The Challenge of Governing Digital Platform Ecosystems

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Digital Marketplaces Unleashed

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Abstract

Multi-sided platforms (MSPs) continue to disrupt long-established industries. Therefore, there is a growing popularity to scientifically examine how and why those platforms become more and more economically important. The centerpiece to orchestrate the interaction between the involved parties is the platform governance. While past studies concentrated on describing and identifying those mechanisms, this article aims to provide more detailed knowledge on the practical implications of implementing platform mechanisms differently. With this goal in mind, the article conducted a literature review to identify important platform governance mechanisms. Building on that, a multiple-case analysis was carried out examining seven successful MSPs and how they governed their platform. The results indicate that platform governance mechanisms are incorporated in different shapes and characteristics. The governance structure, for example, ranged from a very centralistic and autocratic organization to a more split approach with empowerment on the user side. Also, the accessibility varies from a high degree of openness to detailed background checks users need to pass in order to participate in the platform. Out of these findings, different tradeoffs can be derived. A high degree of openness, for example, goes along with a greater quantity of products or

services, but lacks in quality and indicates a higher perceived risk. Overall this article shows the practical implications and characteristics of different platform governance characteristics and helps practitioners and scientists to learn from successful MSPs.

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The Challenge of Governing Digital Platform Ecosystems

47

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Abstract

Multi-sided platforms (MSPs) continue to disrupt long-established industries. Therefore, there is a growing popularity to scientifically examine how and why those platforms become more and more economically important. The centerpiece to orchestrate the interaction between the involved parties is the platform governance. While past studies concentrated on describing and identifying those mechanisms, this article aims to provide more detailed knowledge on the practical implications of implementing platform mechanisms differently. With this goal in mind, the article conducted a literature review to identify important platform governance mechanisms. Building on that, a multiple-case analysis was carried out examining seven successful MSPs and how they governed their platform. The results indicate that platform governance mechanisms are incorporated in different shapes and characteristics. The governance structure, for example, ranged from a very centralistic and autocratic organization to a more split approach with empowerment on the user side. Also, the accessibility varies from a high degree of openness to detailed background checks users need to pass in order to participate in the platform. Out of these findings, different tradeoffs can be derived. A high

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degree of openness, for example, goes along with a greater quantity of products or services, but lacks in quality and indicates a higher perceived risk. Overall this article shows the practical implications and characteristics of different platform governance characteristics and helps practitioners and scientists to learn from successful MSPs.

47.1 Multi-sided Platforms[1,2]

Digital marketplaces such as multi-sided platforms (MSPs) are continuing to grow in importance [1]. Prominent representatives are start-ups like Airbnb or Uber who are challenging traditional business models in the taxi or gastronomy industry. These digital companies extend the classical point of sale by providing a platform where everyone can offer services or products to the corresponding market. Also, traditional industries like the equipment manufacturer Trumpf engage and invest in MSPs [2]. On the contrary, there are also companies who got market power but failed to establish a digital business model. Garmin, for instance, dominated the navigation market and was overran by Apple and Google offering various navigation applications [3]. The economic importance of MSPs can be highlighted by Alibaba initial public offering (IPO), which holds the title of the largest IPO in history [4].

The foundation of each MSP is the underlying platform which orchestrates the interactions between the different sides [3]. Within this platform, the interplay of actions is controlled and managed by various platform governance mechanisms [5, 6]. In order to understand why platforms are disrupting long-established industries, it is crucial to look closer on how those mechanisms work.

Even though platform governance mechanisms are theoretically well researched [5, 6], the practical implementation lacks of examination. The degree of openness, for example, can be on the hand too low resulting in an insufficient growth or on the other hand too high, losing control over the platform [7, 8]. This article aims to improve the theoretical understanding by showing tradeoffs resulting from a different implementation of platform governance. Also, practitioners gain valuable insights on how to set up their platform governance strategy and which tradeoffs they need to take into consideration.

47.2 Multi-sided Platform Governance Mechanisms

In order to get a better understanding of a platforms governance, a literature research was conducted to identify important mechanisms according to science [7]. The results are

[1] This chapter is based on a publication at Multikonferenz Wirtschaftsinformatik 2016: Hein, A.; Schreieck, M.; Wiesche, M.; Krcmar, H. (2016). Multiple-Case Analysis on Governance Mechanisms of Multi-Sided Platforms. Multikonferenz Wirtschaftsinformatik (MKWI), Ilmenau.

