PLATFORM BUSINESS MODEL COMPASS

Guiding platform companies through business model

Master Thesis

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Platform Business Model Compass: Guiding Platform Companies Through Business Model Development

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ABSTRACT

Digital platforms constitute some of the most successful and valuable companies in the 21st century, becoming ever more prominent and important to understand. Yet, there is a gap in the literature that neglects the interrelations between business models, strategy and digital platforms. The lack thereof translates into an issue for practitioners as there is no framework that covers key elements for platform business model. Therefore, this paper sets out to investigate what business model components are relevant for platforms to discover how companies can define and document their competitive business model. Through a qualitative research design including both primary (semi-structured interviews) and secondary data collection (academic publications, articles, reports), this paper develops a framework based on the BMC. It discovers that the relevant components for platform business model design are: *core interactions*, *network effect management*, *governance*, *technological infrastructure* and *monetization strategy*, while *metrics* add a dimension of evaluating the performance thereof. These elements constitute the Platform Business Model Compass, which takes into account the networked perspective on the platform value chain. Furthermore, it finds that key for platform success is network effects and a healthy ecosystem. Thus, the paper contributes with a platform specific business model framework, that is applicable to various typologies of platforms in different contexts such as gap analysis, ideation, and investor presentations.

1
INTRODUCTION

1.1 Background of the Topic

In recent decades, multi-sided platforms have become some of the most valuable firms in the world. Companies such as Amazon, Apple, Microsoft and Airbnb represent some of the most successful platform business models in terms of customer value, revenue growth rates and market valuation (Torrance & Staeritz, 2019). This begs the question of what enables their transformational power in the economic world since marketplaces have already existed for centuries.

The literature characterizes multi-sided platforms as intermediaries for value exchanges between two or more markets of consumers and producers that interact in ways not otherwise possible, with the potential for nonlinear increase in both utility and value (Parker & Van Alstyne, 2005; Cusumano, Gawer & Yoffie, 2019). This highlights the difference to businesses organized in traditional buyer-supplier relationships, i.e., so-called "pipeline businesses". While pipeline business create value by having inputs in order to create products or services as outputs, platform companies do not own the means of production, but rather facilitate interactions across a large number of participants that interactively create and consume value (Gawer & Cusumano, 2014; Thomas et al., 2014).

This different type of value creation changes the traditional way of looking at competition and the sources of competitive advantage. Today's digital technology facilitates scale and collaboration at a global level. And the opportunities only seem to grow with the development of artificial intelligence, virtual and augmented reality or the Internet of Things. To this, the role of the platform is to provide the technical infrastructure and governance so that network effects can be unleashed, and value can be created. In contrast to supply economies of scale, which are driven by production efficiencies, network effects are based on demand economies of scale. This implies that increased numbers of participants or data improve the value of the platform. Thus, value increases exponentially, while costs increase linearly. Therefore, building a business around network effects requires a different way of thinking about market dynamics and competitive strategy (Gawer & Cusumano, 2014; Thomas et al., 2014).

One of the reasons why firms like Uber and Airbnb are so successful is that they are able to adopt new ways of structuring firm and industry boundaries. By shifting organizational design away from selling products or services towards the facilitation of economic exchanges between two or more related user groups (e.g.,

riders and drivers in case of Uber), multi-sided platforms can introduce new transaction mechanisms more rapidly and at much lower cost (Ibid.). Thus, a smart monetization strategy begins by considering the forms of value created by platforms, and then determining which sources of excess value can be monetized.

Lastly, a key factor for platforms' success is that they grow only when they sustain a healthy ecosystem (Pidun & Reeves, 2019). Platform companies combine digital technologies in novel ways to orchestrate an ecosystem of supply and demand enabling co-creation among actors (Hein, Schreieck, Wiesche, Böhm, & Kremar, 2019a). The platform cannot grow unless the entire ecosystem it facilitates contributes and shares the value fairly.

In sum, the relevance and impact of platform companies in today's world is evident due to their special characteristics in terms of serving multi-sided markets, novel ways of monetizing, enabling and benefitting from network effects and ecosystem development. The use of data and technology transform our economic and social world and pose new challenges and opportunities for companies. However, many companies seem to have difficulties with structuring and managing these aspects in an efficient way. We observe that young companies as well as traditional ones are struggling with grasping the complexity of platform business models (Zhaoa, von Delft, Morgan-Thomas, & Buck, 2019), which is elaborated followingly.

1.2 Problem Formulation

This thesis is motivated by both a practical and a theoretical problem. The former aims to solve a corporate problem by creating an artifact, reflecting the problem-solving nature of design science research (Pries-Heje & Baskerville, 2008). The latter is concerned with the identification of a gap in the literature regarding the integration and overlap between three research streams.

In respect to the practical problem, the research departs in understanding the problem that the start-up IndieFrame (henceforth; IF) is facing. IF is a media digital platform that connects content-contributors, which can be individuals, semi-professionals and freelance journalists, with publishers such as newspapers or media agencies. The platform's aim is to facilitate the selling/buying process of user-generated content and democratize the process of reporting. However, the company has been struggling to identify and document the core aspects of its platform business model, which has led to the problem of clearly communicating its value to relevant stakeholders such as investors, but also to potential users. Due to the challenges of integrating and linking various platform business model components, IF had difficulties defining a strategy and mapping its competitive advantage.

In particular, when the company attempted to apply tools like the *Business Model Canvas* (henceforth; BMC) by Osterwalder and Pigneur (2010), the framework was missing key elements that are necessary for defining a two-sided platform like that of IF. This is rooted in the fact that two– or multi-sided platforms depend on assembling networks for value creation rather than a linear value chain of resources. Therefore, also the interlinks between the components of a platform business model are more complex than what the original BMC allows to capture. Hence, we argue that IF's issue belongs to a broader class of problems of defining and documenting a functioning platform business model (Gregor & Hevner, 2013). Based on this, we identified a need for a framework, which practitioners as well as academics can use to develop and assess competitive digital platform business models.

Second, by looking into the literature it became apparent that digital platforms, business models and strategy are interrelated concepts, however, a clear comprehension thereof was missing. For instance, both strategy and business models are widely used terms, yet, they are not always consistently applied (Normann, 1977; Magretta, 2002; Seddon et al. 2004; Wirtz et al. 2016). The emergence of digital platform business models and the lack of clearly understanding them in relation to competitiveness calls for an investigation of the three literature streams strategy, business models and digital platforms. Moreover, this gap in literature adds relevance to develop a framework that can help companies like IF to define and document a competitive platform business model. Hence, the following overarching research question emerged:

How can companies define and document their platform business model and what is the added value for having a specific framework for that?

The underlying motivation is to solve IF's problem by developing a framework that helps them define their business model. Viewing a business model to be a *"system that is made up of components, linkages between the components, and dynamics"* (Afuah & Tucci, 2000, p. 4), we set out to investigate what components platform business models are made of in order to develop a valuable framework. Thus, the following sub-research questions emerged:

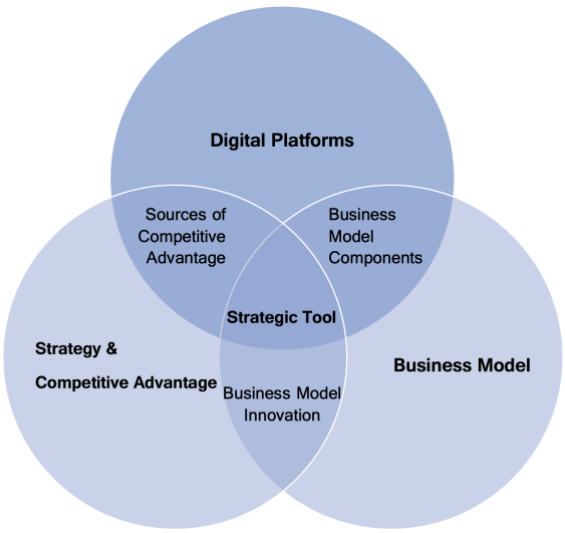
1. What components are relevant for a platform business model?
2. How can these components constitute a framework for platform business models?
3. What added value and for whom does such a framework bring?

1.3 Contribution

As illustrated by Figure 1.1, the contribution of this thesis is twofold. First, an overview of the three literature streams *strategy and competitive advantage*, *business models*, and *digital platforms* and their interrelations is provided with the aim to identify relevant components that are necessary to create a competitive platform business model. Thereby, the second contribution of this paper is an artifact in the form of a framework, which is based on literature and empirical findings and helps to define and document platform business models. With the new framework, practitioners such as IF can overcome the issues experienced with the BMC and are equipped to define two- or multi-sided platform business models. As the design of business models contributes to firm performance, the framework should enable holistic thinking of the business model, instead of addressing just a single component (Andries et al., 2013; Casadesus-Masanell and Ricart, 2010; Zott and Amit, 2010).

In addition, the paper contributes with the development of a framework that is applicable to various typologies of platforms in different business contexts, including both private persons but also businesses as the consumers. The framework helps in the process of structuring and documenting business models. However, the paper sees a specific value for young companies who are developing their business models, or pipeline businesses who aim to transform into a platform company. In particular, the framework enables multi-sided platforms to identify the value co-creating participants and their respective value propositions, contributions and exchanges, which the BMC does not account for.

Fig. 1.1. Overview of Literature Streams in relation to the strategic tool



Source: Self-developed by authors

1.4 Topic Delimitation

The aim of this paper is to establish a framework that practitioners can use to define platform business models, integrating three research streams: *strategy*, *business model* and *digital platform*. It is important to note that the research field strategy covers various concepts, but this paper focuses specifically on the concept of *competitive advantage*. Since it is often the subordinate goal to generate or secure a competitive advantage when structuring business models, we argue that *business models can be a source of competitive advantage*. We acknowledge that there can be many different sources of competitive advantage and that in order to develop market understanding, competitor analysis is often a prerequisite. However, this paper emphasizes the relevant components of a platform business model and how the integration of that can foster ecosystem health and growth. Hence, other sources of competitive advantage are not considered.

In relation to that, the paper acknowledges the need for business model evolution and innovation due to changing market dynamics. However, this paper does not aim to create a dynamic framework that encompasses business model evolution. Instead, the framework is static in nature and depicts a "snapshot" of the business model to construct the connection between various elements. However, it can be used as a diagnostic tool that compares the current with the intended or future business model in order to spark the discussion around business model innovation and transformation. Hence, it can also help managers for a gap-analysis.

Lastly, the scope of this paper limits the possibility to validate and test the framework in its real-life context. Instead, the validation is based on qualitative expert interviews and analytical multi-case applications. We acknowledge that this only allows for conceptual and descriptive validation. Thus, the paper does not conduct empirical testing including measuring its impact in real-life, and rather focuses on conceptually enhancing the understanding of platform business models and their components.

1.5 Outline

To answer the research question, the outline of the paper is as follows. First, the paper reflects on the methodology including research paradigm, approach, method and design that underpins the research. Then, a literature review describes and analyses the research fields of *strategy*, *business model* and *digital platforms*, and discusses how they interrelate and what the most relevant components are to develop a framework for platform business model. This leads to the initial framework development based on academic literature. After, an improved framework is derived through iteration based on feedback from academics, practitioners and experts by aligning it with their insights from the real business world. This is followed by

a multi-case application to validate and test its applicability in different platform contexts. Following this final evaluation, the framework is applied to IF in an attempt to solve their problem and offer a final recommendation, including a discussion of its added value. Lastly, a conclusion summarizes the research findings, answering all the research questions.

2
METHODOLOGY

This section elucidates the methodological considerations driving our choices regarding the conduct of the research. Therefore, it first describes the paper's philosophical underpinnings and research paradigm which are rooted in design science, including the implications for the research method adopted thereof. This is followed by an elaboration of the method of design science, research approach, design and strategy and their interconnections, which helps understand how the research question was answered. Lastly, a complete description of data collection and analysis is provided, including reflections on the trustworthiness of the data and ethical considerations addressing the limitations of the research.

2.1 Philosophy of Science: Ontological, Epistemological and Axiological Considerations

The research philosophy affects how researchers conduct a specific research study and interpret the researched phenomena (Johnson & Clark, 2006). Therefore, the term is related to the development of knowledge and the nature of that knowledge (Saunders et al., 2012). There exists a number of different research philosophies and these are often presented as rather opposing worldviews in academic literature. Thus, the adoption of a research philosophy depends on the field of study, the research project itself and the phenomena under investigation and it contains assumptions about the way the researcher views the world. Nevertheless, Niglas (2010) argues against completely opposing worldviews and suggests that the adopted philosophy of science is rather positioned on a continuum of multi-dimensional factors.

The research philosophy of a study is concerned with three key concepts: ontology, epistemology and axiology. Ontology is defined as the study of being and the basic building blocks of existence (Moses & Knutsen, 2012). Thus, it considers the researcher's assumptions about how the world works. The two poles of the ontology continuum are rooted in objectivism and subjectivism. Former assumes that social entities exist externally of social actors, while latter assumes that social actors construct social entities through their actions and perceptions (Saunders et al., 2012). Epistemology, on the other hand, is the philosophical study of knowledge posing the question *"what is knowledge?"* (Moses & Knutsen, 2012). It is concerned with possibilities, nature, sources and limitations of knowledge in research, but can also constitute the criteria by which the researcher classifies what does and does not comprise knowledge (Hallebone & Priest, 2009). Lastly, axiology adds a dimension of the researcher's personal values and how these affect the different

stages of the research process. Axiology is important to consider as personal values can affect the generated results. Thus, it is important for assuring the results' credibility (Saunders et al., 2012). Following ontological, epistemological and axiological considerations are reflected upon and how these affect the research.

This paper seeks to understand how business models are composed for digital platform companies to be competitive, and thereby construct a framework that can aid platform managers to define a competitive business model. To answer the research question, we see the importance of being adaptable in terms of world view and knowledge construction. On the one hand, the ontological consideration behind this research is that the nature of reality can be perceived objectively, with the belief that business models exist as a formal structure external to its social actors. On the other hand, because social actors in relation to business models are managers that attach their own individual perceptions when interacting with the concept of business models, we also adopt a subjective view on the nature of reality (Saunders et al., 2012). This ontological position resembles pragmatism and promotes more precise and reliable findings in answering the research question, by allowing for flexibility in the underlying assumptions of the study and the methods and techniques applied in relation to gathering and analyzing data (Kelemen & Rumens, 2008).

In accordance with the flexibility of the underlying ontology, this paper also takes an epistemologically flexible position between natural and social sciences. The paper agrees with critical realists on the stance that our knowledge of reality cannot be understood independently of the social actors involved in the knowledge derivation process, and therefore our knowledge of reality is a result of social conditioning (Saunders et al., 2012; Dobson, 2002). Therefore, to understand the phenomenon of business models and their influence on competitive advantage, we both aim to hypothesize and evaluate based on the theory and "laws" of the concept, but also incorporate an understanding of the social structures that give rise to the phenomenon (Ibid.).

Lastly, from an axiological perspective, pragmatism allows us to concentrate on what is regarded as feasible truth to answer the research question (Tashakkori & Teddlie, 2003). As pragmatism is considered to be problem-driven and focuses on the actual research and less on natural laws, it supports our understanding of the studied phenomena and guides us along the process. Thus, we adopt the position that *"no single point of view can ever give the entire picture and that there may be multiple realities"* (Saunders et al.,

2012, p. 130). Therefore, pragmatism seems to be advantageous to align research methodology, our beliefs and research paradigm. This leads us to the adoption of design science; a methodological approach that relies on pragmatism as a new research direction concerned with devising artifacts that solve real-world problems.

2.2 Research Approach: Design Science

Simon (1996) puts design science on par with the natural and social sciences, as a science that makes up for the shortcomings of the traditional ones. Purely looking into the meaning of the words, *design* can be defined as the "*shaping of artifacts and events to create a more desirable future*" (Boland, 2002, p. 725), while science stems from the Latin *scientia* meaning "*knowledge*" (Merriam-Webster Online Dictionary, n.d.). Woodhill (2012) interprets this as the creation of future knowledge, which is in line with Simon's (1996) understanding of design science as a science of the artificial to solve particular problems or designing something that does not yet exist. Whereas traditional sciences have the objectives of exploring, describing, explaining and predicting (van Aken 2004; Romme, 2003), the objective of design science is to prescribe solutions or methods for solving a problem or designing a new artifact (Dresch et al., 2015).

In relation to the objective of science, the starting point in design science is the need to design or build an artifact to solve a real-life problem, whereas in traditional science the starting point is theoretical or an observation of reality (Dresch et al., 2015). This is related to the fact that the knowledge that is created is relevant and rigorous in terms of both being recognized in the academic community but also useful for professionals. In this context, design science is the optimal research paradigm for this paper, since the research question stems from a problem that we identified together with the digital platform company IF. IF was experiencing problems with defining its business model with the existing frameworks, which meant that the company was neglecting focus on important aspects of running a digital platform company. Identifying the research problem in a practical context further allowed us to identify a gap in the literature. Thus, design science allows us to construct a framework - an artifact - that is relevant and useful both for practitioners but also for academia. Thereby the knowledge created is transdisciplinary in character and can reduce a gap that exists between theory and practice (Ibid.).

2.3 Research Method: Design Science Research

Design science research is the method that is "*oriented to the solving of specific problems to obtain a satisfactory solution for the situation even if the solution is not optimal*" (Dresch et al., 2015, p. 68). It is important to gain a strong understanding of the problem to construct and evaluate artifacts that enable the transformation of situations by changing their conditions into better or more desirable states (March & Smith, 1995; March & Storey, 2008). Furthermore, the aim of these solutions is to be liable to generalization for a specific class of problems. Class of problems can be understood as *"the organization of a set of problems, either practical or theoretical, that contain useful artifacts for action in organizations*" (Dresch et al. 2015, p. 104). If the knowledge generated in a specific context is generalized, it can be classified into a particular class of problems, which can later be accessed by other organizations that have similar problems (Ibid.). We consider the issue of defining a functioning platform business model a class of problems, centering around the observation that companies are struggling by using current frameworks because they neglect considering relevant platform elements. To solve the specific problem for IF, design science research helps us develop and evaluate an artifact for solving not only this problem, but also to make the solution generalizable for the class of problems.

But first it is important to understand what goes under the term artifact and determine what type of artifact this research is aiming to develop. Artifacts are the products of design science research and can be thought of as manmade (Dresch et al., 2015). Artifacts are "*a meeting point [...] between an 'inner' environment, the substance and organization of the artifact itself, and an 'outer' environment [...] in which it operates*" (Simon, 1996, p. 29). Thus, it can be seen as the organization of components of the inner environment to achieve a particular goal in the outer environment (Dresch et al., 2015). In the case of IF, this is related to the problem of organizing the business model (inner environment) to achieve competitiveness (outer environment). March & Smith (1995) classify artifacts into four types; constructs, models, methods, and instantiations. Nevertheless, a fifth important classification, design propositions, is related to the theoretical contributions of conducting design science research (Dresch et al., 2015).

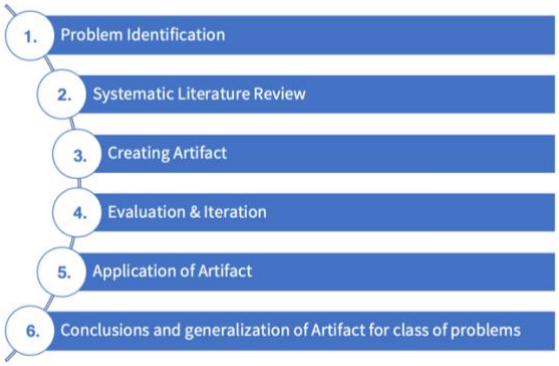
As we aim to develop a framework that helps companies define relevant aspects for their platform business model, we classify this artifact as a *design proposition*. Thus, design propositions *"correspond to a generic template that can be used to develop solutions for a particular class of problems"* (Dresch et al., 2015, p. 110). Moreover, we aim to develop a protocol that explains how the artifact should be used and applied,

which we consider to be an *instantiation.* Instantiations "consist of a coherent set of rules that guide the use of artifacts" (Dresch et al. 2015).

2.3.1 Steps of Design Science Research

Different authors suggest certain steps in order to fulfill the objectives of design science which are: 1) proper problem formulation, 2) suggestion and development of the artifact, and 3) an evaluation of the artifact (Dresch et al., 2015). Building on this, our research takes the following steps depicted in Figure 2.1. First, we seek to gain a proper understanding of the problem at hand. This step is conducted with the case company, IF, by conversing with the founders in several rounds of interviews and observations. When the problem was clearly understood, we conducted a systematic literature review to look for existing frameworks, where we identified that the BMC would serve as a basis for our framework. We also identified platform specific elements by looking into digital platform literature. From this, it was possible to conduct the next step; creating the artifact itself. Once it was developed, we initiated the next step; evaluation and iteration of the artifact through semi-structured interviews with both practitioners, i.e. founders of digital platform companies, experts, i.e. more experienced managers in the field, investors, and academic experts. These insights enabled us to further develop the artifact, and demonstrate the rigor and relevance in our research. Once the final framework was developed, we applied it to four case companies to test its applicability in a descriptive evaluation method, using informed arguments to demonstrate the utility of the artifact. Then we applied it to the case company IF in a proposal on how to structure their business model and thereby attempted to solve their problem. With these steps taken into account, we were enabled to discuss generalization of the artifact for the class of problems and the subsequent conclusions.

Fig. 2.1. Steps of Design Science Research



Source: Developed by authors

2.4 Research Process: Abduction

Linked to research philosophy, approach and method is the reasoning that guides the research process. Therefore, it is important to be clear on the extent to which theory defines the research process and the role of hypothesis testing in the study. Thus, three ways of reasoning can be distinguished: induction, deduction and abduction. First the differences between these are explained followed by an argument of why this study adopts the abductive reasoning considering aspects of logic, use of data, use of theory and generalizability.

While induction aims to generate new theory and generalizations based on generated data, deduction tests the validity of hypotheses and is thus concerned with theory falsification or verification (Saunders et al. 2012). However, both reasonings have weaknesses. Deduction is criticized for a lack of clarity in respect to appropriately choosing the theory tested as well as the tendency to construct a rigid methodology (Saunders et al. 2012). Meanwhile, critics of induction argue that *"no amount of empirical data will necessarily enable theory-building"* (Bryman & Bell, 2015, p. 27).

Positioned between these two poles is abduction, which aims to address the weaknesses associated with both deduction and induction. Abductive research often starts from a surprise or puzzle and is devoted to the exploration and explanation of it. It involves deciding what the most likely inference that can be made from a set of observations is (Bryman & Bell, 2015). Hence, abduction differs from deduction as it focuses on the development of theoretical models, rather than confirming existing theory. In contrast to induction, the abductive reasoning does not aim to generate new theories, but rather tries to add and extend existing theories (Ibid.). This is in line with our research objective, as the aim was to further develop existing frameworks, filling a literature gap and serving practitioners' needs. Thus, the emphasis lies on theory development, rather than theory generation (Dubois & Gadde, 2002).

Given the nature of our research objective and the pragmatic philosophy of science, abduction seemed most suitable for this paper. According to Dubois and Gadde (2002), abduction is useful if the objective is to discover new things because it enables to move back and forth between theory and data in order to develop new or modify existing theory. This logic of generating testable conclusions suited our research, as this study departed in design science research with the aim to produce scientific knowledge that includes innovative constructions intended to solve a real-world problem.

The starting point was the BMC, which we expanded by integrating relevant aspects for platform businesses derived from literature. Through empirical research we gained new insights and extended the framework, and this *"continuous dialogue between the data and preunderstanding"* (Bryman & Bell, 2015, p. 27)

fostered openness towards surprises and enhanced the understanding of the research field. Thus, our data collection analysis was guided by an abductive approach as it was based on the application of an existing, but adapted and extended theoretical framework (Robson, 2011). Unlike inductive and deductive reasoning, abductive research enabled us to explain, develop and change the theoretical framework before, during and after the research process (Dubois & Gadde, 2002). Thus, our original framework was modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the research process (Ibid.). Dubois and Gadde (2002) argue that this is a form of systematic combining, developing refinements of existing theory than inventing new ones.

2.5 Research Design: Qualitative Research

Research design can be understood as the process that turns the research question into a research project (Robson, 2002). It reflects the general plan of how to answer the research question, containing clear objectives, specification of data collection sources and constraints (Saunders et al. 2012). Thus, research design can be generally classified into quantitative and qualitative research. A quantitative design aims to quantify a problem through numerical data, with the intent to draw conclusions to generalize the outcome (Ibid.). A qualitative design is used to gain an understanding of underlying reasons, opinions, and motivations. Hence, it provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research (Ibid.).

Thus, it is important to define the research objectives which influence the type of research that is conducted. While the objectives of traditional science are exploring, describing, explaining and predicting (Saunders et al., 2012; Bryman & Bell, 2015), this study followed design science that aims to generate knowledge through problem-solving, which is prescriptive in nature (Van Aken, 2004; Dresch et al. 2015). Prescriptive research is rather applied than theoretical in character. It goes beyond identifying success of outcomes, but instead recommends solutions or new ideas. Indeed, design science research starts from problems that come from the field (relevance) and provides an artifact (solution) in order to develop prescriptive knowledge, while meeting the standards and norms of scientific research (rigor) (Cloutier & Renard, 2018).

Since the research question indicates the sub-question of *what* elements of a business model are important for digital platforms and *how* they can be organized to be competitive, it seems that the nature of the study is both *prescriptive* and *exploratory*. While prescription focuses more on the "what" of the research subject, exploration emphasizes the "how". The study follows a prescriptive design as it is solution focused in respect to creating an artifact with the right elements (Van Aken, 2004). The study is explorative because it seeks new insights to assess the development of platform business models in a new context (Robson,

2002, p. 59). It intends *"to tackle new problems on which little or no previous research has been done"* (Brown, 2006, p. 43). Since our research area is still quite novel, and to our best knowledge no research on the specific topic has been conducted yet, an exploratory study is required to answer the outlined research questions.

For this purpose, a qualitative research design was chosen. A literature review and non-standardised qualitative expert interviews are useful steps in research design to understand the problem. Semi-structured interviews provide an opportunity to explore answers, where interviewees need to explain or build on their responses. A limitation of a qualitative approach is that data is interpreted through the researcher's understanding and may therefore be considered to be more subjective. However, it is useful for generating new theories and adding more complex information to it, which makes it more exploratory in nature.
A great advantage of exploratory research design is its flexibility and adaptation to change, while laying the groundwork for future studies. Hence, the design is emergent because with results of new data and insights, the direction of the research can change as well (Yin, 2014). However, we were aware that exploratory studies generate qualitative information and interpretation can be subject to bias. Thus, we aimed to triangulate the data, which is further explained in the data collection. Moreover, we acknowledge that the number of interviewees is modest, which could limit the representativeness and generalizability of the obtained data. Therefore, we validated the data in a second round through a multiple-case application, which is further elaborated in the following section.

2.6 Research Strategy: Case Study

The choice of research strategy is guided by the research question and objectives, the extent of existing knowledge as well as the chosen philosophical underpinnings (Saunders et al. 2012). Considering the given resources, the time available, and the adopted design science approach, the most appropriate strategy for our research was case study, which is elaborated followingly.

Due to the previously outlined prescriptive and exploratory study objectives, a case study approach was chosen because it is defined as *"a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence"* (Robson, 2002, p.178). Firstly, using a case study is a well-suited strategy to explore a research field within real-life environments (Eisenhardt & Graebner, 2007), which is in line with the study investigating IF's problem. Thus, we started out with an in-depth analysis of a bounded system to identify the problem (Miles & Huberman, 1994). To do so, a single-case study was chosen as it enabled rich understanding of the context of the research and the processes being enacted (Morris & Wood, 1991). Yet, to enhance the

external validity and generalizability of our findings, we analysed four more case companies in a descriptive evaluation to validate the artifact.

Since case studies are often criticized in terms of rigor, it is necessary to make the procedures of data collection used very explicit in order to grant additional credibility to the studies. Only then is it possible for readers to judge the solidity and adequacy of the applied methodology (Ellram, 1996). Furthermore, when using a case study strategy, data triangulation is crucial in order to increase the quality of the interpretation and inferences made from the collected primary data (Gerring, 2004).

2.7 Data collection

There are three main purposes of data collection that this thesis necessitates, namely, 1) for the construction of the framework, 2) the validation and adjustment of the framework, and 3) to test its applicability in use cases. This section reflects on the paper's primary and secondary data collection.

2.7.1 Secondary Data Collection

With the aim of constructing a conceptual framework that can be used by practitioners, this paper made extensive use of secondary data in the initial stages. Secondary data are by definition collected by other researchers for a different purpose but are however useful in application to the presented objective (Veal, 2011). Therefore, secondary data has some crucial benefits and advantages in application, but also limitations, which is elaborated below.

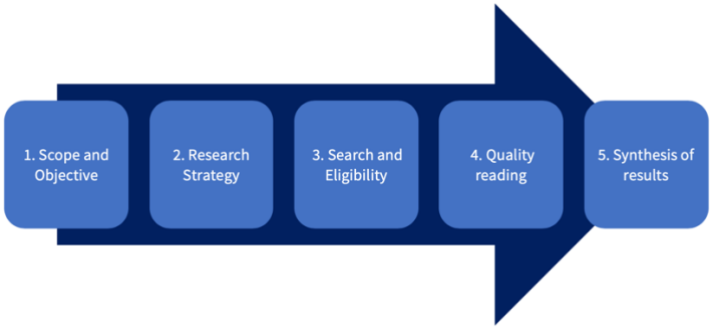
The main benefit of using it is that it requires fewer resources and less time, as one can take advantage of what previous research has produced and assess this. Therefore, it is also both cheaper and easier to collect information from it (Veal, 2011). In this context, it allowed us to include insights and data that would have been out of the scope and scale of this paper to investigate, as for example the original BMC. Nevertheless, the use of secondary data enhances the triangulation of the primary findings, because it puts the findings from the collected empirical data into a greater context and allows for comparison with findings from previous studies. Thereby, secondary data contributes to the extent and depth of the analysis (Creswell, 2014).

