Course:	SKOM12
Term:	Spring 2020
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Exploring Strategic Communication Challenges in the Era of the Voice Assistant

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Master's thesis

Abstract

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Using machine learning and artificial intelligence technologies, voice assistant (VA) has become a new social phenomenon and a market game changer in multiple industries. This thesis focuses on the strategic communication challenges brought about by the VA. The researcher applies the theoretical framework of the communication value circle (CVC) and the gatekeeping theory (GK), adopting the applied thematic analysis (ATA) as the overarching method. After selecting and examining 18 industry reports and transcripts of 19 interviewees who are experienced with VA, challenges are identified. The results point out five key challenges and reveal VA's game changer position in the field of strategic communication, both theoretically and empirically. The challenges are: 'VA gatekeepers in the consumer journey', 'the management of VA-merged communication', 'new stakeholder relationships and negative associations', 'VA-triggered change and crisis' and 'new roles and skills of strategic communicators'. This study also places technology-based communicators under the spotlight of organizational communication theory. It enriches the CVC framework by offering new application means and contributes to GK theory with a case study of algorithm-based gatekeepers. In addition, this study also proves the effectiveness of the ATA approach in abstracting a holistic picture of complex, technology-driven strategic communication issues. As well as three future research suggestions, the author also presents an expanded model for easy application by communication managers.

Keyword: Voice Assistant, Virtual Assistant, Strategic Communication, Applied Thematic Analysis, Document Analysis, Communication Value Circle, Gatekeeping Theory, Game Changer

Word Count: 19, 640

Table of contents

List of Tables

List of Figures

Chapter 1. Introduction

Artificial intelligence (AI) is a revolutionary technology that is changing every aspect of human society, and has been deeply rooted in the communication field since Alan Turing situates communication as the deciding factor in AI (Campbell, Sands, Ferraro, Tsao & Mavrommatis, 2020; Gunkel, 2012). Organizations are especially fascinated by its ability to facilitate digital transformation and its value as a symbol of innovation (Kaczmarek-Śliwińska, 2019; Makridakis, 2017). Among all AI-based artifacts, voice assistant (VA) is one of the most well-known thanks to the popularity of smart phones and intelligent speakers. Some prominent VA market players are Amazon.com Inc. (Alexa), Apple Inc. (Siri), Microsoft Corporation IBM Corporation (Cortana), and Google (Google assistant) (Bieliauskas & Schreiber; Psmarketresearch, 2020). Despite there being many current technical descriptions, in this paper VA is defined as an intelligent agent that can communicate with the user through oral language, and that is categorized as conversational AI by academia (Bellamkonda, Naresh, Gandhi, & DasGupta, 2018). Moreover, VA is especially important for communication studies as it is designed to achieve natural dialogues between humans and machines. (Kepuska & Bohouta, 2018). Although VA and chatbots share the same ability to carry on conversations, the ability to process the human voice draws a clear line between VA and text-based chatbots; 'humanity' is what makes VA a true game-changer.

In academia, a phenomenon driven by resource, competition, risk, innovation and engagement could be listed as a strategic issue and deserves communicators' attention (Vecchiato & Roveda, 2010; Zerfass, Vercic, Nothhaft & Werder, 2018). VA development is driven by financial, human labor, and public resources; its organizational adoption is driven by innovation and competition; its growth demands in-depth engagement of organizational members and end-users, and it is associated with critical issues. VA is hence a strategic game changer that challenges organizations thoroughly. Since strategic communication is defined as purposeful

communication carried by organizations to fulfill their goals, as a prominent new medium and communicator, VA merits more consideration in this field.

Meanwhile, as an emerging research phenomenon, VA is getting more and more attention from academia, including the fields of computer science, engineering, healthcare, and social sciences. However, current communication studies neglect this on-going game-changing process led by VA, and omit to identify challenges faced by organizations, and studies focusing on strategic communication still lack a holistic view. Hence, there is a gap in research on exploring strategic communication challenges, which needs to be identified and studied in the context of VA's emergence.

Identifying this gap is based on existing communication studies. Typical communication studies focus on the application of VA as a technology (Jones, 2018; Moriuchi, 2019; Wu, Chen & Dou, 2016), new changes in VA-merged consumer behaviors (Kumar, Rajan, Venkatesan & Lecinski, 2019), ethical discussion on privacy (Burbach et al., 2019), social regulations (Hirish, 2018), gender perspectives (Garcia & Lopez, 2018), and the obsoleteness of communication theories (Garcia & Lopez, 2018; Guan, 2019; Narang & Shankar, 2019). Moreover, such studies usually deal with VA as one general AI technology, ignoring the distinctions between different branches and the different ecosystems built upon them. Although some communication scholars have already set an agenda on Big data and Automation (Weissenberg, Zerfass & Moreno, 2017), Human-Machine Communication (Guzman, 2019), and chatbot research toolkit (Araujo, 2020), etc., VA, the most fruitful artifact growing from the crown jewel of AI (Huang, 2019) still has no agenda of its own.

Opportunities for organizations created by VA's development have already been identified by scholars. However, as a sophisticated intelligent system, VA's development requires a high financial investment and a long incubation period, and there are critical social legitimacy, ethical, and trust issues (Campbell et al., 2020). As with other AI-driven developments, challenges also exist alongside VA-driven opportunities. The organizational challenges brought about by VA are mainly threefold, firstly from the most essential stakeholder – consumers. Studies show that consumers are getting used to the VA-embedded connected lifestyle, and some even build attachments to VA, such as recognizing VAs as friends or virtual family members (MainichiJapan, 2020). In the year 2018 alone, 250 billion voice searches

were conducted in the US, ranging from ‘what to eat’ to ‘who will win the presidential election this year’ (Kinsella, 2019). Such behavior patterns indicate that consumers are assigning more influence to their VA in their decision-making processes. Secondly, organizations’ intangible asset management is facing challenges, too. For instance, VA is connecting everything in smart homes including appliances, lighting, and power, etc., which makes smart homes an intimate concealed environment; and VA’s connection ability makes it a new gatekeeper for brands. One example of VA being a gatekeeper is illustrated by field surveys, which show that different VA products have different limitations in granting ‘permissions’ to other brands when asked to give buying suggestions (Voicebot.ai, 2019). This indicates that consumer preferences are already being influenced by VA, and Alexa, for example, will point to results on Amazon Prime instead of other e-commerce platforms or offline stores (Yoffie, Wu, Sweitzer, Eden & Ahuja, 2018).

Despite limited visibility caused by VA’s gatekeeper role, branding professionals are starting to notice the significance of sonic branding and are trying to build brands through voice technologies that aren’t fully trusted by consumers yet (Vernuccio, Patrizi & Pastore, 2020). Since the content suggested by VA is based on existing online information which can be designed by the organization or user-generated content (UGC), and some UGC might differ from the desired brand identity, so VA can cause misunderstandings between consumers and brands or even damage brand image (PRchitects, 2019).

Lastly, on a societal level, on one hand the public sphere is being invaded by VA, and on the other hand, the VA market itself is under-regulated. Cases are documented of users consulting VA on political topics such as presidential elections (Schwartz, 2020). Journalists and scholars are already showing concerns about the new relationships being built between users and their VAs (Shulevitz, 2018). At the same time, VA companies are busy working on self-regulation and legitimization under public supervision, for instance, the connected home project on IP (Zigbeealliance, 2019).

Challenges on different levels brought about by VA have a close correlation with the concerns of strategic communication studies, and what makes VA more relevant for strategic communication scholars today is that the unexpected COVID-19 pandemic brings more positive perspectives for it. For instance, in the currently

high-profile healthcare industry, demand for contactless diagnosis, remote personal care and virtual elderly care is increasing rapidly and these demands bring VA to organizations' attention in seizing opportunities to develop next generation connected solutions, causing a speed up of VA research and development (R&D) in both the consumer and enterprise markets (Canalys, 2020; Lal, 2020; National public media, 2020).

1.1 Aim and Research question

The aim of this explorative research is twofold. First, to obtain data and increase the knowledge of VA in the field of strategic communication. Second, to address and analyze communication challenges brought about by VA that have existed or will appear in different types of organization in the process of achieving organizational goals. As a result, this will generate new insights into VA-driven strategic communication and help fill the research gap. A qualitative approach of applied thematic analysis is conducted towards two types of contextual data: 18 VA-related industry reports, and 19 semi-structured interviews that are designed based on the documentary analysis result of the former reports. This mixed approach aims to provide researchers with a holistic picture of VA-merged organizational communication, further enrich general strategic communication research on VA as a communicator and shed light on future research directions.

Hence, the research questions (RQ) is:

What are the strategic communication challenges that will be brought about by VA in the near future?

1.2 Disposition

The structure of this qualitative study takes the form of six chapters. The literature review which is divided into two main parts: a brief background intro to VA explains VA's technology base and its development path; previous research on VA's communication challenges in organizational communication, marketing, branding, PR, corporate communication, advertising, strategic management, and other filed research, organized by the perspectives of customers, enterprises, and public organizations. Thereafter, the theory chapter presents the CCO and the communication value circle (CVC) framework which guide the methodology and analysis. The fifth chapter, methodology, addresses epistemological positioning, qualitative research strategy, and design. The findings and discussions are placed in the sixth and seventh chapters, presenting key VA-driven strategic challenges and answering the research question. Lastly, the study provides directions and suggestions for further research.

Chapter 2. Background: VA and VA as a communicator

From a social science perspective, AI aims to explain knowledge and how to gain and practice knowledge (Singh, 2018), VA, as a product and sub-technology of AI, shares the ability to manage knowledge. Besides, as stated in the former chapter, VA is born with in-depth connection with communication and holds the goal of achieving natural dialogues with humankind (Gunkel, 2012; Kepuska & Bohouta, 2018), it is an intelligent conversational agent that can interpret human speech and respond via synthesized voices (Hoy, 2018). Although VA products are designed using different technological approaches, for instance, Google Assistant is built upon Deep Neural Networks (DNN), Cortana is based on ML, and Alexa is boosted by Automatic Speech Recognition (ASR) and NLU, the general process of a human-VA interaction follows the structure of a general dialogue system:

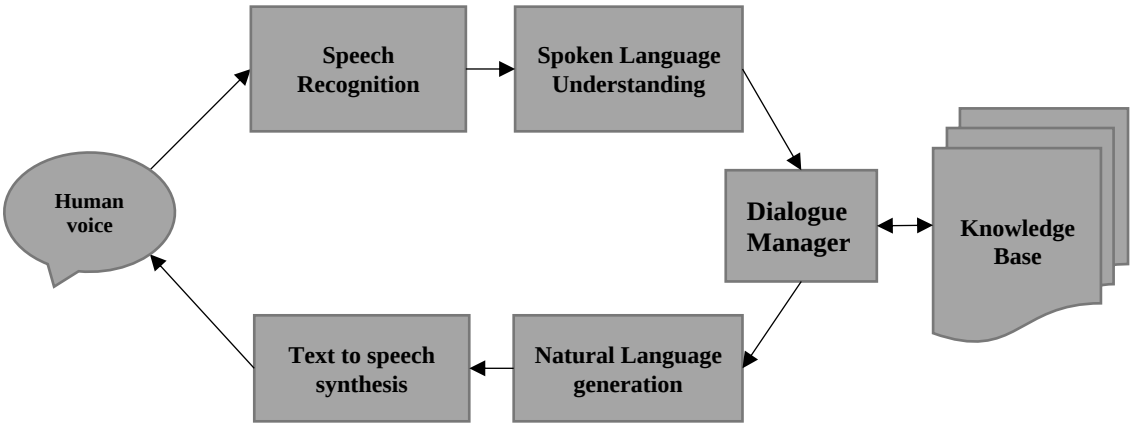


Figure 1 The structure of a General Dialogue System, by Kepuska & Bohouta, 2018

VAs' functionalities are not just limited to answering questions and processing conversations; when embedded in different devices from smartphones, home devices, vehicles, to business infrastructures and connected to the Internet, their

agency can achieve full potential for people who want to have support and assistance in a hands-free or eyes-free way (Hoy, 2018; Kepuska & Bohouta, 2018; Kosta et.al, 2019). On the other hand, the verbalized communication feature of VA also restrains its usability, security, and privacy in the public environment, therefore the most popular application scenarios of VA are home, in-car, and in a closed workplace. In addition to VA's communication mode, its capability in knowledge management and flexible application context attract organizations to embrace VAs either as stand-alone units for organizational decision-making and executive operation or as parts to integrate into existing products or services to create value (Brill, Munoz & Miller, 2019; Diederich, Brendel & Kolbe, 2019). VAs can be used as tools in many contexts, for example, online shopping, education, searching information, answering questions, using other applications and devices, and even building friendships through their intelligent search techniques (Nasirian et al., 2017). More related studies will be analyzed in the next section of the literature review.

Although the business world recognizes VA as a disruptive innovation driver and value creator in both consumer and enterprise markets, the role of VA as a communicator or a message transmission platform is still under debate. According to Falk Rehkoph (2019), VA has played the role of a voice-activated helper when searching for information, organizing our schedules, and completing all manner of everyday tasks in more intuitive ways. Its words, which can only be read back from its database, indicate that it is not able to be an independent entity and thus can only be defined as a message transmission platform. However, many communication scholars acknowledge the VA as a new type of communicator. Computers are considered as 'Others' in communication exchanges with people in Gunkel's study (2012). Nowadays, Guzman and Lewis (2019) claim that communicative AI is a machine subject that people make meaning 'with', other than 'through', hence it is a communicator. What's more, communicative machines are also identified as social actors since humans tend to unconsciously apply social cues to computers, and VA will make such reproductive behavior patterns more prevalent since it is designed for social interactions (Lee, Lee & Sheehan, 2019).

Despite the high expectation of its communicator role, VA technology hasn't reached its full potential. Research from Gartner in 2017 stated that the technology of the voice assistant needed about 5-10 years to reach its plateau of productivity,

then this prediction was shortened to 2-5 years in 2018 and VA was positioned as at the point of descending from a 'peak of inflated expectations' to a 'trough of disillusionment'. Consistently with this research finding, current VA can assist users to carry out tasks via speech, primarily in simple information retrieval or service execution tasks in the private context (Gnewuch et al., 2017; Knoteis et al., 2019), and can save the time of users by simple speech interaction, as well as freeing hands and eyes, (Cohen & Oviatt 1995; Moussawi, 2018), but current VA products only perform well in processing tasks of low complexity (Zamora, 2017). For tasks that require multitasking (Luger & Sellen, 2016), or in situations where there are other input modalities, they are less usable (Cohen & Oviatt, 1995). Such a lab-reality gap also provides enough time for social science scholars to prepare for the coming challenges raised by VA's disruptive innovation ability in different industries.

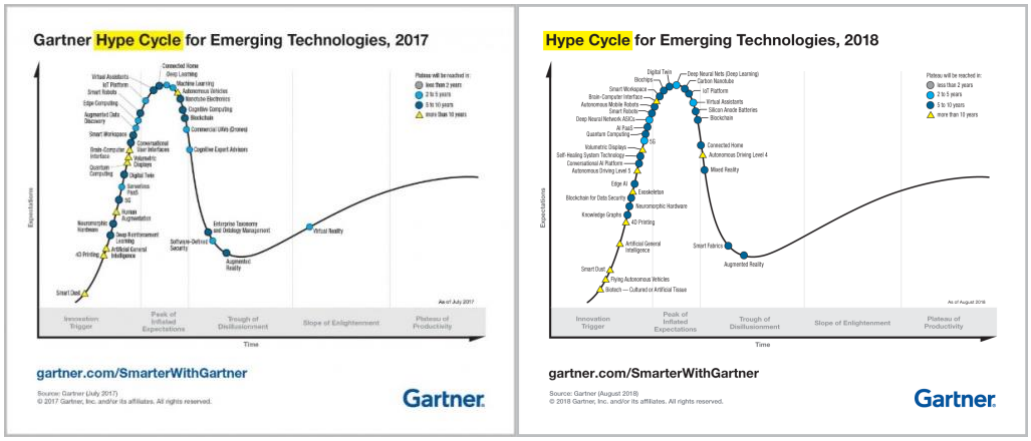


Figure 2 Gartner Hype Cycle for Emerging Technologies, 2017 & 2018. Reprinted from Gartner.com 2017&2018, retrieved from https://www.gartner.com/en/newsroom/press-releases/2017-08-15-gartner-identifies-three-megatrends-that-will-drive-digital-business-into-the-next-decade & https://blogs.gartner.com/smarterwithgartner/files/2018/08/PR_490866_5_Trends_in_the_Emerging_Tech_Hype_Cycle_2018_Hype_Cycle.png. Copyright 2017&2017 by Gartner Inc.

