

Closed Platforms Open Doors: Deriving Strategic Implications from the Free-Floating Car Sharing Platform DriveNow

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ABSTRACT

This paper examines the free-floating car-sharing company DriveNow, governed by a joint venture of BMW Group and Sixt SE. The platform-mediated network model is used to determine DriveNow is a closed platform. Relating this to adoption/appropriability characteristics, I show how the closed nature of the platform strategically affects DriveNow.

It is concluded that DriveNow, although closed, can pursue at least three successful platform strategies, but struggles capitalizing on multi-sided network effects. The paper thus shows how a closed platform born through traditional ventures, despite growth bottlenecks, also has the potential to disrupt industries.

1. Introduction

Digital platforms are radically transforming every industry today (de Reuver, Sørensen, & Basole, 2017). The competitive edge and profit growth achieved through digital platforms indicate why so many firms are including the power of platforms into their existing business strategies (Parker, Van Alstyne, & Choudary, 2016). For some “born-digital” companies like Microsoft and Amazon, this inclusion of and diversification through platforms is easier than for traditional businesses that have relied on linear value chains for decades.

This paper focuses on firms engaging in traditional business activities and how digital platforms can benefit them. This will be examined through the theoretical lens of open versus closed platforms. The case used to exemplify and narrow the scope of the research question below is “DriveNow GmbH & Co. KG”, a free-floating car-sharing company from Germany that was founded in 2011 through a partnership of BMW Group, founded in 1916 and Sixt SE, founded in 1912. The two parent companies have well-defined, traditional business models with core value-creating activities that align well with the linear value chain concept described later. DriveNow exemplifies these companies’ attempt to jointly enter transportation markets currently being disrupted by platform businesses such as Uber, BlaBlaCar, and others (Parker, Van Alstyne, & Choudary, 2016). DriveNow itself, as argued here, can be considered

a closed platform that does not yet fully capitalize on open multi-sided network effects.

The relevance of exploring digital platforms and researching them in the IS field has been recently emphasized by de Reuver, Sørensen, & Basole (2017). The challenges highlighted by the researchers stem from the exponentially growing scale of platform innovation, increasing complexity of architectures and the spread of digital platforms to many industries (de Reuver, Sørensen, & Basole, 2017).

The spread across industries forms the motivation for this explorative research on DriveNow – a player in the transportation and mobility industry – which has been to date overlooked in platform discussions despite its relevant developments as a digital platform. The lens of “platform openness”, a core concept of digital platforms (de Reuver, Sørensen, & Basole, 2017, p. 4), is selected to analyze DriveNow. As later applied in the conceptual analysis, DriveNow’s closed nature leads to strategic implications that form the basis for future research.

This paper examines the following research question:

How is the joint venture car-sharing platform DriveNow strategically affected by its closed platform characteristics?

The paper proceeds with a literature review covering three sections: (1) The advantages and successful strategies of digital platforms, (2) an overview of open and closed platforms, and (3) how to assess platform openness.

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The concepts from the literature review are then applied to the DriveNow case, which, based on secondary data, determines two things: (1) DriveNow is a closed platform, and (2) the closed nature of DriveNow has strategic implications, which are outlined in the same fashion as proposed by the platform-mediated network model introduced in the literature review. The paper closes with limitations and contributions to future research, and concluding remarks.

The methodology of this research relies on literature from prominent, peer-reviewed journals and expert authors on digital platforms to form its theoretical basis. Information related to DriveNow was collected through secondary, official company sources and analytically applied to the theoretical concepts. Together, this allows for an exploration of the research question to highlight the relevance of this case for future research on digital platforms. Because the research intention of the paper is exploratory, rather than confirmatory, this method is argued to be appropriate for the context and scope at hand (Walsham, 2006).

2. Literature Review on Digital Platforms

2.1 Advantages and Successful Strategies

Parker, Van Alstyne, & Choudary (2016) distinguish between pipeline and platform businesses. The pipeline analogy shows how traditional businesses, like automotive OEMs, create value by aligning their operations in linear chains of value creation. A pipeline describes a linear transition: from acquiring inputs at the start of the pipe, transforming them along the way, and selling the output at the end of the pipe.