Looking into its limitations, one key disadvantage is that the purpose of the data collection was different. Therefore, there will be discrepancies in alignment with the research question, which can lead to incorrect interpretation (Veal, 2011). Furthermore, because there is typically a lack of (detailed) methodology description, it can be problematic to guarantee the quality of the data. Therefore, as researchers we must be aware of potential uncontrollable biases in the collection of secondary data and the subsequent analysis of these (Saunders et al., 2012). Therefore, in the process of secondary data collection, we carefully evaluated data sources in terms of validity and reliability, by having a strong use of highly renowned and peer-reviewed sources.

2.7.1.1 Systematic Literature Review

The aim of the systematic literature review was to become aware of what had previously been researched about the topic and what was missing, in order to create a synthesis that resulted in new knowledge (Dresch et al., 2015; Gough et al., 2012; Kitchenham, 2010). To ensure that the review is unbiased, accurate, auditable, replicable and updateable, the method should be planned, explicit, responsible and justifiable. In short, it has to be *systematic*. Therefore, we followed the steps in Figure 2.2. building on several authors' suggestions for necessary steps (Saunders et al., 2012; Dresch et al., 2015).

Fig. 2.2. Systematic literature review process



Source: self-developed by authors

The first step of commencing the literature review was to scope the objective and the topic of the literature review. Based on the identified research problem, we chose to look into three different literature streams: business models, strategy covering competitive advantage, and digital platforms. The clear objective was

to identify the overlaps and differences in this literature. The second step was to define the search strategy and have a clear vision of what to search for and where. We based the search strategy on international studies from the databases EBSCOhost, BrowZine, Scopus and Google Scholar. These databases were chosen due to their large coverage in management literature, including both academic papers, theses, books, etc. The search terms were, accordingly to the objective, rather broad and covered all three areas of interest. Thus, we used the following search terms: i) "business model", ii) "competitive advantage", "competitive advantage strategy", iii) "digital platform", "digital platform business model" or "digital platform strategy". The next step was to search and choose the eligible literature by performing an inspectional reading of the studies found in the search. By reading titles and abstracts, the eligible studies were chosen based on some specific inclusion and exclusion criteria presented in Table 2.1.

Table 2.1. Inclusion and Exclusion Criteria

INCLUSION CRITERIA	EXCLUSION CRITERIA
• Text in English or German • Publications have been peer reviewed • Papers that study business models, competitive advantage and/or digital platforms	• Papers that just cite "business model", "strategy", "competitive advantage", and "digital platform" but don't have a focus on the topics • Papers that are not management-related but focus on specific technology or IT systems

Source: self-developed by authors

Through the search we identified more than 200 seemingly relevant publications that would address the topics of business models, strategy and digital platforms, either in combination or separately. To gain a narrower and focused assortment of relevant articles, we conducted a quality reading and excluded literature that did not have its main focus on the *components of business models* and *the sources of competitive advantage*. For the topic of digital platforms, we excluded literature that did not have a focus on the topic in relation to strategy or business models. Through the quality reading we also identified other relevant academic sources that we incorporated in the review. This led us to select 120 publications to include in the review. Upon reading the publications, we synthesized the results presented in chapter 3 (Literature Review).

2.7.2 Primary Data-Collection

This section dives into techniques for gathering primary data, i.e. data that is produced by us (Dresch et al. 2015). Data collection is crucial to ensure the operationalization of the research and needs to be aligned with the overall research method and goals (Ibid.). Following a qualitative research design, primary data has been gathered through semi-structured interviews and observations as a supplement method. The goal with collecting the data was to validate the framework to make subsequent corrections. The following describes and discusses the data collection technique applied including.

2.7.2.1 Semi-structured interviews

First of all, interviews may be classified into three types regarding formality and structure: structured interviews, semi-structured interviews, and unstructured or in-depth interviews (Saunders et al. 2012). In structured interviews the interviewer defines and follows a pre-established script and cannot adapt the questions in response to the situation and are referred to as "quantitative research interviews". In contrast, unstructured interviews are often referred to as "qualitative research interviews" because the interviewee may develop the situations as seen fit and the subjects may be explored in a broader manner (King, 2004, Saunders et al. 2012). Thus, questions are open and may be answered in an informal conversation (Saunders et al. 2012).

Positioned between those two types are semi-structured interviews; a method combining both structured questions with unstructured exploration. This technique was chosen because it fits the purpose of the research and provides the flexibility to rephrase questions in order to gain a greater understanding (Saunders et al. 2012). Semi-structured interviews were the best fit to answer our research question because we started out with a list of key themes and questions derived from our framework, which created an outline for what we wanted to cover in the interviews (Silverman, 2007). But the exploratory nature of our research and the abductive approach required flexibility in terms of questions asked and to explore the topic further by including additional questions (Easterby-Smith et al., 2008). Hence, semi-structured interviews enabled us to omit or adapt questions depending on the flow of the conversation, the interview partner and the organizational setting. For example, we were able to develop different interview guides, which we needed to address different groups of interview partners (i.e. experts, academics or platform business owners).

Moreover, the semi-structure provided us with the opportunity to 'probe' answers, meaning that interviewees could explain or build on their responses. As interviewees might have used words in a particular way, it enabled us to probe these meanings, which added depth to the obtained data. Moreover, this opened up for discussions and topics that we had not anticipated beforehand, but which were significant

to address the research question and objective. This led to a richer and more detailed set of data (Saunders et al. 2012). In addition, semi-structured interviews were of advantage in terms of establishing personal contact. Often potential participants who receive a questionnaire via the Internet can be reluctant to complete it as they hesitate to provide sensitive and confidential information to a stranger. Therefore, through personal interviews we achieved a higher response rate than using questionnaires (Saunders et al. 2012). Lastly, semi-structured interviews were advantageous because we asked complex and open-ended questions, implying that the order of questions varied, which is not possible in structured interviews (Easterby-Smith *et al*. 2008; Jankowicz 2005).

Nevertheless, semi-structured interviews also have some disadvantages. They are criticized for data quality issues concerning (1) *reliability*, (2) different forms of *biases*, (3) *validity* and (4) *generalisability* (Bryman, 1988; Yin, 2009). First, the lack of standardisation in semi-structured interviews poses questions to the *reliability* of the data (Saunders et al. 2012). Nonetheless, Marshall and Rossman (2006) argue that such research is not intended to be exactly repeatable and that its strength lies in investigating a complex, dynamic and real-life phenomenon at a specific point of time and location, which can also be subject to change. To compensate this, we obeyed a rigorous methodology that accurately describes the research process and offers other researchers the possibility to reanalyse the findings and follow the procedure to apply a similar approach in the future. Thus, we tried to address the issue of reliability and justify the selection of our approach.

Second, there are different types of biases to be aware of when conducting semi-structured interviews. Often the interpretation of questions and answers can be influenced by biases introduced by the interviewer (Easterby-Smith *et al*. 2008). However, not only does the manner in which the interviewer questions and interacts with the respondent impact the data (Silverman, 2007), but also the interviewee may withhold important information, which the researcher has no control over. Table 2.2 lists biases related to either the researcher or the participant and describes how we attempted to minimize them throughout the entire research process to stay objective and transparent.

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Table 2.2. Overview of biases, drivers and countermeasures

Type of bias	Drivers of bias	Counter-measures
Researcher Bias	Halo effect: perception distortion or tendency to see something or someone in a certain light because of a single, positive attribute	Using multiple researchers and taking independent notes to avoid single-subjective perception of interviewee. Being well informed about interviewee and organisation through multiple sources
Researcher Bias	Leading questions and wording bias: questions that lead the participants in the direction of probable outcomes may result in biased answers	Keeping the questions simple and avoiding words that could introduce bias, i.e. avoid leading questions that can prompt the participant to respond in favour of a particular assumption. I.e. use of neutral (nonleading and nondirective) prompts such as these: "Tell me about..." "Could you explain more what you meant by...?" "How do you feel about...?" "Could you describe...?"
Researcher Bias	Question-order bias: questions may influence the responses to subsequent questions. Thus, participants may compare and judge subsequent questions based on their response to the first question resulting in a biased and inaccurate answer	Consider potential bias while constructing the interview and order the questions suitably. Asking general questions first, before moving to specific or sensitive questions
Researcher Bias	Confirmation bias: researchers interpret the data to support the hypothesis and may omit data that does not favour the hypothesis	Consider all obtained data and analyse it with a clear and unbiased mind. Continually re-evaluating the impressions and responses to ensure that pre-existing assumptions are not automatically confirmed.
Participant Bias	Acquiescence bias: participant chooses to agree with the researcher just to complete the interview once fatigue sets in	Asking open-ended questions to prevent simple agreement or disagreement and guide conversation to gain honest answers. If the answers sound untrue, rephrase or ask follow-up questions.
Participant Bias	Social desirability bias: participants respond inaccurately in order to be liked or accepted in cases of sensitive, personal or controversial topics.	Phrasing questions in a manner that enables participants to feel accepted no matter the answer or opt for indirect questions that ask what a third party would do in a particular situation.
Participant Bias	Habituation bias: occurs when participants provide the same answers in response to similarly-worded questions.	Ensure that different questions are worded differently and that the questions are engaging throughout the interview.
Participant Bias	Level of trust	Embracing transparency and authenticity from first contact onwards, clear communication research objective, procedure and required time, emphasized that research is not use for commercial purposes

Source: Sarniak, 2015

Third, validity concerns the "appropriateness" of the tools, processes, and data (Leung, 2015), i.e. whether the sampling and data collection is appropriate. To enhance construct validity, we made sure that our interview guide covered the key "constructs", i.e. themes identified in the literature. Moreover, we facilitated validation of data through cross verification from more than two sources, i.e. by interviewing several people from different backgrounds and using two researchers (Denzin, 1973).

Fourth, due to the small sample size of 13 interviews, the representativeness of the cases and thus the external validity can be questioned. However, the wider applicability of the findings and relevance depends on whether the research is relatable to existing theories (Marshall & Rossman, 2006; Yin, 2009). As our framework is derived from theory and provides the structure of our research, we can clearly demonstrate a relation to existing theories. Moreover, through the validation by experts as well as the multiple-case application, we also showed a broader significance of our findings (Saunders et al., 2012). Although we are aware that it is not possible to derive statistical generalizations from our results, we have attempted to validate the model from different perspectives and industries to ensure its usage in different settings and increase the generalizability.

2.7.2.2 Sampling

This section elaborates on the chosen sampling strategy. Generally, sampling techniques can be divided into probability (representative sampling) and non-probability sampling (judgemental sampling) (Saunders et al. 2012). For our research, non-probability sampling was an appropriate and credible technique because it was of high importance that the interviews are particularly informative (Patton, 2002; Neuman, 2005). We decided to use purposive sampling, which falls under non-probability sampling, as it enabled us to select interviewee that were most helpful to answer our research question and met our objectives (Saunders et al. 2012). Since our research question is concerned with understanding what elements are important for digital platform companies, the purpose of our interviews was to validate the framework and to receive feedback on which elements make sense to include or exclude. Therefore, we further used heterogeneous sampling, which is a sub-strategy of purposive sampling. This approach relies on the researchers' capability to select interviewees with different characteristics to enhance high variation within the collected data (Ibid). The strength of this approach lies in identifying key themes, because any pattern that emerges in a small, heterogeneous sample is likely to be of particular interest and value (Patton, 2002). By choosing different groups of practitioners and academics with different backgrounds and within different industries, we guaranteed highly diverse data sources.

Following Patton (2002), we determined selection criteria before we selected the sample to ensure maximum variation. The main selection criteria for interview partners was experience with developing (platform) business models, from both a practical and a theoretical perspective. Hence, we created four groups: founders of platform companies with less experience; practitioners with extensive business experience; academics with expertise within digital platforms and business models; and investors of startups. Hence, practitioners were based on the criteria that they have founded a company or are familiar with the process of creating a business model. The second important selection criteria was that interviewees hold a position as decision taker and are knowledgeable about digital businesses. Through the interview process, we also used the *"snowball principle"* where we asked interviewees to forward us to other knowledgeable potential interviewees, that we otherwise would not have access to. Even though the sample was partly "*snowballing*", it stayed heterogenous and followed our selection criteria to avoid bias and homogeneity (Lee, 1993).

The issue of sample size is ambiguous for purposive sampling. The literature suggests collecting data until saturation is reached, meaning that with every additional data few, if any, new insights are gained. We reached saturation after conducting 13 interviews. Table 2.3 provides an overview of our interview partners and describes their diverse characteristics.

Table 2.3. Overview of interview partners

Code	Company Name	Industry	Name	Position
Platform Companies				
P1	Hilfr	Cleaning	Niels Martin Andersen	Co-founder
P2	Happy Helper	Cleaning	Dennis Forchhammer	Co-founder and CEO
P3	IndieFrame	Media	Lars Brask & Cecilia Valsted	Both co-founder and CEO
P4	Pars	Art	Lasse Marker	Founder and CEO
Expert Interviews				
E1	Helden.de	Insure-tech	Stefan Herbst	Founder and CEO
E2	Ownr	Prop-tech	Nils Kohle	President and CEO
E3	Storyliner	SaaS	Michael Schmidt	Founder and CEO
E4	Flightright	Legal-tech	Marek Janetzke	CEO
E5	PwC Germany	Consulting	Christoph Haß	Co-Lead Startup Services & Scale up
Academics				
A1	CBS	University	Michel van der Borgh	Associate Professor
A2	Nova	University	Leid Zejnilovic	Assistant Professor
A3	CBS	University	Carmelo Cennamo	Professor of Strategy & Entrepreneurship
Investors				
I1	PwC Germany	Consulting	Axel Steffen	Lead Partner of the PwC start-up and digital venture initiative Next Level

Source: self-developed by authors

2.7.2.3 Interview Procedure

The following steps summarize the data collection procedure of the semi-structured interviews to increase transparency. Interviews were conducted in May and June 2020, lasting between 30 and 60 minutes. The initial contact was established through LinkedIn messages or by email in which we presented ourselves, the research topic and the objective of our investigation. In accordance with Saunders et al. (2012), we informed the interviewees about the formalities and the length of the interviews and the concrete period in which we would be able to talk. We offered the interviewees to choose the specific time to ensure that they would feel comfortable.

During the interviews, we followed a protocol that started with informing the interviewee about the purpose of the interview and asked about both confidentiality of information and permission to audio record. Recording enabled us to listen carefully without missing important information and to ask follow-up questions. In addition, we were always two interviewers to ensure that information is not subjectively misinterpreted, and themes of the interview were clearly assigned to a person. Moreover, by involving multiple researchers we facilitated investigator triangulation to help the validation of data. Even though we recorded the interview for later transcription, hand notes were taken throughout the interview to write down observations and key messages. The majority of interviews were conducted in English; only one was conducted in German as the interviewee felt more comfortable speaking in his mother tongue. This interview was translated by one of the German speaking researchers for the coding.

2.7.2.4 Participant Observations

Observations can add to the richness of research data and are perceived as a complementary to the primary data collection technique for this study (Saunders et al. 2012). One type of observation is participant observation which is *"the researcher attempts to participate fully in the lives and activities of subjects and thus becomes a member of their group, organisation or community. This enables researchers to share their experiences by not merely observing what is happening but also feeling it"* (Gill & Johnson 2002, p. 144). Thus, it can be seen as a form of immersion in the research setting (Delbridge & Kirkpatrick, 1994). Because one of us worked as a part-time student in the case company, we included insider research to collect participant observations.

Brannick and Coghlan (2007) argue that the advantage of insider researchers is having both pre-understanding and access. Critics perceive this form of research not conforming to standards of intellectual rigour due to substantive emotional investment in the setting and the disability to attain the necessary distance and objectivity for valid research (Saunders et al. 2012). However, insider research can reveal tacit knowledge and valuable information that traditional approaches are not able to uncover (Brannick & Coghlan, 2007). They argue that it can be valid and useful through a process of reflexive awareness, as inside researchers can articulate deeply embedded knowledge due to socialisation in the organisational system and reframe it as theoretical knowledge (Saunders et al. 2012).

Even though participant observation generates high ecological validity due to the fact that it involves studying the problem in a real-life context, there are threats to validity and reliability (Saunders et al. 2012). As mentioned before, observer bias challenges reliability as it is difficult for us to detach ourselves completely, which is impossible to avoid (Delbridge & Kirkpatrick, 1994). Thus, we could only be aware

of the bias and aimed to control it. Hence, the study sees the advantage of participant observation, but only views it as complementary.

2.8 Data Analysis Procedure for Qualitative Primary Data

This section reflects on the analysis procedure of qualitative data gained from the interviews. Being a complex and iterative process, data analysis "*involves moving back and forth between concrete bits of data and abstract concepts, between inductive and deductive reasoning, and between description and interpretation*" (Merriam & Tisdell, 2016, p. 202). In line with this, Saunders et al. (2012) postulate that data analysis procedures move within three dimensions: 1) less structured vs. more structured, 2) relying on interpretation vs. being more formalized, and 3) inductive vs. deductive analysis.

To prepare for a thorough analysis, we transcribed the audio-recorded interviews using Otter.ai, an online machine-learning transcription tool, followed by a manual data cleaning process. Using this tool vastly reduced our time spent on transcribing and allowed for a highly detailed transcription of the extensive interviews. To ensure no valuable data was lost in the process, we carefully examined the recordings and transcripts several times. Furthermore, we reviewed and coupled the notes taken during the interviews to add the context of our personal thoughts during the interview. The transcripts were not sent back to the interviewees for checkup except for one who demanded it. Firstly, because it would create a substantial delay to the research, and secondly, to avoid significant, retrospective changes in the information provided keeping the authenticity and richness of data (Saunders et al., 2012).

The qualitative data obtained through our semi-structured interviews has richness and fullness and is non-standardized and complex in nature. Therefore, we sought to condense, categorize and restructure it to create a meaningful analysis (Saunders et al., 2012). By categorizing data, a structure emerged helping us to answer the research question and to avoid an impressionist view on the data (Ibid.). Because our data analysis process was based on categorization, it could be argued that the process was highly formalized and structured (Saunders et al., 2012). Concerning the approach, the procedure was both inductive and deductive. Since the constructed theoretical framework guided the questions during the data collection process, we were able to reflect upon and develop relevant categories prior to the analysis. However, some categories emerged which were unanticipated during the interviews, why we developed further categories upon collecting the data. Thus, the categorization of our data was both concept-driven using academic literature and existing theory, but also data driven (Robson, 2011). This allowed for the chosen categories to fulfill the aspects of being 1) internally meaningful, because they are related to the data, and 2) externally meaningful, because categories are interrelated (Dey, 1993; Saunders et al., 2012).

To gain a clear overview of the collected data, we actively reduced it by simplifying and unitizing certain statements made by the interviewees in the categorization, resembling the *data display and analysis* method by Miles & Huberman (1994). We furthermore displayed the data categorization in a tabular form, where the columns represented the different categories/codes and the rows were divided by the interviewees. This structured overview of the data allowed us to compare the key themes, terms and patterns across interviewees and the overlaps and discrepancies between their statements, further refining the focus of the analysis (Dey, 1993). Thus, it facilitated the interpretation of the collected data.

2.9 Trustworthiness of Data

As the nature of the research is qualitative, it is important to reflect on the trustworthiness of data to ensure the quality of the research (Bryman & Bell, 2007). Several researchers argue that trustworthiness of qualitative data consists of four different components; credibility, transferability, dependability and conformability (Veal, 2011; Bryman, 2012; Loh, 2013). Therefore, this section is dedicated to assessing these elements in relation to how the study was generally conducted.

First, credibility refers to the validity of the findings, i.e. whether the obtained findings truly represent and measure the phenomenon under investigation. To ensure credibility, we put a strong focus on the sources, how the data was collected and used. An important aspect here is the triangulation of data. We triangulated our findings by using different sources of primary data as well as secondary data, identifying and elucidating contradictions with findings from previous studies (Creswell, 2014).

Second, transferability refers to the applicability of the findings in other contexts (Bryman & Bell, 2007). Thus, it is related to the generalizability of the study. In light of design science, we studied a specific problem with the aim of making it applicable to a class of similar problems. As the objective was to solve a specific problem for IF, the focus lied on depth rather than breadth limiting the transferability. However, as the study triangulated the findings with insights from experts, practitioners and academics as primary data sources as well analyzed the artifacts' applicability to four different cases, it can be argued that the findings become more generalizable.

Third, dependability refers to reliability of the findings at another time. Therefore, it reflects the stability and consistency of the results and the ability to be replicated by other researchers. As the research depends

on human behavior, which is never static, one main concern in this context are biases and errors. Thus, to control these and the reliability of the findings, we first and foremost reflected extensively on the methodology and design of the research, which would allow others to follow the same process closely (Yin, 2009; Bryman & Bell, 2007). This included a detailed documentation of the methodology and data collection methods, offering other researchers the opportunity to reanalyze the data (Bryman & Bell, 2015). Furthermore, basing the team work strongly on communication and reflections helped reduce individual biases, as we would see things from different perspectives. Nonetheless, it is important to mention our awareness of the explorative nature of the research, why it may not be exactly repeatable. Instead, the strength of the study lies in its focus on investigating a complex and dynamic real-life phenomenon at a specific point in time (Marshall & Rossman, 2006).

Fourth, confirmability refers to the objectivity of the researcher while carrying out the research and thereby the degree of neutrality in the findings. This means that findings should not be biased by the researcher's personal values or motivations but be based purely on the participants' responses (Bryman & Bell, 2007). Therefore, we put a strong emphasis on identifying and countering biases in both the structured interviews but also in the subsequent data analysis procedure.

3
LITERATURE REVIEW

The literature review is conducted as the starting point for the framework that the paper seeks to develop. It investigates the underlying concepts and theories of three research fields: strategy in terms of competitive advantage, business models and digital platforms. Based on an analysis and discussion of these aspects in relation to one another, the paper extracts the most relevant and influential factors for deriving a framework that can help digital platform companies define their business model to succeed in the market.

3.1 Strategy & Perspectives on Competitive Advantage

The purpose of this section is to introduce the concept of competitive advantage from strategy literature, because an underlying assumption is that companies want to be competitive when being established. Since the 20th century, academics and scholars have discussed what corporate strategy is and coined it to the concept of competitive advantage. Inevitably, different views on how to achieve competitive advantage to perform in the market have emerged (Porter, 1979; 1980; 1985; Barney; 1991). During the literature inspection, it was evident that in the field of strategy there are two key literature streams reflecting on the concept of competitive advantage; industrial organization and resource-based view (henceforth IO and RBV, respectively). Therefore, the objective of this section is to understand the different views on sources to competitive advantage for corporate strategy and the boundaries thereof, which will help us identify important aspects of competition to consider when designing a successful business model. Finally, a synthesis serves as an understanding of competitive advantage and as a context for later sections in the paper that discusses strategy in the era of platforms.

3.1.1 Industrial Organization

In essence, the IO research paradigm of strategy postulates that a company's competitiveness in the marketplace depends critically on the characteristics of the industry environment in which it competes (Porter, 1981). This is depicted by the Structure-Conduct-Performance framework, which proposes that a company formulates its strategy based on the industry structure, which jointly determines the collective performance of the companies in the marketplace (Bain, 1968; Mason, 1953). Furthermore, the IO view contains two focal assumptions about the path to companies' competitive advantage, namely; 1) that industries consist of companies that are identical in terms of the strategic resources they hold and the

strategies they pursue indicating high resource homogeneity, which 2) stems from the fact that the resources that companies use to implement their strategies are highly mobile (Porter, 1981; Rumelt, 1984; Scherer, 1980). Thus, a company's competitive advantage would be a result of its industry position. To evaluate an industry, Porter (1979) suggested to analyze five driving competitive forces; threat of new entrants, bargaining power of suppliers and of buyers, threat of substitute products or services, and inter-industry rivalry among existing firms (Ibid.). Furthermore, he argued that industries could be grouped into five types; fragmented, emerging, mature, declining or global. Therefore, companies would need to adapt to these industry factors to achieve sustainable competitive advantage (Porter, 1979;1980; 1981; 1996).

In combination with the IO assumptions mentioned above and in relation to the prominence in the late 1980s of developing strategic taxonomies, new theories emerged on how to compete within an industry (Mansfield & Fourie, 2004). One key influential contribution of Porter (1980; 1996) was based on *generic strategies*. He suggested choosing an appropriate industry and positioning a company within this industry through a generic strategy of either cost leadership, differentiation or focus. These generic strategies would offer customer value in each their way; whereas cost leadership would offer customers value through the competitively lowest price in the industry, success with differentiation strategy would come from offering customers products with relatively perceived higher value at a price premium. Additionally, the focus strategy suggests concentrating on one specific segment within the industry to achieve competitive advantage through either cost leadership or differentiation (Porter, 1980).

Porter's work from 1985 about a company's value chain nevertheless has its relevance for external sources of competitive advantage, due to its reflection on industry-level networks and relationships. The framework was originally developed to be used for analyzing and representing the value creation logic of a company, by breaking down the activities it engages in, from raw materials through to the final consumer including primary and secondary activities (Porter, 1985). However, the framework was advanced by Christensen and Rosenbloom in 1995 with the argument that companies are interrelated and use complementary assets produced by other firms to improve and expand their offering. Thereby, the value created is distributed among the different actors involved causing intersections of different companies' value chains along with the creation of so-called *value networks* where interaction among each other benefits the entire group/industry (Christensen & Rosenbloom, 1995). Thus, it is argued that key for creating and sustaining

competitive advantage requires both understanding a company's value chain and its position in and linkages to the entire value system/network (Christensen & Rosenbloom, 1995).

Some key critiques that the IO school of thought has been met by is its pure focus on environmental determinants for organizational performance and assumption that companies within an industry are homogenous in terms of resources and capabilities. This neglects the significance that some unique characteristics of individual organizations can contribute to successful performance, such as managers' capabilities. Furthermore, critics argue that the fast pace of change in today's business environment limits the appropriate use of the underlying strategies suggested by the IO view (Barney, 1991; Wright et al., 1994; Barney et al. 2011). Despite the fact that the five forces, generic strategy theorems and value chain concepts are used by strategic management scholars and practitioners today, the emerging role of internal organizational capabilities and resources induced the development of another research perspective, namely the RBV (Barney, 2001; Barney et al. 2011).

3.1.2 Resource-Based View

In contrast to IO school of thought, the RBV argues that a company's competitiveness in the marketplace is highly dependent on its internal resources (Barney, 1991). The market reflects low mobility of resources, which makes them highly heterogeneous among companies within industries. Thus, because no two companies have acquired the same set of organizational resources, such as capabilities, skills, experiences, and cultures, the underpinning concept of the RBV is that no two organizations are identical in competition (Collis & Montgomery, 1995). Therefore, the theory argues that in order to achieve competitive advantage, companies must identify their internally available critical resources and explore these to full capacity (Fahy, 2000). Furthermore, because not all resources are of importance for achieving competitive advantage, it is imperative that these key resources have the certain characteristics of being VRIN; *valuable*, *rare*, *in-imitable* and *non-substitutable (*Barney, 1991*)*. Barney (1991) explains that *"(a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in a firm's environment, (b) it must be rare among a firm's current and potential competition, (c) it must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource [...]*." (Barney, 1991: 105–106). Thus, RBV emphasizes to answer why some resources are more advantage-generating than others, and why resource-asymmetries and the consequent competitive advantage exists in an environment of open competition (Fahy, 2000).

Since resources as such are not productive themselves, one set of authors in the field have gone deeper into the construct of resources and suggested differentiating between *resources* and *capabilities* in order to better analyze a company's assets (Barney, 1986; Castanias & Helfat, 1991; Fiol, 1991; Kogut & Zander, 1992; Amit & Schoemaker, 1993). A further classification of resources distinguishes between tangible and intangible assets which a company can leverage for its economic purposes, and these can be separated into financial, physical, human and intellectual capital (Fahey & Randall, 1994; Johnson, et al. 2008). Furthermore, Johnson et al. (2008) distinguishes between threshold and unique resources. Former refers to those needed for the company's existence by being sufficient in meeting customers' minimum requirements, while the latter refers to those resources that possess the VRIN attributes and thereby underpin the competitive advantage.

To use these resources effectively and successfully, companies need capabilities, which refers to the company's competences; namely a bundle of human resource elements such as experience, abilities, education and skills (Bontis et al. 2000). Amit & Schoemaker (1993) argue the capabilities facilitate the activities of the company in using the resources in a competitive manner. Similar to the division of resources, competences can be classified into threshold and core competences. While threshold competences are activities and processes that meet the minimum requirements (Ackermann & Eden, 2010), core competencies can be defined as the "*collective learning in the organization, especially the capacity to coordinate diverse production skills and integrate streams of technologies* (Prahalad & Hamel, 1990, p. 79). It is the emphasis on core competencies with VRIN attributes, which are organizational processes that are difficult for competitors to reproduce or imitate, that lead to a competitive advantage (Guerrero, 2003). Thus, the theory of core competence allows companies to rethink, identify and exploit opportunities for growth in global competition (Hamel & Prahalad, 1994; Prahalad & Hamel, 1990).

Although critics recognize that the RBV has helped a more comprehensive development of the strategy research field, they hold that certain issues are still unclear or unexplained (Hedman & Kalling, 2003). One key critique is the predominant focus on internal aspects of organizations, why the view does not provide a holistic perspective for understanding how resources can be utilized to create value, limiting the theory to mostly being a conceptual framework (Peppard & Rylander, 2001b; Bontis, 1999; 2000). Thus, it is argued that RBV alone is not sufficient to explain organizational success.

