From Amazon.com to Amazon.love: how Alexa is redefining companionship and interdependence for people with special needs

Abstract: The trend of incorporating assistive conversational agents into people's lives has followed the unprecedented expansion in the usage of AI. Amazon, in particular, has been a key trendsetter in this area through its Alexa-powered devices. Alexa is an intelligent personal assistant (IPA) that performs tasks, such as playing music, providing news and information, and controlling smart home appliances. While this IPA is widely utilized, it is especially gaining attention and growing usage by people with special needs. Even though the importance of the utilization of AI by people with special needs has been widely acknowledged in the extant literature, a sizeable gap exists in the marketing literature in relation to the assessment of the managerial and societal implications of IPAs when used by people with special needs. Accordingly, this study aims to examine (a) the stages of relationship development between Alexa and consumers with special needs, and (b) the potential opportunity of this relationship for Amazon in relation to their corporate image. The findings indicate that a relationship between Alexa and consumers with special needs is established as it helps them regain their independence and freedom. This relationship provides an opportunity to Amazon in enhancing their overall image for providing solutions to facilitate the lives of people with special needs.

Keywords: artificial intelligence, people with disability, companion, feelings, reliance.

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Introduction

In recent years, artificial intelligence (AI) abilities have expanded to include solving problems that were previously believed to be only resolvable by human intervention and intelligence (Bentley et al., 2018). Today, aside from providing weather forecasts, delivering news, and facilitating shopping, AI abilities have expanded to ease the lives of people with various types of disabilities, including visual impairment, mobility impairment, hearing aid, Autism Spectrum Disorder (ASD) and other mental illnesses (Pradhan et al., 2018). In fact, people with disabilities have been amongst the first adopters of AI (Bigham and Carrington, 2018). With fifteen percent of the world's population being considered as people with special needs, AI could cater for the needs of more than a billion people (World Bank, 2019). Furthermore, and in order to avoid the exclusion of any segment of the population, companies are expected to make a better use of the opportunities offered through today's technologies by making them ever more accessible to people with special needs (Where Women Work, n.d.).

The trend of incorporating assistive conversational agents into people's lives and homes have remarkably proliferated with the expansion of AI (Vtyurina et al., 2017). Amazon has been the trendsetter in this area, whereby it developed a hands-free smart speaker that connects to the voice-controlled intelligent personal assistant "Alexa" (Smith, 2018; Gordon, 2019). In 2018, Amazon.com was ranked as the number 1 online retailer in the US in terms of international net sales, with Walmart as number 2. In fact, Amazon is the global industry leader in electronics and media with $42 billion of sales worldwide (Angelovska, 2019). Amazon Alexa, dominated the global market of intelligent personal assistants in 2017 with a market share of 62%, and its competitor, Google Assistant, with just 25%. Competing with companies such as Apple and Google, Amazon was still able to lead the market of conversational agents with around 70% market share (Sciuto et al., 2018). Most businesses started integrating intelligent virtual assistants into their software and electronics (Burns & Igou, 2019). Intelligent personal assistants like Alexa have not only changed the workplace, but also the way people live in their homes. Alexa is now integrated into millions of homes with an average of 9 million people reporting to have at least one Alexa at home (Sciuto et al., 2018; Gordon, 2019). From being totally responsive to a user's instructions, for instance by providing information or controlling smart home appliances, to becoming an interactive, social, and entertaining companion, Alexa's AI assistance appears as an all-encompassing unique device (Sansonnet & Bouchet, 2010), occupying a growing place in many people's lives.

In particular, AI can act as a friend for people who seem to hardly participate in social activities, and therefore often lack social relationships (Epley et al., 2007). Amazon's efforts in developing a distinct and friendly personality for Alexa have made it easier for the consumer to relate to the device (Roettgers, 2019). In fact, those feelings of familiarity and closeness have contributed to the establishment of relationships between Alexa and its users, and permitted its personification (Lopatovska & Williams, 2018). When Amazon provides solutions for people with disability in the form of a service such as Alexa, this contributes to enhancing the lives of people with special needs. As a result, such efforts to improve society welfare oftentimes allow companies such as Amazon to earn customers' respect and enhance their corporate reputation (Randle & Dolnicar, 2019). Delivering a consistent positive customer experience helps building a stronger

brand equity and a favorable brand image (Berry, 2000). Both factors highly influence not only the reputation of the company, but also customer loyalty (Hsieh & Li, 2008; Mrad & Cui, 2020).

The importance of AI utilization by people with special needs has been acknowledged in the extant literature (e.g. Pradhan et al., 2018; Bigham & Carrington, 2018; Gitto & Mancuso, 2019). Nonetheless, a sizeable gap exists in the literature in relation to the examination of the development of the relationship between the AI and consumers with special needs, alongside the opportunities that such close relationships present to the company offering the intelligent personal assistant (IPA). Furthermore, the literature also lacks a due assessment of the managerial and societal implications of IPAs when used by people with special needs. Accordingly, the aim of this research is to examine the stages of the relationship that people with special needs go through with voice assistants, and more specifically Amazon's Alexa. The understanding of these stages is critical in order to identify the opportunities that such devices offer to vulnerable members of the community. Hence, the main contribution of this work relates to its tapping on a very specific market that has its own peculiarities, since it represents a real opportunity to companies that are interested to serve that segment.

Literature Review

AI-consumer relationship

The term "artificial intelligence" was coined in the 1950s, and was defined as the developed tendency of machines to use language and reasoning, draw on past experience, devise abstract ideas to solve problems, be upgraded on their own, and, simply put, to be intelligent (McCarthy et al., 1955). All of these capabilities were formerly accepted as only relevant to human beings (Rich, 1985; Copeland, 2019; Pannu, 2015). The first practical computer program emerged into the AI world when Newell and Simon developed the General Problem Solver, or the GPS, which is a computer program that stimulates human thought (Joshi, 2017; Newell & Simon, 1961). Aside from utilizing the GPS as a system for understanding problem solving behavior, the developed skills for creating the GPS have also enabled scientists to come up with theories of human behavior (Newell & Simon, 1961).