Just as there are ethical codes and privacy concerns regarding AI, VAs also raise similar concerns in society. They are prone to various adoption barriers such as privacy concerns and social acceptability (Easwara Moorthy & Vu, 2015), or speech recognition errors (D'Mello et al., 2010). Clarke (2019) concludes that VA's main challenges lie in its understandability, control, and audibility, which further challenge social power relations, social order, fairness, policy, law, and democracy. Hence, more challenges will be described in detail in the next session.

Chapter 3. Literature Review

This chapter will provide an overview of the discussions that surround VA, its relationship to strategic communication, and the communication challenges brought out by VA that have been identified by scholars. The purpose is to give a holistic view of what research and empirical studies have touched upon so far. Due to lack of VA research in communication studies and the multidisciplinary nature of VA, this paper presents a literature review of 62 papers from mixed disciplines including organizational communication, marketing, branding, media and communication studies, business management, political science, computer science, information systems, and medical science based on a list of keywords (see Table 1). In the meantime, based on the adoption period for new technologies as well as the short time frame of a master thesis, this research reviews literature from 2015 to 2020.

Table 1. Key words and source (2015-2020)

No.	Key words	Source
1	Chat Bot	(Bellamkonda et al., 2018)
2	Conversational Agent	(Diederich et al., 2019)
3	Conversational Interface	(Arend & March, 2018)
4	Data-Driven Virtual Assistant	(Garcia & Lopez, 2018)
5	Dialogue System	(Diederich et al., 2019)
6	Digital Assistant	(Brill, Munoz, & Miller, 2019)
7	Digital Personal Assistant	(Lopatovska et al., 2019)
8	Intelligent Personal Assistant	(Lee et al., 2019)
9	Intelligent Employee Assistant	(Manseau, 2019)
10	Social Robot	(Kosta et al., 2019)
11	Spoken Dialouge System	(Kepuska & Bohouta, 2018)
12	Voice Assistant	(Strohmann et al., 2018)
13	Voice Activated Assistant	(Lee, Lee, & Sheehan, 2019)

14	Virtual Assistant	(Diederich, Brendel, & Kolbe, 2019)
15	Virtual Voice Assistant	(Burbach et al., Jul 2019)
16	Virtual Personal Assitant	(Kepuska & Bohouta, Jan 2018)

3.1 VA-driven customer-level challenges

In contrast to organizational users, individual VA customers are widely researched because of VA's high visibility and accessibility. This literature review identified three different focus patterns on VA-related consumer research: Firstly, research on consumers' expectation-experience gap, secondly, studies on VA-driven trust issues; lastly, investigations into VA-human relationships.

3.1.1 Consumers' expectation-experience gap on VA

Brill, Munoz, and Miller (2019) highlighted that although consumers have instantly embraced VA, as a technology product it is now in the halo effect zone, where negative reviews become more predominant and user adoption slows down. Quantitative surveys have been designed to test VA users' contextual experience and the results have confirmed that consumer expectation and confirmation of expectation have a positive effect on consumers' satisfaction with VA. This study derives from a positive perspective of humans emotionally dependent on technology, and expectations confirmation theory (ECT) was selected as a theoretical foundation. Despite the positive result, Brill et. al (2019)'s study also reveals that information privacy concerns challenge the relationship between confirmation of expectation and customer satisfaction. Similarly, other empirical research on VA consumer's engagement and loyalty in the setting of e-commerce shows that consumers' subjective norms (consumers' belief in a group's willingness to abide by certain behavior) in using the internet has an impact on the perceived usefulness and perceived ease of use of VA (Moriuchi, 2019). Moriuchi (2019)'s study is based on the theory of the technology acceptance model (TAM), and it found that consumer's engagement with VA served as a partial mediator for the relationship between consumers' perceived usefulness and loyalty for both transactional and non-transactional activities online. This indicates the importance of managing consumer expectations through current user experience, which

challenges communication professionals to understand and engage in the design of VA products.

According to Yang and Lee (2019), consumers' intentions to adopt and use VA devices are influenced by perceived usefulness, perceived enjoyment, and VA product-related characteristics based on the theory of perceived value. Besides proving that perceived usefulness and enjoyment have a positive impact on usage intention, that quantitative research highlights the importance of content quality in shaping consumers' perceived usefulness (Yang & Lee, 2019), which is also a communication-related challenge.

3.1.2 VA-driven private concern and trust issues

Among all the challenges of VA, trust issues such as information and privacy concerns have followed VA from its birth, and also draw the most attention from scholars. Trust is essential to all types of organization and has a positive impact on customer loyalty, organizational reputation, and brand image (Poon & Albaum, 2019; Martin, 2018). A lack of trust from customers can lead to strategic issues and undermine the foundations of an organization.

Garcia and Lopez (2018) discover three key challenges in trusting VA from the consumer perspective: lacking knowledge on VA, mistrusting VA to solve complex problems, and challenges in managing and handling personal and private data. In their exploration of the trust-building process between humans and VA, these scholars also note the importance of granting more power and control to human consumers and highlight the difficulties in trusting VA in decision-making. Similarly, a systemic literature review conducted in 2019 identified three research streams on enhancing trust in VA: user-interface driven trust studies aiming to enhance trust through VA feature design, such as haptics and audio-visuals; interaction-driven trust research focusing on longitudinal interaction and experiences between VA and users; explanation-driven trust research holding to the belief in building transparency through understandability (Zierau, Engel, Sollner & Leimeister, 2019). Brill, Munoz, and Miller (2019) also pointed out that VA as a technology product provides a rich digital footprint of its users, hence further raising concerns on the organization's data collection and usage, including data misuse or abuse, etc. In addition to the above, Lee, Lee, and Sheehan (2019) also

emphasize that what makes VA special in usability, security, and privacy is deeply rooted in VA's reliance on the voice-user interface.

There are more papers concerning VA-driven trust issues, but since some of them also relate to the next level consequences, such as lack of laws and regulations from authorities, the rest will be addressed in later chapters.

3.1.3 Challenges caused by the change in consumer-VA relationships

As mentioned in the introduction, some VA users have built an attachment to their VA and have drawn scholars' attention from multiple disciplines. According to Schifferstein & Zwartkruis-Pelgrim (2008), consumer-product attachment has a positive impact on their willingness to use a product. Hence, consumers' attachment to VA also has an impact on VA- embedded products and deserves attention. VA's intelligence, human voice, and personified name make it unique and more likely to engender consumer attachment (Gao, Pan, Wang & Chen, 2018). For instance, in Fullwood, Quinn, Kaye, and Redding's (2017) research on smartphone attachment, participants already made anthropomorphic and sentimental associations with their phones. Additionally, human social roles such as assistant, friend, and family member are also applied to VA by their human owners, as presented in some 2018 research. Especially for disabled patients, daily VA-interactions form a sense of control and independence (Gao et al., 2018). Some researchers even argue that VA has an equal effect to humans in creating emotional, relational, and mental benefits (Ho, Hancock & Miner, 2018). Just as Jones (2018) says in her paper, no distance can be detected between human users and VA since the interface has disappeared, hence the device to human distance and machine to friend interval are also disappearing.

Moreover, like other AI technology, VA also relies on the 'datalization' of human users. The current rapid development of Internet of Things (IoT) devices has sped up this datalization process, and consumers are not only the users of the technology but also own the source of VA's intelligence (namely the data) and participate in the development process. Given this, there might be challenges regarding product ownership, for instance, who owns the data, and who has access to the data (Mashhadi, Kawsar & Acer, 2014).

As product ownership changes, the consumer-producer relationship is also shifting in the era of VA. Such a shift was witnessed and analyzed by Piccinini, Gregory and Kolbe in 2015. Described what they call digital transformation, the researchers identified several change patterns in the new consumer-producer relationship which feature with deeper interaction, the shift of power (from producer to consumer) as a consequence of the democratization of content, and consumer partnerships (i.e. consumers as members of the product development team). Such changes raise challenges to corporate strategy and agility in operation. Managerial scholars also acknowledged such changes and further pointed out the challenges toward maintaining existing business models and formalizing new business models for organizations (Seeger & Brick, 2013).

Challenges towards consumer-brand relationships are also occurring, for instance, the always-on brand-consumer interactions, shorter brand-consumer distance, highly personalized branding content, and the longer consumer journey, challenge organizations' ability to access, understand, and manage data and provide better brand experience for consumers (Shah & Shay, 2018). Some studies discover VA's potential to influence brand personality based on its humanized communication attributes (Bergman & Sundin, 2019), and name-brand VA can affect the distance between brand and consumers through direct voice dialogue, which enhances consumers' brand anthropomorphism perception (Maria, Michela & Alberto, 2020). Alongside the more visible challenges mentioned above, the following paragraph explains in detail what are the changes in VA-human relationships and what challenges this has triggered.

From a macro perspective, challenges associated with such VA-human relationship changes lie in almost every aspect of the human lifestyle from learning activities to companionship, and some scholars believe the reason to be the personalization of VA (Kumar, Rajan, Venkatesan & Kecinski, 2019). In research conducted by Druga, Breazeal Williams, and Resnic (2017), children are found to attribute intent and emotion to objects, and voice and tone make a difference to the perceived friendliness of agents. Moreover, Lee, Lee, and Sheehan's research (2019) reveals more conditions in establishing human-VA attachment, for instance, the appearance of aliveness and the zero-disappointment level. They also highlight that the para-social relationship between VA and its users is a one-sided illusion of intimacy from the human side, which is enhanced through more interactions over

time and finally accumulated into attachment; and the emotions and attitudes shaped by a dyadic para-social relationship in return, shape the social dynamics of the entire group, just like the changes brought by a new puppy dog to the whole family. Besides the role of friend or family members, the servant is another typical social role desired by VA consumers. A 2019 study shows that the obtained sense of control and mastery of and feeling superior towards VA encourages consumers to further interact with VA and extend the relationship (Schweitzer, Belk, Jordan & Ortner, 2019). Another interesting finding shows that individual emotional attachment to a collaboration agent can contribute to a positive evaluation of team experience from the perspective of a team member (You & Robert, 2017), which sheds light on studies of VA-embedded group relationships and VA as a member in a workplace. Since the organization is the pivot point for strategic communication studies, more organization-related VA-driven challenges are addressed in the next paragraphs separately.

3.2 VA-driven organizational challenges

In this section, VA-driven organizational challenges are reviewed in the following order: organizational value creation, from the business model, product/service research and development (R & D); organizational decision-making, marketing, brand reputation and corporate identity; internal communication, and crisis resilience, aiming to showcase typical challenges identified by scholars.

March (2019) classifies VA as a typical product of the digital surveillance economy business model, the core of which is the mining and monetizing of personal data. And this business model will be challenged in different ways based on different data protection regulations (i.e. GDPR) in different spaces and time frames. A corporation whose behavior is legal in one country today can be illegal another day or in another country. Meanwhile, VA has also deepened the gap between early and late adopters, VA start-ups find it harder to survive than tech oligarchs. Traditional services such as call centers are also facing challenges.

For organizations that adopt VA into their market solutions, there are also challenges in the R&D of VA-embedded products/services. One of them is the management of consumers' expectations. Brill, Munoz, and Miller (2019) claimed in their research that the gap between consumers' expectations and their confirmed

experiences demands proper communication with customers from firms. Another study identified that the more complicated the product features are, the harder it is for consumers to get a holistic view, hence it is important to help users make sense of the process and purpose of personal information collection (Kosta, Pierson, Slamanig, Fischer-Hübner & Krenn, 2018). While Ram and others acknowledge the challenges in acquiring high-quality conversational data for the training of VA in R&D (Ram, Prasad, Khatri, et al., 2018), Makridakis (2017), Yang and Lee (2019) also warn of the high risks associated with the commercialization of VA-driven innovation, including barriers to technology development, investment, finance, market competition, etc.

More challenges lie in the organizational application of VA. According to Bhattacharya (2018), VA can contribute to strategic organizational decision-making only when both business intelligence and human experts are connected to VA. The ethical perspectives concern listed by Kaczmarek-Śliwińska (2019), is that it is complicated and difficult to define ethical limits for AI-embedded communication activities, and this raises ethical professional challenges for communication practitioners.

VA-merged communication has changed marketing and brings challenges. With the development of VA technology, the way people receive advertising or marketing has greatly changed. According to Jones (2018), not only is the focus of marketing itself shifting from being a start/stop campaign-driven activity to a constantly running, highly individualized and adaptive activity due to the popularity of voice-controlled virtual assistants, but also the focus of marketers is changing. In the past, advertising or marketing focused on the product itself. However, with the large amount of information that consumers can actively gain from VA, they have stopped being passive message receivers and become empowered with messages and information. The focus has to be shifted from product to consumer to reach the same marketing effect as before. According to her, this ‘screenless’ communication presents significant challenges for brands used to ‘pushing’ messages to audiences in exchange for the content they seek in the hope of creating preferences.

Similarly, V. Kumar, Bharath Rajan, Rajkumar Venkatesan, and Jim Lecinski in 2019 voiced challenges brought up by the rapid development of artificial intelligence in terms of marketing. Personalization has to be added into offerings

by companies to win over consumers. Personalization is one of the factors that has contributed to artificial intelligence's popularity, indicating to companies that they should make decisions based on consumers' preferences. According to them, personalized engagement marketing is an important approach to create, communicate, and deliver personalized offerings to customers. In the personification of VA, challenges lie in the unclear impact of different social roles, such as servant, partner, friend, or family member (Schweitzer et al., 2019). Smith (2018)'s study provides another insight that not all types of marketing message are suitable for a VA-embedded campaigns, and the bottom line is that the message must provide value for the customers.

Brands are interested in having conversations with consumers and audiences through the VA for several reasons. According to Wu, Chen & Dou (2017), recent research indicates that a friend-like interaction with VA can result in a positive brand warmth and positive brand attachment. Research has also shown that the perceived ability of a brand to fulfill an individual's need for competence enhancement can facilitate brand attachment (Proksch et. al., 2015). But a challenge to corporate identity is raised by Robert (2018). He identifies a possible gap between VA's invisible and fluid identity and its role as the interface for a corporate, which is hard to measure and evaluate.

The workplace is one of the sectors under the biggest influence from the development of VA. On one hand, the application of VA in the workplace can free part of employees' productivity and enable them to devote it to more important activity. For instance, using intelligent employee assistants (IEA), it is possible to improve the workplace and employees' productivity by completing routine tasks for them (Manseau, 2019). On the other hand, according to Robert and others, it will negatively affect employee engagement, regarding fairness, control, job satisfaction, and sense of meaningfulness (Robert et. al, 2019). Similarly, Scholar, Brougham and Haar also found out that a great awareness of VA has a negative relationship with organizational commitment and career satisfaction, and is positively related to turnover intentions, cynicism, and depression (Brougham & Haar, 2018).

In terms of employment, VA also triggers challenges in the loss of human positions, even though it causes an improvement in working efficiency and higher production. According to Bruun and Duka (2018), AI has already substituted for

human employment in areas that were previously thought to be uncomputerizable. With the advance of automation and other technologies, the employment rate may drop significantly and potentially lead to a serious social crisis if attention is not paid to it (Bruun & Duka, 2018).