3.1.4 Sub-conclusion

The aim of this section was to introduce the concept of competitive advantage from strategy literature. It is evident that there have been different paradigms in the research field, whereas RBV is supporting the fact that a company's internal factors, i.e. resources and capabilities, will sustain a company's competitive advantage as long as these are hard for competitors to achieve. IO on the other hand argues that a company's source of competitive advantage comes from its industry position and relationships in the value networks. Nevertheless, it is important to note that this literature is predominantly based on traditional enterprises with linear value chains, and therefore the paper discusses in section 3.3.3 how competitive advantage can be achieved for digital platforms, taking into account the discussed strategy literature and RBV and IO views.

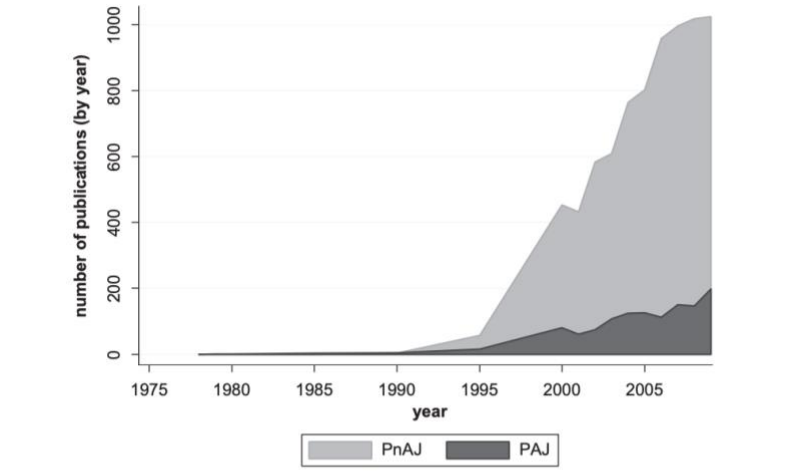
3.2 Business Model Literature

The purpose of this section is to give an overview of how the term *business model* is defined and conceptualized by practitioners and scientists from various fields such as e-commerce, strategy, technology management, and organizational theory (Zott & Amit, 2010; Wirtz et al. 2016). Therefore, the development of the concept is explained, followed by a definition of it. The aim is to give an overview and position the paper within the spectrum of the various definitions. After, a discussion about the concepts of business model and strategy synthesizes the arguments and lays the foundation for understanding how business model innovation can be a source of competitive advantage.

3.2.1 The Emergence of the Business Model Concept

Initially, business models were understood as an operative activity for system modelling and gained greater significance with the evolving technological development and the invention of electronic businesses (Eriksson & Penker, 2000). After the dot-com boom in the 1990ies, the concept gained more attention and studies on business models grew especially within the e-commerce, e-market, and internet-based business (Mahadevan, 2000), and academics' interests "virtually exploded", illustrated by Figure 3.1.

Fig. 3.1. Business Model Articles in the Business/Management Field



Note: This area graph shows trends in the number of business model articles. PnAJ = articles published in nonacademic journals; PAJ = articles published in academic journals.
Source: Business Source Complete, EBSCOhost database, January 1975–December 2009.

Source: Zott, Amit & Massa 2010

The business model terminology spread to various fields during the dot-com period and was used within numerous frameworks such as business plan, business strategy, value creation, globalization and organization design (Ghaziani & Ventresca, 2005; DaSilva & Trkman, 2014). One reason why business model definitions are so diverse is that researchers examined business models through different lenses according to the phenomena of interest of the respective study (Zott et al., 2011). This resulted in different, sometimes conflicting, interpretations of what the term business model means (Massa et al., 2017), leading to the development of silos in the literature: e-business and the use of information technology in organizations; strategic issues, such as value creation, competitive advantage, and firm performance; and innovation and technology management (Massa et al., 2017) (Appendix 1).

3.2.2 Business Model Definition

Acknowledging that the proposed taxonomies of business models are neither exhaustive nor rigid, the paper attempts to synthesize the different definitions, conceptualizations and frameworks. Following the research by Massa et al. (2017), the various definitions are categorized into three groups: 1) cognitive/linguistic schema, 2) content-related structural aspects of BMs, and 3) business models and the dynamic perspective.

3.2.3.1 Cognitive/Linguistic Schema to Understand Business Models

The first group is interested in how business models are interpreted by organizational members. It is based on the assumption that managers hold *images* of systems in their mind when making decisions and these are shaped by their own cognitive frames (Chesbrough & Rosenbloom, 2002). Thus, Linder and Cantrell (2001) define business models as a cognitive schema, viewing it as the *"company's logic for making money in the current business environment"* (Linder & Cantrell, 2001, p. 13). In contrast, Magretta (2002) sees business models as linguistic *"stories that explain how enterprises work"* (Magretta, 2002, p. 4). In reference to Peter Drucker (1954), Magretta (2002) argues that business models should describe who the customers are, what their value is, as well as define the underlying economic logic that explains how value is delivered to customers and how costs are appropriated. By developing a narrative that explains the aforementioned aspects, everyone in the organization can be aligned (Ibid.).

Aspara et al. (2010) argue that business models reside primarily in the minds of top managers and their perceived logic of how value is created (Aspara et al., 2010). Taking this thought further, Baden-Fuller and Haeflinger (2013) argue that managers hold business model frames in their minds that define in which way technology gets developed. The study of Polaroid by Tripsas and Gavetti (2000) underlined that the management had difficulties changing the razor-and-blade business model (cheap cameras, expensive film) when newer and disruptive digital photography technologies emerged. The cognitive frames and images of the razor-and-blade business model in managers' heads contributed to their failure to adopt a new and more relevant business model (Tripsas & Gavetti, 2000). Similarly, Martins et al. (2015) offer a comprehensive definition to see BMs as *"cognitive structures that consist of concepts and relations among them that organize managerial understanding about the design of activities and exchanges that reflect the critical interdependencies and value-creation relations in their firms' exchange networks."* (Martins et al., 2015, p. 105). Thus, business models are schemas that systematize managers' understanding of the firm's value creating design (Zott et al., 2011).

3.2.3.2 Content-Related Structural Aspects of a Business Model

The second group can be divided into scholars that described either the general structure and components of business models, or those that tried to synthesize elements in a unified architecture. Within the content-related structural discussion, business models have been reduced to their individual components to reveal how a firm is structured and implemented in the networked economy (Hamel, 2000; Rayport & Jaworski,

2000; Mahadevan, 2000; Hedman & Kalling, 2002; Afuah & Tucci, 2003; Johnson et al., 2008). According to this logic, a business model shows how the various components work together and have a clearly defined linkage. However, there is no agreement in the literature what the key components of a business model are. For instance, Hamel (2000) builds a framework that includes four major components - customer interface, core strategy, strategic resources, and value network - which are linked by customer benefits, configuration of activities, and company boundaries (Hamel, 2000). Mahadevan (2000), on the other hand describes BMs as a unique blend of three streams that are critical to the business, including the value stream for the business partners and the buyers, the revenue stream, and the logistical stream (Mahadevan, 2000).

The other group of scholars referred to depiction, frames or architecture in relation to business models (Timmers, 1998; Venkatraman & Henderson, 1998; Linder & Cantrell, 2000; Afuah & Tucci, 2003; Eriksson & Penker, 2000; Teece, 2010). Thus, in the early stage of BM research, a rather static structural representation of BMs can be identified, where business models were understood as an *"architecture for product, service and information flows, including a description of the various business actors and their roles; a description of the sources of revenues, and a description of the potential benefits for the various business actors."*(Timmers, 1998, p. 4).

Others described business models as a mediating construct between technology and economic value, emphasizing how the value chain is structured (Chesbrough & Rosenbloom, 2002). Thus, technology's value remains latent until it is commercialized through the right business model or the *"the architecture of revenue"* in order to capture value from that technology (Ibid, p. 530). The authors ascribe six attributes to a business model: clear value proposition; identified market segment; elements of value chain; defined cost structure and profit potential; position within value network; and formulated competitive advantage. A case study of Xerox Corporation showed how the company grew by employing an effective business model to commercialize a technology rejected by other leading companies. Hence, it is argued that the business model is more essential to success than the technology applied (Ibid). One popular approach among practitioners is the BMC, which is a hands-on tool that fosters understanding, discussion, creativity and analysis (Osterwalder & Pigneur, 2010). The BMC was commercialized in co-creation with 470 practitioners into a strategic management template.

Despite the lack of a generally accepted definition (Appendix 2), the literature review reveals the relevance of notions such as *value* (value stream, customer value, value proposition), *financial aspects* (revenue streams, cost structures), *aspects related to the architecture of the network between the firm and its exchange partners* (delivery channels, network relationships, logistical streams, infrastructure) and *customer related aspects* (Mahadevan, 2000; Stewart & Zhao, 2000; Afuah & Tucci, 2001, Appelgate, 2001).

3.2.3.3 Dynamic Approaches of Business Models

The previous literature has taken a rather static approach (Lindner et al. 2010; Van Putten & Schief, 2012), why the next section discusses the dynamic character of business models. The dynamic perspective is concerned with why and how (new) business models emerge. The business model can either be seen as a static model, linking the core business and its components, or as a transformational model. This two-fold approach is what creates understanding of the business model evolution (Demil & Lecocq 2010). Demil and Lecocq (2010) exemplify a transformational approach, using business models as a tool to address change and innovation in the organization, or in the model itself. The authors emphasize the importance of viewing the business model as a dynamic constant to sustain performance (Ibid.).

Nonetheless, a static perspective enables to build typologies and study the relationship between business models and performance. An advantage for managers is that the static view gives a consistent picture of the different business model components and how they are arranged. This allows for an easier communication, which can for example be important for entrepreneurs who aim to win the confidence of investors (Ibid). Yet, with a static approach, it is impossible to describe the process of business model evolution. Hence, a benefit of the dynamic perspective is that it helps to reflect on how managers can change their business models. But such an approach has the tendency to discuss change rather than looking at how business models change themselves (Yip, 2004, Teece, 2007).

By reconciling both approaches and studying the English football club Arsenal FC for two decades, Demil and Lecocq (2010) find business model evolution to be a process involving voluntary and emergent changes *within* and *between* permanently linked core components. Further, they argue that firm sustainability depends on anticipating and reacting to sequences of voluntary and emerging change. Hence, they call the capability of a firm to build and sustain its performance while changing its business model *'dynamic*

consistency' (Demil & Lecocq, 2010). Moreover, structural changes in costs and/or revenues are the first 'symptoms' of business model evolution. They define two main types business model change; One is voluntarily and based on deliberate decisions; the other is emerging and externally induced and thus outside of the manager's control (Wirtz et al. 2015).

3.2.3.5 Sub-Conclusion

In sum, the concept of business models is an aggregated representation of the relevant activities in a company. There are diverging opinions on its definition where some argue for it to be a cognitive/linguistic schema and others focus on the architecture or its components. This paper adopts the comprehensive definition of Wirtz et al. (2015) and assumes that a firm's business model encompasses the architecture of value creation, strategic as well as customer and market components in order to achieve the superordinate goal of generating or securing the competitive advantage. To further explore how a competitive advantage can be generated through the business model, the next sections elucidates the link between BM and strategy.

3.2.4 Business Models & Strategy

Since many scholars have questioned whether business model is a term that can stand by itself or is synonymous with strategy (Massa et al., 2017), the paper now explores the relationship between business models and strategy. DaSilva and Trkman (2014) have addressed that business models have not only evolved into an unclear idea, but that it also has a cannibalizing tendency towards strategy. Even though most authors agree that business models and strategy are two separate concepts, the boundaries between the terms are blurred. Magretta (2002) argues that business models describe how pieces of a business fit together while not taking into account the dimension of competition because that is what strategy is for; e.g. many Internet-retailers entered into the market with identical business models, and did not employ a strategy to differentiate themselves in terms of customer segmentation, value creation and product portfolio (Magretta, 2002). Hence, strategy can be about how companies are going to be better by being different, relating to the competitive advantage (Ibid.). In contrast, Zott and Amit (2008) argue that firms can address the same customer need and employ similar product market strategies, but the differentiation comes from different business models. Thus, business model design and product market strategy are also seen as complements and not substitutes (Zott & Amit, 2008).

This shows that there are some different positions within the literature. Overall, there are three main aspects that researchers have discussed that this paper elucidates in the following: (1) the distinction between the business model and strategy, (2) business model innovation as a source of competitive advantage, and (3) the networked nature of value creation.

3.2.3.1 The Distinction Between Business Models & Strategy

The strategic management literature review revealed that one of the main aspects of strategy is to develop a competitive advantage (Mansfield & Fourie, 2004). Therefore, one must understand the interrelation between the business model and strategy (Zott & Amit, 2010).

Shafer et al. (2005) highlight that all strategic choices are deployed through the business model, which is an ongoing process due to the dynamic environment firms find themselves in. Further, they emphasize that the business model embodies a set of choices, and outlines a company's strategy through analyzing, testing and validation (Ibid.). Similarly, Osterwalder (2004) describes the business model as a blueprint of the strategy or the company's logic of earning money. In that regard, business models encompass the pattern of economic exchanges with external parties, outlines details of the value proposition for all the stakeholders and sketches the activity system used to create and deliver value to its customers (Zott & Amit, 2008; Seddon et al., 2004, Zott et al., 2011). Compared to strategy, business model is a more recent concept, augmented by the internet and underpinning the value creation process. It is argued that the focus on the value proposition and emphasis on the role of the customer appears to be less pronounced in the strategy literature than it is for business models (Zott et al. 2011).

Nonetheless, Mansfield and Fourie (2004) argue that neither strategy nor business models in isolation indicate success, but that both are required. In a similar manner, Teece (2010) reasons that a business model is more generic than a strategy. Hence, one needs to combine both strategy and business model in order to protect a competitive advantage (Teece, 2010). He proposes that in order to employ a competitively sustainable business model, a strategy analysis is required. This includes segmenting the market, creating a value proposition for each segment, setting up the apparatus to deliver that value and lastly figuring out `isolating mechanism' that hinder imitations by competitors (Ibid.). Since the business model neither refers to the firm's positioning in product markets based on differentiation or cost leadership nor describes the

areas of business in which a firm becomes active, scholars contended that the business model can be a source of competitive advantage that is distinct from the firm's product market position (Christensen, 2001).

According to Richardson (2008), the business model explains how the activities of the firm work together to execute its strategy, thus bridging strategy formulation and implementation (Zott & Amit, 2007). Hence, the business model presents a means for the coherent implementation of a strategy (Dahan et al. 2010) or is a reflection of the firm's realized strategy (Casadesus-Masanell & Ricart, 2010). In contrast to this, Chesbrough (2010) believes that the business model defines the company strategy. Another angle is proposed by Osterwalder et al. (2005), who distinguish between strategy and business model by suggesting that strategy includes execution and implementation, whereas business model is more focused on how the organisation works as a system. Others see that strategy traditionally puts greater emphasis on competition, value capture, and competitive advantage, while the business model concept seems to focus more on cooperation, partnership, and joint value creation (Magretta, 2002; Mäkinen & Seppänen, 2007; Mansfield & Fourie, 2004).

3.2.3.2 Business Model Innovation as a Source of Competitive Advantage

As previously elaborated, the ability of systematically developing and implementing new business models has become increasingly important and the literature has shifted from a static towards a dynamic perspective (Stampfl, 2016). Business models have been recognized as a new type of innovation, which is different from traditional subjects of process, product, and organizational innovation and involves new forms of cooperation and collaboration (Ibid.). Generally, business model innovation involves changes around the architecture – the content ("what"), the structure ("how"), and the governance ("who") – of a business activity (Zott & Amit, 2010). For example, business model innovation can occur by adding new activities, by linking activities in a new way or by changing the parties performing an activity (Amit et al., 2012). In a similar vein, Casadesus-Masanell and Zhu (2013) refer to business model innovation as the search for new logics of the firm and emphasize the creation of new value propositions for customers, suppliers and partners.

Scholars argued that if business models are built in novel and effective ways, they can result in superior value creation (Morris et al., 2005). For example, Amit & Zott (2001) argue that novelty is one out of four interdependent dimensions (efficiency, complementarities, lock-in and novelty) that drive the value

creation. They believe that business models span firm and industry boundaries and that *"a business model depicts the design of transaction content, structure, governance so as to create value through exploitation of business opportunities"* (Amit & Zott, 2001, p. 511). Hence, novelty means new ways of structuring transactions. According to them, the choice of transaction structure has an impact on the flexibility, adaptability and scalability of transaction. Overall, their paper suggests that the evolvement of virtual markets opens a new playground for business model innovation and thus require more integrative, dynamic, adaptive and entrepreneurial strategies from companies (Ibid.). In addition to this, Demil et al. (2015) argue that business model innovation might have a profound impact on *"the way people live, work, consume, interact with each other*" (Demil at al., 2015, p. 2), and refer to companies such as Airbnb, Apple, eBay, Facebook or Google.

Linking this to strategy and finding new ways to generate a competitive advantage, Chesbrough (2003) introduced the notion of open innovation as a mode of innovation in which firms look outside their boundaries in order to leverage internal and external sources of ideas, rather than relying on internal ideas to advance business. This shift from in-house R&D to crowds, which resembles the assembly of resources from networks rather than having ownership.. Moreover, Afuah and Tucci (2001) argue that the business model is a unifying construct that enables competitive advantage and firm performance because it is a method by "*which a firm builds and uses its resources to offer its customers better value and to make money in doing so"* (Afuah & Tucci, 2001, p. 3). When considering a firm's strategic choices of business model innovation and their implication on financial performance, Aspara et al. (2010) examined that smaller firms with a high strategic emphasis on business model innovation and low emphasis on replication experience a higher average value of profitable growth than firms that do not strategically emphasize either dimension. Similarly, a study by Giesen et al. (2007) identified three types of business model innovation (industry, revenue and enterprise models) that lead to greater success. Taking all these studies and aspects into account, the paper argues that business model innovation can be a source of competitive advantage.

3.2.3.3 The Networked Nature of Value Creation

As elaborated before, the digital economy has provided companies with the possibility to develop novel forms of value creation mechanisms. A defining characteristic is that that value is created within a networked market (Zott & Amit, 2009). According to Hamel (2000), both value creation and value capture occur in a value network that includes suppliers, partners, distribution channels, and coalitions that extend

the company's resources. Amit & Zott (2001) observed that value creation spans firms' and industries' boundaries. Hence, value creation mechanisms within business models often exceed the value that can be created through Schumpeterian innovation, the (re)configuration of the value chain (Porter, 1985), the formation of strategic networks among firms, or the exploitation of firms' specific core competencies (Ibid.).

Business models could integrate disparate strategic perspectives such as the RBV and IO. For example, traditional theories such as RBV consider value creation to be a supply-side phenomenon, where value is created exclusively by producers. Thus, competitive advantage is single-sourced; either resource or activity based (Barney, 1991; Peteraf, 1993; Porter, 1980, 1985, 1996). In contrast, when considering business models especially in the context of platforms, value creation is both a supply- and demand-side phenomenon and is created by producers, customers and other members of their value-creation ecosystems (Massa et al, 2017). Therefore, competitive advantage can be multi-sourced, including resources and activities from both supply and/or demand side, thereby merging IO and RBV aspects. In sum, the business model concept does not necessarily involve a linear mechanism for value creation from suppliers to firm to customers, but rather involves a more complex, interconnected set of exchange relationships and activities among multiple players, which is especially relevant for digital platforms (Ibid.).

3.2.5 Sub-Conclusion

This section has shown the divergent views on the relationship between business models and strategy. Some authors lean more towards the argument that the two concepts are highly different aspects in business administration, while others put stronger emphasis on the complementarities between them (Zott & Amit, 2008; Mansfield & Fourie, 2004; Teece, 2010). Additionally, the review has indicated that business model innovation is increasingly important in the literature and the capability of companies to adapt the business model to changes which reflect a shift from a static towards a more dynamic business model approach. The paper argues that business model innovation can be a source of competitive advantage as it can lead to new ways for value creation and increased firm performance because if business models are built in novel and effective ways, they are harder to imitate. Lastly, the aspect of value creation in networked markets, especially within the platform context, implies that in some contexts value creation is both a supply- and demand-side phenomenon and created by participants in the value-creation ecosystems. To this, competitive advantage can be multi-sourced and incorporates both network perspectives from IO, but also resource and capability perspectives from RBV.

3.3 Understanding Digital Platforms

3.3.1 Platforms & Ecosystems

The digital platform as a business model has facilitated the success of many of today's biggest and most powerful companies, like Google, Amazon or Microsoft. But what exactly is a digital platform? In a traditional sense, platforms as business models have existed for many centuries in the form of marketplaces, shopping malls, stock-exchanges, etc., acting as facilitators of transactions between different users, such as buyers and sellers (McIntyre & Srinivasan, 2016). Digital platforms are technologies applicable to different industries and can minimize transaction costs or create value that allows for transactions that otherwise would not have occurred (Evans et al., 2008; Evans & Schmalensee, 2005). Platforms can be viewed as multi-sided markets, where two or more user groups interact through an intermediary to the benefit of all parties. Thereby, platforms facilitate the direct interaction between users from different sides affiliated to the platform (Hagiu & Wright, 2015). In relation to this, platforms can also be understood as *"products and services that bring together groups of users in two-sided networks"* (Eisenmann et al., 2006: 2), that provide infrastructure and rules that facilitate the interaction between the two groups (Ibid.). Thus, in its simplest form, a digital platform can be understood as a (virtual) place that enables value-creating interactions between users that can gain some sort of value from one another (Parker et al., 2016).

An important concept related to platforms is the ecosystem that develops around them. An ecosystem describes the community of interacting organizations and/or individuals that co-evolve their capabilities and roles as participants on the platform (Iansiti & Levien, 2004). The term stems from the concept of business ecosystems, which Moore (1993, 1996) referred to as a community of interconnected heterogeneous actors with complementary competences that participate in a value-creation process. Ecosystems are dynamic and innovation plays a big role in business ecosystems, because organizations and individuals co-evolve new capabilities to support new products and satisfy customer needs. Thus, each company is embedded in an ecosystem, that extends beyond traditional industry boundaries, in which it develops and evolves within. As individuals and organizations within an ecosystem pursue their own goals in their relationships with one another, value creation within the ecosystem is dependent on the entities within it. Scholars have therefore increasingly made links between platforms and ecosystems, as companies can guide the formation of ecosystems by designing platforms on which they emerge (Gawer & Cusumano, 2014; Gawer, 2014; Isckia & Lescop, 2015; Altman & Tushman, 2017).

3.3.2 Key Elements of Platform Business Models

3.3.2.1 Value Creation, Value Exchanges & Core Interactions

One main way authors distinguish platform businesses from traditional, linear pipeline businesses is the way value is created (Parker et al. 2016). Latter are called pipeline due to the fact that they employ a step-by-step arrangement for value creation and transfer with producers at one end and consumers at the other, as proposed by Porter (1985) with the linear value chain. I.e. a linear business controls a series of activities along the value chain with which it designs and manufactures or offers a product or service, that is then put for sale for a customer to buy it (Parker et al. 2016). However, for businesses with platform structure, value may be (co-)created, changed, exchanged and consumed in a variety of ways and places. This is because the platform does not take ownership of products or services, but rather depends on resources, such as skills, ideas and physical assets, and activities controlled and provided by agents on different sides of the market (Adner & Kapoor, 2010; Boudreau & Jeppesen, 2015; Thomas et al., 2014). Thus, the role of the platform is to connect these value creators and consumers on different sides of the market, instead of developing, manufacturing or selling these products and service (Parker et al. 2016; Hagiu & Yoffie, 2009).

The design of a digital platform is crucial for its success. One key aspect to consider when designing a digital platform is the clarification of the single most important form of activity that takes place between the users of the platform, namely the *core interaction*. Its importance lies in its role of attracting different users to the platform, as it constitutes the "why" of the platform (Parker et al., 2016). Choudary (2015) argues that the key to platform success can be explained with sustainable and repeatable interactions breeding ecosystem growth or emergence. Thus, reflecting the exchange of value between relevant users, the core interaction must appeal to users on all sides of the marketplace. As in any economic or social exchange, taking place in either the real or virtual world, three types of value exchanges can be identified, namely; information, product or service, and currency. Information exchange is crucial for every platform, as it for some platforms enables the users to decide upon engagement in any further value exchange, while for others it may be the sole purpose of the platform. Following information exchange, some platforms may have the purpose of letting users exchange some sort of goods or services, be it on the platform itself or in the physical world. Lastly, exchange between goods and services among users usually incurs some sort of currency exchange. This can both take the form of money, but also other forms of intangible value, like attention, influence, reputation, etc. (Parker et al., 2016).

As the fundamental purpose of a platform is to facilitate the core interaction, understanding the mechanisms for it is important. Parker et al. (2016) argue that a valuable core interaction involves three clearly defined key components; participants, value unit, and filter. *Participants* can be boiled down to producers (of value) and consumers (of value), having in mind that a platform user can play a different role in different interactions, i.e. switching sides or roles. The *value unit* refers to the items exchanged by platform users, and it plays a crucial role in the workings of any platform. As value units are not necessarily created by the platform, but by the producers on it, it implies low control over the content on the platform. Lastly, an important algorithmic, software-based tool that enables the exchange of the appropriate value units between users are *filters*. Overwhelming amounts of irrelevant value units may drive users to abandon a platform, emphasizing the importance of filters. Thus, the most basic structure for a platform is to have participants that can exchange relevant filtered value units, which sustains the platform's core interaction (Ibid). It is evident that platforms expand and scale over time and offer different kinds of core interactions, however, successful platforms must begin with a single core interaction that consistently generates high value for its users (Ibid).

3.3.2.2 Network Effects

The idea that creating a sustainable core interaction that users can engage in fosters the attraction of more participants reflects the concept of *network effects*. Network effects refer to the impact that the number of users of a platform has on the value created for each user (Shapiro & Varian, 1998; Parker et al., 2016). A popular example is that of telephoning; when there exists only one telephone in the world, you cannot call anyone, and it creates no value. However, the more telephones exist, the more connections are made possible and value grows nonlinearly (Van Hove, 2016). Similarly, in two-sided markets network effects can also occur; the presence of more value-consumers can attract the presence of more value-producers to the platform, and vice versa. Therefore, network effects also refer to demand-side economies, which in contrast to supply economies of scale driven by production efficiencies, bases the growth on demand economies of scale. These are driven by efficiencies in social networks and demand aggregation (Parker et al., 2016). Thus, as monopolies in the industrial era were created by supply economies of scale, demand economies of scale foster monopoly-like business environments in the 21st century Internet era (Ibid.).

For multi-sided markets there exists four types of network effects that must be managed. These are same-side and cross-side network effects that can either be positive or negative as the number of users grows. As the name indicates, same-side network effects are created by the users on the same side of the market, meaning for example the effect producers have on other producers on the platform. When they are positive, the benefits for a user increases the more users of the same kind are engaged in the platform, as reflected by the telephone example. However, in some contexts extensive growth can have a negative impact on the platform by for instance fostering severe competition among users on one side, which is called negative same-side network effects. In contrast, cross-side network effects reflect the influence users on one side of the market have on the users from the opposite side of the market, as for example the effect consumers have on producers and vice versa. When they are positive, the growth of users on the one side of the market has a positive effect for the users on the other side of the market creating win-win results. If there is a lack of healthy balance between users on both sides, these cross-side network effects can become negative by for instance increasing noise and inefficiency on the platform (Parker et al., 2016).

3.3.2.3 Monetization of Platforms

Collecting revenue from a platform is a substantially different task than from a linear business. In the traditional value chain, the simple movement of value from left to right indicates that on the left side are the company's costs, while on the right side is the revenue from consumers. However, in multi-sided markets, cost and revenue are more complex to analyse, because the distinct group of users on each side implies cost and revenue to be dispersed to all sides. From the platform's perspective, it means that it incurs cost for serving both types of participants, but at the same time it has the opportunity to collect revenue from each side (Eisenmann et al., 2006). In fact, the monetization strategy a platform chooses depends on the excess value that is created on the platform that it can capture. Therefore, deciding upon a monetization strategy, it is essential to commence with an analysis of the value that is accrued within the platform that could not otherwise exist.

Generally, there are four sources of excess value that platforms can generate for its users. These are; 1) Access to value created on the platform (for consumers), 2) Access to a community or market (for producers), 3) Access to tools and services that facilitate interaction (for both), and 4) Access to curation mechanisms that enhance the quality of interactions (for both). The complexity of deciding on the most optimal monetization strategy lies in the task of considering all four forms of value in determining which

one creates the excess value that can be exploited *without* hindering the growth of network effects. (Parker et al., 2016). To measure this excess value, however, the number of visitors alone, i.e. network size, does not necessarily reflect the value of the platform. But the interactions themselves must be desirable among users to make them stay on the platform, which can create a significant amount of excess value that can then be captured. Nevertheless, it is important that the monetization strategy doesn't destroy the network effects for it to be sustainable.

There exist different ways of monetizing the excess value generated, having in mind the four sources explained above. When the interaction between users on the platform involves some kind of monetary exchange for a product or service, platforms can choose to impose a *transaction fee*. It may be calculated as a percentage of the transaction price or as a fixed fee depending on the frequency and size of transactions. Another monetization option is by *charging for access to the platform*, given that it already has a solid user base that can be attractive for other types of potential users or third parties. However, the added content as value units must enhance the value of the platform for the existing users to keep network effects positive. In a similar manner, platforms may *charge some users for enhanced access*, given that the platform can generate some additional value for them. However, the platform must be aware of increased noise and thereby decreased relevance of content for consumers, in order to avoid negative network effects. Given noise and high quantity of content on a platform imposing difficulty for users to find high-quality content they are searching for, platforms can create value through curation and thereby charge for *enhanced curation*.