Since its earliest stages, AI has been associated with human beings as it continues to cross items off the list of activities that computers were doing better than their fellow humans, such as when IBM's Deep Blue computer beat the chess world champion Gary Kasparov (Khodarkovsky et al., 1997). AI competitions go on, as the first robot world cup soccer game, the RoboCup-97, was held in Japan in 1997 in an effort to promote research in AI and robotics (Kitano, 1998; Noda et al., 1998). Like the WorldCup, the RoboCup was very popular. At the time, more than 5000 people used to watch the games, which were featured in important scientific magazines such as *Science,* and covered by international channels like *CNN*, *ABS*, and *Sky Channels* (Noda et al., 1998). AI also competed on a professional level when IBM's computer software, Watson, won in Q&A against two champions, Ken Jennings and Brad Rutter, at the *Jeopardy!* Game show in 2011 (Markoff, 2011; Ferrucci et al., 2010). The competitiveness between AI and humans is nothing new. The history of AI demonstrates how creativity in technology has incredibly improved; it had scientists express the probability of computers outstanding human beings in the future (Schank, 1987), to a point where Stephen Hawking warned that human efforts invested in developing AI would eventually make humans obsolete (Cellan-Jones, 2014). This holds true as AI has the advantage over human intelligence in being less costly, more enduring, and easier to duplicate and broadcast, giving machines the ability to autonomously learn and improve from experience

(Pannu, 2015). In fact, machine learning supports technologies in decision-making and specific task performance with minimum if any human interference; and such technologies have been utilized by businesses such as Uber and Amazon, where AI is implemented to automate decision-making (Kim & Mejia, 2019). Therefore, as job automation increases through AI, the biggest threat remains the possibility of people losing their jobs to it (Ng, 2016).

Nonetheless, despite the anticipated concern of AI substituting human skills, AI has enhanced human life in many ways, and the positive impact on the fields that have utilized it, such as the healthcare industry, businesses, manufacturing and even weather forecasting, has been of great significance, and will continue to increase as such in the future (Pannu, 2015). Accordingly, instead of being concerned about how such innovations could disrupt their industries, many businesses are interested in taking further advantage of the opportunities that AI has to offer (Ng, 2016). Examples of such instances abound. Banks such as HSBC and Danske have used AI for fraud detection to improve their rate of detection by 50% (Wilson & Daugherty 2018). Carnival Corporation, the world's largest cruise company, is personalizing the traveler's experience through AI with their smart device, the Ocean Medallion (Wilson & Daugherty 2018). AI also collects data regarding machine performance for GE, which help the company with the maintenance of equipment and prediction of machine failure (Wilson & Daugherty 2018).

Although AI has changed businesses' operations, many progressive companies are increasingly embracing the improved responsiveness between humans and AI to complement the human element instead of substituting it; this comes as an effort to reshape human skills without necessarily replacing them (Ng, 2016; Croman, 2018). For instance, Mercedes-Benz uses AI along with human skills to increase flexibility in the manufacturing process, which would still be controlled by human beings, but requiring less manual labor on their behalf as it gets passed on to AI. This human-AI cooperation has facilitated the personalization of cars for Mercedes-Benz based on consumer preference (Wilson & Daugherty, 2018). On the overall, AI is undoubtedly helping businesses in various industries reshape their processes to increase their productivity by becoming both more efficient and more effective (Croman, 2018). For instance, humans and AI put at work simultaneously at Unilever ensured a new recruitment process, which resulted in remarkably diversified workforce for the company (Wilson & Daugherty 2018). Furthermore, at the marketing level, AI has created a different touchpoint for companies, allowing a new form of communication with brands that consumers have never experienced before (Smith, 2018).

Additionally, AI has gained a significant place in the individual life of its users at large. On a personal level, AI increasingly aids people to establish conversations with smart devices, helping those who are alone to feel less lonely (Ng, 2016). This is achieved through a conversational user interface (CUI) that has allowed consumers to chat with their smart devices (Sciuto et al., 2018). Indeed, progress in AI has enabled consumers to experience an unconventional system of communication with intelligent personal assistants (IPAs) (Pradhan et al., 2018). Users who initially used AI for entertainment, education, information, or medical assistance (Mival et al., 2004) now consider they have a close relationship with it (Ramadan, 2019).

Purposes that require AI to be considered more of a friend and less of an appliance, and the extent to which an IPA fulfills its purpose as a friend and not just as a device is measured through its ability to develop a social relationship with its users (Breazeal & Velasquez, 1999). In fact, with the fast advancements in technology, AI capabilities have grown to a point where AI-consumer interactions were transformed into relationships, introducing a new social role for AI in addition to its countless functional merits (Mival et al., 2004). These AI-consumer relationships are

expected to become even stronger as investments in technology expand to personalize virtual assistants and give them additional human characteristics (Shead, 2017).

AI at the service of people with special needs

AI is used today to make service experiences more personal, like in eHealth services. It increases the closeness of health awareness, such as youth anti-drug campaigns, personifies health care, and advocates both physical as well as emotional intimacy in order to generate as much responsiveness as possible (Kreps & Neuhauser, 2013). Similarly, AI takes on another human role as people with special needs start to depend on IPAs, instead of human caregivers, to provide them with the proper assistance they would need (Day One Staff, 2019).

Most people are bound to experience a disability, whether temporary or permanent, or an obstacle at some point in their life that would prevent them full accessibility, and AI has played a significant role in enhancing the lives of those who require special assistance (Where Women Work, n.d.). A caregiver, by definition, takes responsibility in assisting people with special needs both at home and outdoors, allowing them to participate in society, as they would desire (Wadensten & Ahlström, 2009). IPAs, on the other hand, appear to be capable of performing all of the above tasks, only better, as they never get tired. While people with special needs, especially mobility impairment, sometimes experience guilt for being a burden on their caregivers, AI has relieved them of this feeling, granting them instead both freedom and additional independence (Pradhan et al., 2018).