In 2017, Wiesenberg, Zerfass, and Moreno also identified a major lack of attention to such technologies. Moreover, although a lack of technical knowledge and skill was admitted by practitioners, there was also a level of ignorance regarding organizational reputation crises driven by ethical and legal issues in the data-driven era. Similarly, according to Kneble and Seele (2019), disinformation, misinformation, and sensationalism nowadays add more skepticism and hostility to the fluid communication environment, making it very challenging for organizations to manage their authenticity among stakeholders. Besides, VA and other AI technology's ability to process the pervasive amount of data also raise challenges directly regarding communication jobs and strategic communication science. Just as Hirish (2018) points out in his paper, the lack of regulations regarding data management and machine autonomy is a challenge to not only corporate firms but also society, which leads to our next section.

3.3 Synthesis

To sum up, to date, the question of what strategic communication challenges are brought out by VA has not been fully answered. On the one hand, the literature review shows the vigorous studies related to VA and once again proves its strategic significance from both theoretical and empirical perspectives. Attention is being drawn to the details of its technological application and in-depth discussions on VA's positive and negative social impacts are hot in the air. On the other hand, the current literature review presents a problematic situation in this research, because VA is such a widely connected topic linked with almost all types of communication from all kinds of entities. Such a result is very similar to the ongoing debate on the definition of strategic communication: it is too vague, broad, and overlaps with other existing fields of communication-related studies. Also, it highlights the uniqueness of this research that it is not a simple case study that can diagnose using traditional theories, such as semiotics or hermeneutics, etc. The futurist nature of this research demands an inductive and comprehensive research method to get a

glimpse of the holistic picture. Last but not least, the literature review also points out a close tie with ongoing empirical practices, which are more business or managerially focused. Hence, an interpretive theoretical framework is needed to be able to translate those strategic organizational challenges into academic strategic communication challenges.

Chapter 4. Theoretical framework

'(CVC) is a holistic approach to systematizing communication value needs to integrate various layers.'

- Zerfass & Viertmann, 2017, p.74.

So that this research can be as broad and comprehensive as possible, the standards for the theory selection of this paper can be summarized into three: 1) the ability to suit all types of organization, 2) proficiency in functioning as a translator between practical strategic organizational challenges and academic strategic communication challenges. 3) offering inductive and descriptive approaches. Especially, the second standard puts a huge limitation on the selection of theory, since only strategic communication theories can fulfill such a mission as an academic interpreter. Strategic communication by definition focuses on maximizing the organization's strategic value. This provides another perspective to answer this research question, a perspective of the organization and its core values. Following such a consideration, a relevant theory for this research is the theoretical framework of the Communication Value Circle (CVC) (Zerfass & Viertmann, 2017). In order to understand VA's position within the current organizational relationship matrices, gatekeeping theory (Shoemaker & Vot, 2009) is also employed in this research.

4.1 The Communication Value Circle

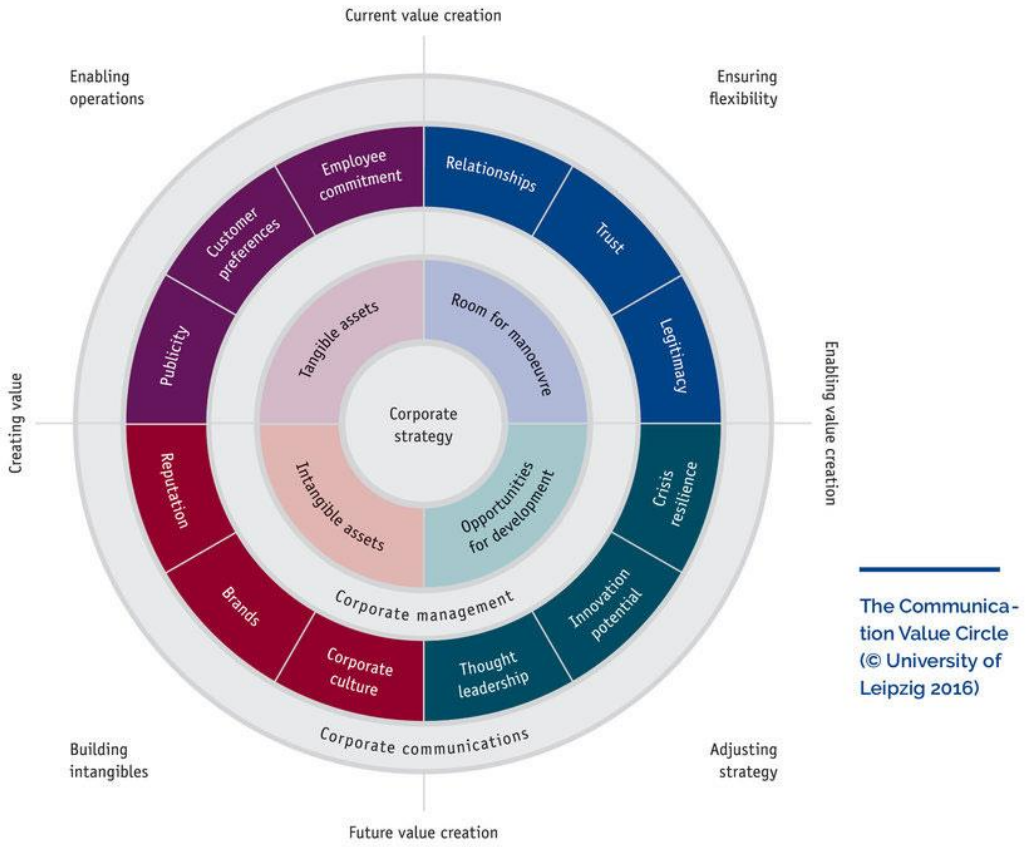


Figure 3 The Communication Value Circle, from Zerfass & Viertmann, 2017, Copy right University of Leipzig 2016.

So As shown in the figure above, one key feature about CVC is that it is an interdisciplinary framework, which integrates the perspectives of business strategy, management, and corporate communication through the process of value co-creation. Creating tangible and intangible assets, maintaining the current organizational operation, and finding opportunities for future development is the basic core corporate strategy for all kinds of entities, and is put at the center of the CVC framework. The most valuable offering of this framework is the twelve generic value dimensions: relationships, trust, legitimacy, crises resistance innovation potential, thought leadership, corporate culture, brands, reputation, publicity, customer preferences, and employee commitment. These values are valid for all functions within an organization, from sales to human resources, and of course strategic communication. Additionally, the outer range of the circle shows four dimensions for communication to contribute to organizational success:

enabling operations both internally and externally, building intangibles such as reputation and brands, ensuring flexibility through strengthening relationships and networks, and adjusting strategy and boosting decision making through thought leadership, innovation and crisis resilience in a dynamic and constantly changing environment.

There are another three points that also shed light on this research. Firstly, the significance of listening as a way of communication is highlighted in this theoretical framework, which is also written into the definition of strategic communication (Zerfass et al., 2018). Secondly, those listed values can also be applied in reverse, which means anything that might endanger or threaten these values creation also needs to be noticed and dealt with. Thirdly, as mentioned by Zerfass and Viertmann (2017), the CVC framework should be applicable to any types of entities with possible adjustments and adaptation based on the context of the selected organization, such as the field of action, the size, the stage of development, and its stakeholders. Hence the value dimensions are also applicable to not-for-profit organizations such as public services and NGOs, which are included in this research.

What makes it a perfect match is that CVC is designed to identify and systematize communication goals linked to generic corporate goals. It was designed to enhance the communication scholar's alignment to organization goals and functions and vice versa. The use of this framework in this research is from the inside out, which is opposite to its original order: from **the strategic organizational challenges** to **the strategic communication challenges**.

4.2 VA as a gatekeeper

The easiest way to understand VA's significance in the field of communication is to place VA into traditional communication models. For instance, in the two-step-flow model, it places opinion leaders in between potential customers and mass media communication (Katz & Lazarsfeld, 1955), so VA also functions as a new type of opinion leader. According to gatekeeping theory, information is selected, filtered and then disseminated to potential customers by gatekeepers, such as editors and new directors (Shoemaker & Vot, 2009). VA in this regard also plays a gatekeeping role for its users, and the gatekeeping rules are jointly formed by the

technology owner, the user, and the political powers. Another more vivid model is by Westley and Maclean (Figure 4), which highlights the importance of feedback by receivers (Westley & Maclean, 1957). VA's gatekeeper role as well as the jointly formed nature of communication can be more clearly visualized.

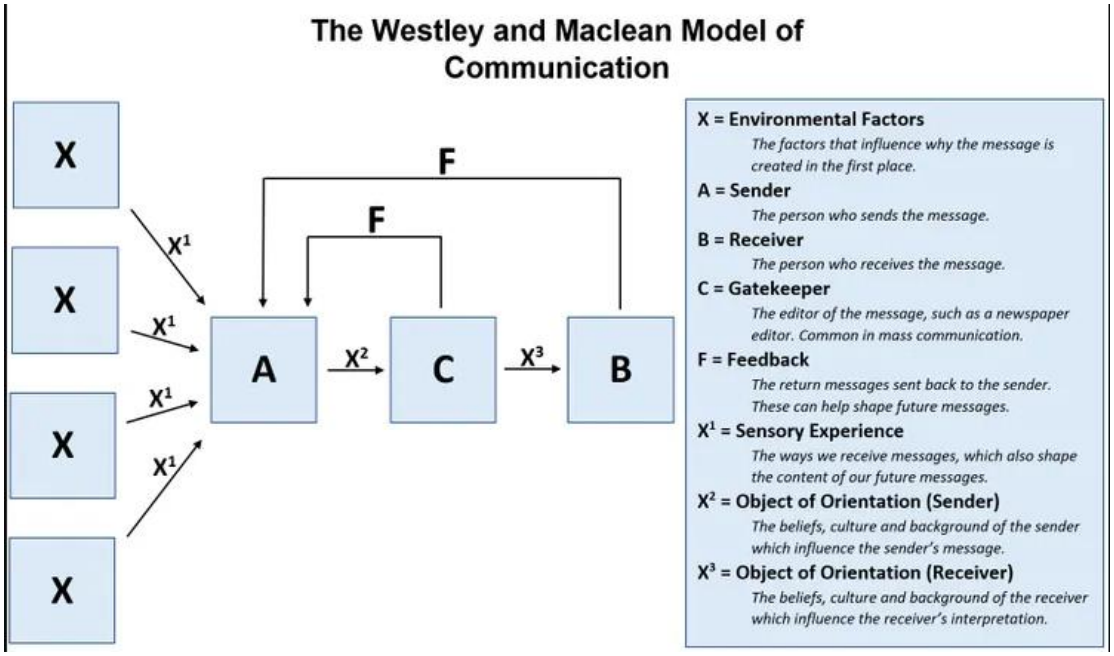


Figure 4 The Westley and MacLean Model of Communication. Reprinted from Chrew,2020. Retrieved from https://helpfulprofessor.com/communication-models/

According to Erizkova (2018), gatekeeping theory has developed from traditional media gatekeeping to network gatekeeping. Different to focusing on filtering processes by media gatekeepers such as reporters and editors, network gatekeeping theory (NGT) puts more attention on technology-powered networks, such as the Internet. NGT includes sub-theories of network gatekeeper identification and network gatekeeper salience, and the former will be explained in detail regarding the research object of this paper.

A network gatekeeper is defined as an agency that has the ability to gatekeep information through a system within the network (Erizkova, 2018). The gatekeeping capability is defined as 'the power to select, withhold, display, shape, repeat, localize, disregard, and delete information' (p. 2). Accordingly, algorithms that are built upon big data also play a gatekeeping role in information production and consumption, and construct social realities jointly with human gatekeepers such as media actors and influencers. A significant feature of algorithm-based gatekeepers is the joint ownership of data shared between the owner and the user of algorithm-embedded products, such as Amazon and Alexa. As Erizkova (2018)

states in her paper, such gatekeepers make a negative contribution to social reality, making it more fragmented, empowering technology monopolies, harming democracy and deepening social inequalities.

For strategic communication scholars, it has always been a major challenge to identify important gatekeepers so as to reach gated audiences in the network, and engaging gatekeepers is a critical practice in this field, especially in public relations and marketing (Erizkova, 2018). Although one can find numerable best practices and tips on how to identify, attract and manage human gatekeepers, there's no clear manual for managing algorithm-based gatekeepers such as VA, which makes it crucial for researchers to address this cognition gap.

Chapter 5. Methodology

This thesis aims, as previously outlined, to both acquire data to fill in the research gap and explore the strategic communication challenges in creating organizational values. To ensure a comprehensive analysis that is grounded in the theory presented in the third chapter, the following section describes the research strategy, the approaches, and the collection of data.

5.1 Social constructionism

Social constructionism states that the world is constructed by social interactions and discourses by people, and language is at the center of the knowledge-building process (Burr, 2003). According to this tradition, all objects and social realties are created and socially contrasted through practice, and change over time (Berger & Luckmann, 1991). The author of this research believes that the world is experienced indirectly through our inner subjective self, through the ideas that we hold about our surroundings that are communicated through language. Hence, the language used to describe an object and the object itself are equally important. Such a belief situates this qualitative study into the social constructionism realm.

There are three more reasons for the epistemological stance of this research. Firstly, the author is seeking for a holistic picture of a certain knowledge, which is VA as a game-changing artifact in the context of current organizational relationship matrices from a strategic communication perspective. Such a purpose hints at the underpinning hypothesis of this study, which is that the full picture of a social phenomenon is socially constructed in the minds of different groups and individuals, and may be diverse and contested. The second reason is the focus of this research on the near future. As Slaughter states, 'social construction moves debates about the currently threatened world and its many future options away from the simpler and immediate arena of externals to the process of self-understanding, self-constitution and mediation of power and meaning at these formative levels' (Slaughter, 2004, p. 110). 'Future' is a comparative concept concerned with the

status quo, hence the description of change or differences is the focus of future studies. According to Fuller and Loogma (2009), such descriptions reside within individuals or groups in various forms, either unconsciously or highly explicitly. The process of abstracting and categorizing future related description is dealing with the constructions of the real.

Following the above argument, documents can be seen as a more organized form of descriptions. According to Saldaña (2013), documents are the result of social constructions in which personal filters based on ideologies and economic and political perspectives always exist. Especially when talking about future trends in the technology sector, it is not a novel approach for interest groups to promote agreed future trends using technical arguments; some typical tactics aim at self-fulfilling prophecies and emotional rhetoric (Guice, 1999). In this research, the author is aware that industry trends are about talking things into existence and the complex power-relations behind each report. But these reports also 'play a role in shaping social relations, coordinating activities and creating meanings' (Guice, 1999, p. 94), and making the future available for people to discuss, contribute and visualize.

Last but not least, the aim of the research is **not to study an objective truth**, but to describe VA's communication role and explore the communication challenges it brings to organizations in a strategic manner. Since the theoretical perspective from the CVC framework is already grounded in social constructionism, the industry reports and interviews researched in this study add a qualitative empirical perspective to describing the new organizational reality constructed by VA-merged communication.

