

Generations' Perception Towards the Interaction with AI

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Abstract

Acknowledging the ongoing trend and increasing implementation of different forms of AI that simulate human behavior for various tasks in a human-like manner, the focus of the present research is set to determine the attitude of consumers towards interaction with AI from a more personal point of view, rather than from an operational perspective. The present research mainly focuses on differences between two age groups of respondents: aged over and under 30. In order to obtain insights about generations' perceptions towards the interaction with AI, a primary data analysis has been conducted. The questionnaire contains 31 items and is set to test the following nine aspects regarding consumer-AI interactions: performance expectancy, effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety, willingness to accept AI and objection to use AI. The results show that in the case of AI, there are only average significant differences between the studied age groups, the two groups being at the moment more alike than different in their perception towards AI. As AI advances at a rapid pace, practical implications consist in indicating relevant AI aspects to be studied for further human-AI interaction related research.

Keywords

Artificial intelligence, consumer perception, human-AI-interaction

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Introduction

Since the emergence of artificial intelligence (AI) on the market and its implementation in more and more solution-oriented applications, researchers have begun looking for a generally applicable acceptance model, in order to assess consumers' willingness to interact with various AI devices. Such a generally applicable model is still in research, given the fact that AI in general is to be considered a dynamic technology, with various characteristics, depending on its application. Accordingly, consumers interact with AI in different contexts, such as: AI call center agents, chatbots or virtual avatars answering different questions, engaging in post-purchase services, providing customer support, digital voice assistants acting as personal assistants help you through the day, social robots greeting, guiding and addressing concerns in customer-facing services, service-providing humanoid robots and also even care-providing humanoid robots.

Considering that consumers have nowadays various and sometimes also unusual interaction occasions with AI, it is interesting to determine significant differences in customers perceptions regarding important AI-interaction aspects. Therefore, research needs to focus more on how AI is perceived by consumers and on gaining insights on what drives or hinders human-AI interactions. More precisely, the aim of the present research, is to investigate how different AI is perceived by generations: people aged over and under 30. The current paper assesses their perception of AI, based on nine research relevant aspects: performance and effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety towards AI, willingness to accept and objection the use AI. After a brief literature review of the mentioned aspects, for obtaining differential insights, a primary data analysis relying on a questionnaire containing 31 items has been conducted. In the second part of the paper, the research methodology is explained, and results are assessed via discriminant analysis discussed. Principal findings of our research only show, that for the time being, both age groups seem to share similar perspectives in terms of the nine chosen AI related aspects.

1. Literature Review

Artificial intelligence (AI) has become increasingly present in our everyday life, from voice assistants to chatbots and even algorithms' recommendation. As AI continues to pervade our interactions with the technology, understanding how different generations perceive these different forms of AI, it is important and can have major implications for the design and implementation of AI systems. By identifying the differences between generations when we talk about their willingness to accept and use technology, will help developers to create more user-friendly and effective AI systems that will meet the needs and the expectations of different types of consumers (Pelau and Barbul, 2021).

Performance and Effort Expectancy

Both performance and effort expectancy are two important factors that can indicate an individual's beliefs about the benefits he or she can gain and the level of effort required to use technology (Venkatesh et al., 2003). According to Venkatesh et al. (2003), performance expectancy refers to „the degree to which an individual believes that using a system will help him or her to attain gains in job performance”. Effort expectancy in the other hand, is defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003). These two cognitions form a crucial component of an individual's internal belief system, which serves as the foundation for their behavioral intentions (Maruping et al., 2017).

Social Influence

According to Venkatesh et al. (2003), social influence is the extent to which an individual perceives that significant others in their social environment expect or endorse their use of a new system. In other words, it refers to how much importance an individual gives to the opinions and beliefs of people who are important to them, regarding the use of the new system (Venkatesh et al., 2003). Similar to performance and effort expectancy, social influence is considered to have an impact on the formation of the internal belief system that shapes an individual's behavioral intention (Maruping et al., 2017).

