

# The complementor journey to the voice destination

An exploratory case study of the heterogeneity of complementors in a multi-sided platform  
based on speech recognition technology

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## **Abstract:**

Multi-sided platforms have a rising importance in business and society as they are capable to significantly alter industry structures and social interaction. Providers of complementary services play a crucial role for the functioning of multi-sided platforms. Despite their importance, the perspective of complementors has been a neglected area of research. With this thesis we aim to overcome this research gap by using a qualitative research design and drawing upon literature on market development and expectations in commercial and technological development. By conducting an exploratory case study, we investigate the interaction of complementors with a multi-sided platform based on speech recognition technology. We find that expectations and public narratives play a major role in the joining process of complementors. Moreover, the heterogeneity of complementors' characteristics and expectations have an important impact on complementors' platform engagement. We hope that our conceptual and empirical contributions will prove valuable for both researchers and practitioners and raise awareness of the role of complementors in multi-sided platforms.

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**Keywords:** complementors, multi-sided platforms, markets as configurations, marketness, expectations

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## Glossary

Alexa	The artificial intelligence/virtual assistant from Amazon. Can answer simple questions and commands posed by a human actor
Amazon Echo	The smart speaker device from Amazon with Alexa as integrated artificial intelligence
Clout	The ability to influence others, an actor with high clout is seen to have big impact on other actors
Complementor	Company providing a platform with complementary products, for example app makers for the app store
Skill	Ancillary/Complementary products to the Alexa platform
Smart Speaker	Wireless speaker with integrated artificial intelligence offering hands-free activation and interactive actions
Provider	Company with a platform that complementors can build complementary products for
Platform	A technology base on which other software applications can be built upon
Speech recognition	The process of capturing spoken words using a microphone and automatically converting them into a digitally stored set of words

# 1 Introduction

## 1.1 Relevance

This thesis researches the role of complementors in a multi-sided platform and investigates the reasons why complementors join a platform based on a novel technology and how their heterogeneity impacts engagement on the platform. This topic is of high relevance as we are currently witnessing a “platformization” of business and society (The Economist, 2014), as platforms transform the economy by using technology to connect people, organizations, and resources in interactive ecosystems (Parker, Van Alstyne, & Choudary, 2016). The current business landscape is considerably coined by platform-based firms like Google, Amazon and Facebook as their increased webs of influence significantly impact industries (Barile et al., 2016). Consequently, these firms have considerable impact on other companies and play a crucial role in technological development.

The most recent development of the mentioned tech firms is the intensive investment in speech recognition technology. The technology is predicted to have considerable impact on businesses and society. Whereas some see the technology as vehicle for establishing a better, more creative and inclusive society (Newsweek, 2017), others point out negative aspects such as privacy concerns (Pastukhov & Els, 2016). Some forecasts estimate that every second search will be voice-based in 2020 (Forbes.com 2018b), and predict a considerable impact on several industries such as retail, manufacturing and media (Malison, 2016; Cherian & Pounder, 2017). The rise of voice technology was considerably catalysed through the development of smart speakers; voice-commanded devices that are usually placed in customers’ homes and enable a variety of different tasks (Kabir, 2018). Official figures about sold devices are not available, but Amazon is assumed to be the market leader (Statista, 2018). In order to offer a variety of tasks, the developers of the smart speakers such as Amazon build platforms around these devices which enable third parties, so called complementors, to provide services on the platform. To offer their services, complementors develop “skills”, programmable applications using the underlying technology provided by Amazon. To date, the Amazon’s ecosystem features more than 40,000 skills (Amazon.com, 2018).

Being at the wake of a rapidly diffusing platform based on a potentially ground-breaking technological shift with both challenges and opportunities for established industries, calls for research to understand the implications of this development. More specifically, because platforms can alter industry structures (Greve & Song, 2017) and powerful platform providers can impact complementors negatively (Kang, 2017), it is crucial to understand the impact that new platforms might have on complementors.

## 1.2 Problematization

Despite the stated importance of multi-sided platforms, research in this area leaves several questions unanswered, especially with regard to the role of complementors. We will therefore lay out the root causes and underlying assumptions leading to these shortcomings in order to find fruitful research avenues (Sandberg & Alvesson, 2011). Following, we mainly question the narrow focus on network effects and the neglect of the complementor's role because they lead to shortcomings in the understanding of multi-sided platforms.

To begin with, research on platforms has mainly focused on platform providers and end users, thereby neglecting the role of the complementors (Jacobides, Cennamo, & Gawer, 2015). It was simplistically assumed that complementors would support a platform once a critical mass of users is reached (Huotari, 2017). This implicitly neglects the heterogeneity of attributes and motivations of complementors. Moreover, this simplistic reasoning builds upon the flawed assumption that platform success depends nearly exclusively on network effects, resulting from a high number of users and complementors (McIntyre & Srinivasan, 2016). Owing to this biased view and a focus on statistical and analytical modelling rather than qualitative research (Huotari, 2017), complementors' challenges in platform settings and their impact on platform performance have been carelessly neglected in previous research (Jacobides et al., 2015; Kang, 2017). Even though some researchers developed models that take the role of complementors into account, those models are of limited contribution owing to their simplistic perspective on complementors (Huotari, 2017). Finally, most research on platforms tend to focus on existing platforms and does not take the important early stages of platforms properly into account (Kim & Kim, 2018).

In summary, we see current shortcomings as a result of the overemphasis on quantitative research with a consequent neglect of qualitative aspects. In our thesis, we seek to free ourselves from the paradigms that currently determine the understanding of multi-sided platforms. Moreover, by deliberately exploring the role of complementors we answer the call of McIntyre & Srinivasan (2016) who called adopting a complementor perspective an 'important avenue of future research'.



### 1.3 Purpose and Research Question

The purpose of this thesis is to address the current lacking theoretical understanding of complementors in multi-sided platforms. As the scarce research on complementors fails to provide a comprehensive overview about the role of complementors in platform-settings, we consider a deliberate holistic complementor perspective the foundation for our research.

We aim to address the current shortcomings and contribute to a more nuanced understanding of the working of platforms, especially in its early stages. More specifically, we want to develop the understanding of what we call ‘complementor journey’ in the following: the process of joining, early presence and further engagement of complementors in multi-sided platforms. There is not only scant research in each of these phases. What is missing is a holistic conceptualization of the whole ‘complementor journey’. We argue that, in order to grasp the perspective of complementors in every step of this process and to understand the interlinkages of the different phases, it is imperative to study these aspects holistically rather than in isolation. We seek to realize this by answering the following research questions:

- Research Question 1: What are the reasons for complementors to join multi-sided platforms based on novel technologies?
- Research Question 2: How does the heterogeneity of complementors influence their presence on multi-sided platforms based on novel technologies?

Owing to the void of suitable literature in the research about multi-sided platforms, we will turn towards other theoretical contributions to answer the posed questions. We seek to understand the dynamics of the platform setting by applying a perspective that is usually used to describe markets as ongoing constructions and investigate their emergence, evolution, and cease.

More specifically, we will investigate the ‘complementor journey’ of complementors on the Amazon Alexa platform. Alexa is the artificial intelligence of Amazon (Amazon, 2018). It is integrated in several physical devices, most commonly in “smart speakers” which are placed in the users’ homes. Alexa can be commanded via voice and is able to handle various requests, such as controlling lights and heaters, playing music or setting timers. Alexa is simultaneously the foundation for the Amazon Alexa platform. Thus, other companies can use the technology and develop own functions and services. These functions and services are called “Skills”. Our research deals with companies who joined the platform and developed skills for the Alexa platform. To illustrate, music provider Spotify has developed a skill for Alexa allowing Echo

owners to command Alexa to play music by a simple command as "Alexa- put on my Spotify list" (Smith, 2016). Figure 1 below conceptualizes the functioning of the Alexa platform.

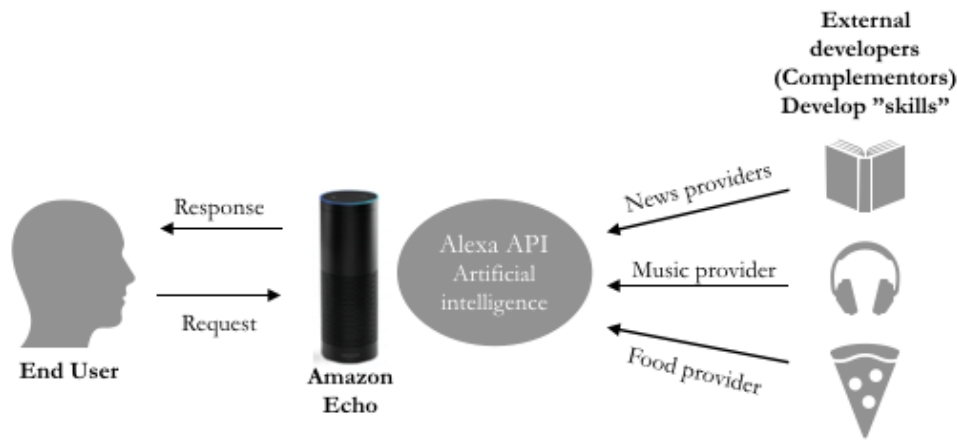


Figure 1 Amazon Alexa Platform (own conceptualization)

#### 1.4 Expected Contributions and Outline

The expected contributions of this thesis are multifarious. First, we aim to add conceptual contributions to the literature on multi-sided platforms which currently lacks comprehensiveness and nuanced viewpoints. More specifically, we seek to contribute to the understanding of complementors' reasons to join a platform based on a novel technology and give new insights about the implications of their platform presence. Moreover, we expect to provide valuable insights about the functioning of platforms by introducing concepts from contributions that are usually applied to describe the dynamics in markets. Simultaneously, we contribute to the literature on markets with empirical insights. Furthermore, we also expect the research to offer practical contributions. Since the imperative of business has changed considerably in the face of companies such as Amazon, many companies seek for guidance on how to develop their strategies. We aim to create a better understanding of complementors' presence in platforms which might support complementors in their decision making regarding joining and investing in platforms.

The remaining paper is structured as follows. In the following section we examine the existing theories to identify the research gap and present the theoretical framework that guides our research. In the third part we present the methodological choices used to answer the research questions. In the fourth section, the empirical findings are outlined and subsequently analysed and discussed. Finally, concluding remarks and an outlook will be presented.

## 2 Theoretical Background

*The theoretical background lays the formation for this study. It is divided into three parts considered important to answer the research questions. We will begin with presenting the contributions and limitations of current research on multi-sided platforms for our research purpose (2.1). Subsequently, we will present insights from literature on the construction of markets (2.2) and expectations in commercial and technological development (2.3). In section (2.4), we synthesise the findings and form the theoretical framework that will guide our research.*

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### 2.1 Multi-sided Platforms

#### 2.1.1 Overview

As indicated above, digital platforms play a major role in modern business and society as they lead to a ‘...concomitant breakdown and integration of industry structure.’ (Barile et al., 2016). However, despite their power and relevance in the modern business, many important aspects of multi-sided platforms are understudied as pointed out in 1.2. Before shedding light on specific aspects of platform business models which are relevant for our purpose, we will provide a brief overview of the matter.

The wide-spread use and relevance of the term “multi-sided platform” does not prevent it from conceptual ambiguity, resulting from either overly narrow definitions or vagueness (Hagiu & Wright, 2015). Therefore, we begin with the generic conceptualization that, at the most fundamental level, organizations that enable direct interactions between two or more distinct but platform-affiliated sides, can be seen as multi-sided platforms (Hagiu & Wright, 2015). More specifically, a platform describes the organization of aspects such as technology and complementary assets and usually consists of platform providers and complementors. Whereas platform providers provide the overall system of technology, complementors build ancillary products that interact with customers (Muegge, 2013). Figure 2 illustrates the specifics of the platform business model and displays the differences to the linear business model.

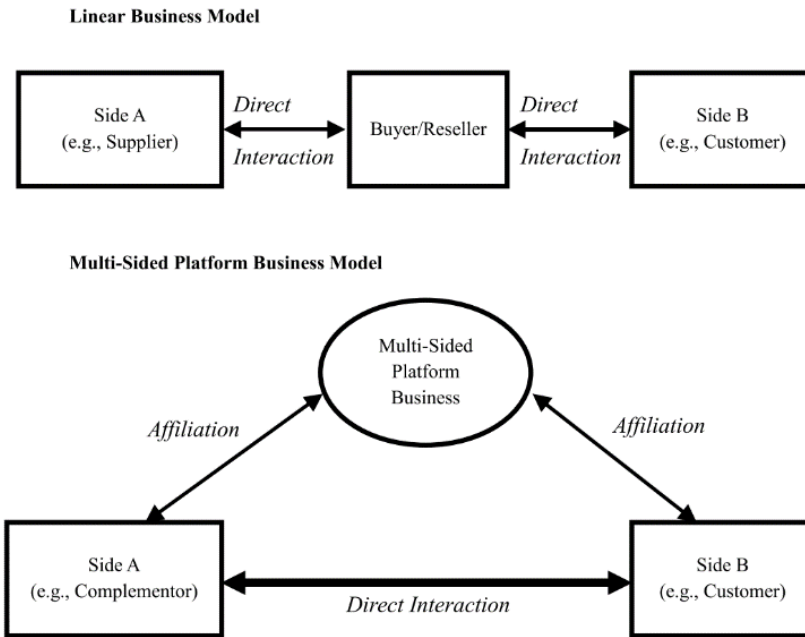


Figure 2 Linear Business Model and Multi-Sided Platform Business Model (Altman, 2015)

The platform owner provides the platform which is often accompanied with tools and infrastructure such as Software Development Kits to lower entry barriers and increase accessibility for complementors (Altman, 2015). The provider is dependent on complementor contributions to benefit from network benefits, improve the user experience and thereby successfully compete with rival services or platforms (Kang, 2017). However, the relationship is coined by mutual dependency. We will therefore present a more detailed elaboration on the role of complementors in platform settings in the following paragraph.

### 2.1.2 Complementors in Platforms

The role of complementors has been neglected in previous research. One of the reasons leading to this neglect is the underlying belief among researchers that the functioning of multi-sided platforms can — to a large extent — be explained with indirect network-effects which refers to the utility of technology usage depending on usage within a user's network of user (Huotari, 2017). The concept of indirect network effects is related to the notion that increased consumer demand and complementary products on a market are mutually reinforcing. This idea also implies that complementors will support a platform as soon as a critical mass is obtained. However, recent research cast doubt on the narrow focus on network effects and stresses that other factors, such as quality aspects, are also important. Especially in technological platforms, the quality of the technological aspects is considered an important factor in shaping the demand (Zhu & Iansiti, 2012).

## Reasons to join

The reasons for why complementors join a platform have, as mentioned, been an underexplored area. The research related to complementors have rather addressed strategic decisions of platform providers including pricing decisions, competition, standardization and coordination (Altman, 2015). One of the few contributions taking a complementor perspective came from Kude et al. (2010), who criticised that previous research studied the motivations to join platforms with a narrow focus on specific resources and capabilities. Consequently, they investigated complementors' motivations from a broader perspective and researched several motivations simultaneously (Kude et al., 2010)<sup>1</sup>. They argue that four different characteristics of the platform provider motivated complementors to join: Two forms of **technological capital**, **commercial capital**, and **social capital**. Firstly, technological capital refers to the ability to provide integrated systems and innovative system architectures. Secondly, commercial capital is the ability to provide access to broad markets. Finally, the social capital is related to the reputation of the platform, which is closely linked to the brand name of the firm and the signalling of 'trustworthiness'. The social capital and the ability to provide integrated systems are said to be more important than the other two factors (Kude et al., 2010).

