing of pseudonymous data sets whilst maintaining the entitlement to data protection. It is also necessary to discuss whether and in what specific fields there is a possibility to deregulate existing requirements – e.g. for health data in medical AI research.

## 5.2 Funding and project development

### R&D funding for distributed and federated platforms

Distributed and federated platforms ensure that use can be made of the platform principle whilst preventing data concentration and the formation of monopolies. They thus contributed actively to data protection. Since they buttress several aspects of digital sovereignty, a great deal of funding should be provided for research into and development of them. This R&D funding should embrace the necessary basic technologies, such as edge computing, and the technologies which build on this, e.g. distributed learning processes. Important network effects can also be achieved via the funding of standardised open interfaces, such as IDS connectors[19], and their targeted dissemination, so that authorities, companies and other organisations can share data autonomously.

This is particularly true of technologies made available under open source licences. These can be used independently of the original developer by many market participants, and thus make the European market in general more competitive. In the same way, the manner in which the development of the basic technologies of the internet was funded by DARPA and NASA and made freely available was a key factor driving the success of the internet companies in Silicon Valley. Funding should therefore go in particular to corresponding licensed technologies.

### Separation of technical and commercial operators

In order to support a rapid development of platform-based ecosystems, funding programmes should aim to support open interfaces, since only these can enable cross-platform growth. Also, separate funding should be possible for technical and commercial operator models. This is because the more technical resources there are available on the market, the greater is the likelihood that platform-based business models will be built up and expanded. Coupled funding, in contrast, would slow down the process of innovation, since small and medium-sized enterprises, for example, would have to start by laboriously acquiring technical expertise.

### Promotion of "standards Made in Europe"

Targeted funding of research and development work into open data interfaces and the development of open and interoperable distributed platforms and services helps to establish a leading role for Europe with a counter-model to the closed industrial consortium standards set by industry, building on consensual and transparent standards as an international market advantage. Not least, this can be supported by standardisation mandates from the European Commission to the European standardisation bodies.

### Model public-sector projects

Digital sovereignty is also of particular strategic importance in terms of the information technology of the Federation, Länder, municipalities and other public-sector bodies. Here, again, these bodies can serve as role models. Following the consolidation of the Federal IT, further synergies need to be tapped via a further packaging and concentration of information technology and the use of new technologies like cloud and edge computing which fulfil criteria like openness and federation with a view to permanent digital sovereignty. The upholding of the security interests of the public sector must feed into this and will not lessen the role model function.

19 International Data Spaces; cf. also International Data Spaces Association (2019) and www.internationaldataspaces.org.

Such an approach delivers additional added value for the digital sovereignty of Germany and Europe, particularly where the public sector uses its power as a buyer to live up to its responsibility. This requires support and requirements for the widespread use of standardised interfaces so that authorities, companies, organisations, etc. can network themselves securely and share data autonomously. In order to realise economies of scale and network effects, and to press ahead with *de facto* standardisation, interfaces offering data sovereignty must be made a compulsory part of the specifications of public-sector tendering processes. This will require the establishment of uniform and interoperable formats for the sharing of non-personal data. Data services and applications must be made available for use in an exemplary way via tender procedures, public notices and competitions. Here, it is important to incentivise data services via competitive tenders or to increase awareness of and give recognition to successful services via award ceremonies. The same applies to exemplary use cases.

### Development of the necessary skills

In order to promote platform-based ecosystems to strengthen digital sovereignty at European level, it is necessary to be able firstly to understand, and secondly to assess in terms of digital sovereignty the underlying technological and market-based principles and preconditions for platforms as sketched out above. The skills required for this must be built up accordingly.

## Table: Criteria for digital sovereignty in terms of platforms

| Degree of digital sovereignty / Categories of digital sovereignty | low (= high dependency) | medium | high (= no dependency) |
|---|---|---|---|
| **Data** | The platform operator decides which data it provides to whom and how it uses them itself. | Users have full control over who has access to data and can delete the data at any time. | Data can be read, altered and deleted by the user, irrespective of the technical platform. User is free to select the place of storage. |
| **Distribution and federation** | Platform can only be operated by one commercial operator. | Under certain conditions, instances of the platform can be controlled and operated separately. | Instances of the platform can be operated without any need for approval by a central organisation. |
| **Interfaces** | No or only proprietary interfaces available | Support for a large number of open standards and interfaces | Access to all data and functions via open, freely available interfaces with open source reference implementation |
| **Software for the operation of the technical platform** | Software is not available as a source code or in binary, it is only available to the platform operator. | Software can be run and controlled independently of the platform operator or by a different operator. | Source code of the software can be altered or can be used in altered form, independently of the platform operator. |
| **Hardware/technical platform** | Commercial operator must purchase technical solution from outside the EU. | Existing non-EU solutions can be supplemented by EU developments. | All the technical components can be developed and provided in the EU. |
| **Technical control** | The platform is only available from a single provider, there is no possibility to exercise control or to migrate. | Users control important parts and can migrate these to others, the establishment of a self-operated solution is possible. | Users exercise control over all components (source code, hardware, ...). |
| **Skills** | Virtually no understanding of principle, preconditions and underlying technology; focus is on applications. | Understanding of principle, preconditions and technology basically exists; in particular, ability to assess existing players. | Ability to understand the principles, preconditions, technological interrelationships, to assess existing players exists and is available. |
| **Jurisdiction** | Platform is subject to non-EU law. | Platform is subject to non-EU law, but there are robust contracts which ensure compliance with European standards. | Platform is located in Germany or the European Union and is exclusively subject to this jurisdiction. |

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