Artificial Intelligence-based Assistants and Platforms

Rainer Schmidt
Munich University of Applied Sciences
rainer.schmidt@hm.edu

Rainer Alt
Leipzig University
rainer.alt@uni-leipzig.de

Alfred Zimmermann
Reutlingen University
alfred.zimmermann@reutlingen-university.de

1. Introduction

Assistants and platforms based on artificial intelligence (AI) have become a new general-purpose technology (Helpman, 1998) in the digital economy, with chatbots and virtual personal assistants as examples. AI-based assistants and platforms provide seamless and intuitive access to digital services and devices. They free humans from the burden of acquiring domain knowledge and resources, allowing them to focus on more complex tasks. AI-based assistants also create business value by automating processes, intensifying user interaction, reducing errors, and speeding up interactions. While the concept of digital assistants is not new, the diffusion of general-purpose assistants, such as Amazon's Alexa, Apple's Siri, or Google's Assistant (Këpuska & Bohouta, 2018), has fundamentally changed the presence of assistants. The technology is constantly advancing with developments in voice processing (Sivapriyan et al., 2021) and generative technologies, such as ChatGPT, Google Bard (Gozalo-Brizuela & Garrido-Merchan, 2023), and large language models like Bloom (Scao et al., 2022).

At the same time, AI-based assistant systems have often evolved into digital platforms themselves (e.g., (e.g. Alt, 2021; Schmidt et al., 2021)), which provide access to digital services from various providers (e.g., media or shopping services) and link to multiple devices (e.g., Zigbee, IFTTT) (Schmidt et al., 2023). At the platform's core lies AI technology, like voice recognition in Alexa or a generative model in ChatGPT (Gozalo-Brizuela & Garrido-Merchan, 2023). The platform architecture enables the reuse of this core functionality in many contexts and the creation of complementary products and services. In addition, the platform architecture of AI-based assistants enables learning, scaling, and automation of cognition and predictions (Agrawal et al., 2022), leading to data network effects (Gregory et al., 2022).

As information systems are sociotechnical (Bonina et al., 2021), AI-based assistants and platforms should be viewed as a step towards humanizing technology and work as well as living environments. They increasingly influence private life and work (Marikyan et al., 2022). AI-based assistants and technologies support numerous application domains and might even serve to integrate across these domains. Therefore, understanding the use and impact in complex settings, such as healthcare, education, engineering, or public administration, is important for research and practice.

2. Goal of Minitrack

Starting in 2021, the minitrack "Artificial Intelligence-based Assistants and Platforms" takes place for the fourth time and is the single minitrack at HICSS dedicated specifically to AI-based assistants and platforms. The minitrack provides a platform to discuss novel methods, models, processes, and approaches related to designing, implementing, deploying, operating, and optimizing AI-based assistants for the digital economy. Over the years, the perspective has been widened to also include ecosystems and platforms of AI-based assistants. Among the key topics are:

- Virtual AI-based assistants and chatbots, such as Alexa, Siri, Google, ChatGPT
- Mechanics in AI-based assistant platforms and ecosystems, e.g., drivers, dynamics, intelligence
- Forms of digital assistance, e.g., digital twins, metaverse, virtual communities
- Business models and processes based on AI-based assistants and platforms
- AI-assistants in the customer journey (pre-/ after sales, service demands)
- Applications in specific domains: e.g., health, education and research, engineering, finance, governance

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- Social, ethical, juridical, political, and business implications of assistants and platforms
- Assistants and chatbots in research and society, e.g., plagiarism and authorship
- Methods, models, and architectures to design and manage AI-based assistants and platforms
- Strategy, innovation, and management of assistants and platforms
- Human interaction and collaboration with AI-based assistants
- Transparency and explainability of the behavior of AI-based assistants
- User, context, cognitive, and learning models for assistants and platforms
- Assessments of AI-based assistants and platforms, e.g., quality and maturity
- Benefits, risks, security, privacy, and trust of assistants and platforms
- Governance and regulation of digital assistants and platforms

3. Accepted Papers

The 2024 succession of the minitrack received 14 papers, with seven accepted after a rigorous review process with two phases.