Given that there are different types of users on the platform, who each benefit from it in their own way, the question of whom to charge also arises. Differences in economic status, motivations, objectives, incentives and value derived guides the decisions about whom to charge. One option is to *charge all users*; however, this may discourage participation and affect network effects negatively. On another note, when one group of users highly value connection to another group, but the need is not reciprocated, platforms can choose to *charge one side of users while subsidizing the other*. In this line, when some users have the ability to attract a large number of other users, platforms may choose to *subsidize these while charging the attracted users a full price*. Furthermore, if there exists a price sensitive group of users who are likely to abandon the platform, platforms can choose to *subsidize price-sensitive users while charging some users full price*. Thus, the choice of pricing can cause some friction, why it becomes a question of discovering the most friction-resilient users.

3.3.2.4 Architecture

Whitney et al. (2004) define the architecture (of any complex system) as "*an abstract description of the entities of a system and how they are related*" (Whitney et al., 2004: 2). Parker et al. (2016) argue that the architecture of a platform is concerned with the questions of *how* to build a platform that enables the core interaction, while it also allows for scale and encourages positive network effects. Thus, the architecture encompasses both the description of the structure and function of the overall system, but it also covers the governance of relationships among its users and their interoperation. Thus, the platform technically constitutes an infrastructure for users, including the tools and rules for the value-exchanges. To perform successfully by fostering a growing number of core interactions, platforms enact three key functions; 1) *pulling* consumers and producers to the platform, 2) *facilitating* the interactions, and 3) *matching* the right participants effectively.

Pull

In contrast to linear businesses, platforms rather rely on *pull* than *push* strategies for attracting customers. The main challenge in pulling users to the platform is solving the chicken-or-egg problem, meaning that *users will not be attracted to the platform unless it offers value, while the platform won't have any value unless it has users*. There are three ways to overcome the chicken-or-egg problem; 1) by staging value creation, i.e. arranging the creation of value units that attract one or more sets of users, 2) by focusing on one side of the market to attract the other, or 3) by simultaneous onboarding, i.e. creating conditions so that value units can be created even when the overall size of the network is small. Thus, to pull users the goods and services must be designed to be so attractive that they create a natural pull of customers into their orbit. Nevertheless, pulling users is a main concern platform-owners have when launching the interface, why there is a need for a well-thought and context-specific launch strategy. To this, an important thing to consider is – besides the effect and importance of pull-strategies - competitors' business designs. Knowing the value offered by competitors can allow for identification of an untouched niche market, despite similar value units on surface level.

However, once users are pulled on to the platform, another challenge arises; namely keeping the interest of users who have engaged in the platform. To this, *feedback loops* are powerful tools to encourage user-retention to the platform. A feedback loop is an iteration of action in which a flow of value units creates a response from the user in a repetitive way, due to its relevance for the user. Thus, reflecting the repetitive

behavior, feedback loops have the power of enhancing network effects and increasing the network while increasing value creation. One can distinguish between *single-user* and *multi-user* feedback loops. In a single-user feedback loop, a user's interests, preferences and needs are concluded based on this user's activity, and therefore recommendations for new value units and connections are made based on this to increase activity. However, multi-user feedback loops include activity between at least two types of users. Therefore, in such a loop, activity from a producer is conveyed to the relevant consumer, whose activity is in turn fed back to the producer. Thus, the aim of feedback loops is to create a constant stream of self-reinforcing activity to keep users on the platform and even engage more heavily.

Facilitate

The process of facilitating encompasses providing the infrastructure in which value-creation and exchange happens, but it also includes *governance principles* of the platform's interactions. Thus, on the one hand, facilitation comprises alleviating the process of creating and exchanging goods and services with high value for the platform's producers, by for example offering producers helpful tools. For example, Instagram offers producers a toolbox to edit pictures on the platform before sharing, while Uber offers producers (drivers) a way to communicate and transact with consumers. On the other hand, facilitation also includes raising or lowering barriers to usage, depending on the desired outcome of the platform. In some contexts, lowering barriers to usage can encourage interactions and thereby expand participation on the platform, inducing growth. However, in other specific contexts, it can be beneficial to increase barriers to usage to ensure only desirable interactions and avoid or discourage bad ones (for example with Airbnb guests destroying apartments). This is highly related to the impact of trust on the success for digital platforms, which is an essential aspect when facilitating interactions. Without a sufficient level of trust, both towards the brand and towards other participants, participants will not be comfortable with engaging in the core interaction as perceived risk may outweigh the possible financial gains of using the platform (Reillier & Reillier, 2017). Thus, it is important for a platform to foster trust through governance mechanisms.

In relation to discouragement and avoidance of behavior with negative impact, also referred to as market failure, platforms establish governance principles that foster trust building. In fact, governance covers setting rules in the interest of the entire ecosystem about who can participate in it, how to divide the value produced fairly, and how to resolve potential conflicts. Market failure is caused by four main reasons; *information asymmetry*, (negative) *externalities*, *monopoly power* (in the ecosystem), and *risk*. First,

information asymmetry can impact the market when it leads to opportunistic behavior by one party, causing a bad interaction. Second, *externalities*, referring to the spillover costs accrued to objects that are not involved in the given interaction, lead to bad interactions when they are *negative*. Third, when one supplier in the ecosystem gains too much power, such as *monopoly power*, they can affect interactions negatively by e.g. demanding higher prices. Lastly, markets can fail due to unexpected happenings in interactions, referring to *risk*.

To prevent and overcome market failure that has negative impact on trust, there exist four types of governance tools (which are derived from practices used by nation-states); *laws*, *norms*, *architecture*, and *markets* (Reillier & Reillier, 2017; Parker et al., 2016). By employing laws, platforms can determine exactly what constitutes bad behavior and impose consequences for those that exhibit it. However, with norms imposed on the users, platforms can encourage and nudge good behavior by having a dedicated community. Because norms reflect behavior, they can be constructed through behavior design, which is a repeated sequence of trigger, action, reward and investment. Furthermore, good architecture, referring to the software-system itself, can be used to detect inefficiencies from information asymmetries and prevent opportunistic behavior, but it can also foster more growth, which will be elaborated upon in the following paragraph. The idea of markets as governance tools for platforms lies in the power of social currency to create incentives for good behavior and discourage bad behavior.

Match

Lastly, successfully matching the right platform participants with one another ensuring that relevant goods and services are exchanged constitutes a crucial function of the platform architecture. The importance lies in the tolerance and interest of users, who will be driven away from using the platform if they don't gain any value, which is among other things dependent on good matching. To this, the technology aspect of digital platforms plays an interesting role (compared to traditional physical platforms like shopping malls) because it enables for the use of algorithms to perform the work of matching. However, to this, having data about users and their activity is crucial to feed the algorithm for optimal matching. The usage of data depends on the access the platform has to it, and it can be both static such as identity, gender, nationality, but also dynamic such as location, age, and point-in-time interest. However, the more data is available, the better the algorithms can perform the matching. Therefore, it is important for platforms to have in place a data-acquisition strategy, by for example creating incentives and encouraging users to share data. To this,

trust to the platform and the brand also plays a crucial role, because participants will be more comfortable to share data with a brand they trust (Reillier & Reillier, 2017).

3.3.3 Platforms & Strategy

When it comes to platform strategy, it can be argued that aspects such as multi-sided markets, network effects, non-linear value chains and non-ownership of value creating resources adds more dimensions to the sources where companies gain competitive advantage. As the literature review on classical strategy depicted, scholars have traditionally looked into either the firm resources (RBV) or the market attributes (IO) to determine and foster competitive advantage. Although these views can have some explanatory elements for platform strategy, they cannot fully grasp the entire nature of platform competitiveness.

First, it is important to understand how platform competition differentiates from traditional competition. Platform competition is typically characterized by winner-takes-it-all (WTA) outcomes, which is similar to traditional monopolies. However, whereas monopolies are typically sustained by advantages in terms of supply, WTA dynamics are driven by network effects. Because users are better off being present on a dominant platform given its large base of users, potential users' decisions to invest in and support a given platform are strongly influenced by the presence and strength of the platform's network effects. Thus, the platform with the highest number of users is able to "tip the market" in its favor (Eisenmann et al., 2006; Katz & Shapiro, 1994; Shapiro & Varian, 1998).

Because of technology, platform companies have been enabled to grow at a much faster pace than ever. As the purpose of platforms is to connect different interested parties, its growth and expansion is fueled by assembling the resources and capabilities of pre-existing entities instead of developing these internally, which facilitates rapid expansion given network effects (Parker et al., 2016). Therefore, the traditional assumption that competition is a zero-sum game and that competitive advantage can be gained by having a favorable industry position by controlling the forces of competition suggested by Porter (1979), meets some challenges. In contrast, platforms are more inclined to blur the boundaries among market participants and treat e.g. buyers and suppliers as value-creating partners. Thus, instead of being the mediator in a linear value chain, i.e. distinguishing suppliers for production and buyers for selling the end product to, indicating a necessary power position towards each, platforms take on the role as bringing together these participants. Thus, instead of gaining competitive advantage from having bargaining power over suppliers and buyers,

platforms are more dependent on bringing these together and growing a network/ecosystem, i.e. being a preferred choice for the kind of interaction sought among other similar platforms.

Building on this, the basic premise of economic models is that competition among platforms and their networks is driven by the adoption of the platform by both producers and consumers (Gawer, 2014). At the same time, in contrast to the assumption of a zero-sum game of competition in traditional strategy literature, platforms aid the growth of the entire value of a market or creation of new ones. Thus, instead of responding to markets, platforms use network effects to remake markets, which gives power to managing network effects effectively to sustain competitive advantage. This challenges the IO view's proposition of targeting a market through a generic competitive strategy. Thus, instead of going for a share of a rather static market by competing on price or differentiation, platforms can ensure competitive advantage through dominance in a WTA competitive landscape by fostering network effects, since a larger network creates more value for the users in platform context.

Taking a step back to thinking of monetization, it poses the question of how do platforms generate revenue? As found in section 3.3.2.3., the answer is by collecting excess value created by platform users. Therefore, in order to collect even more revenue and grow, the platform must ensure that the entire ecosystem of its users is thriving – only then can the platform orchestrator thrive. Therefore, it needs to ensure positive network effects, by providing desirable and valuable interactions. This implies a shift from protecting and creating value inside the company, to enabling value-creation outside the company. Therefore, ownership of value-creating resources, as posed by the RBV, is not a crucial factor for competitive advantage in the context of platforms. Rather the facilitation of opportunity for value-creation for users can sustain a platform's competitive advantage - i.e. assembling, and not controlling, the value-creating assets. One can draw a parallel to the RBV, as platforms seek exclusive access to essential assets, by developing rules, practices and protocols that discourage multihoming, i.e. the practice using several of the same type of platform (Parker et al., 2016). Nevertheless, what the RBV contributions discussed in section 3.1.3. can add to platform competitiveness is the focus on a company's capabilities, i.e. human resources in the form of savvy managers, to foster network effects and a healthy ecosystem. It can be argued that human resource elements such as experience, education and skills related to platform businesses contribute to the company's goal of creating network effects and supporting the ecosystem.

3.3.4 Sub-Conclusion

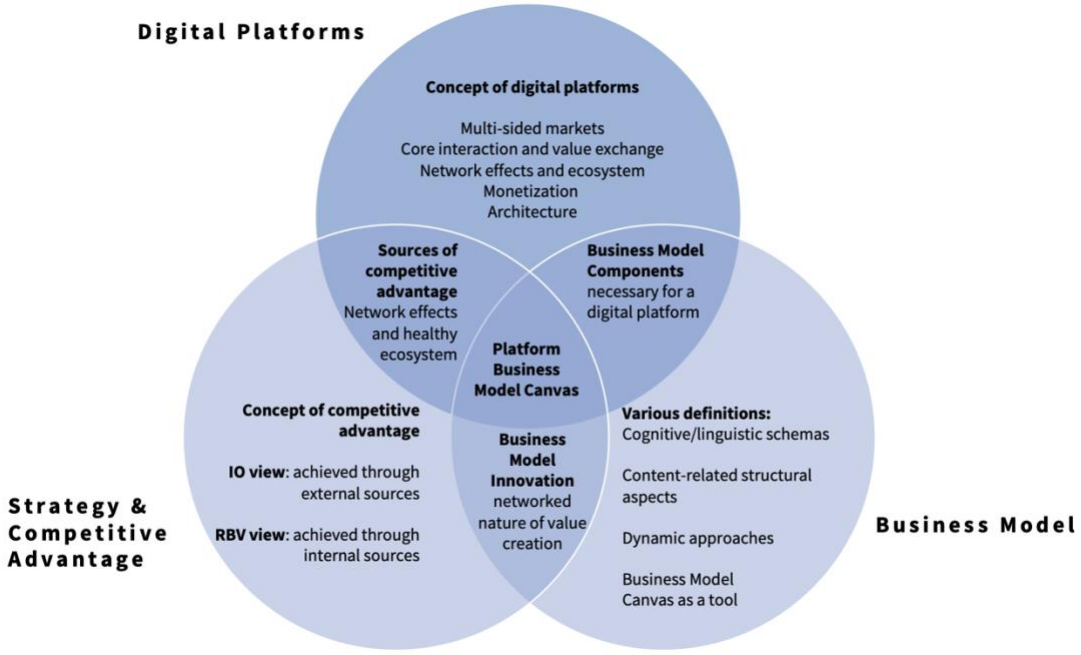
The aim of this section was to introduce the concept of platforms by looking into its business model components and how strategy and competitive advantage unfolds for these. Digital platforms are by design different from linear business models because they connect multiple sides of markets, and therefore do not own or have control over the value-creating assets. Therefore, business aspects such as revenue generation and growth are approached differently than in pipeline businesses. This leads to the finding that platform strategy is to a large extent different in the context of digital platforms, as it concerns both strategy between platforms but also within its ecosystem. Therefore, to be competitive, platforms must first foster healthy network effects attracting users, and as the ecosystem grows and evolves, the platform must ensure a healthy environment with opportunities for value-creation.

4

PLATFORM BUSINESS MODEL FRAMEWORK

In the previous chapter, the key literature and concepts from the field strategy, business model and platforms, and the overlaps and boundaries thereof were analyzed and discussed as illustrated below in Figure 4.1. This section is dedicated to synthesizing the three literature streams and to create a framework that entails the main building blocks and components for developing a strategic business model.

Fig. 4.1. Overview of Findings in the Literature Review



Source: self-developed by authors

The paper uses the BMC as the starting point, because of its strong academic foundation and high relevance to business practitioners. We are aware that other business model frameworks exist, and some of them are even derived from the BMC, such as the Lean Startup Canvas and Value Proposition Canvas. They do however not fully grasp a structured overview needed in this context, which the BMC facilitates. The BMC holistically covers the components that are usually seen in business models. Therefore, we found it appropriate to be used as the foundation for the framework that we are developing for platform business.

Since platform business models are distinct due their multi-sided market structure, the paper aims to translate the building blocks of the BMC into a framework that is more suitable for platforms. While Osterwalder & Pigneur (2010) argue that multi-sided platforms represent an increasingly important *business model pattern*, this paper sees a need to create a platform-specific canvas that integrates all relevant aspects for developing a platform business model. The BMC includes nine basic building blocks that show the logic of how a company creates and captures value, and it covers the four main areas of a business: *customers*, *offer*, *infrastructure*, and *financial viability* (Ibid.).

These four areas are used as a bridge to establish a link to the relevant platform components. Table 4.1. shows the BMC building blocks and how they interrelate with platform components identified in the literature. On the one hand, the purpose is to show similarities and differences between the two. On the other hand, the visualization should reveal the thought process of how the framework for *Platform Business Model Canvas* was derived.

Table 4.1. Relating BMC to Platform Business Model Canvas

Business Model Canvas			Platform Business Model Canvas	
Building Blocks	**Components**	**Business Areas**	**Building Blocks**	**Components**
Customer Segments	Mass/niche market, segmented/diversified, multi-sided platforms	Customers	Users	Consumers Producers
Channels	Indirect/direct, owned/partner		Network Effects	Positive/negative same-side effects Positive/negative cross-side effects Causal feedback loop
Customer Relationships	Self-service/automated, co-creation etc.			
Value Propositions	Brand, status, performance, design, price, accessibility etc.	Offer	Core Interaction	Participants, value units (three types of exchange), filter
Key Resources	Physical, human, intellectual, financial	Infrastructure	Architecture	Pull, facilitate and match through helpful tools
Key Activities	Production, problem solving, platform/network			
Key Partnerships	Strategic alliance, coopetition, joint venture, buyer-supplier relationship		Governance	Pull, facilitate and match through rules and governing behaviour
Revenue Streams	Asset sale, usage fee, subscription fees, lending/rental/leasing	Financial Viability	Monetization Strategy	Transaction/subscription fee, charging for access or enhanced access, or enhanced curation
Cost Structure	Cost-drive or value-driven (incl. fixed/variable costs, economies of scale and scope)			

Source: Self-developed by authors

4.1 Scope and Intended use of the Framework

The paper aims to build a framework that establishes a common ground covering the main building blocks of a digital platform business model. This sets out a twofold usage of the framework: a template for 1) developing new, or 2) documenting existing business models. This entails that the framework is static in nature, as it allows the user to discover at a point in time the construct of a business model and the connection between the necessary elements. Thus, the framework is not dynamic as it does not reflect a transformational process. However, we do acknowledge the generally dynamic nature of business models discussed in section 3.2.3.2. Due to the fact that business model innovation and responses to external market developments are central components of platform firm behavior to develop a competitive advantage, we acknowledge the need for managing and changing business models over time. Therefore, we argue that the framework can aid that process by giving a picture of how the business model components are arranged at a given point in time, which can help managers understand the gap between how it looks today and how they want it to be. However, other tools are necessary to develop the process of that transformation.

4.2 Discussing Components of Platform Business Models

4.2.1 Business Area: Customers

To begin with the field of customers, traditional businesses would need to think about: (1) customer segments, (2) channels and (3) customer relationship when developing a business model (Osterwalder & Pigneur, 2010).

First, multi-sided platforms speak of customers as *users* that are divided into producers and consumers, of which each has its own value proposition and associated revenue stream. Both producer and consumer can be further subdivided into various segments. Similar to traditional business models, platforms may segment different groups of people with common needs, behavior or other attributes. Yet, the relationship between producers and consumers is more complex than a simple segmentation because different types of users can take on more than one role. For instance, on Airbnb, one can consume an apartment, while at another instance switch sides and rent out an apartment. Moreover, multi-sided platforms serve interdependent customer segments. For example, if there were not any Uber drivers, no one could book a ride. Vice versa without paying customers, no Uber driver would join the platform. Hence, there is a boundary condition that implies that the platform must attract and serve both consumer and producer simultaneously since the value for one user group depends substantially on the number of users on the other side. To avoid the chicken-or-egg problem, platform business models can subsidize a customer segment or side of the platform. Through offering “free” services to one side, non-paying customers can be financed by another

part of the business model. For example, free online platforms are often financed through advertising (Anderson, 2009). However, one challenge that multi-sided platforms face is to decide which side to subsidize and to understand which side is more sensitive to price.

Second, businesses try to communicate with customer segments through distinct *channels* or touch points along the customer journey. Thus, traditional organizations choose between reaching customers through their own or partner channels by either direct (sales force, web sales, own stores) or indirect (partner, stores, wholesaler) means. They often rely heavily on accessing customers through specific communication channels that the company owns or pay for, focusing on awareness creation through push-strategies (Parker et al. 2016). Even though push-strategies can still be used for platform businesses, pull strategies designed to encourage virality are more relevant since solely creating awareness does not drive adoption and usage anymore (Ibid.). This underlines that the most important channel is the platform, where the matching of producers and consumers takes place. Nonetheless, not all value exchanges have to occur on the platform but can happen outside of it as well.

Third, according to Osterwalder and Pigneur (2010), businesses need to consider what type of *customer relationships* they want to have, ranging on a continuum from personal to automated services. One type of relationship that is increasingly popular is co-creation, where companies are going beyond the traditional customer-vendor relationship to co-create value with customers (Osterwalder & Pigneur, 2010). This links well to platforms because co-creation lies at its core and user commitment and active usage are more significant indicators of customer adoption than sign-ups or acquisition. By co-creating value with customers, platform users are more engaged than in a typical customer-vendor relationship.

One of the main distinctions of platforms is the shift from a linear structure into a complex relationship between producers, consumers and the platform itself, in which they exchange, consume, and sometimes co-create value in a variety of ways and places made possible through the connections that the platform facilitates (Parker et al. 2016). What is essential for the growth of a platform and the extension of relationships are network effects (Evans & David, 2003). Capitalizing on network effects is easier to scale outside of the firm. Thus, instead of growing internally, i.e. employees, platforms grow external crowds. By collecting producers and consumers, the platform's role can be best described as a network orchestrator. By fostering a culture of quality control without direct control over the value creation, platforms can maintain "healthy relationships" to its user base.

4.2.2 Business Area: Offer

Tapping into *offer*, the main building block is the *value proposition* or the reason why customers turn to one company over another (Osterwalder & Pigneur, 2010). For traditional companies it encompasses a service or a product that solves a need for customers. But for platforms, the value proposition is embodied in the *core interaction* consisting of participants, filters and different types of exchange. Value propositions can be quantitative (e.g. price, speed of service) or qualitative (design, customer experience), which can be the case for both linear businesses and platforms. Yet, platforms do not create value units themselves and have less control over the process of value-creation since the producer creates the value and the consumer consumes it. Hence, it is crucial that the platform provides an open, participative infrastructure for the interactions and sets governance conditions for them. Thus, the overarching purpose is to consummate matches among users and facilitate the exchange of goods, services or social currency, thereby enabling value creation for all participants (Parker et al. 2016). By doing so, platforms disrupt traditional competitive industries by facilitating and displaying new supply to the market. For example, platforms within the sharing economy utilize that many items sit idle most of the time, i.e. boats, cars, houses etc. The value of platforms lies in the fact that transaction costs are lowered, and market participants are connected with greater power and efficiency; trough re-intermediation, i.e. replacing non-scalable and inefficient agent intermediaries; through automated systems, or through market aggregation, i.e. creating new efficiencies by aggregating unorganized markets. Thereby, platforms provide new "value propositions" to customers.

In fact, there are four forms of value that would not exist without a platform. These could be expressed as sources of excess value that are generated by the platform. The first is access to value created on the platform for consumers. The second is directed towards producers or third-party providers and lies in access to a community or market. Third, the platform provides access to tools and services that facilitate the interaction and offers value to both consumers and producers. Fourth, value lies in access to curation mechanisms that enhance the quality of interactions.

4.3.3 Business Area: Infrastructure

Continuing with the infrastructure, there are three building blocks in the BMC: *key resources*, *activities* and *partnerships*.

Firstly, the *key resources* reflect the most important assets that are necessary to operate the business model, e.g. offer the value proposition, reach markets, earn revenues etc. Yet, these resources can vary depending on the type of business model and are either physical, financial, intellectual, or human (Osterwalder & Pigneur, 2010). One of the main differences is that platforms act as orchestrators and often do not own physical assets. For example, Airbnb does not own accommodations, but facilitates matches between

producers and consumers on the platform, thus, the community provides the resources. By de-linking ownership of physical assets from the value they create, platforms can independently trade the usage of assets in the most efficient and valuable way. Thus, a platform business model uses technology to connect various resources in an interactive ecosystem, moving from controlling internal resources to orchestrating external resources and building communities (Parker et al. 2016).

However, external resources do not entirely replace internal resources, but are complementary. Therefore, the paper suggests including the components of pulling, facilitating and matching in the framework, because within platform business models the emphasis lies more on ecosystem governance and persuasion of outside partners (Ibid.). Since platform businesses create value by using resources they do not own or control, it enables them to grow much faster than traditional businesses (Ibid.). Most importantly, platforms invert the firm which implies that a platform's value is created by the community of users. Thus, it turns the firm inside out, e.g. human resources shift from employees to crowds. Similarly, the focus from internal activities shifts to external activities.

Secondly, *key activities* describe the most important things a company must do to make its business model work. Osterwalder and Pigneur (2010) categorize activities into *production*, *problem solving* and *platform/network activities*. While production activities dominate within manufacturing, problem-solving and knowledge management are activities done by consultancies, hospitals and other service organizations. Osterwalder and Pigneur (2010) argue that platforms key activities relate to platform management, service provisioning, and platform promotion. However, we argue to relate key activities to the architecture of the platform and include pull, facilitate and match activities. Pull activities go beyond simple platform promotion as they aim to attract users and to overcome the chicken-or-egg problem, which is especially important during the launch of a platform. Facilitating activities might resemble service provisioning, but also entail providing the necessary infrastructure and governance for interactions such as raising or lowering barriers to usage. Lastly, matching is not only a necessary activity within platform management, but it encompasses also the development of the algorithm and the collection of data to perform matching. Based on the previous arguments, we highlight that platforms are not solely an activity under infrastructure, but require specific components such as pulling, facilitating and matching that companies need to consider.

Thirdly, *key partnerships* depict the network of suppliers and partners that make the business model functional. They often become the foundation of many business models as companies form alliances to optimize, reduce risks or acquire resources. The most basic partnership is the relationship between buyer and supplier and is driven by the interest of optimizing the allocation of resources and activities. For

platforms, resources and activities are orchestrated, so that the platform acts as a mediator between buyers and suppliers. Hence, partnerships play a bigger role for platforms in terms of growing network effects between different "partners" i.e. users of the platform. Osterwalder and Pigneur (2010) mention that partnerships can be determined by the need to acquire knowledge, licenses, or access to customers. For example, merger and acquisitions follow the strategy to pursue companies that either add complementary products or market access or subtract supply chain costs. However, for platforms such vertical integration implies that any new business platform purchases must be well integrated into the existing platform which can cause technical and strategic challenges.

4.3.4 Business Area: Financial Viability

The last business area discusses financial viability which is made up of *revenue streams* and *cost structures.* According to Osterwalder and Pigneur's (2010) model, *revenue streams* describe the money a company generates from each customer segment minus the costs to generate earnings. They are linked to pricing mechanisms which can be *fixed* or *dynamic*.

As explained previously, the value of a platform lies in the network effects it creates. Thus, a platform must think about how to monetize on the network effects and the excess value it creates. For traditional businesses, there are several ways to generate revenue streams: through asset sale, usage fee, subscription fees, lending/renting/leasing, licensing, brokerage or advertising. For platforms there are similar techniques for monetization, i.e. charging a transaction fee, charging users for enhanced access, or third-party producers for access to a community or charging a subscription fee for enhanced curation. One of the more critical questions is, however, whom to charge since different users of the platform play different roles and charging them can have differing network effects. For example, signing up to Facebook does not cost any money. But if Facebook added monetization to the producer side, it would create friction and barriers to enter the platform and eventually discourage people to participate. Thus, companies need to ask themselves how they can generate revenues without reducing positive network effects.

Secondly, considering the *cost structure* of a business entails all costs incurred to operate the business model and are characterized by fixed costs, variable costs, economies of scale and scope. Hence, important questions to ask are: what are the most important costs inherent in the business model? Which key resources and activities are most expensive? Generally, there are cost-driven and value-driven business models. On the one hand, cost-driven businesses pay attention to maintaining the leanest cost structure through low price value proposition, maximum automation and extensive outsourcing. On the other hand, value-driven businesses emphasize premium value proposition and high degree of personalized services, e.g. luxury hotels.

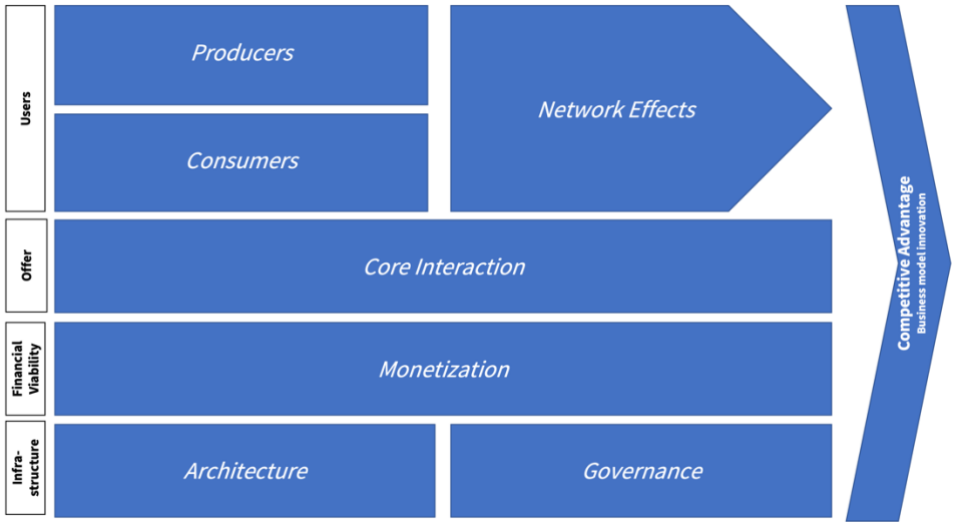
Nonetheless, this cannot be strictly applied to platform business models because firms such as Airbnb and Dropbox are not valuable due to their cost structure, the capital employed or machinery. They are valuable because of the communities that participate in their platforms. This can be explained by the fact that platforms rely more on demand-side economies of scale, than on supply-side economies of scale. Supply-side economies of scale are driven by massive fixed costs of production in industries where volume matters such as railroads, aircraft or pharmaceutical development. Demand-side economies of scale are expressed in network effects and are the market power of the Internet-era. Due to positive network effects, both the value created, and the profit margins increase as more users participate in the ecosystem, leading to higher value relative to other firms with comparable revenues that lack network effects. Moreover, platforms benefit from low marginal costs of distribution, enabling them to target and serve large markets with much smaller investments. By orchestrating the value creation, platforms often do not have inventory costs and can scale rapidly and easily with minimal structural restrictions.