[2] We thank the German Federal Ministry for Economic Affairs and Energy for funding this research as part of the project 01MD15001D (ExCELL).

displayed in Table 47.1 and range from dimensions like *Governance Structure* to *External Relationships.*

Governance structure, for example, contains decision rights and the ownership status of the company. An MSP can be organized centrally or diffused. There might be also an imbalance in power between the different parties in terms of authority and responsibility.

Platform transparency and usage of platform boundary resources are covered in the dimension *resources & documentation*. They describe the use of application programming interfaces (APIs) or helpful tools like software development kits (SDKs) as well as having a documentation in place.

Accessibility & control combines the mechanisms of output control & monitoring, input control and securing, as well as platform accessibility, openness and process control. They describe how the output of a developer is evaluated, penalized or rewarded, what is allowed to be on the platform, who is allowed to collaborate and which procedures are in place to regulate the platform.

Table 47.1 Platform governance mechanisms. (Own representation based on literature review)

Dimensions	Mechanisms	Description
Governance structure	Governance structure Decision rights Ownership status	Is the set-up centralized or diffused? How are authority and responsibility divided between the platform owner and module developers? Is the platform proprietary to a single firm or is it shared by multiple owners?
Resources & documentation	Platform transparency Platform boundary resources	Does the documentation ensure an easy understanding and usability of the platform? Are governance decisions concerning the platform's marketplace easy to follow and understandable? Are Application programming interfaces (APIs) used to cultivate the platform ecosystems through third-party development?
Accessibility & control	Output control & monitoring	How are outputs evaluated, penalized, or rewarded?
	Input control Securing	What mechanisms are in place to control which products or services are allowed? How to assess the quality of services or products?
	Platform accessibility Process control Platform openness	Who has access to the platform and are there any restrictions on participation? Who controls the process and is in charge for setting up regulations? Is the platform open or closed?
Trust & perceived risk	Strengthen trust Reduce perceived risk	Does the platform enhance trust? How can the perceived risk of platform participants be minimized?
Pricing	Pricing subsidy Revenue	Who is setting the price? Who decides on participation, who is paying and who values?
External Relationships	External relationship management	How are inter-firm dependencies managed? What is the architecture of participation? Does the platform allow technical interoperability between other systems?

Trust & perceived risk are forming the next dimension, which relates to the nature of a platform ecosystem to foster trust on the user or developer side.

The seventh section topics is *pricing* and clarifies which party is setting the price, who decides on participating on the platform, who is paying and which side profits. The last dimension is represented by managing *external relationships* and describes how inter-firm dependencies are governed. Apart from these dimensions, also the underlying business model might have an impact on how the implementation of governance mechanisms is shaped. Therefore, we complemented this dimension in the following multiple-case study analysis.

47.3 Governance Mechanisms in Practice

After identifying important platform governance mechanisms, we wanted to analyze if and how successful MSP providers apply those aspects. Therefore, we selected seven MSP companies with four different underlying business models, each of them successful in terms of market capitalization or market shares. On the basis of these companies we identified several cases for each of them and conducted a multiple-case study analysis [9]. Table 47.2 summarizes the final results and practical implications.

It can be shown that each of the previously defined platform governance mechanisms can be incorporated in a different way. The g*overnance structure* ranges from a very centralistic and autocratic organization to a more split approach with empowerment on the user side. In terms of *resources & documentation,* it can be shown that six out of seven companies used APIs to engage third-party application developers. *Accessibility and control* vary from having no restrictions to requiring users to pass a detailed background check if they want to enter the platform. The same applies to the *input control.* Measurements can be applying very basic community standards or reviewing each input manually. The *output control* describes how other users evaluate the user-generated output. A noticeable feature is that every analyzed MSP uses a rating or review system. If there are two distinct sides participating in the platform, the use of two-sided or asynchronous ranking systems was representative. In order to establish *trust* and decrease the *perceived risk,* all companies used techniques and tools. They include very basic forms of individualized privacy settings and account verifications, to more sophisticated solutions like offering extra services, insurances or requiring background checks. *Pricing* shows models like advertising, getting sales margins or one-time fees. The last mechanism deals with *external relationships* and indicates that all seven MSPs use forms of partnerships. Most common are strategic partnerships and partnerships through acquisition. As mentioned before each analyzed MSP can be categorized into a different *business model.* Facebook and WeChat for example fit in the category of social networks, Alibaba corresponds to the merchant model, Airbnb and Uber are service platforms and the App and Play-Store are application platforms.