Platform businesses operate under value networks – different platform participants create value, without requiring traditional resources by the platform provider. The advantages of creating and maintaining platform businesses traces back to several areas. First is the platform's potential to capitalize on network effects when catering to multi-sided markets (Parker, Van Alstyne, & Choudary, 2016). Network effects describe “the impact that the number of users of a platform has on the value created for each user” (Parker, Van Alstyne, & Choudary, 2016). These network effects, as outlined by many academics e.g. Armstrong (2006), Evans (2003) and Rochet & Tirole (2003), can create immense growth, far surpassing other growth-building tools used by traditional businesses such as price effects and brand effects (Parker, Van Alstyne, & Choudary, 2016).

Second, the platform business does not typically rely on resources, as it does not create value through supply-side resources such as machinery, human resources or capital, but through the networks of users it establishes. Parker, Van Alstyne, & Choudary (2016) describe a shift that turns traditional businesses inside-out – moving away from internal, supply-side activities and focusing on external, demand-side activities to maximize growth of a strong, value-

creating network. This means a platform can create faster growth with high revenue stream potential with less commitment to owning expensive resources. This makes the platform business disruptive to some industries and attractive to many traditional businesses.

To be successful, a platform needs to employ four strategies, all of which are influenced by the degree of openness, discussed below. Most research on platforms has agreed upon four areas critical to successful platforms (Suarez & Cusumano, 2009, p. 77). A successful platform must (1) utilize pricing strategies e.g. Eisenmann (2005), (2) have a wide range of complementary products e.g. Gawer & Cusumano (2002), (3) capitalize on network effects e.g. Katz & Shapiro (1986), and (4) create technological and design advantages e.g. Suarez & Utterback (1995). These four strategies will be later examined in the DriveNow example.

2.2 Open and Closed Platforms

Varying levels of platform openness can be found in digital platforms, for instance in iOS and Android (Benlian, Hilker, & Hess, 2015), payment platforms (Ondrus, Gannamaneni, & Lyytinen, 2015), or digital marketplaces (Ghazawneh & Henfridsson, 2015). There has been consensus among academics that choosing an adequate degree of platform openness is important for businesses that choose to create and maintain platforms (Gawer & Cusumano, 2002; West, 2003; Gawer & Henderson, 2007; Eisenmann, 2008; Parker, Van Alstyne, & Choudary, 2016). Whether a platform should be open or closed is not dichotomous. West (2003) argues that a trade-off takes place between two elements: (1) adoption and (2) appropriability. He suggests an assessment of these elements is required to determine whether a platform should lean towards open or closed characteristics.

West (2003) states an open platform leads to higher adoption. On the plus side, this allows the platform to capitalize on network effects and reduce user concerns, leading to major advantages for the platform providers (Eisenmann, Parker, & Van Alstyne, 2009). On the downside, increasing a platform's openness also leads to reduced appropriability (West, 2003), or reduced switching-costs for users and higher competition among platform providers. This in turn forms a disadvantage for platform providers and highlights the careful trade-off when deciding between an open and a closed platform (Eisenmann, Parker, & Van Alstyne, 2009).

But how can platform business creators and maintainers assess whether their platform should be open or closed according to the above strategies? Eisenmann, Parker, & Van Alstyne (2009) argue that the answer lies within the exchanges of platform participants and the role of underlying platform components and rules. The next section covers the “platform-mediated network” (Eisenmann, Parker, & Van Alstyne, 2009), which serves as a suitable model to chronologically discuss a platform's openness. The model will be used to exemplify the DriveNow case

in section three and determine both its platform state (open/closed) and, based on the review above, outline strategy implications for the platform.

2.3 Assessing Platform Openness: The Platform-mediated Network

Traditional businesses that employ linear value creation, i.e. “purchase inputs, transform them, and sell output” (Eisenmann, Parker, & Van Alstyne, 2009) are different from exchanges in platform-mediated networks. Instead of linear value creation, the model of platform-mediated networks depicts triangular exchanges between different participants of the platform. The elements of this triangular platform-mediated network are (1) demand-side users (“end users”), (2) supply-side users, (3) platform providers, and (4) platform sponsors. Points one to three form a triangulation among demand users, supply users, and the platform itself. Platform providers serve as the point of contact for underlying components, rules, and architectures that form the foundation of the platform. Platform sponsors design and hold intellectual property rights for the components, rules, and ecosystem of the platform. Platform sponsor and provider roles can be filled by one or many companies.

See Figure 1 below for an illustration of the platform-mediated network, adapted from Eisenmann, Parker, & Van Alstyne (2009), which incorporates platform research from a wide range of academics (Rochet & Tirole, 2003; Schmalensee & Evans, 2007; Boudreau, 2008; Baldwin & Clark, 2000).

