

SUCCESS DETERMINANTS OF OPEN INNOVATION PARTNERSHIPS BETWEEN CAR MANUFACTURERS AND START- UPS IN GERMANY

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ABSTRACT

In a context of saturated markets, increasing price pressure, growing competition, changing preferences and consumption patterns, the automotive industry is evolving into a diversified mobility industry. This disruptive transformation challenges German car manufacturers to reinvent themselves and innovate in diverse directions. Since loose open-innovation (OI) partnerships with start-ups offer manufacturers not only flexibility but, more importantly, cutting-edge expertise from outside the traditional industry, they have become the partner of choice since 2010. Although incumbent-start-up partnerships are on the rise, the current literature scarcely addresses the challenges that arise from innovation cooperation with such disparate partners. Therefore, this study attempts to identify the success determinants to provide practitioners with guidance and contribute to close current gaps in literature. Based on a qualitative research design, in form of semi-structured expert interviews, key barriers and drivers concerning leadership, work methods, culture and intellectual property were identified. Considering the start-up's, the incumbent's and the interface's perspectives, the paper provides a conceptual framework that illustrates the interrelations and challenges in open innovation partnerships. The start-up's group expertise and maturity turned out to be a major driver for



initiating collaboration. The key collaborative success drivers are agile work methods, the group's internal cultural transformation, the interface's autonomy, and a solid level of trust and openness between the involved parties. Besides practical recommendations, derived by the identified success factors, the paper constitutes a theoretical basis for further research.

Keywords: *open innovation, start-up partnerships, automotive industry, innovation management*

INTRODUCTION

Today, the automotive industry is undergoing an unprecedented transformation. As the change of mobility is progressing faster than ever - driven especially by digitisation (VDA, 2019), Original Equipment Manufacturers (OEMs) are forced to reinvent themselves in ever shorter periods of time. Due to growing customer demands for eco-friendly driving systems, sophisticated entertainment, driving assistance and mobility services, car manufacturers find themselves in a race for innovation. Moreover, as connectivity and autonomous driving are predicted to play an important role in future mobility, the industry faces a shift in value pools dominated by growing significance of electronics, IT and software (McKinsey&Company, 2019). Since competencies that so far have been less important became success drivers, OEMs are also put under pressure by the lack of specialised personnel (Homfeldt, Rese, Brenner, Baler, & Schäfer, 2017). In consequence, carmakers are increasingly opening corporate borders to react to the market's dynamic and increase their innovativeness by integrating external expertise (Wilhelm & Dolfmsma, 2019). Since the blurring of product and service as well as online and analogue, industry boundaries are dissolving. The combination of strong internal R&D capabilities and integration of external expertise allows companies to react to these challenges for various reasons: It facilitates large corporations to connect to their customers. Further, it enables the access to state-of-the-art technologies as well as specialist knowledge. Moreover, OI allows groups to innovate in diverse directions since it reduces cost and time resources for development. Thus, companies can develop a competitive advantage as OI reduces the time to market. Further, scientific research has empirically

confirmed that collaborative innovations are more likely to have technical significance and commercial success (Borges & Kaminski, 2019). Due to this, OI is increasingly perceived as a fundamental component of a contemporary, futureproof innovation management across industries (McKinsey&Company, 2019).

However, only since 2010 German OEMs have become more involved in OI in order to address the immense innovation pressure resulting from the industry's shift towards a diversified mobility sector (McKinsey&Company, 2019). As a result, automakers engage in more dynamic collaborations with smaller companies and entrepreneurs. Start-up collaborations in particular are perceived in playing a vital role in the manufacturer's defence of their market leading positions. Today, they have become desirable innovation partners to OEMs as they are a major source of radical innovations (Spender, 2017; Gimenez-Fernandez & Beukel, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). Daimler, Volkswagen and BMW thus established corporate accelerators, incubators and innovation platforms to simplify the interaction with start-ups (Neumann, 2019). However, they struggle to exploit the potential (Wilhelm & Dolfsma, 2019). The failure rate of incumbent-start-up partnerships is relatively high as 'in too many cases, open innovation between large firms and start-ups is ending up nowhere' (Usman & Vanhaverbeke, 2017, p. 172). In case of German automakers, this weakness reinforces the 'closely integrated and in-house driven approach to vehicle development, enabled by close, two-way interaction with suppliers over a long cycle' (Hertenstein & Williamson, 2018, p. 46). The rise in innovator platforms initiated by German OEMs represent the increase in importance recognised in the group. Surprisingly, this development is not mirrored by current literature. The automotive industry is neglected in OI research and also asymmetric partnerships are currently rarely found. Although singular studies emphasize the challenges of dissimilar partnerships, they fail to identify success determinants. By drawing on the limited evidence available and the collection of primary data through interviews, the paper offers a multi-faceted view of the challenges of asymmetric OI partnerships. The paper contributes to both, academia and practice by providing a conceptual framework that presents the main success determinants.