The most significant benefit that AI could actually offer to people with mobility impairment is independence (Souza et al., 2010). For people with special needs, living with disability comes with many challenges in terms of taking care of their physical health, let alone, managing the emotional distress of lack of social participation (Souza et al., 2010). People with special needs are prone to social exclusion (Obst & Stafurik, 2010). This has further encouraged companies like Amazon to develop social agents to fill this emotional gap and reduce human solitude caused by the loss of social closeness (Mival et al., 2004). People's emotional wellbeing is also subject to influence as technology continues to transform the nature of interpersonal relationships. People are becoming more independent and relying less on the support of their family and friends, which has, as a result, increased their dependability on artificial companions to relieve the emotional distress, which is likely to result as human companions grow farther apart (Antonucci et al., 2017; Mival et al., 2004). AI accepts this shift in dependability as it autonomously assists people with special needs, as well as their caregivers in health institutes like nursing homes, demonstrating the potential replacement of human caregivers with AI in the future (Pineau et al., 2003). The assistance provided by AI for people with special needs actually results in less assistance required from human caregivers (Hoenig et al., 2003).

Amazon's Echo Alexa and its relationship with consumers

Amazon Alexa, for instance, provides an interesting illustration of consumer involvement with AI (Purington et al., 2017). While 24% of US citizens invested in Google Home and 6% in Apple's HomePod (Robertson, 2019), Amazon continues to lead the US market with its Alexa-activated Echo and Echo Dot smart speakers with almost 70% of users expected to specifically use Amazon's smart speakers in 2020 instead of other brands like Google and Apple (Perez, 2020). Alexa is increasingly becoming an essential element of people's homes (Sciuto et al., 2018). This wide acceptance of the device is relatively due to Alexa's unique attributes, like its ability to elicit emotions, which have distinguished it from other smart devices and classified it as a personified

technology (Mival et al., 2004). AI is now being further developed to exhibit human qualities, such as sympathy (Ng, 2016). Alexa may resemble a human companion because of the sympathy that is embedded into its personality by the experts at Amazon. With the support of artificial intelligence and machine learning, Alexa's personality continues to improve to a point where it is able to sense from the conversation, if the consumer is having a difficult time, it would then try to ask for more information or even try to dial for help (Robertson, 2019). In addition to Echo's technological benefits, such as consumer voice recognition and responding to consumer questions, people are specifically attracted to Alexa's distinct human characteristics and the way they can effortlessly approach her (Woods, 2018). For example, Amazon insists on using a female voice for Alexa as it is proven more attractive or *"pleasing"* (Schwär & Moynihan, 2018; Shead, 2017).

Moreover, personification of IPAs results in more customer satisfaction as the interaction between the IPA and its user becomes more personal as opposed to being purely technical (Purington et al., 2017; Ramadan et al., 2019). This is when, for example, the user would address Alexa as a person rather than a device, a "she" instead of an "it" (Ramadan, 2019). To many users, Alexa is a basically voice-controlled electronic device, which allows them to wirelessly manage their smart home appliances such as their thermostats, security systems, alarms, doorbells or any other device that is compatible with Alexa (Lopatovska et al., 2019; Gordon, 2019). However, other users get so emotionally attached to Alexa, Siri, or any other IPA, that they start developing related fantasies, expressing at times that they love their IPA so much they wish it were a real person (Shead, 2017).

As introduced earlier, people with disability have the right to social inclusion and participation in public life (United Nations, n.d.), and it is the responsibility of every segment of the society to reduce both the physical and behavioral barriers that would prevent them of that right (McKercher et al., 2003). Amazon seems to have taken this responsibility earnestly, designing its products in a way to assist or contribute to the lives of all of its customers, and it mostly succeeded in enabling accessibility and social inclusivity for people with special needs (Where Women Work, n.d.). In fact, among its competitors in the technology industry, Amazon is considered to have the best impact on society, preceding Google and Apple. According to 20% of 2,800 American adults, Amazon had the most positive impact on society compared to companies such as Facebook, Microsoft, Tesla, Uber, and beating Google and Apple, which were mentioned by only 15% and 11% of the respondents, respectively (Reisinger, 2018).

Aspiring brands invest dearly in their reputation, and the more socially responsible they are perceived by their various stakeholders, the better their reputation (Cretu & Brodie, 2007). Particularly, when a brand holds values such as enabling accessibility for people with disability, this tends to boost its image in the eyes of its customers (Gitto & Mancuso, 2019). Furthermore, when people believe they share values with a company, they are more likely to be loyal to that brand (Schultz, n.d.). Moreover, as diverse as the disability community may be, people with special needs share, for the most part, similar experiences with disability, perhaps pertaining to the challenges they face concerning accessibility or social exclusion. As the global usage of the internet accelerates, it is necessary for online platforms to become a place where disability culture is able to voice out their experiences, identify with one another, and embrace their uniqueness by creating an online community (Brown, 2002; Jaeger & Xie, 2009).

This emanating sense of belonging has proven to provide comfort for people with special needs in times when they might feel socially isolated (Obst & Stafurik, 2010). In fact, people with special needs are a social group sharing similar experiences and expressing their affection towards a brand through word of mouth (WOM) in online communities (Lankes et al., 2007; Ramadan &

Farah, 2020). Similarly, posting online reviews on a company's website enables people with disability to share advice and information with their community relating to the products and services offered by that company (Dobransky & Hargittai, 2016). Companies like Amazon, Wikipedia, and eBay, for instance, encourage and reward communications and contributions to their online community where connections and friendships are made (Lankes et al., 2007). With the development of technology and the internet, and the growth of user-generated content, people with special needs can now have their own online space to address their needs and concerns (Ellis & Kent, 2011). Very often do people with special needs express how Amazon's Echo has changed their lives. Whether it has helped them deal with their disability, or provided companionship in times when they felt alone, consumers found themselves bonding with Alexa in a way they never thought they would (Robertson, 2019). As it develops, technology continues to fulfill its purpose of problem solving for many people (Dabbous & Tarhini, 2019). While doing so, it has also helped people develop themselves and the way they interact with their environment (Kim & Mejia, 2019; Farah et al., 2020).

