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What Drives the B2B Platform Economy? A Qualitative Examination of Current Trends, Success Factors, and the Road Ahead

Inga Stange

Technische Universität Berlin

Abstract

Over the past decade, digital platforms have disrupted traditional industries, causing markets to shift and established companies to rethink their business models. While this mainly applied to consumer-oriented sectors so far, it is now assumed that business-to-business (B2B) industries will be the next to join this major transformation wave. From an information system perspective, this study examines which characteristics and modes of operation are responsible for a B2B platform to succeed. By making use of a multiple-case study, drawing on semi-structured interviews with decision-makers from German B2B platform initiatives, and a descriptive report of its current landscape, the paper provides a holistic overview of the multitude of influencing factors on the design of a B2B platform as well as its drivers and barriers. The study contributes to existing literature by consolidating the fragmented state of research and conceptualizing platform considerations into three stages of platform evolution. Its findings suggest that B2B platforms are subject to different mechanisms than their consumer-oriented counterparts and advises platforms to position at the interface of the digital and traditional world by being simultaneously collaborative, simple, scalable, secure, and trusted.

Keywords: Platform economy; B2B platforms; two-sided business models; digital platforms.

1. Introduction

1.1. Problem outlining

The rise of the digital platform economy is forcing companies to rethink long standing business models (Alstyne, Parker, & Choudary, 2016; Riemensperger & Falk, 2020, p. 2; Schreieck, Hein, Wiesche, & Krcmar, 2018, p. 46). In 2016, the popular scholars Parker, Van Alstyne and Choudary even proclaimed a "*global platform revolution*" (Parker, Alstyne, & Choudary, 2016), as an increasing number of bilateral or multilateral platform ventures have already disrupted industries and created new markets (Kang & Dowing, 2015, p. 170). By mediating user interactions, platform-based firms like Amazon and Uber differ from companies that control linear activities (Zhao, von Delft, Morgan-Thomas, & Buck, 2019, p. 2). Platforms are shifting the organizational design away from the 'simple' sale of products towards the principle of linking two or more individual user groups, thus introducing new ways of structuring firm and industry boundaries (Eisenmann, Parker, & Alstyne, 2006, p. 2; Gawer & Cusumano, 2014, p. 417). This has initiated a change in the creation of economic value: from value creation inside the company to mutual value co-creation within a complex ecosystem of actors (Hein et al., 2019, p. 502). Based on these fundamental transformations, Alstyne et al. have formulated the thesis that only those who understand the platform principles and adapt their business model accordingly will survive: "*Learn the new rules of strategy for a platform world, or begin planning your exit*." (2016, p. 9).

So far, this has mainly applied to business-to-consumer (B2C) or consumer-to-consumer (C2C) markets, where digital platforms such as Airbnb or Alibaba have profoundly changed traditional industries. Standing on the threshold of the platform economy, the business-to-business (B2B) sector is assumed to be the next to join this major transformation wave (Drewel, 2019, p. 3; Hein et al., 2019, p. 507; Wortmann, Ellermann, Kühn, & Dumitrescu, 2019, p. 2). Leading companies are already in the process of withdrawing from their core business, while numerous start-ups and consulting firms are shifting their focus to supporting organizations in this transformation (Drewel & Gausemeier, 2018, p. 2). But while there is a growing body of research on B2C plat-

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forms, knowledge about B2B platforms remains scarce and there are few empirical studies that take them into account (Aarikka-Stenroos & Ritala, 2017, p. 21; Hein et al., 2019, p. 516; Loux, Aubry, Tran, & Baudoin, 2019, p. 213). Findings from B2C research, however, are not transferable (Wallbach, Coleman, Elbert, & Benlian, 2019, p. 694) as their context is inherently different (Neumann & Gutt, 2019, p. 2). For instance, network effects in B2B operate differently because, unlike individuals in B2C, companies are complex entities with numerous interdependencies between organizations that must be considered (Wallbach et al., 2019, p. 694). The value co-creation of B2B platforms is thus subject to multi-layered conditions as various ecosystem actors need to be encouraged and clients are more difficult to satisfy due to their requirements as legal entities (Hein et al., 2019, p. 516). In addition, the B2B context differs in terms of perception of trust and decision-making complexity (Neumann & Gutt, 2019, p. 2).

Because of the nascent development status of platforms in the B2B environment and the lack of research, their potential for companies' business models and the associated value creation remains unclear. This shortage of insights may account for the difficulties faced by a substantial number of companies in developing their platforms effectively (Tan, Pan, Lu, & Huang, 2015, p. 248). These are obstacles, the majority of German firms are confronted with as well (Riemensperger & Falk, 2020, p. 1). The fact that platform competition in the B2B sector is increasing rapidly represents both a major challenge and an opportunity for Germany. After all, its economy relies heavily on its highly developed industrial sector with a major share of B2B businesses in the international market. Nevertheless, a recent study of 370 leading companies in Germany revealed that although half of them are engaged in platform business models, only a minority of these are geared to fully exploit the potential advantages and opportunities (Adari, Falk, & Sampson, 2019, p. 3-5). Reasons for these "*considerable difficulties mastering the challenges of establishing own platforms and initiating the powerful chain reactions based on network effects*" are missing knowledge about the establishment of platforms and the monetization of existing ones (Drewel & Gausemeier, 2018, p. 7). Whether the German economy remains capable of defending the relevance of its industry internationally will also depend on its companies participating in B2B platforms – and successfully harnessing their power (Adari et al., 2019, p. 3).

1.2. Research objective

While the awareness of the economic potential of platforms as a central lever for value creation and capture is rising, the phenomenon itself remains underexplored (Zhao et al., 2019, p. 1). This applies particularly to the B2B sector (Hein et al., 2019, p. 516) despite its importance for the competitiveness of German companies, which are currently failing "*to tap the full platform potential*" (Riemensperger & Falk, 2020, p. 1). In response to calls for research, this paper aims to systematically examine which characteristics and modes of operation are responsible for the success of B2B platforms and which control options their operators and users have at their disposal. Accordingly, the research question and its supporting objects of investigation are:

Which factors are relevant for the design of functioning B2B platforms?

1. What are the primary characteristics of B2B platforms, particularly in distinction to B2C and C2C platforms?
2. Is there a correlation between the industrial environment and the existence of platforms and thus an indicator of a prerequisite for success?
3. What are the main challenges companies face building and maintaining B2B platforms?

This research sets out to explore what determines the success of a platform business model from an information system perspective. By making use of a multiple-case approach, the study intends to propose a set of principles that help to address platform challenges in the specific B2B environment. Therefore, the paper is structured as follows: First, to identify the underlying mechanisms of B2B platforms, concepts regarding platform value creation as well as B2B characteristics are described and complemented by a categorization of the existing B2B platform research stream. Next, an intermediate chapter will provide an analysis of the current German B2B platform landscape by means of a quantitative evaluation of 136 companies. Thereafter, the applied methodology is outlined. By drawing on semi-structured expert interviews with founders and managers of B2B platforms, the theoretical framework was empirically challenged and modified. After describing the results of the qualitative research, the contributions of the study are discussed and related to the existing literature. In contrast to existing papers that examine platforms by relying on single cases (Müller, 2019, p. 2), the findings provide a holistic understanding of the phenomenon to facilitate further theory building. The derived guidelines are then outlined to assist practitioners' decision-making to take advantage of the platform economy in B2B. Finally, the study draws conclusions, outlines the limitations of the research design and suggests further research paths.

2. Theoretical Background

In order to lay the theoretical foundation for this research, an overview of the platform economy and its value creation is first given. Since B2B platforms are subject to different mechanisms than their consumer-oriented equivalents (Neumann & Gutt, 2019, p. 2), these are described in the following, as well as a specific taxonomy.

2.1. Value creation in the platform economy

Traditional 'pipeline' businesses have dominated the economy for decades by controlling a linear sequence of activities. Their value chain is initiated by an input (e.g. raw material provided by suppliers), which is transformed in multiple steps and results in a product that entails an increased worth (Alstyne et al., 2016, p. 4). At present,

however, the way in which value is created is undergoing fundamental change. Unlike companies that are organized in buyer-supplier relationships, digital platforms do not own products but mediate the exchange of resources and activities (e.g. physical assets, skills, ideas) provided by actors on different sides of a market (Boudreau & Jeppesen, 2015, p. 1761). Their primary assets are information and interactions, which combined are also the source of the value they create as well as their competitive advantage. Since platforms are orchestrating value generated by others, the value creation is moving from the inside to the outside of the company. As a result, costs are borne by third parties, platform firms shift to zero marginal cost production, and have the ability to scale very effectively. Even though many of the pipeline businesses are still competitive, as soon as a platform enters the same market, "*the platforms virtually always win*" (Alstyne et al., 2016, p. 5). In their core concept, platforms have always existed, for example as marketplaces connecting merchants and consumers. However, it has only recently changed that the ownership of physical infrastructure and assets is becoming increasingly irrelevant with the advent of information technologies. Building and scaling platforms, as well as introducing new transaction mechanisms, functions now rapidly and at much lower cost. (Alstyne et al., 2016, p. 4). A significant characteristic of the platform economy is the fierce competition between platforms that target the same user (Zhao et al., 2019, p. 1). Their survival depends on the dynamic configuration of the relationship between different actors with multiple roles (e.g. users, owners, partners) in order to jointly create value for very specific needs of individual end users (Blaschke, Haki, Aier, & Winter, 2018, p. 4).

2.1.1. Definitions and key concepts of platforms

Comparing Amazon with Adamos, an industrial IoT platform, or WhatsApp, it is obvious that digital platforms have a particularly strong heterogeneity. This results in a multitude of incoherent platform definitions. Many approaches of structuring and classifying platforms (de Reuver, Sørensen, & Basole, 2018, p. 126; Gawer & Cusumano, 2014, p. 417) can be found in the literature. But when comparing different characterizations, it becomes evident that every author emphasizes distinctive platform aspects. While selected facets of platforms are often described in detail, platforms are only rudimentarily differentiated in their breadth (Wortmann et al., 2019, p. 9). Wortmann et al. did a structured evaluation of various platform definitions (i.a. from Choudary, 2015; P. C. Evans & Gawer, 2016; Osterwalder & Pigneur, 2010) and reduced them to the lowest common denominator. Therefore, "*a digital platform is a primarily digital market service with the task of simplifying, centralizing and orchestrating transactions and interactions. Digital platforms can, through their centralizing nature as intermediaries, occur between two or more groups of actors. Their task is to create transparency, to make a matching of or simplify transactions and interactions*" (directly translated from Wortmann et al., 2019, p. 7). This definition excludes technological aspects, thus highlighting a basic differentiation between intermediary and technology platforms. However, despite their various types of appearances, all platforms come with the same basic setup including four different actors (Alstyne et al., 2016, p. 4). The *owner* designs the infrastructure, provides services, and implements rules, the governance, that enable interactions between the parties. (Tan et al., 2015, p. 249). The platform participants consist of *partners* or complementors that supply the platform with special services and modules, of the *producers* delivering the offered products or services and the *consumers* using these available resources (Blaschke et al., 2018, p. 3). Platforms display several characteristics, such as high scalability, heavy data usage and low transaction costs (Engelhardt, Wangler, & Wischmann, 2017, pp. 11–19) and come with different advantages, such as lower market entry barriers, cost reduction, and enhanced communication between customers and suppliers (Kreutzer, Neugebauer, & Pattloch, 2017, p. 33). However, the driving force behind platforms are demand-side economies of scale or: (positive) network effects. In other words, the increasing value of a platform for its owner and users with the growing number of users that adopt it. This is because a larger network with richer data can enable better matches between producers and consumers, provide growing access to the user network and more complementary innovation. The network dynamics have a strong influence on the decision of complementors to join and invest in a platform since developing goods for the dominant platform promises the largest base of users. In turn, the availability of complementary products positively influences consumers' adoption decisions, which further grows the installed base. Thus, greater scale creates more value and increases the incentive for other participants to join the platform which in turn expands the value again. Many monopolies are built on this positive feedback loop (Alstyne et al., 2016, p. 6; Gawer & Cusumano, 2014, p. 417; McIntyre & Srinivasan, 2017, p. 413). The literature differentiates between four types: direct (or same-side), indirect (or cross-side) as well as positive and negative network effects. Direct network effects occur among actors on the same platform side (e.g. large number of users with whom to interact), opposed to indirect network effects which emerge between organizations of different sides (availability and variety of complements). Positive network effects exponentially grow the platform value for existing users, while negative network effects decrease its value (e.g. deteriorating platform performance with every additional user) (Gawer & Cusumano, 2014, p. 422; Helfat & Raubitschek, 2018, p. 1391; Lee, Kim, Noh, & Lee, 2010, p. 97; Wallbach et al., 2019, p. 694). Digital platform research highlights the influence the participant number on each side has on the platform adoption. Its key issue is called the chicken-egg or critical mass problem and represents the main challenge a platform has to overcome in order to establish itself (Loux et al., 2019, p. 214). In the context of an exchange platform, Caillaud and Jullien define the problem as such: "*to attract buyers, an intermediary should have a large base of registered sellers, but these will be willing to register only if they expect many buyers to*

show up." (2003, p. 1). A platform is only used if it provides a benefit, which in turn results from the increasing number of organizations using the platform (Tiwana, 2013, p. 41). Hence, platform owners have to entice the different sides of a platform while facing "*a critical mass constraint that must be satisfied at launch if the business is to be viable*" (D. S. Evans & Schmalensee, 2010, p. 1). The chicken-egg problem can be one-dimensional, only applying to one platform side, or two-dimensional, which means that it pertains all sides of the market. To be able to tackle this problem, literature emphasizes different strategic actions, with a particular focus on pricing policies, to trigger positive network externalities (Loux et al., 2019, p. 214).

2.1.2. Platform leaders and the new need to orchestrate ecosystems

Due to interconnected, internationally intertwined and complex business environments, value creation shifts from the single contributions by a firm to the co-creation of value in complex ecosystems and "*from traditional inter-firm competition to a joint approach of coopetition*" (de Reuver et al., 2018, p. 131; Hein et al., 2019, p. 503). And "*as the central point of gravity within its business ecosystem to facilitate value co-creation processes among its business ecosystem's constituent actors*" (Blaschke et al., 2018, p. 13), platforms are tightly connected to ecosystems (de Reuver et al., 2018, p. 131). Research stresses the importance of orchestrating ecosystems (Helfat & Raubitschek, 2018, p. 1391), since these open the path to new customer groups, superior innovations, new corporate cultures and thrive disruption and scalability power with partners (Kreutzer & Land, 2016; Kreutzer et al., 2017). The more players join and co-create value with complementary products and services, the higher the platform's resource potential and the more valuable it becomes (Blaschke et al., 2018, p. 8). A competitive advantage stemming from a broadly adopted platform with strong network effects with a global ecosystem of complementors is hard for other potential entrants to demolish (Gawer & Cusumano, 2014, p. 9). The central player in an ecosystem is often called *platform leader* (Gawer & Cusumano, 2014, p. 423). Developing a strategy on how to achieve platform leadership is central because it leverages enormous financial benefits (Lee et al., 2010, p. 92). The leader's function exceeds the matchmaker's role, as it must organize the ecosystem in addition to selling its core product or service (Helfat & Raubitschek, 2018, p. 1392). As the architect of their ecosystem, platform leaders inherit four roles according to Loux et al. (2019): bringing "*a welfare-enhancing vision of the collective ecosystem*", building platform consensus, shaping the overall ecosystem design around a core product and facilitating the development of complementary innovations (p. 221). They guide the development of complementary products and services by third parties instead of remaining passively impacted by the decisions of others (Gawer & Cusumano, 2014, p. 423). In order to leverage cross-side network effects in competition with other ecosystems for higher shares among end-users and complementors, platform leaders have to find the right approach to governance (Helfat & Raubitschek, 2018, p. 1392; Schreieck, Wiesche, & Krcmar, 2016, p. 6). This is a challenging task given the constantly changing conditions, the growing number of involved actors, high uncertainty and multi-faceted characteristics of these ecosystems. Moreover, platform leaders continuously face threats of competitive innovation, not unlikely to emerge out of its own ecosystem. Therefore, "*the viability of a digital ecosystem depends on continued innovation.*" (Helfat & Raubitschek, 2018, p. 1392).