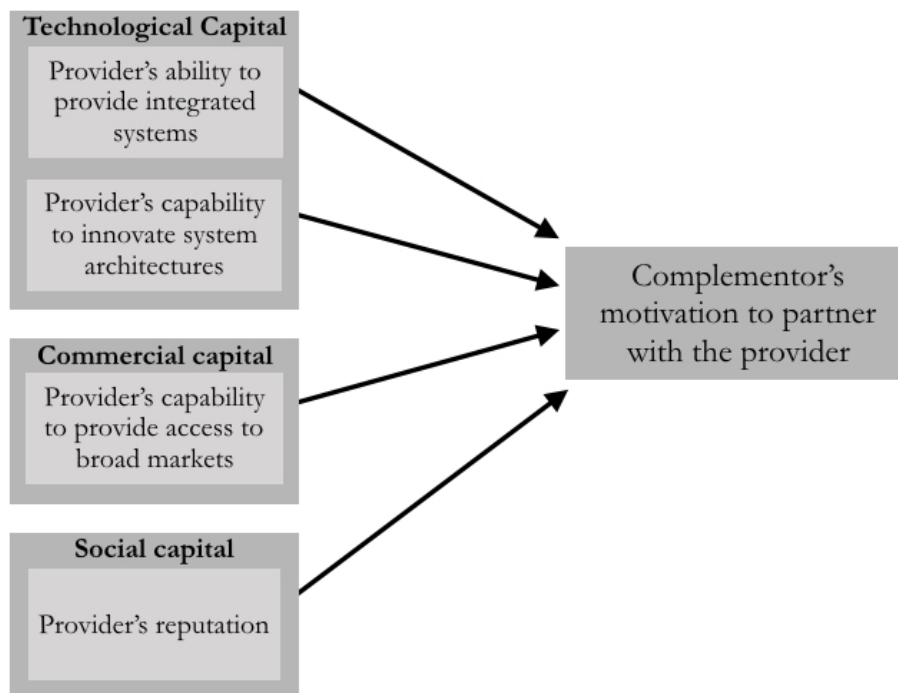


Figure 3 Complementor's motivation to partner with provider (Kude et al., 2010)

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<sup>1</sup> Even though (Kude et al., 2010) use the terms “hub” and “spoke” instead of “provider” and “complementor”, we

As the framework, which is illustrated in *Figure 3*, focuses solely on the motivation to join a platform, we will draw on other contributions to generate an understanding of the complementors' role in the phases after joining the platform.

### Dependency Challenges of Complementors

To begin with, despite the importance of complementors for platforms, the relationship between complementor and platform provider is coined by asymmetry and dependency. Altman (2015) found that complementors face dependency in regards of technologies, information, and values and employ different strategies to respond which is displayed in Figure 4. First, **technology** dependencies relate to the technological requirements the platform provider places upon the complementors and to the required interoperability of connected products. Second, **information** dependencies refer to the receipt of communication from the platform provider and the related balancing of information sharing and secrecy. Finally, due to the fact that independent companies with different and potentially conflicting goals and perspectives come together in a platform setting, complementors can face **values-based** dependencies when the platform provider has differing perceptions of customer value (Altman, 2015).

Facing these challenges, complementors undergo a process of several phases in regards of their response strategies. In the first phase – the compliance-centric phase - complementors comply with the given rules and specifications. In the following influence-centric phase, complementors seek to influence the platform by providing feedback, suggesting developments, and negotiating with the provider. The final innovation-centric phase is characterized by complementors' efforts to design products that are less dependent on information, values and technological specifications of the platform provider (Altman, 2015).

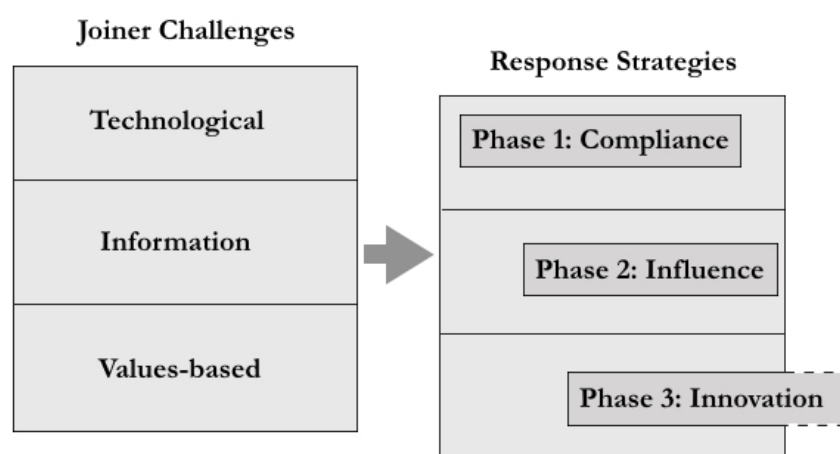


Figure 4 Dependency of Complementors in Multi-sided Platforms, adopted from (Altman, 2015)

## **Competition between complementor and platform provider**

Whereas the framework by Altman (2015) provides valuable insights about the managerial challenges of platform presence, it leaves out one crucial issue complementors face in platform settings: the competition between complementor and platform provider. Greve & Song (2017) found that platforms can alter industry structures and power distribution which can impact product design, market share and pricing. Kang (2017) notes that the substantial power platform owners possess, has potentially negative impact on complementors. This is especially true when platform owners launch products that compete with complementors' offerings. This aspect has been neglected in earlier research as the provider-complementor relationship was mostly regarded as cooperative, owing to the reciprocal dependency between these actors (Kang, 2017). However, recent research assumes that platform-owner entry usually has negative impacts on affected complementors and simultaneously signals threat to potential entrants or unaffected complementors. Even though the negative effects are seen as stronger, the entrance of the owner can also have a positive signalling effect. Complementors can capitalize on the "rising tide lifts all the boats" effect as the entry of the provider into a category increases its visibility (Kang, 2017).

### **2.1.3 Limitations**

Despite the above-mentioned relevance of platform-based companies and their impact on industries and companies, a striking lack of research about complementors in platforms can be identified (Altman, 2015). The reason for this is that research on platforms have been focused on platform providers and individual users, thereby neglecting the role of complementors (Jacobides et al., 2015; McIntyre & Srinivasan, 2016). Even though the framework by Kude et al. (2010) provides some insight about complementors' motivations to join, knowledge about the heterogeneity of complementors' motivations and behavioural orientation regarding joining a platform remains underdeveloped (McIntyre & Srinivasan, 2016). Additionally, most research on platforms tends to focus on existing platforms and does not take the important early stages of platforms properly into account (Kim & Kim, 2018). Moreover, even though research has begun to acknowledge the competitive dynamics between platform owner and complementor and the related challenges of joining ecosystems, knowledge in this area is still underdeveloped (Kang, 2017; Wen & Zhu, 2017). Furthermore, the current stream of literature on platform business models is largely based on analytical and statistical modelling. The underlying assumption of perfect rationality among actors does not reflect the complexity of platform settings properly and fails to provide a more nuanced picture of reality (Huotari, 2017).

Concluding this section, it can be stated that research on multi-sided platforms provides some insights which can enhance our understanding and guide our research. Apart from the well-established description of the general functioning of multi-sided platforms, the contributions from Kude et al. (2010) and Altman (2015) are of particular value. However, several shortcomings limit the usefulness for our purpose as previous research systematically neglects the role of complementors and is overly focused on quantitative research and specific aspects of multi-sided platforms.

Where, we ask then, do we find a perspective that allows holistic conceptualization of innovation processes and acknowledges the interlinkage of activities of various actors? To answer this question, we now turn our attention to literature on the construction of markets.

## 2.2 The construction of markets

Before elaborating on the details of the “construction of markets” perspective, we want to briefly point out its basic conceptualization and relevance for our purpose. The following contributions build upon a “markets as practices” approach which regards **markets as ongoing constructions** and is therefore concerned with the emergence, evolution and cease of markets as outcomes of practices of various actors (Vargo et al., 2017). This dynamic notion already indicates the relevance for our setting, but one could still wonder what justifies the application of a perspective which attempts to depict whole markets in a platform setting. We argue, however, that considerable **overlaps between markets and platforms** exist as they are both forms of economic organizing and exchange. The similarities become further apparent considering the fact that multi-sided platforms are often called “multi-sided markets” or “market places” (Eisenmann, Parker, & Van Alstyne, 2006; Rochet & Tirole, 2004). On a more general level, Araujo, Kjellberg, & Spencer (2008) point out that the practices view is not limited to markets but also applies to other settings such as organizations and management control systems which justifies our argument further.

### 2.2.1 Markets as Practices

Despite the importance of markets for business, researchers have paid little attention to a realistic understanding of markets. As Venkatesh, Penaloza, & Firat (2006) put it: ‘...the term market is everywhere and nowhere in our literature.’ Mainstream marketing adopted its definition of markets from neoclassical economics and therefore sees markets as given and pre-existing constructs (Vargo et al., 2017). Consequently, markets are constant topics of interest but are often thought to require no explanation. However, this perspective is being criticised for its



narrow focus on specific parts of markets (Vargo et al., 2017). To tackle these shortcomings, new approaches for the understanding of markets have been developed, for example seeing them as communication networks, knowledge structures and institutionalized solutions (Vargo et al., 2017).

Another perspective focuses on the practices in markets. **Market practices** are the interactions between market actors in a market configuration (Storbacka & Nenonen, 2011a; Kjellberg & Helgesson, 2006). The practice approach regards markets as ongoing constructions rather than seeing them as given and is therefore more concerned about the emergence, evolution and cease of markets as outcomes of practices (Vargo et al., 2017).

A central contribution in this field came from (Kjellberg & Helgesson, 2006). According to them, markets consist of continuous translation that connects exchange practices, representational practices and normalizing practices. As illustrated in Figure 5, these practices are interrelated and form chains between each other.

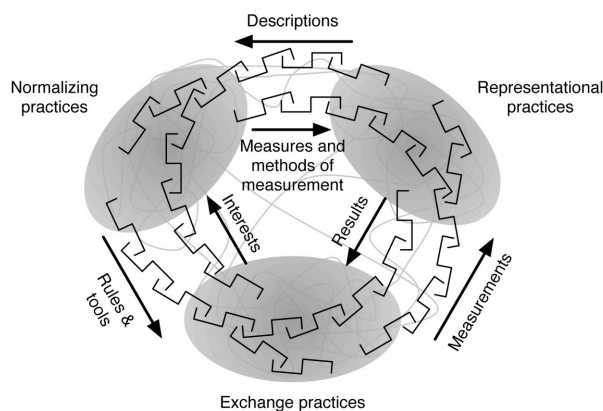


Figure 5 Market Practices (Kjellberg & Helgesson, 2006)

The exchange practice describes the concrete interactions between market actors. By means of **exchange practices**, value propositions are communicated, refined, and agreed on (Kjellberg & Helgesson, 2006). They impact the definition of exchange objects and the configuration of the buyer-seller configuration (Storbacka & Nenonen, 2011a). **Normalizing practices** relate to norms and rules, such as formal laws, technology standards and socially agreed on codes of conduct. Normalizing practices allow efficient exchange practices as they reduce ambiguity and uncertainty (Kjellberg & Helgesson, 2006). Finally, **representational practices** help to reflect the market in question and produce shared images of the market. The representational practices refer to the common language and concepts used to describe and symbolize markets and their actions (Kjellberg & Helgesson, 2006). Through representational practices such as firm presentations,

market analyses and media coverage the market characteristics become visible for a variety of – often unrelated – actors (Storbacka & Nenonen, 2011a). The market practice view suggests that markets are **continuously changed** through the interlinked practices market actors engage in.

### 2.2.2 Markets as Configurations

The above discussed market practices framework from Kjellberg & Helgesson (2006) provide us with an understanding regarding the construction of markets. However, for our purpose of understanding the evolution of the Alexa platform, we are in need of a comprehensive framework that grasps the entirety of the evolution from various angles. More specifically, we seek to understand how the focal actor Amazon impacts the market and practices of the platform complementors. Therefore, we are in need of a conceptualization of markets that takes companies' ability to **influence markets** into account.

A useful contribution comes from Storbacka & Nenonen (2011b) who used the term '**market scripting**' to illustrate the activities a focal actor can use to change the market configuration. Their framework stresses the role of actors in markets and extends the idea of markets as interlinked practices by conceptualizing **markets as configurations** of interdependent elements that facilitate resource integration (Storbacka & Nenonen, 2011a). The authors stress similarities between this conceptualization and the construct "business ecosystem" (Storbacka & Nenonen, 2011a). As considerable overlaps between business ecosystems and multi-sided platforms exist, we consider the market as configurations perspective highly relevant for our research purpose. This conceptualization also acknowledges that market actors can actively influence the market configuration. The authors call this process 'market scripting' which is defined '... as the conscious activities conducted by a market actor in order to alter the current market configuration in its favour' (Storbacka & Nenonen, 2011b). Accordingly, market networks can be described by analysing the actions of the scripting actor and analyse its relationships to other actors. The goal of 'market scripting' is to align the **mental models and business models** of other actors with the models of the scripting actor. Owing to the increased importance of value-creation in networks, the authors propose that firms should offer 'market propositions' to illustrate their perspective on the market and align other actors with that view.

As shown in Figure 6, market scripting occurs on two analytical levels and in three phases. The starting point for market scripting lies in the mental models, the deeply ingrained assumptions that influence how individuals understand the world, of the focal actor (Storbacka & Nenonen, 2011a). The mental model is translated into the visible business model which is the

interface that connects market actors as ‘...all interactions between market actors are in fact interactions between actors' business models’ (Storbacka & Nenonen, 2011b). Eventually, the business model leads to changes in exchange, representational and normalizing **market practices**. However, the scripting does not only occur on the **firm level** of the focal actor. The crucial aspect of market scripting is that the scripting actor seeks to influence the configurative elements of the other market actors which is illustrated by the **meso level** in the framework. The impact of this change depends on the actor’s ‘**clout**’ - the ability to influence others – which is related to the actor’s relative size within the market configuration, the longitudinal development path of the position and the relative strength of the business model (Storbacka & Nenonen, 2011a).

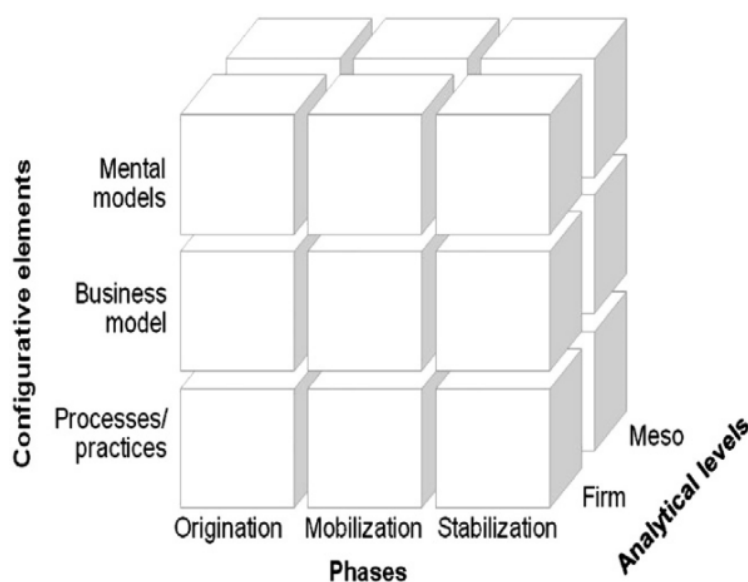


Figure 6 Market-scripting dimensions (Storbacka & Nenonen, 2011b)

Moreover, the market scripting phase occurs in the three phases origination, mobilization, and stabilization. These phases are characterized by different levels of configurational fit between the configurative elements. To assess the fit, the framework draws upon the useful concept of ‘**marketness**’, which refers to a continuum describing the configurational fit of the different market elements resulting in different degrees of stability (Storbacka & Nenonen, 2011a). According to the authors, markets undergo several phases with varying degrees of marketness. The following Table 1 illustrates the different phases of marketness and the respective characteristics in regards of configurational fit, network positions, business models and market practices. Whereas **high marketness** is coined by strong configurational fit, established network positions and business models, and reinforcing market practices, situations with **very low**

**marketness** are characterized by uncertainty and lack of established roles and practices. Situations with low marketness are accordingly placed between those two (Storbacka & Nenonen, 2011b). Following the reasoning that markets and platforms have significant conceptual overlaps, we argue that the marketness concept can also be used to assess the **configurational fit** among elements in a **platform setting**. The holistic assessment of interlinkages of different actors can extend our understanding of platform performance beyond the narrow consideration of network effects.