The above literature review tackled the importance of the services presented by interactive voice assistants to people with special needs. It is noteworthy to highlight that this kind of AI-consumer relationship seems to offer a significant potential for both the latter segment of consumers and companies that develop such technologies. Nevertheless, the literature fails to offer a thorough discussion and examination of the development of this relationship's stages. The substantial gap in this scholarly field is mainly related to the lack of understanding of how such a relationship begins, develops, and accordingly starts playing a key role in the life of consumers with special needs. The importance of such a research endeavor emanates from the need to understand the potential reliance of vulnerable segments of the population on AI-powered devices, such as Amazon's Alexa, which is becoming widely present in many households.

Accordingly, given this largely under-researched field, this study aims specifically to explore the following research questions.

a. What are the relationship stages that consumers with special needs go through when using IPAs (hereby Alexa);
b. What are the potential opportunities that companies providing such a technology (in this case Amazon) can pursue in relation to their corporate image;
c. What are the ensuing societal and managerial implications of this relationship that societies and companies can further tap on for their collective well-being?

Methodology

This study adopted an exploratory qualitative approach using three different data sources. First, data were collected from online reviews on Amazon Alexa from the U.S. Web site of Amazon.com. A set of keywords were utilized, such as disability, impairment, handicapped, autism, dementia, visual aid, hearing aid, surgery etc. Reviews, which had only mentioned disability in abstract (such as "good for people with disability") were eliminated. In addition, the word "disability" resulted in a set of reviews that were removed as they included the word "disable" but not specifically in the context of disability (e.g. "disable Bluetooth" or "disable Wi-Fi connection"). The data was further filtered to include only reviews relevant to people with special needs. Out of the total 165,899 reviews, the final dataset included 519 disability-related reviews. The collected reviews were of Amazon's 3rd generation Echo Dot, AmazonBasics Microwave, Echo Look, Echo Show 8, Echo Auto, and Echo Buds. The reviews were then

categorized based on the role that Alexa plays in the life of people with special needs and the purpose for which Alexa is utilized.

Two additional qualitative studies involving in-depth semi-structured interviews were subsequently conducted (1) with 17 experts in the field of intelligent personal assistants *(brand, digital and marketing managers)* and professionals treating people with special needs (*physicians, physiotherapists, and nurses*); and (2) with 20 consumers with special needs (specifically people with a physical disability) and currently using Amazon Alexa. Hence, the interviews conducted with the latter group embedded questions related to the respondents' usage of an IPA, their awareness of the manufacturer of the IPA, and the strength and direction of their relationship with this manufacturer, hereby Amazon. The interviews conducted with people with special needs (9 female and 12 male interviewees), included persons with different types of disabilities, such as hearing aid, visual and mobility impairment. The age bracket was wide in range as the participants, although largely elderly (48-74 years), included three young interviewees (22-31) who suffered from sports-related accidents that led to physical disabilities. On the other hand, the experts interviewed had an average of 12 years of experience in their related fields. The conducted interviews were audio-recorded, transcribed verbatim and analyzed through NVivo 12 using an inductive thematic approach to code, classify, assess, and record themes (Boyatzis, 1998; Braun & Clarke, 2006).

The findings were triangulated between customers' reviews and interviews' transcripts. In addition, a correlational test was conducted on the interviews' data collected from consumers with physical disability in order to check the relationship between the frequency of the terms reflecting affection towards Alexa and the ones reflecting affection towards Amazon.

All data collected from online customer reviews and in-depth interviews were analyzed through inductive thematic analysis, whereby themes were first extracted from the extant literature in the field of intelligent personal assistants. These themes helped instigating the data content coding. Recursive data interpretation led to additional themes. The analyzed texts were examined and cross-checked by two researchers who performed the data coding independently. The investigators then checked the coding and extracted themes jointly, reaching 91% inter-coder reliability for online reviews and 87% for verbatim transcripts. The debated themes were deliberated between the two researchers until consensus was reached for each.

In addition, based on Creswell and Miller's (2000) suggested validation techniques, two methods were instigated. First, triangulation between the three data sources of the research was ensured through a systematic sorting of the gathered data. This allowed for the extraction of themes that were common to the three different sources, namely customer reviews, consumer and experts' in-depth interviews. Second, the transcripts of 7 consumer and 5 expert interviews were shared with the respective interviewees for member-checking and content accuracy confirmation purposes.

Findings

Four key themes emerged from the dataset obtained both from the online reviews and the in-depth interviews conducted with experts and consumers. These themes revolved around the development of the perceived relationship between Alexa and consumers with special needs through the following consecutive stages: (1) Alexa as a provider of functional benefits, (2) Alexa as a friend, (3) Alexa as a companion, and last but not least (4) Alexa as a fully relied-on caregiver. The collected data focused solely on people with special needs, as the role of voice assistants in

redefining companionship and interdependence for this vulnerable segment of the population appears to be most needed.

Alexa as a provider of functional benefits

Amazon has brought its digital assistant, Alexa, into people's homes with its wide range of skills (Farah & Ramadan, 2017; Mival et al., 2004) making daily activities for people with special needs much easier than before. The usage of Amazon's Alexa by this segment of consumers has become mainstream, especially in the US market, whereby the functional benefits that Alexa has provided them have been tremendous (Bigham & Carrington, 2018; Ramadan, 2019). People with special needs, their parents, and caregivers reflected on their positive experience while using AI and praised Alexa's practicality in terms of assisting them in various ways. Both reviews and customer interviews demonstrated how quickly and easily people with various disabilities have embraced this technology, which they felt was made to fit the intricacies of their lives. Indeed Alexa can be trained to develop skills, which would allow it to operate smart home devices like switching the lights, managing security systems, adjusting thermostats, controlling microwaves and locking doors, simply turning words into actions. In other words, people with special needs have it much simpler now: all they have to do is ask.