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Table 47.2 Result of the multiple-case study analysis

Business Model	External relationships	Pricing	Trust & perceived risk	Accessibility & control			Resources & documentation	Governance structure	
				Output	Input	Control			
Social network	Strategic partnerships	Advertising, marketing, applications	Privacy settings/Privacy issues	Rating, "Likes", comments, Advertising dashboard	Community standards	No restrictions besides terms and conditions	API, Software Development Kit (SDK), documentation	Autocratic and centralized, self-organizing platform	**Facebook**
	Strategic partnerships, service extension	Advertising, marketing, applications	Account verification, limited number of messages	Follower, broadcast interfaces	Strict rules for platform curation	No restrictions for users, strict restrictions for businesses	API, SDK, help center, guides	Autocratic and centralized, high degree of control	**WeChat**
Merchant	Partnerships through acquisition	Sales margins, payment and service fees	Several services to strengthen trust (e. g. Trust pass)	Reviews, ratings, feedback profile, statistics	Optional inspection service	No restrictions	API, SDK, learning and training center	Central, self-organizing	**Alibaba**

Table 47.2 (Continued)

Business Model	External relationships	Pricing	Trust & perceived risk	Accessibility & control			Resources & documentation	Governance structure	
				Output	Input	Control			
Service Platform	Localities and local communities	Service and conversion fee	Insurance, verification and rating system	Asynchronous ranking, reviews, statistics, comments	Identity verification	Host is in control, identity verification	Help center	Split, host has decision rights	**Airbnb**
	Strategic partnerships, service extension	Dynamic pricing, Service fee	Background check, pricing surging, insurance, privacy issues	Two-sided ranking, suspension on ranking, comments	Background check. Car requirements	Background check, Uber controls pricing	Help center, API, documentation	Split, Uber controls pricing, passenger controls through rating	**Uber**
Application Platform	Many partnerships	30% of sales, One time registration fee	Malware, rating, diversity of systems	Ratings, comments, number of downloads	No manual App reviews	Google developer account needed	SDK, API, documentation, checklist	Centric, from loose to tight control	**Play-Store**
	Selective, strategic partnerships	30% of sales, Annual fee	Rating, feedback mechanism, less fraud and malware	Ratings, comments, number of downloads	Manual reviews, censorship, protected system	Apple developer account needed	SDK, API, toolkits, documentation, guides	Centric, tight control	**App-Store**

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After providing an overview of the different characteristics of implementing platform governance mechanisms we will continue explaining their practical use and accompanied tradeoffs in detail.

47.4 Characteristics and Tradeoffs of Governance Implementation

This section discusses the characteristics and tradeoffs of a different platform governance mechanism implementation.

Governance Structure This mechanism deals with centralistic and decentralistic structures, decision rights and the degree of ownership status. Different characteristics and implementations result a high or low degree of platform monetization in exchange for user growth. A good example to show the implications of a low vs. a high degree of decision rights or ownership status can be found in the Google Play-Store. Fig. 47.1 illustrates the shift from a free to use open source version with a decentralistic governance (1) to a tighter led model in an inverted u shape. The decentral and open approach led to a rapid growth in terms of the user base in comparison to the App-Store but also brought tensions due to the lack of control and problems to commercialize the platform [10]. Therefore, the tradeoff of having a more closed and centralized governance with platform control and regulation abilities is a reduced user growth and problems with commercialization.

Across all cases, we could identify tradeoffs in implementing the platform governance structure in different ways. A more centralized governance model with moderate decision rights and ownership status offers a high degree of platform control and commercialization. On the other side, a more decentralistic approach allows benefitting from self-organizational effects by reducing administrative work when implementing for example rating systems to determine the product or service quality. In summary, low ownership causes a loss of control, while a too high degree of ownership restricts user interaction.

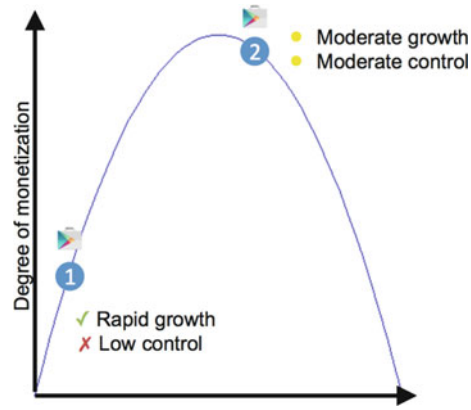

Fig. 47.1 Visualization of the tradeoff ownership status. (Own research)

Resources & Documentation The two different characteristics of this dimension are if a platform provides additional resources like APIs or SDKs coupled with documentation or not. Providing insights and interfaces can open up new business opportunities, while losing information superiority. Uber and Facebook for example both provide an API to open up new business markets [11]. In particular Uber expanded its platform by integrating the service of taxi reservations into hotel booking systems [12]. Facebook utilized the API to crate the sub-market of applications, which is now a million dollar market with over 150 million user every month [13]. By providing an API both companies allowed developers to create new out of the box applications. It needs to be mentioned, that even in the presence of APIs, companies can still regulate how much access they want to provide. Nevertheless, they open up the platform and provide insights and information.