Hedonic Motivation

The concept of hedonic value represents the individual's desire towards entertainment and emotional satisfaction when using a product or service (Yang and Lee, 2010). Hedonic motivation pertains to the enjoyment or satisfaction a person expects from utilizing AI devices in service delivery (Allam et al., 2019; Law et al., 2018; Venkatesh et al., 2012). If an user is motivated by pleasure-seeking when it comes to AI devices, utilizing them can be advantageous as it fulfills their desire for enjoyment and new experiences, ultimately meeting their personal interests and needs (Fryer et al., 2017). Consumers who use AI devices for the sake of pleasure-seeking are more likely to have favorable attitudes towards their usage (Gursoy et al., 2019). According to Gursoy et al. (2019), consumers who use AI devices with hedonic motivations perceive AI assistants as a unique and innovative aspect of the consumer experience, distinct from typical or conventional shopping encounters. Additionally, some people find pleasure in communicating with AI devices or fulfilling their curiosity (Fryer et al., 2017; Hasan et al., 2021)

Anthropomorphism

Anthropomorphism describes the extent to which an object displays human-like traits, like human aspect, self-awareness, and emotional expression (Kim & McGill, 2018). This concept is used in diverse fields, including psychology, marketing, and computer science, among others (Schanke et al., 2021). The role of anthropomorphism in the effectiveness of AI artifacts is significant (Schanke et al., 2021) as it influences to a great extent the user experience in human-AI interactions (Cheng et al., 2022). According to Hu et al. (2021) who evaluated the perception of human-like qualities in conversational AI through an examination of two social cues: humanness voice and ability of AI devices to understand humanness, found that enhancing the human-like qualities of AI devices does not necessarily result in increased trust (Cheng et al., 2022). The analysis conducted by Belanche et al. (2021) focused on three distinct components of a robot's humanness: perceived physical human-likeness, perceived warmth and perceived competence. They indicated that these three constructs can impact customers' perceptions of service value in various ways, including emotional and utilitarian values. Particularly, they discovered that the perception of warmth may hold greater significance for customers who have minimal need for interaction. This suggests that users who highly value human interaction may feel more anxious with bots (Cheng et al., 2022).

Trust

Trust refers to an individual's willingness to place himself in a vulnerable position regarding the actions of another party (Mayer et al., 1995). In the context of AI, trust is defined as the confidence or belief that an AI-agent can provide genuine and trustworthy services with accurate reported results (Shin, 2021). It plays a significant role in encouraging people to accept and use new technology (Corritore et al., 2003; Nordheim,

et al., 2019) and can directly impact an individual's intention to switch to an alternative option (Li et al., 2007; Liang et al., 2018; Ranaweera & Prabhu, 2003). Previous studies have indicated that trust in AI can result in beneficial outcomes, including a greater reliance on AI agents, higher perceived performance of AI, and an increased level of trust in sellers, ultimately leading to an increase in purchase intention (Cheng et al., 2021; Shin, 2021; Yen & Chiang, 2020). Also, previous research has generally approved the notion that the level of trust that consumers have in existing services or technologies, or their providers, is inversely related to the likelihood of them switching to a new one (Mezger et al., 2020).

Anxiety towards AI devices

Anxiety can be defined as the individuals feel regarding the possibility or likelihood of experiencing adverse outcomes that they believe they cannot avoid (Schlenker & Leary, 1982). Social anxiety is one of the multiple types of anxiety that entails an ongoing and apparent sense of apprehension or unease in particular social contexts where individuals may be subject to scrutiny by others (American Psychiatric Association, 2013; Maes et al., 2019). Research has indicated that consumers with elevated levels of social anxiety are more prone to developing addiction to social media. They are more attentive to social media's functional and emotional aspects and its ability to aid in their interactions with others and meet their emotional needs. The presence of social anxiety can influence consumer's capacity to explore, assess and accept new technology products (Yuan et al. 2022). When consumers with high level of social anxiety undergo the process of adopting a product, they tend to evaluate it based on its practical usefulness and enjoyment (Yuan et al. 2022). The correlation between the benefits of an AI assistant (such as responsiveness, compatibility and anthropomorphism) and user's perceived utilitarian values is influenced by the presence of social anxiety (Yuan et al. 2022).