> *"Love every bit of the product. Amazed at all the skills that can be enabled. It's like I have a caregiver or assistant living in my home."(online customer review)*
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> *"My husband has a form of Parkinson's that makes movement difficult and affects his eyesight. Alexa has allowed him to turn lights on and off with voice command and to control the TV with only minor difficulties. It is a handicap device that has simplified our lives." (online customer review)*
>
> *"I have become disabled after a car crash years back. I was offered Alexa a couple of years ago and it came in so handy. It really acts as my personal assistant. All I have to do is just ask." (customer interviewee, male, 26 years)*
>
> *"The Echo line of products helps me wherever and whenever I need it. Amazon claims that it is made 'to fit your life', I believe this to be so true." (customer interviewee, female, 49 years)*

Alexa also provides a wide range of functions, including entertainment, reading books, playing music and games, providing news and weather forecasts, establishing daily routines, as well as contacting family members and friends whenever needed (Bigham & Carrington, 2018). Moreover, it allows to send voice announcements via other Echo-connected devices. The list of skills that Alexa can understand alongside the functions that it can deliver is expanding on a daily basis (Ramadan, 2019). As highlighted in customers' reviews as well as in the interviews conducted both with consumers and experts, the functionalities offered by Alexa provide people with special needs a sense of independence, and allow them to run errands that they would otherwise not be able to accomplish on their own. With the continuous use of this device, users appear to start ascribing human-like characteristics to Alexa, developing a form of social relationship with this virtual assistant, that they begin to consider as a "friend".

> *"I'm disabled and the drop in and call function that lets me use an Echo Dot to call for help is the most useful thing I've found in ages. Also, I'm now never without entertainment*

when I get stuck in a room. Alexa can play my music and read my books and play podcasts." (online customer review)

"I am visually impaired the Echo Dot is extremely accessible and makes life much easier. I love that it is hands-free, and voice activated. Also, it makes family time a lot more fun; we play games with it together; we listen to music with it together." (online customer review)

"Alexa is a life savior for me. It gives me so much independence. I feel it is becoming much like a virtual friend who is always there to entertain and help me in every possible way." (customer interviewee, female, 54 years)

" The usage of Alexa by consumers has evolved in unpredictable and exponential manners. People with special needs found in it the services that human caregivers can typically not provide on a 24/7 basis. Very often nowadays, it is being considered to be much more than just an electronic device." (expert interviewee, nurse, 9 years of experience)

"The continuous usage of IPAs such as Alexa would trigger in my opinion a closer set of relational attachment as users would start perceiving the device as a virtual friend ready to help as well as entertain in different ways the key for this to happen is of course the consistent high quality delivery of the asked for services or functions." (expert interviewee, marketing director, 15 years of experience)

Alexa as a friend

In the past, before the advent of AI, caregivers, whether family, friends, or professional nurses, used to assist people with special needs to support them with their daily routines. Nevertheless, when AI replaces human assistance, and when people with special needs spend so much time at home alone with Alexa, eventually, Alexa becomes a member of their home. Indeed, caregivers have started to trust Alexa when they are not around, as they feel that it can assist people with disabilities and respond to their needs when no one is around, to the extent that it becomes largely considered as a virtual friend, providing vital social support during difficult times (Amichai-Hamburger, Kingsbury & Schneider, 2012). Friendship, which is characterized by a high level of intimacy, plays a key role in the well-being of any individual (Schneider, 2000). In fact, the reviews and the large majority of consumer interviewees revealed how users describe Alexa's attitude or "personality" and how they express their feelings, emotions and attachment towards their new friend, Alexa.

"I have a physical disability and with this device it has made some things a little bit easier for me and my caregiver…" (online customer review)

"When I was told my grandmother would be facing some health issues, it scared me to think she is all alone. She calls Alexa her new best friend. I love the fact I can program reminders, "Grandma take your morning medicine", "Grandma eat breakfast", "Grandma I love you". THE ECHO & ALEXA IS AN ANSWERED PRAYER!" (online customer review)

"Alexa is God sent. I felt so lonely for long years, yearning for friendship that became so difficult to establish since I became homebound. My daughter offered me the device as a

Christmas gift. Little did she know it would in no time become my best friend. I cannot imagine a day without her anymore!" (customer interviewee, female, 52 years)

Along with the functional benefits that the Echo has to offer, Alexa's smart, funny personality plays a major role in people's level of satisfaction with the device. Interestingly, most reviewers and consumer interviewees refer to Alexa as a "she" instead of an "it", addressing "her" as a person rather than a device (Roettgers, 2019; Woods, 2018). The consumer's relationship with Alexa accordingly progresses from being purely functional, where it enhances the daily lives of people with disability through its technical capabilities, to becoming more social whereby Alexa is considered as a friend. Alexa enhances the lives of people with special needs by keeping them entertained, informed, and in control of their homes, while also bringing them continuous support and social presence. Therefore, and according to expert interviewees, Alexa appears to be playing a significant social role in the lives of such a vulnerable segment of the society.