Literature Review

Open Innovation

The literature review traces the development of traditional innovation management to OI while highlighting the benefits and drawbacks of each of them. The theoretical foundation is presented, providing an overview of the current state of research. Although OI was only introduced by Henry Chesbrough in 2003, it has already become a new paradigm in business practice and increasingly attracts the attention of executives (Brunswick & Chesbrough, 2018; Chesbrough, 2003). Today, 80 percent of larger companies in the US, Canada and Europe practice OI (Brunswick & Chesbrough, 2018). Nevertheless, since OI is relatively young, the literature review revealed several research gaps. Asymmetric partnerships are still under researched (Brunswick & Chesbrough, 2018). This is especially surprising since more than 50 percent of the surveyed larger firms are unsatisfied with the outcome of start-up partnerships as they ‘under-delivering on their promise’ (Accenture, 2015a, p. 2). Contemporary research observe that start-up-incumbent collaborations struggle to master a partnership as ‘in too many cases, open innovation between large firms and start-ups is ending up nowhere’ (Usman & Vanhaverbeke, 2017, p. 172). Nevertheless, current research neither reflects this challenge (de Groote & Backmann, 2018; Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). Despite the high failure rate, the interest in identifying success drivers is surprisingly low. Throughout OI literature, the search for success determinants is rare. This is caused by the focus on the questions ‘why to cooperate?’ and ‘with whom?’ rather than the ‘how?’ (Agostini & Caviggioli, 2015). As a result, numerous researchers identified potential advantages, drawbacks, antecedents and outcomes but neglected conditions and complexities of transforming potential benefits into actual success (Bormann *et al.*, 2018). However, a few findings offered valuable points of references for subsequent data collection.

Points of Reference

On the one hand, within the few findings on asymmetric partnerships, leadership competence emerged as a key determinant (Hogenhuis, van den

Hende, & Hultnik, 2016; Islam, Buxmann, & Ding, 2017). Since a power imbalance might promote an imbalance in leadership responsibility, the innovation process is endangered by incumbents that govern the innovation process in the desired direction (Islam, Buxmann, & Ding, 2017, p. 1037) or hamper innovativeness through restricted problem solving skills and creativity (Hogenhuis, van den Hende, & Hultnik, 2016). Moreover, work methods were identified to a major hindrance in incumbent-start-up partnerships. In line with the resource-based view, 'complementary resources and knowledge are vital when selecting a partner' (de Groote & Backmann, 2018, p. 2). Therefore, asymmetric partnerships are recognised as a win-win situation since each side has what the other one lacks (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Wikhamn, 2020). Nevertheless, discrepancies between a start-ups' agile and entrepreneurial way of working and a groups bureaucratic, strategy-driven, working life which is determined by rigid routines and hierarchies, are observed to be a major hindrance (Gimenez-Fernandez & Beukel, 2017): 'The combination of entrepreneurial activity with corporate ability seems like a perfect match, but elusive to achieve' (Weiblen & Chesbrough, 2015, p. 66). Besides leadership and work methods, culture and its interrelation to organisation is frequently observed as a key success obstacle in asymmetric partnerships, suggesting transferability to the automotive industry (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Weiblen & Chesbrough, 2015). As car manufacturers increasingly co-creating innovations with start-ups outside the traditional industry, bridging cultural distances is assumed to be even more challenging. After reviewing the current state of the literature, intellectual property (IP) management is also seen as a major obstacle (Wikhamn, 2020). Since traditional industries, like the automotive sector, has long been focusing on strong internal R&D, highest level of confidentiality and patent applications, the fear of losing success-critical IP hampers an effective exchange of knowledge between innovation partners. Coupled with the power imbalance and the mutual dependency, complex challenges arise that impair successful innovation cooperation, according to the few studies conducted to date (Lauritzen & Karafyllia, 2019; Islam, Buxmann, & Ding, 2017).

