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AI Assistants as Non-human Actors in Service Design

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Digital channels and devices have become common touchpoints in services; in connection to physical touchpoints, they aim to create a holistic journey for the user. The development of technology and the increasing use of artificial intelligence (AI) over the past years provide new possibilities for how service encounters can be created. Many of these service encounters are created not only between humans but also include non-human actors, such as AI assistants.

In this conceptual paper, we view an AI assistant as an example of a non-human actor in value co-creation during service encounters. By supporting the natural language communication in service interactions, an AI assistant can function as a direct service interface for a customer or support the service delivery by augmenting the abilities of a human actor, such as a customer service specialist. By examining service encounters, we raise the question of how an AI assistant, as a non-human actor in value co-creation, can affect a service encounter. Moreover, we ask how as a non-human actor, an AI assistant should be considered in a service design process.

Keywords: *service encounter, service design, non-human actor, AI assistants*

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Introduction

Service design is a holistic field that views service systems with the core principles of human-centredness and co-creation (Sanders & Stappers, 2008). Considering the needs of users and other stakeholders, service design aims to provide value through service solutions that may contain both digital and physical elements. Especially in the context of digital services, the advancement of technologies and digital capacities has increased the range of available solutions. Access to increased computer power and amount of data and the use of decentralised solutions on the cloud (McCarthy, 2017) have also made it possible to use artificial intelligence (AI) in service offerings in more meaningful ways. The use of AI can change the way that people are able to interact with services, as well as reveal information that can help improve the service offerings. With a wide range of interactions and content possibilities, such services form complex and multi-channelled ecosystems (Morelli, 2002; Sousa & Voss, 2006).

Service designers address complex challenges by understanding the needs of all involved stakeholders, as well as use design tools and methods to analyse the challenges, develop solutions and deliver services in a holistic and human-centred way (Miettinen & Koivisto, 2009). The human-centred approach to service design (Stickdorn, Hormess, Lawrence, & Schneider, 2017) allows the designer to include all actors in the service system, aiming to enhance the service encounters (Voorhees et al., 2017) throughout the service journey and support the moments of value co-creation (Jaakkola & Alexander, 2014; Payne, Storbacka, & Frow, 2008). Although service design focuses on humans as its core, many service encounters also include non-human actors, such as machines. Machines may play an active role in a service and in creating the service value, but they are often perceived as general service elements rather than actors in it. An AI assistant is an example of a non-human actor in services.

AI assistants are computational systems that function as interfaces for services, information and skills (Shevat, 2017). For example, Amazon Echo and Apple's Siri have made AI assistants more familiar to the market by introducing the use of voice user interface (VUI). AI assistants are based on AI technology and communicate with humans in natural language, supporting users in their tasks (Ashfar, 2017; Jolley, 2016). An AI assistant interacts with a user, whether a customer or an employee, through voice or text. Through a conversation, it learns about the user's needs and finds the right solution or answer. A service may use an AI assistant in different ways – as a direct interface for the customer, a skill on the service backend

supporting the service delivery or an assistant to employees by augmenting their capacities to deliver better service in the encounter with the customer. Whether or not an AI assistant is visible in the service encounter, it plays an active role in the service value co-creation.

In this paper, we view AI assistants as non-human actors in service encounters. By using existing examples, we address the question of how AI assistants can affect a service encounter and how they should be considered in a service design process. In this conceptual paper, we take inspiration from studies concerning service encounters between non-human and human actors. In the next section, we introduce the concept of a non-human actor, and then present AI assistants as non-human actors in service design, supported by digital media. Our discussion addresses the role of AI assistants in service encounters from two perspectives: AI assistant as a direct customer interface, and AI assistant augmenting human agents in customer service.

Non-human Actors in Services

Services involve several actors (see Latour, 2005) and are based on interactions with touchpoints, which can be actions, interactions or products (Segelström & Holmid, 2012). Co-creation is an important part of services (Holmlid, 2009). In design-based approaches, the user co-creates the service together with the organisational resources and the situational context (Wetter-Edman, 2012). Moreover, Polaine (2012) argues that all services are grounded in relationships and interactions between the provider and the customer. Usually, these involve complex value networks among different stakeholders. Almost every interaction, be it machine-to-human, human-to-human, one-to-one or a socially networked service, fundamentally occurs between humans even if it is mediated by using technology. Nevertheless, the role of non-humans in service interactions is often overlooked; we argue that such neglect excludes non-humans as components of social interactions (Latour, 2005).