2.2. B2B platforms

Also, companies in B2B markets have started shifting from selling products to building platforms that enable others, including customers, suppliers, and partners, to create value. This is forcing organizations with a history of controlling the product pipeline to rethink traditional business models. Given the increasing commoditizing of B2B offerings, platforms offer new revenue streams (e.g. in the form of data-fueled services), accelerate market efficiency by lowering transaction costs and provide a path to diversification. In this way, they help firms avoid becoming redundant (Li & Penard, 2014, p. 2; Riemensperger & Falk, 2019). In the following, the differences between B2C and B2B platforms as well as a specific taxonomy will be elaborated as a basis for the subsequent in-depth chapters.

2.2.1. Differences of B2C and B2B platform value creation

Value creation in B2C and B2B environments underlies different mechanisms, also when it comes to platform-based business models (Hein et al., 2019, p. 503). Thus, not all strategies that initiated the industry-disrupting success of B2C platforms can be applied to B2B. While there are already established platform leaders in the B2C area with powerful monopolies, which placed themselves at the intersection of demand and supply, "*the rules of the game are much different for B2B platforms*" (Riemensperger & Falk, 2020, p. 1). As organizations are not singular individuals, value co-creation in the B2B context is taking place under more compound conditions. Users are harder to satisfy because of their requirements as legal entities and their dependence on the platform for business-critical procedures. Since numerous interdependencies between the actors have to be considered, the service ecosystem is multifaceted compared to B2C environments (Hein et al., 2019, pp. 504 & 516; Wallbach et al., 2019, p. 694). Connections to customers are usually complex, deep and long-term with recurring sales and their journeys involve a high number of actors in order to realize the business. Not only because pricing, volume and delivery terms are negotiated individually, also because customization of entire processes is common: "*value-creating flexibility to meet the needs of key customers*". A key source of innovation in B2B but very rare in B2C is the development of new products in cooperation with a supplier (Maechler, Poenaru, Rüdt von Collenberg, & Schulze, n.d.). Whereas in B2C, purchases are often on a transactional basis. Moreover, network

effects "*are just as important for B2B platforms as they are for B2C*" (Riemensperger & Falk, 2019) but need to be managed differently. By thinking in industrial networks beyond conventional value chains, B2B platforms can generate network effects on a different scale. However, due to the fact that B2B products are usually targeting a very specialized and niche customer group, they do not tend to result in a global 'winner-takes-all' supremacy (Riemensperger & Falk, 2019). Adari et al. explain this weakened premise with the necessity of industry-specific knowledge and the reluctance of companies to join a competitor's platform. Hence, multiple platforms with "*strong industry-specific business models and varied portfolio offerings*" are assumed to be able to coexist (2019, p. 6).

2.2.2. Taxonomy B2B platforms

In order to be able to develop strategies for specific platform types, a differentiated understanding is needed (Wortmann et al., 2019, p. 6). However, existing research is very fragmented, despite the importance of a distinct typology (Blaschke, Haki, Aier, & Winter, 2019, p. 572), and industry practitioners propose a wide variety of definitions (see 2.1.2). All these approaches often differentiate platforms insufficiently and do not adequately reflect the heterogeneity of B2B platforms and possible combinations of elementary aspects (Wortmann et al., 2019, p. 3). Therefore, Wortmann et al. (2019) evaluated 57 digital platforms and identified, beneath intermediary and technology platforms as the overarching structure, five B2B platform cluster (see Figure 1):

1. *Bi- or multilateral markets*: These platforms are characterized by their role as intermediaries, enabling two or more stakeholder groups to match. Thus, the collaboration is undefined. This cluster is divided into four subtypes:
   (a) *Regionally dependent markets*: Platform players must be located close to each other in order to realize a matching (e.g. *Uber for Business*).
   (b) *Pure intermediary platforms*: Their primary function is the matchmaking between players rather than processing transactions (e.g. *Chembid,* a meta search engine for chemicals).
   (c) *Marketplaces*: Here, digital and physical goods or services are traded (e.g. *Amazon Business*).
   (d) *Social networks*: This platform's roles cannot clearly be defined as they depend on whether a user creates or consumes content (e.g. *Xing*).
2. *Service platforms*: Also function as intermediaries, but with a defined collaboration. Here, two actors specifically come to the platform to use a specific service (e.g. data exchange via *Dropbox*).
3. *IoT-based intermediaries*: These are based on IoT platforms but function primarily as an intermediary similar to the bi- or multilateral markets (e.g. *Tapio,* which is based on *Adamos*).
4. *IoT platforms*: These platforms providers pursue pipeline business models, which acquire and use these platform solutions to implement e.g. smart services.
5. *Smart IoT platforms*: These platforms are very similar to IoT platforms but represent a further stage of expansion. In addition to the platform itself, smart services of the provider are already offered (e.g. App Store for *Microsoft Azure*) (Wortmann et al., 2019, pp. 19–21).

Technological platforms (*IoT* and *smart IoT platforms*) are fundamentally different to intermediaries. While the use of IoT platforms confronts companies with technical issues due to the variety of interfaces and missing data acquisition of production machines, the development of intermediary platforms requires knowledge of the market mechanisms and the players involved (Wortmann et al., 2019, p. 3). Thus, a differentiation between these types is needed in order to be able to give precise strategic recommendations. In the scope of this research, technological platforms will not be included. The term *platform* refers to a digital intermediary that enables interaction in a two- or multilateral market by connecting all players to the platform. Furthermore, the subcategory *social networks* was neglected as this type is a social media system with the purpose of managing relations and branding in B2B marketing (Wang, Rod, Ji, & Deng, 2017, p. 1127), thus underlies its very own mechanisms.

2.3. Specific characteristics of B2B platforms

The following chapter provides an overview of the very fragmented B2B platform literature in order to answer the research gap and to examine influencing factors of platforms. After the papers have been sourced, patterns were identified, and the studies classified into three categories: participant acquisition and platform adoption, platform design, and ecosystem building.

2.3.1. Participant acquisition and platform adoption

This section summarizes actions the platform owner has to pursue in order to convince consumers and producers to participate (Drewel & Gausemeier, 2018, p. 7).

Customer orientation

The platform owner's role to attract and satisfy suitable participants on both sides is a complex customer management task. This triadic relationship is special to platform settings and requires new customer orientation efforts, on which positive outcomes the B2B platforms heavily rely on (Chakravarty, Kumar, & Grewal, 2014, pp. 1–2). Customer orientation in a B2B platform setting contains the customization of trading interfaces, technical help lines, and workflow support systems to meet the specific needs in a particular industry. To face this challenge, Chakravarty et al. propose a dual focus: retaining a high total customer orientation as well as customer orientation asymmetry, the extent to which a platform serves one side more e.g. when facing powerful actors on one market side (2014, p. 4). With promoting an asymmetry to be purposeful they argue in contrast to the traditional marketing literature (e.g. Appiah-Adu & Singh, 1998, p. 386), which suggests a high focus on all customers. Yet, the effect on the platform performance

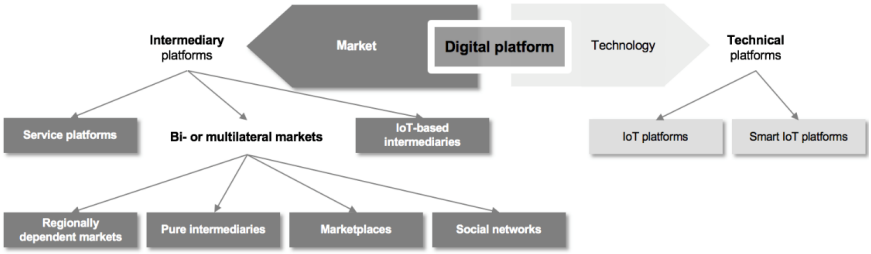

Figure 1: B2B platform taxonomy based on Wortmann et al. (2019)

correlates with customer concentration, for example a platform with concentrated buyers should focus asymmetrically on sellers (2014, p. 19). These positive effects are weaker when two-sided matching is conducted, hence, buyers and sellers interact directly (versus indirectly, one-sided matching). They are stronger with dynamic price opposed to a static price discovery (further elaborated in 2.3.2) with stable offering prices during negotiations (2014, p. 1). In summary, a platform should focus more asymmetrically toward sellers when they use dynamic instead of static pricing and with one-sided rather than two-sided matching processes. Overall, total customer orientation is "*a key lever that firms can manipulate to influence performance*" but only if dependency considerations are included (Chakravarty et al., 2014, p. 19). In addition to that, Berens, Kolb, and Haase (2019) state that a B2B company has to stay in immediate exchange with the customer, in contrary to B2C platforms, which are able to change certain features without direct user contact. Moreover, while B2C service is offered online, B2B companies rather provide it personal (Berens et al., 2019, p. 362). The B2B customer base is often comprised by a few larger firms and new services have to exactly match their needs. This is also due to the restrictions B2B firms underlie when it comes to change. Usually, their business processes are deep-rooted and as accurate and fast as possible as errors can have serious consequences for their B2B customers. Close cooperation with customers therefore reduces the risk of failure and keeps the churn rate low (Berens et al., 2019, p. 357).

Impact of quality and quantity of suppliers on network effects

During the early development stages of a platform, the owner has to focus on solving the chicken-egg problem. This is, in many B2B cases, assembling a critical mass of suppliers. Li and Penard (2014) examined the impact of quantitative and qualitative network effects on pricing and trading decisions and concluded that the attractiveness of a platform depends on both, quantity and quality of suppliers, but is to varying degrees contingent on a platform's maturity. They suggest that quality effects substitute for quantity effects as the size of the platform grows. While the quantity of participating suppliers is critical during early phases, supplier quality is much more important in mature stages, when the platform has reached critical mass (p. 1). According to the authors, a platform can create its competitive advantage by finding the optimal combination of qualitative and quantitative network effects. They "*need to design screening mechanisms in addition to enforcing some minimum quality standards*" in order to gather the critical mass of suppliers in the early stage without disregarding quality issues. Since the number of suppliers depends on access fees and their quality on the platform's screening and regulation policy, Li and Penard advise pricing as the crucial instrument (p. 2 & 12). Therefore, "*designing pricing schemes that regulate the number of suppliers and incite them to provide enough variety, quality, and trust*" (p. 12) is of high strategic relevance.

The role of affiliation costs and interdependencies in adoption decisions

Another perspective on platform adoption offer Loux et al. (2019) by considering the business user's point of view. They emphasize that high affiliation costs and tight interdependencies between users' activities (at project level) result in platform adoption constraints disregarding the incentive effect of pricing policy (p. 212). These affiliation costs rise when the platform adoption involves change in internal and inter-organizational processes, as well as interdependently when another user makes an adaption choice the organization is tightly coupled to. When these costs reach a significant level, they discourage adoption, even when subsidized by charging no price. Therefore, the pricing policy is less important as an incentive mechanism and urges the platform owner to activate other levers that ease adoption and, thus, grow the user base (p. 221). Secondly, Loux et al. stress that beyond the number of users on the platform's sides, additional interdependency issues have to be considered. According to them, the proportion of organizations which use the same platform functions as a moderator between the aggregated user number and its net utility. This impacts cross-group network effects either positively or negatively depending on if a growing aggregated user base turns into an increase in the number of projects where all the actors use the same platform (p. 221). Thirdly, under these interdependency constraints, platform adoption should not be stimulated by attracting one side before approaching the other (p. 213). This consecutive platform adoption path can result in negative cross-group network externalities and make multi-sided platforms decreasingly attractive, "*as the aggregate user base grows in the presence of tight couplings between the users'*

activities". To foster adoption, a concurrent pattern, simultaneity between different sides on a project level, is a critical condition for success, since it can activate positive network effects (p. 221).

Platform diffusion

Wallbach et al. identified 21 key inhibitors of multisided platform diffusion and disclosed that the majority of these factors slow down or impede positive, mainly cross-side, network effects (2019, p. 693). Especially technical and regulatory requirements have an impact on diffusion. If required functionalities of the system are missing, there is a lack of additional subscribers and positive network effects cannot be triggered (p. 701). Further, the factor *mindset* indicates that implemented workarounds infiltrate the diffusion process as well as the perceived ease of use which is influencing the initial acceptance within the employees (p. 702). C*haracteristics of system providers* describes that the system has to be neutral as well as reliable and communication activities have to create an understanding of the platform and leverage word of mouth (p. 703). In *competition*, a conflict of interest, barriers through contractual relationships, a missing identification with the community idea and an unfair governance structure are influencing factors. *Processes* explains that heterogeneous processes are slowing down the diffusion as well as process dynamics such as complexity or short-time orders (p. 704).

2.3.2. Platform design and organizational setup

In this section, the platform infrastructure, which enables high-quality transactions between the participants and supports them in value creation, and organizational requirements are examined (Drewel, Gausemeier, Koldewey, & Özcan, 2018, p. 7).

Platform openness

Openness is an important driver of network effects and refers to the degree on how open platforms should be designed towards third-party contributors. The focus lies on finding the "*right degree to balance the trade-off between diversity and control*" (Schreieck, Wiesche, & Krcmar, 2017, p. 14). While high openness comes with a high variety of complementary products or services but with reduced control of the ecosystem, low openness reduces the platform's generativity but can ensure quality and other standards (Schreieck et al., 2017, p. 15). According to Riemensperger and Falk, "*an ecosystem of value creators will never grow"* when a platform is closed off (2019). After having studied the majority of German platforms, they discovered that most of them are discounting their network effects by not being run as open and networked ecosystems. This is confirmed by Adari et al., who are stating that a "*mindset of "platform protectionism" and risk aversion stands in the way of creating business models with truly disruptive impact on existing market structures*" (2019, p. 5). After having studied German B2B platforms, they discovered that most of the companies do not fully leverage network effects and exploit its power "*by strictly protecting the customer interface not only from potentially harmful competitors, but also from helpful co-operators that could improve the end-user experience by providing valuable third-party services*" (Adari et al., 2019, p. 5).

Secure data exchange

During a platform's life cycle, pivoting the underlying business model is an ongoing process. Which is, as investigated by Berens et al., highly based on data and the derived insights. Therefore, algorithms help to gain valuable information (2019, p. 356). But in B2B, actors closely guard and protect their data, hence, limit insights as well as data-driven services. Sensitive data is much more protected than in B2C where users do not hesitate to provide personal data if the services received are considered worth it (Adari et al., 2019, p. 5). However, without data access "*the B2B platform owner is blind to the next opportunity*". To face this dilemma, a data strategy for how data will be collected, priced, and monetized is crucial. Riemesperger and Falk (2020) recommend a three folded approach: turning to a marketplace that sells data, providing data protection and taking advantage of data partnerships (p. 2).

Pricing

According to Chakravarty et al. (2014), three contextual attributes are the key descriptors of platform business models and moderate the effect of buyer (seller) concentration. Two of these are related to monetization: dynamic/ static pricing and platform transaction fee structure. Dynamic, as opposed to static pricing, is best understood by the example of bidding. It "*creates uncertainty about actual prices and participants' individual outcomes: buyers perceive a greater risk of overpaying, and sellers fear not getting the desired amount for their offerings*." (p. 5). When it comes to subscription fees, participants perceive the switching costs increasingly greater "*as the proportion of fixed component increases*" and lower "*as the proportion of transaction-based fees increases*" (p.5). Berens et al. (2019) conclude that 'pay-per-transaction' is a widespread pricing model with subscription progressively becoming relevant for the majority of B2B companies. Moreover, under certain conditions low pricing is "*crucially important to gain competitive advantage"* (2019, p. 358).