RESEARCH APPROACH, METHODOLOGY AND DESIGN

Due to the scarcity of current literature, the need to collect primary data arose. Based on the small number of empirical research, an inductive approach is observed as the most appropriate methodology. As qualitative research supports the study's explorative character, interviews were conducted. The semi-structured character is defined by a guideline that allows respondents to set their own priorities, while still maintaining a certain degree of comparability. Since the majority of OI literature concentrates solely on the incumbents (Gimenez-Fernandez & Beukel, 2017), the study enriches contemporary findings by including start-up employees. In respect to the research purpose and limitations of time and feasibility, the study concentrates on a purposive sampling, implying that interview partners are selected based on their experience and expertise within the specific field of business (Bryman & Bell, 2011). As the data collection requires the involvement of staff at management level, the number of participants is limited according to the restricted access, time and resource constraints. Due to the COVID-19 pandemic, access has become increasingly difficult. Therefore, the sample consists of four experts, three on start-up (S1, S2, S3) and one on manufacturer side (M1). The relatively small sample is critically reflected in terms of transferability and generalisability. To further enhance the finding's quality, interviews were considered as a social interaction. Due to that, collected data is critically reflected, considering expectations, differences in age, gender or status (Edelbroek, Peters, & Blomme, 2019). The data is collected and explored without a predetermined theoretical or descriptive framework (Saunders, Lewis, & Thorhill, 2016). The thematic analysis is applied to identify common patterns (Bryman & Bell, 2011). As a result, theory emerges from data collection, analysis and interpretation, grounded in the research participants' social reality.

RESEARCH FINDINGS

Figure 1 illustrates the most influential success drivers for asymmetric OI partnerships that emerged from data analysis. In contrary to previous findings, the paper differentiates between the OEM and its interface. The identified success determinants are briefly presented below.

Leadership

Current findings assume that larger companies struggle in transferring policy- or directional power to start-ups which is confirmed by collected data (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016). The asymmetry of size is therefore transmitted to an imbalance in power. Both studies that examined the effect of leadership on incumbent-start-up cooperation in greater detail indicate a negative effect by the incumbent's superiority in managerial power. This assumption, however, builds on different foundations: Whereas Hogenhuis and colleagues (2011) observe the superiority negatively affecting the elaboration and conceptualisation of ideas caused by a shortage in skills, Islam and colleagues (2017) observe fair negotiations to be at risk. In contrast to these findings, none of the participants observed the leadership dominance as a key barrier to cooperation (Hogenhuis, van den Hende, & Hultnik, 2016; Islam, Buxmann, & Ding, 2017). Instead, openness appeared to be the main driving force to support idea elaboration and problem-solving. Derived by the experience of various group collaborations, it turned out to be, above all, as fundamental for successful cooperation, as the entrepreneur states.

‘By openness I mean, if you presenting a company to the outside world, you are always trying to say that you are good, right? Even when there is something bad, you gonna say: We are good, there is no problem, no, it's good. So, that means, in the end, the start-up does not really know what's their problem. So, you are asking them: You want an innovation project, for what? They must share honestly: That are the problems we experience, these are the problems that we have. And then, we can find a solution for the problem and solve the problem’ (S3)

This is also evident in the responses of other participants as they primarily reflect the lack in transparency of the group as one of the greatest shortcomings in asymmetric partnerships. In order to contribute to a qualitative, innovative solution, the innovation partners must be enabled to develop a mutual understanding of the manufacturer's problem, weaknesses, and respective needs.

Work Methods

Hogenhuis’ assumption that OEM dominance would hinder effective collaboration due to skills shortages has also been proven wrong for the German automotive sector. Today, the interfaces have already developed into centers of excellence, driven by the employee diversity and a focus to agile and creative work methods that match the start-ups way of thinking and creating innovations.