5.2 Applied thematic analysis

Based on the descriptive and exploratory nature of this study, inductive analysis is selected as the main method, involving the researcher examining the qualitative data through reading and rereading to identify key words and themes to sketch out the analysis before more detailed consideration (Guest, MacQueen & Namey, 2011). Among many methodological frameworks that aim to enhance the rigor and transparency of qualitative analysis, applied thematic analysis (ATA) is an inductive framework established by Guest and his co-authors (2011). The goal of

ATA is to achieve higher research credibility through systematicity and visibility of methods and procedures. As the authors define it, ATA is based on inductive thematic analysis, and flexibly focuses on every possible tool to facilitate analysis in a transparent, efficient and ethical manner. It is comprehensively

> *… designed to identify and examine themes from textual data in a way that is transparent and credible…its primary concern is with presenting the stories and experiences voiced by study participants as accurately and comprehensively as possible.' (Guest et al., 2011, pp.15-16)*

Since ATA still falls into the general methodology of thematic analysis, it shares similar analytical processes. According to Fereday and Muir-Cochrane (2006), thematic analysis recognizes patterns within data, and identifies themes using codes to categorize the analysis. The process requires the researcher to firstly do focused reading and review of the textual data, then selected data is coded and categories are built based on the data's characteristics, then themes that are relevant for the researched phenomenon are discovered. In a nutshell, it can be divided into the following five steps:

1) Establish analytical objectives
2) Gain familiarity with the data
3) Assign preliminary codes to the data to describe the content.
4) Identify & review key themes in the text, then name and transform them into codes and aggregate them in a codebook
5) Produce a report based on the final themes and codebook

5.3 Document analysis

Qualitative researchers commonly gather textual data using existing documents such as media reports and industry reports as part of research methodologies. These documents are beneficial for social analysis since they offer understanding of past and present service systems, policies and other social realities (Mackieson, Shlonsky & Connolly, 2019). According to Krippendorff (2018), document analysis is a useful method for gathering new facts about a program, determining the main stakeholders involved, and hinting at what data still needs to be collected. Since the research question in this paper is a 'what' question that needs to locate

the changes and challenges brought about by VA in organizational value creation processes, analysis of authoritative VA industry reports made by professional consulting agencies or public authorities is a plausible method to firstly map a structure of the challenges and then provide a foundation for designing the semi-structured interviews. Besides, to analyze documents published by industry actors is justified in many ways. Especially within professional agencies, industry reports or white papers are results based on scientific large-scale research carried out by professionals. Such documents can tell us not only about the process of their creation but also about what is being considered important, what is believed to be desirable and, in this case, what expectations the collective of people drafting the document has for the future. The publication of such documents is preceded by extensive internal discussions and alignment. It is therefore natural that the supplementary methodological approach chosen here is document analysis.

5.4 Data Collection

The following section will explain the sampling directed by the combined approaches of both document analysis and interviewing. The two approaches are connected in a time order, the patterns and questions developed from document analysis lay a foundation for the next step, the semi-structured interview, which is designed to solve the puzzles identified in the first step analysis.

5.4.1 Selection of Documents

As Glenn A. Bowen (2009) states, the focus of content analysis shouldn't be on the quantity of documents, but on the quality and the richness of evidence contained inside them, based on their research objectives and design. This fully justifies the number of analyzed documents, given the scope of this study. In order to avoid selection bias by the researcher, the documents were selected before reading them in detail, through searching key words 'industry report' combined with different VA key words (Table 1). The table below lists 18 selected industry reports that were identified as relevant to VA, issued by authoritative publishers such as top-ranking agencies or state offices, and within a time range from 2018 to 2020. The key challenge in this research methodology is that it is a macro approach that might easily mislead the researcher. Due to the advent nature of the VA topic, there's no

dedicated industry report that has a systemic perspective. Therefore, the researcher has to enlarge the scale of the documents so as to have a holistic understanding of VA.

Table 2 presents the list of final selected documents, categorized into two levels. First, the primary level industry reports which are from key consulting agencies and academic associations globally, published in the last six months, and covering relevant VA topics from AI, mobile marketing, smart speakers to the digital world in COVID-19. The secondary level includes another 9 reports from national strategies on AI to dedicated reports on VA, which are published from 2018 to 2019. This group of reports is quickly skimmed through as a supplement to the primary reports.

Table 2. Selected documents: industry reports on two levels

No.	Title	Publisher	Type	Year	Region	Priority
I	**Primary level**	**Analyzed by Nvivo**				
1	Technology Vision 2020	Accenture	Industry report	2020	Global	High
2	Mobile marketing ecosystem report 2020	MMA	Industry report	2020	IN Global	High
3	2019 年 中美人工智能产业及厂商评估 2019 China-US Artificial Intelligence Industry and Vendor Evaluation (my translation)	沙利文 Frost & Sullivan	Industry report	2020	US, CH	High
4	Technology, media, and telecommunications predictions 2020	Deloitte	Industry report	2019	Global	High
5	中国智能语音行业研究报告 China Intelligent Voice Industry Research Report (my translation)	iResearch	Industry report	2020	CH	High
6	State of Voice	Adobe	Industry report	2019	US	High

7	Voice AI 2020 predictions from 46 Voice industry Pros	Voicebot.ai	News	2020	US	High
8	Our new world	Bond	Industry report	2020	Global	High
9	Artificial intelligence index 2019 annual report	Stanford University	Academic technology report	2019	Global	High
II	**Supplementary level**	**Manually skimmed through**				
1	中国新一代人工智能发展报告 2019 Report of Artificial Intelligence Development 2019	Tsinghua University	Strategy	2019	CH	Medium
2	The artificial intelligence research and development strategic plan: 2019 updated	Executive Office of the President of the United States	Strategy	2019	US	Medium
3	The EU approach to AI	European Commission	Strategy	2020	EU	Medium
4	The rise of Virtual Personal Assistants	European Commission	Industry report	2018	EU	Medium
5	Conversational commerce	Capgemini	Consumer insight	2018	FR, GE, UK, US	Medium
6	Consumer Intelligence series: prepare for the voice revolution	PWC	Consumer insight	2018	US	Medium
7	Smart speaker consumer adoption report	Voicebot.ai	Consumer insight	2019	US	LOW
8	The state of Voice assistants as a marketing channel	Voicebot.ai	Industry report	2019	US	LOW
9	Voice assistant SEO report for Brands	Voicebot.ai	Industry report	2019	US	LOW

5.4.2 Interview design, sampling and procedure

To gain profound and new insights from the participants' personal experience with VA, interviews are selected as the second research method since the author believes

that interviewing people about their individual life and work experience with VA allows a broad and in-depth exploration. The type of interview conducted in this research can be categorized as a semi-structured interview, since only a few questions were prepared in order to cover topics crucial for answering the research question (Bryman, 2012). Based on the identified themes from document analysis, interview questions are designed to address areas such as the participants' understanding of VA, how they define the relevance of VA, the changes, expectations and challenges that VA has brought to their private and work life, and in line with the main research question, their perception of the challenges that will appear in the next 2-5 years. Other than that, it was decided to stay open to interviewees' leads, in order to react to topics mentioned by the participants, since these provide insight into the interviewees' perspectives of what is relevant and important (Bryman, 2012; Silverman, 2013). Thus, it provides access to the way participants view their social world (Bryman, 2012).

Purposeful sampling is a widely adopted approach in qualitative research when identifying and filtering for information-rich cases out of limited resources. The chosen cases include individuals or groups with special knowledge or experience of a phenomenon of interest (Cresswell & Plano Clark, 2011; Patton, 2002). Following this approach, the author aims to conduct not less than 15 and not more than 20 interviews with four sub-groups who have a close knowledge of aspects of the research question, with each group consisting of five to ten people so the necessary number of interviews can be achieved. Also, based on the identified themes from document analysis, samples are collected from multiple geographical regions including North America, the EU, and China, to gain a more holistic understanding of the phenomenon from a global perspective. The four groups are:

- **Group 1 – The heavy users.** Here heavy user is defined as a paid user with an above-average use frequency of the products, based on the definition of Dik Warren Twedt's (1964) 'heavy half'.
- **Group 2 - The practitioners.** In this paper this refers specifically to people who work in the companies that develop and sell VA products, in the form of products (devices) or services (enterprise solutions), regardless of the size of the companies.
- **Group 3 - The researchers.** Scholars in the field of VA or strategic communication are selected to gain an academic perspective, but with no

limitation on their level of academic background. As long as they have already conducted research on VA or strategic communication, it doesn't matter whether their backgrounds are in education or medical care.

- **Group 4 - Communication professionals.** This group refers specifically to people who work in strategic communication-related managerial or higher positions, which means they must have more than six years of working experience in positions such as PR, marketing, advertising, consulting or internal communication.

All-in-all, 19 interviews were conducted, and all participants were chosen due to their availability and their active involvement in VA. Participant information is listed in Table 3. Since some participants belongs to more than one sub-group, the table is designed based on figures from different groups, not the total number of participants.

Table 3. Interview Sampling

No.	Name	Title	Location	Group*	VA Language	Date
1	Xinxin Liao	Product Head of VA Entrepreneur	China	1,2	CH	03-Apr
2	Duo Sun	Senior Marketing Manager, Xiaodu Smart Speaker, Baidu Group	China	2,4	CH	04-Apr
3	Anonym	Senior Manager, Baidu IDG	China	2,4	CH	05-Apr
4	Grayson Han	CEO, ATME Culture & Communications Group	Canada	4	CH	06-Apr
5	Nanxi Hu	VP, Blueview	China	4	CH	07-Apr
6	Lutic Liu	Senior Software developer, Phd in NLP	United States	1	EN	07-Apr
7	Dimitrij Aleshkov	Senior Tech Advisor, HBG Works	Sweden	1	EN/RU	08-Apr
8	Yuedong Zhang	Senior Media Manager, BlueFoucs	China	1,4	CH	08-Apr
9	Liang Zhao	Manager, Flytek	China	2,4	CH	10-Apr
10	Jialiang Han	Developer	China	1	EN	11-Apr
11	Dada (Anonym)	Manager, Alibaba group	China	1,2	CH	11-Apr
12	Xiaoma Song	Fonder & CEO	China	4	CH	12-Apr
13	Eason	Senior Consultant, iResearch	China	1,4	CH	13-Apr
14	Jiezheng Diao	Senior Reporter	China	1,2	CH	13-Apr
15	Parul Gosh	Fonder, ThisisHBG	Sweden	1	EN	13-Apr
16	Qiufan Chen	Sci-fi writer, CCO	China	1	CH	13-Apr
17	Ilkin Mehrabov	Senior Lecturer, LU	Sweden	3	/	13-Apr

18	Xiangjie Hu	Communication Manager, Vanyitech	China	4	CH	13-Apr
19	Anonym	Student, LU	Sweden	1	SE	14-Apr

** Group 1-Heavy user; 2- VA practitioner; 3- Scholar; 4- Communication professional*

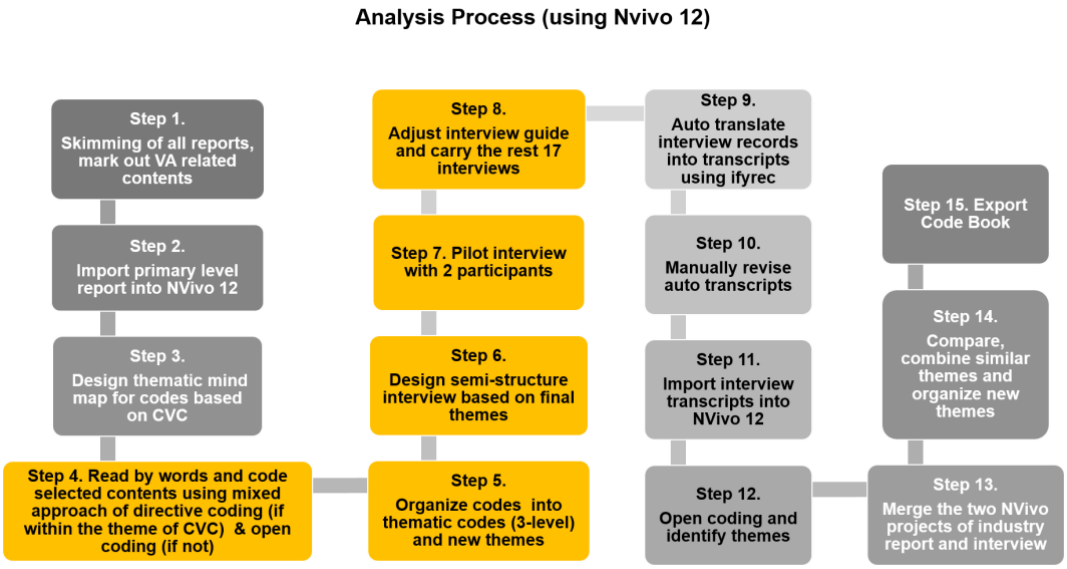
Prior to data collection, a pilot interview was conducted to practice the process of interviewing, aiming to nurture the interviewers' abilities and experience (Bryman, 2012). The pilot interview was also used to test the language and phrasing of questions, aiming to enhance the comprehensibility to the interview participants (Bryman, 2012). Since the interview is carried out in two languages, the English version of the interview questions was revised after 2 pilot interviews in Chinese to make it more relevant to the different cultural background. Other than that, it was decided to stay open to interviewees' leads, in order to react to topics mentioned by the participants, since those provide insight into the interviewees' perspectives of what is relevant and important (Silverman, 2013; Bryman, 2012). Thus, it provides access to the way participants view their social world (Bryman, 2012). Even though the topic of and reason for the research was shared to reassure the participants, the research question itself was not all communicated in advance; only groups 2, 3 and 4 were informed, in order to reduce the influence on the interview answers (Silverman, 2013).

In addition, due to the COVID-19 situation during this research process, all interviews were carried through digital online meetings, using the tools Zoom and WeChat. The interviews last between 20-45 minutes; only audio records are collected as research data, and video chat is only used as a way of creating a comfortable environment and atmosphere, as well as an engaged interviewing style in order to create rapport (May, 2011), since this paper doesn't focus on the narrative perspectives. For more details about the qualitative interviews, please see Appendix 2.3.

5.5 Analytical process

As mentioned at the beginning of this chapter, this research adopts an inductive approach and all empirical materials including industry reports and interviews were coded following qualitative applied thematic analysis (ATA). The document analysis and interview are carried out partially in parallel to collect data in a time-

efficient way. In order to present a holistic picture of the process, a flow chart was used here as a guide for the readers.



**Note: Yellow steps are carried in a parallel manner*

Figure 5 Analysis of the process

Document analysis was carried out following the same process as Bowen stated: finding, selecting, making sense of, and synthesizing data (Bowen, 2009). After skimming through the selected reports, relevant data was highlighted and marked (Step 1). The relevance is filtered by not only the explicitly mentioned key words, but also contextual relevance which shares similarities with VA. For instance, some text mentioned explicitly not VA but AI with communication skills, but the researcher took these as relevant data since VA falls into the category of communicative AI. Then, the nine selected primary reports were imported into Nvivo 12, which is the main software supporting this qualitative research (Step 2). Before directive coding, a node concept mind-map was designed and imported into Nvivo which forms the basic directive nodes for the applied thematic analysis (Step 3). The mind map includes two hierarchal codes with four quadrant values such as ‘enabling operation’, and the three value dimensions ‘publicity’, ‘customer preferences’, ‘employee commitment’ underneath. After that, the selected reports were read word by word and coded. When content is relevant but not within the directive codes, an open coding approach was used to reveal the patterns in such content (Step 4). The directive approach mentioned in Step 4 can also be recognized as ‘provisional coding’, which establishes a predetermined start list set of codes

based on the literature review and theoretical framework of the study (Bowen, 2009).

Step 5 is the theme development; coded nodes on NVivo were examined to identify patterns of meaning. After the preliminary analysis, 17 main categories were identified (along with 98 sub-categories), such as ecosystem maturity, innovation potential, crisis resilience, challenge in VA-merged communication campaigns, product (service) and operation, challenges in society, trust, relationships, etc. The numbers of times sources refer to each category and subcategory were counted automatically by the software. As Braun and Clarke (2006) mentioned, the flexibility of thematic analysis is that it allows the researcher to determine the themes and their prevalence in a number of ways. The themes concluded here are not the final themes of this research, but they build up the foundations for the next steps of analysis, and they were re-examined in later steps to add more validity and reliability.