	High marketness	Low marketness	Very low marketness
<b>Fit among elements</b>	Strong	Poor	
<b>Network positions</b>	Established	In the making	
<b>Business models</b>	Configured		
<b>Market practices</b>	Established and mutually reinforcing	In the making	<p><b>Exchange practices</b> are figured out, maybe no exchange realized</p> <p>Lack of commonly accepted <b>norms</b> and competing viewpoints</p> <p><b>Representation</b> focuses on making actor and unit of exchange visible through symbolic representation</p>

Table 1 Levels of Marketness

However, the framework comes with **limitations** in regards of applicability for our research purpose. Understanding the mental models and business models requires deep insights into the actions and thoughts of involved actors. However, we were not able to receive access to Amazon which limits our ability to investigate the firm level of the focal actor. Moreover, owing to the fact that our access to the complementors was restricted to rather short interviews, we argue that a realistic exploration of the mental and business models on the meso level is also not realizable in our context. The same holds for the analysis of practices on a micro level, actors' actions in a highly specific sense, which is usually the unit of analysis in practice research (Andersson, Aspenberg, & Kjellberg, 2008). Moreover, the authors provide no objective criteria for evaluating the marketness which makes it difficult to precisely detect the phase of market development.

We will therefore neglect the role of mental and business models and focus on observable market practices and the concepts of marketness and market scripting of a focal actor. Moreover, as the framework implies that firms have subjective views and that actors engage in collective sensemaking Storbacka & Nenonen (2011b), we will develop this argument further by introducing the concepts of performativity and multiplicity in the next paragraph.

### 2.2.3 Performativity and Multiplicity

Performativity and Multiplicity are central concepts of the markets as practice perspective (Kjellberg & Helgesson, 2006). **Performativity** relates to the connection of ideas and reality, more specifically, how ideas can affect reality. Applied to the field of markets, performativity is related to the notion on how ideas about markets affect real markets. We follow the conceptualization of MacKenzie (2004) and Kjellberg & Helgesson (2006) and consider performativity as a ‘...process through which shared ideas shape the world by shaping actions’ (Kjellberg & Helgesson, 2006). For our purpose, we are interested in the concept of generic performativity which relates to situations where ideas have non-exclusive roles in the shaping of reality. As ideas differ among various actors, market participants often have different and sometimes conflicting definitions of the market owing to different perspectives, different environments, and different goals (Kjellberg & Helgesson, 2006). This difference in market definitions is depicted by the term **multiplicity** which results in varying actions among actors. To put it differently, ‘firms do not act in (exactly) the same market twice’ (Kjellberg & Helgesson, 2006), and affect future market conditions differently through their activities. The concepts of performativity and multiplicity can be particularly useful for our research setting where actors have several different, and at times competing, ideas about the Alexa platform.

**To summarize, literature about the construction of markets helps us to overcome the shortcomings from the platform literature as it provides a holistic view on market innovation processes which can be justifiably applied in our platform setting. Moreover, the market scripting framework equips us with a conceptualization that takes the market-shaping capabilities of a focal actor, in our case platform provider Amazon, into account. In addition, the literature provides us with the concept of marketness that can guide our understanding regarding the functioning of platforms. Finally, we acknowledge that ideas have performative characters and that market definitions are not objectively given but socially constructed and consequently differ among actors.**

We will develop the last aspect further by describing the performative role that expectations play in the creation of markets, especially in regard to novel technologies.

## 2.3 Expectations in Technological and Economic Development

### 2.3.1 Expectations in Technology Innovation

Expectations have a longstanding history in economic theory, especially in regards of new technology development as they play a central role in guiding activities and mobilizing resources (Borup, et al., 2006). Araujo, et al., (2014) define **expectations** as **representations of future** technological contexts, capabilities, and market possibilities for new technologies.

In their research of driverless cars, Araujo, et al., (2014) explore the role of expectations as market shaping devices by exploring the generation, circulation and representation of expectations among actors working on technologies without an existing market. In this context, expectations are especially crucial in the early stages of technology when ambiguity, uncertainty and potential conflict are high. The authors show that representations of expectations are used to compare the current “World A” with the future “World B” and that these representations are used to provide persuasive arguments for why World B is worth the effort of engagement and investment. Accordingly, inflated expectations in the form of **hypes** are seen as important aspects for the creation of interest but are often overly deterministic, focusing on technological aspects and neglecting the social, political, economic and cultural factors on which the success of technologies depend (Araujo et al., 2014). Therefore, phases of hype are often followed by phases of disappointment (Araujo et al., 2014).

However, as indicated before, expectations are not limited to the mere representation but have a **performative character** as ‘...they actively participate in the construction and development of the scenarios they narrate.’ (Araujo et al., 2014). In a similar vein Lampel (2001) stresses that human imagination may be of equal importance as economic calculations and technical constraints, especially at critical junctures of technological evolution. **Expectations** are usually not univocal but often **differ among actors** and have greater authority for those further away from the actual technological work (Borup et al., 2006). Therefore, these actors see the technology as an inevitable march of progress and face lower uncertainty. Related to the notion that expectations differ among actors, it is worth mentioning that expectations are usually not exclusively of rhetorical substance but circulate among different actors in varying material forms. Following the argumentation of performativity, expectations become ‘...’inscribed’ in texts, actions, bodies, materials, objects and machines’. Therefore, it is worth investigating how imagination is transferred into materiality and how expectations about the future become substance (Borup et al., 2006).

The concept of **inscription** can provide a valuable lens to understand the circulation of expectations and refers to the idea that technical objects embody patterns of use and shape heterogeneous networks. Akrich (1992) argues that neither technological determinism nor social constructivism describes the role of technical objects in these networks properly as both technological and social aspects are part of the object. Innovators inscribe their vision of the world in the technical objects which is an attempt ‘...to predetermine the settings that users are asked to imagine’ (Akrich, 1992). The resulting script expresses the choices of the designer about the roles of the machine, the human actor and its relationships. Consequently, humans delegate tasks to technologies but are themselves bounded by technologies that significantly determine their actions within a sociotechnical network (Cressman, 2009).

### 2.3.2 Expectations in Multi-sided Platforms

Expectations do not only play a role in general technological and commercial development, but also in multi-sided platforms. Research on expectations in platforms have focused on consumers’ expectations as their expectations about the future market size of platforms is a crucial factor for platform development. Some scholars even call consumer expectations the ‘most critical factor in determining market domination’ because each consumer prefers to join the platform with the highest probability of a large user base owing to network effects (Iansiti & Zhu, 2007).

As for most parts of platform-focused research, the role of complementors’ expectations have been a neglected area which relates back to the previously mentioned emphasis on statistical and analytical modelling and related assumption of perfect rationality. As an example, Hagiu, Ha, & Halaburda (2014) researched the role of expectations of users and developers in platform-settings but assumed that developers always form rational and responsive expectations. In a similar vein, Iansiti & Zhu (2007) model the users as forward-looking but assume myopia for the developers because developers tend to base their decisions on the current user base in their investigated setting of video games. However, they also point out that other markets might call for appreciation of forward-looking developers and leave this issue for future research. As we consider the exploration of complementors expectations in platforms highly relevant, the following section provides more insights on how public expectations are generated and circulated.

### 2.3.3 Contributors of Public Narratives and Expectations

The role of the media and textual narratives such as reports, case studies, news items about technologies and their positioning in existing socio-technical landscapes, has been an area of

interest for researchers (Borup et al., 2006). In line with the role of performativity Anand & Peterson (2000) point out that markets are not objectively given, but are constructed through the ‘...generation, distribution, and interpretation of a web of information about activity in the ‘market’ in the form of sales and trade reports, newspaper articles, sales reports and rumours.’ According to Lampel (2001), innovators of technological innovation have to raise attention and awareness as well as producing curiosity and anticipation which includes previews, media coverage and speculation of next moves. As our setting includes a technological innovator, we will focus on general and mass media to understand the generation and circulation of expectations.

We acknowledge the argument of Kriechbaum, López Prol, & Posch (2018), who argued that mass media represents an appropriate source of information when the focus is on technology diffusion because mass media, even though lacking some nuances of the discourse ‘...reflect a general atmospheric picture.’ However, other contributions point to the crucial role of more specialised media as, according to Pollock & Williams (2009), ‘...industry analysts fulfil a crucial role in shaping expectations about the development of technological fields...’ and ‘...hold the ropes and set the rules of the game.’ Pollock & Williams (2009) find that the theories and tools industry analysts distribute, impact the thinking and framing processes of market actors and thereby produce the setting they describe. Or as Rinallo & Golfetto (2006) put it: ‘the relationship between market representations and actual markets in a postmodern world is reversed: it is the market that adjusts to representations and not vice versa.’

Anand & Peterson (2000) use the term information regimes to describe organizations that make information about market activity available. These information regimes have three main characteristics: they provide **attention focus**, support participants in **sensemaking** of market activity and are **socially** and politically **constructed** and influenced from **biases** and assumptions that are largely taken for granted (Anand & Peterson, 2000). Knowing that firms build their actions to a large extent on information published by these regimes (Anand & Peterson, 2000), is important for our research because analysing the information regimes provides us with information about the foundation of the complementors’ decision making.

**To summarize, expectations play a crucial role in technological and commercial development. This is especially true in early stages of technologies as expectations work as vehicle for mobilization owing to their performative character. Even though research acknowledges the crucial role of expectations in platform settings, the focus has been**



mostly on users' expectations. Complementors' expectations have been simplistically modelled as rational. Moreover, expectations differ among actors and become materialized in various forms. Finally, various media play a major role in the generation and circulation of expectations because actors rely to a large extent on their market representations.

## 2.4 Synthesis, Research Gap and Theoretical Framework

This section aims to present the respective contributions and shortcomings of our three research streams in a concise way and put them into relation to each other to formulate the research gap. In a second step, we will build our theoretical framework which combines the different contributions and shows their relevance for answering the research question and thereby addressing the research gap.

As we investigate a **multi-sided platform**, our starting point for research was the literature on platforms. However, we found several shortcomings of previous contributions. Most notably, the scholars focus on network effects and research platforms with analytical and statistical modelling. The underlying assumption of perfect rationality neglects the heterogeneity of actors, especially the complementors'. Furthermore, the research is mostly conducted in static settings in later stages of platform development and usually narrowly focuses on specific issues leading to an inability of capturing the dynamism, entirety, and complexity of new platforms. Therefore, we have to combine different contributions to guide our research about the 'complementor journey'. We find these contributions in the work about complementors' motivations (Kude et al., 2010), and challenges of platform presence (Altman, 2015).

To overcome the shortcomings of platform research, we turned towards the literature about the **construction of markets** which stresses the dynamic and interlinked character of innovation. This idea is further developed in the concept of market scripting which emphasizes the multiplicity of markets and interlinkage of actors but simultaneously acknowledges the crucial role of focal actors in market creation, in our case platform provider Amazon. Finally, the concept of 'marketness' is assumed to be useful for a qualitative assessment of platform success, thereby overcoming the narrow focus of platform-related research on indirect network effects. However, the perspective lacks to provide insights about why actors engage in markets in the first place, especially in settings with novel technologies and related uncertainty.

This shortcoming can be overcome with the literature about **expectations** as it shows the crucial role expectations play in commercial and technological development, especially in early stages of technologies. Media plays a crucial role in generation and circulation of expectations. However, the role of complementors' expectations in platform settings is barely researched.

The elaborations above allow us to formulate a more concise **research gap**: A striking lack of attention and contributions about the role of complementors in multi-sided platforms. This is especially true in regards of their motivations to join a platform based on a novel technology with high uncertainty about future development and payoffs. Even though the literature on expectations acknowledges the importance of expectations in commercial and technological development, knowledge about complementors' expectations in new platforms based on novel technologies is underdeveloped. Moreover, little is known about the impact of complementors' heterogeneity on their platform presence and engagement as most research on this issue – owing to the focus on indirect network effects – is mainly focused on the absolute number of complementors and less interested in a qualitative assessment of their presence. The following framework illustrates how each literature stream contributes to answering the research question and thereby addressing the identified research gap.

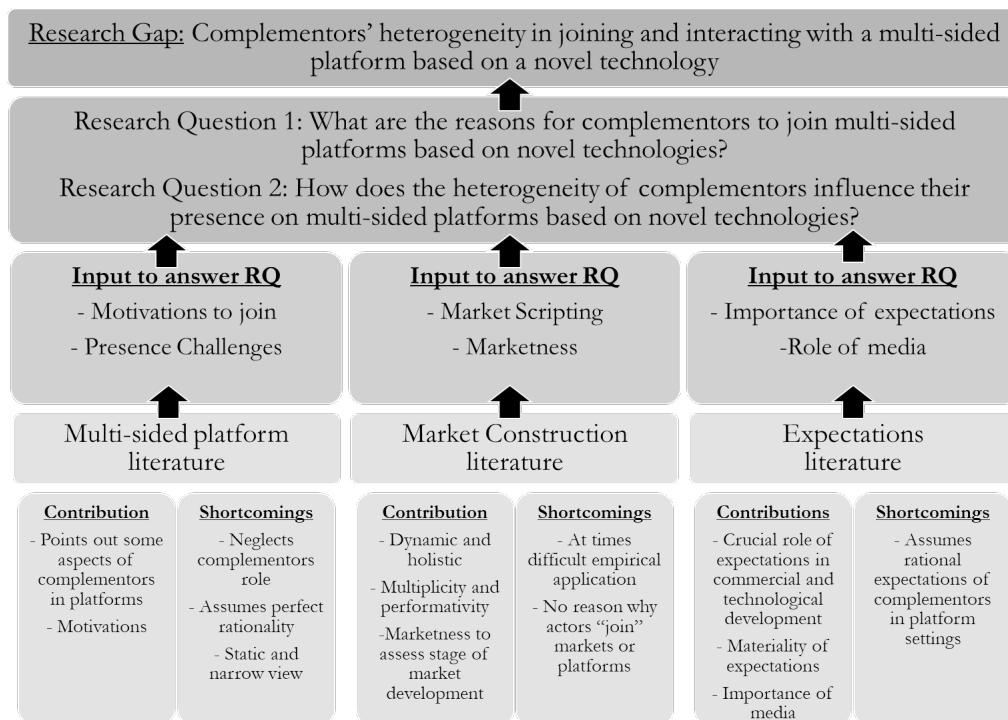


Figure 7 Theoretical Framework

### 3 Methodology

*The following section covers the methodology of the thesis and the approach we undertook to answer the posed research questions. First, in 3.1 we elaborate on the methodological fit, covering the research philosophy, approach, strategy, and design. In 3.2 we cover the data collection and analysis procedure as well as quality aspects of the main study. Finally, in 3.3, the data collection and analysis of the complementing study of media are presented.*

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#### 3.1 Methodological Fit

To ensure the quality of the research, internal consistency among the different elements had to be ensured. Drawing upon the research of Edmondson & Mcmanus (2007) this includes fit between the research question, prior work, research design and theoretical contribution. The study took an **abductive** approach to answer the research questions. When exploring a new area with the aim to contribute to existing theory, an abductive approach is considered appropriate (Saunders, Lewis, & Thornhill, 2007). Furthermore, a **qualitative case study** with multiple overlapping units was selected as research method. This was complemented with a longitudinal media content analysis as both literature review and empirical findings pointed towards the significant impact media had on our interviewees. The following sections will present the methodological choices of the thesis. The choices were guided by the in Figure 8 illustrated "research onion" which provides an effective way to lay out the research as it incorporates all relevant areas of the research process (Saunders et al., 2007).

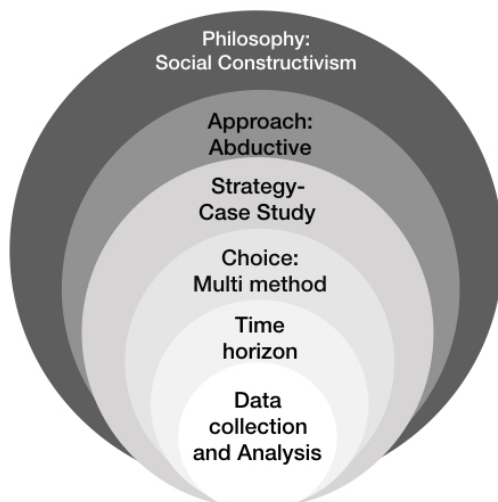


Figure 8 Research Onion

### 3.1.1 Research Philosophy

The research philosophy is related to the authors' world view, development of knowledge and nature of knowledge (Saunders et al., 2007). In relation to the phenomena under investigation, we took a **social constructivism** approach when conducting the research. As the context of the study, the Amazon Alexa platform, was in its initial stage and the complementors engage in sensemaking, the different interviewees were likely to have different perceptions and interpretations of the situation (Saunders et al., 2007). As different truths may be enacted as part of the on-going practices, openness to the created knowledge due to the expectations and actions of different actors had to be ensured (Kjellberg and Helgesson, 2006).