Beyond visualizing network effects, the application of a platform-mediated network to a platform business and assessing its participants constitutes a method that has been used to determine platform openness (Eisenmann, Parker, & Van Alstyne, 2009, p. 133). The concept of digital platform openness constitutes

looking beyond organizational arrangements and including technologies like APIs and software development kits (de Reuver, Sørensen, & Basole, 2017). However, because no primary data was collected for this case, the platform-mediated network best allows for systematic analysis of those areas that can be examined with secondary, available data on the company.

In section three, the engagement of participants within DriveNow’s platform-mediated network will be examined to determine individual degrees of openness and derive strategic implications. A platform can be seen as open when no restrictions are placed on its use and development by platform participants (Eisenmann, Parker, & Van Alstyne, 2009, p. 131).

3. Conceptual Analysis of DriveNow

3.1 Background: DriveNow and its Core Interaction

Car-sharing services have emerged within the sharing economy as a type of corporate sharing that adheres to cost reductions for using cars, environmental and traffic concerns (Shaheen, Cohen, & Chung, 2009). DriveNow is one of these services. It was founded in 2011 and began its operation in Munich and Berlin. Founded by both automotive manufacturer BMW Group and car-rental service Sixt, each with 50% stakes in the joint venture, customers of DriveNow can flexibly book BMWs/MINIs found near them through a mobile application and return them anywhere in the designated business area. Membership requires a one-time fee and a valid driver’s license. The revenue model is based on pay-per-minute use of the vehicle, which is extended with additional revenue streams like in-car services (insurance), minute packages, and fees for parking outside the business area. With 800.000 customers worldwide, DriveNow has been operating profitably since 2014 (DriveNow GmbH &

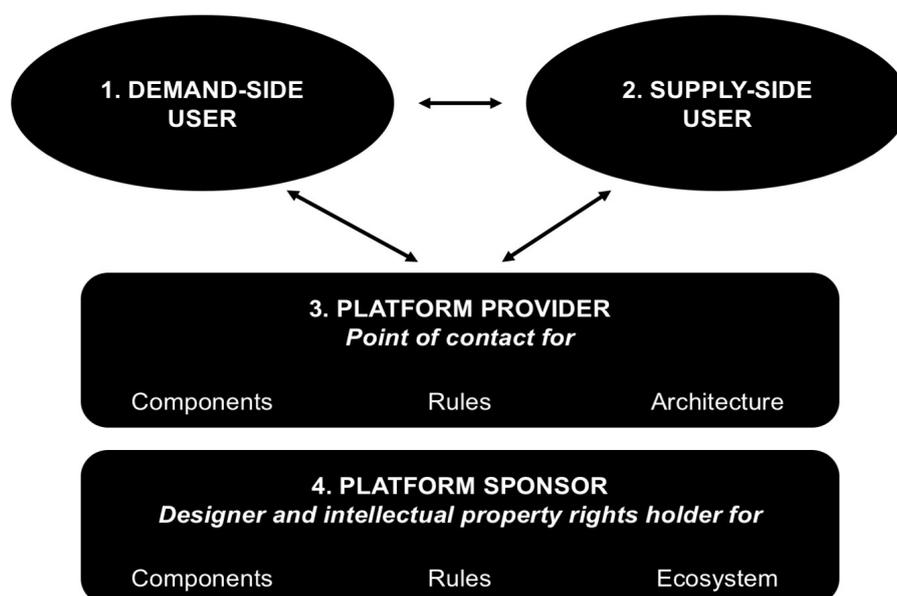


Figure 1. Platform-mediated Network. Adapted from Eisenmann, Parker, & Van Alstyne (2009).

Co. KG, 2017). A detailed profile of DriveNow can be found in Appendix A.

The core interaction (Parker, Van Alstyne, & Choudary, 2016) of the DriveNow platform is among the DriveNow customers, who pay per minute to rent cars of the DriveNow fleet; BMW and Sixt (and other partners), who provide vehicles and rental expertise respectively to the customers through the platform; rentable fleets of vehicles on the road as the primary value unit to the DriveNow platform; and location- and vehicle-based filters to enable intelligent rental recommendations to DriveNow customers (e.g. closest automatic vehicle to customer’s location).

DriveNow differs from multi-sided platform services such as Uber because it is corporate-enabled, rather than private-enabled, and it does employ resources (Kindel, Kobbe, Mertens, & Munzinger, 2015). DriveNow relies on a combined network of corporations (BMW, Sixt and other partners) to operate its service, compared to Uber, which relies on a network of both private drivers and riders to operate its platform. Even though its backbone is corporate, DriveNow can be applied to the platform-mediated network outlined in section 2.3 to determine platform participants and platform openness.