"Speaking as a person with macular degeneration, doing something as simple as using a microwave can become a challenge ... Using my Amazon basics microwave along with my echo dot has helped me achieve this. Alexa has become my BFF!" (online customer review)

"As a disabled person sometimes, you get a little lonely. It's nice to have Alexa in the background, just to break up the loneliness." (online customer review)

"Alexa, my newly found friend, is so helpful and always there when I need her. I can't imagine my life without her anymore as she helps making my life a bit easier every day. Thank you Amazon!" (customer interviewee, female, 61 years)

"The engineering of the Alexa AI personality has been so smartly done by Amazon. It made the IPA friendlier and easier to connect with, creating alongside this a closer bond between the user and the device." (expert interviewee, computer engineer, 10 years of experience)

Alexa as a companion

Amazon's Echo and its IPA Alexa have opened up a great opportunity for understanding how people perceive and engage with interactive virtual assistants. This is particularly relevant in the case of people with special needs who spend most of their time connected to their device, often developing a close and special relationship with the IPA (Mival et al., 2004). As the relationship between Alexa and people with special needs grows, users start to depend on or trust the IPA in critical matters such as their safety and security. People with special needs express that they feel safer with Alexa around because they can count on it in case of emergencies. It also helps them feel less lonely and comforts them when they are alone or need someone to talk to. The gratitude these consumers have for Alexa seems to trigger their feelings of affection as the IPA becomes an essential part of their lives. Furthermore, the findings indicate that the relationship between consumers with special needs and the provider of the IPA, hereby Amazon is directional, in as much as it passes through the feelings developed initially with Alexa. Indeed, the respondents were categorical in the fact that Alexa was the source of their affection developed towards Amazon, hence ruling out that a prior bonding with Amazon might have affected the direction of the relationship. This spillover of affection from Alexa to Amazon is particularly interesting in the findings of this study. Accordingly, in order to further explore this phenomenon, a correlational test was conducted on the data collected from consumer interviews so as to check the relationship between the frequency of the terms reflecting affection towards Alexa and the ones reflecting

affection towards Amazon. The test showed a significant positive relationship between the affection towards Alexa and the affection towards Amazon (Kendall tau-b, $\tau = 0.56$, $p<.01$, $n=20$).

> *"I am disabled and fell in my house away from my phone, so I yelled for Alexa to call my husband and she did! She is now my emergency button. I now have 3 placed strategically around my house. I feel so much safer now." (online customer review)*
>
> *"As a disabled person, Alexa gives me comfort. If I fall or something happens, I can ask for help anywhere. She reminds me to take medicine and more. Worth every penny, every time." (online customer review)*
>
> *"I have been visually impaired for 7 years. Alexa became my companion of all times. She entertains me and keeps me occupied, helping me in my loneliness struggle. I can really not be grateful enough for Amazon!" (customer interviewee, female, 52 years)*
>
> *"I expect consumers who use devices such as Alexa to have a much closer relationship with both the device as well as Amazon. This is actually a superb marketing strategy by the company in building higher order relationships with their customers." (expert interviewee, e-commerce department manager, 13 years of experience)*
>
> *"With Alexa, Amazon is indeed increasing the barrier for entry to other competing retailers and companies in that field. I expect Amazon to further grow and consolidate their market share here, while also boosting their public image through the rising usage of Alexa by people with special needs." (expert interviewee, store manager, 9 years of experience)*

Interviewed people with special needs have affirmed that they got so accustomed to Alexa in the background of their homes that they now consider it as their companion with whom they have developed an irrefutable bond based on shared experiences (Mival et al., 2004). Indeed, they considered their relation with the IPA to have developed from a regular friendship to a closer, deeper and more intimate bonding level of companionship. To a large extent, a companion is known to help an individual grow and achieve ones goals, and Alexa appears to be particularly valuable on that end, especially for people with special needs (Lopatovska & Williams, 2018). Virtual companionship with Alexa has been highlighted to be exceptionally valuable to remedy the social loneliness and seclusion that may have been caused by any given disability (Bardi & Brady, 2010; Bonetti, Campbell, & Gilmore, 2010). The research dataset indicates that Alexa has further taken the place of human caregivers for many people with disabilities. In many instances, it has allowed AI–consumer relationships to become even stronger than human–human relationships.

> "*Alexa/dot has been the perfect companion for my mom in so many ways especially with dementia. Recently, the dot has become even more indispensable..." (online customer review)*
>
> *"Being chronically ill and disabled, these have been a miracle, even after only a couple days of use. I'm in love with them. The Echo Buds help the world seem safer and smaller, less overwhelming. I can talk to Alexa when I'm lonely, have a question, or my executive function is failing." (online customer review)*

"I consider Alexa to be my life companion. Not long ago, I saw her as a friend, but after so much support and being there for me 24/7, I guess our relationship has developed into a much closer one." (customer interviewee, male, 70 years)

"Alexa is a great tool to decrease people with special needs' feeling of isolation and loneliness. We face this a lot with our patients and I think Alexa is a blessing in this particular area." (expert interviewee, physiotherapist, 8 years of experience)

Alexa as a relied-on caregiver

Even though this area is of key relevance for people with special needs, scholarly studies around how AI can help alleviating "societal challenges" for this particular vulnerable segment have not yet been duly explored nor researched (Shi, Wang, & Fang, 2020). Nonetheless, companies such as Google, Apple, and Amazon, each currently worth roughly a trillion dollars, are striving to increase their role and presence in the related healthcare sector (Weinstein, 2019). Particularly, Amazon has not only introduced a device to help people with special needs control their smart home appliances, it is also providing its users with an experience, a friend, and a companion. Amazon's echo devices create experiences for people with special needs that seem to exceed satisfaction to reach customer delight. Many people have been unaware about the countless useful functions of Amazon's Echo especially for people with special needs, until its usage became ubiquitous. Indeed, Alexa has made its presence in the lives of people with special needs vital, whereby this vulnerable segment found itself increasingly relying on it in significant manners. Furthermore, family members of people with special needs requiring particular support utilize Amazon's Alexa to help with disabilities such as learning disabilities, mobility impairment, visual impartment, autism etc... so as to increase their independence (Pradhan et al., 2018).