### 3.1.2 Research Approach

Instead of having the intent to test or generate new theories, we aimed to bring new insights and elaborate on existing theories by using them in a new context as suggested by (Ketokivi & Choi, 2014). In our case this implied examining the 'complementor journey' in the emergence of a platform based on a novel technology. Consequently, this thesis took on an **abductive research** approach to answer our research questions because going back and forth between empirical observations and theory allows to expand the understanding of theory and empirical phenomena (Dubois & Gadde, 2017). The abductive approach allowed for new insights to evolve, exemplified by the media analysis that was conducted as a result of the insights from the qualitative interviews with complementors.

### 3.1.3 Research Strategy

We undertook **exploratory research** for this thesis as this approach is useful to seek new insights, ask questions, and assess phenomena in a new light (Robson, 2002). The strategy employed for the study was a **case study with multiple embedded units** of analysis. The case under study was the Amazon Alexa platform, and the units of analysis *Complementors* who had developed a skill for the new platform. We chose this strategy as it provides the opportunity to gain a broader perspective of the units within one case (Yin, 2009). Moreover, this strategy is in line with the identified research gap which displayed a lack of research on the heterogeneity of complementors in platform settings. The qualitative study was complemented with a **content analysis** of different **media** to gain a richer data set and analyse the role of media in this context to better understand the complementors' actions.

### 3.1.4 Research Choice

The research choice fell on a **multi-method study** as we conducted both qualitative interviews as well as a media content analysis to better understand the context under study. According to Tashakkori & Teddlie (1998), collecting data from multiple sources should be done to better evaluate the findings and draw inferences from them. Multiple methods also allow for triangulation to take place which is an important aspect to increase the credibility of the research (Yin, 2009). Consequently, the interview data was enriched by secondary data from the companies as well as collecting information from the Amazon website and news providers. The aim of the content analysis was not to generate a direct cause and effect relationship between the media coverage and complementors' views but to provide us and the reader with an understanding of the landscape surrounding the complementors. A summarising overview of the research process is provided in figure below

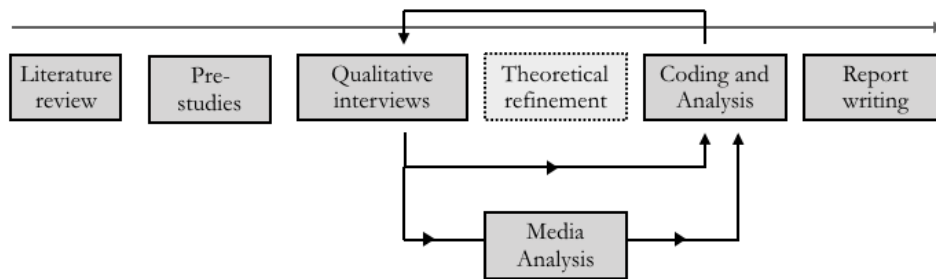


Figure 9 Research Process

## 3.2 Main Study - Interviews

### 3.2.1 Data Collection and Analysis

#### Interviews, prestudy

Owing to the complexity and novelty of the topic we conducted four pre-study interviews with experts from academia and business to generate a solid understanding of the phenomena of interest. The pre-study also guided our route towards potential interviewees for the main study.

#### Sample selection

The unit of analysis for our case is complementors of the Amazon Alexa platform. To ensure the relevance of the participants' contribution for answering the research question (Bryman & Bell, 2007), the sample was chosen purposively. The rationale for a purposive sampling was the need to get in touch with organisations that had joined or tested the Amazon Alexa platform. Owing to our limited knowledge about the Alexa platform and the fact that only a small portion of the currently available skills is built for commercial purposes, we were guided by our pre-study

interviews as well as trend reports to identify areas in which the technology is expected to be relevant. Moreover, we identified the active complementors through research on Amazon's German website which provides an overview about the available Alexa skills (Amazon.de, 2018). As a result of the pre-study, industry specific research and availability on the platform, four main areas for our research were identified: financial services, media & entertainment, retail/FMCG and transaction-based services<sup>2</sup>. The companies within these areas vary in their characteristics in terms of business models, size and infrastructure but are still thematically connected. As an example, the section "Media & Entertainment" includes a radio station and a news provider with different organizational characteristics yet similar services on the Alexa platform. One practical reason for this sampling was the difficulty to get access to several highly similar organizations within each area. More importantly, this sample allowed us to understand the perceptions of actors from various perspectives which generated broader insights. While this limits our ability to generalize the results and precisely cross-compare among industries, we argue that contributing with nuanced insights is particularly valuable as the current research on platforms is overly focused on statistical and analytical modelling and thereby neglects the heterogeneity of complementors. Moreover, this is in line with our theoretical framework because Storbacka and Nenonen (2011) argued that the value of proposed market propositions is dependent on company-specific characteristics. Thus, our approach allows us to understand the value of Amazon's market proposition from various angles which enriches our research.

After identifying the companies through the process described above, we reached out to around 50 companies via telephone, emails and social networks. For the main study, 16 interviews were conducted. Out of these 16 complementors, twelve had developed skills and four had extensive experience within voice technology. Several reasons led to the decision to choose complementors from both Scandinavia and Germany. First, it enabled broader access to companies. Moreover, the areas provide different stages of development. The Alexa platform was officially introduced in Germany in 2016 but is not available in Sweden yet. This allowed a further exploration of the role of expectations as several companies in Sweden developed Alexa skills despite the absence of the platform. As pointed out above, we accept the limited generalizability to generate broader insight and a nuanced understanding. The following table

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<sup>2</sup> Companies whose main service depend on distinguishable transactions that can be initiated, realized and paid through the Alexa platform, for example ordering food or taxis.

provides a short overview about our interviewees. A detailed list of all interviewees can be found in Appendix 1.

	Role	Company	Area
<i>Prestudy</i>	PhD Student	HHS	Academia
	Co-Founder	AngelR	Expert
	Senior Financial Analyst	Procter and Gamble	Consumer Goods
	CTO/Co-founder	Hedvig	Expert
<i>Main study</i>	Professor & Co-founder	KTH/Furhat	Developer / Skill
	Founder	Furhat Robotics	Developer / Hardware
	Professional IT Strategists	Consorsbank	Finance
	Co-Founder, Interhyp Zukunftswerkstatt	Interhyp	Finance
	AI Strategist and Project Manager	Nordea	Finance
	Project Manager	geno kom Werbeagentur GmbH	Finance
	Editorial Developer	Spiegel	Media / Entertainment
	Developer	SR, Swedish radio	Media / Entertainment
	Head of Innovation and Customer Experience	SR, Swedish radio	Media / Entertainment
	Project Manager, Data Science	Sony Music	Media / Entertainment
	Technology Trend Manager	Schibsted	Media / Entertainment
	Head of Digital Solutions	Real	Retail/FMCG
	Head of Digital Communications	Coop	Retail/FMCG
	Co-Founder	Vocally	Transactions
	Product Manager, Global products	Delivery Hero	Transactions
	Research Engineer	Artificial Solutions	Transactions

Table 2 List of Interviewees

## **Interview Design**

For this part of the study **semi-structured interviews** were conducted. Semi-structured interviews are recommended for exploratory research and enable the collection to collect a rich and detailed set of data (Saunders et al., 2007; Robson 2002). As we did not intend to verify pre-defined patterns but rather explore how complementors act in the market, a flexible interview format was needed.

An interview guide with questions clustered to themes was used as guidance throughout the interviews. The guide can be found in Appendix 2. In accordance to our exploratory approach, the questions were asked open-ended to allow interviewees to express their thoughts. Additionally, the questions were adjusted towards the specific knowledge and perspective of the interviewees. In order to generate an understanding of the interviewees' contexts and perspectives, information about the complementors was collected through company websites, LinkedIn profiles, published media and press releases prior to the interviews. Each interview started off with an introduction of the interviewers and interviewee in order to create trust and an open atmosphere before the questions related to the study were posed. The interviews lasted between 25-65 minutes. Interviews with complementors based in Sweden were held face-to-face. Financial and time-related constraints required us to conduct interviews with interviewees based outside of Sweden via Telephone or Skype. Where possible, the video function of Skype was

used as this is argued to be superior to telephone interviews because it allows to follow the non-verbal behaviour of the respondents and helps to overcome shortcomings that telephone interviews have in regards of trust-building possibilities (Saunders et al., 2007).

### 3.2.2 Data Processing

All interviews of the study were, after approval of the interviewees, audio recorded. This helped us to capture all necessary information from the respondents. Flick (2012) argues this to be an important part of collecting interview data. The interviews were transcribed with the help of the transcribing program O-transcribe, facilitating this otherwise time-consuming activity. As suggested by Flick (2012), the interviews were transcribed within 24 hours. The transcripts were coded and analysed in NVivo to extract themes in order to structure our findings and, in line with our abductive logic, support the development of the theoretical framework. In line with Charmaz (2006), two rounds of coding were conducted. The first round was conducted openly to extract categories that facilitate the understanding of the data. The subsequent round was conducted more focused to generate structured themes for our analysis.

### 3.2.3 Quality of Study

The assessment of qualitative research has not yet been clearly defined (Flick, 2012). For this study we follow Guba & Lincoln (1994) who suggest that the quality of a qualitative research study should be examined with the trustworthiness criteria. Below, the study's compliance with credibility, transferability and dependability will be explained.

#### **Credibility**

Credibility parallels internal validity of quantitative research (Lincoln & Guba, 1985) and describes to which extent the results appear to be acceptable representations of the data (Wallendorf & Belk, 1989). Several measures were in place to ensure the credibility of our research. Firstly, interviewees were able to review the statements used in the thesis for confirmation of the interpretive and descriptive accuracy (Merriam, S.B. and Tisdell, 2016). Secondly, in line with Bryman & Bell (2007), triangulation was used by investigating external sources such as company websites, Alexa skills and public reporting.

#### **Transferability**

Transferability of a study relates to the external validity and the possibility to generalize findings to other contexts (Lincoln & Guba, 1985). The difficulty for a qualitative study typically stems



from the small sample size which typically limits the possibility to generalize (Bryman and Bell, 2007). As we cannot foresee how other researchers might transfer our findings, we aim to provide as rich empirical data as possible to enable an accurate evaluation of potential transferability to other contexts (Lincoln and Guba, 1985).

### **Dependability**

Dependability of a study concerns the possibility for other researchers to replicate the study (Shenton, 2004). However, the changing nature of phenomena explored through qualitative research makes replicability difficult (Fidel, 1993). Especially in the context of the technological development in this study, the context and viewpoints of interviewees are likely to change. However, to enable the reader to fully understand the moment of this study, we provide documentation of the study in regard to research design, documentation and data gathering information (Shenton, 2004). Therefore, documentation such as information about interviewees, interview guide, coding structure and sources for media content analysis are included in the appendix. One aspect to ensure reliability of the study is the quality of documented data, as all interviews were recorded and transcribed it allows for comparison to distinguish between our interpretation of the data with the statements of interviewees.

## **3.3 Complementing Study – Media Analysis**

### **3.3.1 Data Collection and Analysis**

As mentioned earlier, the explorative and abductive approach of the study resulted in a content analysis of news websites and a specialized online blog to generate an understanding of how media might have impacted complementors' decisions. Flick (2012) argues that web pages are a good way to study the social construction of both general and specific issues. Moreover, the aim was to get an understanding of the longitudinal development related to the researched topic. Content analysis is any technique making inferences by objectively and systematically identifying specified characteristics of messages (Holsti, 1969). To understand the development and sense making process, content analysis can also be used to track changes in frequency over time (Bryman & Bell, 2009). Content analysis has been argued to be mainly a quantitative research approach, but there is also the possibility to take on a more qualitative approach (Macnamara, 2006). A qualitative content analysis does not produce counts and statistical significance but uncover patterns, themes and categories meant to represent the social reality (Zhang & Wildemuth, 2009). To understand the deeper meaning of media and the likely interpretations by audiences, a combination of qualitative and quantitative content analysis is needed (Newbold,

Boyd-Barrett, & Van Den Bulck, 2002). As the purpose of this complementary study is to provide the reader with a better understanding of the context the complementors act in, we provide the general message and of the media and do not aim to present a comprehensive quantitative presentation. Moreover, the time-related constraints led us to limit the scope of the media analysis.

### **Sample**

As we aimed to get a broad understanding of the role of media on this matter, the chosen sample included several sources with different thematic and geographical backgrounds. The sample was chosen purposively and included both general and specialized media in order to capitalize on the variety of focus and expertise. Firstly, we investigated Spiegel Online, one of the largest general media providers in Germany. Secondly, DI Digital, the digital section of Swedish business magazine Dagens Industri was chosen. Finally, as specialist media, the blog voicebot.ai, specialised on reporting related to voice technology and one of the most known according to our interviewees, was chosen. The blog's specialisation on voice technology allowed us to generate a deep understanding of the topic by using only a single source. As the study explores a technology in diffusion, mass media is considered an appropriate source of information as it is able to reflect the general discourse on the technology (Kriechbaum et al., 2018). However, due to the novelty of the field we wanted to broaden the selection and therefore chose several sources to be able to locate a larger number of appropriate items. Moreover, instead of being guided by search engines or online lists, the sample was generated through discussion with the experts being interviewed during our study which was recommended by (Mcmillan, 2000).

### **Research design**

The content analysis was conducted through visiting the online sites of the above-mentioned sample. One way to manage the sample in content analysis is the chosen time frame of study (Saunders et al. 2007). In regards to the amount of content, we restricted the articles to be analysed to those published between 2016 and 2018 because Alexa was launched in Germany in 2016. The articles under investigation were selected based on the mentioning of the Amazon Alexa. To access these articles, the search function on each website was used where "Amazon Alexa" was specified as key-word. The key-word was chosen based on relevant hits on one of the news-sites and then used for all sites for consistency reasons. This is considered a summative content analysis, where the recurrence of articles covering the topic is first identified and analysed, before a more qualitative approach is initiated (Hsieh & Shannon, 2005). In line with

the abductive logic, the coding scheme was influenced by the interviews and was related to use cases of Alexa, the competitive landscape of voice-related platforms and the general market development.

### 3.3.2 Data Processing

To ensure consistency in the analysis of the data, each published article was downloaded and added to a data set in NVivo. Our data set consisted of 33 articles from Dagens Industri and 25 articles from Spiegel Online. Owing to the large amount of articles published on Voicebot.ai and time-related constraints, we followed the recommendation from Macnamara (2006) and applied a systematic randomisation of articles by selecting every  $n^{\text{th}}$  article. By choosing every fifth article our data set consisted of 49 articles to be analysed. While we acknowledge that a different variable might change the outcome of the analysis, we feel confident that our analysis provides a realistic image of the coverage. The articles were coded in terms of year of publication, publishing media, and an open coding of content. The open coding was done partly based on the predefined coding scheme but also allowed for additional nodes and themes to evolve throughout the analysis. After the first round of coding, a second round was conducted to link the nodes to specific themes. These themes were interpreted by the authors in relation to the publishing media to form an understanding of the role of the message sent by respective publisher (Macnamara, 2006).

### 3.3.3 Quality of the Study

#### **Reliability**

One of the main threats to the quality of content analysis is related to the consistency or reliability of classification (Weber, 2017). To hedge this risk, both authors analysed and coded the content from the media analysis to increase the intercoder reliability. However, it must be mentioned that this was only possible for the English site. Thus, this analysis was conducted first to make sure that both researchers were aligned in terms of interpretation of data. Language barriers made it difficult to conduct the same procedure for the Swedish and German sources which should be taken into account by the reader of this thesis.