3.2 Platform-mediated Network as Applied to DriveNow

Using Eisenmann, Parker, & Van Alstyne’s (2009, p. 136) model for organizing platforms, DriveNow is an example of a joint venture platform: a singular provider of a platform (DriveNow) owned by two platform sponsors (BMW Group, 50% and Sixt, 50%). The two companies will be referred to as the “joint venture firms”.

A visualization of the DriveNow platform-mediated network can be seen in Figure 2 below. The information was retrieved from official DriveNow sources (DriveNow GmbH & Co. KG, 2017) and applied to the model of Eisenmann, Parker, & Van Alstyne (2009). A detailed description of this platform-mediated network can be found in Appendix B.

From Figure 2, we can move to section 3.3 and assess the openness of the DriveNow platform, which chronologically depicts the degree of openness of the individual participants to engage with the platform. The degree of engagement is not supported empirically, but will be explored qualitatively in line with the model’s application of Eisenmann, Parker, & Van Alstyne (2009, p. 133).

3.3 Analysis of Platform Openness

Moving chronologically through Figure 2, *demand-side users* (1) can openly engage with the DriveNow platform if they are paying customers, fulfilling certain legal criteria such as owning a valid driver’s license and not having a criminal record. DriveNow can be used natively on most smartphones (iOS/Android), and can be accessed via the DriveNow website, meaning entry restrictions to customers is mostly limited to the up-front membership cost and legal requirement. Beyond using the platform to rent available DriveNow vehicles, a customer can also contribute to the platform in three ways: (1) Direct contribution, in which customers encode information within the vehicle about its state and transmit this to DriveNow. (2) Indirect contribution, in which customers provide information indirectly through the distance and time they drive, and start- and end-points of the vehicle. (3) Customer-to-customer contribution; DriveNow has recently introduced a new method

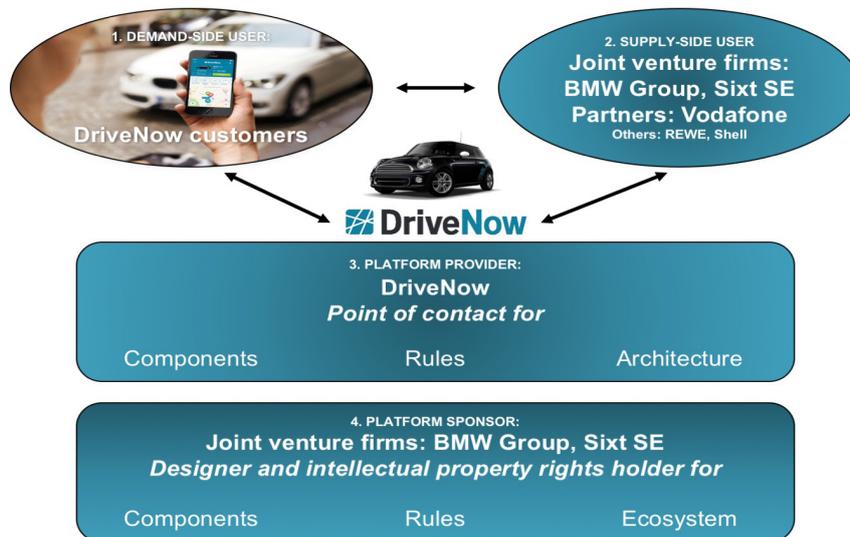


Figure 2. DriveNow’s Platform-mediated Network. Adapted from Eisenmann, Parker, & Van Alstyne (2009). Images from DriveNow GmbH & Co. KG (2017).

called “hand-off”, in which customers can drive the vehicle to a certain location and hand the vehicle over directly to the next customer (DriveNow GmbH & Co. KG, 2017). These three elements, along with near-frictionless entry methods for customers, make the interaction of demand-side users with DriveNow open.

Supply-side users (2) broadly include the joint venture firms, essential partners and other contributors. The supply-side is a lot more closed than the demand-side because the platform is operated under the joint venture firms, who to date have regulated tightly who uses the DriveNow platform on supply-side. So far, supply-side users have been limited to one essential partner, Vodafone, providing the essential networking infrastructure for DriveNow to move its data traffic to provide automatic billing by logging vehicle unlocks, and vehicle driving distance and time to the platform. Additional supply-side users have been added gradually for strategic purposes, such as gas stations to provide users with free minutes when filling up vehicles, and grocery stores to provide promotional incentives to use a DriveNow vehicle to shop at respective stores. Because of this extremely limited usage of DriveNow on supply-side, it can be classified as closed, with exceptions to those few permitted to use the platform.