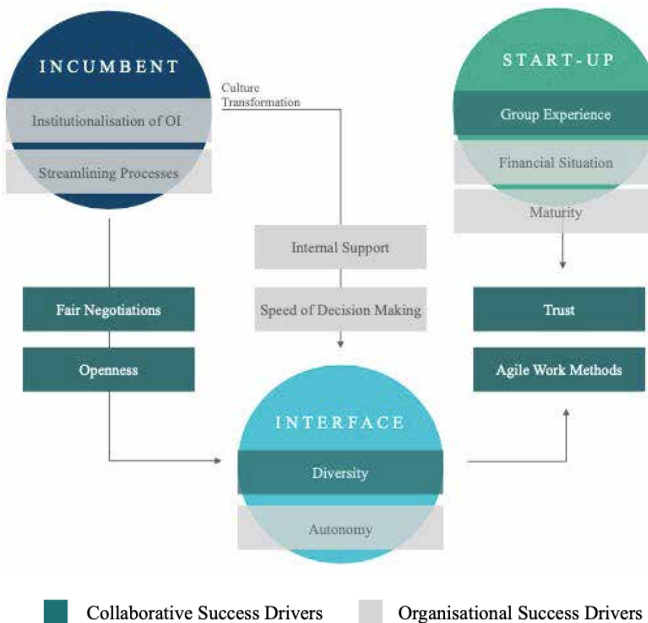


Figure 1: Success Drivers in Innovation Partnerships between Start-ups and German Car Manufacturers (Source by Author)

All respondents highlighted the advantages of agile work methods on which the parties agreed on, right from the beginning of the collaboration. They were consistently recognised for creating an effective and fruitful basement for cooperation as they are ‘very goal-oriented, very collaborative, but also very structured’ (S1). Their strength was also observed as supporting progress and keeping on track during the time-consuming early stages of cooperation. ‘So, from the point of view of working methods, it actually fit together very well. The start-ups are all pretty good in agile decisions anyway, and that fit together very well with the incumbent team’ (S1).

Instead of being challenged by adapting to the way the start-up works, the innovation team member emphasized that agile working methods are already established (M1). Potential differences in work methods become invisible and did not determine the process. Thus, the car manufacturer's innovation teams are already easy to work with from a start-up perspective. Previous research findings of Hogenhuis and colleagues (2016), Weiblen and Chesbrough (2015) and De Groot and Backmann (2020) were not evident in asymmetric partnerships in the German automotive sector. In contrast to Hogenhuis (2016), a successful idea elaboration and innovation conception is not primarily affected by an imbalance in power, but the agreement on agile work methods and the degree of openness towards the cooperation partner which is defined by the incumbent, its attitude to OI and the contractual framework. As Islam and colleagues (2017) stated, an effective cooperation is hampered by unfair negotiations to the detriment of start-ups. The incumbent must be aware of creating a cooperation atmosphere and contractual framework that allow both parties, the interface and the start-up, to share all relevant information. This requires precise rules on IP handling. The participants reflected IP protection as an influential determinant of a cooperation's success and confirms findings by Usman and Vanhaverbeke (2017):

“This (IP) was indeed one of the main conflicts and also one of the greatest points of discussion on how to settle the whole thing. There were a lot of discussions that were not very productive, and, in the end, we came to the conclusion that, well, nothing has been developed yet, maybe we just leave it at very simple regulations” (S1).

Only Weiblen and Chesbrough (2015) yet provide recommendation on how to deal with that issue: They recommend the incumbent to address the start-ups' concerns about losing IP with simple regulations, as confirmed in the statement above. Reducing complexity at a very early stage proved to be one of the best ways to limit the negative impact of the trade-off. ‘Very simple regulations’ result in regulations such as ‘whoever brings in something, get the rights to it, and joint developments are then available for the whole cooperation’ (S3) as well as ‘what we work out for the customer in return for money, belongs to them’ (S3). The easiest way to reduce complexity seems to be a conventionally set up, described by the incumbent as ‘traditional customer-supplier relationship’ (M1). Since IP is

the start-up's main asset (Weiblen & Chesbrough, 2015), fair negotiations are essential to establish a trust-worthy work atmosphere. Trust emerged as one of the most influential success drivers for asymmetric partnerships as it supports the exchange of knowledge and benefits cooperation by bridging organisational distances.

Organisation

Although 'large companies have long sought ways to become more entrepreneurial' (Weiblen & Chesbrough, 2015, p. 68), they are characterised by bureaucratic, strategy-driven, rigid routines and hierarchies that hamper innovativeness since they 'restricts firms from making adjustments changing the way they do things' (Gimenez-Fernandez & Beukel, 2017, p. 22). As OEMs increasingly collaborate with start-ups outside the traditional supply chain, the distance between the parties' working practices is expected to be even more difficult to bridge.