#### **Validity**

To increase the validity of the content analysis Macnamara (2006) emphasize the importance of thoroughly understanding the objectives of the research. In this study, the objective was to explore how Amazon Alexa had been represented in media. Following Neuendorf (2002), we

first conducted a preliminary reading of several articles to get a general understanding of the reported media. Finally, by selecting our sample in accordance with suggested sample methods we aimed to further increase the validity of the analysis (Newbold et al. 2002).

## 4 Empirical Findings

*In order to understand the role of complementors, the complete journey of engagement in the platform have been explored in our study. The empirical findings from the interviews will be presented in combination with the media analysis and the activities of Amazon. In order to provide a detailed and nuanced overview of our findings, we will blend summaries of our findings with several illustrative quotes from our interviewees to enable them to "tell their story" in this early stage of development.*

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### 4.1 Reasons to Join

We start the section of our empirical findings with the main aspects leading to the decision of the complementors to join the Amazon Alexa platform which can be categorized into access to novel technology, easiness to join and the widespread diffusion.

#### 4.1.1 Access to Novel Technology and Ecosystem

What becomes apparent in the interviews with complementors is that current commercialisation of voice technology is perceived to be tied to the smart speaker devices and consequently linked to hardware **investments**. As most complementors lack the internal resources to create hardware devices, they instead seek to profit from the size, financial resources and customer access of Amazon. Schibstedt<sup>3</sup> notes; *"We are not a hardware company and not big enough to be able to scale it."* Complementors express that they have been given an easy access to a new technology through the investments of Amazon.

Moreover, there is a belief among complementors that customers are unlikely to have several smart speakers at home. Vocally states that *"customers will only have one device, but the market will have room for 3 to 4 actors"*. Consequently, a characteristic considered important for the success of smart speakers is the openness of the underlying ecosystem and a wide variety of services. This aspect lets complementors further refrain from developing own voice-based solutions and emphasises the importance of **being present in an ecosystem**. Nordea describes that *"when we develop a chatbot we only do this with our financial services in mind...This chatbot might not be super interesting, as it is too "narrow". Therefore, it is interesting to use platforms...to connect to the wider ecosystem."*

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<sup>3</sup> For readability reasons, we will solely state the companies, and not titles or names of interviewees. However, the quotes reflect the individual opinions of the interviewees and not official company positions.

No interviewees stated clear goals for evaluating and assessing the impact of platform engagement in terms of downloads or customer reviews. Instead, we found the focus to be on **exploration** of the technological and potential commercial opportunities and being early involved in a new technological development. Real mentioned the future possibility to realize transactions through the platform to be one reason to explore the platform. Also, Delivery Hero pointed out that *"New things are appearing in the market that the company has to be prepared for"*. Moreover, the platform provides the opportunity to position oneself as an innovative company. Interhyp stated that the investment was a way to tell *"a cool story to position Interhyp as an innovative company"* and that they initially *"did not expect it to have a large impact on customer base or acquisition"*.

#### 4.1.2 Easiness

Another very prominent reason for complementors to participate in the platform was the easiness to join the platform. Amazon's "Alexa Skill Developer Kit (SDK)" enables complementors to develop skills independently without support or guidance from Amazon. Only some companies, especially larger ones, reported that they were approached by Amazon owing to already established business relationships and received support during the development. The ease of developing an Alexa skill, as well as low investment costs, were recognised as crucial for many developers to engage in the platform. Swedish Radio explains that the sophisticated SDK was why they *'...fell in love with the technology'*. Most interviewees stated that they would not have developed a skill if the development would have had required more resources.

Moreover, the initiative to engage on the platform was usually taken by individuals who developed the skill themselves before presenting prototypes to decision makers within the company. One person even developed the skill during Christmas holidays and then presented the idea to the management team (Interhyp). The process of development was usually short, as Schibsted states they *"had a working prototype up within two days"* and Nordea tells that they had a prototype after a week of development.

#### 4.1.3 Widespread Diffusion

Another reoccurring reason for joining the platform was the strong network position of Amazon. We found that most complementors mentioned the widespread diffusion of the Alexa device as the main reason to join the platform in contrast to other providers.

*"The rational was related to the boom in all kind of voice technologies where Alexa is one of the most used ones, wasn't it like 20 million sold last year?!" (Nordea)*

Whereas some complementors considered other platforms and decided to join Amazon's, others solely focused on Amazon owing to its wide reach. geno kom only looked at Alexa related to its large **market share**. Similarly, Spiegel explained that other providers such as Google Home, Microsoft Cortana and Samsung Bixbi were not considered to have a sufficient reach. Accordingly, the technological capabilities of various voice assistants played only a minor role compared to the number of users.

Additionally, we found that no extensive research was needed to learn about the diffusion of smart speakers and Amazon Alexa. Extensive **media coverage** was one of the main drivers for gaining knowledge about the platform. With the constant exposure to public media, information about the technology was absorbed: *"Isn't that general knowledge? Its easy to stay up to date with new trends as there is a lot of information out there in news, blogs etc. about these new technologies"* (Nordea). Staying up to date through news releases and new technology trends was a recurring theme of how employees at complementing firms kept themselves informed. In order to generate a better understanding of the role of media in the knowledge production and to provide the reader of this thesis with an understanding about the media coverage on Amazon Alexa, the results from the media content analysis will follow in the next section.

Our **media analysis** shows that Alexa was a topic of interest in both Swedish and German mass media and in the specialised blog about voice technology. The reporting on Alexa from Swedish media in Dagens Industri during 2016 was mostly related to functions and use-cases of the smart speaker. About one third covers use-cases of the technology and presents features such as news-reporting, music-player, home automation, food delivery and information search. In 2017, a change is observed as articles focus on the market share of Amazon and regard Alexa as standard solution for smart speakers. In 2017, 85% (11 out of 13) of the articles in Dagens Industri about Alexa have a positive representation of the platform and 61% focus on the dominance of Amazon in terms of devices sold and market share. The number of articles published during the first four months of 2018 equalled nearly 50% of the total coverage in 2017 which indicates an increased degree of reporting. Coverage is mainly on Amazon's strategy to diffuse the technology further by introducing new features or integrating Alexa in cars via cooperation with car manufacturers such as BMW. In general, the coverage on Amazon Alexa has a positive connotation and emphasizes Amazon's leading position in the market.

**German** news provider Spiegel Online delivers a somewhat different sentiment in their reporting. While quite few articles are published in 2016, the ones concerning Alexa have a negative representation of the platform related to difficulties regarding speech recognition. In

2017, the reporting becomes more extensive but the articles mentioning Alexa do not focus specifically on Amazon but provide a rather general reporting on voice technology. However, reporting on market shares is related to the dominance of Alexa giving an indication of the reach of the speaker. In the published articles from 2018, the sentiment towards Amazon can be perceived as more positive as half of the articles mention Alexa in a positive context such as its integration into other areas, differentiation of devices and price advantage over competitors. However, coverage also includes privacy aspects and malfunctions in terms of speech recognition difficulties and unintended interactions such as Alexa's unsolicited "creepy" laughter which raised extensive attention in social networks.

Turning to the coverage of the blog **Voicebot.ai**, the content in 2016 mainly touched upon the different alternatives of voice technology providers. However, about 20% of the articles focus on the large market share of Amazon. The investments from several entrants and the notion that these entrants are in a "race" for diffusion of this potentially crucial technology is another emerging theme.

*"Pretty much, every major technology company is now investing billions of dollars in the intelligent assistant space. This is a race; a race to the single interface for the user...you really only want one smart speaker" - (Voicebot.ai, 2016)*

In 2017, the coverage on the topic increased. Among the analysed articles, four emerging themes were identified: the competitive battle between market actors (27%), Alexa skills and use-cases (27%), general articles on the field on voice technology (27%) as well as articles with a positive connotation about Amazon (18%). The articles related to the competitive landscape mainly concerned the competition between Google and Amazon. Amazon was presented as the player with the most compelling interface for both developers and users and thus for creating skills. The articles published in 2018 further mention and signal the competitive battle between Amazon and Google. Also, several articles focus on the diffusion of Alexa into cars following Amazon's goal of the "Alexa everywhere" strategy which will be elaborated on in the next section.

To summarize, the media analysis shows that voice technology and the Amazon Alexa platform were covered from various media. Several themes of the analysis are congruent with the statements of the interviews, such as the rapid diffusion of the technology, the strong market position of Amazon, and the aspect that consumers will probably not buy several different smart speakers.



To understand the media coverage and resulting awareness of the complementors, **Amazon's actions** concerning the diffusion of the technology is worth considering. Amazon pursued an **“Alexa everywhere”** strategy and launched a variety of Alexa-enabled low-price devices leading to a rapid diffusion of the technology (Business Insider, 2017). Moreover, Amazon established cooperation with other companies to spread the technology into other settings than the home of the customer. A prominent example is the introduction of Alexa in cars of Ford and BMW among other car manufacturers (ZDNet, 2017). The “Alexa everywhere” strategy is complemented with **communication** of the technological innovation. Most notably to mention is the Advertisement Amazon played in the Super Bowl halftime, one of the most prominent programs for advertisement which receives considerable media attention (Forbes.com, 2018a). However, apart from information about the number of available skills on the platform, Amazon employs a rather restrictive information policy and does neither publish sales and transaction figures nor preannouncements of new products (Amazon.com, 2018) (Perez, 2017). This policy fuels media coverage with rumours and speculation.

**To summarise, the findings above suggest that easy access to the novel technology, easiness to join and the widespread diffusion related to Amazon' strategy were influencing factors for the decision to join a platform. Additionally, the brief overview of the media coverage indicated a high congruence between the complementors' reasonings and the media coverage. In the following section, we will present how the complementors were impacted by joining the platform and how they dealt with these implications.**

## 4.2 Implications of Platform Presence

In regard to the second research question we will now present the themes regarding complementors' platform presence. The findings are categorised into challenges and response strategies.

### 4.2.1 Challenges

#### **Technology and Information dependency**

Amazon's provision of the underlying technology to the platform has implications for the complementors. Engaging in the platform and develop a simple skill is found to be relatively easy. The difficulty is instead related to creating a **sophisticated skill** which provides customer value. In order to deliver the complementors' vision of the skill, they had to find own solutions

to develop the skills in the way they envisioned. Real described that Amazon has *"very strict rules"* and that you *"first have to learn what you are allowed and not allowed to do"*. This led to a low performance of many skills and Swedish Radio stated that *"If you look at the skills store now there are quite crappy skills"* and that *"the standards must be raised"*.

Furthermore, our interviewees found it **difficult to obtain information** from Amazon, independent of the aspect if a cooperation with Amazon existed or not. While some companies were approached by Amazon for collaboration and worked closely together with the platform owner, others had no communication channel at all. However, a common statement was that Amazon is very protective regarding internal information which required the complementors to engage in sensemaking about technology and platform.

### **Convergence, Commoditization and Competition**

Complementors expressed concerns regarding the danger of losing control and brand value but saw participation on the platform often as inevitable. Owing to the current dominance of the large technology companies, arranging oneself with them is often seen as unavoidable and seen as better option among two bad ones. geno kom called the big tech firms "the Four Horsemen of the Apocalypse" but also stated that *"you have to open up to developments, its sink or swim...if you cut yourself off, you lose the connection"*. Also related to the technology dependency described in 4.1.1, Nordea expressed the importance of *"being part of a larger ecosystem"*.

Moreover, the **convergence**<sup>4</sup> of various actors and services into a single platform does not come without challenges for the complementors. One crucial aspect of this development is the loss of visibility and customer interaction. The fact that most voice assistants come with a lack of visual cues creates a difficulty for complementors to reach customers. Thus, complementors cannot rely on customers remembering what brand a specific product belongs to. *"Brands would not disappear, but I think it will be harder to do branding"* is stated by hypermarket company Real. In a similar vein, Schibsted stated the potential danger of **commoditization**<sup>5</sup> of their product, meaning that they would lose the customer interface and the ability to differentiate themselves from their competitors:

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<sup>4</sup> The process by which different industries come to share a common technological base resulting in the blurring of boundaries between industries (Nystrom, 2005)

<sup>5</sup> Commoditization means a situation where a company's products and services are very similar to competitor products and services which is often fuelled by globalization, increased information exchange and technological developments. (Dumlupinar, 2006)

*"When it comes to voice, you will say "Alexa, read the news" you will not mention the provider of the news, and that's a scary thing for us because it means our brand gets diluted and we become a simple supplier of content into a platform"*

However, complementors simultaneously highlight the importance of being first on the platform owing to lock-in effects and customer convenience. Being first is particularly essential for complementors who do not have a unique offering. News providers, food delivery chains and music streaming providers all point out the importance of becoming "the standard": *"If you have started using Uber on this platform you won't change ... this is why it is important for the companies to be there early"* Vocally.

One emerging theme related to the dependency on the platform provider was the potential **competition** between platform provider and complementor.<sup>6</sup> A prominent example is the finance industry, especially related to the German actors. The German banking sector saw voice banking as promising technology for the future (Süddeutsche Zeitung, 2018). However, the expectations were not met when Amazon decided to restrict functions for voice banking. Several rumours circulated with regard to the reasons for Amazon's decision. Whereas the official statement stated regulatory issues as reason, speculations about a potential entrance of Amazon in the banking sector arose (Süddeutsche Zeitung, 2018). The interviewees' responses reflect the process of expectation and disappointment and the above stated speculation:

*"Everyone has assumed that a banking skill will be possible when the PSD2 policy was adopted. A day later, it was then in Wirtschaftswoche (a German newspaper) that Amazon does not allow a banking skill. It is very difficult to get information there. Of course, this is bad news for banks. My guess is that Amazon wants to develop its own banking skill."* geno kom

*"That Amazon did not allow any skill has probably several reasons. For one thing, they probably want to protect themselves. If they were to direct sensitive bank data through their systems, they would have to meet requirements. But besides, Amazon is also considering introducing a collaboration with a bank. For me the exact reasons are not clear, I think it's probably a combination of both."* Consorsbank

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<sup>6</sup> This section deals with the issue of competition between provider and complementor. We want to declare that, owing to contrasting reporting and viewpoints, we do not exactly know the reason for Amazon's restriction of the banking skill. However, as competitive dynamics are expected to have influenced the decision, we use this case to illustrate the crucial aspect of complementor-provider competition in platform settings.

Most companies from other areas did not perceive Amazon as direct competitor and have a differentiated view towards the competition with the provider. When asked about the competition with Amazon, hypermarket company Real emphasized the need for distinguishing between Amazon's different business areas and outweighing advantages and disadvantages. They noted that Amazon, despite being a potential competitor owing to their engagement in the retail and grocery business, is more than just a retailer and serves as a platform provider. Therefore, they did not consider refraining from using the technology *"just because it comes from Amazon"*. Additionally, Delivery Hero point out that Amazon's food delivery business mainly operates in the United States as of now and is therefore not considered a direct competitor in Germany.

### **Monetization and Business Model Fit**

A further central aspect for complementors is the matter of monetization. Many interviewees stated that they struggle to find a proper monetization model for this new technology. The relationship between company characteristics and perception of the platform is illustrated by the aspect that two companies with similar services – providing news via Alexa – have quite different evaluations of the technology. Whereas German magazine publisher Spiegel has to find a proper monetization model for the new technology, our interviewee from Swedish Radio sees the technology very positive. Spiegel notes that they want to be present on the platform to learn about the technology and be able to develop new solutions. However, so far, they have not found a way to monetise their solutions as they were either *"too far away from the publishing context or simply did not work because they were too graphic"*. Additionally, Spiegel mentioned that they were unable to include advertisements as revenue source in their Alexa skill. This was due to the fact that their current skill is an automatically generated version of a newsfeed and Amazon does not allow the integration of advertisement in these kinds of skills. To be able to use advertisement in their skill, Spiegel would have to employ a human speaker to read the news. The required additional investments were considered *"not financially viable"* at this point in time for Spiegel. For Swedish Radio, the situation is different. They are a public radio station and are mostly focused on performance metrics related to number of users and are less concerned with revenue generation because they are funded by the state. Moreover, they can capitalize on infrastructural synergies as the production of audio content is part of their main value proposition and therefore easily transferred to the Alexa platform.