The *platform provider* (3), DriveNow, is pursuing the strategy of combining the valuable resources and expertise of its sponsor firms to create a strategic advantage over other platforms, thus not opening its platform to outsiders. Arguably, Vodafone’s infrastructure is enabled at the architectural level, but as a hired contract, they are not integral to the platform itself and do not own a stake. Thus no other complementors are allowed at this level of the platform-mediated network, meaning the platform provider itself is closed.

Finally, the *platform sponsors* (4) are closed due to their business objectives and extensive cost structures established over the years. Breaking this down, BMW Group has tight patents on its vehicles and vehicle technologies, whereas Sixt has tight control on its rental expertise and network. The firms share resources with each other to create a strategic advantage for the DriveNow platform, but so far have not been incentivized to further share their resources with additional sponsors, and have not opened their resources up to outsiders to not lose their competitive positioning. BMW Group sells cars, whereas Sixt provides car rentals, so sharing their resources with other sponsors would threaten their core businesses. This means at the sponsor level, the platform is closed, and particularly complex due to individual business objectives of the joint venture “sponsor” firms.

Summarizing, three sides of DriveNow’s platform-mediated network can be classified as closed, with restrictions on platform development and participation/use, whereas one side, that of the demand-side user, can be classified as open. This means the majority of the DriveNow platform, from a participant perspective, is closed. The implications of

this for strategy will be discussed in 3.4.

3.4 Strategic Implications

As outlined in the literature review, West (2003) argues that a trade-off takes place between two elements: (1) adoption and (2) appropriability, and that an open platform leans towards adoption, whereas a closed platform leans towards appropriability. Cross-referencing this with successful platform strategies (Suarez & Cusumano, 2009, p. 77), (1) pricing strategies, (2) complementary products, (3) network effects, and (4) technological and design advantages, we can infer the following strategic implications:

One side of the DriveNow platform-mediated network is open. The openness of the *demand-side user* (1) may lead to higher adoption (West, 2003). Arguably, the switching-costs for users in this case are higher as platform participation comes with a cost and time investment (driver’s license verification), which offers DriveNow the ability to utilize pricing strategies (Eisenmann, 2005) to cater to these potential platform adopters. High adoption also leads to reduced user concerns, which DriveNow can exploit to drive growth.

Most other sides of the DriveNow platform are however closed, for instance the closed *supply-side user* (2), which contributes to high appropriability (West, 2003). This leads to strategic advantages DriveNow can exploit, such as stability and predictability of the supply-side and more controlled, cost-effective resource allocation to cater to demand, which means DriveNow avoids the “chicken and egg” that burdens multi-sided platforms (Parker, Van Alstyne, & Choudary, 2016). However, it also leads to disadvantages over more open platforms at this level. DriveNow loses out on the potential to capitalize on multi-sided network effects (Katz & Shapiro, 1986), which means it cannot grow as quickly as a competitor such as Uber. This is indicated by the 800.000 customers DriveNow has acquired to date, compared to Uber’s 40 million monthly users (Kokalitcheva, 2016). DriveNow must focus on building its demand-side user base with more traditional growth strategies to increase overall platform growth, and rely on more controlled complementary products and services on supply-side (Gawer & Cusumano, 2002).

Finally, the *platform provider* (3), and *platform sponsor* (4) are closed and offer a proprietary advantage to create competitive technological and design advantages through high appropriability. DriveNow faces the challenge to balance this competitive technological and design advantage with slow market responsiveness. It must utilize the competitive, combinatory strength of its platform sponsors, while not losing out to first-mover advantages of industry competitors. Additionally, it is much harder for DriveNow to flexibly adapt its core value unit due to the deeply ingrained expertise of its parent firms, whereas Uber can more quickly implement complementary services such as “UberEats”. Thus, DriveNow must continuously find ways to capitalize on the expertise of its sponsors while minimizing bureaucratic friction.

A summary of the discussed strategic implications can be derived from Table 1.

