

Table 4. A research agenda on artificially intelligent chatbot technologies for automated customer services

Research areas that require further investigation	Focused research question
Conversational (and verbal) capabilities of chatbots	How and to what extent could chatbots utilize speech recognition software to simulate human conversations?
	How and to what extent could chatbots be capable of understanding the meanings of words and of engaging in natural conversations with online customers?
	Are the chatbots reactive or proactive in their responses to online customers' queries? To what extent can they be reactive or proactive?
	Are the conversational chatbots capable of handling complex queries and complaints? To what extent can they handle queries or complaints?
Anthropomorphic (visual and vocal) features and characteristics of chatbots	How and to what extent could the chatbots' vocal and visual features imitate human customer services agents' responses?
	How and to what extent could chatbots mimic human-like characteristics in their communications with customers?
Customer perceptions about the chatbots' anthropomorphic features and characteristics	Are online customers' perceptions about chatbots influenced by their anthropomorphic features (e.g. by the avatar's gender, age, race, ethnicity, accent)? Why?/Why not?
	Are online customers' perceptions about chatbots influenced by their anthropomorphic characteristics (e.g. empathetic tone of voice, disposition to assist, et cetera)? Why?/Why not?
Effects of socio-demographic factors on customer perceptions about chatbots	Which online customers are likely (or less likely) to engage with a chatbot? Why?/Why not?
	Are online customers willing to share information with a chatbot? Why?/Why not?
	Should online customers be notified that they are communicating with a chatbot? Why?/Why not?
Customer perceptions about the acceptance and usefulness of chatbots	Do online customers prefer availing themselves from chatbots or from human customer service agents? Why do they prefer chatbots over human agents, or vice versa?
	Which utilitarian factors are affecting the online customers' acceptance and usage of chatbots? Are these factors affecting customers' perceptions on chatbots? Why?/Why not?

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Are online customers perceiving chatbots as efficient, functional and responsive? Why?/Why not?

What are the online customers' insights about the accuracy, reliability, adequacy, sufficiency and timeliness of the responses they receive from chatbots?

Are chatbots delivering an added value to customers? Why?/Why not?

Which factors are affecting the customers' perceived value of chatbots?

Are the online customers willing to continue using chatbots? Why?/Why not?

Which factors are affecting the online customers' intentions to use chatbots?

Do online customers prefer to be serviced by a chatbot or by human agent (if they had to choose)? Why? / Why not?

Customer perceptions about the service quality of chatbots

How would online customers describe their experiences with chatbots? Are they experiencing positive or negative emotions (e.g. anxiety)? Why/Why not?

Were online customers satisfied or dissatisfied by the service that was delivered by chatbots? Why?/Why not?

Which factors are affecting the online customers' satisfaction levels with chatbots? Are they affected by their intelligence (e.g. verbal, vocal and visual cues, et cetera) or by their emotional dispositions (e.g. assertiveness, empathetic tone of voice, sociability, et cetera) of chatbots?

Which factors are affecting online customers' loyalty to the interface (e.g. website or SNSs like Facebook Messenger or Whatsapp) that connects them with service businesses' chatbots?

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