While Step 5 was being carried out, interview data collection was conducted. Firstly, the designed interview guide was modified after two pilot interviews to provide more detail and a nuanced context for participants to quickly understand the designed interview questions (Step 6-7). Afterwards, the remaining 17 interviews were carried out based on the participants' availability (Step 8). To meet the time frame of this research, Iflyrec is used to automatically transcribe the digitally recorded interviews (Step 9). Then collected interview data was cleaned and organized manually and was processed in Nvivo 12 using the open coding approach, which breaks down, examines and categorizes data (Step 10-12) (Strauss & Corbin, 1990). As Saldaña (2013) mentioned in her book, open coding is also termed structural coding: it is a question-based coding approach to help researchers access data quickly by labeling and indexing in a structured manner. The rationale for this decision is that: 1. interviews are semi-structured which is already thematic compared with data from documents. 2. Interviews contain more first-hand contextual data such as the participants' geographical information and personal experiences, which might go beyond the theoretical framework and offer extra insights. Directive coding might limit the author's ability to identify such patterns.

Afterwards, the author reviewed both the documents and the interviews separately, then merged them together and checked them again comparably (Step 13-14). On the final database, the researcher cleaned and organized notes into three-

level hierarchical codes based on the concept mind map mentioned in the beginning (Step 3), merged similar categories and created new themes if they didn't fit into existing themes. Overall, the 17 themes from industry reports and 7 themes from interviews were aggregated into 13, and then were reduced into the 6 most strategic categories. As Folkestad (2008) stated, the number of main categories listed in research findings is typically between 3 and 8, which supports the final achievement of the research results. The 6 main categories are the foundation to the final answer to the research question in this paper.

In the final step, a code book is exported for the validation of the whole analysis (Step 15). The overall analysis follows the procedure of exploratory analysis, which is a classic inductive approach driven by content within qualitative research. The content of interactions between researcher and qualitative data drives the coding process and theme identification (Guest et al., 2011).

Chapter 6. Findings

In the following chapter, findings are presented following the five overarching themes emerging from the collected data guided by the CVC framework, including: gatekeeper & customer satisfaction; fluidity vs. control; decision-making & resilience; game changer; new roles & skills. The result shows that VA challenges the whole process of organizational value creation and it influences all four quadrants of the CVC model, from creating tangible and intangible assets to ensuring flexibility and adjusting strategy, although not all 12 dimensions are touched upon. Each overarching theme is constituted by serval sub-themes from categories in the codes which touch upon different dimensions of strategic communication; a thematic coding tree is formed to guide the readers (Figure 4) and illustrative quotes from documents and interviews are evidenced for each theme. Overall, it is a fair statement that the organizational challenges raised by VA are revolutionary. As Zerfass and Viertmann (2017) stated, strategic communication professionals need to pay attention to the real game changers, as soon as possible.

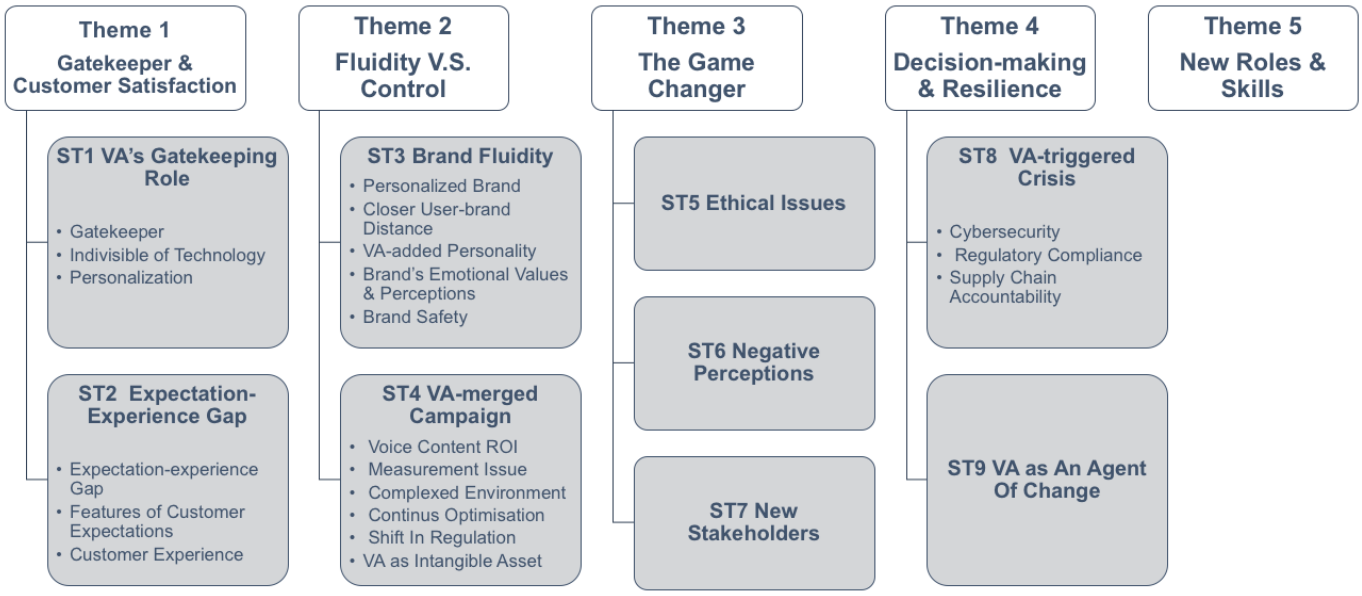


Figure 6 Thematic coding tree

Theme 1: Gatekeeper and customer satisfaction

The most significant theme emerging from the contextual data is 'gatekeeper and customer satisfaction'. Both reports and interview participants acknowledge VA as a new gatekeeper for organizations regarding its influence on external stakeholders such as customers, which might weaken customer satisfaction. Two sub-themes (ST) are identified under enabling operations, the first quadrant in the CVC framework, covering two out of the three value dimensions: '**ST1 - VA's gatekeeping Role**' under the value of publicity and '**ST2 -Expectation-experience Gap**' under the value customer preference.

ST1 - VA's gatekeeping Role

VA is gatekeeping between organizations and VA users, but unlike other existing digital media gatekeepers, there are two significant differences in VA's gatekeeping role: 1) the gates are co-created by the algorithm and users, and are highly personalized, 2) unlike current visual-based digital media which display users' feedback in real time, the reactions from the VA users are invisible to organizations and separated in both time and space. The term publicity is defined as the visibility of an organization to the public, which includes media publicity, product package, executive speech and word of mouth on non-traditional media (Zerfass & Viertmann, 2017). Therefore, this part of the findings also includes codes related to product/service design and even some operational perspectives inside organizations. Several categories appeared during the analysis: **'gatekeeper', 'indivisibility of technology',** and '**personalization'**. Some example quotes are presented below; more are available in the appendix.

The key word gatekeeper is explicitly mentioned several times in both industry reports and interviews. VA manufactures are also aware of VA's role as a gatekeeper:

> VA is acquiring the features of a medium based on its ability to connect and influence users… (Baidu) is also exploring opportunities to extend Xiaodu's business model to marketing and advertising, and bringing high-

quality contents and services to our customers through the medium of VA-embedded smart speakers. (Sun, Senior Marketing Manager of Xiaodu Smart Speaker, Baidu Group, China, Personal communication, April 2020*[1])

VA is connecting content and service.' (Liao, Product Head of VA and Entrepreneur, China, Personal communication, April 2020*)

VA is the next interface (or connecting point) of cars…for instance, it collects the drivers' Point-of-Interest and suggest services along the navigated route. (Anonym, Baidu IDG, China, Personal communication, April 2020*)

…businesses create walled gardens around them, turning a world of unprecedented choice and customization into one of ecosystem lock-in. (Accenture, 2020, p. 11)

And VA's gatekeeping role also raises awareness among communication scholars and professionals:

If the VA decides to give us only limited amounts of info based on some internal algorithm that we have no idea about how it works. Then it might be a big threat, a very tangible threat to democracy, to the public sphere, to public opinion, to make your own choices beat politically with the economical…it's actually much more relevant to economic choices, because if you are only being given results, for example, based on your social economic status. So that all the cheaper choices are actually filtered out. And you are left only with more expensive choices, although they function exactly similar matters as them. Cheaper alternatives than it is also a form of more economic…I don't want to call it discrimination of economic filtering, if we can call it something like that. (Mehrabov, Senior lecturer in strategic communication, Lund University, Sweden, Personal communication, April 2020)

[1] * means the quote is translated into English by the author, and the original quotes are in Chinese

> I was chatting at home (I was using Google Home by then) and then I realized that the Ads on my iPad and computer changed accordingly, and such experience indicates that the VA is in a learning process (of customer preference). Such a status should bring awareness to the communication industry considering both VA as a marketing channel and the risk associated with information privacy protection.' (Han, CEO of ATME Culture & Communications Group, Canada, Personal communication, April 2020*)

Then, the **indivisibility of technology** and **high personalization capability** are the two distinct features for the new gatekeeper -VA.

> 52% of consumers say that technology plays a prominent role or is ingrained into almost all aspects of their day-to-day lives.'…' '90 percent of businesses believe delivering highly personalized services is a top strategic priority……Beyond data privacy alone, there is emerging concern that personalization efforts are trapping people into bubbles—both group and individual echo chambers. (Accenture, 2020, pp. 36-37)

> Now (for me) it's likely just sort of embraced all possible assistants without much resistance' (Gosh, heavy user of Google Home, Sweden, Personal communication, April 2020)

ST2 - Expectation-experience Gap

The value dimension of customer preferences in CVC includes a most essential communication added-value of understanding current and potential consumers. It is defined as attitudes/opinions towards a product, service brand or company held by customers (Zerfass & Viertmann, 2017). Among all mentioned features in VA-driven customer preferences in the researched data, the most remarkable theme is 'the expectation-experience gap' sensed by users. The contextual data shows that although customers might have different geographical backgrounds and preferences towards their VA, their experiences in using VA decide their willingness and frequency of use of it. For instance, if there's no sense of consistent demand in their

use scenarios or the capability of VA fails the users' expectations, VA then ends up as a fancy tech toy. Since customer expectation is a fluid cognition process that is built upon and fed by communication, it is possible for organizations to influence and balance such gaps through communication. Hence, finding the right benchmark for shaping user expectations becomes a strategic challenge. As one interview participant said 'People often refer to current VA products as artificial intellectual disability, but not every VA product is designed to serve as a general assistant, which leads to a cognition gap' (I18*). There are a few categories contributing to this subtheme: '**expectation-experience gap**', '**features of customer expectations**', and **'customer experience**'. Some quotes are presented in the table for better understanding.

The gap is most vividly presented by an interview participant who works as a software engineer in one of the VA manufacturers in the US:

> …which means it (VA) hasn't had sufficient ability to really understand its users to the extent of giving really supportive suggestions.' 'On the one hand I don't have a high expectation of VA (as an engineer), because I know very well that it is very challenging (technically), but on the other hand I still wish it to grow its ability as much as possible. (Lutic, Heavy user of VA, Senior software engineer and Ph.D. in NLP, Personal communication, April 2020*)

More evidences lie separately in the description of both consumer expectation and user experience, for instance, the two quotes below showcase the level of expectations from the consumer's side:

> The demand for connectivity has increased… demand is also being driven by growing expectations... consumers, companies, and governments now expect to be able to stay connected no matter where they are—in isolated and rural areas, at sea, in the air, and everywhere in between. (R04)
>
> The second challenge is how to get (VA) from this like funny toy to do something that is functional and giving you sth… This is I think also one of the biggest challenges like how do your seamless integrated techniques fit into their homes or your workplace. (Aleshkov, IT advisor, HBGWorks, Sweden, Personal communication, April 2020)

And the following quotes present how VA users actually have experiences in their VA-connected life:

> So far, my VA only offers very official information, same as listed on the search engine, but it can't prioritize information based on my personal preferences… To me, current VA is not intelligent enough, my experience sours when it wrongly understands my words… sometimes it even starts without me activating it, very ineligible to be a companion, but I still believe in its future. (Eason, Senior Consultant, iResearch, China, Personal communication, April 2020*)
>
> I personal believe that the key breaking point for VA in the next step is to make VA really (talk) fluently though the development of Natural Lauguage Understanding. (Chen, Entrepreneur and Sci-fi writer, China, Personal communication, April 2020*)
>
> Current VA is already seeming intelligent to me: it can accomplish many tasks, but we (users) still don't have that habit of using it. (Han, Heavy user and Programmer, China, Personal communication, April 2020*)

Theme 2: Fluidity vs. Control

Another recurring theme that emerged from the researched data is fluidity versus control in building intangible assets. Since very few codes are related to the other two value dimensions of corporate culture and reputation, fluidity here refers to brand fluidity. The analysis shows that VA enhances the fluidity of brand image by empowering end users, since individuals are assigned with more power to interpret brands from their own perspectives. This leads to the control perspective from the organizations' side trying to manage the brand identity through communication campaigns. Data shows that organizations hold different attitudes towards VA: some welcome the possibilities of owning VA as an intangible asset, some argue about the difficulties in trying to evaluate VA-merged communication campaigns. Two sub-themes are identified under building intangibles, the second quadrant in the CVC framework, covering two out of the three value dimensions in enabling operations: '**ST3 – Brand fluidity**' '**ST4– VA-merged campaign'**.

ST3 – Brand fluidity

There are two types of brand relevant for this research: the corporate brand and the product brand. According to Van Riel and Fombrun (2007), visibility, distinctiveness, authenticity, transparency, consistency are the key characteristics for building and maintaining brands. As discussed in the former subthemes, brand visibility has already been proved to be problematic with VA as the new gatekeeper, hence this sub-theme focuses on the other characters, and the issues are themed as 'brand fluidity', which although not a solid academic term, describes the issues in a vivid way: brands are socially constructed symbols and the gap between the organizationally defined brand identity and brand image jointly held by stakeholders is problematic for the fulfillment of organizational goals (Kapferer, 1997). In accordance with the literature review, the analysis also shows that VA has brought new features such as **'personalized brand', 'reduced user-brand distance', 'VA-added personality', 'brand's emotional values and perceptions'** , and **'brand safety**'. But the way to balance the fluidity of a brand and the vivid, humanized, and personalized brand footprints remains unanswered and problematic, and how to manage perceived emotional values affiliated with different VA is still an open question. The following text shows the quotes identified through the analysis and are organized by the key categories based on the previously mentioned new features.

The first feature is the **personalized brand**, where customer agency is mentioned repeatedly in several industry reports by industry experts:

> Customer engagement becomes a cakewalk when voice is involved in your marketing strategy as customers need to make only minimal effort to connect with your brand…Personal interaction with customers paves the way for improved customer experience. (MMA, 2020, p.44)
>
> RALF EGGERT, CEO, TRAVELLO Voice assistants will take the next step to become real personal assistants and this will make people more likely to use their language assistants more often. (Voicebot.ai, 2019)

The second feature is **closer brand-customer distance**, the easiest to understand quote is also from an industry report:

> Brands are increasingly becoming Direct to Consumer and that is pushing them towards 'delightful' and 'intelligent' Digital Transformation. (MMA, 2020, p.57)

Added brand emotional value is the third feature emerged from the contextual data, an interesting quote from a father shows such an emotional relationship in a descriptive way while a manager in an autonomous driving product manufacturer explained her understanding in a rational manner:

> (As a father of a single child), I think VA provides my kid with the possibility to enjoy alternative types of power relationship at home. She can communicate with VA in a more equal, even superior manner. (Interview participant 08, Yuedong Zhang, Media Manager of Bluefocus, China, Personal communication, April 2020*)
>
> 'In my opinion, VA is an extension of some of the human functions, the extension of yourself. (Anonym, Baidu IDG, China, Personal communication, April 2020*)

The last feature derived from the data is the **weakening of brand safety:**

> While the emergence of personalized, data-driven mobile advertising has definitely made it easier for marketers to know where, when and why a consumer is available on a certain platform, it has taken away their ability to know whether or not their targeted audience even saw their advertisement…Brand safety issues such as: voice content placed in an inappropriate voice context; the accountability of partners and stakeholders such as media platforms; public safety and supply chain integrity. (MMA, 2020, p.57)

ST4 – VA-merged campaign

As stated in the literature review, scholars have already identified a few changes and challenges in VA-merged communication campaigns. The contextual data acknowledges such trends and elaborates them into several categories**: 'voice content ROI', 'measurement issue', 'complex environment', 'continuous optimization', ' coming shift in regulation', 'experience-based' and 'VA as an intangible asset'**.