4. Limitations and Contribution to Future Research

This paper has examined strategic implications for DriveNow under multiple theoretical lenses and positions, forming a myriad of limitations due a unique combination of concepts and theories. The platform-mediated network, in this paper, has only been employed on a broad level, and more technical, insider insight into DriveNow would be required to understand the interplay and ownership of platform rules, components and architectures. The open versus closed dichotomy was based on research from West (2003), which takes a more open-source software perspective than that of a free-floating car-sharing platform.

However, I believe this combination addresses the research question adequately on a broad level. The secondary data from this case sheds light on the interplay of open and closed characteristics, and their implications for strategy, which has not yet been researched for a joint venture platform like DriveNow. Future research could use this as a stepping stone to go into more technical and quantitative detail in each element of the platform-mediated network, and empirically examine the complexities of running joint venture platforms as outlined here.

Linking back to the concepts outlined in the literature review, the findings from the analysis agree with the research that choosing an adequate degree of platform openness is important for platform businesses (Gawer & Cusumano, 2002; West, 2003; Gawer & Henderson, 2007; Eisenmann, 2008; Parker, Van Alstyne, & Choudary, 2016). The findings also suggest that a careful balance between open and closed characteristics is required (West, 2003), because this balance has strategic implications for the business.

The level of analysis employed here provides a new example in how traditional businesses use a closed platform to their advantage. Responding to the call for digital platform research across industries (de Reuver, Sørensen, & Basole, 2017), businesses from traditional industries moving to platform businesses should be included in future research. That way, patterns could be identified to determine whether having a traditional business model warrants platform closure to capitalize on strategic advantages over competitors, as was the case with DriveNow.

5. Conclusion

Answering the research question, the closed nature of most DriveNow platform participants results in strategic implications characterized by high appropriability. This creates advantages for DriveNow to pursue at least three of the four strategies for successful platforms presented by various academics. These are (1) Pricing strategies, (2) Complementary products and services, and (3) Design and technology advantages. These are respectively challenged by market responsiveness and the ability of the sponsor

firms, BMW Group and Sixt, to find mutual agreement.

However, running profitably for its third year, the utilization of these three platform strategies seems to have been successful, returning the investments to its platform sponsors. The fourth strategy DriveNow is challenged by, and most vital strategy for growth, is that of multi-sided network effects. DriveNow, because it is closed, can only achieve growth of the platform on the demand side. Even though this entails advantages, such as no “chicken and egg” problem and controllable supply-side stability, it limits the growth the platform can achieve compared to competitors utilizing multi-sided strategies.

As this case has shown, DriveNow struggles to capitalize on multi-sided network effects, but thrives through other strategic advantages mostly enabled by its sponsor firms. Thus, this paper has exemplified how a closed platform, even without multi-sided network effects, can give back to traditional businesses by augmenting existing resources and using a platform to diversify strategically. It is exciting to see closed platforms born out of traditional ventures open new doors and strategic alternatives for industry disruption.

References

- Armstrong, M. (2006). Competition in two-sided markets. *RAND Journal of Economics*, 37, 668-691.
- Baldwin, C., & Clark, K. (2000). *Design rules: the power of modularity* (Vol. 1). Cambridge, MA: MIT Press.
- Benlian, A., Hilkert, D., & Hess, T. (2015). How open is this platform? The meaning and measurement of platform openness from the complementors' perspective. *Journal of Information Technology*, 30(3), 209-228.
- Boudreau, K. (2008). Opening the platform vs. opening the complementary good? The effect on product innovation in handheld computing. HEC Working Paper.
- de Reuver, M., Sørensen, C., & Basole, R. C. (2017). The digital platform: a research agenda. *Journal of Information Technology*, (online), 1-12.
- DriveNow GmbH & Co. KG. (2017). Press - DriveNow. Retrieved from Drive-Now.com: <https://www.drive-now.com/gb/en/press>
- Eisenmann, T. (2005). *Managing networked businesses: course overview for students*. Boston, MA: Harvard Business School Note.
- Eisenmann, T. (2008). *Managing proprietary and shared platforms*. *California Management Review*, 50(4), 31-53.
- Eisenmann, T., Parker, G., & Van Alstyne, M. (2009). Opening platforms: how, when and why? In A. Gawer, *Platforms, Markets and Innovation* (pp. 131-162). MA: Edward Elgar Publishing Inc.
- Evans, D. S. (2003). The antitrust economics of multi-sided platform markets. *Yale Journal on Regulation*, 20, 325-382.
- Gawer, A., & Cusumano, M. (2002). *Platform leadership: wow Intel, Microsoft, and Cisco drive industry innovation*. Boston, MA: Harvard Business School Press.
- Gawer, A., & Henderson, R. (2007). Platform owner entry and innovation in complementary markets: evidence from Intel. *Journal of Economics and Management Strategy*, 16, 1-34.