Being human and understanding the aspects of humanness have been researched in many scholarly domains, such as psychology and philosophy (e.g., Haslam et al., 2005; Martinez, Rodriguez-Bailon, Moya, & Vaes, 2017), as well as in cognitive science and the field of AI (Kile, 2013; Vernon & Furlong, 2007). Defining humanness relates to the understanding of ourselves and our differences from others. However, what is perceived as human can be subjective and influenced by the cultural context. According

to Haslam, Bain, Douge, Lee, and Bastian (2005), the qualities of humanness can be described through human uniqueness, such as morality and rationality, and through the characteristics of human nature, such as emotional responsiveness and cognitive openness. When these qualities are missing from a being or an object, the phenomenon can be recognised as dehumanisation (Haslam et al., 2005). It can be argued that a machine such as an AI assistant lacks human traits, but its dehumanisation does not prevent it from having agency. Agency becomes evident in practices of interaction between actors (Koski & Bäcklund, 2017).

When defining a non-human actor, first of all, it is relevant to ask if there is a possibility that non-humans, such as AI assistants, have agency. Does agency require uniquely human attributes, such as morality and rationality (e.g., Haslam et al., 2005) or consciousness and intentionality (Knappett & Malafouris, 2008)? Alternatively, should agency be determined by other characteristics? We lean towards the latter option and refer to Latour, who argues that "an actor is what is made to act by many others" (2005, p. 46). This view also implies the understanding that agency does not require a social tie, in its ordinary meaning as a link between actors. In our research, social connection does not indicate a domain of reality or any particular item but relates to a "momentary association" (Latour, 2005, p. 65) between entities. Therefore, interaction between actors is the key point when thinking about agency. Malafouris (2008, p. 35) also refers to this idea by stating that instead of the human condition, the "flow of activity itself" is the identifier of agency. If interaction and activity itself are essential in agency, it should be extended outside the human property to other entities, such as artefacts (e.g., Knappett & Malafouris, 2008).

As human actors, we constantly overlook artefacts, such as doors, windows, chairs and tables, because we engage with these mundane things all the time through our different senses. Even artefacts that are closely modelled after humans usually lack the criteria for agency (Knappett & Malafouris, 2008, p. ix). However, the understanding of agency and its implications is narrow and limited if agency is strictly linked to the human property. Therefore, our point of departure is that acting does not necessarily require a person – or an entity with human attributes – who practises one's agency. This point of view steps out of human centredness by assigning a role to artefacts, however mundane, or resembling human intelligence (see also Knappett & Malafouris, 2008).

When speaking of actors, it is problematic to specify who or what is acting since "an actor is never alone in acting" (Latour, 2005, p. 46).

Therefore, agency becomes a question of *what*, instead of being *who*. In other words, anything having an effect on an outcome has agency (see also Sonck-Rautio, 2017). Thus, AI assistants, as entities closely modelled after humans and human intelligence, have agency. We argue that in service design, it is fruitful to consider AI assistants as significant actors when exploring the role of entities other than humans in service encounters.

AI Assistants as Non-human Actors in Digital Services

Digital channels, such as mobile applications, and devices, such as smartphones, are already common touchpoints in services. In connection to physical touchpoints, they aim to create a holistic user experience. The combination of physical and digital service touchpoints, such as location-based mobile applications, connectivity solutions, or screens and digital guidance in the service environment, is increasingly used to offer assistance without the need for complete reliance on human employment. On the other hand, purely digital solutions have increased, resulting in a large scope of services that would have been impossible to achieve otherwise. The variety of connected digital services form ecosystems (Annarelli, Battistella, & Nonino, 2016; Morelli, 2002) that are becoming more complex with the wide range of service offerings for customers to choose from. There is an application for almost anything that could be imagined.

One of the technologies that is more commonly utilised with digital services is AI. Since the start of AI development in the 1950s (Lungarella, Iida, Bongard, & Pfeifer, 2007) and the introduction of the Turing test[1] (Turing, 2009), there has been an ambition to create AI that resembles humans as much as possible, the so-called strong AI (Copeland, 2000). Although we are still far from realising strong AI or artificial general intelligence that would be able to perform any task that a human could (Pennachin & Goertzel, 2007), the topic of AI has initiated many discussions about the effects of AI technology on humankind and our society (Kile, 2013). This issue has also raised questions about the boundaries of humanness related to AI (Tian et al., 2017; Vernon & Furlong, 2007). The advances in AI skills, such as natural language processing and neural networks, over the past years have made it possible to utilise the technology for the benefit of service deliveries.