One example for not having an API is Airbnb. However, there is a sub-community hosted by Airbnb called "nerds.airbnb.com" illustrating concepts like deep linking to overcome the fact of not having an API. Furthermore, unofficial platforms like "airbnbapi.org" appeared, providing unofficial endpoints and a documentation on how to use it. The result of not having an API is that there are no interfaces available to get, analyze or validate the data, which leads to a high degree of information control. On the opposite, business opportunities are dismissed in order to keep information superiority.

The conclusion is that having an API, SDK and proper documentation offers companies to open up new business markets, increase interconnectivity and effectiveness of distribution, supply and customer channels. There are also arguments for not having an API. One might be information superiority by having a closed architecture, in return dismissing business opportunities and opening the field for third party platforms publishing platform data.

Platform Accessibility This dimension deals with making the platform accessible to everyone and having restrictions. While restrictions and control mechanisms might improve the quality and increase transparency, it comes also at the expense of quantity of provided applications and services and potential user growth. An example for accessibility or openness is Facebook, struggling with negative feedback and abuse but granting users anonymity [13, 14]. The platform started with a restriction that only allowed universities to join and opened in 2006 for public, gaining massive user growth [15]. On the other hand, WeChat requires verification in order to open business accounts, increasing the entry barriers by creating transparency [16]. The blue graph in Fig. 47.2b illustrates the tradeoff between the degree of openness and a potential increase in user growth in exchange for anonymity vs. transparency.

After analyzing all companies and cases we could identify that a high degree of openness goes with a potential higher user base, a less secure platform due to anonymity and increased perceived risk. Having restrictions in place showed in the case of the App- and the Play-Store that the quality of products and services can improve if the process control is retained. The tradeoff is a lack of transparency and negative feedback limiting user freedom.

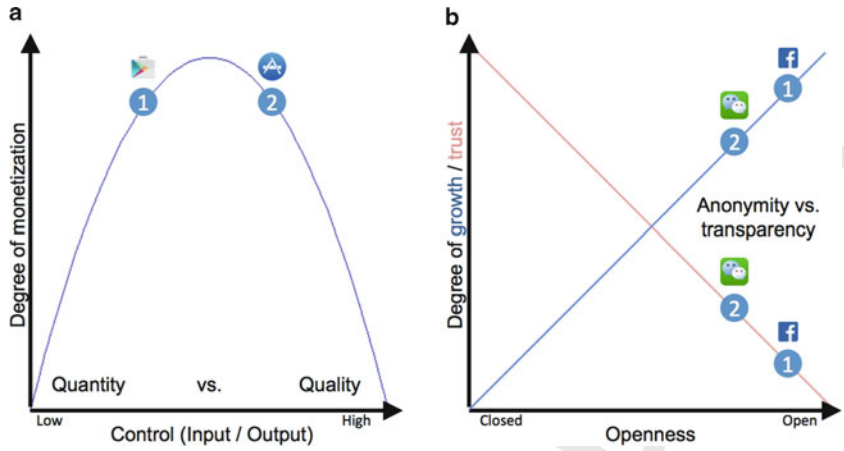

Fig. 47.2 Visualization of the tradeoff platform input & output control (**a**) and platform openness (**b**). (Own research)

Input Control and Securing The tradeoffs for this mechanism is strongly related to the previously discussed *Platform accessibility*. A vivid comparison of input control can be derived from the cases of the Google Play-Store and the Apple App-Store. Where the App-Store follows strict censorship and manual application review processes, Google's Play-Store is less strict and executes only automated reviews. The result is that Apple has less security or quality issues, where Android has a broader variety of applications [17, 18]. This comparison shows that no or laissez-faire input control causes a greater variety of input but entails a decreased quality.