Platform participant	Open/ Closed	Reasoning	Strategic Implications
1. Demand-side user: DriveNow customers	Open	<p>Frictionless entry</p> <ul style="list-style-type: none"> Demand-side users can openly engage with the DriveNow platform if they are paying customers, fulfilling certain legal criteria (no restriction of use) DriveNow can be used natively on most smartphones (iOS/Android) and its website <p>Platform contribution</p> <ul style="list-style-type: none"> Customers can contribute to DriveNow in three ways: <ul style="list-style-type: none"> Direct Indirect Customer-to-customer 	<p>High adoption (West, 2003)</p> <p>Opportunities:</p> <ul style="list-style-type: none"> Higher switching cost; potential to utilize pricing strategies (Eisenmann, 2005) Reduced user concerns (Eisenmann, Parker, & Van Alstyne, 2009) <p>Challenges:</p> <ul style="list-style-type: none"> Strong network effects on only one side and high dynamism (Katz & Shapiro, 1986) Limited demand-side predictability
2. Supply-side user: BMW Group, Sixt SE, Vodafone, Others (see Appendix A)	Closed	<p>Limited and restricted supply-side users</p> <ul style="list-style-type: none"> Supply-side users are limited to the joint venture firms, BMW Group and Sixt SE, as well as partner corporations selected by the joint venture firms, such as Vodafone Because no other supply-side users are allowed to participate in the DriveNow platform, the classification is rather closed than open 	<p>High appropriability (West, 2003)</p> <p>Opportunities:</p> <ul style="list-style-type: none"> Stability and predictability of supply-side; strategic resource allocation No “chicken and egg” problem (Parker, Van Alstyne, & Choudary, 2016) Controlled complementary products and services (Gawer & Cusumano, 2002) <p>Challenges:</p> <ul style="list-style-type: none"> Capitalizing on multi-sided network effects; i.e. Platform growth (Katz & Shapiro, 1986) Tight regulation of complementary products (Gawer & Cusumano, 2002)
3. Platform provider: DriveNow	Closed	<p>Platform governance solely by joint venture firms</p> <ul style="list-style-type: none"> Only BMW Group and Sixt SE have a legal say over the DriveNow platform and no other complementors are enabled at this level, with exception to Vodafone Because of this, the platform is closed on the platform provider level 	<p>High appropriability (West, 2003)</p> <p>Opportunities:</p> <ul style="list-style-type: none"> Design and technological advantages (Suarez & Utterback, 1995) through combinatory expertise of platform sponsor <p>Challenges:</p> <ul style="list-style-type: none"> Market responsiveness due to shared resources and focus on core business; difficult to penetrate other industries
4. Platform sponsor: BMW Group, Sixt SE	Closed	<p>Strong intellectual property protection by joint venture firms</p> <ul style="list-style-type: none"> The tight coupling of BMW Group and Sixt SE governing the DriveNow design and intellectual property make the platform sponsorship closed Each company has own intellectual property (IP) they bring to the platform; e.g. BMW has its patented technologies it brings to DriveNow The complexity to open the platform at this level is high due to the numerous amounts of IP and clashing business objectives of the joint venture firms 	<p>High appropriability (West, 2003)</p> <p>Opportunities:</p> <ul style="list-style-type: none"> Design and technological advantages (Suarez & Utterback, 1995) through combinatory expertise of platform sponsors <p>Challenges:</p> <ul style="list-style-type: none"> Market responsiveness due to bureaucratic friction Difficulties inverting the two firms (Parker, Van Alstyne, & Choudary, 2016) due to individual business objectives

Table 1. Summary of Case and Strategic Implications.

Ghazawneh, A., & Henfridsson, O. (2015). A paradigmatic analysis of digital application marketplaces. *Journal of Information Technology*, 30(3), 198-208.

Katz, M., & Shapiro, C. (1986). Technology adoption in the presence of network externalities. *Journal of Political Economy*, 86(3), 822-841.

Kindel, H., Kobbe, P. C., Mertens, A., & Munzinger, U. (2015). Erfordert die Sharing Economy neue Mechanismen der Markenführung? [Does the sharing economy require new mechanisms of brand leadership?]. *Marketing Review St. Gallen*, 32(4), 54-63.