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[1] Proposed by Alan Turing in 1950, the Turing test aims to determine the intelligence of a computer through written conversation. The test involves a computer, a human interrogator and a human foil. By posing questions to both participants, the interrogator attempts to determine which one is the computer. (Copeland, 2000)

Presumably, one of the most visible forms of utilising AI in the context of services is an AI assistant, also called virtual personal assistant, digital assistant, bot or chatbot, depending on its capacity and purpose. AI assistants are applications that aim to assist users in their everyday tasks, help find the right service solution and assist in fulfilling the steps in a digital service encounter (e.g., Sun, Chen, & Rudnicky, 2016). AI assistants use natural language and are able to communicate with users in a conversational manner through either text or speech, without the involvement of human actors from the side of the service provider. The first chatbots, such as A.L.I.C.E. (Artificial Linguistic Internet Computer Entity) and Mitsuku, were created to show the natural language skills used in written chat conversations with humans. Over the past years, the market entry of many voice assistants, such as Siri from Apple, Alexa from Amazon or Cortana from Microsoft, has made users more familiar with the possibilities of voice as a conversational form of interaction with digital services. According to Gartner (2016), users expect VUI to be available in further services, and AI assistants are starting to replace traditional touch-based smartphone applications as preferred interaction channels by users.

Enabling a human-like conversational interaction is an essential aspect of an AI assistant (Figure 1), but when defining an AI assistant as an actor, it should also have a specific purpose in the service. For example, the purpose can be to answer a user's questions in a meaningful way with the right information, perform requested service tasks (such as booking a customer's appointment with a service provider) or support employees in their work process. To achieve its purpose, an AI assistant needs to possess a certain level of intelligence and AI skills that allow it, first of all, to understand the user's need and respond to it accordingly. Contextual understanding, including the information about the user and his or her current situation, gives an AI assistant the possibility for a more accurate response. By its actions, an AI assistant can fundamentally affect the outcome of a service delivery; therefore, it is an important actor in the service encounter. In terms of acting, these attributes bring AI Assistants much closer to human intelligence than a mundane artefact, such as a chair, is. Therefore, AI Assistants can be argued as meaningful actors in digital services.
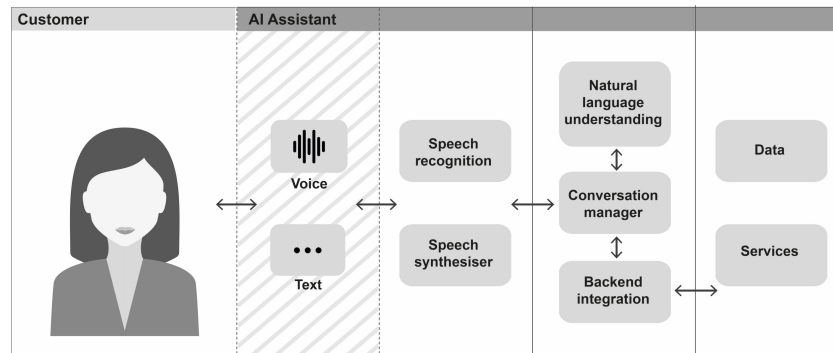
Figure 1. Elements of an AI assistant (based on Janarthanam, 2017, p. 12).

Digital Media Enhancing the Interaction with AI Assistants

Since AI assistants are distributed through digital channels, digital media performs an important role in enhancing the interaction between a user and an AI assistant. A conversational interaction, whether using voice or text, can be supported with other media content in moments when further information is needed to create a multisensory experience. For example, images, graphics, animations, audio recordings and videos can add essential elements to the communication of an AI assistant (Shevat, 2017). Due to technologies, such as advanced cameras, virtual reality and the accessibility of digital devices, the production of moving images has become widely available for many users to view in today's digital world (Mikkola, 2017). Videos are already routinely involved in many aspects of our lives, and the recording techniques vary, from eye tracking (Hua, Krishnawasamy, & Rolland, 2006) to instant streaming in social media.