Organizational agility

Before extensively benefiting from integrating new technologies and business models, companies have to integrate organizational learning. Riemensperger and Falk (2020) state that B2B platform success not only demands the shift from product to platform thinking but "*changing the organization itself, opening up and streamlining highly insular pyramidal management structures*" (p. 2). Therefore, firms should go further than just initiating insulated digital pilots, startup cooperation or labs and "*embrace a holistic digital transformation strategy owned by the CEO*" (p. 2). Here, technology adoption, innovation capacity and leadership are the major success factors. The latter is supported by Berens et al. (2019), who highlight the importance of visionary and

transformational leadership. Whereas particular freedom in intercultural decision-making is critical, some top-down leadership remains important. After having compared B2B and B2C companies, they point out that B2B firms fundamentally struggle with agility. They suffer from less flexibility and greater internal limitations in comparison to B2C companies. These restrictions are caused by a strict top-down culture, a long decision-making process, and their customers business reasons to use a platform. In order to maintain certain standards between companies, flexibility is limited. This can be remedied by setting up independently operating business units (p. 359).

2.3.3. Ecosystem building

When developing a platform, the owner has to decide how and where to position itself within different third parties. In order to optimally design the ecosystem, potential advantages and weaknesses have to be included in the platform structure (Drewel et al., 2018, p. 7). According to Berens et al. (2019), especially B2B platforms depend on partnerships and a large ecosystem, including competitors, for their survival. While B2C platforms build partnerships with global and famous brands to mutually benefit from marketing channels, a B2B platform is defined by partnerships with customers or investors (p. 362). They examined different B2B platforms and in nearly all cases "*a wide-established ecosystem of partnerships largely contributed to the platforms' success. The larger it is, the stronger it gets, the more success for the platform, which is underpinned by network theory*". Some accomplished the extensive network scale by merging with larger companies (p. 361). Building trust is one of the central issues a platform has to tackle. By using partnerships, platforms can strengthen their brand and trustworthiness, for example by presenting references of well-known enterprises on their website or by paying consultants who then recommend the platform to their customers (p. 359).

3. Status quo of the German B2B platform landscape

To comprehend the new competitive reality for B2B organizations, Germany was examined as a geographic market with leading global B2B firms. According to the Federation of German Industries (BDI), the B2B-dominated German industry contributes more than 30 percent to the gross domestic product. It stands to reason that, building on this very strong industrial base, Germany's path to the platform economy is led by B2B platforms (BDI, 2019). In order to gain a realistic understanding of the total population to which the participants in this study belong, the following descriptive report complements the research design by providing a quantitative overview of the domestic B2B platform landscape. It further serves in proposing correlations between industry environments and platform existence. Therefore, 136 platform initiatives were surveyed and examined. Mainly those of local firms but also individual relevant foreign platforms that are active on the German market were considered. The data was collected, extended and validated via various search engines, online tools such as Tracxn, and professional articles. To present more distinct findings, the platform initiatives were split into the categories *corporate* and *startup*. A *startup* is defined as a company that is not older than five years and acts as independently. Thus, spin-offs from incumbents are also located in this category (58 in total, 43%). By contrast, *corporates* are firms with platform initiatives in the core company as well as independently founded platforms that established themselves on the market for more than five years (77 in total, 57%).

Finally, an analysis of the German B2B platform landscape's status quo, based on the evaluation of 136 companies, frames the context for this study.

Distribution of B2B platforms over sectors

First, the distribution of B2B platforms over six broad sectors and one cross-sectoral category was compared (see Figure 2). The traditionally very strong *automotive, transportation and industrial products* sector is also comparatively well developed in the platform environment with a third of the investigated platforms located here (corporates and startups equally). It is followed by *consumer products, retail and TMT* (13%) and *life science, health and chemicals* (11%), with more activities coming from the startup scene (19% vs. 9% in consumer products; 17% vs. 6% in life science). The least undertakings happen in the *infrastructure* sector (8%) – again with a higher number of startups taking advantage of the yet unexploited potential (14% vs. 4%) – as well as in *MRO* (6%) with only one active startup but accounting for 9% of all corporates' platform activities. It is worth noting that the MRO sector consists entirely of marketplaces. Nevertheless, 27% of all studied platform initiatives have no specific sector orientation, the large majority of them are corporates (29 platforms vs. 8). Having a closer look at these sector unspecific platforms, it is not surprising that nearly half of them (46%) pursue a marketplace model with a horizontalization in products. Another 27% are pure intermediary platforms, whose purpose is the matching-making between players, for example data bases with company profiles or product details. This leads to the assumption that not focusing on a particular sector or industry correlates with the offer of either a wide range of cross-industry products or information.

Distribution of B2B platforms across platform types

Second, the distribution of the evaluated B2B platforms over the different types based on Wortmann et al. (2019) was investigated (see Figure 3). As stated above, *social networks* were not included. Moreover, IoT platforms and smart IoT platforms were merged into one category since the distinction between both requires an in-depth, thus, too complex for this research's scope, understanding of business models and service offerings. Starting with intermediaries, marketplaces dominate the B2B sphere accounting for 37% of all platform types, 39% within corporate and 34% within startup platform initiatives. These findings are supported by Adari et al. (2019), who analyzed 180 platforms (both B2B and

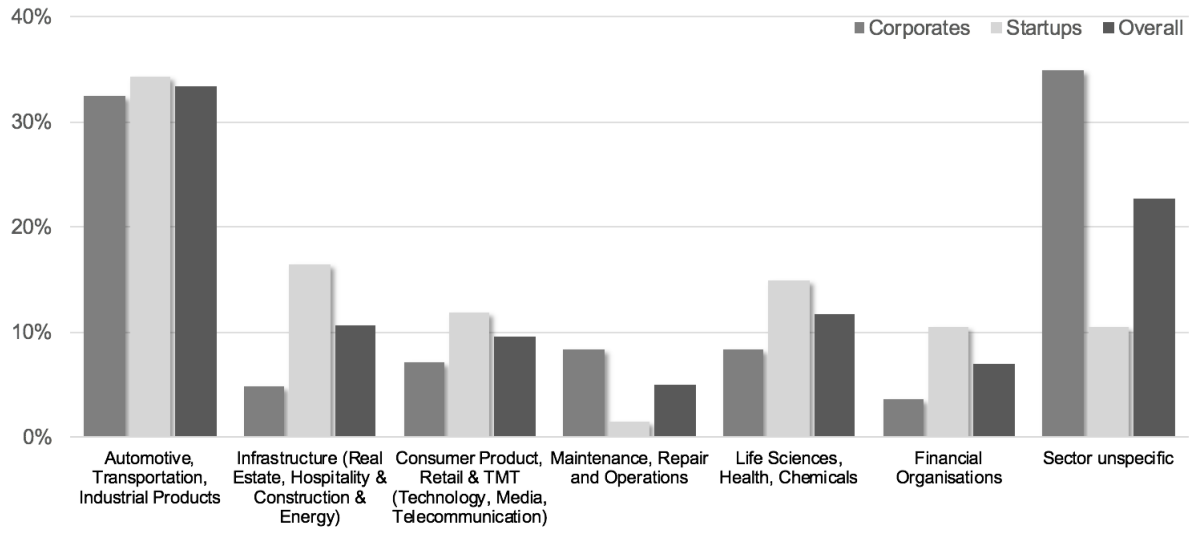

Figure 2: Distribution of all platforms over sectors

B2C) of Germany's top companies. They also found marketplaces "*the most common archetype*" since "*compared with other platform archetypes, marketplaces carry a low risk factor for platform owners due to lower investment requirements and lower management costs associated with comparatively simple ecosystems*" (p. 5). Marketplaces are followed by pure intermediary platforms (21%) without notable difference between company maturities. Startups have, however, recognized the potential of service platforms (almost 20% of all startups are located here), which account for 13% of all platforms. Also, IoT-based intermediaries comprise for 13%, equally distributed within corporates and startups. Only 4% of all platforms are regionally dependent markets, which are exclusively served by startups. In the IoT field are 11% of all platforms located, with large industrial companies as the main players (12 platforms vs. 3).

4. Methodology

In order to scrutinize the research questions, this study adopts a qualitative research design and follows the case study approach proposed by Yin (2018). The subsequent chapter provides detailed information about the employed methods.

4.1. Research design

The B2B platform economy has only recently gained traction in academic studies as well as in the corporate and startup ecosystem (Hein et al., 2019, p. 516). Therefore, this research's topic is a mostly unexplored, emerging field with limited practical (and consequently, empirical) proof. The examination of B2B platforms with the objective to understand their true potential, drivers and impediments that facilitate or hinder adoption, obliges an in-depth understanding of influencing factors and conditions shaping this rising business model. It is a complex phenomenon, incorporating technological, business and social dimensions. Therefore, a qualitative explorative research design is utilized to scrutinize platforms in their real-life context and through interpreting the stakeholders' shared understanding (Klein & Myers, 1999, p. 87). Finally, by using iterative data collection and analysis, explorative insights are gained that answer the research question in a structured manner.

Considering the limited number of successful B2B platforms, the underexploration of the scientific field, and by following many other scholars researching this area, a holistic multiple-case study approach proposed by Yin (2018) was chosen. Case studies are a research approach suitable for exploring complex and barely known phenomena by capturing their richness and identifying patterns, with the outlook of generating theory (Eisenhardt, 1989; Yin, 2018). When facing a complex and dynamically evolving phenomenon, this research design is especially beneficial for answering 'how' and 'why' questions (Yin, 2018, pp. 48–61). It allows the "*testing of cause and effect relations by performing a replication logic with a reasonable amount of fitting case studies*" (Berens et al., 2019, p. 348). Hence, *"analytical generalizability"* (Yin, 2018, p. 37) can also be achieved by small samples of cases based on qualitative data analysis. Using multiple cases, evidence can be sought in different contexts by searching for convergence aspects and divergence (Stake, 2013). As opposed to single case studies, a comprehensive consideration of the research question takes place in several cases (Yin, 2018, p. 48). Consequently, by contrasting and replicating the findings from individual cases, a higher reliability and more robust conclusions due to lower context-specific dependencies, can be achieved (Eisenhardt & Graebner, 2007, p. 27).

The study pursued an integrated, systematic combining – abductive – research approach based on Dubois and Gadde (2002). By challenging the dichotomies of induction and deduction, abduction allows an intertwining of theory and ob-

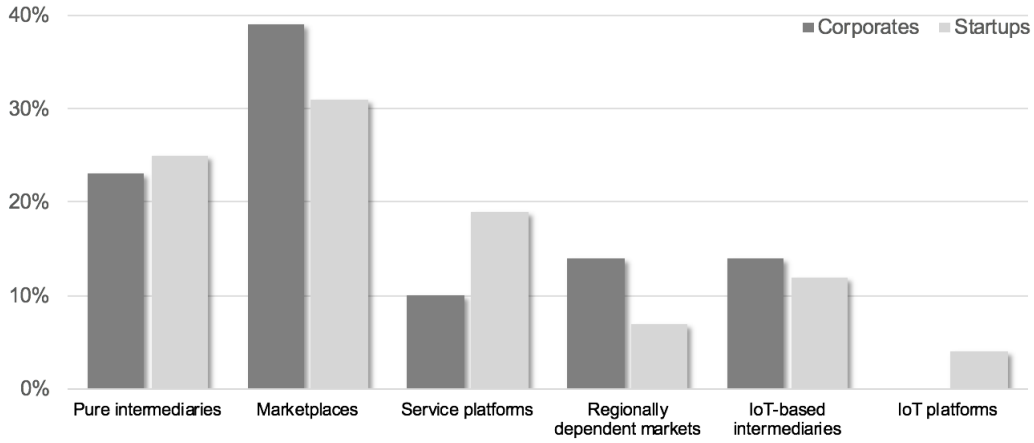

Figure 3: Distribution of platforms across types

servation (Dubois & Gadde, 2002, p. 555). It is suitable for research phenomena where existing theoretical frames do not offer an adequate answer because abduction represents "*the process of providing a theoretical explanation for [an] empirical puzzle*" (Cassell, Cunliffe, & Grandy, 2017, p. 354). Since existing theoretical preconceptions did not seem to sufficiently explain B2B platforms, abduction helps to develop new theoretical models. Dubois and Gadde (2002) are stressing "*theory development, rather than theory generation*" (p. 559) and are building on enhancement of obtainable theories rather than on developing new ones. Abduction-based research is grounded on a framework that leads the search for empirical data. In the course of the data collection, it is successively modified "*as a result of unanticipated empirical findings, but also of theoretical insights gained during the process*" (p. 559). Building on a theoretical review of studies about B2B platforms, these theories were iteratively refined as the empirical data unfolded. Thus *"fruitful cross-fertilization*" (Dubois & Gadde, 2002, p. 559) through the combination of established theory and new notions deriving from the confrontation with reality was created.

4.2. Case sampling

After having defined the research question and the conduction of a preliminary analysis of the theoretical foundations, the second step was the selection of cases based on the 'criterion' sampling strategy (Patton, 1990, p. 182). Here, prior theory determines the choice of cases. Since data collection through interviews is central in case studies (Runeson & Höst, 2009, p. 146), this research was set out with the intention to interview founders or managers of B2B platform initiatives. Drawing on Wortmann et al.'s (2019) taxonomy, B2B platforms are defined as intermediaries, not including technological platforms, connecting different business entities. In order to guarantee comparability, all selected platforms share a set of characteristics. Namely, the platforms contain of a technology- and internet-based, open and participative infrastructure, and facilitate interactions between user groups with the purpose to create value for consumers, producers and partners. Moreover, the company has to be based in Germany. However, to cover as many perspectives as possible within these boundaries, a variety across all platform maturities and types as well as different proximities to a corporate sponsor, were aimed to be included in the sample. It was assumed that managers of B2B platforms are best suited to contribute rich data and understandings of the prevailing reality of the research problem, as they are at the heart of activities and involved in strategic product and business development. The cases were selected through an intensive screening of the dominant search engines and databases. Concerning the number of cases, there is no agreement in literature (Patton, 1990, p. 184). It can, however, be determined by trading off the breadth and depth of the case study inquiry. Closure is reached, when the data is theoretically saturated, meaning that new data no longer offers additional insights (Glaser & Strauss, 1967). This sample includes ten interviews with CEOs or managers of B2B platforms; table 1 shows the characteristics of their companies. 40% of them operate in the *automotive, transportation and industrial products* sector, 30% in *infrastructure* and 10% each in *life sciences, health, chemicals,* as well as *financial products* and *consumer products, retail and TMT.* Therefore, the sample aimed to roughly illustrate the distribution that was surveyed in 2.2.2. In order to be able to make generally valid assumptions about intermediary platforms, a variety across types was included. Only to IoT intermediates could not have been reached out. It is noteworthy that five out of six corporate platform initiatives are in the scale-up phase, while three out of four independently founded platforms are already in a growth maturity. Whereas the corporate backed ventures were all started in 2018 or 2019, the oldest independently acting platform was founded in 1999, with an average age of nearly nine years for all young companies.