Willingness to Accept the use of AI devices

The emergence and prevalence of AI devices in users' everyday life is viewed with both attraction and worry (Pelau et al., 2021). The development of AI has multiple benefits, which are fascinating people but at the same time, with the technology advancement they tend to become more redundant because of the fact that one day, AI devices could become more intelligent and more competent than them (Bryson, 2009; Kaplan & Haenlein, 2020). Research shows that individuals' actual behavior is typically determined by their intentions and willingness to engage in a particular activity. In other words, if individuals intend to do something and are willing to do it, they are more likely to follow through with the action (Cronan, Mullins, & Douglas, 2018). Also, studies in service robots, such as the ones conducted by van Pinxteren et al. (2019) and Song and Kim (2020), suggested that consumers' intention to adopt the technology is positively influenced by their perceived trust, the comfort in using AI devices and the enjoyment in interacting with the robots. This makes the robots an extension of the frontline service associate.

Objection to Use AI devices

As previously mentioned, trust represents an important factor in technology adoption as many people are worried about the collection of their personal data, such as conversations or personal information, without their consent or knowledge. With the increased presence of AI devices in both consumers' homes and workplaces, the risk of cybersecurity threats represents another concern that make people redundant in adopting and accepting AI devices instead of a human being. There are several factors that influence consumers' decision of accepting and using AI devices such as lack of transparency, the privacy concerns or unforeseen consequences (Barbul et al. 2022).

2. Research methodology

Acknowledging the ongoing trend and increasing implementation of different forms of AI that simulate human behavior for various tasks in a human-like manner, the focus of the present research is set to determine the attitude of consumers towards interaction with AI from a more personal point of view, rather than from an operational perspective. The conducted empirical study aims to offer meaningful insights into the consumers' perspectives of AI facilitated tasks, as well as to investigate consumers' attitudes towards direct interaction with AI. To obtain these insights, a primary data analysis has been conducted. The questionnaire contains 31 items and is set to test the following 9 aspects regarding consumer-AI interactions: performance expectancy, effort expectancy, social influence, hedonic motivation, anthropomorphism, trust, anxiety, willingness to accept AI and objection to use AI. These mentioned constructs have been measured via an online questionnaire, with Likert-scale questions, having values between 1 (total disagreement) and 7 (total agreement). A total of 165 randomly chosen respondents, profiled by different characteristics, such as age, gender, education, and income have been involved in the study. For the purpose of the study, the results of the survey have been concluded based on a discriminant analysis conducted with the help of IBM SPSS

Statistics 25, in order to determine significant differences between two sample groups. The significant differences between respondents' choices have been tested depending on the demographic characteristic of the consumer age: people younger than 30 years and people older than 30 years. The sample included 97 people younger than 30 years, 68 people older than 30. The sample consists of a total of 76 males and 89 females.

3. Results and discussions

The results of our research mainly focus on differences between the two age groups of people: older than 30 years and people younger than 30 years. The results show that in the case of AI, there are only average significant differences regarding the independent age-variable, as it can be observed in table 1. Results marked in bold writing show significant differences that are also discussed in the present article.

Performance Expectancy

Tested according to the age structure and divided into the two corresponding groups (under and over 30 years old), the discriminant analysis reveals one significant difference regarding performance expectancy for AI. While both age groups share the same strong opinion on how useful AI can be in daily life, only the younger generation thinks AI can help them with many tasks, whereas respondents above 30 years tend to perceive the capabilities of AI as limited ($F_{PE2}=2.874$, $p_{PE2}=0.092$).

Effort expectancy

When evaluating consumers' perception on the ease of use of AI by age group, two significant differences emerge. First, the younger age group finds it significantly easier to use AI, compared to the older age group ($F_{EE1}=13.372$, $p_{EE1}=0.000$). Second, in terms of the ease of operating AI devices, respondents over 30 years seem to have some doubts and therefore rate their abilities significantly lower than respondent group over 30 years ($F_{EE3}=8.693$, $p_{EE3}=0.004$). Also, regarding the ease of use of AI it is interesting to see, that both groups evaluate themselves as being able (total mean value above scales' average for both groups) to use AI devices without any help from another person. This indicates the fact that, current AI devices have achieved a good level of accessible and adaptable usability for various consumers groups.

Social Influence

In the case of consumers being socially influenced towards using AI, no differences between the two investigated age groups arise at the moment of this research. Both age groups seem not to be influenced in their behavior by their social environment when asked about AI usage in general. This implies that individuals do not give much importance to the opinions or beliefs of others when it comes to using AI. An explanation could be given by the diversity of possible interactions, while also lack of actual interaction occasions that the consumers have experienced and thus not having become a so-called status symbol.