In contrast to previous research, differences in work methods did not emerge as key obstacle since both parties agreed on the application of agile methods. However, there are huge differences between the incumbent and its interface when it comes to agility and decision-making processes. This is why, Figure 1 differentiates between the OEM and its innovation centre. The slowness of the OEMs decision making processes clearly emerged as a major hindrance to successful asymmetric partnership. Pace was consistently named by every participant, including the innovation department member, as a key barrier for the process, confirming the findings of several studies conducted in the context of asymmetric partnerships (Islam, Buxmann, & Ding, 2017; Usman & Vanhaverbeke, 2017). However, the slowness is caused by cultural and organisational issues rather than a mismatch of working methods. Therefore, the mediating interface still have a long way to go in driving the group's internal transformation to improve their collaboration capabilities.

'From a start-up point of view, everything takes a long time, it is more likely to take years, many years rather than months, and also independent of how motivated the individual participants from the respective department are. The specific incumbent's team was very interested and pushed the project quite hard, but to implement the whole thing internally, (...) it's a completely different challenge.' (S3)

This statement again highlights the necessity to differentiate between the incumbents and its interface. Although start-ups are aware that ‘working with a group can be difficult, above all, it can be long. That is, I believe, no secret’ (S3), the slowness of decision-making processes, might endanger an entrepreneur’s financial liability due to a start-ups financial restraints. Since the start-up participants repeatedly emphasized challenges caused by slowness, it might be one of the main reasons contributing to the start-ups growing dissatisfaction with incumbent collaborations, accessed by Usman and Vanhaverbeke (2017) and Accenture (2015). Therefore, not only to prove the technological fit and marketability of the start-ups’ asset, it’s maturity should be preventively accessed through scanning and selection mechanisms. Since the maturity as well as financial liability emerged to be key driver in asymmetric partnerships, they are captured in Figure 1. In addition to the financial issues that are caused rigid processes, another success-critical factor is influenced: trust. Since Edelbroek and colleagues (2019) observe a significant and direct interrelation between the perceived quality of the open innovation processes and the participant’s commitment and work efforts, the incumbent should continuously look for ways to simplify and accelerate processes. The corporate environment is detected by Wilhelm and Dolfsma (2019) as not necessarily hinder OI with partners from within the traditional supply chain as these are often conceptualised as buyer-supplier partnerships. In contrast, the incumbent’s organisational and cultural setting cause significant challenges when partnering with companies from outside the conservative network. Since the integration of off-industry expertise will determine the manufacturer’s competitiveness and innovativeness, OEMs must urgently drive forward their cultural transformation and organisational renewal. The necessary cultural transformation is already addressed by the interviewed interface. It sees itself as a company-internal promoter of integrating innovation-friendly structures and work procedures to streamline processes and become more agile in decision-making. In both roles of the interface, the mediating role in the collaboration with the start-up and the internal role as a driver of organisational change, success depends on internal support. The importance attached to OI within the company is therefore directly related to the potential success of OI collaborations. In addition to organisational differences, current literature identifies cultural distances encountered in such partnerships as one of the major obstacles.

Culture

That culture is hampering the co-creation process, especially in asymmetric partnerships, has been assumed in several studies (Islam, Buxmann, & Ding, 2017; Hogenhuis, van den Hende, & Hultnik, 2016; Weiblen & Chesbrough, 2015), suggesting transferability to the automotive industry. Since car manufacturers increasingly co-creating innovations with start-ups outside the traditional industry, bridging cultural distances is assumed to be even more challenging. In line with recent research findings, culture is observed as a hindrance by all start-up participants (Islam, Buxmann, & Ding, 2017). Nevertheless, it is a barrier that can be significantly reduced by experience of working in or with a group and loses considerable importance under these conditions:

‘So, in our company we have many years of experience working within a group, and are, therefore, familiar with (...) the structures, with the thinking, with the peculiarities (...) we are not the 20-year-old start-up founders who (...) are then culturally completely shocked and disoriented here, but we understand how the groups function. That has certainly made it easier’ (S2).

Knowing the unwritten rules can significantly increase the success of OI cooperation, especially on start-up side:

‘In such a group there are certain procedures, if I hold a meeting in a larger group, then there is a certain choreography, a certain generally, valid structuring and organisation of a topic down to individual contributions. (...) There are of course all cultural conditions or cultural attributes that definitely exist in the group and I believe that if you have internalised them and deal with them sensitively, you will be able to get through them more easily than if you are putting your foot in it’ (S2).