The food delivery area illustrates a further example of configurational challenges and its impact on the companies. Owing to the lack of visual cues, food delivery companies can no longer just provide graphic content but have to adapt to the specifics of the technology and

change their offering. Delivery Hero states that they, instead of providing the customer with a full menu, provide the customer with recommendations. As the provision of "*smart recommendations*" rather than "*a long list of options*" requires different capabilities, the company has to adopt their practices and offering to the technological capabilities of the platform.

**These illustrations show that complementors faced challenges concerning the technological and informational dependency on Amazon, the convergence, commoditization, and competition that comes with the platform presence and the generation of a monetization model. Even though overlaps among the complementors were discovered, the findings also show that the impact of this challenges was not univocal but company-specific. The complementors' responses to these challenges will be described in the following section.**

#### 4.2.2 Complementors' responses

##### Commitment to platform

Most complementors consider the current commitment to the platform as sufficient in this stage. By getting on early, complementors were able to explore the technology and develop and test the capabilities of the platform. After initial investments, only a few complementors engage in further updating and developing their skill. The future possibility to provide transactions for Real and Delivery Hero as well as the opportunity to extend the customer base for Swedish Radio were mentioned as motives for further investing in the platform. However, most complementors refrained from further investments as they were not able to see a clear use-case.

Owing to the shortcomings and related to the initial reasons to join the platform, other factors led to the early commitment to the platform. By testing and trying out the platform at an early stage, complementors believed competitive advantages could be reached. According to Delivery Hero '*...it is better to start investigating earlier than later to have something ready when it becomes mainstream rather than to develop in rush when all competitors already provide that service*'. Also, we found tendencies that companies who previously had not been on the forefront of technological shifts expressed the importance of taking part in this new technology. Schibsted draw the comparison to the past and mentioned that they '*...don't want to be late and make the same mistakes that we have done with other technologies*'. Spiegel tries '*...to be present low-level and then perhaps with the right idea in the right moment develop something bigger*'. Furthermore, Consorsbank was concerned that the platform comes with negative implications for customer privacy and data security which led them to refrain from developing an Alexa skill with customer-sensitive data. As this reduces the

usefulness of the skill significantly, developing the skill further is currently of low priority in comparison to other projects. Accordingly, most interviewees stressed the importance of early exploration and platform presence but also mentioned a **“wait and see position”** owing to the various challenges described before.

A further facet of the current responses was the common attempt to benefit from a potential **signalling value** while awaiting sophisticated and monetizable use-cases. Schibsted’s current *‘... business case is primarily branding...’* and being *‘...seen as innovative’*. Relating to the data security issues, Consorsbank’s strategy was similar as they noted that they *‘...have developed the skill to signal that we are part of the new technology.’* Genokom states that *‘for the banks, Alexa is mainly an image thing right now; to show that they are a cool bank’*.

As the branding aspect was an interesting and commonly stated finding, the following paragraph seeks to provide a more detailed and nuanced picture of this response strategy.

### **Communication of Platform Presence**

In general, it can be stated that the complementors did not market their presence extensively to their customers but rather communicated their activities towards the industry. As the link to business value is considered weak and performance of technology is still questionable, we found that complementors were very **careful with promoting** the specific skills towards customers. German bank Consorsbank stated that they market their skill *‘...on our website. But not prominently. And also shortly in our newsletter but that’s it.’* Additionally, we found the belief that extensively promoting a skill with limited customer value could backfire on the brand as *“the customer will blame the brand, and that’s a risk for us”, Delivery Hero.*

Interhyp mentioned that *‘...customers who use Alexa should find our skill and be able to use it but we don’t push it too much.’* However, we found that many companies spread information about their platform presence through **press releases** which was then picked up and circulated by the media. As an example, Interhyp’s release of the Alexa skill was reported on in cash-online.de, wallstreet-online.de, tagesspiegel.de and handelsblatt.com among others. The statement below by hypermarket company Real nicely illustrates the different communication strategies towards customers and industry:

*‘We spread this in the trade press because it is positive news. And for the end customer we have posted a part on our website and mentioned it in our newsletter. But we do not overdo it both because we do not know how many customers have such a device and how relevant the topic is for them. That’s why we do not want to “spam” our customers.’*

To summarize, the findings related to complementors engagement in the platform point out the ease of joining the platform, but that further value must be identified to engage in additional investments. The hype around the new technology have urged many players to get on the platform and some of them are actively working on further development of their skills. However, the currently limited business value from the platform in combination with the insufficient technological performance makes many complementors reluctant to heavily promote their offering towards end users. However, several actors seek to actively position themselves as innovative towards media and industry peers.

## 5 Analysis and Discussion

*The following section will analyse and discuss the empirical findings that were generated throughout our research and presented above. The analysis follows the structure of our research questions and is therefore categorized into complementors' joining process (5.1) and their presence on the platform (5.2). The findings of those two sections will subsequently be presented in our summarizing framework (5.3).*

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### 5.1 Joining Process

Our findings displayed above show several interesting aspects concerning the joining process of complementors. The analysis will be guided by the framework developed by (Kude et al., 2010), who stated that technological, commercial and social capital of the platform provider are crucial aspects impacting the complementor's decision to join. The analysis will be complemented with our insights derived from the contributions from Storbacka & Nenonen (2011b) and the role of expectations.

In general, we found considerable thematical overlaps with the factors Kude et al., (2010) identified, as the major themes we identified were the access to a novel technology, wide diffusion and the importance of Amazon. However, our findings differ from the original framework in a significant structural way. As typical for research on multi-sided platforms, Kude et al., (2010) imply a rational assessment of the current provider characteristics. In contrast to this, our findings show that the joining process was not solely based on an objective assessment of current capabilities but infused by expectations about the future.

#### 5.1.1 Technological Capital

One of the main reasons to join for the complementors was the access to the novel technology. The interviewees believed that Amazon's platform provides solutions that the companies would not be able to develop themselves. In line with the reasoning of Kude et al. (2010), Amazon provides complementors with an integrated network and innovative voice technology. Instead of investing in own technological solutions, complementors see a need to benefit from the infrastructure of Amazon. However, in contrast to the findings from Kude et al. (2010) and in line with the previously mentioned impact of **expectations**, complementors did not join the platform because of the current technological capabilities but due to the capabilities that might be available in the future.

Moreover, we identified a factor which was not stated by Kude et al. (2010): the easiness to join. Our findings show that the vast majority of complementors would not have joined if considerably more resources would have been required. We interpret this deviation from Kude's



framework as logical consequence of the different setting we investigated. As we investigated a dynamic and uncertain environment, payoffs cannot be reliably estimated by the complementors. Accordingly, they care about **risk-limitation** and are reluctant to invest significant resources. In contrast, Kude et al. (2010) describes a more certain environment which enables a more sounded assessment of return on investment.

### 5.1.2 Social Capital

According to Kude et al. (2010), the hub's reputation is a crucial driver for complementor acquisition. Our findings point into the same direction as they stress the cruciality of Amazon's role. However, we found that the term 'clout' by Storbacka & Nenonen (2011b) depicts the aspect more realistically because the definition of Kude et al. (2010) is limited to a rather positive connotation as it is closely linked to the brand name of the firm and the signalling of 'trustworthiness'. However, we found that many complementor's were not enthusiastic about the cooperation but rather saw it as a '**sink or swim**' decision owing to the relevance and dominance of Amazon.

We therefore argue that the significant '**clout**' – the ability to influence others - of Amazon helped to diffuse the platform. As pointed out by Storbacka & Nenonen (2011b), the ability of a focal actor to influence market configurations depends on its size, network position, and longitudinal development leading to its network position. Amazon's successful development and current position as one of the most valuable companies in the world helped them to diffuse the innovation and get the complementor's attention. Many companies saw cooperation with them as nearly inevitable, despite challenges and potential negative impacts such as dependency, convergence and commoditization. We argue that Amazon's ability to significantly alter industry structures (Greve & Song, 2017) led to this situation. This was further complemented by the "Alexa everywhere" strategy which enabled a fast diffusion of the technology and made Amazon the top-of-mind provider for our interviewees.

### 5.1.3 Commercial Capital

The access to broad markets was one of the main reasons for complementors to engage in the platform. Our empirics indicate that the **wide diffusion** of Alexa was even more important than the detailed technological capabilities compared to other platform providers. Most companies focused on Amazon owing to their wide reach. Others quickly dismissed other platforms after comparing their diffusion with Alexa's. This finding relates to the concept of **network effects** which describes that the value of a technology in a platform is dependent on the number of

complementors and users. However, owing to the high uncertainty most companies were unable to identify the quality of the network effects for their purposes and based their decision on expectations about the future magnitude and quality of network effects. Even though the monetization and customer acquisition opportunities are currently limited, the belief that the technology would benefit the complementors in a later stage was common. This also explains the lack of clear goals of the engagement in the platform of complementors. In line with research on the role of expectations of Araujo et al. (2014), we saw that positive representation from media provided complementors with arguments of why to invest in the technology. The investment of Swedish Radio illustrates the role of expectations as they developed a skill before Alexa was available in Sweden and capable of providing access to Swedish Radio's main customers. For them, the high expectations translated into engagement in the platform even though the market was not yet in place. This behaviour illustrates the reasoning of Rinallo & Golfetto (2006): 'the relationship between market representations and actual markets in a postmodern world is reversed: it is the market that adjusts to representations and not vice versa.' In line with the argument from Borup et al. (2006), we see that expectations have a central role in guiding activities and mobilising resources of complementors. Due to the fact that **public narratives** and expectations of the **future importance** of the technology are considered central findings of our research, we will explain these aspects in more detail in the next section.

#### 5.1.4 Public Narratives

Storbacka & Nenonen (2011b) wondered how scripting actors can mobilize support and who contributes to the development of performative elements. Even though we cannot state a definitive cause and effect relationship between media coverage and the decision to join, our findings indicate that **media attention** was one of the key drivers for complementors to join. Even though we did not investigate other platforms, we feel confident to hypothesize that other focal actors with less clout would have received less media attention which would have hampered their diffusion.

As Anand & Peterson (2000) mentioned, information regimes, by presenting information about market activity, provide attention focus, support participants in sensemaking of market activity, are socially constructed and influenced from biases and assumptions that are largely taken for granted. Most interviewees were well aware of the fact that Amazon was the market leader in the smart speaker market and based their decision to join on the wide diffusion of Alexa. Interestingly, both media and complementors focused nearly exclusively on the diffusion of the devices, thereby neglecting a comparison of technological capabilities among different

voice technology providers. We see this as further indicator for how the representational practices of media lead to **public narratives** that influence complementors in their way to assess and qualify the technology. Moreover, we see the further confirmation of Rinallo & Golfetto (2006) who stated that the market adjusts to its representation. The media presented voice technology as the “next big thing” and forecasted how the technology and the platform provider will disrupt several industries. Consequently, many complementors perceived engagement in the platform and technology as important, thereby contributing to the predicted future.

We conducted the data generation and analysis to understand complementors’ reasons for joining a multi-sided platform based on a novel technology. Our research shows a variety of factors: Complementors join the platform to explore the novel technology. Moreover, they perceive that the main value of this technology can only be fully realized in a platform setting. Owing to the current uncertainty, the easiness to join and related risk-reduction were essential. In addition, we find that the access to a large customer base was crucial despite limited ability to capitalize on network effects. We further find that the assessment of these characteristics is infused by expectations about the future. These expectations are to a large extent constructed and narrated by various media and assumed to be closely related to the provider’s clout which goes beyond the concept of social capital and includes the ability to alter industry structures. The following framework illustrates our analysis.

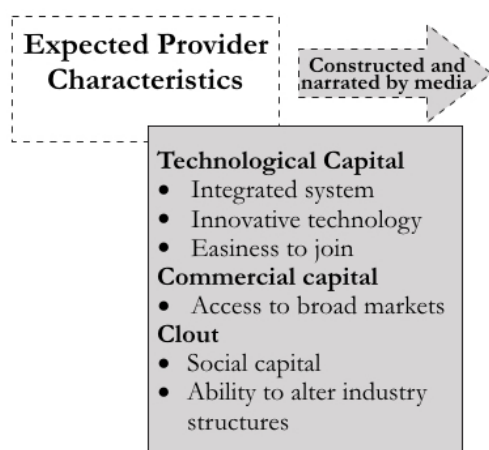


Figure 10 Complementor's reasons to join the platform

After setting the understanding for complementors’ reasons to join the platform, the next paragraph will explore the subsequent phase of the “complementor journey”: the platform presence.

## 5.2 Platform Presence

### 5.2.1 Overview

In order to understand the implications of platform presence, it is helpful to build a general understanding of the platform configuration. In line with our theoretical framework which is based on literature on markets as practices and configurations, we will focus on the practices the actors engage in and the resulting configuration which is generated through the interlinkages of actors. The different actors, Amazon, the media and complementors contribute to the platform in different yet interlinked ways. Even though all actors can be expected to engage in all practices to a certain extent, we will focus on the crucial practices the actors use in the platform setting.

	Actors		
	Amazon	Media	Complementors
<b>Exchange practices</b>	Building the exchange infrastructure Configuring exchange agents and partnering with companies Designing use scripts for skills		Qualifying the technology Designing use scripts for new use cases and contexts
<b>Normalising practices</b>	Employs strict rules what is allowed and what not Reviews every skill before publishing	Guiding public discussion Showing norms how to evaluate: rather diffusion than speech recognition rates, also privacy Influencing the perception of what are acceptable exchanges	Some co-develop with Amazon, thereby potentially contributing to norms Most are 'norm-takers'
<b>Representational practices</b>	Stating number of skills on platform Communication of innovation	Presenting analysis and speculation of how many devices are sold Reports on number and functions of skills on the platform Show current and potential use cases	Contributing to dissemination of market image by promoting platform involvement

Figure 11 Configuration of actors in Amazon Alexa Platform

The summarizing table above shows an interesting pattern about the different roles the actors play in the platform. **Amazon** is active in all three areas but, according to our analysis, engages mostly in **normalizing** and **exchange** practices. This includes designing use scripts for actual end users and the provision of technology infrastructure to enable complementors to develop own use scripts. Moreover, Amazon establishes norms by employing strict platform rules and reviewing the skills before they are published. Apart from the marketing activities such as advertisement during the Superbowl event, Amazon does not extensively represent the market in aggregation as they have a rather restrictive information policy and solely release the number of available skills on the platform.

The **representation** of the market is mainly done by the **media**. They extensively seek to depict market information by providing sales estimations, reporting on complementor and user involvement and the rapid increase of these figures. As our media analysis has shown, most

media focuses on the rapid diffusion of the technology, thereby leading to public attention and potentially contributing to a hype. However, the media also engages in **normalizing** practices by guiding the public discussion, showing norms how to evaluate the technology and influencing the perceptions of acceptable exchanges.

As mentioned in the first part of the analysis, the **complementors** are expected to be significantly influenced by the representational practices of the media. Consequently, they decided to join the platform and engage in **exchange** practices by qualifying the technology through testing and designing use scripts for new use cases and contexts. Only some complementors have an established cooperation with Amazon which might enable them to influence norms and standards. However, most complementors are assumed to be **“norm takers”** whose only choice is between accepting Amazon’s rules and not engaging in the platform. Finally, by engaging in the platform and promoting their activities, they contribute to the market **representation**.

Building on this general understanding of the interactions in the platform, we will present a more detailed description of the platform configuration in the following sections by building upon the concept of marketness by Storbacka & Nenonen (2011b). More specifically, it will be described how the in section 4.2 identified aspects such as monetization, commoditization, and dependency lead to different levels of configurational fit. We found that the marketness differed considerably among the different complementors. The following table displays the different levels of marketness for different companies and the respective reasons for this level of marketness. We purposely refrained from developing cause-and-effect relationships between the marketness and impacting factors as those are highly company-specific. For the same reason, we do not attempt to score the impact of the different factors for marketness as issues in only one of the factors can significantly limit marketness. Moreover, as no objective assessment criteria for marketness exist, the categorization reflects our subjective evaluation. We based our assessment on the congruence between the company’s primary offering and the offering on the Alexa platform. In other words, we estimated how much of the company’s value proposition can be realized through the Alexa skill. The following sections will explain the different stages of marketness in more detail.