4.3 Deriving the Framework

This section sums up the findings from the previous discussion and explains how the framework should be understood. First of all, the four business areas - *customers, offer, infrastructure* and *financial viability* - have been deemed relevant to make up the structure of the *Platform Business Model Canvas* illustrated by Figure 4.2.

While Osterwalder and Pigneur's (2010) model suggests that the field *customers* is composed of customer segments, channels and customer relationship, the paper has identified that for platforms it makes more sense to define and segment *users*, i.e. producers and consumers and think about how to build and capitalize on network effects. Network effects are the main reason for platform's exponential growth and are a crucial building block when it comes to the competitiveness of platform business models. Thus, start-up companies need to consider how to create lock-in effects and offer frictionless entry without causing negative network effects. As multi-sided platforms serve interdependent customer segments, it is essential that both sides of the market grow in such pace that demand and supply are in balance. Thus, instead of focusing on classical push-strategies, platforms have to pull users and encourage participation on the platform.

Fig. 4.2. The Platform Business Model Canvas



Source: self-developed by authors

When thinking about the *offer*, the *Platform Business Model Canvas* includes the core interaction rather than the value proposition. This entails considerations about participants, but also value units, filters and value exchanges. Thereby, platform users and the core interaction are closely interlinked. One type of value exchange is information exchange, which is the starting point of every interaction. It takes place through the platform and enables users to decide how to engage, leading to other possible value exchanges of goods/services and currency. Moreover, to make value exchanges easier, the platform must consider the types of filters it offers the users. It is crucial that the platform provides an open, participative infrastructure for the interactions and sets governance conditions for them. Therefore, offer and infrastructure are also closely linked and reveal once again the complexity of relationships of the platforms.

The *infrastructure* refers to architecture and governance. Platform managers should make design choices regarding the architecture and governance systems in the form of pull, facilitate and matching activities. Thereby, both the technical structure as a tool is important for growth, but also the rules for the value-exchanges are crucial to grow the number of core interactions. Without proper architecture and governance, i.e. providing tools and rules to make exchanges easy and mutually rewarding, the platform cannot foster efficient matching, which would hinder the creation of accurate, useful, relevant and interesting interactions.

Lastly, the *financial viability* of a platform is determined by its monetization strategy. Instead of a traditional divide between revenue stream and cost structure, digital platforms should focus on excess value that is created and whom to charge, since they have costs to serve all types of users. The ability to monetize the excess value of exchanges is linked to the types of currencies it can capture and internalize. Thus, the platform manager must carefully assess where excess value occurs and where it can be monetized without creating friction to the network effects.

4.3.1 Competitive Advantage in relation to the framework

As the aim of competitive advantage is to find out *what makes consumers choose you over competitors*, we can now discuss the connection between the elements in the framework and winning the market. It can be argued that it is the combination of all the components in the framework that has the potential to make the business model competitive. As the literature indicated, platform competition is characterized by WTA dynamics where the platform with the strongest network effects and ecosystem can tip the market in their favour. In this context, network effects are crucial in the first place and it can be argued that they are a threshold resource for platforms to a certain extent (Johnson et al., 2008). It however depends on the nature of the platform what constitutes a critical mass of participants, why their significance can vary (Parker et al., 2016). Nevertheless, it can be argued that the platform that wins the critical mass of users has a competitive advantage over competitors, as it has a self-reinforcing effect of attracting users. For example, if you are able to attract the best producers, consumers will follow, while having the largest consumer base will attract the producers.

The reason why all the elements matter in relation to competitiveness is because they are interrelated with the network effects. An unsuccessful monetization strategy can erode the network and interactions. However, it is not sufficient to solely attract users to the platform but keeping them on it is just as important as exemplified by the failure of the social media platform Myspace, which failed to sustain consumers who switched to Facebook in the early 2000s (Parker et al., 2016). To ensure this, it is important that the ecosystem is healthy. Thus, a key factor that can help sustain platform competitive advantage is succeeding in enabling value creation and distribution. In this context, governance and architecture play a key role as it covers how the platform enables strong interaction and value creation, but also how it governs the ecosystem wealth. And lastly, the core interaction also plays a crucial role for competitiveness, as it constitutes what attracts users to the platform, but also is the main reason for them to stay.

4.4 Sub-Conclusion

Although the framework is static in nature, the paper incorporates business model innovation as part of a company's strategy that can help the company stay competitive. This means that a company should be aware of changes in the internal and external environment and adopt their business model accordingly in order to use it as a competitive advantage. Although you may have strong network effects at a given point in time, this may change quickly. Thus, managing network effects is crucial, and is strongly related to the rest of the business model. Furthermore, platforms often innovate and expand over time and gradually include more core interactions. However, innovation of the platform can also lead to excessive complexity, e.g. causing technical problems for programmers or developers that could hinder navigation. Therefore, a balance between changing the core interactions slowly while allowing for positive adaptations is important.

5

FRAMEWORK ITERATION

The purpose of this section is to evaluate and analyze the findings from the interviews and use the new insights gained for an iteration of the framework in order to improve its functionality. Therefore, we first summarize and reflect on key points gained through the interviews. Then, we develop an iterated version of the framework by incorporating these insights. Lastly, we explain how this new framework can be used and establish a manual that explains how it can be applied step by step.

5.1 Key themes and critiques that emerged from the interviews

Despite the fact that all interviewees perceived the Platform Business Model Canvas to be useful, they pointed out certain elements that needed refinement concerning *participants, the disentanglement of value, network effects*, *activities of the platform* and *metrics*. While all aspects in the previous model were perceived as important and regarded as a "checklist", it was suggested that some elements needed to be more explicit in the framework. Thus, the emphasis of the practitioners, experts and academics aided us in reflecting on the importance of including them which is further elaborated in the following.

5.1.1 Segmentation of Participants

Several interviewees (E4, A1 and A2) emphasized that the framework lacked three aspects in relation to the participants on the platform: *third parties*, *partnership*, and *segmentation* of the users and overlooking these hinders the framework to be applied properly to multi-sided markets. Concerning *third parties*, it is often observed that they are a type of customer as they pay for access to a market or community, which is an important aspect in relation to the monetization strategy (Parker et al., 2016). For example, YouTube charges advertisers for access to the platform as it provides a great market of consumers. This enables YouTube to keep the platform free of charge for the producers of content and consumers thereof. Thus, the third party is a crucial participant for the platform that must be included in the business model, as it is the paying customer and the platform's source of revenue.

In regard to *partnerships*, there was a strong consensus that partnerships are very important to include for platform business models for several reasons. As elaborated by A1, partnerships can be a way to gain access to specific resources that the platform does not own. As platforms mainly connect different users that perform the core interaction, partnership might be necessary to bring value-creating resources and capabilities. For example, Amazon partners up with logistics companies like DHL that distribute their products. Thus, it can be argued that some partnerships can be necessary to orchestrate value creation between platform participants. In connection to this, P2 argues that partnerships can also be a way of outsourcing certain activities and thereby potentially save costs.

Moreover, partnerships can also play a crucial role for the platform's go-to-market-strategy. For example, in the form of investors that aid the company to overcome financial or management related obstacles as argued by E5. But they can also be a way of entering a specific market which can be exemplified by the art platform PARS with interviewee P4. On the one hand, PARS is working on establishing partnerships with big museums in Denmark to gain exposure to the masses; and on the other hand, it sees galleries as its partners through which it can gain access to the artists and their work. Thereby, as suggested by E5, partnerships can be a type of channel where the company can gain exposure. Thus, partnerships can be necessary for the core interaction, although the partner itself does not necessarily directly participate in the exchange of the platform.

Furthermore, exclusive partnerships can also play an important role for how the platform is perceived. For example, P1 stresses that the special agreement of his company Hilfr - a platform for finding cleaning personnel - and the Danish trade union 3F positions the company as being in the regulatory safe zone, which is attractive to many consumers. For the above-mentioned reasons, it can be argued that partnerships can be highly valuable for a platform's competitive advantage, whether it concerns gaining access to specific resources and markets, outsourcing activities, driving down costs, or having exclusivity that allows for unique value propositions. Therefore, it is an important aspect to include in the iterated version of the strategic framework.

Lastly, a key point that was highlighted by both A1 and A2 related to the participants is the fact that there can exist *different segments* within each user group. Especially as the platform grows and new core interactions emerge, different segments within the user groups can occur. Therefore, A1 and A2 argued that it can be helpful to include segmentation, which has been discussed in the literature review, but was not made explicit in the framework.

5.1.2 The disentanglement of value

Another important insight was gained in relation to value. A critique by A2 was that the framework only considered value creation and exchange between producers and consumers in the core interaction, while there in fact exists different types of value for the producer, the consumer, partners and third parties. In addition, it was argued that it is not only the participants contributing with value, but that the platform itself plays a role in the process. Therefore, the question arose how value can be disentangled and how to the different value contributions by participants, i.e. value creation, delivery and capture can be incorporated. E4 argued that for Amazon for example, consumers can provide a lot of value by giving reviews, which increases the trust of the platform and consequently creates value for the platform. Therefore, a disentanglement of value and its different dimensions in relation to the platform and its participants is called for.

This disentanglement of value affects two other important aspects of the framework: value propositions and monetization. First, value needs to be disentangled to become clearer about the specific value propositions. As E4 and P1 argued, different participants on the platform are attracted by distinctive value propositions that need to be customized. Thus, the value proposition - from the original BMC - must be incorporated more explicitly in the iterated framework. Thus, we have to make it more explicit what each participant hopes to gain from the platform.

Second, for monetization it is important to identify where the excess value lies. As described in the literature, there are four sources of excess value that platforms can generate for its users: access to value created on the platform, access to a community or market, access to tools and services that facilitate interaction, and access to curation mechanisms that enhance the quality of interactions (Parker et al. 2016). A2 and E4 argued that by identifying what each participant contributes with and receives in return, it becomes easier to recognize where the excess value lies. In addition, it helps to think about which participant is more resilient towards being charged. Using the example of YouTube again, the company

allows for highly differentiated types of value for the different participants, and only manages to charge the third parties successfully. The platform has in fact attempted to monetize consumers of content through its premium account version but has not been as successful in comparison with other streaming platforms like Netflix and HBO, because consumers are more resilient towards being charged for the value (Liang, 2019). Thus, it can be argued that identifying what each participant brings and receives, i.e. identifying different forms of value contributions and the exchanges, helps to think about whom to charge and how to monetize.

In line with this, Iansiti and Lakhani (2020) argue that a distinctive characteristic of multi-sided platforms is that they have the advantage to innovate the business models by experimenting and recombining value creation and capture. Compared to incumbent companies, where value is captured straightforwardly from the customer through a pricing mechanism, platforms have a wide range of options because value creation, delivery and appropriation can be separated more easily between different stakeholders. Therefore, the disentanglement of value needs to be included in the iterated framework as it provides the opportunity to distinguish between different participants and how they contribute to value creation. It further enables to specify where excess value is created on the platform which helps to create a more refined monetization strategy.

5.1.4 Network Effects: Data and Network Size

Through the interviews, two assumptions of the model have been challenged in relation to (1) network size and (2) effects by both A1 and A2. (1) Network size is not always decisive for a platform's competitive advantage. Network effects only work as a source of competitive advantage if a platform is also "sticky", meaning that if users can leave the platform easily, scale through network effects does not bring future competitive advantage (Tucker, 2018). (2) It is not always people creating network effects, but instead the focus can lie on gathering more data generated through devices. Thus, when a product's value increases with more data and when additional usage of that product yields data, then the unit of analysis is data causing "data network effects".

In relation to the first assumption, P4 who operates in a B2C context argued that a big network where more users on one side attract more users on the other side is not always a desirable goal. For example, the art-platform PARS focuses on having a relatively small, but high quality user base of producers, i.e. the artists. Therefore, it does not attempt to stimulate organic growth of the network through network effects, but rather actively approaches and chooses the artists that supply the platform. Thus, the goal is to have a large

consumer base relative to the producer base, but still reach an equilibrium of supply and demand with strong core interactions. Nevertheless, this is an important point to consider as different types of platforms have different ways of approaching the business model and network effects.

Considering the second assumption, the sole focus on people as the central unit of analysis in relation to network effects and value creation needs to be reconsidered since in reality it is oftentimes data collected through machines that is the crucial part in the core interaction. For example, a platform company may have few consumers, but numerous devices with sensors that collect data that act as producers. Then, as A1 argued, one cannot speak about stimulating network effects between people, but between machines by creating even larger amounts of data. In many B2B settings the network may not be big in terms of number of participants on the platform, but instead provides a great amount of data generated that can be valuable for another participant group. For instance, Siemens Digital automates factories, which enables them to collect large amounts of data that offer useful insights for car manufacturers, who then purchase the data insights. Thus, the business model becomes about measuring data from one participant and selling it to another one as argued by A1. Therefore, it is important to consider in the framework that the participants on one side can be either personal actors or machines, as it has a strong influence on network effects and how to stimulate these. It can be argued that platforms can be made sticky through customers owning data through a platform. The reasoning is that data created through machines and stored on a platform can lead to lock-in effects, which in turn supports network effects (Tucker, 2018). This perspective also becomes very relevant when considering the development in the areas of Internet of Things or Industrial Internet of Things where the value lies in the data generated.

5.1.5 Key Activities and Resources

An area from the BMC that gained attention was key activities and resources of the platform, as several interviewees (A1, A2, E4) commented that it is not addressed explicitly enough in the infrastructure section of the framework. As the framework solely focused on architecture and governance as part of the infrastructure, it did not make explicit what the key activities and resources are needed to enable the core interaction in these categories. Thus, it is important to illustrate how the platform manages a healthy ecosystem including key activities and resources in relation to: stimulating network effects; governing the core interactions of the participants; matching participants (producers, consumers, partners, third-parties) through technological infrastructure; and staying financially viable by deploying the a monetization strategy that collects revenue without impeding on network effects.

As argued by E4, all of these activities are highly related. For example, governing behavior and controlling who adopts the platform can be done simultaneously, which are both activities to manage network effects and ecosystem health. E4 further explains that in the case of Zalando, the company adjusts its service level accordingly to the customer's cost to revenue ratio. Thus, if the customer is too expensive, e.g. continually sends back the orders, the service level will be lowered so that they eventually abandon the platform, while profitable customers will receive good service to stay. Thereby, the platform controls attraction and pushes costly consumers away.

5.1.6 Metrics

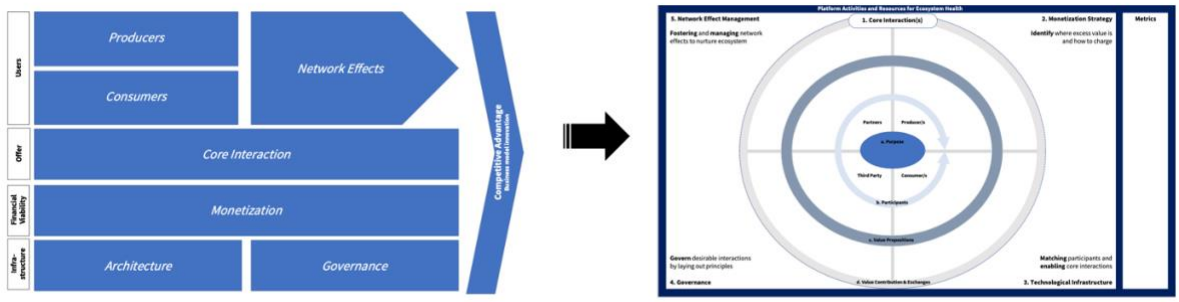
Lastly, a topic that re-occurred, but has not been covered before was that of metrics. This was related to the success of a business model, and how metrics are crucial to determine whether a business model is performing well or not, and where improvements can be made. Thus, E3 argued that including metrics is an important guidance element when both developing a business model, but also operating and maintaining it. Furthermore, A3 argued that metrics reveal distinctions between different business models, as there is no one size fits all metric, but rather they need to be tailored in each case. In line with this, the metrics a platform utilizes are also dependent on the stage of maturity, i.e. whether the company is in a startup, growth or mature phase (Parker et al., 2016). Nevertheless, adding an element of metrics can allow for the framework to be applicable for business model innovation. Metrics will guide companies in identifying weak spots in the business model that can be improved for more success.

5.2 Introducing the Platform Business Model Compass

Having identified the main shortcomings of the initial framework, this section is dedicated to incorporating the new insights to an iterated version, which we name the Platform Business Model Compass. First, the paper reflects on the inclusion of the new aspects and the subsequent new visualization. This is followed by a manual with an explanation of the different elements and how these ought to be understood and applied.

5.2.1 New visualization and Included Aspects

Fig. 5.1. Old vs. New Visualization



Source: self-developed by authors

The insights gained from the interviews indicated that a new visualization was necessary to account for the added participants (third parties and partners) and the disentanglement of value. Thus, we found it helpful to change the visual into a circular shape. It allowed us to have room for more and different participants, and to clarify what value each participant contributes with and gains, and thereby to identify the connections between different participants. The new circular visualization takes its point of departure in the Service Dominant Business Model Radar (SDBMR), which in contrast to the value chain focus of the BMC, takes rather a value network perspective and focuses on collaborations at the network level of actors (Turekten & Grefen, 2017). The SDBMR portrays the collection of heterogeneous actors that each have a role in interacting with one another to achieve shared goals that eventually incurs come costs and benefits for each one (Ibid.). Thus, we argue that the network perspective is fundamental to platform businesses and needs to be incorporated in our framework since platforms constitute networks of actors that each contribute actively to perform the core interaction. Based on our primary research and the aforementioned arguments, we derived the following components for our framework.

We decided that the Core Interaction in our framework must encompass:

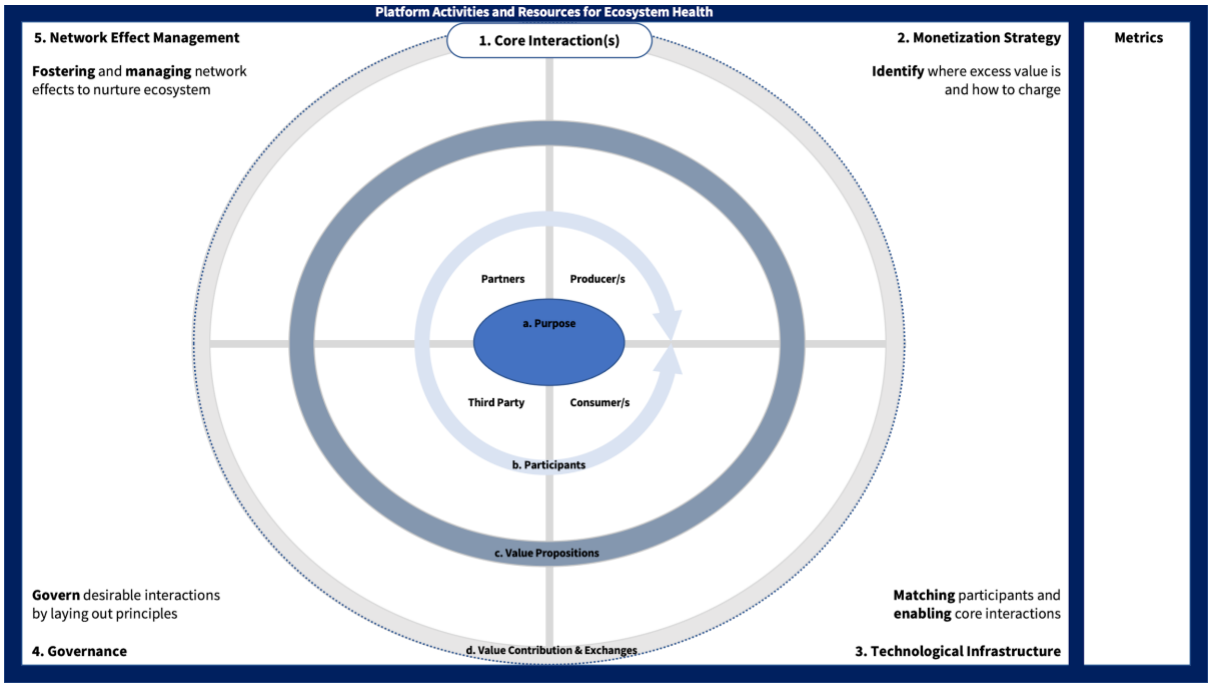
a. Purpose
b. Participants
c. Value propositions
d. And value contribution and exchanges

The core interactions are visualized as a multi-layered circle that depict the value creating activities by the various participants. In this way the segmentation becomes visible, but also the disentanglement of value. The core interactions are embedded in a frame that describes the platform activities and resources for ecosystem health, which includes the following elements:

2. Monetization Strategy
3. Technical Infrastructure
4. Governance
5. Network Effect Management

Lastly, we included Metrics in the visualization in order for the company to define what key metrics are relevant to measure the success of the core interaction, which are, however, very context specific.

Fig. 5.2. Platform Business Model Compass



Source: self-developed by authors

To begin with the (1) *core interaction*, this visualization shows how it is the central part of a platform business model and reflects an overall element grasping the (a) purpose of the platform and the set of actions that participants perform repeatedly to gain value from the platform. By adding the layers (b) participants, (c) value propositions, (d) and value contribution and exchanges, all ongoing value creating interactions on the platform are visualized depicting that a platform can have multiple interactions layered on top of each other including several participants.

First, in the core lies the (a) *purpose* of the platform. It is important to understand the overall *why* of the platform, which was in the previous model covered by the element core interaction (Parker et al. 2016). However, the new version sees the core interaction as a collection of elements that sustain it, we argue that it is crucial to first understand the *purpose* of the platform and what potential problem it is trying to solve because it depicts the main reason why participants come together to the platform. It is the most important core interaction that takes place and unites all the participants.

The next layer delineates the (b) *participants* covering producers, consumers, third parties and partners. It is crucial to highlight that we expanded the term users to participants in order to include the third parties and partners in order to portray multi-sided market platforms. We understand third parties as entities that have a clear interest in joining the platform as they want to gain access to the platform's community. Partnerships on the other hand are defined by a platform's need to gain access to those external resources or capabilities as they enable value-creating activities that are necessary for the core-interaction. Partnerships are very relevant as the companies might form alliances for optimization, reduce risks or acquire necessary resources. It is also important to mention that platforms that depend on data can incorporate machines under the producer segment because the machines produce data and insights that can be consumed. The reason why the platform itself is not a part of the participant element visually is because the platform's main activity and contribution is always to connect different user groups to facilitate the value creation without having direct control. Thus, the platform's main value creating activities are reflected in the outer square.

Following that, the next layer displays the (c) *value proposition* for each participant, because the interviewees pointed out that it is crucial to clarify what type of value a platform can offer each user segment in order to attract them. The identification of various participants and the circular shape gives space for the specific definition of value proposition which has not been possible before.

The last layer encompasses the (d) *value contribution*, i.e. the activities and resources participants bring to the platform, and the related *value exchanges* between them. From the interviews, an important insight gained was that value must be disentangled and addressed more explicitly. By adding the layer it aids us to understand what component of value each participant contributes with and between whom these are exchanged. This can later help to identify where excess value is created that can be monetized later on.

Looking at the outer frame, it includes all *platform activities and resources for ecosystem health.* We see it as important to add it as a new element that encompasses (2) *monetization strategy*, (3) *technological infrastructure*, (4) *governance* and (5) *network effect management*, and key *metrics*. We found it necessary to more explicitly address the types of activities a platform performs and distinguish them from the activities that participants perform, hence the circular and square shapes. This is because the platform's task is to provide the infrastructure to orchestrate and enable core interactions between participants. Therefore, the platform's activities are depicted in a frame, which should be understood as the base for the core interactions.

Moving from the (1) *core interaction* to (2) *monetization strategy* in the outer frame, there is a close link between the (d) *value contribution and exchanges* and the (2) *monetization strategy* because it covers the identification of aforementioned excess value and considerations on how and whom to charge. In multi-sided markets cost and revenue are more complex to analyse since the distinct group of users on each side implies cost and revenue to be dispersed to all sides. Monetizing does not only entail identifying excess value, but also discovering the the most friction-resilient users. If there exists a price sensitive group of users who are likely to abandon the platform, platforms can choose to subsidize price-sensitive users while charging some users full price. Understanding the dynamics between the participants and knowing who attracts who enables the platform to discover the best pricing techniques.

Next is the (3) *technological infrastructure.* The former framework saw the infrastructure of the platform to be divided between architecture and governance. However, we saw a need to extend the term architecture to *technological infrastructure* as it covers all activities and resources needed to match and enable the core interaction from a technological perspective. Thus, it includes architecture but also data collection strategy, algorithms, tools to facilitate the core interaction, filter, etc. Thus, it is concerned with how the platform is built to enable the core interaction, while allowing for scale and encouraging network effects.

(4) Governance, however, focuses on governing desirable interactions by laying out principles and hence includes not only internal, but also external governance. Even though both aspects are interlinked, they are also separate activities that should not stand under one umbrella term as previously. Hence, it covers the governance of relationships among its users and their interoperation through different types of governance tools like laws, norms, architecture, and markets (Reillier & Reillier, 2017; Parker et al., 2016). This is highly related to the impact of trust on the success for platforms, which is an essential aspect when facilitating interactions. In fact, governance covers setting rules in the interest of the entire ecosystem about who can participate in it, how to divide the value produced fairly, and how to resolve potential conflicts.

For (5) *network effect management* we added the layer of fostering and managing the right type of network effects, i.e. same-side and cross-side network effects that can either be positive or negative, in order to nurture and stimulate the entire ecosystem. Thus, it is important for platforms to not only think about launching strategies, reaching critical mass and solving the chicken-or-egg problem, but going beyond that and consider how to sustain users in the long-term. As discussed, network effects play a crucial role, but are not always the sole source of competitive advantage. Hence, it is of significance to reflect what network strategy is best suitable.

Lastly, we have added the element of *metrics* in the strategic framework. Metrics are important to track the performance and success of the platform business model. The typical metrics used for pipeline companies, such as cash flow, inventory turns, operating income, gross margins, overhead, and return on investments, do typically not apply as well to platforms because they measure the efficiency with which value flows through the pipeline (Parker et al., 2016). As platforms primarily create value through the impact of network effects, useful metrics need to measure and quantify the rate of interaction success and the related factors that foster it, i.e. governance, matching, value distribution, optimal ratio of network participants, etc..

Furthermore, the specific metrics depend on the type of company and the stage of maturity. For example, in the startup phase it may be more important to track the growth of the platform, while retention, conversion and engagement may be more important in the later phases (Ibid.).

We decided to not make the competitive advantage an explicit element in the framework, but rather implicit. The key premise is that the ecosystem health and the combination between all the components in the framework are crucial for the competitive advantage. By assembling resources and capabilities from outside, a platform can build a strong ecosystem that will ensure a better market position. Yet, there can be many different specific aspects to a competitive advantage that are context dependent and evolve over time, which the framework does not capture. For these reasons, it has been excluded from the iterated framework. We see that the alignment of all the aforementioned elements becomes more important, the higher the competition is since companies are pressured to create value in the best possible way. Thus, higher alignment between all components enables a competitive advantage and will make the platform business model more functional and consequently more profitable.

Together the inner circle (1) *core interaction*, the outer frame of *platform activities and resources for ecosystem health* and *metrics* comprise the final framework, the Platform Business Model Compass (henceforth; Compass) illustrated in Fig. 5.2. As an additional factor for using the developed framework, we have created a manual that goes into more detail about how to use the Compass. The manual contains short description of each element and the key questions that should aid the application of the framework in developing or documenting a platform business model.

5.3 Manual: How to use the new Platform Business Model Compass

The following section explains the different parts of the strategic framework in a step by step process, including key questions for each section that should guide its application. It is important to stress that the list of key questions for each element is indicative, but not exhaustive.

5.3.1 Core Interaction(s)

The core interaction of a platform is crucial because it consists of the different participants and the set of actions and resources, they repeatable exchange to gain value from the platform. In this context, we define the core interaction to cover the *purpose* of the platform, the related *participants* and their distinctive value *propositions*, and the *contributions* and *exchanges* between them.

5.3.1.1 Purpose

We start with the purpose, which reflects why the platform exists in the first place. Thus, the purpose should reflect the mission of the platform and the potential problem it is trying to solve. Therefore, one should start to think about:

- What problem are you trying to solve?
- What is your mission?
- What does the platform facilitate that may otherwise not happen?
- What is the aggregate purpose for all participants in using it?

5.3.1.2 Participants

The participants define who participates in exchanging value in the core interaction, and can be thought of as the platform's supply and demand side. This includes both consumers and producers, but also key partners and third-party providers who take part or benefit from the value creation and core interaction. Platform participants can play different roles in different interactions and hence are able to switch sides or roles (as in the case of Airbnb), which would most typically be between consumers and producers. Key question in this element are:

- Who are the producers of value?
- Who are the consumers of value?
- Who are key partners that are necessary to enable the platform?
- Who are potential third-parties that have an interest in joining the platform?

5.3.1.3 Value Proposition

The value proposition to each participant encompasses how a platform is distinctive and attractive compared to other options, and entails the reason each participant group chooses to use a platform. It can be quantitative (e.g. price, speed of service) or qualitative (design, customer experience) in nature (Osterwalder & Pigneur, 2010). Thus, it is important to consider how using the platform provides value for each type of participant. Therefore, key questions to consider are:

- How does the platform provide value?
- What are the benefits for each participant?
- What does the platform give them?

Possible, but not limited, value propositions are:

- demand side: convenience, amount of choice, low search efforts, easy transaction, transparent rating, etc.
- supply side: additional income, low upfront investment, ease of joining, extended market reach, lower customer acquisition costs etc.
- third parties: access to aggregated markets, deep knowledge about the market through data, etc.
- key partners: business opportunities, access to network, wider reach to customers

5.3.1.4 Value contribution and exchanges

Lasty, the core interaction involves identifying what value each participant contributes with, and what they get in exchange, i.e. the exchange itself. There are three general categories of value that can be exchanged on a digital platform; information, product or service, and currency (Parker et al., 2016). Therefore, it is important to think about:

- What value unit does each participant bring?
- Who receives/consumes this value unit?

