

Dissertation Title	User Experience with Artificial Intelligence Based Conversational Agents: A Usability and Capability Perspective.
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Abstract

As conversational agents (CAs) become increasingly integrated into our daily lives, understanding and enhancing user experience (UX) in these interactions is critical. Yet, the tools to measure this experience remain underdeveloped. This study bridges that gap by introducing the Conversational Agent Scale for User Experience (CASUX), an innovative, standardized framework designed to capture both traditional UX metrics like ease of use and proficiency, as well as more human-centric dimensions such as personality, humanness, and etiquette. Through a rigorous mixed-method approach, involving six distinct studies ranging from user interviews to lab experiments, we identified nine essential UX dimensions and 34 measurement items. Our findings reveal that while ease of use remains a cornerstone for both functional and social tasks, users place a premium on human-like characteristics when engaging in social tasks, such as natural voice tone and conversational mannerisms.

Technically, we utilized natural language understanding (NLU) and dialogue management with the Alexa Development Kit to develop two conversational agents (CAs) to investigate how different response types impact user experience (UX). The first CAs, with Low Conversational Capability (LCC), adheres strictly to Grice's maxims (quality, relevance, quantity, and manner). The second CA, with High Conversational Capability (HCC), incorporates additional maxims of transparency, benevolence, and priority. Our study explored how these enhanced maxims, such as benevolence and transparency, influence UX compared to the traditional maxims. Interestingly, these traits fostered a stronger emotional connection with users without compromising the system's functional reliability.

Furthermore, this research explored how different types of task influence UX perceptions, revealing that social tasks emphasize dimensions like humanness, while functional tasks prioritize practicality and proficiency. The work also examined how additional conversational maxims such as benevolence, transparency, and priority, enhanced emotional engagement and perceived anthropomorphism in CAs without significantly affecting ease of use or technical proficiency.

Overall, CASUX offers a powerful tool for both researchers and designers, equipping them with insights to craft more intuitive and human like CAs. Our work not only redefines how we evaluate UX in conversational agents but also paves the way for the creation of CAs that genuinely resonate with users on both practical and emotional levels.

Keywords: Anthropomorphism/ Cognitive Absorption/ Conversational agents/ Factor analysis/ Grice maxim/ Scale development/ Task analysis/ User experience