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Wolfgang Kerber: "Dynamic Competition, Digital Ecosystems, and Competition Policy"

The Network Law Review is pleased to present you with a Dynamic Competition Initiative ("DCI") symposium. Co-sponsored by UC Berkeley, EUI, and Vrije Universiteit Amsterdam's ALTI, the DCI seeks to develop and advance innovation-based dynamic competition theories, tools, and policy processes adapted to the nature and pace of innovation in the 21st century. The symposium features guest speakers and panelists from DCI's first annual conference held in April 2023. This contribution is signed by Wolfgang Kerber, Professor of Economics at the University of Marburg.

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1. Digital revolution, dynamic competition, and the "rules of the game"

The current digital transformation can be understood as a Schumpeterian revolution of the entire economy and society through an ongoing process of innovation and technological change as the most important driver of economic development. Schumpeter emphasized the importance of entrepreneurs, the creation of new products, new production technologies, and new business models (as forms of organization). Schumpeterian competition can lead to a rivalrous dynamic process of competing with such innovations, in which certain firms advance, and others catch up or overtake them through imitation and own innovations. In Germany, such a Schumpeterian concept of dynamic competition as an ongoing rivalrous and dynamic process of innovation and imitation was developed in the 1950s to 1970s and was widely accepted as a much more modern approach than the neoclassical economics approach with its static concept of perfect competition. Since through the innovations in these dynamic competition processes, market structures change and also new markets can emerge, markets and market structures were seen as endogenous results of dynamic competition. Only permanent market power but not temporary market power was seen as a problem.[1]

Another (more well-known) German approach is Ordoliberalism, which focuses on the institutional framework for markets and competition (also called "competitive order" or "economic constitution"). Its main idea is that economic policy should not consist of interventionistic measures into the market but instead should be "Ordnungspolitik," i.e., a policy that focuses on the question of proper sets of rules for the markets for enabling well-functioning markets and competition processes ("rules of the game").[2] This can also encompass innovation and dynamic competition. The question of how an appropriate institutional framework for markets and competition should look like is difficult and requires deep theoretical and empirical research (e.g., by institutional economics and law & economics).

Particularly important is that a Schumpeterian revolution, with its deep and rapid change of technological and economic conditions through (radical) innovations, also need a coevolution of this institutional framework for markets.[3] New technological and economic innovations can lead to entirely new problems, for which the current legal rules and regulations cannot offer appropriate solutions. Vice versa, the current rules and regulatory regimes can impede or even block new valuable innovations and therefore have negative effects on dynamic competition. As a consequence, it is a key task for economic policy to adapt the legal and regulatory framework for markets to the new technological and economic conditions, in order (1) to enable valuable new innovations, and (2) to solve potential new market failure problems, e.g., through new externalities. Such a dynamic view on economic policy, which also might require radical legal innovations, goes beyond the traditional (more static) view of Ordoliberalism.

2. Digital ecosystems as organisational innovation

In the digital economy, new forms of business ecosystems have emerged as very successful innovative business models. This led management studies to the development of a new theory of digital ecosystems.[4] Its basic idea is that such an ecosystem consists of a group of firms, which contribute with their products and services to the joint creation of value of the entire ecosystem for customers. The value-creating character of such ecosystems is economically based upon the complementary character of the products and services (often based upon economies of scope on the production and/or consumption side). Usually, these ecosystems have a leading firm (orchestrator), which, e.g., as a provider of a platform, plays a key role in the governance of the ecosystem by setting the rules for this ecosystem, and by helping to coordinate the contributions of the many complementing firms in order to increase the overall value. Such ecosystems usually have a modular structure regarding these complementing products and services, which implies interfaces but also can enable competition at the level of these complementary contributions. Competition can exist between ecosystems, between the orchestrators and the complementing firms but – due to the modular structure – also between the complementors within the ecosystem. Therefore, in ecosystems, often a complex combination of cooperation and competition exists (co-opetition).