Videos can provide evidence of human behaviour and human-to-human or human-to-machine interactions. Videos make it possible to capture the emotions involved the interactions and reflect them to the viewers. Videos can help the viewers understand the context of the captured situation and share knowledge about the content. In services that include non-human actors, a video can be a mediator that enables the user to feel stronger as part of the situation and experience. For such purposes, a video has been perceived as one of the most suitable formats to capture and present the whole experience with its all nuances. According to Dovleac (2015, p. 34), "social media allow information to be transmitted across multiple platforms in a variety of formats, including text, sound, video, games and interactive

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sequences". The massive digital presence on social media is therefore one of the greatest channels for communicating and sharing service experiences through videos and enables the growing volumes of service experiences.

Digital technologies and videos have made changes in social sciences by providing new methods and techniques of studying human experiences (Lahlou, 2010). In the service design field, the use of videos is also known in digital ethnography as an evaluative or formative research method (Miettinen & Koivisto, 2009). In the service context, a video can play multiple roles, such as analysing service situations, providing information, communicating experiences, prototyping new service solutions and acting as a mediator among different actors in service situations (Ylirisku & Buur, 2007). In this paper, we discuss digital media mainly as video content.

AI Assistants Augmenting Service Encounters

Utilising technology as part of a service encounter in general is not new. Specifically, the fields of human-computer interaction (HCI) and interaction design have been researching the role of technology in human interactions (Dix, 2009; Myers, 1996; Shneiderman, 2010). Guidelines for user interface design have also been used for a long time to enhance the interactions with the technology interfaces (Galitz, 2007; Mayhew, 1992). Design practice for human-technology interaction often uses research frameworks, such as people, objects, environments, messages, services (POEMS) and activities, environments, interactions, objects, users (AEIOU), which aim to observe all the affecting elements around the interaction. Service design applies an even more holistic approach that aims to address the entire service system, including stakeholders, products, interfaces, interactions, actions, environments, processes, technologies and systems (Stickdorn et al., 2017).

Many of the existing design frameworks may categorise technology under either objects or interactions or leave it out from the design practice itself, considering technology as an enabling backend element. Over the past couple of years since the rise of the popularity of chatbots and voice interfaces, a number of works on design guidelines and principles have been published, mainly by practitioners. Showing the importance of personality and conversation design, the guidelines focus on the implementation of AI assistants for different kinds of purposes (Harris, 2004; Janarthanam, 2017; Pearl, 2016; Shevat, 2017). Nevertheless, a connection to a holistic service system is often missing because the assistants are addressed as stand-alone

services or as layover interfaces for an existing service. In the following sections, we discuss an AI assistant's agency and role in service delivery and service encounters through existing chatbot examples.

AI Assistant as a Direct Customer Interface

First of all, an AI assistant can be a direct service interface for the customer (Figure 2), making the interaction convenient through written or spoken discussion (Harris, 2004). Services are often parts of a larger ecosystem where several entities might need to be involved to fulfil a task or go through an entire service journey. Travel services are good examples of such an ecosystem. A tourism experience can be defined as customers' subjective evaluation and experience of events related to their tourist activities that begin before and continue during and after the trip (Tung & Ritchie, 2011). Adaptive Path has created a holistic experience map[2] of rail travels showing the entire customer journey from planning to travel and post-travel experience. As an AI assistant can have access to several services through backend service integrations (Janarthanam, 2017), it performs a role as an orchestrator and helper, making the service process cleaner and more manageable for the customer.

Many AI assistants already exist for travel services, for example, as chatbots to help customers in travel planning (e.g., Kayak chatbot), book the services for the travel, such as flights (e.g., Oscar by Air New Zealand) and hotel reservations (e.g., Expedia chatbot), and connect customers with service providers through common messaging platforms, such as Whatsapp or Facebook Messenger, for further details regarding the booked tickets, for instance. When a customer is preparing for travel, an AI assistant can provide current information, such as insights about the trip location (e.g., Assist). The assistant can also help in storing all the needed documents, such as boarding passes (e.g., KLM chatbot).

As a service interface, an AI assistant is a conversational representative of a brand or a service. The customer experience is built through the conversational interaction, which is affected by the assistant's created personality and tone of voice (Figure 1). Nevertheless, all customers are different and also have varied needs for the provided services. Therefore, the challenge for AI assistants, such as travel chatbots, is to provide a flexible solution that can adapt at a certain level to an individual customer's needs and expectations without increasing the complexity of the technology

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[2] http://adaptivepath.org/uploads/documents/RailEurope_AdaptivePath_CXMap_FINAL.pdf