Marketness	Company	Reason for Marketness Level
<b>High</b>	Swedish Radio (Media)	High Technological Fit High Business Model Fit Infrastructure Synergies
<b>Low-medium</b>	Spiegel (Media) Deliveryhero (Transaction) Vocally (Transaction) Real (Retail)	Medium Technological Fit Challenging Monetization Infrastructural Issues
<b>Very low</b>	Consorsbank (Finance) Interhyp (Finance) geno kom (Finance) Sony Music (Media) Procter & Gamble (Retail)	Normalizing Practice of Amazon Low Relevance for Business model
	Nordea (Finance) Coop (Retail) Schibsted (Media)	Dependency on Amazon's market entry

Figure 12 Levels of Marketness for different complementors

### 5.2.2 High Marketness

In high marketness situations, the core elements of the market are mutually reinforcing, norms and exchange practices are established, and the actor's network positions are known (Storbacka & Nenonen, 2011b). We consider Swedish Radio in a situation with high marketness owing to a high configurational fit and company-specific attributes that overcame the shortcomings of the platform.

As pointed out in our findings, playing music is seen as one of the best use cases for the current technology. Accordingly, Swedish Radio was very satisfied with the new technology and saw participation in the platform as ‘...an obvious development.’ Even though Swedish Radio faced some issues regarding the **dependency** of Amazon, they were able to develop a successful skill. Despite difficulties regarding information generation from Amazon, the technological challenges were limited owing to the simplicity and fit of the service. Moreover, in contrast to other companies that will be elaborated on in later stages, Swedish Radio has a **high configurational fit** with Amazon and no issues regarding convergence, monetization, and adaptability. As a public state-funded radio station, Swedish Radio's goal is to ‘be consumed’ and not to maximize profits which makes it easier for them to join a platform without a clear monetization model. Moreover, the organisations' infrastructure allows an easy adaptation to the technology. As the audio content is already produced for the main business, Swedish Radio can capitalize on **synergies** with its existing structures which is in contrast to other companies described in the next section.

### 5.2.3 Low – medium Marketness

For most complementors, the Alexa platform currently provides low - medium marketness. These situations are coined by attempts to create exchange yet limited value co-creation and fit of market elements. We found that this to be true for many companies in the areas media / entertainment, retail, and transactions.

To begin with, several companies faced challenges regarding the **dependency** from Amazon. Most notably, interviewees stated that they could not develop the skills the way they wanted to because of technological challenges and occasionally restrictions by platform provider Amazon. A further aspect of this relates to the characteristics of the underlying technology with the absence of visual cues. Our findings show that the technology requires changes in the offering as many services currently rely on graphic interfaces. The most prominent examples in our sample are news providers such as Spiegel and food delivery firms like Delivery Hero. Consequently, the **exchange practice** was not fully implemented. However, the actors are currently in the development process.

By developing a skill, complementors agree to the terms and conditions of Amazon which can be in **conflict to the values** of the complementor. They saw the danger of convergence and commoditization of their products but saw little choice owing Amazon's **clout**. Despite concerns, arranging oneself with Amazon was often seen as inevitable and seen as better option among two bad ones. This aspect illustrates the complementor's role as "norm-takers" of Amazon's normalizing practices. They did not see the opportunity to impact the platform in their favour and saw their choice as "accept or exit". However, **competition** with the platform provider was rather an abstract aspect and did not hinder the complementors from participating in the platform. The competition between Amazon and Delivery Hero, for example, is taking place on a broader business level and not limited to the Alexa platform. Moreover, Real distinguished between Amazon's platform business and their retail business which is a potential competitor for Real.

Further problems arose from **configurational issues**. Our interviewee from the hypermarket company Real mentioned that further development on the internal systems is required to realize a transactional skill. A further configurational issue became apparent in the case of German media company "Spiegel". Even though the service has similarities to Swedish Radio's skill – news and entertainment – the internal requirements differ considerably. As illustrated above, Swedish Radio is able to use synergies from other channels and can therefore

easily adapt to the new technology. Spiegel however, would have to engage a speaker to read the news in order to create proper audio files which comes with costs. Related to that finding is the issue of **monetization**. In contrast to state-funded Swedish Radio, Spiegel has to monetize their offerings which leads to further reluctance to invest in a technology without profitability promises. Owing to these issues, the company's current skill is limited to an acoustic version of an automatically generated newsfeed which can be seen as functioning but rather unsophisticated realization of exchange practices.

Relating to the **response strategies** developed by Altman (2015), we see that the complementors in low-medium marketness situations are mostly in the compliance and influence phases. Some companies such as Real or Spiegel were approached by Amazon and had direct communication and co-creation channels with the platform provider. This enabled them to provide feedback to improve the specifications and negotiate with the platform provider which are typical responses for the influence phase. However, other companies were not able to establish a relationship with Amazon and had no choice but to comply with the platform provider.

The situation with low-medium marketness further illustrates the crucial role of **expectations** in technological development. In the above mentioned high-marketness situation, expectations about the future are of minor importance because the positive aspects of the technology are already experienceable for the actors. In a setting with low-medium marketness however, expectations play a crucial role. Some actors are in this a **“wait and see”** position and plan to observe the development of the platform. However, other actors work actively towards an **envisioned future** in which their current actions will pay off. Currently, these actors state that they face significant challenges and that the value creation is limited. However, they believe that the technology will be relevant in the future and therefore already engage in it in the present. This illustrates the performative character of expectations: **by working towards an envisioned future, the actors contribute to the realization of the future they imagine.**

**In summary, these findings show that the actors in the areas retail and news as well as transaction-based companies are currently facing issues regarding the realization of their vision of this new technology owing to platform and company specific characteristics. Whereas some are in a “wait and see” situation, other actors are actively working on the realization of exchange practices. Nevertheless, the value creation is still limited which is typical for low-medium marketness situations. However, expectations about a promising**



future let many interviewees view the ‘...market configuration as an attractive source of resources for their future value creation’ (Storbacka & Nenonen, 2011b), which causes them to engage in the technology.

#### 5.2.4 Very Low Marketness

Our empirics also indicate that some companies are currently situated in situations with very low marketness. According to Storbacka & Nenonen (2011b), these situations might lack some market practices and sometimes exchanges might be not realized. In others, their realization is time-consuming and requires iteration rounds to be agreed upon. Moreover, competing viewpoints and a lack of commonly accepted norms are often characteristic for these situations. Representations are mostly limited to symbolic representations in order to increase the visibility of exchange units and market actors (Storbacka & Nenonen, 2011b).

Some companies simply faced a low marketness owing to the fact that the platform was not established in their market. Nordea, for example, developed an Alexa skill but depends on Amazon’s entry into the Swedish market to capitalize on it. Unlike Swedish Radio, the value of their skill is influenced by geographical proximity and more subject to Alexa’s speech recognition of the local language which limits the usefulness of publishing a skill before the market is established. However, as explained before, these actors still explore the platform as they expect it to be relevant in the future. However, in this section we want to focus on companies that are already present on the platform and face a low marketness situation.

Our findings suggest that the Alexa platform currently provides extremely low marketness for companies of the finance sector. The current platform infrastructure does **not enable exchange practices** in terms of banking transactions. Several factors contributed to that development. To begin with, the **dependency** of the complementor from the platform provider becomes obvious. The financial service industry saw voice technology as promising technology. However, Amazon’s **normalizing practices** in the form of not allowing banking transactions prevented the complementors from realizing their vision. Moreover, in one instance, values-based dependency between complementor and provider became apparent. German bank Consorsbank saw customer data security as one of the most important aspects. However, the concerns regarding data security and data privacy led the bank to refrain from a full-service solution for Alexa and prioritizing inhouse-solutions instead. Other firms such as Interhyp did not perceive the technology as relevant for the future because customers were not expected to adopt the innovation. Consequently, the firms do not plan any further investment in the platform.

However, despite these shortcomings, the actors often engaged in quite intensive marketing efforts to position themselves as innovative and on the forefront of technology. The concept of **inscription** is useful to elaborate on potential consequences of this behaviour.

Inscription, which means that expectations become inscribed and materialized in texts, actions and objects among others, comes with some complication in the platform setting. The innovator, in this case Amazon, is not the only innovator of the technical object. Instead, as common in platform settings, the user will only interact partially with Amazon's innovation. Rather, a lot of interaction with the user will be channelled through the innovations of complementors, in this case the "skills". Therefore, Amazon might not only have to inscribe its vision of the end-user of Amazon Alexa but also its vision of the complementor as well as the complementor's vision of the end-user. However, the various dependencies and Amazon's **normalizing practices** often **hindered** the complementors' **inscription** of their visions and expectations into the skill. However, the mere fact that the complementors engaged in the platform leads to further circulation of public expectations as the number of skills in the platform is a crucial aspect constantly reported by Amazon and the media. Furthermore, complementors actively contributed to the circulation of public expectations by promoting their presence on the platform in the media. This was also true for companies that expected Alexa to have a rather limited impact on their future, such as Interhyp or Consorsbank. More provocatively formulated, one could say that some complementors inscribe and circulate expectations that do not reflect their true visions in order to benefit from the marketing effect. This response strategy, which we call **self-beneficial signalling** is fuelled through the significant attention the technology and platform received which provides the stage to market oneself. Moreover, this is potentially a side effect of the easiness to join as it is likely that higher entry barriers would reduce the probability of this behaviour.

**Our second research question was to explore how the heterogeneity of complementors influences their presence on the platform. We found that several different factors impact the marketness and consequently the value of the platform for complementors. The identified factors were monetization, convergence, commoditization, provider-complementor dependency and competition, and configurational fit. By applying the concept of marketness, we found that the impact of those factors on the platform presence differed significantly among the complementors. In other words, the value of the platform depends not only on platform characteristics, but to a significant extent on the characteristics of the complementor. However, we have also shown that, apart from**

company characteristics, subjective expectations are drivers for further platform engagement. Related to that, we found that further engagement is not univocal in situations with similar marketness but also depends on subjective expectations about the future relevance of the platform. This was exemplified with the different response strategies apparent in the low-medium marketness situation. Finally, complementors are assumed to contribute to the generation and circulation of expectations through their platform engagement and promotional activities. It has to be emphasized that this occurs on all levels of marketness and independent of subjective expectations regarding the future value of the platform and technology. These findings are illustrated in the following framework.

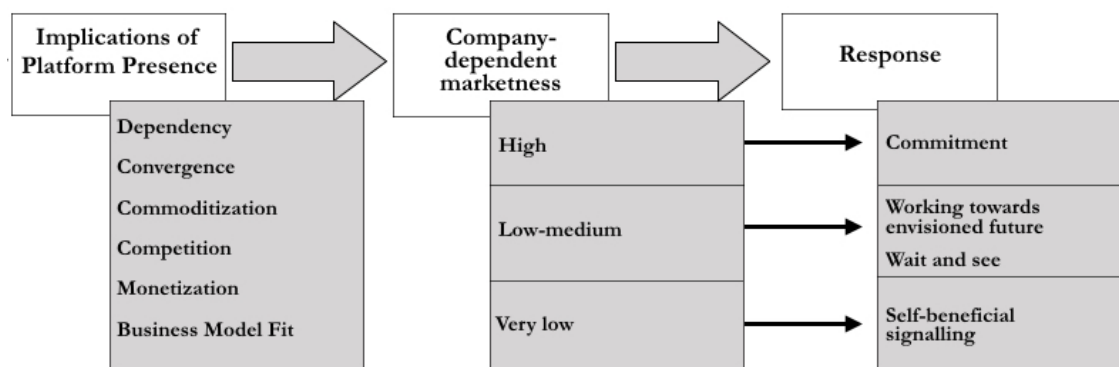


Figure 13 Complementors' presence on the platform

### 5.3 Summarizing Framework

Owing to the detailed summaries that were presented in the sections 5.1 and 5.2, the purpose of this section is to provide a brief overview of the complementor journey and put our findings into context. Therefore, the first part of the discussion will show our newly created framework which incorporates aspects from our theoretical framework and our empirical findings. Moreover, in accordance with our abductive approach we turn to other contributions to explain findings which our theoretical framework leaves unanswered.

The following framework illustrates the complementor journey which will be briefly summarized in the following. The evaluation of the provider characteristics and the related joining process is based on expectations about future rather than current capabilities. The media plays a major role in constructing and narrating the importance of the technology and the platform provider Amazon. Owing to the heterogeneity of characteristics and expectations, complementors differ in

terms of exposure to various impacting factors, marketness of their situations, perceived value of platform presence and further engagement in the platform. However, the engagement and promotional activities of actors across all levels of marketness is expected to contribute to the further generation and circulation of expectations which will be further addressed in the next paragraph.

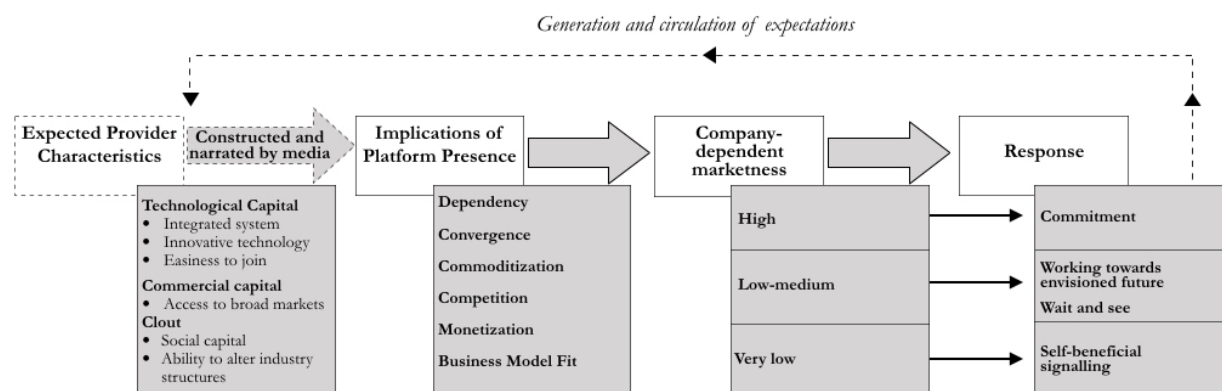


Figure 14 The complementor journey

To put our work into perspective and to be consistent with our abductive approach we want to briefly draw upon theoretical contributions that were not part of our literature framework but help to explain two of our main findings which we did not expect in advance: the nature of the joining process and the response strategy focused on self-beneficial signalling.

Even though we approached our research with the idea that complementors do not act perfectly rational, we did not foresee the crucial role of public narratives and expectations for the joining process. For the complementor, joining and testing the platform came at nearly no cost, both time and financial wise. Therefore, we do not consider joining the platform as irrational per se as it allowed to explore a new technology with relatively little resources. However, a certain **irrationality** might be assumed on a higher level, regarding the consideration of the platform in the first place. Inoue & Tsujimoto (2017) mention that ‘...the strength of indirect network effects might be affected by **bandwagon effects**’ that occur when the adoption of an innovation is based upon the adoption decision of others rather than an individual assessment. Moreover, the researchers hypothesize that participants driven by bandwagon considerations would likely lead to a **lack of contribution** to the platform ecosystem. Related to that, some research suggest that platform-based market interaction related to bounded rationality or even irrationality can result in **overcrowding** (Huotari, 2017). A similar notion came from Paper, Inoue, & Science (2015) who found that Nintendo was unable to sustain the popularity of its new game console Wii because complementors were unable to adopt to the new motion-sensor technology. Relating this to our

findings, we feel confident to hypothesize that bandwagon effects — considerably constructed by the media, fuelled by the easiness to join and occasionally leading to lack of support — were at play in our research. Moreover, the abundance of low-quality skills on the platform could be interpreted as overcrowding whereas complementors' difficulty to capitalize on the technology provides similarities to the above-mentioned case of Nintendo.

A second finding that we did not expect and fail to explain with our theoretical framework is what we call **self-beneficial signalling** response strategy that occurred in situations with very low marketness. However, the contribution of Boudreau & Jeppesen (2015) points towards a similar direction. In their study about of unpaid platform complementors, the researchers found that signalling and reputational motivations are responsive to platform growth in the absence of price mechanisms. However, this strategy is likely to contribute to the bandwagon effect described above and therefore to the diffusion of the technology. After pointing out these aspects that complement our research, we will now conclude with a summary and outlook.