Particularly important is that we should not interpret such ecosystems as only efficiency-enhancing systems, which optimize the exploitation of the complementarities (economies of scope) in a static sense. In digital contexts, it is part of this concept of digital ecosystems that they also enable ongoing innovations, both at the level of the architecture and organisation of the ecosystem (by the orchestrator) and at the level of the complementing firms with respect to the products and services. Therefore, it is also an important task of the orchestrator to organise the co-evolution of the many complementary products and services through innovations at both levels, which also implies coordination between the innovation activities of all firms within the ecosystem (also with the help of modularization and interfaces). However, this task also requires far-reaching entrepreneurial capabilities ("dynamic capabilities") of the orchestrator.[5]

Whereas such digital ecosystems can have huge benefits, also with respect to innovation, the orchestrating firm often has also huge economic power over the ecosystem and the many complementors. This power is based either on a central platform or the control over a key bottleneck or a critical resource, like, e.g., essential sets of data. A critical question is whether effective competition exists between ecosystems. If this works well, i.e., that both the customers, as well as the firms in the ecosystem, can easily switch to competing ecosystems, then the power of an orchestrator remains limited. However, often either no other comparable competing ecosystems exist, or the customers and/or the firms are locked into the ecosystem, leading to a dependency on the ecosystem. This can be strengthened by technological measures and far-reaching contractual arrangements. In these cases, the orchestrating firm has economic power, which is not controlled anymore by effective competition.

This power can be, on the one hand, necessary, for fulfilling the task of successfully orchestrating the ecosystem and ensuring the creation of value in the ecosystem (although through monitoring the behavior of the firms). However, the orchestrator can also use it for exploiting dependent complementing firms (including endangering their innovation incentives), for leveraging market power to other markets within the ecosystem, and/or for

increasing entry barriers for other firms that would like to compete with the ecosystem.[6] Digital ecosystems with powerful orchestrators can therefore be very beneficial, but they also can have negative effects on competition and innovation. This ambivalence leads to the conclusion that under certain conditions, such digital ecosystems also have to be analyzed with respect to potential negative effects on competition and innovation, and might be a problem for competition policy.

3. Connected cars as an IoT ecosystem: Access to in-vehicle data and resources

The transition to connected cars, with its huge amount of collected data and connectivity, is a large innovative step and leads to a fundamental transformation of the automobile sector and the business models of car manufacturers and traditional and new service providers with the possibility of many new innovative services. In the EU, it has led to a controversial policy discussion about access to the data that are generated and collected in connected cars.[7] For the governance of connected cars, the European car manufacturers have introduced the so-called "extended vehicle" concept. It implies that the car manufacturers have technically designed their cars in such a way that all data generated in the connected vehicle are directly transmitted to proprietary external servers of the car manufacturers. This gives them exclusive de facto control over all in-vehicle data, i.e., neither the owners of the cars nor other firms, who would like to offer services to the car users (like, e.g., repair, navigation, or insurance services), can get access to these data. In addition, car manufacturers have also designed their cars as closed systems, i.e., car owners are not free to choose between service providers, if the service requires technical access to the connected cars, due to the lack of interoperability.

Since the exclusive control of car manufacturers over access to the data and the technical functions of the connected car gives them a gatekeeper position, they can control the access to all secondary markets for services (to the car users) that require access to either the "in-vehicle data" and/or access to the technical functions of the car. Of course, the "extended vehicle" concept of the car manufacturers includes options for making B2B agreements between independent service providers and the car manufacturers about access to the in-vehicle data and technical access to the car. However, the car manufacturers can decide freely whether, with whom, and under what terms and conditions they make such agreements. As a consequence, the independent service providers in the automotive industry are very concerned that through this gatekeeper position they can be foreclosed from these markets, and/or that their profits from these markets and their innovations can be reaped by the car manufacturers through high fees for access to the data and/or functions of the cars. This can lead to less competition, less innovation, and also less consumer choice with regard to many services, which could be offered to the users of connected cars. Therefore, it can be argued that this exclusive control over access to "in-vehicle data and resources" might impede dynamic competition in these secondary markets.