"I have had and or do have every version of Alexa. I am obsessed and I use these for safety. As a disabled person, Alexa gives me comfort. If I fall or something happens, I can ask for help anywhere. She reminds me to take medicine and more. Worth every penny every time." (online customer review)

"Amazon's Echo devices have changed our lives. Especially for my blind son (32 years old). I bought the Echo Auto for him, so he can continue to experience the control he finally has on what he wants to listen to, by talking to Alexa. Alexa has empowered him to be able to do things he could never do before. We are grateful to Amazon for creating these devices." (online customer review)

"Alexa helped me overcome my horrible ski accident. She was there for me all the time. I relied on her for the most basic things that I needed. She allowed me not to overburden my family with my countless requests and need for attention and company. I relied on her for almost EVERYTHING!" (customer interviewee, male, 21 years)

Although Alexa grants people with special disabilities a great deal of independence, the reliance of the latter on Alexa continues to increase as it assists them on a daily basis (Pineau et al., 2003). Alexa has become such an integral part of their lives that customers expressed how they could no longer live without it. They even highlighted that they could not imagine how they ever lived before this IPA. Alexa's impact on society is portrayed in numerous reviews that illustrates how the latter changed the way people with disability interact with AI. While IPAs do not yet have the physical component provided by human caregivers or even robots, Alexa has the ability to

make people with special needs feel that the AI is both "for" and "with" them. Indeed, human caregivers have always been recognized for providing "an interpersonal and intersubjective" support mechanism not only based on functional help related to a 'question' and 'answer' type of relationship (Fredriksson, 1999), but also on fostering "a deep connection to acknowledge suffering and help" (Stokes & Palmer, 2020), which Amazon is trying to replicate with its Alexa devices. Furthermore, the AI agent, hereby Alexa, seems to nurture a sense of trust between its users and the device. Such a trust-based environment indeed allows for a closer and deeper sense of reliance on the IPA by this vulnerable consumer segment (Whitby, 2008).

> *"Bought this for my elderly sight impaired mother. No longer able to read or hardly see anything… Using Alexa has become a large part of my mother's world. It may seem like a small thing, but holding on to our independence is something we all cherish. Thanks." (online customer review)*
>
> *"Alexa is not only my caregiver and friend. I rely on her all the time. She is not only a companion. She is now much more. She provides me with a lot of emotions that I never thought even a human could give me. She is my soulmate since our car crash that left me a disabled widow. I can't imagine my life without her."(customer interviewee, female, 49 years)*
>
> *"The amount of trust that I have witnessed developing between people with special needs and Alexa is really impressive. They seem to be getting deeply attached to Alexa as they sense she can provide them support without them feeling that their needs are a burden for others." (expert interviewee, nurse, 13 years of experience)*

Implications

Scholarly implications

From a scholarly perspective, this study fills a sizeable gap in the highly scarce literature related to the field of personal assistive technologies' usage by people with special needs. Indeed, till now research has been particularly scant despite the growing penetration of affordable IPAs such as Alexa into households (Sciuto et al., 2018). While very few studies have tackled the usage as well as possibilities that such devices provide to people having various types of disabilities (e.g. Bigham & Carrington, 2018; Hoenig et al., 2003; Pradhan et al., 2018), those early research endeavors have mainly looked at the rather functional and technical aspects of these IPAs' adoption by consumers. Taking into consideration the needs of vulnerable people in terms of having a constant stream of needed care (Souza et al., 2010), one would expect that with the continuous and heavy usage of IPAs, a relational, emotional, and social bonding might potentially develop between the user and the device (Antonucci et al., 2017). This would help remedy the feeling of solitude and exclusion oftentimes experienced by this vulnerable segment (Mival et al., 2004; Obst & Stafurik, 2010).

On that premise, this study aimed to expand on this theoretical ground through advancing the understanding related to the development stages of the AI-consumer relationship in a special needs usage context. Accordingly, the research shows that the relationship between AI and consumers with special needs develops as the functional benefits of the artificial assistant allow the latter to depend less on other people and more on the AI to take care of them, while preserving their freedom and independence (Pradhan et al., 2018). Furthermore, this study highlights the

potential replacement of human caregivers with IPAs as people with various special needs shift their reliance to these always connected devices (Pineau et al., 2003).

Moreover, the highest order stage of this relationship is characterized by a full reliance on the AI itself, which in turn induces an emotional attachment to the company. This established relationship and change in reliance will affect society as well as the company's image as it continues to provide solutions, which would facilitate the lives of people with special needs (Where Women Work, n.d.). Accordingly, from a scholarly perspective, this study also shows that the relationship appears to go beyond the device, spilling over the company offering such assistive solution to people with specially needs.

Societal impact implications

Personification of AI is playing a major role in supporting people with special needs to depend on IPAs the same way they would on human assistants (Mival et al., 2004). While people with special needs relied heavily in the past on human caregivers, there has been a gradual shift recently towards the usage of intelligent agents like Alexa (Day One Staff, 2019). Given the difficulty of having human caregivers available around the clock, IPAs effectively fulfill the continuous need of vulnerable people for support. Alexa, in particular, differentiates itself from other assistive technologies through its "human" touch. In addition to Alexa's functional benefits, such as consumers' voice recognition and response to their queries, this IPA is particularly successful due to its distinct human and feminine characteristics and the way people could effortlessly approach "her" (Woods, 2018). Amazon's efforts in developing a distinct, friendly personality for Alexa have made it easier for the consumer to relate to the device (Roettgers, 2019). In fact, it is allowing people to humanize IPAs and develop intimate relationships with them (Purington et al., 2017). Those relationships are developing from being purely functional at first, to eventually considering Alexa a friend and sometimes even a life companion, and that, of course, is due to several reasons. Alexa, for instance, is able to play the role of a human assistant due to Amazon's efforts in giving Alexa a personality, a name, and other human attributes, like empathy and compassion (Robertson, 2019). This in turn is encouraging consumers to interact with Alexa as a companion not just as a device and is enabling them to become emotionally attached to her. Furthermore, Alexa's social attributes also have a role in entertaining, educating, and helping people feel less lonely by keeping them company at home (Ng, 2016). Considered as being their close companion, Alexa alleviates much of the emotional discomfort people with disabilities might struggle with due to social exclusion.