Table 1: Sample characteristics

No.	Company	Position	Platform type	Sector	Industry	Maturity	Customers	Corporate proximity	Funding	No. of employees	Interview length
1	Marketplace for chemicals	CEO	Pure intermediary	L-S, H, C	Chemicals	Scale-up	B2B	Corporate spin-off	2018	20 - 50	52 min
2	Transaction platform for logistics in the bulk goods industry	Manager	Regionally dependent markets	Infrastructure	Construction	Scale-up	B2B	Corporate as business angel (holds 51%)	2018	10 - 20	59 min
3	Platform for secondary raw material and waste handling	CEO	Marketplace	A, T, I-P	Industrial products	Scale-up	B2B	Corporate spin-off (holds 100%)	2018	0 - 10	53 min
4	Platform for the automotive service after market	CEO	Regionally dependent markets	A, T, I-P	Automotive	Scale-up	B2B & B2C	Corporate spin-off (holds majority)	2018	10 - 20	47 min
5	Marketplace for renting of construction machinery	Manager	Marketplace	Infrastructure	Construction	MVP launch	B2B	Corporate business unit project	2019	0 - 10	41 min
6	Platform for the automotive market	Manager	Pure intermediary	A, T, I-P	Automotive	Scale-up	B2B & B2C	Corporate spin-off	2018		1 h 06 min
7	Marketplace for animal and plant by-products	CEO	Marketplace	A, T, I-P	Organic raw materials	MVP launch	B2B	Independent (startup)	2019	0 - 10	51 min
8	Online marketplace for PV projects & solar systems	CEO	Marketplace	Infrastructure	Energy	Growth	B2B & B2C	Independent (startup)	2012	20 - 50	46 min
9	Transaction platform for construction financing and instalment loans	CEO	Service platform	Financial products	Finance	Growth	B2B & B2C	Independent (now corporate group)	1999	200+	1 h 15 min
10	Platform for the fashion industry	CEO	Service platform	Consumer product, retail & TMT	Retail	Growth	B2B	Independent (startup)	2015	50 - 100	58 min

4.3. Data collection

The interviewees were approached via email or LinkedIn with information about the study's purpose and its procedure. Finally, ten semi-structured interviews, with an average duration of 55 minutes, were conducted. All were carried out via phone or Skype, audio-recorded and subsequently transcribed. During the entire research process, the participants were assured anonymity. By semi-structuring the interviews, "*room for improvisation and exploration of the underlying phenomenon*" was opened up (Hein et al., 2019, p. 507). A guideline was used to inform the interview conduction, but, in accordance with Flick (2014, p. 217), was adapted during the data collection process. In this way, consistent data collection was secured while opportunities to develop new theoretical insights were opened up. Each participant was asked a comparable set of questions to be answered freely and open-ended. First, initial ground setting information was focused. The interviewees were asked general questions about themselves and their position, as well as about the organization's founding, business model and stakeholders. Next, specifications of the platform design in relation to strategic aspects were addressed, followed by discussing differences of B2B and B2C markets and platforms. Then, the interviewees were asked to evaluate their platform's success as well as drivers, barriers and their targeted vision. All answers were contested with individual deep-diving questions to ensure comprehensive insights into each case. To open up the opportunity for further discussions, the interview was completed by asking whether the participants want to add anything of relevance, which was not brought up yet. Despite being directed by the guideline and the aim to dig deeper into understanding the informants' views, the interviewer allowed to share the preferred information, tried to ensure neutrality by not influencing opinions or imposing topics, and paid attention to a non-judgmental form of listening. A sample of the guideline as well as an exemplary interview excerpt can be found in Appendix 1 and 2. To strengthen reliability and to allow for triangulation, the data collection was supplemented with additional sources of information (Flick, 2014, pp. 182–190; Yin, 2013, pp. 119–121). Thus, data from websites, press releases and coverage has been included.

4.4. Data analysis

The aim of the data analysis is to derive conclusions from the collected data by obtaining a clear chain of evidence, an intersubjectively comprehensible understanding of these derivations (Yin, 2013, 2018). Qualitative analysis is conducted in parallel to the data collection and with the use of systematic techniques (Runeson & Höst, 2009, p. 151). This study makes use of procedures and approaches commonly associated with "*codified common sense*" (p.59) based on Robson (2002, p. 459 ff.). An approach that combines the two main methods of qualitative research: content analysis and grounded theory. After having cleaned the transcripts, of social discourse for example, a series of steps was carried out in order to convert the raw data into codes. Once familiarity with the data was established, the analysis started with open coding, namely, assigning parts of the text to a code representing a certain theme. These emergent, inductive, codes were supplemented by a priori, deductive, codes that have been identified beforehand, in this case from examining theory, and matched to data patterns. Thus, 295 codes with 485 interview quotes were associated. Codes were then formed into a hierarchy of sub-codes. In axial coding, 32 subcategories, that cluster open codes related to the same aspect thus describe the relationships between codes, were identified (Charmaz, 2006, p. 60). Selective coding represents the data analysis process's last stage. Here, these subcategories were reduced into five classifications which demonstrate theoretical themes and concepts (Robson, 2002, p. 483). These describe the initial situation in B2B markets, network effects, a B2B platform's company setup, its design as well as the further development. The data analysis used within-case (identifying unique patterns of each case) and cross-case analysis (identifying generalized patterns across cases) in order to verify and sharpen hypotheses. Lastly, the findings were triangulated with the data from secondary sources.

5. Findings

Emergent from the interviews, common patterns of B2B platforms' characteristics, as well as drivers, barriers and success factors were identified. The following chapters will reflect on the findings derived from the analysis of the interview data according to the third-order themes.

5.1. Challenges and platform opportunities in B2B markets

In order to understand which factors influence the design of a B2B platform, it is first necessary to comprehend which characteristics shape the B2B landscape, especially in distinction to B2C markets, and with which new offers platform companies try to disrupt old structures.

Challenges in B2B markets and their differences to B2C

By asking the participants about the problems their platforms solve, it became obvious that despite the difference in industries, many B2B markets share similar characteristics. All interviewees reported very analog, not digitized markets, 40% even described their B2B surrounding as a digital greenfield, "*stone edgy*" (I10), that required to start with very basic digital solutions. Three participants ascribed B2C markets a digitalization advance of 10 to 15 years. Half of the respondents portrayed the sales processes as offline and traditional, 30% mentioned the industry's data management as a huge deficit or "*last century*" (I1) resulting in a lack of market insights and historical data, that makes contracting difficult. Additionally, 70% pictured their industry as very fragmented. The decentralized players are limited in geographic reach, thus, lacking access to new customers and appropriate order quantities. Without the necessary digital tools, they struggle to reach out to big customers as well as their value chain partners. This lack of new clients results in

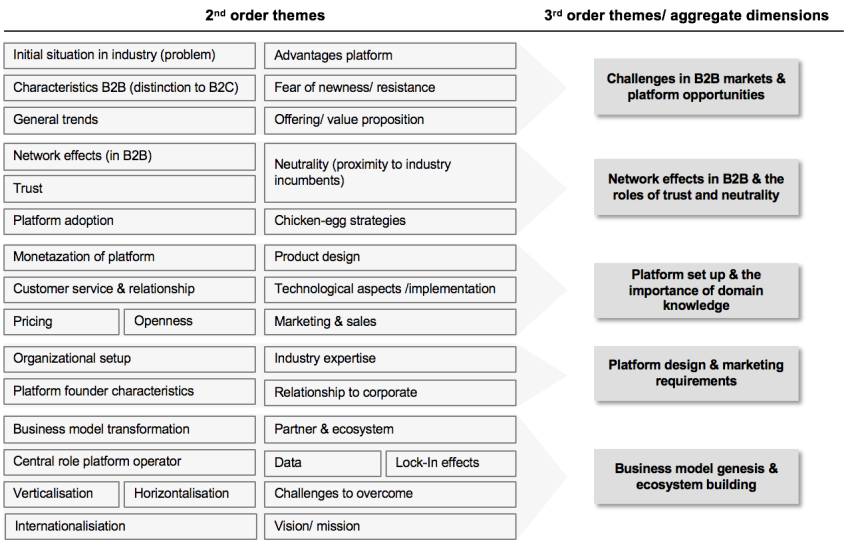

Figure 4: 2nd and 3rd order themes

very long relationships, which is also reinforced by the partly already very old industrial age. Moreover, 60% called their B2B environments intransparent and inefficient. The first leads to a strong lack of trust and security, "*a fear of fraud and defaults*" (I3), thus to manual verification processes and continuous partner reviews. This contributes additionally to market inefficiencies caused by non-standardized and highly manual processes. Moreover, two participants reported that long-established players who benefit from the current market state have a strong interest of using their power to preserve it. Particularly platform 2 and 7 reported conflicts with "*Platzhirschen*" ('old bulls'; I2) who control the market and hinder new players' entry. Partly, according to the interviewees, because some collude and ally prices. Two reasons for this supremacy of single companies are the trend of consolidation, which was mentioned especially in the construction and automotive industry, and very niche and focused markets, as 40% described. As a result, one of the major distinctions to B2C are much smaller markets with less customers. Furthermore, the high degrees of professionalism and conservatism were mentioned as main distinguishing factors. Listed reasons were high-value assets, high expenses, the risk aversion of companies compared to individual customers (company capital vs. own money) and regulatory issues in B2B. Consumers in B2C were described as open, flexible and free in their decisions and "*by far less rational and economical*" (I6), with smaller but easier to convert baskets. Having operated in B2C, interviewee 4 further explained that competing for consumers is extremely expensive (because of high marketing spending) and at the same time difficult to get a high customer lifetime value. As the interviews showed, most of the elaborated differences between B2C and B2B mainly relate to the buyer/customer and not the producer side.

Platform opportunities in B2B markets

Building upon these market inefficiencies, the examined platforms were formed with a multitude of offerings. On closer inspection, however, it is noticeable that all value propositions are based on either one or both of the following promises: reducing transaction costs and enabling business relations. Since platform value propositions are at least two-folded, it can be observed that reduced transaction costs in terms of convenience, namely, to save effort and time, is particularly relevant for the buyer side and new business opportunities for suppliers/producers. Reduced transaction costs in their various manifestations, are included in all of the platforms' offerings. It encompasses different aspects but the most central is the enablement of process efficiency, which was mentioned by 80% of the interviewees, mainly through saving manual efforts. This is associated with the visibility and efficiency of order processing which 60% of the platforms incorporated into their product offering.

> "I know exactly what was delivered to me as a one-to-one buyer. I can see this directly online. I have the delivery notes, the invoice; everything is neatly filed and digitally tracked, I don't have to scan. This makes the whole process much leaner than todays." (I2)

Furthermore, order transparency is accompanied by supply chain visibility, thus, improving the control of suppliers. Interviewee 6 summarized*: "So it's no headache anymore to anyone".* The other aspect all value propositions can be narrowed down to, is the enablement of business relationships. This is achieved through modernizing sales and marketing processes by giving the supplier online visibility, providing an additional (digital) sales channel and, thus, market reach. Interviewee 1 explains that many producers in a fragmented market, like the chemical, have currently no chance of reaching out to big customers:

> "There're more than 22,000 chemical companies in the EU. There are a lot of segments that are

> extremely fragmented, and they are extremely niche. A lot of family-run small sized businesses. And for them, it makes a lot of sense to be part of a larger network because simply they weren't able to participate in the sales (...) of their products. And with the help of this online platform, they all of a sudden are (...). Listing their products on our marketplace, is a very, very first step. Very basic stuff. Like giving them an online visibility, making them findable on Google, for example (...)." (I1)

An interviewee from the automotive industry agreed that a platform "*offers many opportunities because I can reach customers I could not reach before*" (I4) and company 5 added that their clients perceive them as an external sales department. Also, for service platforms, where stakeholders meet for a specific service and not necessarily for trade like on a marketplace, additional revenue can be a positive side effect due to an overall increased visibility. In addition, platforms provide access to markets, good prices and short-term supply for buyers, independently from the former, very important company network. Because of the transparency and variety of offers, interviewee 1 is "*convinced that the marketplace will in the long run always outpace any web shop offer*". Transparency was named by 50% as a key value added and is further characterized by market insights and an overview of a market's demand and supply. This part of the value proposition aligns with the most important advantage 70% of the participants see in platforms: the ability to bundle supply in fragmented markets (hence, satisfy diverse demand), to balance availability (hence, supply and demand), and to provide transparency as well as supply chain security and visibility. This seems to be particularly relevant for marketplace models:

> "On our marketplace you will find 10-20, in some instances 25, different suppliers of sources of one particular product available. So, you will have a significant choice as a buyer and supply chain security to find offers. In the web shop you will always be limited to just one." (I1)

Also, other platform types consider this as an impactful strength. For example, the representative of a regionally dependent platform stated: "*ultimately, this platform model has the advantage of simply being a kind of network where the regional strengths of the respective players can be bundled.*" (I2). This relates to another benefit 40% of the interviewees named: opposed to linear businesses, platforms are not restricted (e.g. to an area) and easily scalable. Additionally, for 30% of the participants, an essential gain is a platform's function as the basis for data-driven business models. Two respondents named the enabling of collaborative ecosystems, where more value for everyone is created and, thus, the possibility of covering the entire customer lifetime value, as central. Another 20% mentioned the ability to build a cost-saving, value-creating industry standard. These various platform advantages will be discussed in more detail in the following chapters.

5.2. Network effects in B2B & the roles of trust and neutrality

Being the central construct in B2C, network effects play also a relevant role in the B2B context. There are many approaches the companies pursue in order to trigger these and overcome the chicken-egg problem. However, all are based on one premise: trust as the most central aspect to drive platform adoption in B2B.

Network effects in B2B

For 60% of the interviewees, network effects in B2B are just as important as in B2C. Only for one respondent (I9) they have less impact because of their lower power. The remaining 30% agreed on an overall importance of network effects but emphasized their complexity in B2B. Both platform sides must be carefully balanced, taking into account the different network effect strengths on the provider and producer side, depending on the number of players. Overall, network effects lose importance when the market is highly consolidated and dominated by only a few players Concerning winner-takes-all dynamics, only the operators of service platforms evaluated these as relevant for B2B. Both intend to provide the infrastructure for the industry and have strong lock-in effects through deep technical integration or the amount of data collected.: *"it will be stupid for another company to start the same thing. There have been a few minor initiatives and they just had no chance." (I10)*. In contrast, the CEO of a marketplace stated that there is no winner-takes-all since B2B markets are much more focused. This supports Riemsberger and Falk (2019) as well as Adari et al. (2019, p.6), who both explained the decreased importance of the winner-takes-all premise with niche customer groups, the necessity of industry-specific knowledge and the reluctance of companies to join a competitor's platform.

> "I don't think it's a winner takes it all run. I mean, especially in e-commerce, you have this winner-takes-all thing, these first mover markets. That's why the big scale up strategies, the huge funding rounds, burn rates, etc. I don't believe that's the case with us. Because we're in a very focused market that is not super digitized. So, there is not just the next incumbent with a slightly bigger tech team coming and just doing the same as we do. That is not gonna happen that easily." (I8)

Platform adoption challenge: facilitating trust and ensuring neutrality

Two of the biggest adoption constraints with which 40% of the platforms struggle, are the fear of technology and the skepticism towards new ways of doing things. Half of the participants explained that trust and security issues, particularly in terms of data, are the crucial barrier to overcome.

Given the degree of an industry's platform readiness it can be very time-consuming and tough to convince its players because *"you have to guarantee that everything's trustworthy" (I3)*. Especially for companies in the MVP (minimum viable product) launch phase this seems to be a bottleneck:

> "At the moment they don't want that at all, because they think: "If you can look with your computer into ours, then you will see things you are not supposed to see". They are afraid of data misuse. (...) This unhealthy half-knowledge in the market is our big challenge. (...) it's a tough process, people don't really trust us yet." (I5)

Trust as the central element for B2B platforms was highlighted by 80%. Its significance is mainly due to the high expenditure at stake and the far-reaching consequences that individual errors can have. Only interviewee 8 emphasized that trust is not a distinctive feature of B2B and equally important in B2C. Having a closer look at the platform, which serves B2B as well as wealthy B2C customers, who are going to make large investments, its representative's statement does not necessarily contradict with the others' opinion. It can be concluded that the importance of trust depends on the money at stake as well as the number of potential customers in a market and the impact the loss of a single customer has. Since B2B customers are much more professional and rarely forgive mistakes, they need to trust their partners to be competent, efficient and reliable. "*Contract compliance is the most important thing*", added interviewee 2. There is always the threat of negative network effects after a customer was dissatisfied. Often, industry players are connected and word of mouth spreads quickly if a new company is not trustworthy. Again, in particular if the industry is specialized and/or determined by a few powerful players. Respondent 4 explained that losing a single customer for a B2C platform is far less of a concern than if they would fail to satisfy one of their 12 demand side clients. Since trust in product and service are key, a semi-finished platform would not succeed. It is crucial to start off with a functioning product since customers expect to be able to rely on the platform offering from the beginning on. This confirms Wallbach et al. (2019), who identified 21 key inhibitors to platform diffusion: if required system functionalities are missing, there is a lack of additional subscribers and positive network effects cannot be triggered (p. 701). Besides building trust with the platform's products and services, the companies apply different strategies in order to appear trustworthy. Platform 10's strategy is not exploiting their strong position in the market (no change in pricing) and 50% of the participants use the reputation of partners and customers, for example by displaying references and logos on the website: *"(...) they are looking for references. And as soon as you can explain to them that you have already their competitors ABCD on the platform (...),they get open to join as well"* (I6). Trust is key in B2B and different strategies that will be examined in the following chapters, from marketing over sales to product design, can often be drawn back to it.