The different types of values that are exchanged on the platform can be identified in the model with a "+" or "-" to visualize the flow of values between different participants as illustrated in the later applications, Fig. 6.3.

5.3.2 The outer frame: Platform activities and resources

Once the core interaction and its related components are identified, the platform can think about how to manage its own activities and resources that are illustrated in the outer frame.

5.3.2.1 Monetization Strategy

Linked to the value creation by the participants is the monetization strategy. By looking into (d) value contributions and exchanges, the platform can identify what sources of excess value are generated that can be charged. As found in the literature review, there are four different excess values that can be charged:

- For consumers: Access to value
- For producers or third-parties: access to a community or market.
- For consumers and producers: access to tools and services that facilitate the interaction
- For consumers and producers: access to curation mechanisms that enhance the quality of interactions.

To find the most optimal monetization strategy, the platform should consider all four forms of value to determine which one creates the excess value that can be utilized without having a negative impact on the network effects. Therefore, consider:

- Which type of above mentioned values does the platform mainly facilitate?
- Who is less price sensitive?
- Whom do we charge?
- What is our technique to charge?
    - Transaction-based, subscription, charge for (enhanced) access or curation, etc.
- Do we subsidize some of the users

5.3.2.2 Technological infrastructure

The technological infrastructure resembles the key resources and activities related to the technology of the platform. The main goal is to match participants and enable the core interactions through the technological infrastructure, useful tools and filters. Technology plays a key role for good matching and includes the use of algorithms to perform the work. Collecting data is crucial to feed the algorithm and thus, the following aspects are important to consider:

- Have we developed an efficient algorithm that matches the right participants?
- What is the data collection strategy to feed the algorithms?

- Can data be used for other purposes?
- Do we offer helpful tools to produce the value unit?
- What kind of filters do we use to facilitate the core interaction?
- Do we incorporate AI or machine learning to optimize and automate matching processes?

5.3.2.3 Governance

This section covers the key activities and resources related to the governance of the platform. Under the governance element, the key activity is to govern desirable interactions by laying out principles and mechanisms to foster ecosystem health including fair value distribution. It is important to reflect what are the rules of the platform in terms of governing behavior to control the participation on the platform, but also how you approach external relations.

- Who can participate in the ecosystem?
- How do we ensure a fair value distribution and avoid market failure?
- How can we resolve potential conflicts?
- What curating mechanisms are in place to guide action?
- How do we create trust and willingness to share data?
- How do you manage and interact with relevant external stakeholders?

5.3.2.4 Network Effect Management

Network effects are a unique feature of multi-sided platform companies, why we need to consider the key activities and resources related to fostering and managing them. They can either be same-sided or cross-sided. It is also important to consider if they have a positive or negative effect. Therefore, managing them is important for ecosystem health to avoid destruction of the network. A helpful tool to get an overview of the network effects is a causal loop diagram, which illustrates whether there are same-sided or cross-sided effects, and whether they are negative or positive, i.e. have a reinforcing, balancing or eroding impact. Having this overview can help identify managers where to stimulate or slow down network effects. Hence, key questions are:

- What type of network effects do we need and between whom?
- What are the feedback loops that keep users on the platform?
- How can we stimulate or slow down the network effects?

Nevertheless, in the beginning stages, a key activity of the platform is to pull participants to foster network effects. However, companies often struggle with attracting both sides when launching a platform. To solve the chicken or egg platform, companies need to develop context-specific launch strategies and decide whether to stage value creation, focus on one side, or onboard simultaneously. In this stage, it is important to consider questions like:

- How do we solve the chicken or egg problem in the initial phases:
    - Which side do you want to attract first?
    - Which part is more likely to attract another part?
- What pull and push strategies do we use?
- How can we provide frictionless entry to reach a critical mass?

5.3.3 Key Metrics

By setting up key metrics that can help determine whether the BM is successful and identify where the shortcomings may stem from, managers can use the model in a more dynamic manner. As stated, platform metrics must cover the success of interactions and the main factors that contribute to it. Furthermore, metrics must be 1) actionable and related to success, 2) accessible, i.e. comprehensible to use, 3) and auditable by being based on data that is clear to measure (Parker et al., 2016). Nevertheless, metrics are highly context specific and depend on the type and maturity of the platform, but some examples are seen in Table 5.1.

Table 5.1. Overview of Key Metrics

What is measured	Key Metrics
Success of core interaction	• The ratio of users on the platform to the number of times a core interaction occurs • The percentage of listings that lead to interactions • User stickiness: DAU, MAU, WAU Ratios (daily active user, monthly active user, weekly active user)

Network effects	• Optimal critical mass:
	  • Total number of participants
	  • Total number of active participants
	  • Growth rate of participants
	• Network balance for a healthy ecosystem:
	  • ratio of participants (e.g. producer-to-consumer ratio)

Governance	• Trust:
	  • abandonment rate of platform by all types of participants
	  • percentage of participants willing to share data

Technical infrastructure	• Matching quality:
	  • conversion rate
	  • number of cancelled interactions
	  • time between initiation of core interaction to finish

Monetization	• Implemented monetization:
	  • Number of signup to paid services (subscription)
	  • Number of transactions occurred

Source: self-developed by authors

5.4 Sub-conclusion

This section incorporated key themes and critiques that emerged from the interviews concerning the refinements of participants, the disentanglement of value, network effects, activities of the platform and metrics into a new and improved framework: The Platform Business Model Compass. The old Platform Business Model Canvas was transformed into a new visualization that integrates the networked perspective of the SDBMR to compensate for aspects that were missing before. The Compass is complemented with a manual that practitioners can use for application.

6
CASE VALIDATION

The purpose of this section is to validate the Compass' usability and applicability by evaluating how well the framework captures the business model of Airbnb, Facebook, Amazon Business and Predix. We followed a descriptive evaluation technique proposed by Hevner et al. (2004), which suggests the use of an informed argument through literature and the construction of scenarios to demonstrate the utility. Therefore, we have developed a 2x2 matrix to construct different scenarios with different case companies to test the framework's applicability. We are aware of the limitation that the framework due to the given scope and limited time and resources could not be tested through an experiment by implementing it with IF. However, to ensure the validity of the research and expose its reliability, we tried to conduct the research with an appropriate amount of rigor and demonstrate the framework has fulfilled the following criteria for its development: feasibility, flexibility and convenience (March & Storey, 2008). The following explains the choice of cases, the matrix and the case applications.

6.1 Choice of Cases

By testing the *Compass* through several large established platform companies, we are able to validate the model against different contexts. However, it is important to consider that there exist different typologies of digital platforms. One general distinction is between *exchange* and *maker* platforms (Moazed, n.d.). *Exchange* platforms facilitate an exchange or a long-term collaboration to achieve a shared outcome and are more focused on reducing transaction costs by facilitating the exchange (Hermans, 2015). *Maker* platforms provide the underlying infrastructure and tools that enable their participants to create outcomes such as written or graphic content, software, valuable insights, etc. Data plays a significant role for both types in enabling the business model. Generating and capturing large amounts of data helps exchange platforms in the matching activity, and plays a crucial role for maker platforms in value creation. Therefore, we validate the framework against both types of platforms.

Another dimension that must be taken into account is the nature of the consumer. The rise of the internet and digital platforms has allowed for an easier means of connection (Parker et al., 2016). In this context, there has been a growth in peer to peer interactions, whether it concerns mobility such as Uber or GoMore, housing such as Airbnb, financing such as Lending Club, etc. (Bajpai, 2016; Harmoney, 2015). Meanwhile, platforms also facilitate the connection between businesses and private persons as for example Amazon or

eBay does. However, there also exists platforms that connect businesses to other businesses seen in cases such as Tradewheel, Alibaba and Amazon Business. Thus, we argue that adding this dimension helps to test the applicability of the framework in different contexts.

The two dimensions described above constitute the matrix illustrated in figure 6.1., which depicts the choice of case companies. It helped us search for different types of companies that would either be an exchange platform or maker platform, with private persons or businesses as consumers. We identified several potential case companies as illustrated in table 6.1. and based the final selection of case companies on their representativeness of the category. Thus, we chose the final case companies Airbnb, Facebook, Amazon Business and Predix.

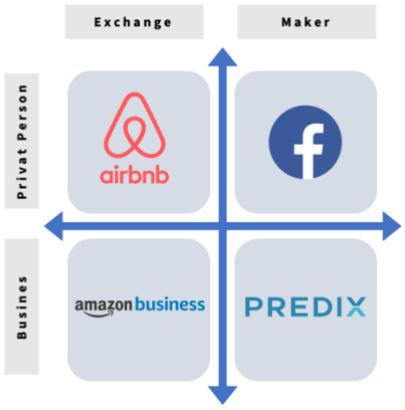
Airbnb constitutes a great example of an exchange platform between private persons because it captures both peer to peer exchange, but also business to private person exchanges. In a similar vein, Amazon Business was chosen because it constitutes a classic case of a B2B marketplace where businesses can exchange products. Predix was chosen as a B2B maker platform because it facilitates sensors that capture data from which insights are extracted and used for creating complementary products/services. The maker is the machine, and the consumer is the company to which the machine is attached. Lastly, Facebook constitutes a good example of a maker platform because it facilitates the architecture and tools for people to stay connected, hence the nature of the consumer is a private person. At the same time, Facebook collects data from the interactions it facilitates for the users, which it uses to attract third parties. Thus, for the maker platforms there is a strong emphasis on data collection and use thereof.

Table 6.1. Examples Exchange and Maker Platforms

	Exchange	Maker
Private person	Airbnb, Amazon, Tinder, Paypal, Ledning Club, IndieFrame, hyve	Facebook, Youtube, Instagram, Tik Tok
Business	Amazon Business, Alibaba, Tradewheel	Predix, Siemens Digital, IBM Watson

Source: self-developed by authors

Fig. 6.1. Network Companies Matrix

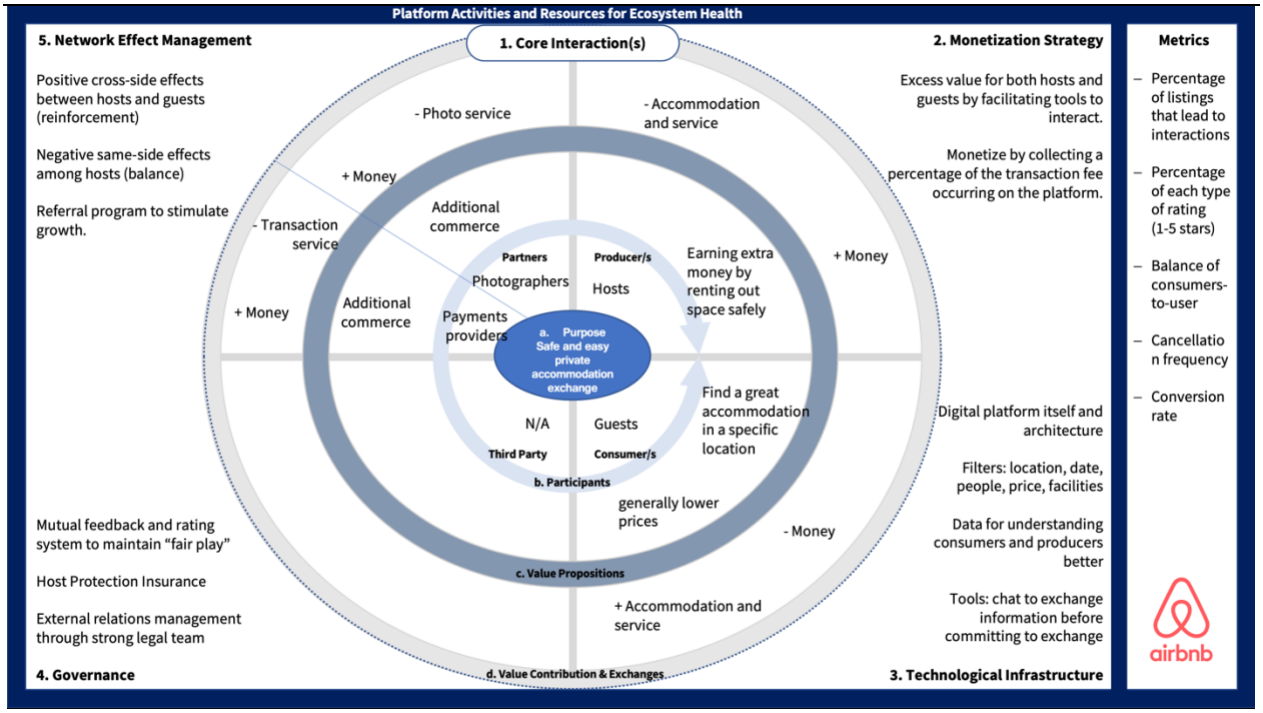


Source: self-developed by authors

6.2 Airbnb Application

Airbnb is a well-known case that falls under the category *exchange platform*, where the nature of its consumers are *private persons*. Airbnb is a vacation rental online marketplace that offers arrangements for lodging, primarily homestays, or tourism experiences. Figure 6.2. illustrates how its business model is applied in the *Compass.*

Fig. 6.2. Airbnb Application



Source: developed by authors

Step 1: The Core Interaction

a. Purpose

We first look into the purpose of the platform. Airbnb believes in the idea that "*people are fundamentally good and every community is a place where you can belong*" (Airbnb, n.d.). Thus, Airbnb strives to make "*a world where anyone can belong anywhere*" (Atkin, 2019). The company follows this mission by creating a marketplace where private persons can easily rent out their home to other private persons that are looking for accommodation in that specific area.

b. Participants

The participants related to the platform are as follows. The hosts are producers because they offer a value - an accommodation. Therefore, the guests have the role as consumers. Nevertheless, Airbnb has some important partnerships that help the core interaction to be realized. These are the payment providers such as PayPal and Apple Pay, but also freelance photographers that were employed in the beginning phases of the platform to enhance the look of the accommodations and thereby attract consumers (Airbnb, n.d.). There are no apparent third parties that seek access to the market created on the platform. However, as the platform has grown, more organized owners of multiple facilities have started using the platform to access the consumers. It can be argued, nevertheless, that these are a type of producer on the platform, as they have the same access and no distinctions in usage exist.

c. Value Propositions

By aggregating a previously unorganized market and untapping the potential of peer-to-peer transactions, Airbnb lowers transaction costs and connects market participants through greater efficiency (Parker et al., 2016). Thus, the platform offers new value propositions to different participants. Whereas for the producers, the value proposed can be *earning some extra money by renting out space safely*; the value proposed for consumers is to *find a great accommodation in a specific location for generally lower prices safely*. There is a focus on safety because AirBnb governs and chooses who can use the platform and who should be excluded, if bad behavior from one side occurs. Lastly, for the key partners is *extended commerce* in their specific field. For example, for payments providers the platform offers revenue based on the transactions it handles, while for the photographers it offers a customer base.

d. Value Contribution and Exchanges

Next, we need to identify the value contribution and exchanges. For hosts, it is evident that they contribute by enlisting the accommodation for rent. Hosts can choose the level of service they want to offer, stretching from providing towels and hygiene products to cleaning services and breakfast. This in turn can affect their ratings which incentivizes hosts to deliver a sufficient service level. For guests, the value contribution is twofold. Guests offer both information and currency. The former regarding the purpose of renting the space, which in turn gives the hosts the opportunity to evaluate whether they perceive it as a safe exchange. The latter is in the form of money when they pay for the rental. For partners, the value contribution is a money transaction space and professional photos to make the platform more attractive. This leads to how value is exchanged and between whom. There is a clear exchange flow between hosts and guests, namely the accommodation going from the producer to the consumer, and the currency going from the consumer to the producer. Key partners also incur transaction fees flowing from Airbnb itself, which constitutes a cost for the platform.

Step 2: Monetization Strategy

To understand the monetization strategy, it is helpful to look back at the value exchange flows. Through these, we identify that there is excess value created for both consumers and producers through access to tools that facilitate the core interaction between them. Both gain a form of value through the mutual rating system, that helps them feel more confident about the exchange. Thus, Airbnb can charge both of these participants, because both experience a form of excess value. Since a transaction occurs between these two parties on the platform, Airbnb charges both hosts and guests by claiming a percentage of the transaction fee.

Step 3: Technological Infrastructure

Looking into the technical infrastructure, the main resource of Airbnb is the digital platform itself and its architecture. The architecture of Airbnb contains filters that facilitate the matching of users when guests are searching for an accommodation. These filters are mainly based on location, dates and number of people, but also more specific ones regarding price and facilities. These filters are crucial to make the platform user friendly, reduce barriers to usage and increase the quality of matching. Moreover, Airbnb takes advantage of the data generated through the platform to better understand both its consumers and producers. For example, Airbnb uses the data and algorithms to help hosts determine the right prices for their accommodation (Marr, n.d.). Lastly, an important tool is the opportunity to exchange messages between hosts and guests before committing to renting or subletting an accommodation. It can be argued that this

tool plays a role in making people feel more comfortable with private exchange of homes (Reillier & Reillier, 2017), which is related to the next point concerning governance.

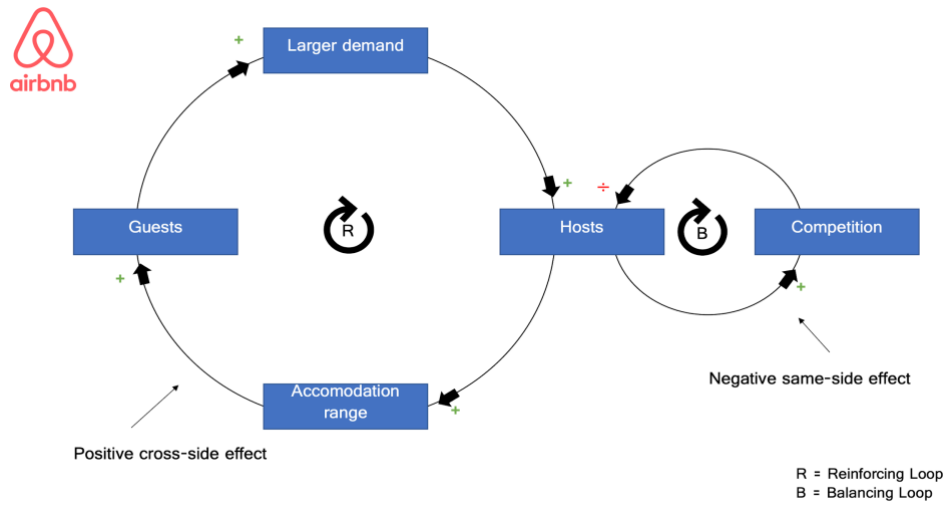
Step 4: Governance

A very important element of Airbnb's governance system is the mutual feedback and rating system between hosts and guests. This helps Airbnb incentivize good interactions and curate users, since bad behaviour leads to bad ratings, which in turn drives out bad users. This is a way to create trust between users, which is critical to both incentivize hosts to rent out their private homes with personal belongings, but also for guests that need to be comfortable entering a stranger's home (Reillier & Reillier, 2017). To further create a sense of trust and security, Airbnb offers its *"Host Protection Insurance"* that acts as the primary coverage for incidents and damages related to an Airbnb stay (Airbnb, n.d.). Another important aspect of the logical infrastructure is external governance in relation to local governments and other potential stakeholders. In fact, Airbnb faces many regulatory problems, which is common in the early stages of major innovations as they are not compatible with existing regulatory frameworks (Guttentag, 2017). Therefore, a key resource for Airbnb is a strong legal team to actively manage legal issues (Carville et al., 2020).

Step 5: Network Effect Management

The growth of the network on Airbnb depends on both producers and consumers, and therefore, the platform focuses on fostering positive cross-sided network effects. This means that more users will attract more producers, and vice versa through a reinforcing effect illustrated in Fig. 6.3. Furthermore, the feedback loop that encourages sustainable engagement in further core interactions can be traced back to the rating system, as every time a guest completes a stay, both guests and hosts provide a star rating and written review. This reinforces action and encourages further engagement, and thereby keeps the users on the platform (Stavem & Presthus, 2017). However, another type of network effect is a negative same-side effect among producers. If too many producers enter the platform, more competition arises, which will in turn decrease the number of producers. Thus, this mechanism helps Airbnb to balance supply, as competition will simply rule out the least favorable suppliers. Figure 6.4. illustrates the different network effects in a causal loop diagram. One way Airbnb stimulates the network effects is through host and guest referral programs that offer a subsidy when users onboard new participants.

Fig. 6.3. Airbnb Causal Loop Diagram



Source: self-developed by authors

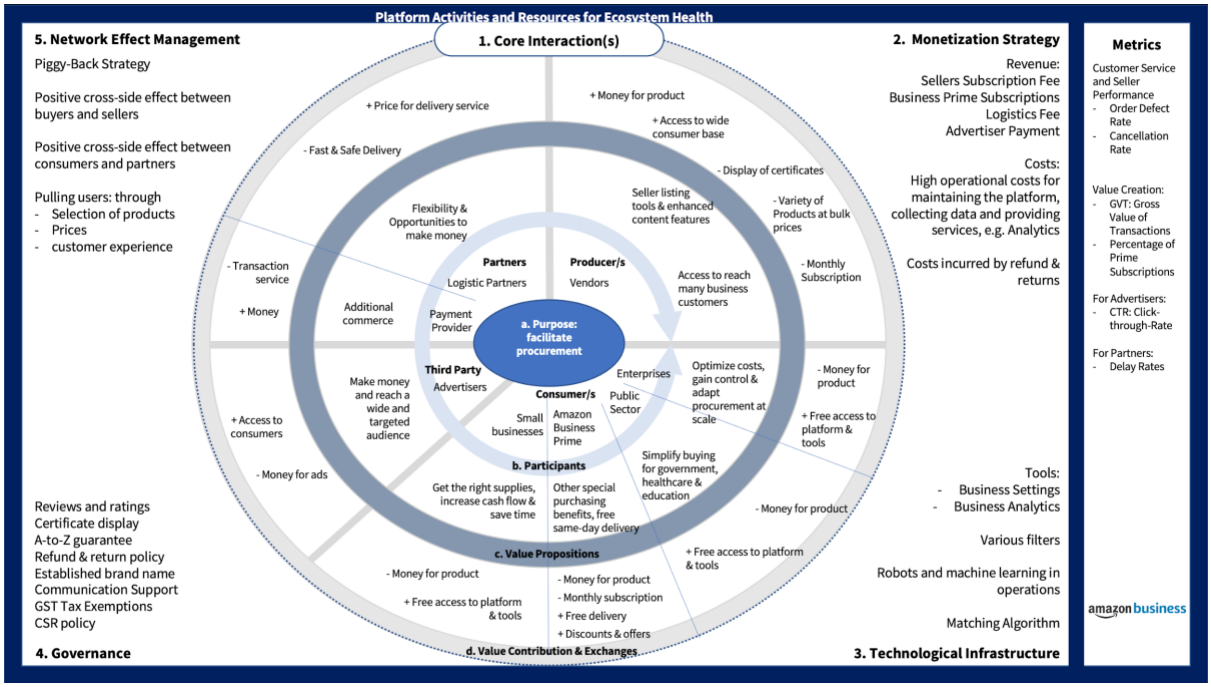
Step 6: Metrics

When identifying relevant metrics, it is important to consider at which stage of the business life cycle Airbnb is. As Airbnb reached more than 150 million users and is present in more than 100.000 cities worldwide, the company entered the maturity phase (iProperty Management, 2020). Therefore, the metrics for Airbnb should rather reflect engagement and innovation. Key metrics could be the *percentage of listings that lead to interactions* and compare it at different points in time. To identify innovation, the platform could use metrics on the data captured within the platform about consumer preferences. For example, through the rating system it could measure the *percentage of each type of rating (1-5 stars)*, and thereby go deeper into analysing what consumers prefer and what discourages them from interacting. This can lead to new features and innovation, such as Airbnb Plus - a more luxurious offering based on the same principle - and reducing the noise of having too many listings to choose from for certain consumer segments (Airbnb, n.d.). Other important metrics are related to factors contributing to sustain the core interactions, such as *balance of consumers-to-users*, *cancellation frequency* and *conversion rate*.

6.3 Amazon Business Application

The next case analyzes Amazon Business representing an exchange platform within business to business industry. While Amazon has a very diversified business model entailing e-commerce, cloud computing, digital streaming, and artificial intelligence (Amzon.com Inc, 2020), the focus lies on Amazon Business, a procurement platform that provides access to business products at special pricing with quantity discounts (Betters-Picaro, 2019).

Fig. 6.4. Amazon Business Application



Source: self-developed by authors

Step 1: The Core Interaction

a. Purpose

Starting with the purpose of Amazon Business, it relates to the parent company's core vision to be "*earth's most customer-centric company; to build a place where people can come to find and discover anything they might want to buy online"* (Amazon, 2020). The mission is to continually raise the customer experience by using the internet and technology to enable consumers to find anything they are looking for, while empowering businesses to maximize their success (Ibid.). Amazon Business is the expansion into the B2B segment, offering a procurement platform (Forrester, 2020). Thereby, the company offers business-only pricing and enables companies to manage their procurement processes.

b. Participants

Looking into the different participants, Amazon Business is open to companies of all sizes. The consumers are generally categorized as buyers, but can be segmented into: enterprises, small businesses, public institutions, and Business Prime members (a premium membership with additional services only available in the U.S., Germany and Japan) (Freedman, 2020). The producer side consists of different vendors, which are required to be able to sell business goods in bulk at discount prices (Ibid.). Concerning partnerships, Amazon Business collaborates with logistics partners like DHL or FedEx in order to be able to meet the

global demand. However, the company also provides delivery itself. In particular, vendors have the possibility to either send products to an Amazon warehouse called "Fulfillment Centre", which falls under the category FBA (Fulfilled by Amazon). Or they deliver products directly to customers, falling under the FBM category (Fulfilled by Merchant). Lastly, Amazon Business offers third parties to place advertisements on its platform.

c. Value Propositions

Defining the value propositions, we see different ones to specific participants. Value proposed to consumers is supplier optimization and cost reduction through access to a wide range of sellers, as well as sourcing insights through detailed data and analytics. Enterprises are attracted by the possibility to *"optimize costs, gain control, and adapt procurement at scale"* (Amazon, 2020). While small businesses can *"get the right supplies, increase cash flow, and save time"* (Amazon, 2020), the public sector is assured to *"simplify buying for government, healthcare and education" (*Amazon, 2020). For Business Prime consumers, special features are included, thus, the value proposition includes savings, convenient shipping, payment terms, and advanced eProcurement capabilities to help guide and manage teams (Forrest, 2020). In a similar vein, Amazon Business offers the producer side access to over 1 million business customers (Amazon, 2020). To reach them effectively, Amazon Business provides tools for listing and pricing (Ibid). In this way, Amazon Business re-intermediates the market and creates new efficiencies by aggregating unorganized markets (Parker et al., 2016). Regarding partnerships, their value proposed is extended commerce through their own delivery systems or by tapping into the logistics of Amazon Business. For third parties, i.e. advertisers, the platform gives access to a wide audience of consumers.

d. Value Contributions and Exchanges

Considering the value contributions and exchange of each participant, the producers contribute with a variety of products at competitive prices. In exchange, they receive money and access to all the tools the platform provides, i.e. display of products, certificates. Furthermore, for producers there is a monthly subscription fee of currently $39.99 (Amazon, 2020). Similarly, the consumers have access to a wide range of vendors and pay for the products. In addition, Business Prime users gain access to special features such as access to free delivery, discounts and member-only offers (D'Angelo, 2020); in turn they are charged a subscription fee. There are five different Prime subscription packages with varying degrees of services, which gives consumers the chance to buy the best subscription according to their needs (Amazon, 2020). In case of the logistics partners, they contribute with fast and save delivery in exchange for money. Lastly, for the third parties the value contribution is advertisements, which they exchange for a fee to access consumers.

Step 2: Monetization Strategy

The next aspect is concerned with the monetization strategy. It is essential to identify where the excess value lies for participants in order to strategize whom to charge. Both producers and consumers have access to tools and services (e.g. pricing guidance, analytics, dashboard overviews) that facilitate and enhance the quality of interactions. Thus, Amazon Business is able to charge for enhanced access, access to a community and enhanced curation. On the one hand, the producers' excess value lies in the access to a large market, which they pay a subscription fee for. In this way the producer side subsidizes the consumer side, which enhances the growth of the consumer side, and thus facilitates network effects. On the other hand, consumers can join the platform for free, however, by charging *Business Prime* members for enhanced features, another revenue stream is created. For the logistics partners, if companies can choose to sell through FBA agreements, a fee is paid to Amazon Business. In addition, the company charges third parties for placing advertisements as they get access to a big consumer market (Lee, 2019).

Step 3: Technological Infrastructure

In the technological infrastructure the platform itself constitutes a key resource. It encompasses essential tools for the production of the different value units such as payment processes and display of products to enable matching. However, as Amazon Business is a hybrid model, it also offers off-platform services such as inventory management and shipments tracking (Better-Picaro, 2019). However, Amazon Business tools can further be divided into (1) business setting and (2) business analytics. The former includes among other things the establishment of order-approval procedures and spending caps, or saving preferred suppliers (Amazon, 2020). The latter enables companies to see charts and other infographics that track and monitor business spending. By collecting all the relevant data, Amazon Business can offer its customers customized spending reports to track procurement metrics and to identify purchase trends and opportunities in order to consolidate and reduce wasteful spend.