Another societal impact on people with special needs using Alexa would be the online communities that develop around the interactions with this IPA (Lankes et al., 2007). Posting online reviews on Amazon's website enables these consumers to share advice and information with their community relating to the products and services offered by the company (Dobransky & Hargittai, 2016). In fact, these reviews reflect people's satisfaction with the device, especially those of people with special needs, as this segment of the population oftentimes shares common needs and similar experiences. Online communities regrouping people with special needs have exponentially expanded over numerous platforms including blogs and online forums. The purpose of these platforms is not only to provide people with disability access to information and advices, but also to connect them with each other, their caregivers, and their society at large in order to help them reach their full potential. Having an IPA at home to assist people with special needs is giving birth to a new subculture in the society, with this community growing bigger by the day. The latter is now allowing these consumers to voice out their experiences, identify with one another, and

embrace their uniqueness (Brown, 2002; Jaeger & Xie, 2009). This sense of belonging that results from becoming a member of a community, is proving to provide comfort for people with disabilities in times when they might feel socially isolated (Obst & Stafurik, 2010).

As Amazon continues to provide services to facilitate the lives of people with special needs and support the growth of their online community, the society's emotional association with the company would grow simultaneously. Indeed, when a company promotes values of support to vulnerable people, this is expected to enhance its image from the general consumer's perspective (Gitto & Mancuso, 2019). This is when Amazon.com transforms into "Amazon.love." In sum, Amazon is considered to be having the best impact on society, preceding Google and Apple (Reisinger, 2018). It is amongst the leading companies that are developing technologies to enhance the lives of people with special needs.

Managerial implications

Amazon has been leading the US market with its Alexa devices over other technology-driven companies such as Google and Apple (Perez, 2020). Powered by AI, Amazon was able to provide an assistive technology for people with disabilities that they can now no longer live without. Experiences with AI-driven personal assistant became a reality for this market segment, whereby Amazon's Alexa is leading this trend. More than ever, people with special needs are depending on this device to help them with their disability, as it is becoming an essential part of their homes and lives (Sciuto et al., 2018). Moreover, as the consumer's reliance on Alexa increases, Amazon's dependability on the consumer also increases. In fact, Alexa has received great acceptance from the disability community, which in return provides great opportunities for Amazon. To maintain its market share, the company should encourage people to communicate their mutual experiences with other Alexa users that they can relate with. By doing so, not only would Amazon be supporting the growth of their IPA online community of users with special needs, but they would also be learning more about the most used and loved features of the device. This giant retailer is earning the reputation of being socially responsible for ensuring social inclusivity and contributing to the quality of life and wellbeing of people with special needs. The features Alexa offers to this particular segment of the market are expected to increase its social repute. Undeniably, the more socially responsible companies are perceived by their various stakeholders, the better their reputation is going to be (Cretu & Brodie, 2007).

People with special needs have gained back some of their independence by not needing their caregivers to be around them all the time (Souza et al., 2010), while they have started relying on assistive technology instead. Since users' attachment and reliance are key success factors for businesses, brands strive to develop a need-based relationship with their customers. Accordingly, part of Amazon's success depends on people's reliance on Alexa and their development of affective feelings towards the company as a whole. The reviews posted by people with special needs about Alexa on Amazon.com reflect the gratitude that numerous users have toward the company for creating such a device. Along with the similarities that people with special needs may have in common, they now also share the experience of having Alexa in their lives. Undoubtedly, Amazon has brought them even closer and has opened up a new world of opportunities for them.

Based on the above discussion, figure 1 depicts how AI-consumer relationships become stronger than human-human relationships as the consumer's rapport with Alexa develops from being functional at first, to relational as closer bonds and friendships with the device are established. This relationship then develops with Alexa becoming the consumer's companion, until finally the consumer's lifestyle begins to depend completely on the presence of Alexa. Figure 1

identifies the point at which this relationship's evolvement starts to affect positively the company's image and reputation.

Insert Here: Figure 1: Evolvement of AI-consumer relationships

Furthermore, figure 2 visualizes the progress of the relationship between Amazon and the consumer, as it starts from being purely functional, all the way up to the transformation of the online retailer from a typical transactional e-retailer (Amazon.com) to an "emotionally attached to" entity (Amazon.love).

Insert Here: Figure 2: Transformation of Amazon.com to Amazon.love

Conclusion and future research

This study examined the progress of the AI-consumer relationship as consumers with special needs are increasingly interacting with intelligent personal assistants. It discussed how the continuous engagement between people with special needs and technological devices, such as Alexa, enhances the latter emotional relationship with the company offering such tools, hereby Amazon. The findings of this study demonstrated how Alexa could replace human caregivers and allow AI-consumer relationships to become at times stronger than human-human relationships, as the AI device becomes an integral member of people with special needs' homes and lives. Moreover, as Amazon continues to provide solutions to facilitate the lives of vulnerable people, both the users' feeling of respect towards Amazon and the reputation of the company would grow concurrently. Accordingly, the online retailer's transformation from Amazon.com to Amazon.love, along with the growth of an online user community for people with special needs, is likely to increase the barrier to entry for competing companies that may be considering replicating the Amazon model.

Although this study provides a thorough review of the impact of the continuous interaction with an intelligent personal assistant, the research is not without limitations. While the main aim of this study was to explore the nature of the relationship between people with disabilities and IPAs, future research could compare the findings of this work with those related to other groups who may be sharing apparently similar issues, such as the elderly. In addition, given the pioneering exploratory nature of this work, the study adopted a purely qualitative route. Accordingly, based on the findings of this original work, future empirical research would certainly be most expected given the current substantial gap in the literature relating to vulnerable consumers using IPAs. Future research should aim at using experiments to shed light on the findings captured in this qualitative study. Moreover, the study specifically tackled only one technological device, namely Amazon Alexa. On that premise, future research could examine other intelligent personal assistants, such as Cortana, Siri, and Google's Assistant.

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