The European Commission acknowledged this problem for competition and innovation already some years ago and announced proposals for solving this problem with regard to connected cars. In that respect, it is important that a regulatory solution for mandated access to essential repair and maintenance information has already existed for a long time in order to protect competition in automotive aftermarkets (type approval regulation for motor vehicles). However, this regulatory solution was designed only for the old technology of traditional cars, and will therefore get increasingly ineffective and obsolete through the transition to connected cars. An updating and adapting of this regulatory regime to the new technological and economic conditions of connected cars has not happened so far.[8]

How does this example of connected cars and the ensuing policy discussion fit with the above-described new theory of digital ecosystems? In a first step, we could try to interpret the "extended vehicle" concept as a strategy of the car manufacturers for developing and implementing digital ecosystems that consist of the cars themselves and an additional set of services, which are offered by a number of firms that have contracts with the car manufacturers. From the perspective of the digital ecosystem theory, the car manufacturers could be interpreted as the orchestrators and the service providers as the complementors in such an ecosystem. It could be suggested that the car manufacturers would use their position as orchestrators for helping to improve the co-evolution of the manifold services in their ecosystems to provide more value to their customers, i.e., the car owners and users.

From this perspective, the exclusive control over the in-vehicle data and technical access to the car could be seen as an instrument, which gives the orchestrator the power to make (innovative) decisions about the best design of this entire bundle of car and services, and therefore as a perhaps necessary precondition for creating more value in this digital ecosystem. This also could imply the transition to another business model, which does focus less on revenues through the sale of the cars but emphasizes the revenues through manifold services during the entire life-cycle of the connected cars. If competition between such ecosystems of the car manufacturers would work very well (systems competition), then the negative effects of less competition and innovation on secondary markets through the control by the orchestrators might be limited,[9] and overcompensated by the advantages of a better exploitation of potential economies of scope on the supply- and demand-side of this bundle of the car and these services.

However, the question arises whether this is a correct interpretation in the case of the extended vehicle concept of European car manufacturers, and can explain and justify their insistence on exclusive control over access to data and functions of connected cars. First, it is interesting that they never used such arguments to defend their governance concept. For a long time, they only defended the exclusive control with the argument of safety and cybersecurity. More recently, they also used the argument about the need to monetize the data for financing huge investments in connected cars. But they never made an argument along the lines of the theory of digital ecosystems with its idea of the need for an orchestrator, who is needed for creating more value through a better coevolution of complementing services. On the contrary, the consultancy firm McKinsey, which developed concepts for new business models for connected cars, has argued that the established large (European) car manufacturers have so far not succeeded in resetting their organization and changing their business models, and, in particular, still lack many partnerships for developing attractive ecosystems. In addition, they also have not been successful with respect to the commercialisation of in-vehicle data.[10]

Although this needs much more research, it can be suggested that the exclusive control of car manufacturers over the car data and technical access has not contributed to more innovation with regard to new complementing services. On the contrary, the restricted access of independent service providers to data and functions of the car does lead to huge impediments to the innovation activities of many service providers, who lack the possibility to try out new innovative services and develop new secondary markets. Therefore the gatekeeper power position of the car manufacturers might have negative effects on innovation and competition for new services in the mobility sector. This is also the main concern of the EU Commission in its policy initiative for a reform of the (above-mentioned) type approval regulation in the automotive sector, which explicitly should help to enable more innovation and competition in the mobility sector.[11] Another important motivation for the insistence of the car manufacturers to have exclusive control over the access to the data and functions of the car, can be the threat by the large tech firms, which might be much better capable of offering innovative services than the car firms. This might lead to the danger that they get drawn in and integrated into the much larger ecosystems of these tech firms. From that perspective, the strategy of exclusive control could perhaps be better explained as a defensive strategy against competitors, which, overall, might have primarily negative effects on competition and innovation.