## 6 Conclusion and Outlook

*The following section will summarize our research (6.1), show its limitations (6.2) and contributions (6.3) & (6.4) and point out important aspects that are relevant to develop our insights further (6.5).*

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### 6.1 Summary

Multi-sided platforms have raised a high attention in both practice and theory. Despite their high relevance in this matter, the role of complementors has been neglected in previous research. This shortcoming was mainly driven by the focus on statistical and analytical modelling with an implied perfect rationality of actors. By drawing upon literature on market development and expectations in technological and commercial development, and acknowledging the heterogeneity of complementors, several shortcomings of current research have been overcome and a comprehensive overview about complementors in platforms has been developed. Our findings show the crucial role of media and public expectations in the joining process which casts further doubt on the prevailing assumption of complementors' perfect rationality. Moreover, the heterogeneity of complementors' characteristics and expectations leads to significant differences in platform presence and further engagement. Whereas some complementors work actively towards their envisioned future, others employ a more observing strategy or use the platform presence as vehicle for self-promotion. However, the engagement of the actors on the platform is expected to lead to further diffusion of the platform, independent of the complementors' perception of the technology and platform.

### 6.2 Limitations

Despite various contributions that will be shown in the subsequent paragraphs, our research is not free from limitations. To begin with, the focus on the heterogeneity of actors in combination with the small sample size of complementors limits generalizability. Moreover, some aspects of the research were focused on past events which might have led to retrospective sensemaking of the interviewees and limits insights about longitudinal development of thoughts, expectations, and activities. In addition, the stated opinions do only reflect the views of individuals and are not necessarily representative for the organizations. We had to accept these shortcomings that come with conducting interviews owing to time-related and financial constraints. Even though we sought to overcome these issues with the complementing media analysis, the derived conclusions are not perfectly representative and do not allow to build cause-and-effect relationships. Accordingly, we can only make reasonable assumptions about the joining process of complementors. The same holds for the assumed impact of complementors' engagement and

promotional activities on the further generation and circulation of expectations. Even though reasonable, this relationship remains an assumption. Moreover, even though the application of the marketness concept to assess the configurational fit of the platform generated valuable insights, the evaluation was done subjectively and fails to provide objective criteria.

### 6.3 Managerial implications

To begin with, we would like to state that we appreciate the early interaction and exploration of the novel technology as we consider early engagement with novel technologies an important driver for commercial and societal development.

Our research points out that the joining process and platform presence is subject to company-specific characteristics and expectations. Accordingly, successful presence of market actors does not necessarily translate into a promising opportunity for others. Therefore, we urge complementors to assess the configurational fit between the platform and company before undertaking considerable investments. We are convinced that our developed framework can raise awareness of important aspects to consider and support complementors in their assessment. Related to that we want to state a cautionary note and urge complementors to be aware that bandwagon effects might be at play in technology diffusion and include this aspect into their decision-making process. Moreover, our study provides important insights for platform providers as our framework enables them to assess the value of their offering to various complementors which enhances platform development and complementor targeting. We consider this especially crucial for providers with less clout than Amazon and less ability to create public hypes as we assume that they rely more on the platform's configurational fit with complementors.

### 6.4 Theoretical Contribution

Our thesis contributes to research on multi-sided platforms as it deliberately takes a complementor perspective as called for by researchers (McIntyre & Srinivasan, 2016) and thereby addresses the research gap about complementors in platforms. This was achieved by challenging the currently emphasis on rationality and network effects which prevails in the research area and leads to the scarce body of qualitative insights in platform settings (Huotari, 2017). More specifically, we have shown that complementors are not perfectly rational but are subject to expectations in their decision to join and support a platform which goes beyond the concept of network effects. Thereby, we simultaneously contribute to the literature on expectations which currently neglects the role of not perfectly rational expectations of complementors. Moreover, we show that complementors might employ self-beneficial strategies and use the platform as

vehicle for marketing purposes which adds further insights about the heterogeneity of complementors as this aspect was barely addressed by previous research (Boudreau & Jeppesen, 2015). Moreover, as we, in contrast to most existing research, do not focus on a specific issue, we were able to draw a more holistic picture of complementors' interaction with multi-sided platforms which enabled us to hypothesize about the link between the media attention and the complementors' self-beneficial signalling strategy. Finally, by applying the concepts of marketness we presented a new approach to assess platform performance qualitatively which goes beyond the simple assessment based on numbers of users and complementors.

Moreover, we make empirical contributions to the markets as configuration literature as we, in contrast to Storbacka & Nenonen (2011b), investigated a setting where the focal actor possesses considerable clout. As we explored the importance of media in market scripting, we contribute to answering the authors' call for more research on how the focal actor is able to mobilize support in their market scripting attempts. Finally, our research included situations with varying levels of marketness and identified several impacting factors on marketness in platform settings. Owing to the conceptual overlaps of platforms and markets, we are confident that our findings also provide useful insights to understand market configurations.

## 6.5 Further Research

The findings of the research open up several interesting areas of research. Firstly, as our study was conducted within a limited time period and investigated several aspects in hindsight, we call for longitudinal studies to explore and validate our findings further. Moreover, the provided company-specific insights require further research to be of more generalizable use. While we focused on the differences between the complementors, it is important to understand how both complementors' similarities and differences impact behaviour in platform settings to draw more refined theoretical and practical conclusions. Of particular interest would be a more detailed analysis of the drivers of the response strategy "self-beneficial signalling". Do the complementors plan to employ this behaviour before engaging in the platform or is it a response to the inability to capitalize on the technology of the platform? We call for longitudinal studies to answer these questions. Furthermore, what does the rapid diffusion with low-quality complementor products mean for platform development? The mechanisms between diffusion, platform quality and platform success need further exploration. Finally, we researched a platform that was targeted towards consumers and raised considerable media attention. We leave it to further research to explore how our findings can be transferred to platforms in B2B settings and less media attention.



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## 8 Appendix

### Appendix 1: Interview participants

<i>Prestudy</i>	C-P Ahlbom	PhD Student	HHS	Academia	18-01-14	45	Face to face
	V. Liliestråle	Co-Founder	AngelR	Expert	18-01-17	35	Face to face
	J. Lundgren	Senior Financial Analyst	Procter and Gamble	Consumer Goods	18-02-06	45	Skype video
	J. Ardelius	CTO/Co-founder	Hedvig	Expert	18-02-14	30	Face to face
<i>Main study</i>	G. Skantze	Professor & Co-founder	KTH/Furhat	Developer / Skill	18-02-28	58	Face to face
	S. Al Moubayed	Founder	Furhat Robotics	Developer / Hardware	18-03-07	25	Face to face
	W. Füssel & S. Nussbaum-Rupp	Professional IT Strategists	Consorsbank	Finance	18-03-09	45	Telephone
	J.Münchenberg	Co-Founder, Interhyp Zukunftswerkstatt	Interhyp	Finance	18-03-15	63	Skype video
	K. Grönvall	AI Strategist and Project Manager	Nordea	Finance	18-03-20	65	Telephone
	D. Kunert	Project Manager	geno kom Werbeagentur GmbH	Finance	18-03-01	31	Skype
	T. Hellwig	Editorial Developer	Spiegel	Media / Entertainment	18-04-19	34	Telephone
	M. Sunesson	Developer	SR, Swedish radio	Media / Entertainment	18-03-05	52	Face to face
	T. Granryd	Head of Innovation and Customer Experience	SR, Swedish radio	Media / Entertainment	18-03-05	45	Face to face
	M. Sebek	Project Manager, Data Science	Sony Music	Media / Entertainment	18-03-28	45	Face to face
	A. Grimstad	Technology Trend Manager	Schibsted	Media / Entertainment	18-04-10	59	Skype video
	S. Janßen	Head of Digital Solutions	Real	Retail/FMCG	18-04-18	32	Telephone
	H. Staaf	Head of Digital Communications	Coop	Retail/FMCG	18-05-02	25	Face to face
	S.Åkerlund	Co-Founder	Vocally	Transactions	18-02-20	60	Face to face
	A.Novykov, M. Grabowski	Product Manager, Global products	Delivery Hero	Transactions	18-04-25	30	Skype video
	E. Aili	Research Engineer	Artificial Solutions	Transactions	18-03-09	45	Face to face

## **Appendix 2: Interview guide**

Below interview guide serves as an indicator for questions posed with complementor firms, certain adoption to questions done in regards to interviewee.

*Instruction: start off with introduction of researchers and thesis process, procedure of interview and ask for permission to record, possibility to anonymise*

### **Introduction to interviewee**

Please briefly explain your role and position within company?

What is your relation in regards to Amazon alexa skill development within the firm?

### **Decision Process**

When did you first consider joining the platform / developing the skill?

How was this process triggered?

Who were the main actors involved?

How do you keep yourself up to date in regards to the technology?

What was the rationale behind the decision?

How was the final decision made?

### **User centric questions**

How would you describe the importance of Amazon Alexa?

How do you believe customers will use your skill?

Did customers request the skill before you developed it?

Have customers started to use the skill?

How do you evaluate the impact of being present on the platform?

### **Platform / Technology**

What is your opinion about the technology “Digital assistants” in regards of impact on society and business in general?

What potential controversies / obstacles / disadvantages do you see with this new technology? (both in terms of impact on society and business)

How do you see the role of the platform provider Amazon?

### **Business impact?**

How do you perceive the importance of this technology / channel for your business model?

How do you see the risk and potential reward of joining this platform?

Do you see a conflict between this new technology / channel and your current business model?

How do you market the technology / brand yourself on the platform?

Do you plan new further investments in this technology?

Competitors moves and activities

### **Technology Evaluation**

Overall impact / importance of technology (next big thing or just gimmick)

Current stage of development

### **Finalising questions**

Can you think of something else that could be valuable for us to cover in regards to this thesis?

After answering these questions, do you want to be anonymised in the final publication?



### Appendix 3: Example of result and coding in media analysis

Example of coding scheme				
Focus of article	Alexa	Voice	Tech	Competitors
<i>Derived from headline and content</i>	<i>Amazon wants to abolish Alexa's uncontrolled laughter</i>	<i>Digital assistants and dialects</i>	<i>Twelve Views of the World of Tomorrow</i>	<i>A weekend with Apple's HomePod</i>
How is alexa presented	Positive	Negative	Neutral	
<i>What words are used in the context of Alexa</i>	<i>Role model, forefront, competitive, better performance</i>	<i>Bad language, stupid, big brother award, backed</i>	<i>Digital assistant, smart speaker</i>	
Presentation of usage	Yes	No		
<i>Skills etc.</i>	<i>music, provide news, ask questions, order goods</i>	<i>Not mentioned</i>	-	
Over all message of article	Importance of voice	Voice not developed	Neutral	
	<i>Voice is inevitable, voice is the future</i>	<i>Not smart enough, voice not yet ready, do things without request</i>	<i>Regular reporting</i>	
Market share presentation	Yes	No		
<i>Alexa in relation to competitors</i>	<i>The most popular, the most sold, conquered the market</i>	<i>Not mentioned</i>		

Spiegel 2016 (4 articles)				
Focus of article	Alexa	Voice	Tech	Competitors
	50%	25%	25%	
How is alexa presented	Positive	Negative	Neutral	
	25%	50%	25%	
Presentation of usage	Yes	No		
	25%	75%	-	
Over all message of article	Importance of voice	Voice not developed	Neutral	
	50%	25%	25%	
Market share presentation	Yes	No		
	-	100%		

Spiegel 2017 (13 articles)				
Focus of article	Alexa	Voice	Tech	Competitors
	15%	62%	31%	46%
How is alexa presented	Positive	Negative	Neutral	
	0%	38%	23%	
Presentation of usage	Yes	No		
	15%	85%		
Over all impression of article	Importance of voice	Voice not developed	Neutral	
	31%	31%	38%	
Market share presentation	Yes	No		
	23%	77%		

Spiegel 2018 (8 articles)				
Focus of article	Alexa	Voice	Tech	Competitors
	50%	38%	-	13%
How is alexa presented	Positive	Negative	Neutral	
	50%	38%	13%	
Presentation of usage	Yes	No		
	38%	63%	-	
Over all impression of article	Importance of voice	Voice not developed	Neutral	
	50%	13%	38%	
Market share presentation	Yes	No		
	38%	63%		

Code	Category	Interpretation
Dominant market share Leading company Early entrance	Alexa considered leading in voice	Business magazine in Sweden writing about Alexa as the leading company creates positive representation

Quantitative coding

Qualitative interpretation

## Accessed sites, Spiegel analysis

### 2016 Accessed 2018-04-25

<http://www.spiegel.de/netzwelt/gadgets/raspberry-pi-so-baut-man-einen-lautsprecher-a-la-amazon-echo-a-1081891.html>  
<http://www.spiegel.de/netzwelt/gadgets/sxsw-south-by-southwest-zwoelf-ausblicke-auf-die-welt-von-morgen-a-1082473.html>  
<http://www.spiegel.de/spiegel/spiegelwissen/d-146252589.html>  
<http://www.spiegel.de/netzwelt/web/tatort-faktencheck-koennen-hacker-staedte-abschalten-a-1126264.html>

### 2017 Accessed 2018-04-25

<http://www.spiegel.de/netzwelt/gadgets/super-bowl-google-werbung-aktiviert-google-home-a-1133315.html>  
<http://www.spiegel.de/netzwelt/apps/sprachassistent-google-home-veraergert-nutzer-mit-scheinbarer-disney-werbung-a-1139218.html>  
<http://www.spiegel.de/netzwelt/gadgets/galaxy-s8-samsung-stellt-virtuellen-assistenten-bixby-vor-a-1139707.html>  
<http://www.spiegel.de/spiegel/print/d-150460285.html>  
<http://www.spiegel.de/netzwelt/gadgets/build-2017-microsoft-verkauft-kuenstliche-intelligenz-an-entwickler-a-1147101.html>  
<http://www.spiegel.de/netzwelt/netzpolitik/eprivacy-verlage-kritisieren-in-einem-offenen-brief-plaene-der-eu-a-1149884.html>  
<http://www.spiegel.de/netzwelt/gadgets/wwdc-das-bringt-apples-entwicklerkonferenz-a-1150605.html>  
<http://www.spiegel.de/wissenschaft/mensch/digitale-zukunft-roboter-und-rasierklingen-a-1159046.html>  
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<http://www.spiegel.de/netzwelt/gadgets/sony-xperia-touch-im-test-mit-diesem-beamer-wird-der-tisch-zum-touchscreen-a-1161248.html>  
<http://www.spiegel.de/netzwelt/web/blueborne-forscher-warner-vor-hackerangriffen-per-bluetooth-a-1167663.html>  
<http://www.spiegel.de/netzwelt/gadgets/sonos-one-mit-sprachsteuerung-im-test-nachzuegler-mit-startschwierigkeiten-a-1173301.html>  
<http://www.spiegel.de/netzwelt/gadgets/apple-verschiebt-start-von-siri-lautsprecher-homepod-a-1178709.html>  
<http://www.spiegel.de/panorama/tiere-die-kuriosesten-tiermeldungen-2017-a-1182767.html>

### 2018 Accessed 2018-04-25

<http://www.spiegel.de/netzwelt/gadgets/amazon-echo-spot-im-test-guck-mal-wie-der-guckt-a-1189376.html>  
<http://www.spiegel.de/netzwelt/gadgets/amazon-alexa-und-google-assistent-antworten-auf-die-wichtigsten-fragen-a-1190408.html>  
<http://www.spiegel.de/netzwelt/gadgets/alexa-und-google-assistent-amazon-echo-google-home-und-co-im-test-a-1179885.html>  
<http://www.spiegel.de/netzwelt/gadgets/homepod-im-test-apples-smart-speaker-mit-siri-a-1192991.html>  
<http://www.spiegel.de/netzwelt/gadgets/digitale-assistenten-siri-alexa-und-google-assistent-bei-dialekten-a-1194032.html>  
<http://www.spiegel.de/netzwelt/gadgets/amazon-kauft-tuerklingel-hersteller-ring-a-1195754.html>  
<http://www.spiegel.de/netzwelt/gadgets/amazon-will-alexa-das-unkontrollierte-lachen-abgewöhnen-a-1197007.html>  
<http://www.spiegel.de/netzwelt/web/big-brother-award-2018-verliehen-preisträger-soma-schiesst-zurück-a-1203922.html>