This quote explains the thinking behind **ROI**:

> The catch is that measuring this ROI, as mentioned above, is essentially impossible. Besides the fact that the value it generates is mostly intangible, it's difficult, if not impossible, to tease out podcasts' specific role in the overall process of building an organization's brand, enhancing its reputation as a thought leader, increasing its employees' skills and knowledge, and getting a foot in the door with prospective clients and employees. (Deloitte, 2019, p.111)

More macro-level concerns are focused on **regulation**, the quote from one interview participant explains that such considerations exist throughout:

> It's because voice is the same, it is also a medium, and it will definitely have a lot of advertisements. Can you set up the filtering of these advertisements yourself, or what it is to push these advertisements to you? In fact, it is a big consideration that is equivalent to the right to know and the right to choose. Correct. But I think you may have some legal and institutional things to regulate. (Chen, Founder and CCO, China, Personal communication, April 2020*)

The last interesting feature appearing in the data is **VA as an intangible asset**. Analysis shows that there are organizations that have already started to adopt VA as brand ambassadors or part of brand interfaces, which can add value for them. The following quote is from a digital marketing professional who has extensive experience in creating campaigns in collaboration with different VAs:

> I believe that with the development of VA, there will be more virtual figures on the internet, such as virtual idols and virtual celebrities. This will trigger

> a huge change for the whole communication ecosystem. The fans of the future will no longer follow a real human being, but some virtual figures. Not only communication, but also ethics and marketing will be involved in this. (Hu, VP of Blueview, China, Personal communication, April 2020*)

Theme 3: Game changer

Game changer is one of the dominant themes that emerged from the contextual data. It is derived using a flexible approach to the theoretical framework. As Zerfass and Viertmann (2017) stated, stakeholder relationships that are based on a perception of legitimacy and trust strengthen organizations' flexibility. Despite VA's fancy overcoat of innovation, '**ethical issues (ST6)**' are born with it, as are '**negative perceptions (ST7)**' by the public. Another notable sub-theme is the rise of '**new stakeholders (ST8)**', which include new friends alongside the supply chain and new supervisors such as activist groups or authoritative entities. For instance, a business model welcomed in one country could become illegal in another country or a few weeks later in the same state. Each sub-theme is explained below.

ST5- Ethical issues

Not surprisingly, ethical issues are the most significant sub-theme when explaining VA as a game changer, as with all AI-based technologies. Both industry experts and interview participants show their concerns about VA-related ethical issues, covering all perspectives from individual, organizational, academic and societal perspectives. Since the literature review has shown the popularity of ethical studies in the academic community regarding the 'datalization' of human society, this research will not waste space on this topic, but instead only present the two most condensed arguments identified from the data. The first one is a more concise list of general categorizations; the latter is an example of organizations trying to find ways out of specialized VA ethical issues:

> Over time, the focus of the artificial intelligence theme has expanded from algorithmic accountability and human rights-based approaches to AI, to include conversations on algorithmic bias and discrimination; privacy and data rights; and the role of AI in the context of governance and elections, censorship and content moderation, and trade and labor. (Standford University, 2019, p.45)
>
> Concerning ethics and actors, the disappearance of Snips that I wrongly predicted to be a success last year, is an epiphenomenon, as other movements are already being launched to offer an open-source NLP. Initiatives, such as Mozilla and for example in France the Voice Lab, bear witness to this. (Voicebot.ai, 2019)

ST6- Negative perceptions

Another sub-theme describing VA's game-changing ability is consumers' negative perceptions towards VA, which hinder the growth of trust from organizations' key stakeholders. According to the author of CVC, trust is the perception of credibility and integrity that stakeholders hold towards an organization's future actions (Zerfass & Viretmann, 2017). This research mainly demonstrated trust issues raised from the customer side directly towards VA, which can be classified into three aspects: privacy, security and accountability.

The majority of consumers are concerned about privacy and security, and the huge knowledge gap between designers and users contributes to such concerns.

> 70% of consumers agree: I am concerned about data privacy and commercial tracking associated with my online activities, behaviors, location and interest…Privacy and security concerns around the troves of valuable data people produce lead to hesitation and distrust. The fact that many of these systems are still "black-box" leaves people skeptical about the fairness and effectiveness of the algorithms…with technologies increasingly able to have a physical impact on our lives, trust is among the important guiding lights in developing new models of operation. (Accenture, 2020, pp. 36-37)

Even current VA users are in need of more proof and a longer time to build trust in VA applications that demand rich private information, such as financial status and home security.

> I think maybe if I see a few people doing it in front of me, it'll take me some time to TRUST it with finances, at least…But the challenge in the beginning was to attempt it and to sort out this whole thing about privacy and the fact that all information is online and nothing is private anymore. That was a challenge. (Gosh, heavy user of Google Home, Sweden, Personal communication, April 2020)
>
> People believes that (at least here in Canada), VA is still profit-oriented and will recommend extra things, which lower users' trust levels and their willingness to use it again. (Han, CEO of ATME Culture & Communications Group, Canada, Personal communication, April 2020*)
>
> Personally, I'm more interested in data protection, as well as privacy enhancement of VAs… where big companies and government know a lot about you, I think it'd be kind of risky, that it becomes an erosion of your privacy…And I guess these big companies collect a lot of private information to sell it to certain actors, so they might have an interest (in misusing the data). (Anonym, Sweden, Personal communication, April 2020)

ST7-New stakeholders

One significant theme that is mentioned in the contextual data is the new stakeholders and relationships triggered by VA. Higher user-engagement repositions customers into more strategic stakeholders, and the advent nature of VA also generates a list of critical new external stakeholders such as **regulation authorities, academics and activist groups**. Even **competitors** in the old days can be new allies in the wake of VA developments.

Legitimacy is highlighted for organizations who have ambitions in the global data industry, just as this quote says in R01:

> Any company with global ambitions risks being overwhelmed as new regulations emerge around the world… And new data privacy laws are expected to make things even tougher…With technology as the foundation of the enterprise, leaders need to update their models and bring business values in line with people's values, or future innovations stand to be rejected and fail…Organizations can't afford to be set back by each new regulation, especially at the speed these laws are coming into effect. (Accenture, 2020, p. 33)

The emergence of future stakeholders from the current competing landscape is widely agreed and presented in different reports and interviews, from all sampling countries. The following quotes explain why current competitors can be future allies.

> This reimagination of the enterprise offers tremendous opportunities to those that take the lead. In every industry, companies' current successes are happening in spite of their foundations, not because of them. When leaders successfully rebuild their technology models to deliver the human focus they've lost, they will be poised to do far more than meet expectations. They'll set the new standard that every competitor—in every industry—will be forced to try to meet. (Accenture, 2020, p. 7)
>
> Iflytek has participated in the designing of some industry standards. (Zhao, Manager in Iflytek, China, Personal communication, April 2020*)
>
> In the future, the boundaries between different devices will be further broken down, offering possibilities for sharable AI on all types of end-devices, which can open new application scenarios and add more humanity to the VA. (iResearch, 2020, p.13*)

Some types of new stakeholders are already mentioned explicitly:

> I do not believe voice platform vendors, voice experience developers, or businesses can solve this problem in isolation. (Voicebot.ai, 2019)
>
> On the other hand, AIoT industry has a very scattered structure with low user stickiness. Device manufactures need to pay enough attention to changes in VA technologies and collaborate openly with service providers

> and content providers to attract more users and expand long-term after-sales services. (iResearch, 2020, p.44*)
>
> They herald a bigger shift that enterprises in every industry must note people will no longer be bystanders when it comes to technology. Whether it's security standards misaligned with today's interconnected ecosystems, bad actors leveraging the content neutrality of social platforms to amplify misinformation, or government regulations that are years behind the technology itself, expectations are not being met —and the resulting tech-clash demands action. (Accenture, 2020, p. 14)

In addition, the data shows that as a typical experience-driven product and a powerful experience-adding service (mentioned the former chapter), organizations will have longer interactions with customers, and take one step further from being an administrator to becoming an enabler and a guide. (R01) The rationale behind this is customer agency, the ability of customers to choose and get informed about the product or service. Or in other words, since human experiences are personal, organizations have to grant more agency to their essential stakeholders such as customers so that they can be more the partner and co-owner of the experiences offered by the product or services.

> Choose-your-own-adventure stories, customization with live user input and tools that let people design their own experiences are all ways that businesses are embracing cooperative experiences. It's a major shift away from how enterprises have operated in the past, but a necessary one. While there is incredible value to be gained from curated experiences, businesses will only access it if they redesign their customization models to emphasize personal agency. Becoming a true partner to customers will be a defining aspect of enterprises' future. (Accenture, 2020, p. 30)

Theme 4: Decision-making and resilience

As mentioned in the first theme, VA weakens organizations' listening ability as a gatekeeper, and this fourth theme of decision-making and resilience is mainly about the consequences of such blocking effects. The contextual data shows that VA as a

new phenomenon also affects organizations' ability to identify competitive advantages and monitor crises. There are two sub-themes emerging from the analysis regarding decision making and resilience: '**ST8- VA-triggered crisis'** and **'ST9-VA as an agent of change**'. From 'thought leadership' and 'innovation potential' to 'crisis resilience', all three communication value dimensions in CVC's last quadrant are covered.

ST8- VA-triggered crisis

VA-triggered crisis is the most remarkable sub-theme that emerges from the contextual data under the academic concept of adjusting strategy through communication. According to Zerfass and Viretman (2017), crisis resilience is the ability to acquire insights on emergent issues that have a negative effect on the organization's operations and managers should take a systematic approach to prevent, monitor and address critical issues in a timely and effective manner. In order to enhance organizational crisis resilience, it is necessary to understand the potential issues that are brought out by the emergence of VA. Through the analysis, several key issues are mentioned, such as cybersecurity, regulatory compliance and supply chain accountability:

The quotes from R09 list the most voted VA-triggered crisis as a research outcome:

> Many companies applying AI do not report taking steps to mitigate the risks. McKinsey's study surveyed respondents on ten of the most widely recognized risks related to AI, including regulatory compliance, equity and fairness, cybersecurity, and personal and individual privacy. Cybersecurity is the risk respondents most often say their companies are mitigating and is cited by 48 percent of respondents from companies that have adopted AI. Thirty-five percent say their organizations are taking steps to mitigate risks associated with regulatory compliance, and three in ten say the same about personal and individual privacy. (Stanford University, 2019, p.102)

While the quote from R07 offers several possible cases about such crisis:

> Fred Zimmerman, Founder, Altbrains Workshop: There will be a "broadcast to the world" event where a voice agent talks to everyone at the same time. It may be planned, or it may be an accident–Google issues an emergency notification about a global threat; Jeff Bezos issues a personal message the day before the election; Siri gets hacked — who knows! And it may or may not contain an interactive element where the system is able to act effectively on the hundreds of millions of responses it will receive. But it will illustrate voice's power to touch everyone at an emotional level at the same moment — a bit like Orson Welles' War of the Worlds and radio. I may be early — this may not occur in 2020, but later — but it is coming. (Voicebot.ai, 2019)

And this quote from R03 highlights the critical scenarios faced by today's international organizations regarding regulatory compliance and supply chain accountability:

> With the continuous improvement of the awareness of technology independence and controllability, in the future, Chinese AI manufacturers will pay more attention to independent research and development to achieve the safe development of AI application fields, and Baidu and other manufacturers will promote them. (Frost & Sullivan China, 2020, p. 50*)

ST9-VA as an agent of change

Data from the study also reveals that VA can be a critical actor inside organizations as an agent of change in fostering their innovation potential and thought leadership. The analysis shows it is important for organizations to review and reinvent their people-centered business model (R01) as well as the significance of changing organizational position for stakeholders both internally and externally. For a knowledge-intensive technology like VA, it's important to unlock all employee's potential in boosting such an organizational reengineering process instead of investing purely in R&D talent. VA cannot stand alone; the power of VA lies in its capabilities to unlock human-potential. Hence, employees who are on the frontline

of serving customers should also be engaged in such a reengineering process to unlock their tacit knowledge and boost their development of organizational thought leadership.

This interview participant talked about VA's innovation potential from a VA manufacture's perspective:

> It is artificial intelligence plus human interaction plus networking capabilities. It is the combination of the three abilities of the three parties, which then opens a new way of life for consumers in the form of voice interaction. One of the basic functional attributes that it has is that it uses smart speakers to connect content, applications, and smart home ecology. It does not produce content itself, it does not develop applications itself, and it does not have its own home equipment or hardware, but it is an interactive medium for all these ends, an interactive medium. (Dada, Manager in Tianmao. China, Personal Communication, April 2020*)

R07 showcased how VA can boost organizational innovation potential by naming vivid application scenarios and examples, and pointed to VA's strategic role in such changes:

> PAT HIGBIE, CO-FOUNDER AND CEO, XAPPMEDIA The availability of Alexa and Google Assistant tightly integrated into fully connected vehicles will begin to achieve critical mass in 2020 and will accelerate the use of voice assistants by the masses. The writing is on the wall and all stakeholders including car manufacturers, voice assistant platforms, radio broadcasters, streaming services, and brands will need a conversational AI strategy in order to win in this paradigm shift.…companies will build brand trust with voice technologies that aren't quite fully trusted yet, and I predict that the use of human-voice will be a big factor in building that trust. (Voicebot.ai, 2019)

And R01 points out the possible path towards adjusting strategies and pointing out the unpreparedness of current organizations:

> Businesses that facilitate human-machine collaboration today will be able to reimagine every aspect of their organization, from the way they design products, to the way they hire and train employees…Only 23% of organizations report they are preparing their workforce for collaborative, interactive, and explainable AI-based systems…Human-AI collaboration is also creating training opportunities that didn't exist before. (Accenture, 2020, p。 53)

Theme 5: New roles and skills

The last theme emerging from the analysis is the new roles and skills of communication professionals. Although it doesn't fit exactly into the CVC framework, it is highly relevant to the research question. It is evident from the data that communication skills are needed across different departments throughout the unit from decision-making to R&D, marketing and CRM. For instance, organizational decision-making relies on listening skills. Leveraging human experience and designing conversational products/services that match the needs of customers for specialists in communication, creating content, managing customer satisfaction pre/aftersales, and the maintenance of stakeholder relationships, also demand communication skills. Some of these new skills emerged from the interviews, the essential ones are selected below:

> Either there is too much information, or we're not able to go cross-platform. So, it is important to invest in capabilities like a tech-backend: capabilities of brand managers to read data, analyze it and feed that back into campaigns. Also, to use that data to course-correct campaigns midway. (MMA, 2020, p.71)

And the interview participant highlighted three key abilities for all communication practitioners who want to survive the coming VA era:

One thing for sure is that a strategic communicator really needs to be creative or needs to be innovative and imaginative because of the three things: imagination, creativity, curiosity, to learn new things to adopt …at least basic skills and how to analyze data, how to analyze numbers. What sense to make out of data analytics …if someone wants to get really ahead of themselves and of the others in their careers, data analytics, basic machine learning, maybe a little bit of programming. (Mehrabov, Senior lecturer in strategic communication, Lund University, Sweden, Personal communication, April 2020)

Chapter 7. Discussion and conclusion

This thesis aims to address the research gap in the social phenomenon VA by obtaining data and analyzing organizational challenges from a strategic communication perspective. In the following chapter the results are discussed following the five key challenges drawn from the analysis and continued with conclusions for future research. Theoretically, this research puts CVC to test, expanding its application scenarios, and further contributing to the development of strategic communication's own theories. This qualitative, applied thematic analysis approach to VA-derived organizational challenges in the near future has provided both a rich description of specific changes and challenges from a strategic communication perspective, and has generated a number of valid, interesting and testable data that are linked to direct evidence both academically and empirically. The overall result has answered the research question in a systemic manner with densified data proofs. The concluding key challenges lie in the perspectives of gatekeeper, brand fluidity, game changer, communication of change, and new roles and skills. Last but not least, this study has more to offer based on contextual conditions of organizations empirically, and indicates possible future research collaboration in the field of strategic communication.