4. Data Act: Unlocking IoT data for more competition and innovation?

The problem of the governance of data in connected cars might also have motivated the EU Commission to address generally the problem of access to IoT data in its recent Data Act (DA) proposal.[12] In ch.II of the Data Act the European Commission wants to introduce for all IoT devices (and both in B2C and B2B contexts) new rights for the users (usually the owners) of these devices to access, use, and share data generated through the use of these devices. The basic problem is the same as in the case of connected cars, namely that the manufacturers design their IoT devices technically in a way that they can get exclusive de facto control over all data generated by these

devices. This leads to the problems that (1) users cannot get sufficient access to their IoT data and use them, as well as (2) also other firms not have enough access to this data for offering services on secondary markets and, in particular, for developing new innovations. Therefore, one of the main objectives of the Commission is the unlocking of IoT data for boosting data-driven innovation and economic growth, and for enabling more competition on secondary markets of IoT devices (e.g., for repair and maintenance services). In that respect, the Data Act could be interpreted as intending to enable and support more dynamic competition.[13]

The above-mentioned new rights for users to access, use, and share IoT data are the key instruments of the Data Act for achieving these objectives. Important is that the Data Act does not question the freedom of manufacturers to design their devices in such a way that they can technically "capture" the IoT data. Instead, its main strategy is to limit the negative effects of this exclusive de facto control through these new user rights. Art. 4 Draft DA gives the users the right to access the IoT data and use it for all legal purposes. According to Art. 5 Draft DA the users also have the right to share this IoT data with third parties. Although these data recipients have to conclude a "licensing" agreement with the data holders (with reasonable compensation under FRAND conditions), it is the users who decide on the data sharing and the purposes for using this IoT data. The basic idea is that this user-initiated data-sharing mechanism, which has similarities with a data portability right, would lead to the unlocking of large amounts of IoT data, and (1) enable other service providers to offer more and also new innovative services on secondary markets, and (2) would lead to much more innovation in the entire data economy.

Therefore, the question emerges, whether this new data-sharing mechanism can be expected to be effective and help to enable and support dynamic competition. However, a deeper analysis shows that the Data Act suffers from a lot of problems, contradictions, and the lack of a clear legal and economic concept. This cannot be discussed here in detail, but the following points might be particularly relevant to the topic of this paper.

(1) It cannot be expected that this data-sharing mechanism will lead to much unlocking of IoT data for innovation, and more competition on secondary markets. The main reason is that the DA entails so many unclear provisions, restrictions, and high requirements for data sharing (with high transaction costs). It will be expensive and unattractive for firms to get access to IoT data through this new user-centric data-sharing mechanism. Particularly important is the need for bilaterally negotiated (licensing) contracts with the data holders, requirements of technical protection measures, unclarity with regard to the protection of trade secrets and personal data, and the narrow (and unclear) scope of the IoT data that can be shared. It is also difficult to build large aggregated data sets by getting only individual data sets from each user. The Data Act does also not solve the problem of lack of interoperability (technical access to the IoT devices), which – as in the connected car example – often is necessary for providing additional services to the users of IoT devices. With respect to the connected car example, it is already clear that the Data Act will not be sufficient for solving the problems. This is the reason why the European Commission started its policy initative for a reform of the sector-specific "type approval regulation" in March 2022 (after the publication of its DA proposal).

(2) The Data Act also entails provisions, which directly impede dynamic competition: One of these provisions is a non-compete clause which prohibits to use the IoT data that are accessed or shared by the users for helping to innovate products, which compete with the original IoT device. This limits innovation competition in the primary markets for IoT devices. The users, secondly, are not allowed to share their IoT data with gatekeepers (as designated by the EU Digital Markets Act). This can have not only direct negative effects on the users but also impede possible benefits through economies of scope on the platforms and ecosystems of these gatekeepers. The prohibition of sharing this data with Google and Apple is a particular problem for car owners, which would often like to integrate their cars with the smartphones and ecosystems of these gatekeepers (Google: Android Auto; Apple: Car Play). Therefore, also dynamic competition between the car manufacturers and these gatekeeper firms might be impeded through this prohibition in the Data Act.[14]