Although, the statements verify culture to be a main hindrance, participants highlighted those cultural differences were ‘not a determining factor for the cooperation’ (S1) for start-ups who are experienced in collaborating with groups or familiar to group typical structures. Thereby, findings of Usman and Vanhaverbeke (2017) who detected group experience as a key driver in asymmetric partnerships are confirmed. The incumbent’s

team member considers the department's diversity as key element in developing a mutual understanding: 'We have a diverse team, and this is also the most important thing in building bridges so that we can cover and absorb different perspectives' (M1). The great expertise is recognised by start-ups as contributing to the team's 'above-average qualification' (S1) and 'professionalism' (S2). These findings confirm the study of Bogers and colleagues that so far received little recognition in the academic debate (Bogers, Foss, & Lyngesie, 2018). Thus, instead of a cultural gap emerging during cooperation, the OEM's understanding, attitude and aptitude towards digital innovations turned out to be more influential, as the quote illustrates:

'The fact that the structures of the automotive industry (...) are very cumbersome and hostile to innovation in some areas. (...) These are things like: A new technology infrastructure is to be used - it's hard to explain that to the management board of an automotive group. Then there is always the question: Why don't we have all the rights? That is our project. (S3)

That the incumbent's decision-maker and key stakeholders partly showed a lack in understanding of the digital innovation's nature and feature, is observed by two of three start-ups. This illustrates once again that OEMs must work above all internally to become more innovation friendly. Consequently, structures must be changed, decision-making processes have to be shortened and new organisational and working cultures have to be lived. The institutionalisation of OI, the streamlining of processes enabled by a cultural transformation are thus illustrated as key success drivers in Figure 1. As the entrepreneur states, OEMs partly lack in an understanding of technologies or innovations. Due to that and the slowness of decision-making processes, the interface's degree of autonomy is success-determining. As illustrated previously, the financial liability, trust and commitment of the start-up can be endangered in case of a long standstill. Since OEMs must become partners easy to work with, they need to rethink either interface autonomy or the involvement of relevant decision-makers.

CONCLUSION AND RECOMMENDATIONS

In light of the automotive industry's transformation, OI, especially partnerships with start-ups from outside the traditional industry, became an

integral part of a future proof innovation management. Although German OEMs increasingly invest in start-up incubators, platforms and networks, they struggle to exploit the benefits of innovation partnerships (Wilhelm & Dolfsma, 2019). Since literature does not offer sufficient information to explain the high failure rates, the research aimed to investigate key success drivers and barriers, determining an asymmetric partnership's success within the German car manufacturing industry. Based on expert interviews, the paper reveals fair negotiations, trust and openness as key drivers rather than a balance of leadership responsibility. Agile work methods turned out to be a key success driver. Moreover, the corporate interface's diversity was emphasized as supporting innovation conception. In contrast to recent research, a cultural gap emerged as less success critical since it can be effectively reduced by the start-up's group experience, confirming Usman and Vanhaverbeke (2017). Further, the cultural alignment is estimated to result from the interface's relatively young age as a business department and their openness towards external partners. In contrast to the less determining inter-company effect of culture, the intra-company effect turned out to be the major hindrance to asymmetric partnerships. This paper therefore distinguishes between the incumbent and its interface. Closely linked to the slowness of processes, resulting from a cultural transformation lagging behind and the limited autonomy of the interfaces which constitute another hindrance, financial restraints arose to be a major barrier. IP protection is another key determinant to success. The simplification of IP handing emerges to be a main driver to asymmetric partnerships during the early stages of collaboration, allowing the standardisation of cooperation conditions. With increasing depth of cooperation, however, flexibility was emphasized by all participants to be a fundamental necessity. Based on these findings, implications for both, business practice and further research are derived.

Besides the thematical enhancement the thesis contributes to, it addresses methodological gaps existing in current literature. Since current empirical research is primarily based on case studies, the thesis adds personal insights of practitioners by the qualitative, interview-based research design (Usman & Vanhaverbeke, 2017; Blankesteyn, de Jong, & Bossink, 2019). Rich data contributes to the micro-foundation, since 'insight into employees' perceptions within the open innovation is still lacking' (Edelbroek, Peters, & Blomme, 2019, p. 6). Since research about asymmetric partnerships is usually conducted from the incumbent's perspective, limitations of

previous studies are conquered (Usman & Vanhaverbeke, 2017; de Groote & Backmann, 2018). Due to the practical relevance of the topic, a list of recommendations for practitioners and policy makers is provided. Another drawback of current literature is thereby addressed.

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