Challenge 1. Maintain the satisfaction of key VA gatekeepers through effective communication throughout the VA-merged consumer journey

The first theme of gatekeeper and customer satisfaction in the findings chapter shows that how users are consuming and reacting to the delivered information becomes a blackbox to the organization and weakens its listening ability significantly. Since listening is stated as an essential part of strategic communication (Zerfass, 2018), VA as a gatekeeper certainly challenges strategic communication. Alternatively, VA is also gatekeeping organizational publicity from the end customers. Hence, the strategic communications challenges are

divided naturally into: limited access to customer preferences; limited publicity and difficulty in bridging customers' expectation-experience gap; and maintaining customer satisfaction towards VA products/services in the process.

In the meantime, the strategies to address these challenges also differ between VA and non-VA manufacturers. The former are currently at the stage of cultivating consumers and maintaining public interest in VA technologies, and as they are busy mapping future markets, they are also doing their best to leverage the business benefit and ecosystem for this. In providing VA accessibilities for enterprise customers to commercialize this gatekeeping technology, they are on the front line in answering questions such as 'When there's no mediator such as cookies on the webpage, how can we get feedback from listeners when they are sitting in their private homes without any access to their instant comments, facial expressions, etc.?'. Therefore, for non-VA manufactures, getting early connections with VA designers can be beneficial in addressing the challenges. But this leads to another issue of accountability of different VA platforms: the first-hand data are under the control of VA-platforms; how can they test the validity of these reports?

Even if consumer preference knowledge is kept up-to-date, there are other issues lying in the internal communication of these new inputs. How to communicate the insights of customer preference internally to support, guide and benefit relevant departments from R&D to CRM, and in the end benefit the organization? How to feed into customer decision journey through VA? These questions demand a high level of organizational agility and flexibility to answer.

The last part of Challenge 1 is the myth management of VA. The findings confirm the existence of an expectation-experience gap from the consumers' side, but the formation of customer expectation and experience are not in the organizations' hands. Expectations towards VA are jointly formed by academics (i.e. computer scientists), interest groups such as high-tech enterprises, public authorities and tech-positive culture (e.g. science fiction popular culture). How to explain clearly the intelligent state of a VA-embedded products while maintaining a relatively high interest level from the consumers, needs substantial communication skill, and requires strategic alignment internally and externally. This leads to the next challenge.

Challenge 2. Listening and understanding, designing and evaluating a VA-merged communication campaign

This second challenge is drawn from the second theme listed in the findings, 'brand fluidity vs. control'. The analysis discovers that VA empowers consumer agency and catalyzes brand liquidity, which isn't a new challenge for the field of branding, but the speed of change and lack of control from the organization's side makes it more problematic. For instance, VA's human voice interface coats every message with a certain personality which is filtered by individual VA users, but whether an alien's voice adds the desired personality to the brand or not may be uncertain.

Moreover, since brand and intangible assets are socially constructed symbols based on messages, prepared voice content is put into the spotlight in the wake of VA. The ROI of investment in always-on contents appreciated by the customer is the first topic for a brand manager to discuss with the board of directors, followed by other issues. For instance, when the content and its communication scenarios are invisible, how should a communication professional spot a right contextual setting for the brand advertising, or avoid wrong placement of an ad in the voice content? How to design conversational branding content so as to appropriately break through the personal filter of the target audience? Or in the very beginning, who are the target audience and where can they be found? How can the brand be protected from wrong contextual positioning as well as the risk of hijacking by VA gatekeepers? How to evaluate the results? All these questions can be included in 'listening and understanding, designing and evaluating a VA-merged communication campaign'.

Another point that is worth discussing is the organizational reputation perspective. Organizational reputation is defined as the collective perception of an organization by its stakeholders. It is by its nature subjective and unstable over time (Zerfass & Viertmann, 2017). Reputation can also be defined as the image of an organization, which is the projected identity of an organization. Hence, the foundation of corporate reputation maintenance is corporate identity management, which is the socially constituted meaning-making process by stakeholders of a specific organization (Cornelissen, 2008). This understanding offers a checking point to examine the changes and challenges that might emerge from the taking-on-board of VA inside an organization.

Following the discussion on the research question, as a technology product with significant social influence, VA is socially symbolic of change, innovation and the backbox myth. Considering that corporate identity is the constructed sense-making product of its members' social identity and organizational identity (Cornelissen, 2008), misalignment might occur at the level of social & organizational identity, further eroding the existing corporate identity and threatening the authenticity of the corporate reputation. Therefore, challenges lie in the alignment of VA's social value with the existing organizational identity as well as the existing corporate identity. The analysis also supports such arguments. Although industry reports in general are positive and optimistic about VA as an AI-based technology, individuals have different opinions on this, especially those with a deeper understand of VA as a technology. All three programmers among the 19 interview participants expressed their personal detachment from VA; for them VAs are just tools and should remain as such.

Challenge 3. Identifying VA-triggered changes in stakeholder relationships and dealing with negative perceptions and ethical issues associated with VA technology

The theme of 'Game Changer' leads to this third challenge about relationships between old and new stakeholders regarding VA. 'Relationships', 'trust' and 'legitimacy' are the three value dimensions listed in the CVC framework in maintaining organizational flexibility. The analysis unveils the new relationship patterns, or possible ways of considering VA-derived relationships, that is: VA has the potential to reshape the whole stakeholder map, new employee/customer relationships, new connections throughout the supply chain and more external stakeholders from academics to policy makers.

The most important challenge lies in the legitimacy of organizations, which is about the license to operate, the alignment of organizational activities with societal norms and shared similarities with other organizations. It is essential to the organization continuing to exist legally. The analysis shows two levels of challenge: internal challenge of VA weakening the business model of an organization, for instance, replacement in traditional tele-sales companies, etc.; and the external

challenges of change and uncertainty globally regarding VA arising from authorities, such as new laws, regulations, industry standards etc. The data collection approach that is common in this market today might become illegal overnight or in another land. Such changes raise several challenges to strategic communication: How to monitor the possible change in the regulations? How to maintain the relationship with public stakeholders to be able to engage with national regulation processes related to VA? How to develop a checklist to prepare the organization for possible regulation changes?

Also external stakeholder relationships are becoming more complex regarding VA's presence. Academically, such relationships are described as the ties between an organization and its stakeholders such as investors, employees, customers, media and NGOs (Zerfass & Viertmann, 2017). One significant change that will be brought out by VA affects the organization-customer relationship. As presented in the findings chapter, the increase in customer agency can also be witnessed in the change of customer preference, where they want more transparency and control over the services they choose. Since human experiences are personal, organizations have to grant more agency to their essential stakeholders such as customers so that they can be more the partner and co-owner of the experiences offered by the product or services. This leads us to changes in defining the ownership of the product or services. Take smart speakers for example, customers are the co-creator of final experiences since they are the designer of usage scenarios, the machine learning coach of their purchased speakers and the data providers. Failure in acknowledging such ownership might lead to the problematic situation of losing track of future product development and a fall in preference relative to competitors.

Another significant challenge lies at the societal level. Speeded up product upgrading processes and deeply connected lifestyles generate as side-effects environmental issues such as digital device recycling throughout the whole supply chain. Also, the craving demand from the customer side will push the product upgrade circle and add higher tech-dependency for the product manufacturers, especially those that have no skills in VA-related products, raising other challenges in the organization-supplier relationship, especially for high-tech suppliers. Since organizations still function through the labor of their employees, this in turn challenges the organization-employee relationship, where employees need to be collaborators with the organization in managing stakeholder relationship changes.

All in all, this leads to a more complex relationship between the organization and its stakeholders, and raises challenges for strategic communication practitioners, who are the stakeholders most interested in VA: what are the expected outcomes for developing or maintaining the relation with a certain stakeholder, under what context, and how to communicate with stakeholders to achieve alignment? Competitors can also be partners in the formation of new industry regulations and standards, your technology supplier might have the key to winning the heart of your customer, etc.

Besides, since belief in the appearance of VA reporters, especially on sports, gaming and news is witnessed during the analysis, how to manage the relationship with these types of 'media'? Or in other words, how to manage VA media/influencers driven by algorithms, not human editors? The path still remains unclear.

At a macro level, as any new technology grows, issues follows. The societal issues brought out by VA lies in the problematic data collection process of VA or VA-enhanced products or services. These ethical issues shadow all artificial intelligent artifacts such as the citizenship of VA. What's more, from the perspective of public authorities, new laws and regulations are needed to manage the existence and operation of VA in both political and economic society. As another high-tech product with the theoretical capability of listening and manipulating its users' political opinions and economic decisions, how to prevent mis and disinformation on VA platforms and in VA-merged communication is a continuous challenge to public organizations. Last but not least, since users are showing stronger trends in developing attachment with their VA, the change in the relationship between humans and technology is no longer a sci-fi topic, but a strategic issue that should be taken into consideration by all. Especially when the size of the VA-familiar population is growing larger, they are on average less sophisticated towards VA compared to current heavy users, such as young people and the elderly. This might not be an issue in 5 years, but in 8 years or even longer. Should VA be considered as a mirror product/extension of humans, or are they indeed an intelligent agent? How should other people deal with your VA after your death? There is a long path ahead in seeking all the answers.

Challenge 4. Managing VA as an agent of change and enhancing organizational resilience against VA-driven crises through strategic communication

As Holtzhausen (2008) pointed out, strategic communicators are the immanent members of the change management crew inside organizations; any actor of change is and should always be in the monitor of the strategic communication community, academically or empirically. Probably already included in the list of digital agile transformation plans, VA is also identified as a powerful agent of change in this study regarding thought leadership, innovation potential and its ability to 'attract' crises. Such findings put humans in the center position when considering dealing with how-to challenges, if we apply the theoretical framework of CVC.

Thought leadership is about presenting organizations to a community of interest with novel, enthralling and unconventional ideas to make sense of the contextual status of today and tomorrow; while innovation potential is defined as the ability to make sense of social change and identify business opportunities as written in the CVC (Zerfass & Viertmann, 2017). The key difference is that thought leadership is a comparative concept which positions organizations externally among their industry peers whereas innovation potential is internally compared between the current status and future possibilities of the same organization. In this regard, innovation potential is a supporting pillar of organizational thought leadership and is the foundation for the upper value of thought leadership. Communication plays a supportive role in strengthening organizations' innovation potential through discovering insights and building innovation-friendly organizational cultures as well as identifying external partners for innovation (Zerfass & Viertmann, 2017). Such importance is also resonant with the collected data, The challenges to all businesses that want to benefit from VA are: how to attract and engage more tech talents when the whole field is suffering from brain-drain from academia to industry? How to balance the huge investment need by VA-driven innovation and acquire financial outcomes？ How to prepare their workforce for collaborative, interactive, and explainable AI-based systems? And one step in the future, how to

evaluate VA as an employee, and how to prepare human employees for human-VA collaboration? How to manage mis & disinformation on VA-merged communication?

Regarding the possible crises following VA's emergence, such as regulatory compliance, equity and fairness, cybersecurity, and personal/ industry privacy identified in the analysis, several strategic communication challenges are triggered, for instance: What new features are needed for a strategic crisis system in the VA era? How to level-up the existing system to counter new critical issues in the VA era? How to align R&D departments with communication departments to tackle the 'beta burden' of VA, and its related product/services through building alignment with customers in a timely manner? How to monitor the accountability of partners and stakeholders to prevent externally oriented VA-crises? How to balance the communication about the fairness, safety and security of VA-related product/service to address customers' blackbox stereotypes on VA; enhance trust among stakeholders; prevent distrust-related crises while protecting organizational intellectual property? How to build a more crisis-sensitive organizational culture to better survive the VA-merged future through communication? There are more questions to ask and there is much more to be done.

Challenge 5. The new roles for strategic communication practitioners in organizations that adopt VA solutions and the new skills needed

The last key challenge in this research emerges from the continual self-reflective questioning by the author herself, how can we as a strategic communicator contribute to the organizations' digestion process of VA? This is not a sophisticated question to ask but very open and gigantic to answer for any researchers from any disciplines. The analysis in this research offers a way of breaking it down into two parts: 'roles' and 'skills', for instance regarding the positioning of communication roles in organizations which adopt VA technologies and the relevant skills and knowledge to prepare for VA-merged communication as a communication professional. But these dimensions are just the beginning of the quest; theoretical definitions are needed to further make sense of VA as a communicator, to understand what it really is and how it can influence the status quo of current

organizational communication ecosystems. Then, where and how to place strategic communicators will be the next challenge; since it depends on the context of the specific organization (rather than being general across an industry), the scale and power relationships within the organization and the people culture, there's no fixed answer to this question. Just as with the issue of 'roles', 'skills' are even more determined by the specific roles of the individual communicator, both as a member of an organization and an independent professional with certain career visions. Moreover, making sense of the new roles and skills needed in dealing with VA also demands strategic thinking based on the context of time and space, since the world is constantly changing and being socially constructed.

7.1 Conclusion

This thesis has argued that VA has and will continue to play a game changing role in different types of organization, and that strategic communication scholars haven't paid enough attention to it. The thematic qualitative approach based on intensive industry reports and semi-structured interviews applied the theoretical framework of CVC to draw out the final five key challenges, which provide a big picture of VA-merged organizational communication. In bullet points, they can be concluded as 'VA gatekeepers in the consumer journey', 'the management of VA-merged communication', 'new stakeholder relationships and negative associations', 'VA-triggered change and crisis' and 'new roles and skills of strategic communicators'. All these challenges fall into four different quadrants of the CVC framework and are selected based on their strategic level.

Theoretically, this research leverages the application of the CVC framework in the context of VA-driven organizational changes and challenges. It offers a new way of applying CVC in an inside-out manner, expanding its theoretical border to inter-disciplinary, future-focused studies and once again proves its high analytical value. It also places technology-based communicators under the spotlight of strategic communication. In addition, this research demonstrates the effectiveness of the ATA approach in abstracting a holistic picture from complex, technology-driven strategic communication issues. It also provides a solid case study of algorithm-based gatekeeper by applying a strategic communication framework

(CVC), thus contributing to the existing gatekeeping theory and opening up more possibilities for future studies.

The practical applications for the key challenges are concluded based on different stages of organizational VA-adoption from a managerial perspective, a diagram (Figure 7) is given for the business reader to use as a self-examination tool to better prepare for the possible challenges. As well as the four quadrants of 'Enabling operation', 'Building intangibles', 'Ensuring flexibility', 'Adjusting strategy', two new axes of time (present/future) and internal/external (of an organization) are added as an extra guide. Key words are put into different quadrants to function as reminders of certain challenges, and communication managers can navigate themselves based on the context and strategic focus of their organizations. For instance, if a company is a big player in the hospitality industry with a plan to test VA in the reception of a digital concept hotel, this implies VA will be adopted internally in the future. Hence this manager can start from the right corner of the following diagram to match their existing plan and will probably find out that the challenges of human-VA collaboration haven't been taken into consideration. Similar approaches can be adopted by other types of organizations, based on the scale, the development status and the focus of their existing plan.

Figure 7 Strategic communication challenges created by VA

7.2 Limitation

Before going into detailed limitations, it is necessary to state that the author is aware of the other democratic issues and societal issues such as ethical issues and data security, etc. Since this study is designed as a strategic, organization-centered piece of research, the author has deliberately chosen to limit the coverage of macro-level societal issues in the discussion part.