(Tnooz, 2017). This can mean not only the service content itself, but also the memory of the previous conversation history with the user.
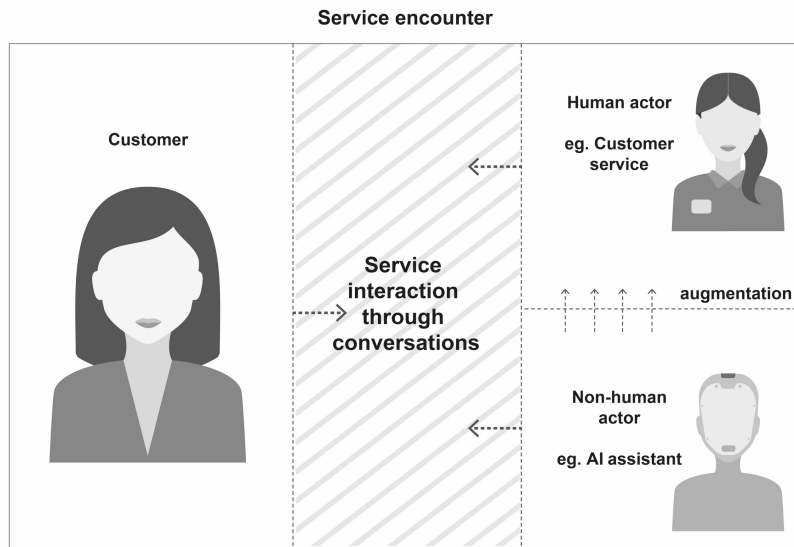

Figure 2. The role of an AI assistant in service encounters.

AI Assistant Augmenting Human Agents in Customer Service

An important aspect of creating successful service interactions using AI assistants is to know their limits. In cases when an AI assistant is unable to satisfy the customer's needs, the interaction may be handed over to a human agent to continue the service (Pichsenmeister, 2016). In case of an interaction handover, an AI assistant plays an important role in providing the human agent with the relevant information and the conversation history as references to avoid any discontinuity and repetitions in the interaction. In such situations, an AI assistant augments the abilities of the human agent by providing access to relevant information (Figure 2).

In the context of customer services, an AI assistant can help in their development by collecting data about the customer interactions and providing suggestions on missing service areas to cover (Frankel, 2016). When an AI assistant recognises a new topic in a conversation with a

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customer, it includes the topic in a report, which can then be addressed by the development team. An AI assistant can provide data and analysis, and a human (e.g., a service designer) can then make meaning out of it and decide how to utilise the provided knowledge for service improvement. By providing insights and recommendations with transparent reasoning, an AI assistant can extend human decision making and creativity, thus augmenting human abilities (Padmanabhan, 2018). For a customer, this process may be invisible, but the results show as better service quality.

Conclusions

AI is one of the fields with the potential of reshaping service interactions in the near future, of which AI assistants in the current market are visible examples. In the previous sections, we have argued for the concept of AI assistants as non-human actors in service encounters, playing an active role in the service delivery. As AI assistants show agency in the service encounter, they are not merely service interfaces but essential actors in the service. When in direct contact with a customer, an AI assistant is a personified representative of the brand and the service, with a consistent performance rate and service quality – an AI does not have a bad day.

For service design, an AI assistant offers a new possibility for creating service interactions with users. An AI assistant is a new type of actor to be included in a service ecosystem. As a direct point of interaction with customers, an assistant provides current customer data that can extend the knowledge about customer needs and behaviour. The data collected through the conversations between an AI assistant and a customer can be a valuable addition to qualitative data, such as an interview or user-testing data that is typically collected during a service design process. In the case of new service development, AI can be used to learn about customer behaviour based on previous services, social media feeds, web conversation, news and other data sources.

Creating a human-like service actor, such as an AI assistant, also involves challenges and responsibilities. A conversational interface that AI assistants use can be much richer in communication than a traditional graphical user interface because the used language and tone of voice communicate a lot of underlying nuances and meanings. Although the assistant might not possess human qualities, the human values of the people creating it will be reflected in the outcome. Therefore, as a non-human actor, an AI assistant may still

replicate the human bias even if unintentionally transferred from the humans involved in the design and the development of the assistant.

The debates on the humanness of AI and the implications for our society can also affect how the technology is applied and for which purposes it is used. Through this conceptual paper, we have shown examples of how AI assistants can take an active role in service delivery as actors capable of their own resolutions and decisions in service situations. Through the conceptual exploration, we recognise the need for further research on non-human actors in the service design field and the role of AI in service design to fully discover their potential.

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