Output Control and Monitoring The multiple-case study showed, that all MSPs use an output control mechanism to check the quality of products or services. Facebook for example uses "Likes", comments and ratings to indicate the popularity of user-generated content. Especially likes are giving a quick hint on how popular the content is, which is an important part for Facebook's infecting success. Google and Apple implemented a one way ranking system to check the quality of applications [18, 19], where Alibaba, Uber and Airbnb use a two-way-ranking system, where the demand and supply rank each other [20, 21]. Both mechanisms shift quality assurance to the respective parties and therefore reduce administrative work for the platform owner in a tradeoff for a decreased control [20].

In general Fig. 47.2a shows that control over *input and output* correlates in a non-linear relationship to the degree of monetization. If there is absolutely no control, users can create whatever they like, quality decreases and malware increases. Having on the other hand, full control narrows the created content and therefore decreases the reach of a wider audience.

Trust & Perceived Risk This mechanism describes how users and developers see the platform in terms of security and risks. Security measures lower the perceived risk in exchange for platform openness. WeChat for example, provides several services such as the business verification process or a security deposit for using the API to increase trust for the platform. Therefore users are likely to use the platform due to the protective mechanisms [16]. Facebook is offering privacy settings to reduce perceived risk but is not successfully overcoming those problems. The resulting tradeoff is that users have the chance to use Facebook anonymously without social consequences which can lead to a higher degree of perceived risk as the result of cyber mobbing or crimes [15], where WeChat's services decrease anonymity but increases trust. This correlation can be seen in the red graph in Fig. 47.2b, showing that a security measure like the verification process of WeChat reduces the perceived risk, in exchange for a less open platform.

Pricing Measures in this dimension address different price policies. There are indications that higher registration fees increase the quality for the sake of quantity. The case study review shows that all underlying price models are related to the associated business models (see Table 47.2). Therefore, a comparison between different business models does not seem to be constructive. Similar business models like the Play-Store and the App-Store show that high registration fees for the developer can be used as a quality gate trading quantity over quality [17]. The case of Uber shows that a lack of transparency on price setting can cause issues regardless of the business model.

External Relationships Establishing business relationships and strategic partnerships might help to grow the user base, but also giving up control over the platform. The example of the Google Play-Store and the Open Handset Alliance with 34 founding members aiming for an open standard for mobile phones illustrates the rise of the Play-Store's underlying operating system Android which even exceeded Apples' iOS growth [17]. As Google wanted to maintain the control of Android and the Play-Store to protect it from patent issues, the tradeoff was limiting the platform's openness and partnerships [10].

Business Model In order to reflect the fact that each of the selected business models has an impact on the setup of platform governance mechanisms, we included this dimension as well. Nevertheless, even similar business models like Airbnb and Uber, delivering services and described as shared economy, are different in terms of services like accommodations and transportations. This is also true for WeChat and Facebook. While WeChat concentrates on the digital market of mobile Social Networks, Facebook tries to cover the classical online- and the mobile market. In order to draw correct conclusions, we recommend comparing not only similar business models but also similar products and services like the App-Store and the Play-Store.

In general, all dimensions show tradeoffs if implemented differently. Especially interesting are the conclusions illustrated in Fig. 47.2. Nevertheless, it is important to stress that the figures and graphs are only a first conclusion of the multiple-case study analysis.

In order to reach significance, it is crucial to gather more concrete facts supporting our claims.

47.5 Conclusion

Multi-sided platforms are continuing to disrupt long-established markets. Therefore, it is crucial to get a deeper understanding of how they work and which factors are of importance. The centerpiece of each MSP is the platform governance, which orchestrates the interaction between the different parties. They describe for example if the overall structure is organized centrally or decentrally, which resources like APIs or SDKs are used or what restrictions are in place to control the openness and the products and services offered on the platform. While the literature offered already theoretical insights about those mechanisms [1, 6, 22, 23], the practical application and tradeoffs were not examined in closer detail. Therefore, we conducted a multiple-case analysis including seven different MSPs. All results were analyzed due to theoretically known platform governance mechanisms. The resulting table highlights for example that both, centrally and decentrally organized platforms exist. There are also different degrees of openness or in- and output-control. Influence factors might be the underlying business model or the current state of maturity of the MSP. Based on these results we observed different tradeoffs of implementing platform governance mechanisms differently. One hypothesis deriving from the case study is that the degree of platform control correlates in a non-linear relationship with the platform monetization. No control provides too much power to users or third-party developers, while too much control leads to a narrower range of products and services. Therefore, this article helps to understand how platform governance mechanisms are implemented by currently successful MSPs and which tradeoffs different implementation causes. Moreover, practitioners may learn from already established digital marketplaces and can transfer this knowledge to other industries.

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Further Reading

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