Neutrality is essential for facilitating trust. In other words: a platform should not be associated with an established market player, otherwise competitors will distrust and reluctant to join. Consequently, the platform will not be able to serve an entire market, which will thus remain as fragmented as before. In accordance with Adari et al. (2019, p.6), who noted the averseness of companies to join a competitor's platform, and Wallbach et al. (2019, p. 703) stressing a system provider's neutrality, 80% of the interviewees agreed that the platform has to be set up outside of a incumbent's core organizational business. Five out of six corporate spin-off platforms aim to be as far away from the corporate sponsor as possible. Even though interviewee 3 did not specifically emphasize the need for separation, the company still has its own legal entity and does not mention the incumbent on the website or its imprint. Interviewee 1 identified the proximity to its funding incumbent as his main competitor's biggest disadvantage. This is among other things because players do not want to help the competition to increase revenue. And yet again, data security plays a main part as a company cannot get access to competitor relevant data. As a result, interviewee 2 explained, *"we entirely carved this out, we build all Chinese walls you could imagine to separate our company*." Furthermore, the separation is crucial for attracting additional investors, who are often deterred when an incumbent and therefore not dynamic company is behind it. Also, three out of four corporate-independent companies highlighted the importance of being perceived as neutral, thus, not working together with investors from the industry. The reason for interviewee 9 not to specifically point out corporate proximity, lies in its history itself: having founded the platform 20 years ago and merged with another company, it became a platform-driven corporate group with no need for an external sponsor. Despite the advantage of industry investors being familiar with the market environment, only private persons and companies that are not from the same market should invest in order to keep neutrality.

> "Our success is that we are perceived as a very neutral platform. (...) So, the industry wouldn't perceive it as "okay shit, my main competitor now has a share of [platform 10]. So, the last thing I would do is becoming part of." We actually had a lot of requests also from these very established companies, (...) and we always said no, because you're not perceived as politically independent or neutral. So, we always make sure to have a very clean and very nonpolitical cap table. And that was key to our success." (I10)

Solving the chicken-egg-problem and triggering network effects

The findings indicate that there is no best practice strategy to achieve network effects. The topic even appears to inherit some kind of mystery: Interviewee 1 described an atomic reaction that cannot be planned but nurtured. To kick in, "*a certain activation energy*" would be necessary. 40%

agreed that the essential premise is that the platform usage becomes an automatism because trust was gained. Company 5 called the transition from the emergency solution for solving a supply shortage to the preferred go-to-tool "*from aspirin tablet to partner*". In order to find that activation energy and reach critical mass, the companies have tried different approaches. One reason, why there is no one-fits-all strategy, are varying dependencies between different players in individual markets. This finding aligns with Loux et al. (2019), who stated that to design a platform and trigger network effects, interdependencies between users, their individual needs and how they operate have to be considered. Interviewee 3 said: "*You definitely have to be aware of the push and pull factor and its market players. How are their supplier connections, what are the dependencies¿'*. Focusing on customer pain points is similarly important to identifying the mainstay ("*Dreh- und Angelpunkt*"; I3) of an industry and designing network effects strategies around the most important participants who dominate the market's center. Loux et al. (2019) emphasized that high affiliation costs and tight interdependencies between users' activities at project level result in platform adoption constraints, and a concurrent pattern – simultaneity between the different sides – is a critical condition for success (p. 221). However, supporting the hypothesis that the individual traits of each industry need to be assessed, 70% of respondents disagreed with the findings of Lux et al. and followed a consecutive platform adoption path by starting with the supply side, "*because if customers want to order and we cannot deliver because we do not yet have the network – then that is again a matter of trust.*" (I2). In order to attract suppliers, interviewee 2 pays them directly, which is very uncommon in the construction industry. Participants 4 and 6 convinced suppliers of the benefits of joining forces and building a network. After having gained their trust, suppliers started asking for memberships and began to approach customers themselves. Having the suppliers pushing the demand side or customers pulling the supply side was for 40% an important tactic for network effects. Platform 3, for example, leverages these, by letting their customers "*either inviting or forcing [their] C and D suppliers to now join digital age*". These cross-side network effects were particularly important for platform 10. They sponsor stakeholders with great negotiation power by discounting their contract in favor of joint campaigns to get more customers onboard. For this task, they have a team dedicated to triggering network effects by ensuring the customers promote the platform. For example, by having a CEO writing a letter to all his clients or getting a newsletter feature.

> "And that really is more of a network push effect from supply to demand side that works really well. And that's actually the way how we grow. So, if I look at how do we acquire new customers? How do we find new retailers? 90% of them are acquired through exactly this network push effect where a brand just invites them." (I10)

Regardless of the primary focus on the supply side, the platforms also answered incoming demand, 70% with the help of partners. For example, by using supply of other (analog operating) partner companies, the platforms were able to fulfill their value proposition right from the start despite their newness. Again, key for the gain of trust. Interviewee 2, for example, uses the infrastructure of its corporate partner to keep their *"4-hour promise"* and, thus, be able to *"always deliver and satisfy everyone*." (I2). Having powerful partners in order to be successful is crucial according to the majority, 50% even stated that launching a platform without them is impossible. These partners are either corporate sponsors, customers that have recognized the platform's potential and an interest in helping them grow or were part of the founder's professional network. Due to a lack of partners, interviewee 5 hides a transactional model behind the supply side with a team manually approaching suppliers for the orders of the demand side. 'Faking' supply with the help of partners was one approach in order to solve the chicken-egg-problem. However, there are many other reasons for the importance of partners in the initial phase of a platform which are going to be elaborated in 5.5.

> „The original founders had the advantage that they already have been in photovoltaic before. They knew some people who helped them to get started and to overcome the chicken-egg-problem by providing a basis offering to make sure that some demand can be generated. (...), by making sure that a relevant offering came just right from the beginning and attracted than a demand and that created interest of others." (I8)

Especially on the demand side, many interviewees across all industries reported consolidated markets that are dominated by big players which require specific strategies because "*if you want to have a pull factor you need the big players.*" (I3). This confirms Chakravarty et al. who propose a high total customer orientation as well as an orientation asymmetry when facing powerful actors on one market side (2014, p. 4). Despite the multitude of advantages, like gaining the market's trust and interest of competitors, their sales cycles are long and require a lot of effort. This will be further elaborated in 5.4. Nevertheless, once such a big customer is won, inter-company network effects can spread throughout subsidiary companies and the like:

> "On the sales side, we only contract with 30 companies, but all of them have fanned out again. One of our clients (...) has a total of 7000 advisors and four brands. (...), and they practically do the distribution among themselves. In this sense, we don't have a large sales force." (I9)

Another approach which was identified throughout half of the interviews was a strategy best described as 'winning segment by segment'. By concentrating on specific segments,

acquiring partners, gaining traction and then organically growing beyond, the platforms were able to trigger strong same-side network effects. Interviewee 10, for example, concentrated their sales strategy on winning specific product champions knowing the pull effect it would activate.

> "And what was really successful for us. And we only understood after two or three years, that it makes much more sense for us to really go segment by segment because once the category champion joins and booked this quantum product, the rest will follow. (...) and then you have this inter-side network effects that when your biggest competitor joins, you want to be there as well. (...) It's just too much if you're trying to get to all of these markets at the same time" (I10)

While the segments platform 10 is concentrating on are rather small, in other industries bigger core sectors are identified and targeted. However, this might depend on the platform type. Whereas marketplaces or intermediary platforms identify wide main segments, locally dependent platforms start with building a partner network for specific regions.

5.3. Platform set up and the importance of domain knowledge

Before the design of the platform is going to be examined, this section will shed light on patterns that were captured concerning the organizational founding setup.

Set up of platform-based ventures

A central aspect to illuminate, is the relationship to the corporate partners or owners, 70% of the interviewees have. In four cases, the corporate acts as a financial investor, in two it is the 100% shareholder, whereas platform 9 merged to a platform-based corporate group. The motivation for established companies to engage in platforms is to modernize the industry's sales and marketing, create an additional sales channel for their own products, and indirect sales by facilitating more revenue, thus, becoming more attractive to existing customers. In chapter 5.2, neutrality as the essential prerequisite of the platform-incumbent relationship was already elaborated. Operating as far away from the corporate core is key due to a multitude of reasons. It is politically necessary because of anti-trust topics especially in terms of data and it enables openness, hence, the opportunity to serve an entire market. Traditionally companies refuse to offer revenue to their competitors and not even want to help their competitor's customers. Additionally, setting up the platform independently is important for creating entrepreneurial freedom since a specific mindset, values and people is required. An established company is usually not capable of disrupting its own business. One of the reasons is internal resistance which is rooted in the employees' fear of being substituted and the distrust towards technology and new processes. Interviewee 3 even reported that the platform was kept secret in the organization, knowing it might cannibalize existing businesses and revenues. Moreover, the core company has different incentives and interests that the platform needs to be protected from:

> "[Platform 6] as a startup was developed in the global digital incubation unit, which is completely separate from any operational business unit. And it was carved out from there and is kept as independent as possible. (...) So, to make sure that they are not occupied by the singular interests of one business unit. Because that could indeed limit the growth of the platform." (I6)

Within the sponsoring company, CEO backup is crucial for the platform. This is, however, a risky decision for her or him as the industry peers anticipate failure. Interviewee 1 explained: "*Everyone is just waiting for it to be a flop, (...). It's not so easy to win something, but it's easy to prove them right*". As stated before, German decision-makers are not seen as very progressive. According to interviewee 5, there is "*a great deal of narrow-mindedness and arrogance in the market*". He further described the problem with their mentality: "*There is no pain but also no desire to change anything. Why should there be, it's working*." The kinship to a corporate also inherits some advantages besides the financial backup. Different participants reported support with strategic decisions, the acceleration of international expansion via their existing infrastructure, and access to an advanced IT. Commonly, the platform idea was developed in the corporate setting and the CEOs were either involved in the ideation process or were approached later to validate the concept and take over the managing position. In only one case it occurred the other way around and the founder contacted the corporate partner. However, in all cases, except one, the CEOs came from outside of the corporate. In alignment with the concept of neutrality and the need of a different mindset, the leadership of someone external seems to be vital. Only platform 5 is still a project of the corporate's business unit but with the plan of carving it out, maybe an external managing director will be approached by then.

Their self-understanding as tech or software development firms, is the reason why particularly interviewee 1 and 9 emphasized that their success depends on their organizational setups. Fundamental for both is to follow agile software development principles. Interviewee 9's platform-based venture was originally founded in 1999 and now employs more than 200 people. Naturally, organizational development is a more dominant topic for this company and was named as one of their central success factors. Especially the holocratic setup is important for them being a knowledge company with many complex problems. The interviewee further described the organization "*as centralized as necessary, as decentralized as possible*". This perfectly aligns with the findings from Berens et al. (2019) who conducted that whereas par-

ticular freedoms in intercultural decision-making are critical, a certain top-down leadership remains important.

The importance of domain knowledge

The fact that only one third of the interviewees had a deep expertise for the particular industries does not indicate a low relevance. In contrary, 60% across all sectors agreed that domain knowledge is key in the B2B world. It is crucial to profoundly understand complex customer pain points and is the main entrance barrier against powerful tech companies:

> "If you want to be successful in a B2B environment, you need to have domain knowledge. You need to understand really in-depth what are the pain points on the seller and buyer journey. And if you do not have that (...), it is just going to be a damn hard job for you (...). And that domain knowledge I think you have to bring. And that is also the reason why you're not seeing the big B2C platforms like Amazon or eBay being active at the moment in the B2B environment, simply because they are not seeing that domain knowledge as their core competence." (I1)

All six respondents concurred that a strong industry competence has to exist prior to the founding process and, if not coming from the CEOs themselves, it is even more essential that the employees bring it along. Instead of hiring these from the corporate sponsor, some platforms even employed staff from their competitors, which additionally ensures neutrality. But domain expertise is not only critical for understanding the customer journey, it also inhibits two further key B2B levers: trust and network. Again, 60% named these the decisive factors, especially in the beginning. This is connected to the fact that powerful partners are needed in order to solve the chicken-egg-problem. Interviewee 10 described that due to the founder's industry network, they had customers who paid the monthly fee from the beginning, even though they were not able to use the product within the next two years. Because they had the industry's trust, they "*got the first customers to buy in basically to nothing*". Opposed to B2C markets, industry competence is a distinctive B2B requirement and a platform founding team needs someone who understands the market's dynamics in-depth and is well connected. It helps a young company to be acknowledged from the established players and to be met on equal terms.

5.4. Platform design and marketing requirements

Since trust in product and service are key and mistakes are rarely forgiven, the platform has to seamlessly fit the customers' needs and function from the very beginning on. Important roles for designing an effective platform are the right pricing structure, customer service as well as sales and marketing considerations.

Product design and platform openness

Platforms support a market's transitioning into the digital age. Their operators must therefore find a way to pick up customers in their various digital stages and ensure a safe shift to the new technology. At the same time, behind every organization's decision-maker is a B2C customer, who is accustomed to certain on-demand models and also expects "*digital Sofort-ness*" (digital now-ness; I9) for business. All interviewees are dealing with this challenge. Half of them stressed that the entire platform design, including pricing and customer service, is a constant trade-off between traditional B2B and successful B2C features. Especially the usability oscillates between a simple, straight to the point user experience known from B2C platforms as well as conservative requirements and the B2B's complexity. Interviewee 3 explained that B2B platforms in the past were not *"funky or cool",* but now employees are used to B2C functionalities from their individual customer experience. Thus, designing usability is becoming increasingly important. Since behind every "*person, who is making a decision, is a human being*", a specific interface design is crucial to "*make it super easy and smooth to transform analog processes into the digital age*." (I3).

> "Between where these guys come from, the SAP world, where they had all this information, very complex and very German engineering style versus a platform that aspires to be as simple as straight to the point as some of the B2C platforms. (...) So we are still struggling and every design that we're making is kind of a trade-off between these two worlds." (I1)

Moreover, when designing the platform, considering openness and quality assurance is central. Interviewee 6 summarized the dilemma most platform operators have to deal with: *"The quality assurance is important and it's important to have it open*." In other words, finding the "*right degree to balance the trade-off between diversity and control*" (Schreieck et al., 2017, p. 14). Whereas high openness comes with a high variety of complementary products or services but with reduced control of the ecosystem, low openness can ensure quality and other standards (Schreieck et al., 2017, p. 15). According to Riemensperger and Falk, "*an ecosystem of value creators will never grow"* when a platform is closed off (2019). This is confirmed by Adari et al., who are stating that a "*mindset of "platform protectionism" and risk aversion stands in the way of creating business models with truly disruptive impact on existing market structures*" (2019, p. 5). They discovered that the majority do not fully leverage and exploit network effects "*by strictly protecting the customer interface"* (2019, p. 5). However, this research's findings on openness are rather mixed. While platform 3 pursues a bank-like verification process, platform 4 focuses critical mass in favor of very high quality. For 50% of the respondents, quality assurance is very important, therefore openness is limited with employees checking each new player on the platform.