Hedonic Motivation

Regarding the hedonic motivation, all three tested items reveal significant differences between generations. Younger respondents seem to gain significantly more emotional, fun and experiential benefits from interaction with AI devices. Therefore, the age group <30 years, significantly rates the interaction with AI as more fun ($F_{HM1}=5.602$, $p_4=0.019$), more entertaining ($F_{HM2}=5.015$, $p_{HM2}=0.026$) and more pleasant ($F_{HM3}=12.580$, $p_{HM2}=0.001$) than the age group >30 years old. As younger people tend to be more technology friendly and adaptable, these differences can be easily explained by their curiosity and enthusiasm towards AI and excitement to interact with AI devices.

Anthropomorphism

Considering the fact that AI is widely characterized by anthropomorphic behavior (Schanke et al., 2021), this is expected to have a great impact on the perceived interaction to AI by consumers. In our research, none of the items tested for anthropomorphism show significant differences between age groups. Nevertheless, it is important to notice that respondents consider AI devices not to have a mind of their own (A1), no free will of their own (A2) and also no emotions at all (A3).

Trust

In terms of consumer trust towards AI, only one significant difference between age groups is observed. The younger age group believes more strongly that AI devices provide accurate information ($F_{T2}=3.878$, $p_{T2}=0.051$). Moreover, also with regard to trust, both respondent groups, feel they can rely on AI devices to achieve certain tasks (T1) and trust AI devices to make reliable recommendations (T3).

Anxiety

When evaluating consumers' anxiety towards AI, the sample groups reveal a fairly calm behavior about AI interactions. All answers are somewhere around 2 and 3 on a 7-point Likert scale, thus showing only little nervousness (AX1), little apprehension (AX2) and little intimidation (AX3) in interactions with AI.

Table no.1. Discriminant analysis regarding generations' perception towards interactions with AI

Code*	Item	\bar{x} <30	\bar{x} >30	\bar{x} Total	F	p-Value
PE1	AI is useful in daily life.	5.75	5.65	5.71	0.256	0.614
PE2	I think AI can help me with many things.	5.63	5.25	5.47	2.874	0.092
PE3	AI is more accurate (makes less errors) than human beings.	4.56	4.31	4.45	0.862	0.355
PE4	AI provides more consistent service than human beings.	4.75	4.76	4.76	0.002	0.963
EE1	I find AI to be easy to use.	5.52	4.63	5.15	13.372	0.000
EE2	I can use AI devices without any help from another person.	5.78	5.41	5.63	2.611	0.108
EE3	Learning to operate AI devices is easy for me.	5.99	5.40	5.75	8.693	0.004
EE4	Interaction with AI devices is difficult to achieve in service encounters (direct contact with consumer).	4.26	4.13	4.21	0.258	0.612
EE5	I find it easy to get AI to do what I want it to do.	4.88	4.22	4.61	7.692	0.006
SI1	Using AI devices reflects a status symbol in my social networks (e.g., friends, family and co-workers).	3.10	2.85	3.00	0.739	0.391
SI2	People who influence my behavior want me to utilize AI devices.	2.70	2.76	2.73	0.054	0.816
SI3	People in my social networks who utilize AI devices have more prestige than those who don't.	2.69	2.38	2.56	1.213	0.272
HM1	Interacting with AI is fun.	4.85	4.24	4.59	5.602	0.019
HM2	Interacting with AI is entertaining.	4.73	4.18	4.50	5.015	0.026
HM3	The actual process of interacting with AI is pleasant.	4.94	4.15	4.61	12.580	0.001
A1	AI devices have a mind of their own.	2.10	1.76	1.96	2.032	0.156
A2	AI devices have their own free will.	1.75	1.63	1.70	0.277	0.599
A3	AI devices have emotions.	1.52	1.43	1.48	0.238	0.626
T1	I feel I can rely on AI devices to do what they are instructed to do.	4.77	4.63	4.72	0.321	0.572
T2	I believe that AI devices provide accurate information.	5.03	4.57	4.84	3.878	0.051
T3	I trust that AI devices make reliable recommendations.	4.51	4.10	4.34	2.713	0.101
AX1	Interacting with AI makes me nervous.	2.39	2.81	2.56	2.836	0.094
AX2	I feel apprehensive about using AI.	2.97	3.18	3.05	0.611	0.436
AX3	Some AI devices are somewhat intimidating to me.	2.46	2.71	2.56	0.754	0.387
AX4	It is embarrassing when you have trouble with the use of an AI device while people are watching.	2.85	2.94	2.88	0.113	0.737
W1	I am willing to receive services delivered by AI.	5.44	4.81	5.18	7.005	0.009
W2	I am likely to interact with AI devices.	5.55	5.15	5.38	2.594	0.109
W3	I intend to use AI in the future.	5.60	4.88	5.30	7.789	0.006
O1	I prefer human contact in service transactions.	5.04	5.41	5.19	1.918	0.168
O2	Interaction with AI lacks social contact.	5.21	5.28	5.24	0.070	0.792
O3	I intend to avoid using AI in the future.	2.41	3.24	2.75	8.691	0.004