In addition, efficient algorithms and filters enable matches between the right participants. For instance algorithms enable relevant listings to be shown first, while filters allow consumers to manually compare alternatives e.g. across different price ranges. Additionally, customers can create purchasing lists for different categories, departments, or functions and reorder items in a single click. Moreover, the company uses artificial intelligence to support e-commerce forecasting and integrates robots like "Pegasus" or "Xanthus" in its newest fulfillment center (Condon, 2019). Hence, automation plays a key role in Amazon's operations, e.g. the company uses machine learning in its fulfillment centers to forecast what customers are ordering and to improve efficiency and speed.

Step 4: Governance

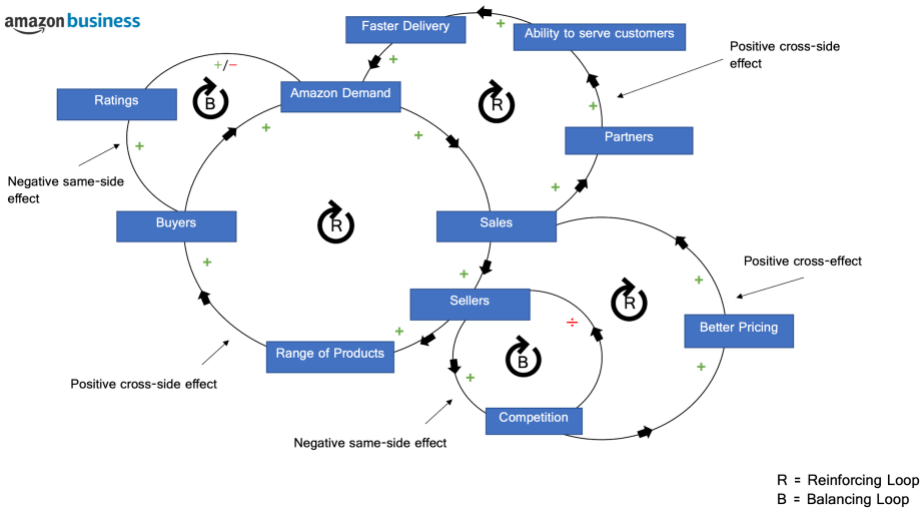
Considering *governance*, a key component to reflect on is how platforms build trust between participants, which is critical for their successful scaling especially when high volume transactions occur (Reillier & Reillier, 2017). There are a couple of mechanisms that Amazon Business employs to govern behavior and enhance trust. First, the platform collects and displays relevant data, i.e. seller certificates on products which increases trust between participants. Second, it leverages the already well-established reputation, which guarantees a certain level of trust. Third, the platform offers a reviews- and rating system that curates interactions. Fourth, Amazon Business protects customers with an "*Amazon A-to-z Guarantee*", that holds when items are sold and fulfilled by a third-party seller (Amazon, 2020). In terms of controlling mechanism, only registered businesses can sign up as sellers, thus creating a small entry barrier (Amazon, 2020). In order to mitigate the risk of bad customer experiences, Amazon Business offers communications support between merchants and buyers and a dispute resolutions center (Reillier & Reillier, 2017). While sellers and buyers can interact directly, Amazon Business acts as an intermediary to manage disputes and excerpt greater control of the customer experience (Ibid.). As Amazon Business offers to levy the "Good and Service Tax" at all stages, it must manage external stakeholders like tax offices and comply with governmental regulation. Since Amazon is a mass employer with global reach Amazon must consider investors' interests on the financial performance of the e-commerce business, but also address governmental and union's interests regarding consumer protection and international retail (Ferguson, 2017).

Step 5: Network Effect Management

Regarding network effect management, it could be argued that the typical chicken-and-egg problem was not so difficult to overcome as Amazon Business could leverage the existing platform to pull participants, resembling a so-called piggy-back strategy (Parker, Alstyne, & Choudary, 2016). Generally, consumers are attracted to the platform due to a great selection, competitive prices and an excellent customer experience. Then, more buyers attract more sellers, which lead to positive feedback loops leading to positive cross-side network effects. Through the rating system, balancing mechanisms come into effect as more buyers lead to more ratings which affect demand for specific products. In addition, the higher the demand and sales volume, the more logistic partners are pulled to the platform, which impacts Amazon Business' ability to serve its customers, leading to faster and more reliable delivery, which creates a positive reinforcing loop. Furthermore, the more sellers join the platform, the higher the competition is. On the one hand, this creates balancing effects, and on the other hand, the heightened competition leads to positive impacts on the pricing, which in turn creates higher sales. As illustrated in Fig. 6.5. These feedback loops can spread across the entire ecosystem, creating linkages of producers, consumers, business partners, and other stakeholders

(Cusumano, 2019). By having a vast number of sellers, additional services and logistics in place, Amazon Business tries to lock-in its participants to conduct all procurement exchanges on the platform while also giving the freedom to partners to integrate their business into their platform, e.g. through FBM agreements.

Fig. 6.5. Amazon Business Causal Loop Diagram



Source: self-developed by authors

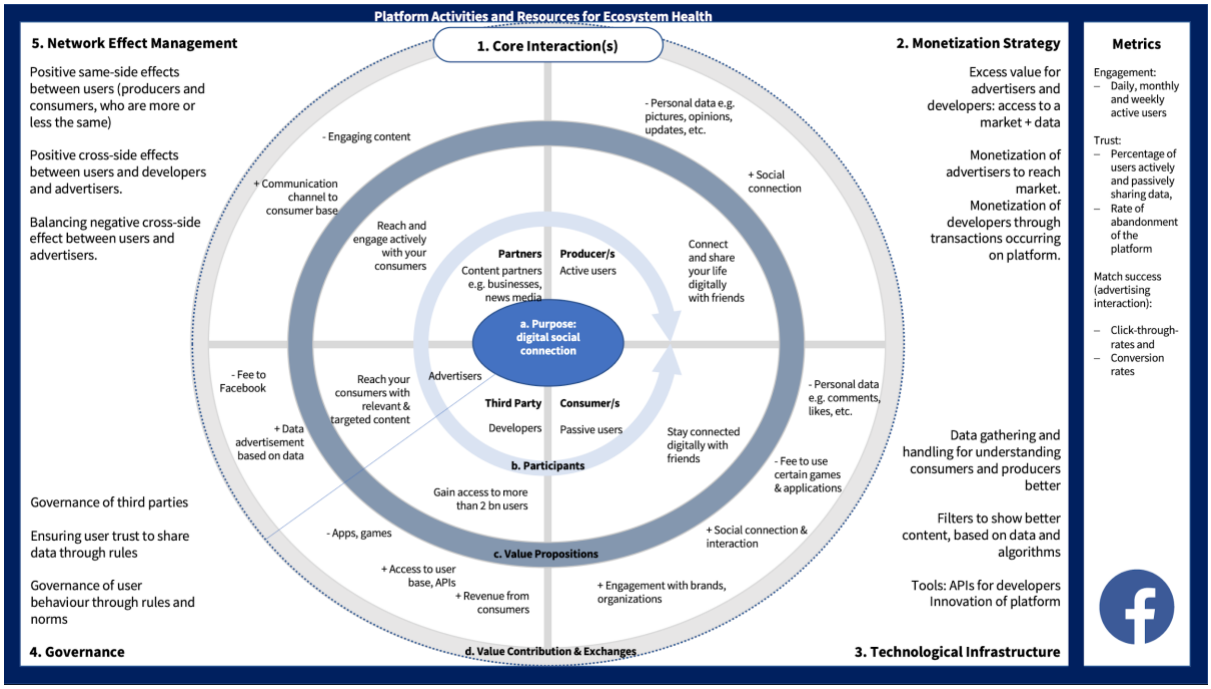
Step 6: Metrics

Finally, to measure performance of the business model, relevant *Metrics* must be identified. Considering the business life cycle, it can be argued that Amazon Business is already in the maturity phase due to its high numbers of participants, sophisticated features and market presence. Instead of measuring growth, Amazon Business focuses on the customer experience to improve its service and sustain interactions. For example, metrics that indicate the seller's performance are the *Order Defect Rate* (ODR). In short, any order that has negative seller feedback, an A-to-Z claim, or a credit card chargeback is considered as having a 'defect'. The ODR is calculated by dividing the number of 'defect' orders by the total number of orders over a certain time period. Alternatively, the *Cancellation Rate* is all seller-cancelled orders represented as a percentage of total orders during a 7-day time period. Moreover, to keep track of the value creation, Amazon Business measures *Gross Value of Transactions* (GTV). The GTV is equal to the number of items sold multiplied by the price collected, thus revenue is equal to commission earned. In order to keep an eye on the Prime user, Amazon Business may calculate the number of Prime users over the total number of consumers to see if their value proposition is appealing enough. For advertisers click-through-rates indicate the advertising performance and for the logistics partners delay rates measure effectiveness.

6.4 Facebook Application

The next case analyses Facebook's social networking business model, representing a maker platform that facilitates interactions between private persons and businesses.

Fig. 6.6. Facebook Application



Source: self-developed by authors

Step 1: The Core Interaction

a. Purpose

Facebook is a social network that was initially established and launched for students at Harvard University, but is now a worldwide network containing more than 2 billion users. Its mission is "*to give people the power to build community and bring the world closer together [...] to stay connected with friends and family, to discover what is going on in the world, to share and express what matters to them*" (Facebook, n.d.). Facebook brings this mission to life by facilitating a platform that allows people to share life updates, pictures and other personal information digitally with one another. Therefore, it can be argued that the purpose of Facebook is to facilitate *digital social connection.*

b. Participants

The array of participants on Facebook is broad. The main users on Facebook are private persons that engage in social connection digitally. The interesting thing is that they can play both the role of consumers and producers of content on the platform. While some of these users are more active in producing content in the form of pictures, updates, etc., some are more inclined to consume it. Therefore, we distinguish here between active and passive users as producers and consumers, respectively. Nevertheless, depending on the interaction, these participants can easily switch sides from being a producer to consumers, and are therefore not tied to a specific role. Another important participant are the key partners, which can be content creators such as businesses, news media, and other types of organizations. They are important because they create content that private consumers can engage with, allowing for a different type of interaction namely to communicate and engage with their favorite brands and organizations. Thus, it creates further incentives and may enhance stickiness to the platform. The great user base and data generated by them in turn attracts third parties such as advertisers and developers.

c. Value Propositions

The value propositions for the participants are diverse, but some have more in common than others. For both the producers and consumers of the platform that often switch roles, the value proposition is highly based on staying connected with friends digitally with an emphasis on sharing and following one another's lives digitally. For the key partners, the value proposition is the ability to reach and engage actively with their respective consumers. Thus, the large number of private consumers on the platform attracts these content providers because they gain a communication channel to their target consumers. For the third parties, the attraction to the platform comes from different sources. Thus, for advertisers, the value proposition is to reach their consumers with targeted and relevant content, which is made possible by the large amount of data shared by the users. For the developers, the value proposition is to gain access to a large potential consumer base that can engage with different types of revenue generating applications and games.

d. Value Contributions and Exchanges

The participants all contribute with different values that are exchanged between them. The main value contribution that both producers and consumers bring is personal data derived from the shared content, such as pictures, updates, opinions, and engagement in the form of likes, comments etc. In turn, they gain social

connection with one another, and thereby value is exchanged between these two groups. When we look into the partners, the main value they contribute with is engaging content for the consumers, which can be links to articles, competitions, and events among other things. The value they gain from the platform is access to communicate with interested consumers, while they create value for Facebook by engaging the consumers even further. Lastly, for third-parties like developers, the contributed value are the applications and games that consumers like to use. Some of these applications have paid content that some consumers use, giving them a fee in return. The advertisers on the other hand contribute with relevant and targeted ads on the platform, that is made possible by the large amount of personal data about preferences that consumers share on the platform.

Step 2: Monetization Strategy

Looking back at the exchange flows and value propositions, we can identify where excess value is created and whom Facebook therefore monetizes. It is clear that value is created for both consumers and producers, however these also have a high sensitivity which means that charging them would drive them away from the platform. Instead, Facebook has identified that exactly this larger user base and data derived from the interactions constitutes a very big excess value for third parties, in particular advertisers. They firstly gain access to a market, but also detailed information which allows for targeted marketing. Thus, Facebook charges advertisers a fee for accessing consumers. But the data plays a crucial role in these exchanges because it enables better and more targeted content, which in turn creates an excess value. Nevertheless, Facebook also monetizes indirectly from developers as some of the applications have paid content Facebook can monetize a percentage of the transaction amount, when consumers purchase on the platform.

Step 3: Technological Infrastructure

The main component of Facebook's technological infrastructure is based heavily on activities related to data gathering and handling. Thus, a key resource for Facebook is to have the capabilities to handle data. This is connected to the monetization strategy of the platform, as it uses data analytics to understand the consumers and producers better to be able to help advertisers create content and target the right people. Nevertheless, the data aspect is also valuable in relation to service consumers and producers. The data is used to feed the algorithms that decide the content that is shown to consumers – both from advertisers, but also from producers and partners. Thus, Facebook uses data to predict what content a consumer would enjoy (Barnhart, 2019). This is also related to the filters that Facebook provides. They are not based on

consumers' active choice, like in the case of Airbnb, but are based on the data and algorithms (Ibid.). Through the data Facebook discovers what people like and dislike about the platform and therefore constantly innovates the interface and its offerings. Lastly, another crucial point under the technological infrastructure is related to tools. Facebook has opened its platform to third parties by having rather open access to Application Programming Interfaces (API) so that developers can build applications. However, due to scandals such as the one related to Cambridge Analytica, Facebook is cutting down on the amount of personal data that third-party developers can collect from the users (Schroepfer, 2018).

Step 4: Governance

For Facebook, governance is much related to the technological infrastructure due to the importance of data. In the first place, it is vital for Facebook to have trust from the users, because lack of trust can lead to abandonment of the platform. Therefore, the company has a clear description of its terms of use and policies, where they state that to be able to receive the benefits of Facebook for free, you accept that they can use personal information such as your activity and interests to advertise relevant content paid by third parties (Facebook, n.d.). Furthermore, the company emphasizes that personal information is not directly sold to third parties, but only used by Facebook to determine the right target group of advertisers. Therefore, users are kept anonymous and not revealed to these third parties (Ibid.). In this context, a key activity for Facebook is also to manage third parties and ensure there is no misuse. This is especially something that has gained focus after the Cambridge Analytica scandal where data was misused to target voters in an election (Granville, 2018).

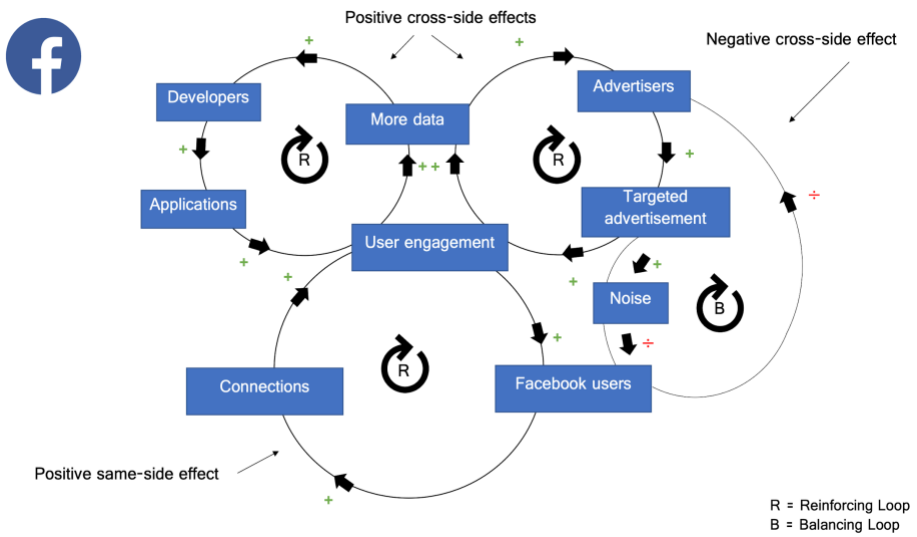
Another aspect is governance of the content that is shared when inappropriate. Facebook has developed and codified some clear community standards that are part of the company's terms of use. The company clearly states the type of behavior that is not tolerated, and which leads to consequences in using the platform, such as pornography, violence, criminal behavior, etc. (Facebook, n.d.). To this, Facebook cultivates norms to encourage users to report this type of behavior to the platform. Furthermore, the company is also internally working on detecting inappropriate content by having hired a large pool of content moderators who have the job of finding and reviewing objectionable material (Nieva, 2018). Nevertheless, the company is also investing in AI technology and capabilities that can aid the process of detecting this type of content (Ibid.).

Step 5: Network Effect Management

Facebook's network has evolved highly since its launch and has attracted different interested parties, reflecting different types of network effects. However, the main effect from the initial stages is a positive same-side effect between regular Facebook users, which we have sorted into producers and consumers that switch sides easily. Therefore, Fig. 6.8. shows a reinforcing loop where more users lead to more connections and higher engagement, consequently attracting even more users. To grow the platform and overcome the chicken-or-egg problem in the initial stages, Facebook followed a micro market strategy in the beginning by first launching at Harvard. This entailed that the company started by targeting a small market that already had people engaging in some sort of interactions, that allowed for the creation of a platform with an active community (Parker et al., 2016). Thus, Facebook avoided sign ups from many random unconnected users, and rather focused on a network with strong interactions. Thus, when they started the expansion, they focused on creating connections in smaller communities, followed by connections across these smaller networks, which allowed for strong growth (Ibid.)

Today there are more than 2 billion users on the platform, making Facebook a well-known brand that is chosen to connect socially online. This large user base has attracted the aforementioned third parties, reflecting cross-side network effects. The high frequency of user engagement leads to large amounts of data about the users, which attracts both advertisers and developers. These in turn create more engaging content in the form of applications and targeted advertising, which leads to even more user engagement, reflecting a reinforcing loop. However, in relation to the advertisers, too much advertising can also create noise on the platform for the users, who in turn can avoid using or abandon the platform. Therefore, it has a balancing effect on advertisers, since fewer users will attract less advertisers as reflected in Fig. 6.7.

Fig. 6.7. Facebook Causal Loop Diagram



Source: self-developed by authors

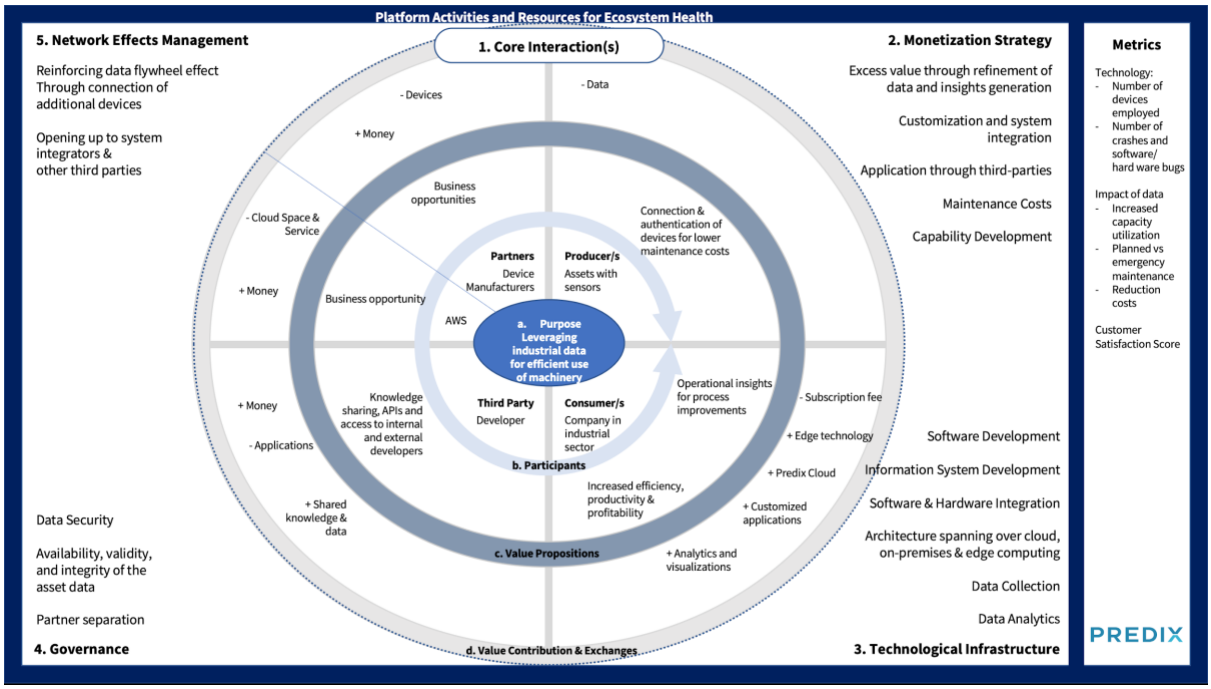
Step 6: Metrics

In relation to the *metrics*, it is important to consider that Facebook has for a long time been in the maturity phase of the business life cycle, and thus constantly innovating and reshaping the offerings on the platform. Nevertheless, the company has been able to attract many different interested parties and build additional core interactions on top of connecting people. Therefore, it is important for Facebook to measure engagement among the main users through metrics such as *daily, monthly and weekly active users*, and see how this evolves and whether new features are needed. But another important aspect for engagement is trust, because the platform depends on people's willingness to share data. Therefore, a key metric could be the *percentage of users actively and passively sharing data*, but also *rate of abandonment of the platform*. Furthermore, as advertisers are the main revenue providers for Facebook, it is important to measure the matching quality in the sense of *click-through-rates* and *conversion rates* for advertisements.

6.5 Predix Application

This section applies the Compass to Predix, a Platform-as-a-Service (PaaS) company by General Electrics (GE) which stands for predictive capability. It is a cloud service platform based on monitoring and analytics of industrial equipment (Ju, Kim, & Ahn, 2016). Thus, it constitutes a maker platform with the consumer being businesses.

Fig. 6.8. Predix Application



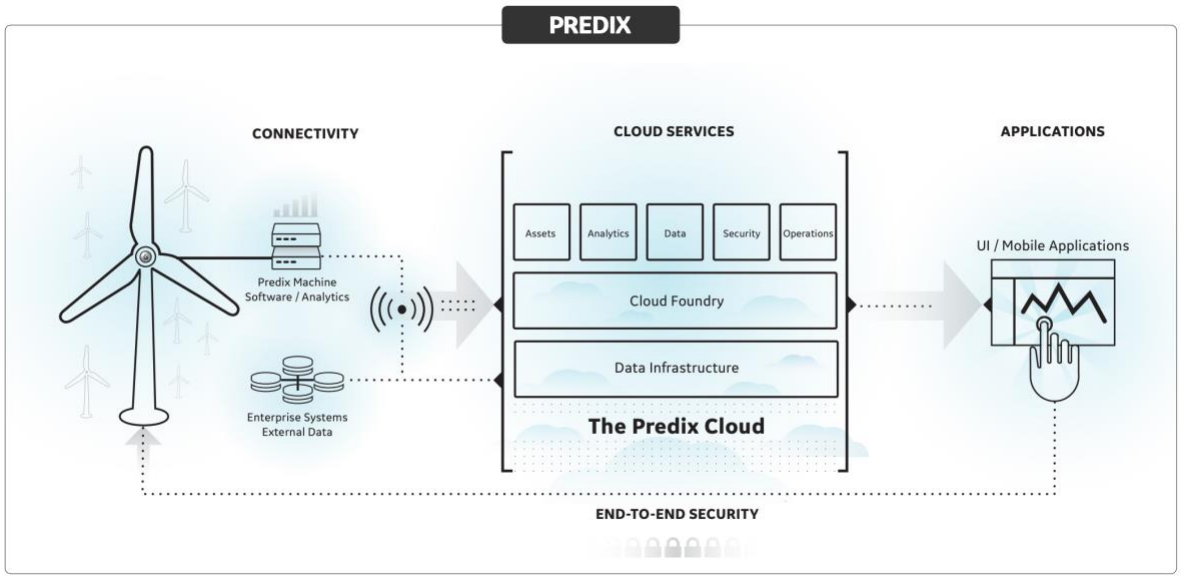
Source: self-developed by authors

Step 1: The Core Interaction

a. Purpose

Predix is GE's attempt to face its competitors in cloud computing, i.e. an example of a traditional pipeline trying to establish a new platform business model (Cusumano, Gawer & Yoffie, 2019). In its core, Predix is a solution for industrial monitoring. It connects directly to industrial sensors and controllers, which allows for local data processing sent to the Predix cloud. There, data is centralized, analyzed, and insights visualized. Therefore, Predix's *purpose* is to connect machines for data capture and thereby leverage the volume, velocity, and variety of machine data in a secure, industrial-strength cloud environment. Through analysis of this data, Predix can deliver personalized and customized IIoT products or services that can help companies in maintenance or optimization of machines (Ju, Kim, & Ahn, 2016). As Predix can also be integrated with services on other cloud platforms, it can be seen as a marketplace of an IIoT ecosystem that enables different stakeholders of the ecosystem to participate in value creating exchanges.

Fig. 6.9. Overview of Predix platform



Source: GE Digital, 2020

b. Participants

As IIoT platforms combine the physical world with the digital one, they foster cooperation between participants from different domains with a wide variety of interests (Schladofsky, et al., 2017). Yet, the fundament of an IIoT ecosystem is the "thing", i.e., the sensored physical entity that communicates information (Ibid.), which is therefore the *producer* of the value units. The *consumer* side consists of companies that use the data to optimize their processes, who own the machines that produce the data. Thus, the consumer and producer are the same entity in the case of Predix. The industrial focus is on: utilities, renewables, aviation, oil and gas, food and beverage, chemicals, consumer packaged goods, and mining (Hardesty, 2018).

The partner side is more complex as the development of such sophisticated technology requires different skills and capabilities. Predix partnered with various competitors such as IBM, SAP and Microsoft to bring together software developers, data analysts, and device security experts (databahn, 2017). For example, Intel and GE partnered to bring Predix to more industries on Intel powered devices. The aim was to connect operations of industrial companies that use Intel chips to Predix. Moreover, an important partner is Amazon AWS as it hosts the Predix platform. Due to their extensive collaborations, we focus on AWS and device manufacturers as partners. Concerning third parties, Predix was intended to be a digital platform for third-party developers. However, all the software built around Predix was from GE's paid partners or internal

business units (Digital-Adoption, 2019). Opening up to third-party developers could create a lot of value for their end customers (Moazed, 2018). However, calibrating the right level of openness is a complex and critical decision, because it affects usage, developer participation, monetization, and regulation (Parker, Alstyne & Choudary, 2016). Concerns arise due to control over intellectual property; however, openness also encourages innovation, which is crucial in the case of Predix.

c. Value Propositions

Regarding the value proposition, Predix's cloud solution generally promises to improve convenience, performance and customization. First, the unity of consumers and producers – the companies - gain operational insights that lead to better team collaboration, process improvements, cost savings and product enhancements through increased efficiency, productivity and profitability. This is due to the fact that consumers can centrally monitor assets and data, analyze anomalies and alerts, and thus use the data views for better decision taking. For example, predictive analytics can detect corrosion inside a refinery pipe, providing real-time production data to uncover additional capacity in a plant, or accelerating new product development by feeding operations and service data back into the product design cycle (Bowen, Goel, Schallehn, & Schertler, 2017).

For partners, i.e. external device manufacturers or AWS, the value proposed is to tap in to additional business opportunities. Lastly, third party developers may be attracted by the knowledge sharing activities that are facilitated through open innovation, but also to gain access to collaborate with internal Predix developers and other external developers.

d. Value Contribution and Exchanges

In terms of value contribution and exchanges, the machines produce the crucial data through the sensors. The price is paid by consumers, who have the choice of choosing between professional, premium and enterprise packages (LaChance & Seay, 2017). In exchange, the consumers gain access to the Predix cloud, customized applications, analytics and visualization of data and Predix edge technology. Customers decide to buy additional services depending on the type of devices that have to be connected or modeled, and the type of data that needs to be collected off devices. Depending on how companies transfer data to the Predix cloud (LaChance & Seay, 2017), third party companies have the opportunity to deliver services such as building additional applications on the Predix cloud (LaChance & Seay, 2017). This becomes interesting for third parties, because they can develop and monetize these applications. Predix's partners contribute with capabilities that the company does not own. Thus, device manufacturers, like Intel, provide sensors to

connect machines to the cloud. In return, they receive money, but also receive business opportunities. Furthermore, AWS provides the cloud space for Predix and in return receives money.

Step 2: Monetization Strategy

Directly linked to the value contribution and exchange is Predix's monetization strategy. The excess value on the platform is created by the incoming industrial data, however, what makes it valuable is the system and refinement of it. This enables Predix to monetize its data ecosystem. First, consumers can be charged for the access to value, as they use data insights for optimization. Additionally, Predix monetizes its cloud and application system, as it provides access to enhanced tools and services. Connected to the data analytics, customers are charged for storage options and visual data output (i.e. PC, smartphone, tablet, etc.); and integration of operational databases to Predix (CRM, ERP, etc.).

Step 3: Technological infrastructure

The technological infrastructure of Predix is highly complex because of the complexity of the architecture. Key resources and activities linked to the technology are for example development of the software, information systems and access to the customer resources and data. Thus, activities for the platform include product and platform development, and the integration of external resources and software. This means that application development must be facilitated, as Predix claims to deploy an architecture that spans cloud, on-premises, and edge computing (GE, 2020). Moreover, data collection and analysis are the key factors for the IIoT business model, which requires capabilities that enable machine-to-machine communication with industrial big data analytics. However, a potential conflict might arise of third-party development, namely the maintenance of platform control and the transfer of design capability to third-party developers (Ghazawneh & Henfridsson, 2013).