> "Data or trusted security is one of the biggest con-

> cerns that platform players have. Because it's a very analog industry. Putting [them] onto a digital platform is quite tough and you have to guarantee that everything's trustworthy. That's why we have a very strict KYC process (...) We take a lot of this data to know who the company is. We also put them on a watch list, so if anything changes, you will automatically know about it. And (...) if there's a company who operates not in the metals industry [it] will be kicked out." (I3)

Hence, quality assurance ensures that there is *"a nice matching between offer and demand*." (I8). Limited openness is not only to prevent that customers distrust the platform and are driven away by an overall lower quality or irrelevance of offers, but also to avoid non-customers to exploit the platform's services. Platform 2, for example, has a team that investigates whether someone is only interested in intercepting prices from the competition. Only three respondents named openness as a core element of their platform. Quality remains important but negligible because their early stage requires traffic on both sides in order to achieve critical mass and to attract ecosystem partners. Without a *"really, really big, unfair advantage" (I4),* exclusivity in the beginning can be a barrier for scaling the platform. Also, for interviewee 10 openness was particularly important in the beginning. After "*accepting everyone simply to gain traction*", they pivoted to a less open platform.

> "As a platform you need the critical mass as soon as possible. And you just do whatever it takes. (...) So now we are much stricter on supplier side with the (...) quality of content that we accept. (...) And we also do have a signup process on retail side, we've changed that. So, in the past it was basically public, you just signed up and you were on the platform immediately. Now we have our CS team checking every request and seeing whether it's a proper retailer or if it's some spam sign up." (I10)

Research also proposes that a platform's attractiveness depends on both, quantity and quality of suppliers, but to varying degrees contingent on a platform's maturity. Li and Penard (2014) conducted that quality effects substitute for quantity effects as the size of the marketplace grows. While the quantity of participating suppliers is critical during the early stage, supplier quality is much more important in the mature stage, when the platform has reached critical mass (p. 1). However, this contradicts with the approach of platform 7 that is still in the MVP launch phase. The interviewee referred to the trust aspect by stating that in the beginning, confidence-building measures are decisive. It has to be paid "*close attention to who is on the platform*". So potential customers "*know they can confidently place their goods, there is a quality check, the onboarding is checked, and it is made sure that they have a license*." (I7). Since every B2B market underlies individual mechanisms and has a different number of players, there does not seem to be an absolute strategy.

Monetization and pricing

The pricing is also based on a compromise between traditional and popular B2C models. It is very differently solved within the companies and again, there seems to be no overarching standard. The respondents reported trial and error approaches and several pivots in order to monetize the platform and find a fitting pricing structure. Most common is a transaction-based model with fees being charged on successful businesses. This is pursued by 60% across all types. In line with Berens et al. (2019) pay-per-transaction is a widespread pricing option with subscription models progressively becoming relevant for the majority of B2B companies. Of the investigated pricing models, 40% offer subscriptions; due to their business model not to be found at marketplaces. However, these are always part of a mixed pricing approach. Interviewee 4 and 6, for example, offer traditional transactional invoicing for the supply side even though "*you don't want to do that but a lot of the service providers want to have it that way*." (I4). Platform 10 built its sales approach on its subscription model: New customers start with a freemium account and then a dedicated sales team convinces them to upgrade to a paid account – "*that's where the growth comes from, actually*." (I10). However, all of the investigated platforms' subscription set-ups have to face one major challenge: in order to pay on a monthly basis, customers need to see an occurring value added. If they perceive it, subscriptions can act as a lock-in effect: *"the incentive to do something outside the platform is actually completely gone*." (I7). This is confirmed by Chakravarty et al. (2014), who state that participants perceive switching costs increasingly greater "*as the proportion of fixed component increases*" (p. 5). Half of the platforms share revenue streams with partners, earning cross-selling fees through extra services they offer via an affiliation system. Moreover, platform 10 is planning on launching an Amazon inspired retail media that includes special coverage or placement on the platform. After having started with monetizing the demand side because of a higher willingness to pay due to a stronger need, platform 10 pivoted the pricing strategy from demand to supply side. They realized the difficulty to get all users paying but at the same time a motivation on the supply side to sponsor the other side. Consequently, the business model was partly turned, and they are monetizing both sides now. As aforementioned, pricing can also help to facilitate trust. Platform 9 has not changed its business model and "*clearly the same prices for everyone*", thus is perceived as "*a major player that has not yet exploited its position in the market*". Naturally, it is not only about finding the fitting pricing model, but also about setting the right price. 50% of the interviewees mentioned some kind of price sensitivity in the industry or a price induced limit of growth. According to interviewee 7, the price structure must be kept as low as possible and interviewee 2 gives special deals to customers who considers the fees as too expensive in order to convince

them:

> "Sometimes customers call us and say your product is cool but your price sucks. Because we want to get people excited about the platform first, we lower the prize. We first want to show that the process works." (I2)

Platform 9 is also giving away certain services for free in favor of market growth. The company is guided by the principle "*market share before revenue growth*". Berens et al. (2019) confirm that under certain conditions low pricing is "*crucially important to gain competitive advantage*" (2019, p. 358). Therefore, platform 1 is not charging anything because it could destroy network effects which are important for gaining customer data. According to its representative, the high valuation of platforms is not based on transaction margins but on their database on customer behavior.

> "It would be simple now to say we are charging you half a percent commission on any transaction that you've done. But I think it would kill potentially the whole network that we're currently building up and the network effects that we're nicely seeing over the last month. And number two, I think it would hinder us in getting to that data driven business model that we are aiming to build over the next couple of months." (I1)

Customer relationship, sales and marketing

Approaching potential customers in B2B rarely works with 'one-strategy-fits-all'. In contrary to B2C, where individuals are targeted, the interviewees reported greatly varying company sizes with different responsibility setups, in addition to the market fragmentation, and a lack of channels that exist in B2C. In some cases, entire buying or selling centers need to be convinced, in others it is a C-level decision. Moreover, platform 8 has the additional challenge of approaching B2C and B2B customers simultaneously, which is a constant stretch between casual and professional communication. This scattering effect makes it difficult to reach out to the right person with a suitable addressing without applying individualized measures.

> "We have really different levels of requirements of our customers (...). I think what's normal in B2B is that you have very long lead cycles and in order to sign a brand like Hugo Boss, we are taking four years sometimes, it's crazy. (...) And I never thought it's possible but the decision to be part of [platform 10], especially on the brand side, seems a very, very strategic one. It's a C-level decision, sometimes it's a board decision. (...) And that's why it takes forever (...), and that certainly slows us down heavily. And it's very dependent on the size of the customer, but it's a pain in the ass for sure." (I10)

Like interviewee 10, 50% of the respondents reported very lengthy and complex conversion cycles that were greatly underestimated by some of the companies. Reasons for this are complex responsibility structures as well as contract negotiations, whereas in B2C, *"you can use PayPal and that's it"* (I4). As elaborated in 5.3, a central challenge in B2B is internal resistance caused by fear of newness. Half of the interviewees reported skepticism up to refusal to act not only within the sponsoring incumbent but also on customer side. Interviewee 7 was "*chasing*" the sales manager of an important customer for months but "*it's mostly up to the sales people who prefer to keep running in a hamster wheel instead of thinking about how they can optimize their processes*". A platform is in the long run something that entirely changes the business and many, especially mid-level, employees dread being replaced. Because of their reluctance, adoption is mainly top down mediated. 40% described CEO support as the key to success when it comes to platform sales.

> "I think it's more the willingness to adapt the existing processes. It's often resistance from individuals. (...) if you can tell the right story to the CEO, you can get them. If you tell the same story to someone in the second or third layer of the organization, it's most likely resistance because they already have lots of projects and they have other priorities. And you touch the system that actually runs, maybe not perfect, but at least it runs." (I9)

However, since young decision-makers have a different decision-making process according to 40%, distinctive sales and marketing approaches considering age differences are required. While CEOs with "*digital DNA*" (I10) get informed in the internet and rather negotiate about details because *"the decision for or against a company has already been made"* (I5), the older generation *"still wants to be convinced"* (I7). These varying expectations towards marketing, sales as well as the platform itself, makes it difficult to target decision-makers with a standardized approach. Therefore, half of the interviewees described their sales and customer activities as intense and persuading. While 30% employ teams that are constantly with the customers making sure they understand the product, many B2C services are commoditized and require less personal contact. For two respondents, their complex registration process is a central issue. Guiding them through is critical to prevent losing them but also to make sure they make right use of the platform.

> "Being a missionary, you have to try to use every possibility you have to show the market "I'm here". Therefore, we have our sales team, who is making appointments with all relevant partners at their office to show them [platform 3]. We have web sessions as well. We have a huge help desk and intercom chat box implemented, where we exactly see on every stage if something works

> or not, or within the registration process someone jumps away." (I3)

Customer relationship is key in B2B, 70% agree. This is particularly in the beginning for the sales process crucial, but also in later stages since the loss of a single customer can cause an enormous effect. Moreover, these bonds are needed "*especially with a really good type of customer and you're just getting a good kind of customer if you have a good relationship*" (I4). Due to the high spending, B2B companies demand exclusive customer service and perceive analog services as a commodity, also from a digital solution. An example was installation and maintenance, "*people coming into my plant regularly. I would expect that this is (...) given and that it would fulfill a minimum level of defined level of quality which I do not need to negotiate*" (I6). At platform 8, customer service is a regular account management including the development of joint long-term goals. Whereas putting the customer first and a tight relationship are essential in B2B, according to some interviewees, B2C companies try to avoid service and rather hide contact possibilities because of its high costs in relation to the general low spending. The different sizes of the client companies come with diverse levels of requirements and pose a challenge not only for marketing and sales, but also for post-closing service. Particularly big companies demand special treatment and a high degree of customization, which is usually not compatible with a platform's offer.

> „It's (...) very difficult for us to navigate this very thin line that is handling the requirements of big customers that have special wishes, that can be branding, features, data structure, whatever, on the one hand. On the other hand, we have one product that fits them all and we cannot do extra features for certain brands. That's just not the way how platforms work, but also, we don't want to lose the brand. (...) That's been a problem from day one. I think the weight of an individual customer is much higher in B2B compared to B2C, since we're talking lower amounts of customers." (I10)

Whether in sales or customer service, 60% of the respondents highlighted the face-to-face building of relationships. Personal contact is necessary for gaining trust, which is "*immensely important in the B2B sector*." (I7). This echoes Berens et al. (2019), who explain that while B2C service is offered online, B2B companies rather provide it personal (p. 362). Here, too, platforms must meet the traditional requirements. A digital product can be designed intuitively, but the customer relationship must still follow established offline procedures.

> "When it comes to trust, these field service experts are super important. (...) If someone registers, we make an appointment directly (...) At the beginning we thought that we didn't need a sales force or experts, the thing is self-explanatory. But we had to realize that the construction industry is actually so determined by sales representatives that if the sales representatives don't show up personally, they don't want to get involved in this kind of thing. Most of them are still very traditional." (I2)

Moreover, building personal relationships implies the importance of offline marketing. Interviewee 10 explained that to promote a fully digital product, a rather analog sales approach is indeed required. The traditional way of building business relationships is still relevant, participant 7 even called the need to reach people personally for the first contact a "*deal breaker*". 40% promote the platform on fairs, events or with paper marketing measures. Additionally, word of mouth was named as crucial, a strong branding that is important to be recognized as qualitative and trustworthy and a marketing that is similar to what, especially the young, decision-makers know from B2C. However, for the majority, marketing and PR are only a door opener for analog sales measures, to "*make it easier to get into conversation." (I7)*

5.5. Business model transformation and ecosystems

Concerning the further development of the platform and its business model, several factors play a role, from the use of data to orchestrating ecosystems. However, despite the different approaches, nearly all interviewees share the same vision: becoming their industry's one-stop-shop.

Business model genesis

From platform ideation to scaling, customer centric development methods remain important. Platform 4, which is still integrated into a corporate environment, had to learn it the hard way after pushing a product in the market that failed: "*a technically very high-quality product was launched, but it didn't really satisfy any need*". 50% emphasized the importance to work with pilot customers to validate and improve the product. Two of them even co-develop the platform with their customers by integrating their feedback, defining joint goals and ultimately, building the crucial tight relationship. This confirms Berens et al. (2019), who state that working closely with the customers lessens the risk of failing and keeps the churn rate low (p.357). However, it is about keeping the right balance. As elaborated in 5.4, listening to customers is key, however, platforms cannot always follow what they wish for. This seems to be a challenge, especially for the two technology-heavy service platforms. Because, *"the downfall of any good software development that tries to standardize something is [when] all the stakeholders are talking into the development and you follow that." (I9)*. By starting with the technology, then expanding behind it and building an ecosystem around, both made the transition from a service provider to the ecosystem's core. Platform 9 iterated its business model after ten years in order to achieve this and, thus, future proof the company. For platform 10, this transformation was mainly driven by their strong lock-in effects through

deep technical integration, elaborated in 5.2. Further lock-in approaches mentioned by all were very long lasting and solid business relationships, the hiding of information about other players to avoid trade alongside the platform or providing the best process, including additional services and products along the entire journey, and user experience. By automating secondary services, companies can get customers to do everything on the platform. As with Amazon, although the seller is visible, the user has little incentive not to purchase through the platform because of its easy handling and usability. This one-stop-shop approach is part of the strategy from 90% of the platforms, whereas the current state of execution depends on the company's maturity. Expanding vertically along the process not only functions as a lock-in effect but also makes "*the whole market much bigger, because we make something possible to an audience, that was not possible for them before*" (I8). Moreover, covering a product's entire lifetime by facilitating a variety of services offered by partners leverages recurring consumption and ultimately, a long customer lifetime. 80% started with a core product, in most cases a rather simple matchmaking, and then expanded (or plan on) it by adding more services around the process.

> "This content thing was just the start to get traction, to get trust, a bit of money and a foot in the door. (...) Basically, our idea is to digitalize all touchpoints between the fashion brands and the retailer – content sharing is just one part of it. (...) The idea with all of our future products is that we start way earlier and that the retailer can actually do all this buying through our platform, can maybe in the future do also the financial part via our platform, meaning the paying, getting insurance, all that stuff." (I10)

These services do not only create lock-in effects but also new monetization options. Next to the in 5.4 elaborated shared revenue streams with partners, platform 2, for example, aims to price synergies between customers:

> "One of the next ideas that will soon be introduced is a kind of disposal process. That means that the customer can also say that I don't just need gravel, I still have to dispose 20 tons of earth. And I can also put something like that on the platform. Then the jackpot would be when someone says I need topsoil and we get money from one for the earth and from the other for the transport." (I2)

While the majority aims for verticalization and process depth, horizontalization as the expansion of the portfolio within the same product group, was mentioned by 40% as another strategic development path. However, there are contradicting opinions about the number of products. Platform 1 aims for the highest possible, whereas platform 2 wants to keep the "*product catalog focused on things the customers are actually asking for*".

Ecosystem building

Partnerships were stressed important by all interviewees, not only to accomplish the mission of building multiple products around the process through a widely connected ecosystem. Various use cases and approaches were named, but ultimately, all are underlined by the same anticipation: a higher output of the overall value created through collaboration.

> "It's from my point of view very much like this red ocean dynamic, where margins for most of the players are on the long run reduced. So, the assumption or the understanding that I have is that, if you approach it through a multi-sided model and in a more collaborative approach by establishing ecosystems, where the participants can create value for themselves, but also add value to the value creation of the others, it would be more beneficial for the value chain." (I6)

New customer demands require companies to join forces. This development is associated, among other things, with the fact that companies "*slowly but surely realize that it is totally smart to put the customer, not the products, in the foreground of their performance"* (I9). Hence, value creation shifts from the single contributions by a firm to the co-creation of value in complex ecosystems and "*from traditional inter-firm competition to a joint approach of coopetition*" (Hein et al., 2019, p. 503).