The paper "User Preferences for Interaction Modalities: The Influence of Task, Context, and User Characteristics when Interacting with Conversational Agents" by Lara Riefle and Carina Benz investigates factors influencing user preferences for text- vs speech-based interaction with conversational agents (CAs). The authors conducted exploratory interviews to identify 14 influencing factors related to task, context, and user characteristics. They performed a scenario-based experiment to quantify the impact of these factors on modality preferences. Key findings provide insights into drivers of user preferences when interacting with CAs, contributing to a more holistic understanding of human-CA interaction. The results can guide researchers and practitioners in decisions regarding investment in CAs and modality choices.

Elizabeth Han, Dezhi Yin, and Han Zhang investigate in their paper "When and How to Implement Choices on Customer Service Chatbots" when and how providing choices improves or impairs customer service chatbot interactions. Based on the fluency concept, the authors posit that choice implementation is only beneficial after a conversational breakdown due to chatbot failure. Choices may not sufficiently enhance fluency for smooth interactions. Furthermore, incomprehensive choice sets reduce fluency in using choices for decisions. Experiments tested when choice provision helps or harms service interactions. The findings foster the understanding of the chatbots' role in customer service experience as well as in deploying choice-equipped chatbots by illuminating when and why choices may be counterproductive or beneficial after conversational breakdowns.

In their paper "Creative Assistants with Style: Making Sense of Generative AI as 'Style Engines'" Sandra Peter and Kai Riemer examine generative AI as creative assistants. The authors argue that focusing on accuracy or veracity misses the defining features of generative AI. They suggest generative AIs encode patterns and styles from training data in neural networks rather than storing content. The ability to explore and combine styles, rather than generate precise replicas, is a key capability of generative AI. The authors propose assessing generative AI as creative assistants based on their ability to explore the world through styles rather than accuracy.

Rainer Schmidt, Rainer Alt, and Alfred Zimmermann propose a network science methodology to understand and visualize the complex structures of multi-platform ecosystems in their paper "Higher-Order Externalities in Multi-Platform Ecosystems". They introduce three new types of higher-order externalities: remote externalities indicating value creation across platforms, transitive externalities representing chains between platforms, and polyadic externalities capturing value creation in relationships between multiple platforms. These concepts address the limitations of traditional externality analysis focused on dyadic relationships. The network-based approach and higher-order externality concepts contribute to understanding the intricacies of multi-platform ecosystems and can inform ecosystem intelligence and management.

The paper "Use or Not: A Qualitative Study on the User Adoption and Abandonment of Voice Shopping with Smart Speakers" by Jiahe Lan, Yu Chen, and Zheng Yan examines user adoption and abandonment of voice shopping using smart speakers. The authors conducted a qualitative study of 43 Tmall Genie users in China. They found that users were initially willing to make low-involvement purchases by voice but tended to limit or abandon voice shopping over time due to time-consuming interactions and mistrust. The authors suggest improvements in technical robustness, conversational product presentation, and cross-platform recommendations to enhance voice shopping systems.

In their paper "Value Added Conversational AI and Digital Health: An Ontology-Driven Approach" Abid Ali Fareedi, Ahmad Ghazawneh, and Magnus Bergquist explore using conversational agents (CAs) and knowledge graphs in healthcare organizations to improve patient flow and reduce waiting times. The

authors used design thinking and conceptual modeling methodologies to develop an ontology-driven approach for building goal-oriented CAs that facilitate information exchange between healthcare practitioners and patients. The ontological models help manage CAs to analyze, structure, and retrieve information to assist work processes in emergency departments. This contribution enables developers to create value-added CAs that improve bottlenecks in information flow, enhance care delivery, and provide better experiences for practitioners and patients.

Finally, Guido Schryen, Mauricio Marrone, and Jiaqi Yang explore the use of generative AI like ChatGPT for literature reviews in information systems research in their paper "Adopting Generative AI for Literature Reviews: An Epistemological Perspective". The authors adopt an epistemological lens to evaluate how these tools support different knowledge-building activities in literature reviews. Their analysis focuses on the innovation potential of generative AI to generate new ideas rather than improve writing. Key insights are offered into how generative AI can aid different literature review tasks, contributing to understanding AI's role in research ideation and knowledge development.

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