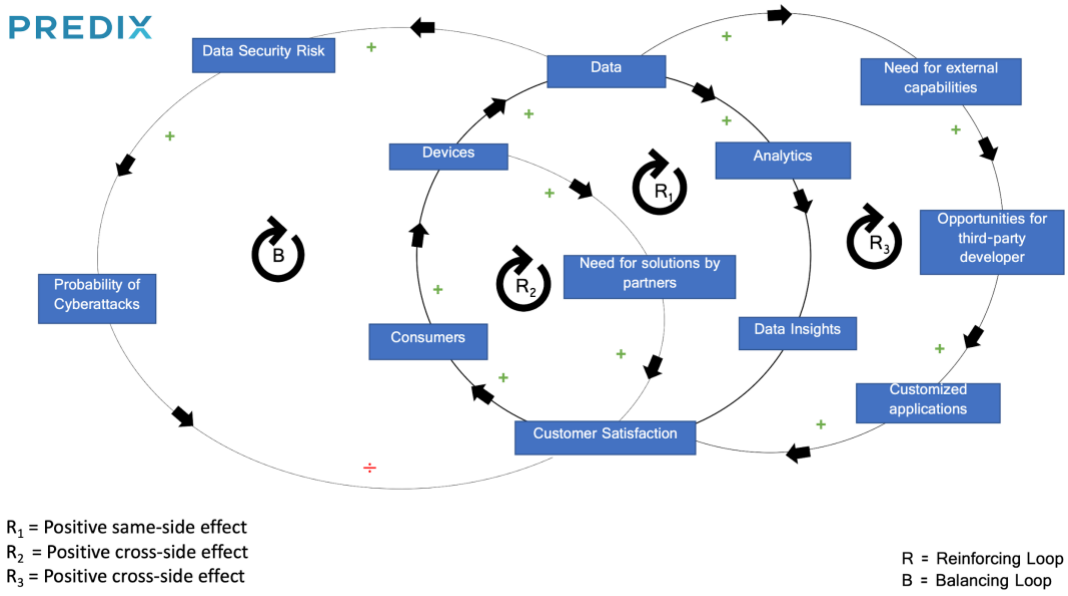
Step 4: Governance

The technical infrastructure and governance seem highly interlinked, as Predix is governed by a technical structure defined through design. However, one of the key concerns is data governance and security for operational data. Predix has to ensure appropriate data policies and security measures to avoid conflicts and risks. Security measures must be designed into the platform, forming a continuously monitored, protected platform for operators. Thus, Predix must guarantee the availability, validity, and integrity of the data, especially since sensitive data is shared within a multi-system integration. In terms of external stakeholder management, Predix must comply with regulatory and international security standards as well tenant data segregation.

Step 5: Network Effect Management

Looking into network effect management, IIoT is growing twice as fast as the consumer Internet (Bowen, Goel, Schallehn, & Schertler, 2017). The IIot ecosystem is changing from a closed to an open networked ecosystem that takes advantage of the data network effects (Ibid.). The reason behind is that digital ecosystems, like Predix, enable unprecedented data accumulation and analysis, driving improvements to products and business processes, spurring further growth and data access (Russo & Albert, 2018). This is illustrated in Fig. 6.10, as more consumers grant Predix more data, which enables better analytics and predictive capabilities. This ultimately enables a better offering of products and services, which in turn attracts more consumers. In turn, we also see a balancing effect as more data leads to higher data security risk, which can be an offsetting factor for consumers. Furthermore, the larger amount of data in the system creates a higher need for external capabilities coming from third party developers, creating a more customized offering to consumers leading to greater customer satisfaction and hence growth. On the partner side, the larger number of consumers and sensory devices attracts more partners to offer solutions and higher customer satisfaction resembling a reinforcing effect.

Fig. 6.10. Predix's Causal Loop Diagram



Source: self-developed by authors

It is important to furthermore consider that digital ecosystems typically grow within the boundaries of existing industry structures, which can be seen through the partnership between Predix, AWS and industrial companies. Thus, the question arises how can Predix scale and stimulate growth and data network effects. One way is to connect additional devices to their IoT service or expand the solution to more business units, which would however remain an internal solution for one organization. Opening up to other system integrators or third parties increases the value of the solution (Russo & Albert, 2018). Providing access to data and exposing the APIs may raise security risks, but with the right protections in place, it also attracts external developers who will contribute valuable applications to the platform (Ibid.).

Step 6: Metrics

The last step is to look into key metrics of organizational performance and success. As Predix is neither in the initial stages of the business life cycle, but has also not completely established itself in potential markets, the following aspects appear important to measure. First, it is important to measure the technology and understand how the hardware and software is performing, e.g. the *number and type of devices deployed*, *number of crashes*, *software and hardware bugs*, and *number of devices running on old software*. Then, it appears important to measure the product performance, i.e. how the customer is engaging with it. This also includes support functions, such as customer satisfaction scores. Related to this is the actual impact the platform provides to customers. More specifically, going beyond just measuring the technical delivery, but also the service, such as the actual *reduction in costs for customers* or *maintenance*. This however depends on the customers and their particular assets and processes that are being optimized.

6.6 Validation of the Artifact

This section synthesizes the applications of the model with the purpose of discussing its validity. This artifact validation adds rigor and robustness to the work, and ensures reliability of the generated results (Dresch et al., 2015). The underlying question driving the validation is "*How well does the artifact capture the business models in the applied cases?"*. We acknowledge that we have limited access to information in each case, why we cannot capture each business model in its entirety. Yet, we researched each case in-depth based on available sources, and evaluated the artifact based on following criteria, also illustrated in table. 6.2:

- Feasibility: what is being proposed can indeed be implemented
- Flexibility: what is being proposed is adaptable to different contexts
- Convenience: what is being proposed is user-friendly in its application

To evaluate the criteria, it is relevant to consider the problem formulation and research question, which indicate that the aim of the artifact is to constitute a useful framework for managers to define and document platform business models. Looking back at the literature review, the artifact incorporates the main building blocks for platform business models, such as the core interaction, network effects, monetization strategy, governance and technological infrastructure in an attempt of creating a holistic picture of a platform business model. When applied to the different cases, it generally gave a rounded picture of the business models of the case companies, and the interplay between the different components.

Table 6.2. Summary of Case Validation

Companies	Airbnb	Facebook	Amazon Business	Predix
Functionality	- Covers the main aspects of the business model - Does not include Airbnb plus or luxe	- Covers the main interactions and aspects of the business model - There are more core interactions that model does not capture	- Fits well, but does not capture entire business model - Amazon Business is just one part in the overall business model of Amazon	- The model does not spark any discussion around competitors - Capture business model well
Flexibility	- Business model is well captured by the framework - Simpler case compared to other platforms	- Capture well to a certain extent (not whole complexity)	- Does not capture that Amazon is a hybrid: does take an active part in value creation - Own assets such as logistics	- Flexible as it captures well how machines act as producers - Example of pipeline business transforming into platform
Convenience	- Very convenient visual - Would cause confusion/noise if more customer segments (e.g. Luxe) were added	- Networked perspective was valuable to understand different stakeholders	- Difficult to fill in for complex models due to many segments, value propositions etc.	- Allows to simplify complex business model and makes it more understandable

Source: self-developed by authors

However, one general observation when the model was applied, was that it gave a rather simplified version of the business models. For example, it did not necessarily cover *all* the core interactions and related stakeholders. This was seen in the case of Facebook, as it mainly covers the core interactions between users and third parties, while Facebook in fact facilitates a plethora of interactions. This issue may have arisen out of convenience for the visual application, as it would have created noise if all the different interactions were included. Thus, there was a focus on what was perceived as the main core interactions for the business to create value. However, for a company like Airbnb, which constitutes a rather simple case of a platform business model with less types of core interactions, the artifact captured the business model well. Thus, it can be argued that the convenience of the model is higher, the simpler the actual business model is. This seems to create a tradeoff between convenience and functionality.

Another critique is that it was difficult to capture the complexity of some of the models, challenging its flexibility. For example, for Amazon Business the framework failed to capture the entire business model, because the company's infrastructure goes beyond the digital and technological, but also includes physical resources such as warehouses, delivery vans and even cargo planes (McBride, 2019). Thus, it is lacking an element that captures other resources than those related to technology, governance or network effects, which is relevant for cases of "hybrid" models like Amazon Business (McAffe & Brynjolfsson, 2017). However, in the case of Predix which operates a complex business model due to the machine data generation focus, the framework proved to be flexible in capturing how these are incorporated through the element participants. Furthermore, the framework gave a good overview of how the machines interact with agents and contribute to the core interactions. In addition, as the framework was applicable to Predix, which is a spin-off from GE, the framework seems to be applicable also to pipeline companies transforming or expanding into platform companies. Moreover, it aided to visualize a complex business model into a simplified version, which has additional value when communicating to external stakeholders. Thus, the flexibility of the framework depends on the stretch. The more it is related to the platform owning value creating assets, the less flexible it is. But if the differentiation is rooted in technology, the model is flexible and captures the connections between the elements. This is highly related to the fact that the framework differentiates from the original BMC by taking a network perspective to value creation instead of a value chain one.

6.6 Sub-Conclusion

Summarizing the findings from the application and validation of the framework based on the three criteria, the Compass seems to be a useful framework, successfully capturing the various business models to a certain extent. First, the functionality is highly dependent on the complexity of the business model, which hence impacts the convenience. The more complex the model is in terms of having many core interactions, the more difficult it becomes for the framework to capture the business model holistically. In line with this, a higher level of complexity in the business model also reduces the convenience of using the visual. Thus, it becomes more convenient if complexity of the business model is reduced in use, although this challenges the functionality. Therefore, there is an inevitable tradeoff between functionality and convenience. Lastly, the flexibility of the model depends on the type of context it is applied to; the analysis showed that it for example is not very flexible towards hybrid business models such as Amazon Business that both have components of platform and pipeline business models. However, in the context of different points of analysis, i.e. whether the platform connects units/people or is based on data generation for interactions, the framework was highly flexible in capturing either scenario.

7

INDIEFRAME DISCUSSION

Having validated the final artifact, this section is dedicated to applying the framework to the case company IF in an attempt to solve its problem of defining its business model. This is followed by a discussion about the framework's added value, addressing the second part of the research question.

7.1 Business Model Assessment of IndieFrame

This section applies the Compass to IF to help the company define its current business model, and thereby aid the managers to identify which elements and the combination of those may be important for the company's success.

Starting with the *Purpose*, IF's mission is twofold; 1) to create more authentic and democratic news flows, and 2) to make user-generated content the new normal for media companies (IndieFrame, 2020). Thereby, the company aims to create a global network of voices, where both the general public and professionals can share content, such as stories and graphics, with the mainstream media leading to better news stories in a faster pace (Ibid.). Currently the participants are mainly consumers and producers. The consumer side consists of news media companies and agencies like ARD, ZDF, Greenpeace, and Axel Springer, but IF also appeals to professional companies in need for graphic content for commercial use (Ibid.). On the producer side, IF attracts two types of segments; professionals and the regular public. Professionals can be even further segmented into journalists and photographers, for example freelancers looking to sell their work. However, IF is not simply a freelance platform, as the main mission is to give a voice to the general public and therefore regular people can join the platform as producers if they have some interesting content to share. Currently, IF does neither have any partners nor third parties on the platform.

The *Value propositions* are distinctive for each participant and segment. First, for the general public, the value proposition is to gain a *voice in the media landscape*. This is especially relevant in countries with higher rates of corruption, where the general public can have difficulties to be heard. For example, the platform launched in Romania where people were more receptive because of the higher corruption level in

the country (Valsted, personal communication, June 20, 2019). However, for professionals the value proposition is more related to *gaining direct access to media*, i.e. gaining access to a market to sell content. As a professional you may have some interesting content at hand, but difficulties in selling it because there is no aggregated marketplace. However, IF intends to exactly aggregate this market and facilitate the exchange for professionals and media. In this line, the value proposition for media is *access to unique news* in both the form of user-generated content, but also professional content. Again, by aggregating the market it can save the media resources in searching for interesting and unique content. Lastly, for businesses the value proposition is *access to professional graphic content*. Although other platforms exist to purchase professional content for commercial purposes, IF sees the opportunity for businesses to use the platform too as a spillover effect of the aggregated markt. Thus, they can be seen as an extra type of user, but not the main target for the platform.

Lastly, the flows of *value exchange* on the platform are quite simple. All segments of producers contribute with a form of unique content, understood in the way that it is not already sold or given to the media. In return, they receive the money for the price they pre-determined by selling the exclusive rights to the piece of content. Thus, the business model also emphasizes that the non-professional producers can monetize their content given there is a demand for it. Consumers contribute with payments in exchange for this unique content. Furthermore, they can create listings requesting some specific type of content that producers can then act on (IndieFrame, 2020.).

For the right *monetization strategy*, we should look into the exchange flows and value propositions. It can be argued that a key value of the platform is aggregation of markets for both consumers and producers. However, IF has identified that excess value is created mostly for the consumers and considers them as least price sensitive. Therefore, it currently employs a twofold monetization strategy: 1) collecting 20 percent of the transaction fee occurring on the platform, and 2) a monthly subscription for consumers. However, the platform has not reached a critical mass that would create the excess value of consumers. Hence, IF has not been successful yet with onboarding media to the platform.

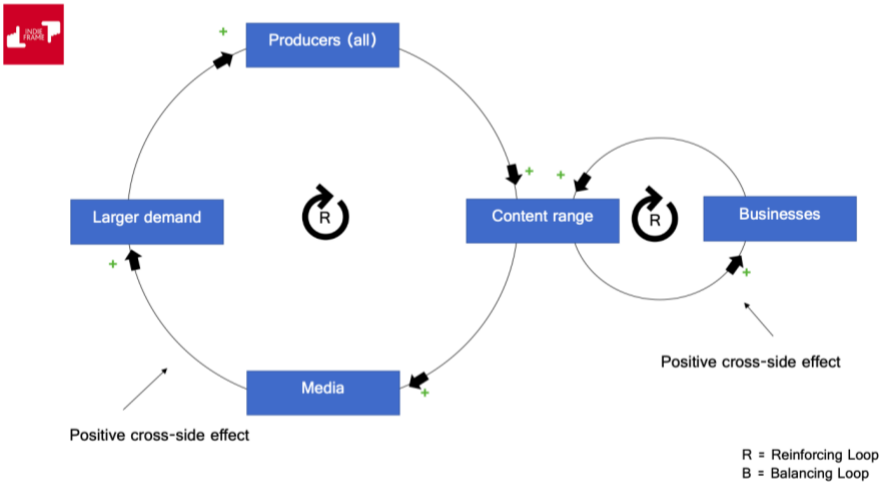
In relation to the *Technological Infrastructure,* IF's key resources are the platform itself, but also its verification technology tool. This tool helps identify when graphics have been manipulated by producers, thus helping create trust on the platform. Furthermore, the platform also offers an assignment tool for

consumers to list and request content assignments, as well as a publisher tool that facilitates the process of creating specific content for producers. The matching on the platform is aided by filters, where consumers can choose between topics, trending, news or creative content.

As IF is in its startup phase, its approach to *Governance* is still very simple and manual. The company does have principles stated in the terms and conditions, explicitly addressing what type of content is prohibited on the platform. For example, content that is of pornographic character, glorifying violence, or fake is not allowed on the platform. To identify and exclude such potential content, IF relies on people to moderate it, and does not yet have the technology to perform the task. However, as the platform has not yet experienced strong growth, the manual moderation is still sufficient enough.

Looking into IF's *Network Effect Management*, it can be argued that IF is a marketplace for media content. Thus, it needs positive cross-side effects between producers, both general public and professionals, and media companies as illustrated in Fig. 7.1. The same effect is seen for businesses, however at a smaller scale as it is not the main target. Nonetheless, the company is currently struggling with the chicken-and-egg problem. Its main strategy for stimulating network effects is to stage value creation, by creating content on the platform itself. However, the company also has a large focus on manually onboarding both consumers and producers on the platform, as a critical mass has not yet been reached.

Fig.7.1. IndieFrame's Causal Loop Diagram



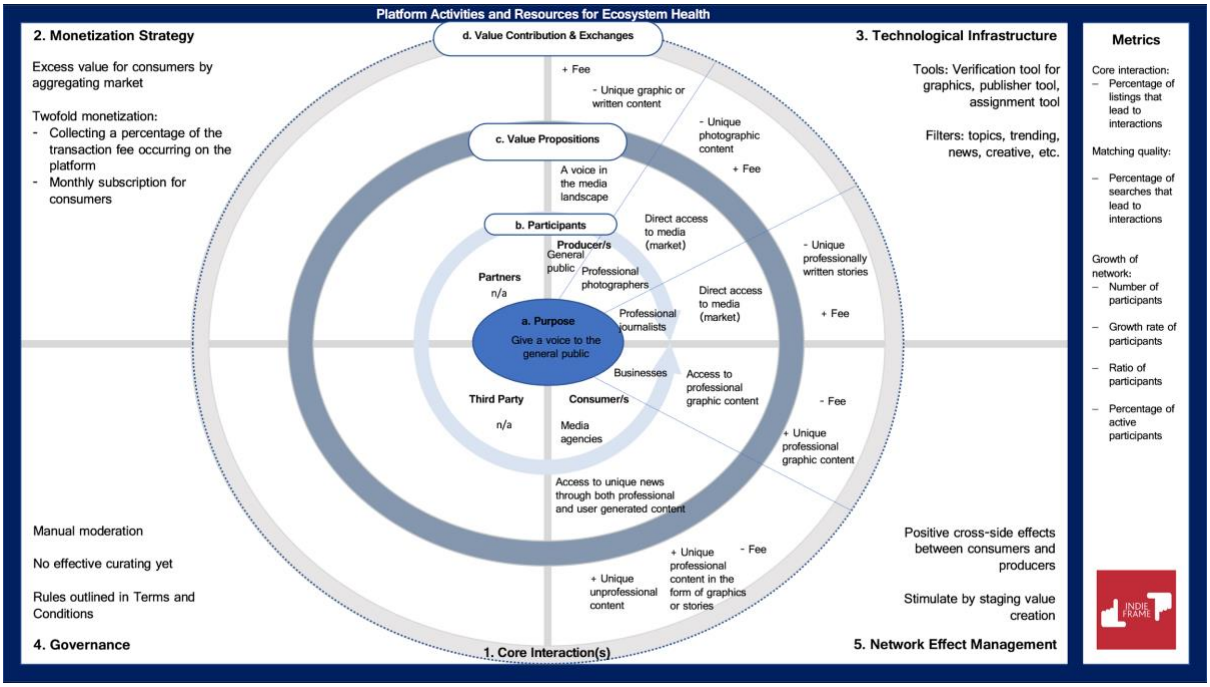
Source: Self-developed by authors

Because IF is still in the startup phase of the business life cycle, key metrics should be concerned with the benefits the core interaction creates for both producers and consumers and the success for it. For example, IF could measure the *percentage of listings that lead to interactions* within a given time period to understand if participants enjoy the core interaction. In extension, a key metric could also be regarding matching quality such as the *percentage of searches that lead to interactions*. Nevertheless, in this stage it is also important to have some key metrics regarding the growth of the platform, such as the growth rate and ratio of different types of participants. But, also the *percentage of active participants* is relevant, since size of the network is not an indicator of success.

Having this structured overview of IF's business model and how the components are interlinked can help us identify some of the pain points that are holding the company back from success in terms of growth and financial viability. First, it is evident that the company has a quite clear view of the targeted participants and how the exchange between these ought to be. However, the problems emerge from the structure related to the elements in the outer frame. Although the company managed to attract a substantial number of users to join the platform during launch in Romania, there has not been any further significant growth followingly. Furthermore, there has neither occurred a significant amount of high-quality interactions (Valsted, personal communication, June 20, 2019). Thus, it can be argued that the desired network effects have not taken off.

Looking at the monetization strategy, it becomes apparent that there is a dealignment in the business model. IF does not yet have a strong enough network and hence monetizing creates a barrier for adopting the platform. If the participants experience a discretion between the intended value proposed and the real value received, monetizing only creates a barrier for attraction of more participants. Perhaps this discrepancy is rooted in some of the other elements; e.g. the technological infrastructure in relation matching quality. Implementing the suggested metric for matching quality can help IF discover whether the problem is rooted in this. Another problem could be rooted in the governance, more specifically the lack of effective curation, which is also important for facilitating good matches. This can indicate that IF needs to further discover the needs of the customers to approach and attract the right ones for matching purposes. Lastly, the structured overview of the business model also helps us identify that there are no third parties or key partners considered in the interactions. Especially the latter can have a big influence in helping IF grow, as argued by E5.

Fig. 7.2. IndieFrame Application



Source: self-developed by authors

7.2 Discussing the Added Value of the framework

The findings of applying the framework to IF lead to a discussion of *what added value the framework brings and for whom*? This implies the following structure. First, the usability of the artifact is discussed in relation to how and when companies use the framework. This is linked to the strengths and weaknesses of the artifact, which leads to the elaboration of the novelty and contribution of the Compass.

How and in what contexts can the model be used?

The analysis of IF revealed that the company finds itself in an early stage of the business model development. As elaborated, their business model is still quite simple and some elements such as partnerships, third party collaborations, technological infrastructure or governance still need to be explored. From the interviews we know the company is still trying to raise money, as the platform does not generate any revenue despite having a monetization strategy. Thus, IF must convince investors as well as users of their business model. The framework helped us identify what elements are missing in IF's business model and where it lacks alignment. Therefore, we see an added-value for start-ups like IF to identify these gaps or pain points in the business model. This has several implications.

First, the metrics elements in the Compass are especially useful to show what can be improved in the business model. Having identified metrics such as *percentage of listings or searches that lead to interactions* that measure the success of the platform, makes the framework more actionable and concrete. The metrics have the potential to reveal why IF is not performing well, and help the company identify what elements of the business model need to undergo change. Therefore, the metrics proved to be an important aspect in the framework that brings an added-value in the context of business model innovation or evolution.

In this context, the application of the Compass brought to light that IF has not considered partnerships that could help them reach participants. In addition, as the company has not reached a critical mass that would enable network effects, the excess value is only hypothetical. Hence, the current monetization strategy seems to be unsuitable as the value consumers of content pay for does not exist yet. Therefore, the framework seems to be useful in the context of observing alignment in the business model, identifying new fields for business model development, and as a discussion based for strategy building.

Lastly, being able to pinpoint which aspects of the business model are not working well is a step in preparing for investor meetings. Thus, it can be useful in the context of clarifying shortcoming and for scenario building. Diagnosing the status-quo problems and creating future scenarios is a potential way to use the framework. Hence, there is added value for start-ups that are in the stages of raising capital. Yet, the case validation has shown that the Compass is applicable in other contexts, such as companies that have already reached the maturity stage. Although the framework may be more relevant for companies with simple business models, the framework is generally useful for structuring and documenting the business model for any use case.

What are the compass' strengths and weaknesses?

Although it has been argued that the Compass can be used in different contexts, it has some strengths and weaknesses. The application to IF showed us that one of its main strengths is a structured overview of the business model, which can help discover the alignment of the elements - or lack thereof - and thus identify the pain points in it. Especially by having the element of metrics in the framework can help managers consider what drives success of their platform. However, it can be argued that a weakness of the framework is its inability to identify the best strategic action to overcome these pain points, which may be particularly helpful for managers that are not experienced in management. Yet, a counterargument is that this feature is beyond the scope of the model's functionality, and that strategic actions need to be evaluated in more dimensions.

Another strength identified by applying the Compass is the circular shape representing the core interaction and its ability to link different activities and value elements to the specific participants. Having this multi sided market perspective enables managers to more easily discover what comprises the core interactions of their business model, and thereby discover whether there is an alignment in the needs of different participants with what is offered. On the other hand, this also relates to a weakness of the model; namely the inconvenience of applying it to platforms with multiple core interactions, and therefore also multiple participants, value elements and exchanges. As argued in the validation in section 6.6, there is a tradeoff between the framework's functionality and convenience. However, to solve this tradeoff problem, it can be argued that for large and complex business models like Facebook or Amazon, each core interaction can be treated as a distinctive "product" in the larger context of the business model. Thereby, the Compass can be used for each separate core interaction offered. Thus, the aggregation of these comprises the full business model, while the aggregation of the participants would comprise the entire ecosystem.

What is the novelty of this new model?

The key differentiator between previous frameworks, like the BMC, and the Compass is that the latter is specifically tailored to platforms. Instead of taking a linear value chain perspective, the Compass encompasses a network perspective on value chain, which better reflects platform businesses. Although this is a similar approach to the Business Model Radar, the Compass adds another dimension reflecting key activities and resources of the platform business models, thus focusing beyond the core interaction. This adds novelty on several different levels.

First, the circular shape of the *Core Interaction(s)* allows us to identify the network of different participants and their contributions. By granting different participants a place in the framework, it is possible to more explicitly address their individual activities. Thus, the multiple sides of the platform network and their roles are clearer than the BMC allows for. As the value of a platform is co-created and not produced in a linear value chain, the Compass' circular visualization with several layers allows to illustrate each connected activity, making it a better fit. Further, the Compass allows to make the flow of value exchanges more visible, which leads to a key aspect, namely the monetization. As previously discussed, platforms have the freedom to experiment, distribute and create value differently. Hence, the tool helps to identify how value can be captured for the platform.

Second, the layer of activities of the participants on the platform enables the identification of several core interactions between the different participants, which is similar to the Business Model Radar. However, the novelty is that the framework also includes key activities and resources of the platform itself, such as monetization strategy, technological infrastructure, network effect management and governance, which are not considered in the Business Model Radar. These elements are key for platform business models, as confirmed by literature and practitioners. Although some of these aspects are covered by the BMC, it does not capture all. In addition, the accompanying guide that provides leading questions is specifically suited for platform companies.

Third, an element that has not been covered by neither the BMC nor the Business Model Radar is metrics. Although the Compass is static in nature, the metrics add a dynamic element. Measuring relevant aspects, can lead to identification of shortcomings and a change in the business model. In addition, metrics also make each element more concrete, as it demands the manager to think in quantifiable and actionable terms. This ties all the aspects together and supports the development of the implicit competitive advantage. Aligning all the components and defining how to measure success thereof permits the establishment of the ecosystem, which is another key factor for success of the platform business model.

7.3 Sub-conclusion

In sum, the application of the Compass to IF and discussion thereof shows that the framework integrates relevant components of strategy, competitive advantage and digital platforms to depict a frame including the key elements for the development of a competitive business model. In this contest, it is more platform specific than the BMC. The visualization encompasses a network perspective facilitating an overview of all the value exchanges and core interactions that take place between different participants, and hence visualize the value-co creating nature of platforms. Lastly, the framework integrates metrics, which facilitate a dynamic thinking of business model innovation and aid the development of competitive advantage. All of these layers comprise the novelty generated by the Platform Business Model Compass.

8
CONCLUSION

8.1 Theoretical and Managerial Implications

The value creation process of a digital platform differs from linear businesses, which changes the dynamics of competition and the components of business models. Therefore, this paper set out to construct a framework that aids platform companies in defining and documenting their business model by drawing on the interlinks of the theoretical fields of business models and competitive advantage in the context of digital platforms. To validate the framework's usefulness in business practice, iterations were conducted based on interviews and multiple-case testing. The results thereof have wider implications on a theoretical and managerial level.

From the literature it was understood that within the platform context, it is key that value creation is both a supply- and demand-side phenomenon, why value is co-created by participants in the ecosystems. Hence, the research proposes a revised version of the BMC by Osterwalder & Pigneur (2010) suggesting new elements that are more platform relevant including: *core interaction*, *monetization strategy*, *technological infrastructure*, *governance* and *network effect management*, and *metrics*. These components constitute the Platform Business Model Compass. The strategy literature highlights that for digital platforms the sources of competitive advantage lay in the network effects and flourishing ecosystem, to which the alignment of the aforementioned elements is crucial. By incorporating a network perspective, we argue that the framework offers an enhanced visualization as it depicts multi-sided platforms' value co-creation, which the BMC misses due to its linear view on value creation. Moreover, the framework includes metrics, which facilitate the process of business model innovation by allowing identification of pain points. Thus, by synthesizing strategy, digital platform and business model literature, the Platform Business Model Compass brings forth a new theoretical perspective and challenges the current approach of developing platform business models.

The managerial implications of the framework relate to its usefulness in various contexts. First, by overcoming the weaknesses of the BMC, the framework solves the issue of companies like IF as it aids in structuring and documenting a platform business model by defining its key components. Second, the framework helps to identify gaps and misalignment in the business model through metrics on the elements, leading to more clarity and the ability to compete in the market. Third, the visualization of the framework

facilitates structured discussion or brainstorming for managers in relation to business model strategy. And last, the framework fosters the process of business model innovation by helping managers to identify aspects that are lacking and incentivizing them to think about relevant metrics to measure success.

8.2 Limitations and Future Research

There are various aspects contributing to the limitation of our study's findings due to constraints in research design and methodology.

First, the data collection limits the validity of the framework. Despite data triangulation with secondary data, we relied on qualitative data provided by interviewees who mainly had an entrepreneurial background with digital platform companies. Even though they provided us with topic relevant insights, it limits the representability and results in selection bias as a proper randomization was not achieved. In addition, through the qualitative nature, the framework may be shaped by their personal biases since interviewees had different ideas of what constitutes an important element of a platform business model depending on their personal experience and expertise. Moreover, we collected data until saturation was reached, however, additional samples and new perspectives could be collected in future research. Another limitation was the access to data, as we did not get more access to investors as interviewees.

Second, in terms of research design, a limitation is that we only performed alpha testing of the tool through interviews and applications. Similar to the qualitative data, the application and validation was performed by us, which may be subject to bias as well. This limits the results to be a proof of concept. Therefore, a more quantitative approach or experimentally based beta testing through implementation would give a more nuanced validation, to which we were limited by time and resources. Thus, for future research it would be interesting to conduct action research by implementing the solutions suggested by applying the framework, and thereby performing a beta testing. This would add another dimension of validation, where the implications of the framework are analyzed. This could include observing how practitioners understand and apply the framework, e.g. through focus groups, and to see whether the framework leads to a positive result for companies.

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