> "Right now, we have a situation where all the big construction machinery manufacturers, (...) have their digital departments and are now trying to become market leaders in these areas. They want to be the fastest and the best. But I don't think that will work. I don't believe that a [corporate] has enough money, personnel and time to build market leadership in such an area. We are far too many years behind to catch up for that. I believe that the future can only work through cooperation, and that we have to join forces and throw together budgets in order to develop functioning platforms." (I5)

Since partnering is a vital part of realizing all interviewees' visions, many intensively search for them and invest exceptional effort into their management. As elaborated in 5.2., platform adoption is driven by powerful partners. There is a multitude of needs for partnering, which will be elaborated in the following, but it seems to be particularly essential in the attempt to reach critical mass. As outlined before, partners help facilitating trust, 'faking' supply, keeping the value proposition and getting in contact with potential customers. Moreover, 40% (all representing the youngest companies) emphasized the cooperation with multiplicators, especially with associations and political institutions, who connect them to potential clients. Finally, to gain trust and use cases, partners are needed who allow their references and

logos for promotion purposes. 40% used partners in the beginning to show that they validated their business processes and to appear trustworthy. This corresponds to Berens et al. (2019), who stated that building trust as the central issue of a platform can be tackled by using partnerships for strengthening brand and trustworthiness. For example, by presenting references of well-known enterprises on the website (p. 359). Furthermore, Berens et al. have found that specifically for B2B, partnerships and a large ecosystem including competitors are essential for survival. They examined different B2B platforms and in nearly all cases "*a wide-established ecosystem of partnerships largely contributed to the platforms' success. The larger it is, the stronger it gets, the more success for the platform, which is underpinned by network theory*" (p. 361). In order to create a thriving ecosystem, 40% of the participants believe that openness as a core element is crucial in the beginning. When it comes to the platform's evolution, third-party providers help building product features and offering additional services, from insurance over payment to transport. External providers are the enabler of the transition to a one-stop-shop and get in turn new clients for their offering. The platform occupies the interface, negotiates service and price with the partners and eventually routes them to the customers. Particularly the collaborations with providers that offer regulated services, like financial offerings that require a bank license, or complex technical know-how were rated crucial. 40% stated that the latter is important for providing a seamless implementation when integrating the customer into the platform technologically. One example was named by platform 10, which cooperates with leading ERP providers in order to avoid building custom integrations for every new client. Other important benefits of collaboration are reduced customer acquisition costs and trust through affiliate marketing. Platform 1, for example, is looking for partners "*who are along the same journey*" but with "*very little overlap in the business model*", thus have a mutual interest in supporting each other grow. One of their partners is a search engine for chemical products. While platform 1 is helping them to get more relevant substance coverage, they are in turn bringing additional referral traffic on their platform. Platform 10 is also pursuing affiliation programs with loose partners, including mutual promotion on a fair or in a newsletter, as well as tight cooperation, for example with their technology providers. After having only focused on the technical aspect of the partnership, platform 10 turned them into business partners who now support the sales process. If an ERP system provider acquires a new customer, they receive a 10% share of the revenues with this customer.

Data

Another central part of a platform's development is data, 80% of the participants agreed to this with varying degrees. According to interviewee 1, as indicated in 5.4, data and the derived customer insights are the main driver for the high valuation of platform companies. When translating an analog model into a digital one, a lot of data is automatically gained. It gives the possessor a huge competitive advantage since "*the one who controls the data will be able to determine how the value is distributed across the chain or the matrix*." (I6). But not exclusively the orchestrator, also the market profits from accumulated data. 5.1 outlines how many industries currently lack insights like market studies or historical data. Platform data can fill this gap and help customers to make more effective decisions. Real time market insights display the market's situation in terms of demand, supply and price. As an example, the prediction of supply side value stream implications caused by the Covid-19 outbreak in China was named.

> "(...), you have a lot of data about the stuff that is on your platform and sold. So, you know what takes how long to be sold or bought and for which price etc. Second, you have a lot of user data, you have understood how and where (...) and what they look for. So obviously, this makes total sense to use these data for better predictability for yourself, but also to monetize these data, by making some data points available to some of your partners, who say with this data I could make much better products for you." (I8)

50% of the respondents believe that the monetization of platforms with business intelligence products will be their future. Platform 1 even aspires to build not only an open marketplace but an entire community setup around industry insights where access will be charged. Whereas five companies are still envisioning data-driven products, three already put some in place. For instance, platform 9 and 10, the largest in terms of employees, offer their customers automized reports about their monthly performance. At platform 9, this is a standardized 80-page report where customers can compare their products and sales to the overall marketplace. For both platforms, providing information to their ecosystem is just a first step before designing features that use the data. While platform 10 is planning benchmarks – displaying which brands, categories or colors are selling well, "*data that's highly, highly, highly interesting for the industry*" – platform 9 already technically reproduced "*the good gut feeling of the consultant*". With the feature called "*probability of success*" ("*Erfolgswahrscheinlichkeit*") they can match customers with banks and predict the probability that a client will get a loan from a certain bank. Also, platform 4 offers a data-driven service by making recommendations whether a car repair is necessary or not. With the exception of platform 4, a company in the scale up phase, making products out of data is something that becomes relevant in later, the growth, stages of a platform's life cycle. Not to mention data monetization, which is aimed by many but realized by no one so far. Moreover, data is also important for validating the companies' own assumptions, hence, for user-centered platform growth, learning in software development and the prediction of its supply and demand. As investigated by Berens et al., pivoting during the platform's life cycle is highly based on data and the derived insights (2019, p. 356). While two com-

panies envision transforming into data-driven business models, with platform 1 waiving transaction fees in favor of gaining as much data as possible, two platforms argue against the collection and use of customer data. Both from the construction industry, they justify their decision with the lack of resources to evaluate the data and the trust aspect:

> "We have no algorithms behind it. When you come around the corner with them, especially in the construction industry, then of course the trust is immediately lost. It is not our intention to haggle the data further." (I2)

This statement contains the central challenge all platforms face, which was outlined in 5.1 and named as one of the major barriers: B2B companies are very protective of their data and concerned about security. Therefore, according to Adari et al., limit data-driven services (2019, p. 5). Moreover, in B2B, actors closely guard and protect their data in order to prevent others from creating value out of it. This is why the platform owner must have a transparent data management and an overview about who is willing to share their data for which value added in return.

> "I think that data means money at the very end. (...) And this is why at current everybody is so protective of their data. (...) We have lawsuits going on because of that. From a platform perspective, I think it's very important, that whoever is orchestrating this platform, has from the very beginning a clear view on who's owning which data and who's allowed to process certain parts of the data. (...) It's about the question to which degree would I be willing to share control on certain parts of my data, so that other parties can generate value out of that as well." (I6)

Legal regulation hinders data-driven business models, which is particularly impacting company 1's transformation. Its representative stated that if certain regulators are implemented, which are actually aimed at Google and Facebook, they will not be able to build their data-driven business model in Europe and consider going to California or Shanghai. Another challenge for building data products, and the reason for its later relevance in a platform's life cycle despite the huge potential, is the collection of a sufficient amount of data and its conversion into valued features.

> "Between the goal and the actual execution, there are thousands of implications. Starting from how you have your data structured, how you collect it, how you can process it to really make something meaningful out of it. Also, the whole data privacy topics. (...) It is a big topic, and everyone agrees that data and monetization are important, but it very, very quickly leads to a dead end if you don't really know what and how. Because you still have to sell a value. And the data itself is not a value. The data is your pool that you can create value out of. " (I8)

Visions & Challenges

The vision that all companies share is the expansion of their current core platform with additional products. Another key vision that most companies are pursuing is to revolutionize their respective industries by digitizing them and disrupting its current mindset. They aim to break traditional silos or even to become the thought leader for it. As elaborated in 5.2, the service platforms, which are the largest in terms of employees in this sample, intend to become the industry's infrastructure. Moreover, since many B2B industries "*think internationally and act internationally*" (I6), for 60% expanding is a central part of the vision. Only two aim to be leading in Germany as opposed to dominating the European or even global market, and two did not comment on this topic. For platform 9 this is due to the nature of the niche they occupy in their industry, there are "*hardly any countries in Europe where this business model is as relevant as in Germany*" (I9). However, in order to realize these visions a ray of challenges has to be overcome. Besides the fact that customers encompass greatly varying company sizes, that affects platforms across all maturities, other barriers seem to depend on the development state. Young ventures have to solve the trust, security and regulatory issues that were previously described. They have to contest industry players, platform 7 even reported personal threats, and disrupt existing structures for the market entry. This supports Wallbach et al. (2019), who identified conflicts of interest and barriers through contractual relationships as influencing factors for platform adoption (p. 704). Moreover, it is difficult for three startups to obtain good price conditions from the producers. Lastly, 30% of the participants experienced an awakening in their industry, with other players also starting to engage in platforms, after the first platform was launched. Triggering network effects and scaling are therefore other key challenges to avoid being overtaken by others.

> "At the end of the day, the thing that matters is that we continue to scale, that we continue to show exponential network effects and growth. And that is a damn hard job for our business development and sales team. (...) But it's very early days and a very early race. And there's no time for us here to stop pushing. We have to go forward. And if we would be stopping for six months, the others would probably have caught up and close the gap that we were able to build over the last weeks and months." (I1)

The platforms in the growth phase do not have to fight for their existence anymore but reported other barriers. The question on how to reinvent the platform to keep on shaping disruption occupies the entrepreneurs as much as the above elaborated transformation of data into products.

> "On the one hand, we have a great responsibility to bring something that (...) is highly relevant to the market into the future. And on the other hand, of course, we ask ourselves the question in terms of the innovator dilemma: How can we attack ourselves and ensure that we do not stand in this pure cycle of innovation and evolution, but how can we enable and shape revolution¿' (I9)

6. Discussion

By means of an abductive research approach, this case study sought to advance the knowledge about the under-theorized phenomenon of B2B platforms. It provides a holistic view about the multitude of influencing factors for the design of a functioning B2B platform as well as its drivers and barriers. The results offer insights into the mechanisms of B2B opposed to B2C industries and show the opportunities platforms have in these yet underexplored markets. The findings confirm and enrich existing concepts and most importantly consolidate the fragmented state of research. They contribute to the related literature by postulating a catalogue of principles to face the challenges of establishing a digital platform in this specific environment. In particular, the significance of trust is stressed as the central bottleneck in platform adoption as well as the importance of ecosystem building and orchestrating in order to establish a sustainable competitive advantage. By linking the different themes and dimensions, the conceptual model in Figure 5 reflects their relations and dynamics and classifies them into three different phases of the platform evolution. This study's contributions will be elaborated according to the three stages.

6.1. Seizing the opportunity

The findings of the case study as well as of the descriptive report of the German B2B platform landscape confirm literatures' (e.g. Hein et al., 2019, p. 507) and practitioners' presumptions (e.g. World Economic Forum, 2017, p. 4): B2B markets offer a multitude of opportunities for platforms. Answering calls for an enhanced understanding of the differences in value creation between B2B and B2C platforms through empirical research (de Reuver et al., 2018), the study contributes by characterizing the two market orientations in distinction to each other. The findings show that many B2B sectors are highly fragmented, intransparent and analog. Platforms can address these inefficiencies by bundling supply and, as a result satisfy diverse demand, balancing its availability and providing transparency as well as supply chain security and visibility. These results refer to prior research, summarizing B2B platform's potentials with "*reducing transaction costs, combining strengths of enterprises, and realizing economies of scale as well as economies of scope*" (Müller, 2019, p. 1). By proposing a categorization of value propositions, the study expands on previous research by showing the multi-sided offerings with which platforms address B2B markets. Therefore, it contributes to the current understanding of B2B value creation potentials which commonly is not stakeholder specific. It is shown that new business opportunities, through digitizing sales processes, are particularly relevant for the supplier side and reduced transaction costs, including saving manual effort, order efficiency and visibility, and improved control of suppliers, for buyers. However, this indicates only the main customer promise since also for buyers, platforms provide access to markets, good prices and short-term supply as well as reduced transaction costs for suppliers. Moreover, the study tried to conduct correlations between an industrial environment and the existence of platforms (see chapter 3). The strongest was found in the *automotive, transportation and industrial products* sector, with a third of the investigated platforms located here, operated by companies over all maturities. Since this sector comprises the traditionally very strong industries in Germany, including large B2B markets, it could be an indicator of success for German platforms to further expand this strength with two-sided business models. After all, despite the number of companies already operating here, there is still a lot of untapped potential due to the sector's size. Further, the findings confirm literature by identifying the marketplace model as the most common platform type. Additionally, they show the activity of start-ups in sectors and types whose existence is considered an indication of highly innovative markets (Okrah & Nepp, 2017, p. 34) and thus could point to further platform opportunities. In summary, since there are no similar studies about the German B2B platform environment to the best of the author's knowledge, this research contributes by indicating patterns concerning popular sectors and platform types. Therefore, it provides orientation and a basis for further investigation of potential dependencies.

6.2. Setting the stage & starting off the platform organization

After having identified a platform opportunity, considerations towards the design of the platform's product, its service offering, and the company's organizational setup are essential. In line with literature (Wallbach et al., 2019, p. 703), the findings propose that neutrality of the venture is key in order to appear trustworthy and to ensure openness to the market as a whole, including the competitors of a corporate sponsor or partner. However, operating independently from an industry incumbent, with an unrelated CEO, is not only important in order to be able to scale the platform. A platform-based company requires a specific mindset, agility and different people in addition to the fact that an established organization is usually not capable of disrupting its own business. Further, internal resistance as well as single interests are likely to arise, which the platform needs to be protected from. Moreover, confirming existing findings (Krell, Braesemann, Stephany, Friederici, & Meier, 2020), it can be deduced that in contrast to B2C markets, industry expertise within the founding team is absolutely crucial. Employees or founder who understand the market's dynamics in-depth