(3) Although the European Commission pretends to pursue the objective of unlocking IoT data for innovation and competition, the provisions in the Data Act protect too much the interests of the manufacturers with regard to their control over IoT data. Instead of promoting innovation- and competition-friendly forms of governance of data, the Data Act tends to entrench the already very strong position of the IoT device manufacturers by legitimising their exclusive de facto control through an incentive argument regarding the investment in data-generating IoT devices (in some analogy to an IP rationale). However, for IoT data no IP-analogous market failure exists, because the investment costs for data-generating IoT devices can be covered by the price of these devices, which are sold to the users. Therefore, this strong position regarding the control over data cannot be justified from an economic perspective.[15]

(4) It might, however, be possible that the Data Act pursues implicitly also industrial policy objectives of strengthening and protecting European IoT device manufacturers against competition and innovation activities of other firms by making access to IoT data difficult (or even prohibiting their sharing via these user rights with the gatekeepers, as designated in the DMA). With regard to the car manufacturers, we already mentioned their struggle with the large tech firms, which is also a conflict about the control over the car data (and, at least as important, about the software in connected cars). At least some of these car manufacturers still want to defend their independence and do not want to get integrated into the ecosystems of the large tech firms. It cannot be excluded that the European Commission is using the Data Act also for defending and strengthening the exclusive control over car data to help car manufacturers against these competitors. Economists are usually very skeptical about such a protectionist industrial policy, both with regard to its long-term "success" regarding the protectionist objective and, of course, regarding its general effects on dynamic competition and economic growth.

5. Conclusions

In the digital transformation the emergence of digital ecosystems represents an interesting new group of organizational innovations, which can lead to many benefits, especially with regard to a better coevolution of complementary products and services. This also can lead to the necessity of a powerful firm as orchestrator of the entire bundle of products and services (offered by the complementors). However, the same power position can also be misused by the orchestrating firm to exploit dependent firms in the ecosystem, especially in the case of lacking effective competition between those ecosystems. With respect to the example of connected cars in Europe, it is very doubtful, whether the gatekeeper position of the car manufacturers with respect to the many secondary markets of connected driving (through their exclusive control over access to data and the functions of the car) can be defended by using the rationale of the theory of digital ecosystems. On the contrary, in this case, this gatekeeper power position might be primarily used in a defensive way to try to control innovation and competition on secondary markets (by foreclosing independent service providers), and for increasing entry barriers for other firms (like the large tech firms) who want to offer innovative services in the automotive sector in competition with the car manufacturers. Although more research is needed, this brief paper suggests that the "extended vehicle" concept of European car manufacturers, with its exclusive control over access to data and the car, might have much more negative effects on competition and innovation than a more open governance concept for connected cars with much more access to data as well as more interoperability.

What might be the policy conclusions from this analysis? A first insight is that due to radical new technological and organisational innovations (such as the connected car itself but also the digital ecosystems), the old legal and regulatory framework might not fit anymore and has to be adapted to the new technological and economic conditions (both for enabling the innovations and for solving new problems). Since we cannot know from a purely theoretical perspective, whether the positive effects of such a power position of one firm with regard to a better "orchestration" of complementing services in such an ecosystem with respect to innovation are larger than the negative effects with respect to competition and innovation on the level of the products and services, it, secondly, might be necessary from a competition policy perspective to analyze very carefully the effects of such ecosystem structures, which are under the control of one firm. Important is that there might be a tradeoff between

innovations at the level of the architecture of the ecosystems, on the one hand, and the innovations at the level of the many products and services within such ecosystems, on the other hand. Therefore, thirdly, it cannot be excluded that legal rules and regulatory solutions, which enable and protect competition and innovation within such ecosystems, might be necessary under certain conditions. The current discussion about mandating access to and sharing of data with other firms as well as interoperability and standardisation reflects such a strategy. This might also lead to the need for sectoral regulatory solutions (like in the case of connected cars).

With the example of the Data Act, we have seen that also policies beyond competition policy can have a far-reaching impact on the conditions for dynamic competition. It is a pity that the Data Act cannot be expected to achieve its objectives of enabling more innovation and competition by unlocking much more IoT data.[16] An innovation- and competition-friendly institutional framework is a key precondition for a successful transition to a well-functioning digital economy and society in the future.

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