PE: performance expectancy, EE: Effort Expectancy, SI: social influence, HM: hedonic motivation, A: anthropomorphism, T: trust, AX: anxiety, W: willingness to accept AI, O: objection to use AI; A **low p-value (< 0.1)** indicates a significant difference between the two groups

Source: Authors' own research

Willingness to Accept AI

When asked about how likely it is that they will interact with AI devices, respondents seem to be aware of the likelihood of future interactions (W2) and are on average interested in these encounters. Both age groups show moderate willingness to accept AI and reveal two significant differences in their answers. The sample group <30 years is significantly more willing to receive AI-delivered services ($F_{W1}=7.005$, $p_{W1}=0.001$) and also show clearer intention to use AI in the future ($F_{W3}=7.789$, $p_{W3}=0.006$) than sample group >30.

Objection to Use AI

When evaluating consumers' objection to use AI by the two chosen age group, interesting findings emerge. On one hand, both respondent groups prefer human contact rather than interactions with AI (O1) and are also of the opinion that these encounters lack social contact (O2). Asked about their future intentions to use AI, all respondents seem inclined to avoid using AI, results showing a significantly stronger objection on the side of the mature sample group ($F_{O3}=8.691$, $p_{O3}=0.004$).

Conclusions

With more applications of AI and consumer-AI interaction opportunities arising, a wide number of research possibilities emerge. Consumers only now slowly start to really familiarize themselves with the true meaning of AI and start experimenting real interactions to AI day by day. Although the present research only addresses a very brief part of the whole AI discussion, it underlines some differences in perception between generations, reaching the conclusion that the two investigated age groups are for now similar in many more aspects, than they are unlike. As the conducted research shows, consumers' attitudes towards AI reflect an answering tendency around the middle scale point – this could also be attributed to a common central tendency bias faced by respondents when confronted with such a hypothetical study. These results are in line with other discriminant tests done in this field (e.g. Pelau & Barbul, 2021; Barbul et al., 2022).

The younger generations show significant more open and trustworthy behavior when interacting with AI. They think AI is there to help them with many tasks, find AI devices easy to use and assess significantly more positive their skills in learning how to operate AI devices. Moreover, finding it easy to get AI to do what one wishes represents a significant difference between the studied age groups. In terms of hedonic motivation, both groups seem to moderately interact with pleasure with AI devices, while the younger enjoy the interaction significantly more, finding it more fun, entertaining, and pleasant. This is also in line with studies made on Generation Z and Millennials stating the fact that these generations are more likely to trust and embrace AI, compared to other generations (Ho et al., 2022). Furthermore, consumers under 30 years show significant more willingness to receive services delivered by AI and therefore also use AI in the future, whereas consumers over 30 show a more significant intention to avoid using AI when possible. These results contribute to future research by providing some insights into current consumers' attitudes towards AI and by preparing accurate testing variables for future AI acceptance models to be tested.

It may seem now that there is little evidence of significant differences between generations regarding AI, but as functionalities and interactions with such devices arise, so will the contrasts between sample groups. Considering the rapid technological developments and the dynamics of AI, further studies need to be undertaken, in order to keep research on consumers' perception up to date. We also acknowledge the limitation considering the background of the respondents, as findings may vary from a culture to another. Moreover, research findings could also differ, when investigating consumers' interaction perspectives targeted on specific AI functionalities (Pelau et al. 2022). The nine investigated constructs are to be assessed in future studies for evaluating different relationships among them. As these variables are already accepted as variables influencing consumers' acceptance of AI (Lu et al., 2019), they could also lay ground for a future structural equation model in order to assess acceptance toward AI.

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