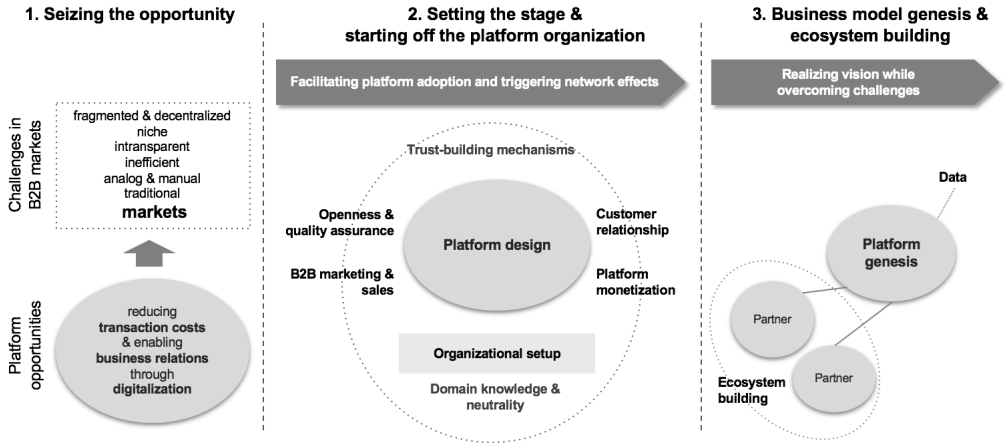

Figure 5: The 3 phases of a B2B platform design

and are well connected within the industry are one of the main barriers against powerful new entrants. Furthermore, being known in the industry is key in order to create trust, B2B platforms' prerequisite for success. By shedding light on the importance of trust, the study strengthens present research: "*trust is the cornerstone of the digital economy*" and "*will support long-term investment, growth and innovation in the platform economy*" (World Economic Forum, 2017, p. 8). The findings suggest that the relevance of trust depends for both B2C and B2B on the money at stake as well as the impact the loss of a single customer has. There is a common understanding in research that B2B customers are very professional and rarely forgive mistakes, they need to trust in their partners to be competent, efficient and reliable. Derived from this notion, the study advises to start off with a functioning product since customers expect to be able to rely on the platform offering right from the start and reputation damages might trigger negative network effects. Additionally, it emphasizes trust facilitation by reputation spillovers of established partners or reference customers. Moreover, in order to successfully design the platform, network effects in B2B have to be taken into consideration. While existing research mainly focuses on activation approaches of these (Li & Penard, 2014; Wallbach et al., 2019), this study first takes a step back and elaborates whether network effects are equally important in B2B and B2C. The findings point out that the effects are similarly critical but are subject to more complex requirements and a careful evaluation in B2B. It is indicated that network effects become less important when the market is very consolidated and consists of only a few players. Additionally, the paper complements research regarding winner-takes-all dynamics. While Riemsberger and Falk (2019) as well as Adari et al. (2019, p.6) affirm an overall decreased importance of the premise, this paper proposes that this is not valid for service platforms. Further, in response to the significance of network effects, strategies to reach critical mass were examined. Although the findings propose that there are no standard chicken-egg-approaches for B2B, the provided overview of implemented strategies might be useful in regard to the currently lacking research. Corresponding with Loux et al. (2019), the study recommends considering interdependencies between the market players and their modes of operation. Adding to this, the research proposes designing network effect strategies around the most important participants who dominate the center of a market. Therefore, the present study echoes the findings by Chakravarty et al. (2014), who advise a high total customer orientation as well as an orientation asymmetry, when facing powerful actors on one market side. Whereas following a consecutive adoption path by approaching the supply first appeared to be a common strategy, answering demand is necessary as well. To avoid having to turn customers away and not being able to realize the value proposition, partners are key when launching a platform. Another strategy that was identified, is engaging suppliers to push the demand side or customers to pull the supply side. In addition to the organizational setup and network effects, the paper complements research regarding a B2B platform's design. In this context, it particularly highlights the balancing act between a user experience known from B2C products and the traditional requirements of B2B markets. It also contributes insights to the widely discussed concept of platform openness. In line with literature (Schreieck et al., 2017), the study confirms the respective benefits of either a closed or open platform approach, but also points out the lack of an absolute strategy due to the individual mechanisms of different B2B markets. While limited openness prevents customers from being driven away by an overall lower quality or irrelevance of offers, the lack of curation mechanisms is associated with the attraction of critical mass. Overall, this research suggests a rather open approach in the beginning to attract customers and partners, and an increasing level of quality assurance in the course of growth, thus confirms the findings of Li and Penard (2014). At the same time, it contradicts Riemensperger and Falk (2019) and Adari et al. (2019), who strongly argue for openness. A possible explanation for these divergent results could lie in the samples' differences. In contrast to this study, Riemensperger and Falk also investigated IoT platforms, so a closed approach for them also in-

cludes technical aspects, namely "*walled off from third-party software developers*" (2019). This dual focus could be the reason for them advocating a high openness. Furthermore, preliminary studies (World Economic Forum, 2017, p. 13) point to the opportunities of new business models for B2B, including commission-based, data monetization or subscription models. With regards to the aforementioned compromise between new perspectives and the conservative reluctance of B2B customers, this study emphasizes the importance of flexible pricing. Despite the fact that subscriptions can have a certain lock-in effect, customers, especially on the supply side, do not seem to be ready for this yet. However, offering a freemium version can help to build trust. Overall, the results recommend mixed pricing with alternative monetization options that will be added gradually. Finally, they emphasize that incorrect pricing can negate network effects and in favor of growth some services might be given away for free. Lastly, when starting off the platform, the B2B customer relationship has to be defined. While existing literature focuses on customer concentration in order to reach critical mass (Chakravarty et al., 2014), these findings complement research by providing considerations towards sales and relationship building. By emphasizing the fact that customers in B2B have greatly varying company sizes with different responsibility setups, the paper stresses the necessity of individual approaches, in sales, marketing as well as service. It specifically sheds light on personalized and face-to-face attention for building trust. This relates to the findings of Roland Berger (2015), stating that personal relationships with the sales contacts is essential in B2B. This study further enriches the knowledge about B2B platform sales by suggesting that platform adoption is top-down mediated and driven by the CEO. This, however, contradicts with the findings of Stolwijk et al., who anticipate that "*CEOs will be struggling to move from an approach driven by cost efficiency and quality towards agility and enhanced customer experience*" (2019, p. 12). These conflicting results might be attributed to the novelty of B2B platforms; statements about how decision-makers deal with them can probably never be universally valid. However, when targeting the CEO, the importance of considering the decision-maker's age emerged as vital from the findings. In contrary to older generations, young CEOs get informed beforehand and rather negotiate about details than about the decision itself. Comparable insights can be found in literature. According to the Roland Berger survey, as of 2015, more than 40% of the decision-makers in Germany already belonged to the 'millennial' generation. They have a significantly different information, communication and relational behavior with respect to their naturalness with the internet and its B2C shopping experience (2015, p. 4). Furthermore, once a company has been acquired, the paper stresses that excellent and analog customer service is a prerequisite, but also serves as a means for the platform operator to quickly solve problems and counteract negative network effects. Nevertheless, it is important to set limits and not to comply with every demand, typically coming from large companies. Therefore, the study suggests a limitation in terms of customer focus to defend an independent position, especially for technological, service platforms. In summary, these findings contribute to the research streams on the implementation of B2B platforms by highlighting a gap between what traditional industries expect in terms of service and what platform companies can deliver. Mastering this balancing act, is one of the key challenges particularly to this phase of platform development. Surprisingly, there is little literature on this subject.

6.3. Business model genesis & ecosystem building

The third phase of the platform evolution is revolving around how to create customer retention levers and long-term competitive advantage. Here, the findings suggest close cooperation with pilot customers to maximally enable user-centricity, echoing insights from literature (Berens et al., 2019, p. 357; Müller, 2019, p. 14). Furthermore, the study adds to the specific yet barely explored research stream of platform expansion. The paper is able to show that a 'one-stop-shop approach' is the intended path in order to ensure recurring consumption, lock-in effects, additional monetization options, and finally, a sustainable development. By staring off with one platform product, companies can gain first traction, the industry's trust and a foothold, before they delve deeper into the process with their offer. Another identified strategic development path is diversifying the product catalogue. By looking at the descriptive report in chapter 3, however, it can be assumed that the breath of the product portfolio is limited to a particular market, when not pursuing a marketplace model. For both, vertical and horizontal scopes, the findings suggest focusing on a particular segment within an industry and then open up the entire market piece by piece. Despite the fact that existing literature has not yet focused specifically on the extension of B2B platforms, similar results can be found in the general platform literature. As early as 2007, Hagiu explained that horizontal expansions pose various challenges, as "*synergies, economies of scale and/or network effects created by novel search or shared costs reductions [have to be weighed] against the increasing complexity costs and diseconomies of specialization*" (p. 22). The results of the present study therefore overlap with his statement that in many cases process depth trumps product breadth (p. 22). Thereby complex product-service-offers create new markets and expand existing ones. To this end, the results underline the importance of a thriving ecosystem in order to extend the value proposition by using service level agreements with partners. In this way, platform providers have the opportunity to concentrate on their core business and assign complementary jobs to the ecosystem. These findings overlap with those of several scholars (Berens et al., 2019, p. 361; Bouncken, Gast, Kraus, & Bogers, 2015, p. 578; Hein et al., 2019, p. 503), who stress the co-creation of value in complex platform-based ecosystems with a coopetition approach in order to cope with fast business dynamics and high uncertainties. This study makes a further contribution by illuminating the importance of partners in accessing a network, promoting trust and reaching critical mass, and ultimately confirming the importance of an ecosystem for

the survival of the platform. While these findings are deducted from a specific context, they do highlight various findings that have been derived from other, broader research streams exploring these emerging ecosystems (e.g., Graça & Camarinha-Matos, 2017). Besides the ecosystem strategy, the study indicates the urgency of a data approach, as discussed by literature (Riemensperger & Falk, 2020, p. 2). It contributes to research by reviewing the current status of its implementation and proposing a correlation between the evolution of data products and a platform's maturity. As great as the aspirations may be, the research provides a realistic picture of how far non-technical platforms of all levels of maturity are still from being data-driven. Despite the great monetization potential of business intelligence products, as also implied in literature (Adari et al., 2019, p. 5), protectionism of B2B customers, legal regulations and data privacy, as well as the actual development of the products will still pose great challenges. The findings further point out the international vision of many platform companies as well as the challenges they will face until then. It confirms prior research, which identifies a lack of trust, competitive thinking, high coordination efforts, and loss of confidential information (Müller, 2019, p. 1) as the main barriers for B2B platforms. This study deepens this research stream by suggesting the occurrence of barriers correlating with a platform's development state.

7. Practical Implications

The findings entail several actionable implications for businesses. To successfully generate value through platforms, they should consider the following aspects:

1. *Identifying new transactions sets*
   When searching for a platform opportunity, companies are advised to identify transactions that are not happening yet instead of simply digitizing existing ones. This reduces the potential conflict with existing players who feel threatened by the platform. Also, over-consolidated markets should be avoided, as powerful players can prevent new entrants. Overall, it should be ensured that transaction costs can be lowered on the buyer side and that the supply side is able to do business in a considerably enhanced way.
2. *Setting up the organization neutral and the team equipped*
   In order to ensure neutrality, B2B platform companies should act independently from any established industry player, otherwise they will not gain the entire market's trust. Moreover, when setting up the organization, it is key to employ domain knowledge into the core team – not only for knowing particular market mechanisms but also for their network and trustworthiness.
3. *Integrating trust building mechanisms into every aspect*
   Trust is fundamental for B2B business. Therefore, platforms should incorporate it into every aspect: from the initial offering, over the platform's design to marketing and sales.
4. *Building partnerships from the beginning on and fostering an ecosystem*
   Even though ecosystem orchestration is becoming only relevant during later stages of a B2B platform's development, partnerships are crucial from the beginning on. They support on the way to critical mass, with product developing as pilot customers, and are crucial for long-term competitive advantage by enabling the ecosystem.
5. *Finding a way to optimally combine B2C usability and B2B requirements*
   When designing the platform, its usability, and branding, companies should consider the B2C consumer behind every decision-maker. However, it must be kept in mind that many industries are still very traditional. This results in a constant balancing act between these popular B2C features, designs and pricing models as well as traditional B2B processes.
6. *Knowing B2B customers and how to approach them*
   The findings emphasize particular characteristics B2B customers have. However, due to their different company sizes, responsibility setups and ages of the decision-makers, B2C's 'one-solution-fits-all', especially in marketing and sales, is hardly possible. Additionally, it may not be under-estimated that relationships in B2B go deeper than to consumers and involve very long sales cycles, which both require a lot of effort.
7. *Getting customers to change their behavior*
   Since platforms disrupt industry structures, they need to initiate a shift in thinking by finding a way to pick up customers in their various digital stages and ensure a safe transition to the new. In order to overcome trust, security and regulatory issues, they should engage co-operative thinking by creating an understanding that collective benefits in the long run are larger when players work together.
8. *Gaining a foothold in one segment and activating push-pull dynamics*
   Instead of trying to capture an entire market all at once, companies should target a specific segment to start with – the niche most in need of the supply or demand – and then expand from there. It is essential to note that every market underlies individual dependencies that need to be examined in detail, especially when forming network effects strategies. The knowledge of these specific mechanisms, namely the pull dynamics from the demand to the supply side, but also the push effects from the supply to the demand side, should be used. Thus, a lot of platform adoption efforts can be saved.
9. *Starting data thinking early*
   Until data unfolds its full potential also for intermediate platforms, they need to process a sufficient amount of transactions and reach a certain level of maturity. However, companies are encouraged to integrate data management from the beginning on. Not only to structure data points for later products, but also to generate

insights for the own platform and ecosystem development.

8. Conclusion

"*Understanding of what causes a (digital) platform to succeed while others fail is still lacking. [...] Studying the conditions in which some platforms thrive and grow while others fail is of value to both research and practice*." (de Reuver et al., 2018, p. 130). Even though B2B platforms have gained more attention from diverse disciplines in recent decades, its research is still highly fragmented (Chakravarty et al., 2014, p. 2). Their importance for the German economy makes it crucial to understand from an academic perspective of what delineates the very few vibrant B2B platforms to thrive in the long run, while so many others remain idle (Blaschke et al., 2018, p. 3). Interviews with decision-makers from German B2B platform initiatives as well as a descriptive report of the landscape's status quo contributed to an advanced understanding of factors relevant for a B2B platform to succeed. The lessons that were abstracted from leading platforms can be particularly helpful and instructive for executives envisioning a platform business model. The study advises platforms to be at the interface of the digital and traditional world by being simultaneously collaborative, simple, scalable, secure, and trusted with data becoming critical for the growth strategy. While the majority of prior literature relies on single cases, these aggregated findings enrich the knowledge about B2B characteristics in contrast to B2C platforms and answer calls for research by generating a holistic overview of their benefits and challenges. It is shown that designing the platform model, fostering adoption and making a margin with it is substantially difficult in B2B as there are different requirements. Only the concentration on network effects as the main value driver does not reflect the B2B reality. Although B2C platform best practices can fail in the B2B world, the study nevertheless encourages B2B companies to include B2C's excellent customer centricity at the core of their strategy. And unlike consumer-facing sectors, that have been overrun by platforms in a short time, B2B companies have decisive advantages over new entrants: an existing customer base, industry expertise, network and trust.

8.1. Limitations

The context and design of a qualitative study has some limitations. Since the results are mainly based on the respondents' narratives, which depend on their background and personal beliefs, the question of generalizability arises by nature. Although the findings have been compared with previous research, the obtained results are contextual, and caution is needed regarding the application to other specific use cases. Also, because the comparability of the participating companies is limited due to different maturity levels, business models and customer segments. Particularly the distinctions between the various platform types listed in 2.2.2, as well as sector specifics could not be sufficiently differentiated within the sample. Since the research was deliberately focused on intermediary platforms, the findings are not applicable to technical (IoT) platforms. Also, the decision to exclusively focus on German companies appropriately served the study's purpose but should be kept in mind when transferring them to another nation's context. Moreover, waiting for theoretical saturation of data was constrained by time, limiting the sample size to 10 interviews. However, the interviews continuously showed similar patterns towards the end of data collection. Additional interviews could have helped to specifically discuss certain conceptual approaches by altering questions or re-consulting previous respondents for clarification. The robustness of the findings is further limited due to the exclusive coverage of the platform owner perspective. Furthermore, the data could be subject to an interviewer bias because the interviews were conducted by one person only (Kvale, 1983, p. 171).

8.2. Future work

Since the specific research stream on B2B platforms is still novel, many avenues for further studies exist. Based on this study's versatile insights, in-depth knowledge for the multitude of aspects that are connected to a platform has to be derived. Some of them are listed hereafter, but without claiming to be complete. For example, an understanding of the role of critical technological infrastructures as well as supporting technologies like APIs, HPC, Cloud, AI or blockchain, is required. Even though this research specifically excludes technological platforms, technology naturally plays an important role for their intermediary counterparts as well. Also, regulation and governance structures of B2B platforms, including ownership of data, are key issues. Furthermore, specifically investigating one platform type, a certain industry or another national region is important in order to gain knowledge about a particular context. Moreover, general macroeconomic effects in productivity and economic growth as well as the added value of B2B platforms for companies should be examined. In addition to exploring certain topics in greater depth, academia could consider a varying or adopted research model. For example, with additional interviews with other platform stakeholder and ecosystem actors. Moreover, the present study can be a basis for further investigation in the form of quantitative analyses, which could provide valuable and statistically robust insights.

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