Kokalitcheva, K. (2016). Uber now has 40 million monthly riders worldwide. Retrieved March 29th, 2017, from Fortune.com: <http://fortune.com/2016/10/20/uber-app-riders/>

Ondrus, J., Gannamaneni, A., & Lyytinen, K. (2015). The impact of openness on the market potential of multi-sided platforms: A case study of mobile payment platforms. *Journal of Information Technology*, 30(3), 260-275.

Parker, G. G., Van Alstyne, M. W., & Choudary, S. P. (2016). *Platform revolution: how networked markets are transforming the economy - and how to make them work for you*. New York: W. W. Norton & Company, Inc.

Rochet, J. C., & Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1(4), 990-1029.

Schmalensee, R., & Evans, D. (2007). *The catalyst code: the strategies behind the world's most dynamic companies*. Boston, MA: Harvard Business School Press.

Shaheen, S., Cohen, A., & Chung, M. (2009). North American car-sharing: a ten-year retrospective. *Transportation Research Record: Journal of the Transportation Research Board*, 2110, 35-44.

Suarez, F. F., & Cusumano, M. A. (2009). The role of services in platform markets. In A. Gawer, *Platforms, Markets and Innovation*. MA: Edward Elgar Publishing Inc.

Suarez, F. F., & Utterback, J. (1995). Dominant designs and the survival of firms. *Strategic Management Journal*, 16, 415-430.

Vodafone. (2017). DriveNow offers a flexible carsharing concept with Vodafone IoT. Retrieved March 3rd, 2017, from Vodafone.com: <http://www.vodafone.com/business/artcile-m2m-drivenow-offers-a-flexible-carsharing-concept>

Walsham, G. (2006). Doing interpretive research. *European Journal of Information Systems*, 15(3), 320-330.

West, J. (2003). How open is open enough? Melding proprietary and open source platform strategies. *Research Policy*, 32, 1259-1285.

Appendix A: DriveNow Company Profile

Official company description: "DriveNow, the carsharing joint venture of the BMW Group and Sixt SE, is available in various European cities and offers a range of high-quality premium vehicles of the BMW and MINI brands to rent, based on the free-floating principle. The vehicles can be hired and returned independent of location within a defined business area. More than 800,000 registered customers find and reserve vehicles using the DriveNow App or website, and are able to use the service across multiple cities." (DriveNow GmbH & Co. KG, 2017)

Company structure: Joint venture; 50/50 BMW Group and Sixt SE

Established: May 2011

Concept: One-way car-sharing

Headquarters: Munich

Number of customers: 800k+ customers

Pricing model: Minute-based rates. Fuel costs, parking, insurance and car tax are all included. Savings and Hourly Packages allow a further reduction of rates per minute

Payment options: Debit or credit card

Vehicles: BMW and MINI models, depending on country. Copenhagen only consists of electric BMWs

Total number of vehicles on road: 5510 (860 of which are electric, roughly 16%)

Cities (number of vehicles): Munich (700), Berlin (1300), Dusseldorf and Cologne (620), Hamburg (580), Vienna (500), London (310), Copenhagen (400), Stockholm (300), Brussels (300), Milan (500)

(DriveNow GmbH & Co. KG, 2017)

Appendix B: DriveNow Platform Participants

The platform-mediated network of DriveNow incorporates:

1. DriveNow customers, as its demand-side users
2. Partnerships of corporations, as its supply-side users, including:
 - o BMW Group (Joint venture firm, 50% stake): Providing the vehicles and vehicle technology to the platform
 - o Sixt SE (Joint venture firm, 50% stake): Providing the rental expertise, the premium services, the IT systems, and customer registration network to the platform
 - o Vodafone (Partner): Providing the networking infrastructure for DriveNow to move its data traffic to provide automatic billing by logging vehicle unlocks, and vehicle driving distance and time to the platform
 - o Others (not essential to the successful operation of DriveNow):
 - Gas Stations: Providing infrastructure for customers to fill up vehicles and receive free minutes in return (e.g. Shell)
 - Sponsored Partners: Cooperations with grocery stores (e.g. REWE) to offer discounts when taking a DriveNow car to shop at the respective store
3. The "DriveNow" platform as the focal platform provider, providing the point of contact for users of both sides concerning:
 - a. Components
 - b. Rules
 - c. Architecture
4. BMW Group and Sixt SE as the platform sponsors, holding the intellectual property rights and responsible for the platform design of:
 - a. Components
 - b. Rules
 - c. Ecosystem

Information retrieved from DriveNow GmbH & Co. KG (2017) and Vodafone (2017)