Although there are certainly limitations in the proceedings, this research has proved be constructive. Considering the timeframe, the pandemic context and the academic nature of a master's thesis, it was not possible to interview more scholars or list all interesting findings in a more systemic manner. But it is desirable in the future to develop a more systemic research agenda towards VA-merged communication, a systemic literature review and digital ethnography within VA fan groups on social media. Case studies based on in-depth interviews across VA manufactures, non-VA manufactures, public organizations and non-profit organizations in countries that speak different languages should provide more insights in understanding the features and changes in VA-merged organizational communication, both academically and empirically.

Another limitation that is worth mentioning is the strong China focus in the interview samplings, which ideally should be more evenly distributed globally. This has happened for two reasons: firstly, China is acknowledged as one of the leading VA markets of with more matured ecosystems and a huge user base, as is state many times in the selected industry reports. Therefore, it is rational and validate to collect the main part of the interview data from China. Secondly, the sudden outbreak of COVID-19 interrupted the markets in Asia and the United States, and interrupted access to key VA organizations within the given timeframe. Consequently, the author had to shift the sampling method to purposeful sampling and collect data by making full use of existing direct and indirect personal connections. Since different geographical groups share similar behavior patterns as human-beings and this study also focuses on the VA as a socially constructed phenomenon in the whole of human society, it should not fundamentally affect the validity or the achievement of the final research findings.

7.3 Future suggestions

This research has an explorative nature and aims to play a role as an activator in the broader academic community, not limited to strategic communication itself. During the analysis, many untouched areas have been identified. But since this is a research dedicated to the field of strategic communication, the author has selected three main focus areas that are valuable for strategic communicators in the future, they are:

Theoretical gaps for understanding VA-emerged communication

The tendency to narrowly acknowledging communication as a human-only social activity leads to a lack of theoretical understanding of communication others, such as computer-based communicative agents. There is abundant research in other fields such as information systems, which been borrows theories from the communication discipline. Some communication scholars such as Gunkel (2012) and Guzman (2018, 2019) have already noted this gap, but more attentions and effort is needed to lay a solid theoretical foundation.

Algorithm-based gatekeepers

As a special form of algorithm-based gatekeeper, VA has already triggered intensive debates on a societal level regarding ethical and democratic issues. But VA is and will not be the last algorithm-based gatekeeper in our socially constructed reality. The advanced algorithms are being allocated with higher autonomous right, and this is increasingly problematic. Challenges brought about by such gatekeepers are not limited to linguistic or dialectic communication, visual communication is also threatened by computer vision algorithms, such as deep fake. The lack of foresight and regulation in all social sectors needs to be addressed as soon as possible.

Multi-agent communication

With more non-human communicators being acknowledged and admitted in the current context, human communication has already been ‘invaded’ by various commutative agents. From the social media bots, virtual assistants, and chat bots, to humanoid robots, the ways of processing knowledge are being transformed into

a diverse mixture of human-human, human-agent and agent-agent communication. The latter, also identified as multi-agent communication, is receiving more attention in the field of computer since, information system and robotic system, but haven't hasn't yet obtain much attention from communication scholars. How to understand, direct and manage the complexity of multi-agent communication needs to be addressed in a rapid manner since empirical practice is speeding up.

Acknowledgement

This thesis has been able to complete thanks to several important people. Firstly, I would like to express my great gratitude towards the supervisors for their acceptance, patience and encouragement. Secondly, I would like to thank all interviewees for their participation and honesty, especially those who accepted invitation as representatives of organizations. Thirdly, I would like to express my deep appreciation to Professor Howard Nothhaft, for his constructive advice, assistance and essential assessments of this research under the context of COVID-19. Lastly, I would like to thank my beloved family, friends and classmates for their continuous support an encouragement during the past eight months.

Without your help, this achievement would not have been possible.

Thanks a lot!

Helsingborg, 2020-08-19
Xiaoyu Huang

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Appendix 1 Interview poster

Appendix 2.1 Interview Guide-CH

1. **前言(知情同意）：您好，**

   我是隆德大学战略传播学专业的研究生黄晓宇。在接下来的15-30**分**钟内，我们接下来将进行一次针对我研究生论文的一次学术采访，采访的**全程都会**进行录音、录像，采访相关的音视频文件会作为学术研究的资料进行**留存和**记录，请问您允许吗？
2. 请您能简单的介绍一下您的基本情况，比如年龄，职业，与语音助手的相关性，**也就是您自己**觉得是海报中的哪一类或哪几类人等。
3. 请您以（深度用户、从业者、研究人员、传媒专业人员）的身份，谈一下基于**您自身**对语音助手的了解，对当下的个人与组织的传播生态有什么样的改变，带来了怎样的挑战？
4. **有研究**报告表明未来的**3~5年后**语音助手将经历技术成熟与大规模的市场应用，**那么，基于您个人的**预判，在这段未来阶段内会有哪些挑战消失及新的挑战出现？
5. **当下的**COVID19**迫使全球更多人适**应在线生活，也为语音助手的生态成熟带来了**一定的机会，您怎么看？**
6. **其他根据**对象的话进行延展讨论
7. 结语：好的，我今天的采访就先到这里了，非常感谢！最后还是要问一下，如**果后期研究复**盘时需要与您进行沟通以确认我的理解正确与否，您是否还愿意**保持**联系？

Appendix 2.2 Interview Guide-EN

1. Foreword (Consent): Hello, I'm Rose Huang, a master student in strategic communication at Lund University. In the next 15 to 30 minutes, we will conduct an academic interview for my master thesis project. The interview will be recorded, and the audio/video files will be recorded and retained as academic research materials. Do you give your consent to this?
2. As the first question, would you please briefly introduce yourself, such as age, occupation, and your relevance to the voice assistant, that is, what type or types of people do you think it is in the poster? (in-depth user, practitioner, researcher, media professional)
3. As an (in-depth user, practitioner, researcher, media professional),based on your own understanding of voice assistants, what changes and challenges have taken place to the communication ecology of individuals and organizations?
4. Some research reports indicate that voice assistants will experience technology & manufacturing maturity and are available for large-scale market applications in the next 5 years. Based on your personal predictions, what new features will appear?
5. The current COVID-19 is forcing more people around the world to adapt to online life, and it also brings certain opportunities for the ecological maturity of voice assistants business. What is your opinion on this?
6. Other extended discussions based on the topics during the interview.
7. Conclusion: Thank you very much for a fruitful interview! Finally, if I need to confirm some details after this interview, are you still willing to keep in touch?

Thank you!

Appendix 2.3 Interview access & process

Access to the Interview participants

Gaining access to the target groups is one of the most challenging undertakings of this study. Large manufacturers have strict regulations and high communication thresholds about external interview inquiries since profit is their primary concern and an academic paper is of little value to them. Also, heavy users are very scattered in the international market and it is difficult to identify whether they are in-depth users. In addition, because scholars are also in the academic circle, they require a high degree of preparation for the interviewers themselves; media professionals have a particularly busy schedule and it is difficult to guarantee to participate in the interviews within the time scale of the thesis. Also, samples in different regions have caused multiple time zone switching, which has also increased the threshold and difficulty in obtaining materials.

However, three ways of identifying and approaching the examination units were found. First, social media are the first step of pooling samples. The Facebook and WeChat platforms were selected as the most commonly used social media in the selected geographical region. On Facebook, a post was created with a brief intro together with an EN poster, and then reposted to several local groups in Sweden and also on a VA related Facebook group sourced through keyword searching. On WeChat, a WeChat moment was created on the authors' personal account and instant messages together with a CH-EN poster were also posted into different groups where communication professionals gathered. Second, progressive interview inquiries are also sent directly to acquaintances of the author, if she knows that this person belongs to any of the four groups. Third, the researcher data base of an AI scholar association in the same organization as the author's were also reviewed and a list of five potential scholars were selected based on the relevance between their studies and VA. An interview inquiry was sent directly to the contact to gain access. There are no ethical objections to contacting the participants under

the provided email address as only explicitly consented statements were published. Therefore, a relevant number of targeted populations can be selected, and interviews can be requested.

The challenging part is to convince the representatives to participate in the study. Therefore, an email will be sent out, including an intro to the author and the circumstances, purpose and content of the interview. It is emphasized that the interview will be conducted in the course of the elaboration of a master's thesis in a field of study, which aims to create knowledge on public participation initiatives. Furthermore, the email will include information on the approximate duration of the interview and its subsequent use.

Course of the Interview

The interview is introduced by an initial briefing that provides an introduction to the topic and purpose and includes the interviewer asking for approval to start the interview (and thus recording it). The guideline consists of on the one hand main questions that will be asked at a suitable point in the interview and on the other hand follow-up questions which can optionally be asked, depending on the course of the conversation. In the interview, the guideline serves as an offer to talk, whereby the interviewees are deliberately not tied to a fixed set of questions. This gives the representative the freedom to address what is most important to them, to emphasize aspects, and to help co-create the course of the interview. Therefore, the participant is given the opportunity to introduce and elaborate on their own patterns of interpretation and action (Keuneke 2005). The interviewer has at any time the opportunity to ask ad hoc questions that deviate from the guidelines and that result from the conversation. At the end of each interview, the participants will be asked if they have anything more to say or want to make any further statements or comments. As the interview subject deals with a mutual interest of the interviewer and interviewee, the conversation is likely to continue after the interview has officially ended, and the sound recording has stopped. Here, the interviewer is encouraged to ask for the interviewee's permission in case the off-the-record content is used (Brinkmann & Kvale, 2015, p. 155).

Appendix 3 Code book exported from NVivo 12

Name	Description	Files	References
0-Current VA status	Theme from interview	12	33
Cons		0	0
Can't provide personalized service	Where described as ‘don’t understand me, etc’	3	4
Higher learning cost of manage VA	Statements such as ‘I don’t want to spend time’	1	1
Limited used due to un-intelligent	I.e. it will just stay in the corner like a toy	4	5
Low frequency of using VA	i.e. Not really that connected	5	6
Not achieved custormer expectation	Claims and emotions such as disappointment	4	5
VA cannot analysis the patterns of consumer behavior		3	3
VA development is limited because of local language		1	1
VA express information lack of integrality		3	3
VA havn't develop into the company work stage		1	1
VA havn't effect the marketing		1	1
VA shopping is seldom used		2	4
VA still not mature with intelligence		3	6
Status		0	0
Custormer prefer use VA in some scenarios		1	1
Deeper connection in daily life		6	8
More convinient to access the information		4	5
Sound device have an effect on lifestyle		1	1
VA applied for customer service		2	2
VA has been use for telephone marketing		1	1
VA involvement depend on connection of devices		1	2
A-Future predications		0	0
COVID-19 related		0	0

Name	Description	Files	References
The virus crisis change people's habit		1	1
The virus crisis didn't change the frequency of using VA		6	6
The virus crisis rapid the development of VA commercial application		2	2
The virus period increasing frequency of using VA		3	3
Future VA market	Globally, 3-5 years, key countries ,key players and key features	1	1
Asia market		2	2
china market		3	4
EU market		1	1
global R&D		1	1
indian market		2	3
key VA player competition		6	8
market potiential		1	2
national strategy		1	1
new consumer segment from non metro cities		2	2
new consumer trait		3	5
nordic market		1	1
US market		2	2
western market		1	1
Tech & business ecosysterm maturity	VA related tech that support the 3-5 year’s prediction	1	1
Business ecosystem maturity		0	0
audio content boost VA		1	1
booming smart phone market		2	3
broadcast still has a share		1	1
distribution senarios		1	1
ephemeral content		1	1
expectation		1	3
knowledge database for VA		1	1
Mobile advertsing booming		1	1
rise of advertising revenue		1	1
rise of voice content		3	9
smart phone as a major platform		1	1
VA boom in consumer market		1	2
wireless headphones are booming		2	5

Name	Description	Files	References
Tech ecosysterm		0	0
5G empower In-car application		1	1
audio phone accessories booming		2	4
edge AI more available for consu mers		2	7
global R&D		1	1
IoT application		1	1
NLP maturity		1	1
seamless interaction		1	2
technology curve		2	2
VA on multiple devices		3	3
Voice cant stand alone		9	12
time prediction for VA	When will VA prosperous	1	1
3 years		1	1
5 years		1	1
towards human level tech		1	3
B-Strat Comm Challenges		1	1
Adjusting strategy		4	4
Crisis resilience		4	5
brand safety in uncertain publising senarios		1	3
constant change		2	5
distrust		2	4
safety concerns in consumer journey		2	2
innovation potential		3	9
application senarios		22	85
how to reimagine the organizationational engagement of VA		2	7
opportunitiy for development		3	3
Thought leadership		2	3
new business model		6	13
Building intangilbles		1	1
Brands		2	9
brand touch point		1	1
closer Brand consumer distance		1	1
new brand ambassador		1	1
challange in understanding, design, evaluation-VA merged communication		4	7
budget distribution on VA		1	1

Name	Description	Files	References
complex environment in VA challeng media buy strategy		1	2
continuous optimisation		1	1
lack of objective mo nitor of voice ad		1	1
listening ability		3	5
local language		3	7
more complexed content format		1	3
new counter spam approach		1	1
new skills for communication pros		4	7
regulation on interative advertising		1	1
strategic assessment of communication		1	1
VA ad related right to know&right to choose		1	1
voice content design		1	1
voice content marketing		2	3
Corportate culture		0	0
Reputation		0	0
Enabling operations		1	1
Customer preference		10	18
comsumer experience		4	4
connected lifestyle		1	2
consumer attention gets shorter		1	1
consumer engagement		3	4
consumer wants more control over their data		3	4
custormer engagement		2	3
demand for stay connected		1	1
demand of personalization		2	2
full digital consumer journey		3	4
how to feed consumer decision making process		1	1
importance of conversation		4	6
improve productivity		1	1
indivisible of technology		1	1
new consumer trait		3	5
new digi native consumer generation		1	1
patterns of consumer behavior		2	2
personalized communication		1	2
personalized service		3	5

Name	Description	Files	References
seeking help from VA		1	1
employee commitment		3	4
employee-VA collaboration		1	2
emplyee engagement		1	1
the ability of employee communicate with VA		1	1
Product(service) and operation		3	12
business ecosystem lock-in		1	2
extend of service		4	7
how to reimagine the organizationational engagement of VA		1	1
lifecyle issue of VA devices		1	1
the ability to evaluate human experience		1	1
To seamless integrated technique into life		1	2
VA may filter economic choices to users		1	1
Ensuring flexibility		1	1
Challenge in society		2	2
change of technology-human relationship		7	14
corporate responsibility		2	3
data security		5	6
delay in regulation		1	3
environment responsibility		1	1
Ethical issues		2	3
moral & ethical trust		2	2
political conflicts		1	1
resistence towards VA		2	2
Legitimacy		3	4
adjust of business model		2	2
complexed integratation standard with Voice marketing		1	1
new industry standards		5	7
new national regulations		3	3
new standard of transparency		3	7
problematic data collection		1	5
VA has media character to make influence to the people		2	3
Relationships		5	13
change of organization-customer relationship		1	2

Name	Description	Files	References
customer agency		1	2
customer as partner		1	1
the question of ownership		1	1
transparency		2	2
co-create of value		1	3
collaboration		2	2
collaboration with employees		1	1
high dependency on tech		1	1
more complexed alignment with stakeholders		2	2
partnerships		2	4
Trust		3	4
Extra recommendation decrease the trust		1	1
Privacy concerns		5	9
C-Different opinions		5	8
Custormer prefer non-personification		3	4
VA should be immersive experience		2	2
VA won't effect the future market		2	2
positive belief in VA embeded lifestyle		1	1
VA application limitations		1	1
VA as a new type of media		0	0
VA tied with customer		1	1
Virtual influencer		1	1

Appendix 4 Other materials

More research materials such as interview transcripts, NVivo project file, the coding concept mind map and more are available on demand, please contact the author via the email address: xi3486hu-s@student.lu.se